

Appendix A: Likelihood of Occurrence

Summary of initial assessment to determine the likelihood of occurrence of threatened species, populations and ecological communities in the proposal site.

An assessment of likelihood of occurrence was made for threatened and migratory species identified from the database search. Additional flora species have been added where the study area is considered to provide potential habitat and additional fauna species that may inhabit the study area have also been included by correlating species habitat requirements with the existing environment. Fish have been omitted from the results due to lack of suitable habitat as have species which are not known from alpine or subalpine environments in NSW.

Five terms for the likelihood of occurrence of species are used in this report. This assessment was based on database or other records, presence or absence of suitable habitat, features of the study area, results of the field survey and professional judgement.

The terms for likelihood of occurrence are defined below:

- “Yes” = the species was or has been observed on the site
- “Likely” = a medium to high probability that a species uses the site
- “Potential” = suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
- “Unlikely” = a very low to low probability that a species uses the site
- “No” = habitat on site and in the vicinity is unsuitable for the species

Scientific Name	Common Name	FM Act	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
FLORA						
<i>Argyrotegium nitidulum</i> syn. <i>Euchiton nitidulus</i>	Shining Cudweed	-	V	V	A mat-forming silver-leaved perennial daisy growing in tall alpine herbfield or open heathland above or close to the treeline. The species is known in NSW only from the high alpine area in the vicinity of Mt Kosciuszko. There is no suitable habitat for the species within the study area.	No
<i>Carex archeri</i>	Archer's Carex	-	E	-	This species is associated with alpine herbfield, sod tussock grassland or alpine heathland and is known in NSW only from the Club Lake and upper Thredbo River areas. There is no suitable habitat for the species within the study area.	No
<i>Carex raleighii</i>	Raleigh Sedge	-	E	-	This rhizomatous perennial herb grows to about 25 cm and has narrow, flat and wiry leaves. The species is very similar to <i>Carex hebes</i> . It is known from a confirmed record from Spencers Creek near Charlottes Pass where it occurs in a broad valley bog on a gentle slope with a patchy cover of moss. The species was not detected within the study area during the survey period despite searches, although it is easily over-looked. However it is considered highly unlikely that the species would occur within the study given its rarity and the very small area of marginal potential habitat within the study area of immediate surrounds.	No
<i>Ranunculus anemoneus</i>	Anemone Buttercup	-	V	V	This perennial forb of the alpine and upper alpine zones tends to occur in areas where snow persists late into the warm season. This perennial forb of the alpine and upper alpine zones tends to occur in areas where snow persists late into the warm season. The species has recovered well after the relaxation of grazing pressure in the alpine areas and is now locally common in a range of communities on the main range between Mt Kosciuszko and Mt Jangungal. Approximately 40 plants were detected during the survey period at three locations with the study area and immediate surrounds.	Yes
<i>Rytidosperma vickeryae</i>		-	E	-	This perennial grass is associated with treeless subalpine streamside vegetation and has been recorded from Perisher, Betts, and Spencers Creeks and tributaries, and Happy Jacks Plain. It is associated with bogs and sphagnum mounds. There is no habitat for the species within the study area.	No
<i>Thesium australe</i>	Austral Toadflax	-	V	V	Occurs in grassland or grassy woodland. Often found in damp sites in association with Kangaroo Grass <i>Themeda australis</i> . There is no suitable habitat for the species within the study area.	No

ENDANGERED ECOLOGICAL COMMUNITIES

Scientific Name	Common Name	FM Act	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps		—	EEC	—	The plant community characterizing this EEC is associated with accumulated peaty or organic-mineral sediments on poorly drained flats in the headwaters of streams. It occurs on undulating tablelands and plateaus, above 400-500 m elevation, generally in catchments with basic volcanic or fine-grained sedimentary substrates or, occasionally, granite. The Upland Bog within and surrounding the study area are part of this EEC.	Yes
Alpine Sphagnum Bogs and Associated Fens		—	—	EEC	This EEC is typically found in alpine, subalpine and montane environments. It contains many endemic species and can usually be defined by the presence of sphagnum moss, even though it may sometimes only be a minor component. It is dominated by shrubs or species such as <i>Empodisma minus</i> and is found in permanently wet areas, such as along streams, valley edges, valley floors and slopes where soils are waterlogged. The Upland Bog within and surrounding the study area are part of this EEC.	Yes
Snowy River Aquatic Ecological Community		EEC	—	—	The bed, banks, floodplains and associated vegetation of the Snowy River and all its tributaries potentially comprise part of this EEC. Perisher Creek and tributaries comprise this EEC. However no creeks will be affected by the proposal.	No
Disclaimer: Data extracted from the Atlas of NSW Wildlife and EPBC Act Protected Matters Report are only indicative and cannot be considered a comprehensive inventory.						
CE = Critically Endangered; E = Endangered; E2 = Endangered Population; EEC = Endangered Ecological Community; V = Vulnerable						

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
MAMMALS					
<i>Burrhamys parvus</i>	Mountain Pygmy-possum	E	E	This species lives only in the alpine and subalpine areas of the highest mountains of Victoria and NSW. It lives in rocky areas where boulders have accumulated below mountain peaks and is frequently associated with alpine heathlands dominated by Mountain Plum Pine <i>Podocarpus lawrencei</i> . The nearest core habitats for the species are several kilometres away at Charlotte Pass and at Mount Blue Cow. The study area provides only marginal habitat for the species as there is no extensive rock outcrops or boulder fields in the immediate vicinity or heathlands dominated by Mountain Plum-pine. It is considered highly unlikely that the species would occur within the study area given the absence of suitable sheltering habitat or preferred foraging habitat within the study area or surrounds.	Unlikely
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V	E	The species prefers moist forest types and is often associated with escarpments. There is no denning habitat for the species within the study area and the potential foraging habitat within the study area would form only a small proportion of the home range of the species, which has been estimated at between 800 ha and 2000 ha. The species may potentially forage in the study area on occasion, however it is unlikely to be dependent upon the habitats there and will not be adversely affected by the proposal.	Unlikely
<i>Mastacomys fuscus</i>	Broad-toothed Rat	V	-	This species occurs in two widely separated areas in NSW, the Barrington Tops area and the wet alpine and subalpine heaths and woodlands of the Kosciuszko NP and adjacent areas. The species lives in a complex of runways through dense vegetation of wet grass, sedge or heath and under the snow in winter. Evidence of the Broad-toothed rat activity was recorded within the study area.	Yes
<i>Pseudomys fumeus</i>	Konoom Smoky Mouse	E	E	Occurs in heath on ridge tops and slopes in sclerophyll forests, heathland and open forest along the coast and inland to sub-alpine regions. Occasionally occurs in ferny gullies. The species has been recorded from subalpine habitats in Victoria and the ACT. The study area does not provide suitable habitat and it would not occur there.	No
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V	—	This bat roosts predominantly in tree hollows and forages in forests, seeming to prefer wet habitats with larger trees. The species is known to utilise montane and subalpine forests and may forage within the study area there from time to time although the study area would not provide any important roosting habitat for the species.	Potential

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
AMPHIBIANS					
<i>Litoria verreauxii alpina</i>	Alpine Tree Frog	E	V	This species occurs in the alpine and subalpine zones of south-eastern NSW and Victoria. It is found in a wide variety of habitats including woodland, heath, grassland and herbfields. It breeds in natural and artificial wetlands including ponds, bogs, fens, streamside pools, dams and drainage channels that are still or slow flowing. The species has disappeared from much of its former range in the last 20 years and is restricted to a few breeding sites in murky ponds. There is no suitable breeding habitat for the species within or nearby the study area and it is considered highly unlikely that it would occur there.	Unlikely
<i>Pseudophryne corroboree</i>	Southern Corroboree Frog	E	E	The Southern Corroboree Frog is limited to sphagnum bogs of the northern Snowy Mountains, in a strip from the Maragle Range in the northwest, through Mt Jagungal to Smiggin Holes in the south. Its range is entirely within Kosciuszko National Park. This species is all but extinct in the wild. It is no longer present at its former southern limit at Smiggin Holes. There is no suitable breeding habitat for the species within or nearby the study area and it is considered highly unlikely that it would occur there.	Unlikely
REPTILES					
<i>Cyclodomorphus praealtus</i>	Alpine She-oak Skink	-	E	In NSW, the species is known from alpine heath and tussock grassland within the Kosciuszko region, preferring treeless or lightly treed areas. The habitats within the study area are unsuitable for this species and it is not expected to occur there.	Unlikely
<i>Loipholis guthega</i>	Guthega Skink	-	CE (Nom)	This species is known from the Snowy Mountains and the Bogong High Plains and is associated with rocky areas in a range of alpine and subalpine vegetation communities. The species lives in extensive colonies associated with a deep burrow network that is constructed in eroded granite and humus soils beneath boulders and shrubs. The study area provides a small amount of potential habitat for the species however it was not detected there despite good survey coverage.	Unlikely
BIRDS					
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V	-	Gang-gang Cockatoos live as pairs inhabiting woodlands of south-eastern Australia. The species feeds primarily on the seeds of eucalypts and acacias and breeds in tree hollows. The species is typically associated with taller montane forests in the region however it does forage in alpine and subalpine woodlands. It is possible that the species may forage within the study area from time to time however it would not breed or roost there.	Likely

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
<i>Ninox strenua</i>	Powerful Owl	V	-	Habitat for this owl species tends to be within eucalypt forest containing a diverse array of understorey plants and appropriate habitat for its primary prey species (gliders and large possums and especially Ringtail Possums). Given the absence of large hollows suitable for breeding and the likely relatively low abundance of preferred prey species it is considered unlikely that the species would occur within the study area.	Unlikely
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	—	The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands, with a nearly continuous distribution in NSW from the coast to the far west (Higgins and Peter 2002; Barrett <i>et al.</i> 2003). It inhabits eucalypt forests and woodlands, especially rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland (DECC 2009). The study area provides a small area of very marginal habitat for the species given the density of the understorey within the Subalpine Woodland, and it is considered unlikely that it would occur within the study area regularly nor be dependent upon the habitats there.	Unlikely
<i>Pachycephala olivacea</i>	Olive Whistler	V	-	This species is usually associated with moist tall forests at high elevations but has been occasionally recorded at lower altitudes. Breeding occurs above 300m within habitats providing both a thick understorey and moderate canopy. In the alps the species is more typically associated with subalpine woodlands with a heathy understorey rather than alpine heaths. It is considered unlikely that the species would occur within the study area and it was not detected there during the survey period.	Unlikely
<i>Melanodryas cucullata</i>	Hooded Robin	V	—	This species generally prefers lightly wooded country, usually open eucalypt woodland, and often occurs in or near clearings or open areas. It requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. The study area provides a small area of very marginal habitat for the species given the density of the understorey where present, and it is considered unlikely that it would occur within the study area regularly nor be dependent upon the habitats there.	Unlikely
<i>Petroica rodinogaster</i>	Pink Robin	V	—	The Pink Robin is found in Tasmania and the uplands of eastern Victoria and far south-eastern NSW, almost as far north as Bombala. It inhabits rainforest and tall, open eucalypt forest, particularly in densely vegetated gullies. In the alps the species is more typically associated with subalpine woodlands with a heathy understorey rather than alpine heaths. It is considered unlikely that the species would occur within the study area and it was not detected there during the survey period.	Unlikely

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
<i>Petroica boodang</i>	Scarlet Robin	V	-	This species is found in south-eastern Australia (extreme south-east Queensland to Tasmania, western Victoria and south-east South Australia) and south-west Western Australia. In NSW it occupies open forests and woodlands from the coast to the inland slopes. Some dispersing birds may appear in autumn or winter on the eastern fringe of the inland plains. The Scarlet Robin breeds in drier eucalypt forests and temperate woodlands, often on ridges and slopes, within an open understorey of shrubs and grasses and sometimes in open areas. Abundant logs and coarse woody debris are important structural components of its habitat. In autumn and winter it migrates to more open habitats such as grassy open woodland or paddocks with scattered trees. There is no suitable habitat for the species within the study area and it is considered unlikely that it would occur there.	Unlikely
<i>Petroica phoenicea</i>	Flame Robin	V	-	The Flame Robin is found in south-eastern Australia (Queensland border to Tasmania, western Victoria and south-east South Australia). In NSW it breeds in upland moist eucalypt forests and woodlands, often on ridges and slopes, in areas of open understorey. It migrates in winter to more open lowland habitats such as grassland with scattered trees and open woodland on the inland slopes and plains. The species is well known from the locality and may potentially use habitats within the study area from time to time for foraging and possibly breeding.	Potential
<i>Rostratula benghalensis australis</i>	Australian Painted Snipe	E	V, M	Resides in swamps, dams and nearby marshy areas that contain grasses, lignum, low scrub or open timber that provides cover. There is no suitable habitat for the species within the study area.	No
<i>Stagonopleura guttata</i>	Diamond Firetail	V	-	This species is found in grassy eucalypt woodlands. The study area provides a small area of very marginal habitat for the species given the density of the understorey within the Subalpine Woodland, and it is considered unlikely that it would occur within the study area regularly nor be dependent upon the habitats there.	Unlikely

Disclaimer: Data extracted from the Atlas of NSW Wildlife and EPBC Act Protected Matters Report are only indicative and cannot be considered a comprehensive inventory. 'Migratory marine species', 'Migratory wetland species', and 'listed marine species' listed on the EPBC Act (and listed on the DEW protected matters report) have not been included in this table, since they are considered unlikely to occur within the study area due to the absence of marine and wetland habitats.

CE = Critically Endangered; E = Endangered; E2 = Endangered Population; V = Vulnerable; M = Migratory; Nom = Nomination

Appendix B: Flora List

SCIENTIFIC NAME	COMMON NAME
<i>Acaena</i> sp.	Bidgee Widgee
<i>Acetosella vulgaris</i> *	Sheep Sorrel
<i>Achillea millefolium</i> *	Yarrow
<i>Astelia psychrocharis</i>	Kosciuszko Pineapple-grass
<i>Baeckea gunniana</i>	Alpine Baeckea
<i>Blechnum penna-marina</i> subsp. <i>alpina</i>	Alpine Water Fern
<i>Carex gaudichaudiana</i>	
<i>Celmsia pugioniformis</i>	
<i>Chionochloa frigida</i>	Ribbony Grass
<i>Craspedia aurantia</i>	A Billy-button
<i>Empodisma minus</i>	Spreading Rope Rush
<i>Epacris paludosa</i>	Swamp Heath
<i>Epilobium gunnianum</i>	Gunn's Willow-herb
<i>Eucalyptus niphophila</i>	Snow Gum
<i>Grevillea australis</i>	Alpine Grevillea
<i>Festuca nigrescens</i> *	Chewings Fescue
<i>Festuca rubra</i> *	Red Fescue
<i>Geranium potentilloides</i>	
<i>Holcus lanatus</i> *	Yorkshire Fog
<i>Hovea montana</i>	Alpine Hovea
<i>Hypochaeris radicata</i> *	Flatweed
<i>Juncus effusus</i> *	Soft Rush
<i>Leptorhynchus squamatus</i>	Scaly Buttons
<i>Luzula novae-cambriae</i>	
<i>Olearia brevipedunculata</i>	
<i>Olearia phlogopappa</i> var. <i>flavescens</i>	Dusty Daisy-bush
<i>Oreomyrrhis eriopoda</i>	Australian Carraway

<i>Orites lancifolia</i>	Alpine Orites
<i>Oxylobium ellipticum</i>	Common Shaggy Pea
<i>Ozothamnus hookeri</i>	Kerosene Bush
<i>Ozothamnus secundiflorus</i>	Cascade Everlasting
<i>Phebalium ovalifolium</i>	
<i>Pimelea alpina</i>	Alpine Rice-flower
<i>Pimelea axiflora</i>	Bootlace Bush
<i>Pimelea ligustrina</i> subsp. <i>ciliata</i>	Kosciuszko Rose
<i>Poa costiniana</i>	Bog Snow Grass
<i>Poa fawcettiae</i>	Smooth Blue Snowgrass
<i>Polystichum proliferum</i>	Mother Shield-fern
<i>Prostanthera cuneata</i>	Alpine Mint Bush
<i>Ranunculus anemoneus</i>	Anemone Buttercup
<i>Ranunculus dissectifolius</i>	
<i>Richea continentis</i>	Candle Heath
<i>Rosaceae</i> sp. <i>Prunis cerasifer</i> ? *	
<i>Tasmannia xerophila</i>	Alpine Pepperbush

Appendix C: Assessment of Significance

EP&A ACT ASSESSMENT OF SIGNIFICANCE (7-PART TEST)

An assessment of the effects of the proposal on threatened species, populations and ecological communities, may be carried out by applying the seven factors from Section 5A of the amended NSW Environmental Planning and Assessment Act 1979 in accordance with gazetted assessment guidelines to each identified threatened species, population and ecological community.

This assessment of significance is presented below for the threatened fauna species Anemone Buttercup, Broad-toothed Rat, Eastern False Pipistrelle, Gang-gang Cockatoo, and Flame Robin, and for the endangered ecological community the Montane Peatlands and Swamps EEC.

Part a)

In the case of a threatened species, whether the action proposed 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

Schedule 2 Vulnerable Species

Flora

Anemone Buttercup *Ranunculus anemoneus* (known occurrence)

The Anemone Buttercup is a perennial forb of the alpine and upper alpine zones which tends to occur in areas where snow persists late into the warm season. The species has recovered well after the relaxation of grazing pressure in the alpine areas and is now locally common in a range of communities on the main range between Mt Kosciuszko and Mt Jangungal. The species is known from a number of locations throughout the Perisher Resort Area and elsewhere in the locality. Approximately 40 plants were detected within the study area and immediate surrounds, including 34 plants and four plants at two separate locations. The plants within the study area occur in areas that are regularly slashed and which are characterised by a mixture of native and exotic grasses and typically in association with areas of impeded drainage.

The Anemone Buttercup individuals within the study area do not occur in the location of any of the proposed tree or rock removal or the relocation of snow making infrastructure. As such, there will be no direct or indirect impacts of the Anemone Buttercup, and safeguards will be incorporated into the proposal to ensure that the Anemone Buttercup individuals within the study area are protected during the implementation of the proposal.

Under these circumstances, the action proposed is highly unlikely to disrupt the life cycle of the Anemone Buttercup such that a viable local population is likely to be placed at risk of extinction.

Fauna

Broad-toothed Rat *Mastacomys fuscus* (Known occurrence)

The Broad-toothed Rat generally occurs in two widely separated areas in NSW, the Barrington Tops area and the wet alpine and subalpine heaths and woodlands of the Kosciuszko NP and adjacent areas. The species lives in a complex of runways through dense vegetation of wet grass, sedge or heath and under the snow in winter. The species appears to be limited to patches of optimal habitat, which is usually close to streams with steep banks, although it will cross unsuitable habitat when dispersing, searching for mates or nest sites. Home ranges range between approximately 0.1 ha and 0.27 ha. Individuals nest alone over summer but congregate in communal nests during winter.

Evidence of the species foraging activity, scats, and runways were recorded throughout the study area and surrounds during the survey period. The mosaic of heath, bog, creeks and rock outcrops in the perisher Front Valley and Centre Valley areas provide excellent habitat for the species which is likely to support a large local population of the species. The species is thought to be locally common in the alpine and high subalpine tracts of the Snowy Mountains area (Green 2002), where suitable habitats are present.

The life cycle of Broad-toothed Rat could be significantly disrupted if:

- Habitats, which may be used as breeding sites, are modified or removed
- Vegetation removal results in the isolation of populations or individuals; or
- The availability of food resources is greatly reduced by vegetation removal or disturbance

Whilst the action proposed will affect a small amount of known habitat for the species, it will affect only a very small amount of the habitat which is available to the species in the Perisher Resort area, and elsewhere in the locality. The removal of Snow Gums trees is unlikely to have any adverse impacts on the species as they do not provide an important habitat resource for the species. The small amount of heath to be affected by the action proposed is insignificant in the context of the amount of heath within the study area and adjoining areas.

It is considered highly unlikely that the action proposed will adversely affect any important nesting sites for the species. Whilst the action proposed will involve the removal of two boulders around which scats of the species were found, these rock habitats are unlikely to comprise important nesting sites for the species. Whilst Broad-toothed Rat scats were present at these two sites, they were present throughout the study area and surrounds, including in association with areas where rock fragments from previous rock removal operations had been piled. The abundance of scats at these two locations was not suggestive of a communal nesting site and no evidence of the grass nests made by the species was detected. Furthermore, the nests of breeding females are typically located close to creek lines in dense mats of Spreading Rope-rush or Poa, neither of which is common within the study area. There is an abundance of alternative rock habitats in the vegetation communities adjoining the study area.

The action proposed will not result in the further fragmentation of the remnant native vegetation within the study area and surrounds or isolate Individuals or population of the Broad-toothed Rat. On the contrary the proposed offset plantings will improve habitat connectivity between patches of remnant vegetation within the area.

Under these circumstances, the action proposed is considered unlikely to disrupt the life cycle of the Broad-toothed Rat such that a viable local population is likely to be placed at risk of extinction.

Eastern False Pipistrelle *Falsistrellus tasmaniensis* (Potential occurrence)

The Eastern False Pipistrelle prefers moist habitats, with trees taller than 20 m. This species generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings (DECC 2005). It is known to forage over large distances and its limited manoeuvrability means that it forages below or near the canopy and usually in forest with an open structure (Law *et al.* 2008). This species has been recorded within the locality and may forage within the study area and surrounds from time to time.

The life cycle of the Eastern False Pipistrelle could be significantly disrupted if:

- Large areas of foraging habitat are removed; or
- Trees with hollows used as important roosting or breeding sites are removed

The proposal will result in the modification of a very small area of potential foraging habitat for this highly mobile species, in the context of the extensive area of similar foraging habitat for the species in the Perisher Resort area and elsewhere in the locality.

The study area does not include any trees with hollows which could potentially support a maternity roost.

The action proposed will not further fragment or isolate any areas of habitat for the species which is highly mobile.

Under these circumstances, the proposal is highly unlikely to have an adverse effect on the life cycle of the Eastern Falsistrelle, such that a viable local population would be placed at the risk of extinction.

Gang-gang Cockatoo *Callocephalon fimbriatum* (Potential occurrence)

In New South Wales, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. It occurs regularly in the Australian Capital Territory, but is rare at the extremities of its range. In summer, this species is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In winter, the Gang-gang Cockatoo may occur at lower altitudes in drier more open eucalypt forests and woodlands, and is often found in urban areas. It may also occur in sub-alpine Snow Gum woodland and occasionally in temperate rainforests (DECC 2005).

The Gang-gang Cockatoo was recorded foraging at Smiggins Holes during the survey period and is likely to occur throughout the Perisher Resort area from time to time during the summer months. However the species would not breed or roost within the study area which does not support any hollow-bearing trees.

The study area provides a very small area of suitable foraging resources for the species. The foraging resources (generally eucalypt trees) to be removed would not be important for the species and occur extensively throughout the locality. Given the extent of foraging resources in the general area, the impacts on the foraging habitats to be affected by the proposal are very minor.

Under these circumstances, the proposal is unlikely to disrupt the life cycle of the Gang-gang Cockatoo such that a viable local population of the species is likely to be placed at risk of extinction.

Flame Robin *Petroica phoenicea* (Potential occurrence)

The Flame Robin is found in south-eastern Australia (Queensland border to Tasmania, western Victoria and south-east South Australia). In NSW it breeds in upland moist eucalypt forests and woodlands, often on ridges and slopes, in areas of open understorey. It migrates in winter to more open lowland habitats such as grassland with scattered trees and open woodland on the inland slopes and plains. There are numerous records of the species throughout the NSW Alps. It was not observed within the study area during the survey period, however it is known from the Perisher Resort area.

The proposal will directly affect a very small amount of potential nesting and foraging habitat for the species. This is negligible in the context of the extensive areas of similar habitat within the Perisher Resort area that will not be affected by the proposal and which will continue to be available to the species. The species is not sedentary and undertakes substantial seasonal migrations, reducing the species dependence on any specific area of known or potential habitat.

Under these circumstances, the proposal is considered unlikely to disrupt the life cycle of the Flame Robin such that a viable local population of the species is likely to be placed at risk of extinction.

Part b)

In the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised.

There are no endangered populations within the study area.

Part c)

In the case of an endangered ecological community, whether the action proposed:

(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.

Montane Peatlands and Swamps

i. Extent of Local Occurrence

The action proposed will not affect the small patches of the Montane Peatlands and Swamps EEC which occur on the margins of the study area and in adjoining areas. These small patches of the community are in relatively good condition and have persisted despite previous clearing associated with the existing ski infrastructure. As such, it is considered unlikely that the community would be adversely affected by the action proposed.

The small patches of the Montane Peatlands and Swamps EEC which occur on the margins of the study area and in adjoining areas are part of a very large local occurrence of the community, extending along the boggy flats associated with Perisher Creek, Rock Creek and the eastern slopes of Mount Piper and estimated to be at least 100 ha in extent.

ii. Composition of Local Occurrence

The composition of the Montane Peatlands and Swamps EEC which occurs on the margins of the study area and in adjoining areas is highly unlikely to be significantly different to the composition in similar habitats within the locality. That is, it is highly unlikely that it supports a unique assemblage of the characteristic species of the community that does not occur elsewhere. In any case, the action proposed will not adversely modify the composition of the community or otherwise adversely affect it such that its local occurrence is likely to be placed at risk of extinction.

Part d)

In relation to the habitat of a threatened species, population or ecological community:

- (i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and*
- (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and*
- (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.*

i. Effects on Extent of Habitat

Threatened Species

Mammals

The action proposed will directly impact on approximately 48 m² of known habitat for the Broad-toothed Rat. The Broad-toothed Rat habitats to be affected overwhelmingly comprise foraging and sheltering habitats and the action proposed will not affect any known communal nesting or likely breeding sites.

The proposal will result in the modification of an insignificantly small amount of foraging habitat for the Eastern False Pipistrelle and will not affect any potential roosting habitat.

Birds

The action proposed will result in the loss of a very small amount of potential foraging habitat for the Gang-gang Cockatoo and potential foraging and breeding habitat for the Flame Robin.

Endangered Populations

There are no endangered populations within the study area.

Endangered Ecological Communities

The action proposed will not affect the local occurrence of the Montane Peatlands and Swamps EEC.

ii. Effects on Habitat Connectivity

Threatened Species

The action proposed will not result in any adverse impacts on habitat connectivity. On the contrary, the proposal involves compensatory plantings of heath species across existing ski runs in three locations, including across the wide expanse of exotic grassland on the lower part of Goats Gully ski run. These actions will enhance connectivity for fauna species between the patches of remnant native vegetation within the area, particularly for small mammals such as the Broad-toothed Rat and reptiles species.

Endangered Populations

There are no endangered populations within the study area.

Endangered Ecological Communities

The action proposed will not affect the local occurrence of the Montane Peatlands and Swamps EEC.

iii. Importance of Habitat to be Affected

Threatened Species

Mammals

The Broad-toothed Rat habitats to be affected overwhelmingly comprise foraging and sheltering habitats and the action proposed will not affect any known communal nesting sites or likely breeding sites. Whilst there is evidence of Broad-toothed Rat use throughout the study area, evidence of Broad-toothed Rat use is common throughout the Front Valley and Centre Valley areas. There are extensive areas of similar or superior habitat in contiguous vegetation elsewhere within the Front Valley and Centre Valley areas and elsewhere within the Perisher Resort area.

Under these circumstances, the habitats to be affected are not considered to be particularly important for Broad-toothed Rat.

The habitats within the study area would not be important for the Eastern False Pipistrelle.

Birds

In the context of the extent of similar habitat available for the Gang-gang Cockatoo and the Flame Robin in the Perisher Resort area and elsewhere in the locality, the habitats within the study area are not considered to be important to the long-term survival of these species in the locality.

Endangered Populations

There are no endangered populations within the study area.

Endangered Ecological Communities

The action proposed will not affect the local occurrence of the Montane Peatlands and Swamps EEC.

Part e)

Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

The action proposed will not affect any critical habitat.

Part f)

Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Recovery Plans

A draft recovery plan has been prepared for the Broad-toothed Rat. The action proposed, in avoiding disturbances to the primary habitats for the species, is consistent with the objectives and actions of this recovery plan.

No recovery plans have been prepared for the Eastern False Pipistrelle, Gang-gang or the Flame Robin.

Threat Abatement Plans

Threat abatement plans have not been prepared for the key threatening process *Clearing of native vegetation* is involved with the action proposed.

Part g)

Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The action proposed involves the key threatening process *Clearing of native vegetation*.

Clearing of native vegetation

Whilst the proposal will result in the removal of approximately 48 m² of Tall Alpine Heath and 41 Snow Gum trees, the vegetation communities to be affected are widespread within the locality and well conserved. Ecology Australia (2002) estimate that there is more than 500 ha of the Tall Alpine Heath with Eucalypts vegetation community between Mount Perisher, Guthega Resort, Mount Blue Cow and Smiggins Holes. In this context the removal or disturbance of approximately 48 m² of the community comprises 0.001 % of the extent between Mount Perisher, Guthega Resort, Mount Blue Cow and Smiggins Hole.

Under these circumstances, any increase in the impact of the key threatening process *Clearing of native vegetation* associated with the action proposed is minor and will not result in a substantial increase in the key threatening process *Clearing of native vegetation*.

Notwithstanding this conclusion, the action proposed has been offset by 300m² of heath planting and rehabilitation and the planting of 82 Snow Gums.

The offset plantings achieve an offset ratio for Snow Gums of 2:1, and approximately 8:1 for Alpine Heath.

EPBC ACT SIGNIFICANT IMPACT CRITERIA ON MIGRATORY SPECIES

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

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

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

No threatened and migratory species listed under the EPBC Act are considered likely to occur within the study area. Only Natter of National Environmental Significance, the Alpine Sphagnum Bogs and Associated Fens EEC, is known to occur within the study area and immediate surrounds.

The relevant Significant Impact Criteria have been applied to Alpine Sphagnum Bogs and Associated Fens EEC to determine the significance of impacts associated with the proposal.

MATTERS TO BE ADDRESSED	IMPACT (COMMONWEALTH LEGISLATION)
(a) any environmental impact on a World Heritage Property or National Heritage Places;	No. The proposal does not impact on a World Heritage Property nor a National Heritage Place as addressed in the SEE. (listed natural: Australian Alpine National Parks and Reserves; nominated historic: Snowy Mountains Scheme NSW).
(b) any environmental impact on Wetlands of International Importance;	No. The proposal will not affect any part of RAMSAR wetland.
(c) any impact on Commonwealth Listed Critically Endangered or Endangered Species or Endangered Ecological Communities;	No. The study area does not provide potential habitat for any Commonwealth listed endangered entities.
(d) any impact on	No. The study area does not provide potential habitat for any Commonwealth listed

MATTERS TO BE ADDRESSED	IMPACT (COMMONWEALTH LEGISLATION)
Commonwealth Listed vulnerable Species;	vulnerable species.
(e) Any impact on a Commonwealth Endangered Ecological Community	<p>Yes: The Alpine Sphagnum Bogs and Associated Fens endangered ecological community occurs within the study area. However the proposal has been designed to avoid any adverse impacts on the community.</p> <p>The significant impact criteria in terms of endangered ecological communities are discussed below:</p> <p><i>a. reduce the extent of an ecological community</i> The proposal will not reduce the extent of the Alpine Sphagnum Bogs and Associated Fens EEC which occurs within study area and surrounds.</p> <p><i>b. adversely affect habitat critical to the survival of an ecological community</i> The proposal will not reduce the extent of the Alpine Sphagnum Bogs and Associated Fens EEC which occurs within study area and surrounds.</p> <p>The local occurrence of the community is known to be at least 100 ha in extent.</p> <p>Under these circumstances, the action proposed will not adversely affect the extent of the Alpine Sphagnum Bogs and Associated Fens EEC such that its local occurrence is likely to be placed at risk of extinction.</p> <p><i>c. modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns</i> The proposal will not reduce the extent of the Alpine Sphagnum Bogs and Associated Fens EEC which occurs within study area and surrounds.</p> <p>The proposal has been designed so as to not modify or destroy the abiotic factors necessary for the survival of the EEC. The EEC occurs in small patches on the margins of the study area and surrounds. These small patches of the community are in relatively good condition and have persisted despite previous clearing associated with the existing ski infrastructure. As such, it is considered unlikely that action proposed will jeopardise the overall survival of the community, which is very extensive in the locality.</p> <p><i>d. cause a substantial change in the species composition of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting.</i> The study area does not support a unique assemblage of characteristic flora species of the Alpine Sphagnum Bogs and Associated Fens EEC that does not occur elsewhere within the local occurrence. Similarly, the fauna assemblage inhabiting the study area is likely to be distributed throughout the local occurrence and contiguous vegetation. Fauna species such as invertebrates, amphibians, reptiles, birds, and mammals utilising foraging substrates within the study area would not be restricted to the areas affected by the action proposed and would be highly likely to continue to utilise habitats in the remainder of the local occurrence.</p> <p><i>e. cause a substantial reduction in the quality or integrity of an ecological community, including, but not limited to:</i> <i>-assisting invasive species, that area harmful to the listed ecological community, to become established, or</i> <i>-causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants in the ecological community which kill or inhibit the growth of species in the ecological community</i></p> <p>The proposal includes appropriate safeguards to limit the potential for invasive plants or</p>

MATTERS TO BE ADDRESSED	IMPACT (COMMONWEALTH LEGISLATION)
	<p>pathogens to encroach upon the Alpine Sphagnum Bogs and Associated Fens EEC. It will also include safeguards which limit the potential for any chemicals or pollutants to enter the Alpine Sphagnum Bogs and Associated Fens EEC in association with the action proposed.</p> <p><i>d. interfere with the recovery of an ecological community</i></p> <p>The Alpine Sphagnum Bogs and Associated Fens EEC has recovered well since the cessation of grazing in the NSW alps and is one of the most common vegetation communities in alpine and subalpine habitats. It has also recovered well since the 2003 wildfires.</p> <p>The proposal, will not reduce the extent of the Alpine Sphagnum Bogs and Associated Fens EEC, will not interfere with any wider recovery of the community, which is only potentially threatened by impacts associated with climate change, the re-introduction of grazing or adverse fire regimes.</p>
(f) any environmental impact on Commonwealth Listed Migratory Species;	No. Commonwealth Listed Migratory Species known from the locality are limited to the Australian Painted Snipe. The Australian Painted Snipe is highly unlikely to occur within the study area nor be dependent upon the habitats there. The proposal will not have any adverse impacts on any listed migratory species.
(g) does any part of the Proposal involve a Nuclear Action;	No. The project does not include a Nuclear Action.
(h) any environmental impact on a Commonwealth Marine Area;	No. There are no Commonwealth Marine Areas within the study area.
(i) In addition, any direct or indirect impact on Commonwealth lands	No. The project does not directly or indirectly affect Commonwealth land.

HEAD OFFICE

Suite 4, Level 1
2-4 Merton Street
Sutherland NSW 2232
T 02 8536 8600
F 02 9542 5622

CANBERRA

Level 2
11 London Circuit
Canberra ACT 2601
T 02 6103 0145
F 02 6103 0148

COFFS HARBOUR

35 Orlando Street
Coffs Harbour Jetty NSW 2450
T 02 6651 5484
F 02 6651 6890

PERTH

Suite 1 & 2
49 Ord Street
West Perth WA 6005
T 08 9227 1070
F 08 9322 1358

DARWIN

16/56 Marina Boulevard
Cullen Bay NT 0820
T 08 8989 5601

SYDNEY

Level 6
299 Sussex Street
Sydney NSW 2000
T 02 8536 8650
F 02 9264 0717

NEWCASTLE

Suites 28 & 29, Level 7
19 Bolton Street
Newcastle NSW 2300
T 02 4910 0125
F 02 4910 0126

ARMIDALE

92 Taylor Street
Armidale NSW 2350
T 02 8081 2681
F 02 6772 1279

WOLLONGONG

Suite 204, Level 2
62 Moore Street
Austinmer NSW 2515
T 02 4201 2200
F 02 4268 4361

BRISBANE

PO Box 1422
Fortitude Valley QLD 4006
T 0400 494 366

ST GEORGES BASIN

8/128 Island Point Road
St Georges Basin NSW 2540
T 02 4443 5555
F 02 4443 6655

NAROOMA

5/20 Canty Street
Narooma NSW 2546
T 02 4476 1151
F 02 4476 1161

MUDGEES

Unit 1, Level 1
79 Market Street
Mudgee NSW 2850
T 02 4302 1230
F 02 6372 9230

GOSFORD

Suite 5, Baker One
1-5 Baker Street
Gosford NSW 2250
T 02 4302 1220
F 02 4322 2897