

**BEFORE THE HEARINGS PANEL  
FOR THE QUEENSTOWN LAKES PROPOSED DISTRICT PLAN**

**IN THE MATTER** of the Resource  
Management Act 1991

**AND**

**IN THE MATTER** of the Rezoning Hearing  
Stream 11 (Ski Area  
Sub Zones)

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**STATEMENT OF EVIDENCE OF KELVIN MICHAEL LLOYD  
ON BEHALF OF QUEENSTOWN LAKES DISTRICT COUNCIL**

**ECOLOGIST – REMARKABLES AND CORONET**

**10 March 2017**

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## 1. INTRODUCTION

- 1.1 My name is Kelvin Michael Lloyd. I am a Senior Ecologist based in Dunedin, and I have been employed as such by Wildland Consultants Ltd. since 2004. Prior to this I worked for Landcare Research as a post-Doctoral Fellow for three years, and I have 15 years' experience as a practicing ecologist. I have a Ph.D and B.Sc.(hons) from the University of Otago, where my studies were primarily undertaken in the Department of Botany. I am a member of the New Zealand Ecological Society, the New Zealand Botanical Society, the Botanical Society of Otago, the New Zealand Plant Conservation Network, the Ornithological Society of New Zealand, and the New Zealand Biosecurity Institute.
- 1.2 I have considerable experience in alpine tussock grassland habitats, having previously undertaken research on the ecology of tussock grassland and alpine vegetation.<sup>1</sup> More recently I have assessed ecological values in montane and alpine habitats on several pastoral leases and other properties in the Queenstown area, including Mt Dewar, adjacent to Coronet Peak Ski Field, and Lowburn Valley, Robrosa, and Mt Difficulty pastoral leases in the Kawarau Gorge and Cardrona River catchments. I also wrote a report on ecological processes in the South Island high country for the Parliamentary Commissioner of the Environment's investigation into tenure review of pastoral leases.
- 1.3 I have undertaken a number of other ecological assessments in the Queenstown Lakes District (**District**), including sites at Wanaka, Hawea, and Glenorchy.
- 1.4 I undertook site visits to assess indigenous vegetation and habitats within the areas covered by the Coronet Ski Area Sub Zone extension requests on 30 January 2017, and within the areas covered by the Remarkables Ski Area Sub

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1 E.g. Lloyd K.M., Pollock M.L., Mason N.W.H. and Lee W.G. (2010). Leaf trait-palatability relationships differ between ungulate species: evidence from cafeteria experiments using naive tussock grasses. *New Zealand Journal of Ecology* 34: 219-226.  
Pirie, M.D., Lloyd, K.M., Lee, W.G., Marti, M., and Linder, H.P. (2010). Diversification of *Chionochloa* (Poaceae) and biogeography of the New Zealand Southern Alps. *Journal of Biogeography* 37: 379-392.  
Lloyd, K.M.; Lee, W.G.; Fenner, M. and Loughnan, A.E. (2003). Vegetation change after artificial disturbance in an alpine *Chionochloa pallens* grassland in New Zealand. *New Zealand Journal of Ecology* 27: 31-36.  
Lee, W.G.; Fenner, M.; Loughnan, A. and Lloyd, K.M. (2000) Long-term effects of defoliation: incomplete recovery of a New Zealand alpine tussock grass, *Chionochloa pallens*, after twenty years. *Journal of Applied Ecology* 37: 348-355

Zone extension requests on 31 January 2017. These assessments were undertaken on foot, during which I noted the types of indigenous vegetation and habitat present, and compiled lists of plant and bird species observed. The assessments generally required 1-2 hours within each proposed Ski Area Sub Zone (**SASZ** or **Sub Zone**) site.

- 1.5 I have had no previous role with the review of the Queenstown Lakes Proposed District Plan (**PDP**).
- 1.6 Apart from reviewing a 2014 report completed by another staff member at Wildlands Consultants Ltd, relating to a retrospective consent sought for clearance of a wetland in the Remarkables Ski Field, I have undertaken no previous work for the operators of the Remarkables or Coronet Peak ski fields or their contractors. In 2011 Wildland Consultants mapped wetlands within the Remarkables Ski Field and adjacent areas, and assessed their ecological significance, but this work was undertaken for the Department of Conservation (**DOC**).
- 1.7 Although this is a Council hearing, I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014 and that I agree to comply with it. I confirm that I have considered all the material facts that I am aware of that might alter or detract from the opinions that I express, and that this evidence is within my area of expertise, except where I state that I am relying on the evidence of another person.
- 1.8 The Queenstown Lakes District Council (**QLDC** or **Council**) has commissioned me to provide expert ecological evidence in relation to the submissions that seek an extension of the SASZ located at the Remarkables and Coronet Peak.
- 1.9 I asked Wildland Consultants GIS staff to digitise in ArcGIS the areas covered by the SASZ extension requests from these submissions, so as to prepare field maps showing these requested SASZ extensions. The areas I refer to in my following evidence are based on these digitised areas.

**1.10** The key documents I have used, or referred to, in forming my view while preparing this brief of evidence are:

- (a) Evidence of Mr Glenn Davis (ecologist) for QLDC for the Rural Hearing Stream 02, dated 6 April 2016 **[CB48]**;
- (b) Section 42A report for Indigenous Vegetation and Biodiversity Chapter 33 dated 7 April 2016 **[CB45]**;
- (c) Right of Reply for Indigenous Vegetation and Biodiversity Chapter 33 dated 3 June 2016 **[CB46]**;
- (d) Reply Chapter 33, Indigenous Vegetation and Biodiversity dated 3 June 2016 **[CB22]**;
- (e) Reply Chapter 21, Rural dated 3 June 2016 **[CB15]**; and
- (f) A QLDC decision (RM160085) on a resource consent application for earthworks and clearance of indigenous vegetation and habitats within the Remarkables Ski Field.

## **2. SCOPE**

**2.1** I consider, from an ecology perspective, the appropriateness of submissions that seek that land zoned Rural General at Remarkables and Coronet Peak be included within the SASZ.

**2.2** In assessing the site-specific submissions, I have considered the significance of indigenous vegetation and habitats at each site, the likely effects that ski field development (or "Ski Area Activities" as defined in the PDP) could have in those areas, the relevant PDP policy framework that would apply to these areas, and other legal instruments that would apply.

**2.3** All references to PDP provision numbers, are to the Council's Reply version of those provisions (unless otherwise stated).

## **3. EXECUTIVE SUMMARY**

### **Extension of Ski Area Sub Zone at Remarkables**

**3.1** I do not oppose the request to include the strip of land between the existing SASZ and the Central Otago District boundary from an ecological perspective, because large parts of this area comprise poorly-vegetated boulderfield and

scree, and clearance of indigenous vegetation would be subject to DOC approval, or would otherwise be a discretionary activity.

- 3.2** I also do not oppose the request for Sub Zone (B) (being 21.67 ha of land located at the base of the Remarkables Ski Field access road), as there are no important ecological values present that would be affected by ski area developments.

#### **Extension of Ski Area Sub Zone at Coronet Peak**

- 3.3** I oppose the extension of the Sub Zone extension into the Back Bowls area, as this area is relatively intact and vulnerable to the adverse effects of ski field activities.

- 3.4** I do not oppose the extension of the Sub Zone into Dirty Four Creek, with vegetation clearance being a discretionary activity, as this catchment has already been modified by ski field activities, and the landforms are less steep and less vulnerable to the propagation of potential adverse effects.

### **4. BACKGROUND**

- 4.1** Within the District, indigenous vegetation above 1,100 metres above sea level (**masl**) is more intact and representative than that which remains on montane hill slopes and valley and in basin floors.<sup>2</sup> The District includes a broad gradient between western mountains with high rainfall, and eastern basins and valley floors that are relatively dry. The strong habitat diversity caused by this gradient results in high botanical diversity within the District.<sup>3</sup>

- 4.2** Coronet Peak Ski Field ranges from approximately 1,100 to 1,651 masl, while Remarkables Ski Field is generally higher, ranging from approximately 1,600 to 1,950 masl.

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2 [CB48] at paragraph 4.5.

3 [CB48] at paragraph 4.3.

- 4.3** Coronet Peak Ski Field lies within the Coronet Peak Recreation Reserve, a Recreation Reserve under section 17 of the Reserves Act 1977, and also on a Crown Pastoral Lease administered by Land Information New Zealand (**LINZ**). It is also subject to a Queen Elizabeth the Second National Trust (**QEII**) open space covenant that covers Coronet Peak Station [**CB72**].
- 4.4** Remarkables Ski Field lies within the Rastus Burn Recreation Reserve, also a reserve under section 17 of the Reserves Act 1977, but differs by being conservation land administered by DOC. Land surrounding the Rastus Burn Recreation Reserve comprises the Remarkables Conservation Area, which has the status of a Stewardship Area under section 25 of the Conservation Act 1987.
- 4.5** Under section 17 of the Reserves Act 1977, Recreation Reserves have the purposes of providing areas for the recreation and sporting activities and physical welfare and enjoyment of the public, and for the protection of the natural environment and beauty of the countryside, with emphasis on the retention of open spaces and on outdoor recreation activities.
- 4.6** Under section 25 of the Conservation Act 1987, Stewardship Areas are to be managed so that their natural and historic resources are protected.
- 4.7** The QEII Open Space Covenant on Coronet Peak Station includes an objective to protect and enhance indigenous biodiversity and encouraging the restoration of indigenous vegetation and animal species, including threatened species.

#### **Relevant PDP plan provisions – Council Reply position**

- 4.8** I am aware that under Rule 33.3.2.3 of the PDP, the Indigenous Vegetation and Biodiversity rules [**CB22**] apply to Ski Area Sub Zones. The clearance of indigenous vegetation within Alpine Environments – land higher than 1,070 masl is a Discretionary Activity in all circumstances (Rule 33.5.10). The only exemption is in Rule 33.3.4.4 where in the SASZ, on land administered under the Conservation Act 1987, indigenous vegetation clearance is exempt from the rules where the relevant approval has been obtained from DOC. The clearance must not exceed the approval, the Council must be provided with a copy of the application and approval, and the Council must be satisfied that

the application adequately identifies the indigenous vegetation to be cleared and the effects of the clearance.

**4.9** This "DOC land" exemption applies to the area proposed for extension of the SASZ adjacent to the Rastus Burn Recreation Reserve (Remarkables Ski Field), but not to the SASZ extension requests at the base of the Remarkables Ski Field access road and covered by the SASZ extension requests adjacent to the Coronet Peak Recreation Reserve.

**4.10** As described above, I reviewed a previous non-notified resource consent (RM160085) granted to NZ Ski for clearance of indigenous vegetation within the Remarkables Ski Field area and Rastus Burn Conservation Area, to allow burial of a water pipeline from Lake Alta. Indigenous vegetation, habitats, and species were well-described in the information accompanying the resource consent application, and in my opinion the conditions attached to the consent were robust, including requiring the reinstatement of the cleared indigenous vegetation. If future consent applications for indigenous vegetation clearance are made, I consider that the discretionary activity status provides QLDC with the ability to consider all relevant ecological issues, and to impose robust conditions to avoid, remedy, or mitigate any adverse effects.

**4.11** In terms of relevant definitions, the Council's position on the "Ski Area Activities" and "passenger lift systems" definitions are as follows **[CB2]**:

<p><b>Ski Area Activities</b></p>	<p>Means the use of natural and physical resources for the purpose of <del>providing for</del> <u>establishing, operating and maintaining the following activities and structures:</u></p> <ul style="list-style-type: none"> <li>• recreational activities either commercial or non-commercial;</li> <li>• <del>chairlifts, t-bars and rope tows to facilitate commercial recreational activities</del> <u>passenger lift systems;</u></li> <li>• use of snowgroomers, snowmobiles and 4WD vehicles for support or operational activities-;</li> <li>• activities ancillary to commercial recreational activities <u>including avalanche safety, ski patrol, formation of snow trails and terrain-;</u></li> <li>• <u>installation and operation of snow making infrastructure including reservoirs, pumps and snow makers-; and</u></li> </ul>
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	<ul style="list-style-type: none"> <li>in the Waiorau Snow Farm Ski Area Sub Zone vehicle and product testing activities, being activities designed to test the safety, efficiency and durability of vehicles, their parts and accessories.</li> </ul>
<b><u>Passenger Lift Systems</u></b>	<u>Means any mechanical system used to convey or transport passengers within or to a Ski Area Sub-Zone, including chairlifts, gondolas, T-bars and rope tows, and including all moving, fixed and ancillary components of such systems such as towers, pylons, cross arms, pulleys, cables, chairs, cabins, and structures to enable the embarking and disembarking of passengers. Excludes base and terminal buildings.</u>

**4.12** Ski Area Activities within the SASZ are permitted activities (Rule 21.4.18). Table 7 of Chapter 21 **[CB15]** is relevant to the SASZ, with the activities listed in that table being controlled activities (with the exception of Visitor Accommodation, which is restricted discretionary). Controlled activities include the construction, relocation, addition or alteration of a building (which would include a terminal/base building), and Passenger Lift Systems. Car parks and commercial activities are not included in the Ski Area Activities definition and so would be assessed under the general provisions for the underlying Rural zone (although I note commercial recreational activities are a Ski Area Activity).

**4.13** I also understand that, under Rule 21.4.19, Ski Area Activities not located within a SASZ are non-complying activities, with the specific exception of commercial heli-skiing which is to be treated as a commercial recreation activity under Rule 21.4.16 and therefore permitted if it met the standards in Table 5. Otherwise commercial recreational activities fall within the definition of Ski Area Activities. Visitor Accommodation is a restricted discretionary activity through reply Rule 21.5.X.<sup>4</sup>

## **Earthworks**

**4.14** I understand that earthworks in the SASZ are currently exempt from the earthworks rules in the Operative District Plan, Chapter 22. I also understand that Council has resolved to notify the earthworks chapter in Stage 2 of the Review as far as it applies to Volume 1 land (ie which includes the land I am considering in this evidence), and therefore I do not know at this point in time whether earthworks in the SASZ will remain exempt, or whether specific

<sup>4</sup> "X" appears to be a placeholder in this reply rule number.

standards will be notified in Stage 2. I refer to Section 5 of Ms Banks' strategic statement of evidence, where she states that it would not be reasonable to assume that the current exemption for earthworks in the SASZ, will extend to any new land zoned SASZ through this hearing.

## **Overview of the Remarkables and Coronet Peak Ski Fields**

- 4.15** Coronet Peak Ski Field occupies relatively stable landforms at lower elevation to the Remarkables Ski Field, and is therefore well-vegetated. Vegetation is predominantly tall tussock grassland dominated by narrow-leaved snow tussock (*Chionochla rigida* subsp. *rigida*) and inaka (*Dracophyllum rosmarinifolium*). The ski field within the Recreation Reserve has been subject to various developments including construction of vehicle tracks, lifts, water reservoirs, snow-making equipment, and smoothing of trails. Some of these activities have resulted in clearance of indigenous vegetation and habitat and its replacement by exotic vegetation, mostly comprising swards of browntop (*Agrostis capillaris*). Some revegetation of cleared areas is being undertaken by planting of narrow-leaved snow tussock.
- 4.16** In contrast, Remarkables Ski Field is only well-vegetated in the central parts of its basins, with upper slopes comprising rock tors on ridges, and extensive boulderfields and screes below these. A number of wetlands are present in the basin floor, largely dominated by comb sedge (*Oreobolus pectinatus*) or bog rush (*Schoenus pauciflorus*), and the uncommon sedge *Carex berggrenii* (At Risk-Naturally Uncommon) is present in several of them.<sup>5</sup> The balance comprises tussock grassland, with slim snow tussock (*Chionochla macra*) dominating at higher elevation, and narrow-leaved snow tussock at lower elevation.
- 4.17** Ski field development activities within the existing Remarkables Ski Field include construction of buildings, roads, and ski lifts, and installation of snow-making facilities. While buildings and roads have cleared and displaced indigenous vegetation and habitats, ski lift towers and snow making facilities have generally been installed in a manner that has avoided significant adverse effects on indigenous vegetation and habitats.

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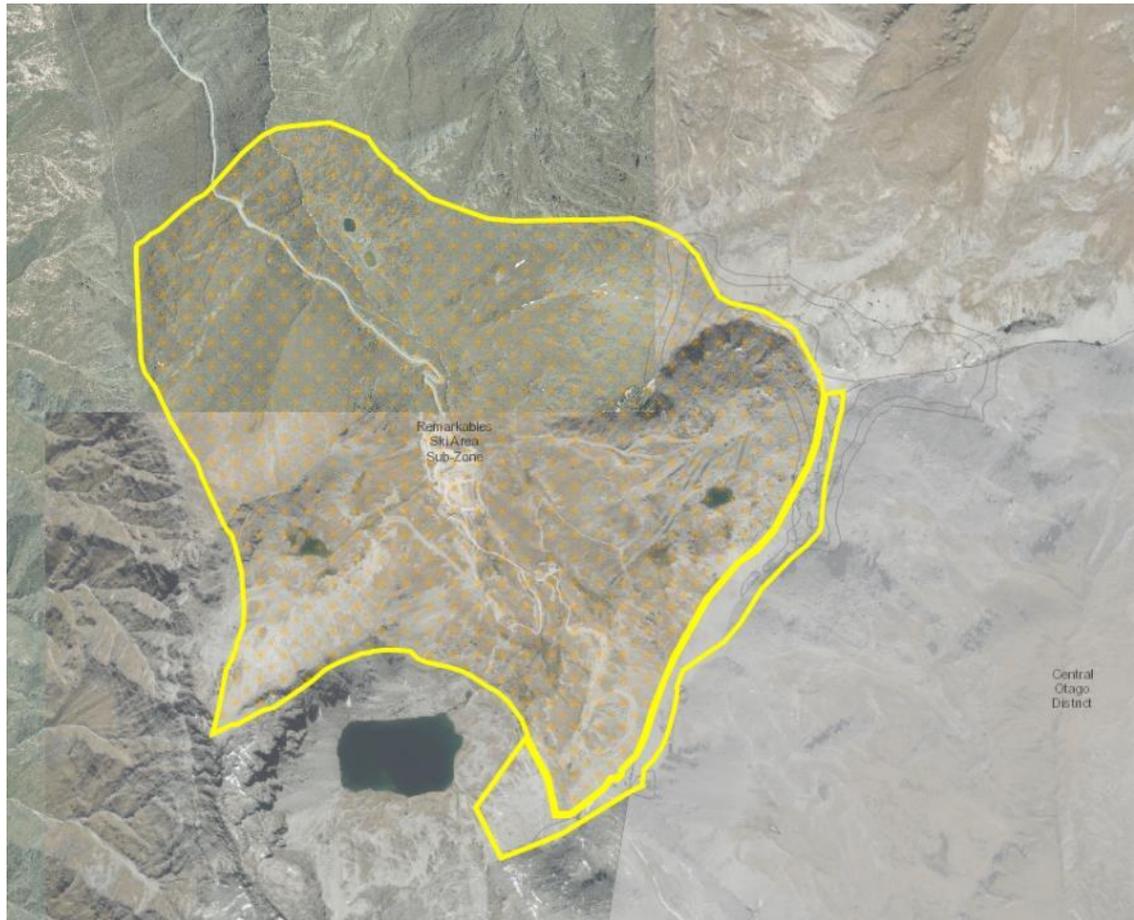
<sup>5</sup> Wildland Consultants 2011: Assessment of wetlands at the Remarkables Ski Area, Queenstown. *Wildland Consultants Contract Report No. 2662*. Prepared for the Department of Conservation.

## 5. THE REMARKABLES SKI AREA SUB ZONE

5.1 **Figures 1 and 2** below show the two areas sought to be extended by NZSki Limited (572). These figures are taken from Ms Banks' second statement of evidence.



**Figure 1:** Remarkables Ski Area Extension (proposed Ski Area Sub Zone B)



**Figure 2:** Remarkables Ski Area Extension (upper eastern margin of SASZ)

**NZSki Limited (572)**

(supported by QPL FS1097, opposed by Ian Dee FS1081, opposition/support not stated - Grant Hensman and others FS1337)

**5.2** NZSki has sought that 21.67 ha of land located at the base of the Remarkables Ski Field access road (on PDP Planning Map 13 **[CB27]**), be included within a new 'Ski Area Sub Zone (B)', which would allow for commercial activity, accommodation, and buildings. The Council's position on these activities is set out earlier in section 4.

**5.3** This particular land is *not* administered under the Conservation Act 1987.

**5.4** This 21.67 ha parcel of land at the base of the ski field access road comprises a former sparse shrubland of matagouri (*Discaria toumatou*) and mingimingi (*Coprosma propinqua*) that has been extensively invaded by exotic trees and shrubs, especially hawthorn (*Crataegus monogyna*) but also sycamore (*Acer pseudoplatanus*), elder (*Sambucus nigra*), crack willow (*Salix fragilis*), sweet

brier (*Rosa rubiginosa*), buddleia (*Buddleia davidii*), Scotch broom (*Cytisus scoparius*), and seedlings of wilding conifer species (**Figure 3**). Numerous exotic grass and herb species are also present. An incised, unnamed stream passes through the upper eastern part of the area, and wilding conifers have been felled on the true left (eastern) bank. The vegetation is similar, albeit more dense, on the slopes above the stream.



**Figure 3:** Sparse indigenous shrubs (foreground) and extensive invasion of exotic woody weeds in the requested Ski Area Sub Zone 'B' at the base of the Remarkables Ski Field access road.

- 5.5** Ecological values of terrestrial indigenous vegetation and habitat within the site are low, and do not pose any issues or constraints for Ski Area Activities (permitted), Passenger Lift Systems (controlled) or provision of visitor accommodation (as a restricted discretionary activity under the Council's provisions). These activities could have beneficial effects if they resulted in better control of the exotic woody weeds currently infesting the site.
- 5.6** NZSki has also sought that 29.67 ha of land located at the upper eastern margin of the notified SASZ (on PDP Planning Map 13), is included as an extension of that Sub Zone, which would allow for commercial activity,

accommodation, and buildings. This particular land is administered under the Conservation Act 1987.

- 5.7** This area of land comprises the strip between the notified SASZ and the territorial boundary of Central Otago District, which loosely follows the ridge between the Rastus Burn and Doolans Creek catchments, and an extension of the SASZ onto the slopes above and east of Lake Alta. There are two main habitat types within this area. Eroding rock tors, and associated boulderfield and scree alternates with sparse cushionfield where the ridge lacks eroding rock tors.
- 5.8** Boulderfield and scree habitats are only sparsely vegetated (**Figure 4**), principally by scattered *Hebe epacridea* shrubs. In occasional stable sites, vertical strips of slim snow tussock grassland are present, and occasional clumps of *Aciphylla lecomtei*. A distinctive habitat is damp, stable gravel at the base of some rock outcrops, which provides habitat for indigenous species such as *Pimelea oreophila*, *Koeleria cheesemanii*, *Leptinella pectinata* subsp. *villosa*, *Carex wakatipu*, *Raoulia youngii*, *Acaena saccaticupula*, *Pachycladon novae-zelandiae*, *Haastia sinclairii*, and *Craspedia lanata*.



**Figure 4:** Relatively stable scree slopes within the proposed rezone area above Lake Alta.

**5.9** Cushionfield comprises sparse cushions of *Myosotis pulvinaris*, *Hectorella caespitosa*, *Raoulia hectorii*, *R. youngii*, *Anisotome imbricata* subsp. *imbricata*, and blue tussock (*Poa colensoi*) in very exposed sites (Figure 3), and *Dracophyllum muscoides*, *D. pronum*, *Aciphylla kirkii*, *Kelleria childii*, *Chionohebe thomsonii*, *Raoulia hectorii*, and *Epilobium porphyrium* in patches of turf in more sheltered locations and on stable scree.

**5.10** All of the above species are typical of high alpine habitats, and apart from *Aciphylla lecomtei* (At Risk-Naturally Uncommon), none are classified as Threatened or At Risk.<sup>6</sup>

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<sup>6</sup> de Lange P., Rolfe J., Champion P., Courtney S., Heenan P., Barkla J., Cameron E., Norton D. and Hitchmough R. 2013: Conservation status of New Zealand indigenous vascular plants, 2012. *New Zealand Threat Classification Series 3*. Department of Conservation, Wellington. 70 pp.



*Figure 5: Cushionfield vegetation on stable, exposed, gently sloping ground in the centre of the requested rezone area. Tall eroding rock tors and unstable scree slopes can be seen in the background, also within the requested rezone area.*

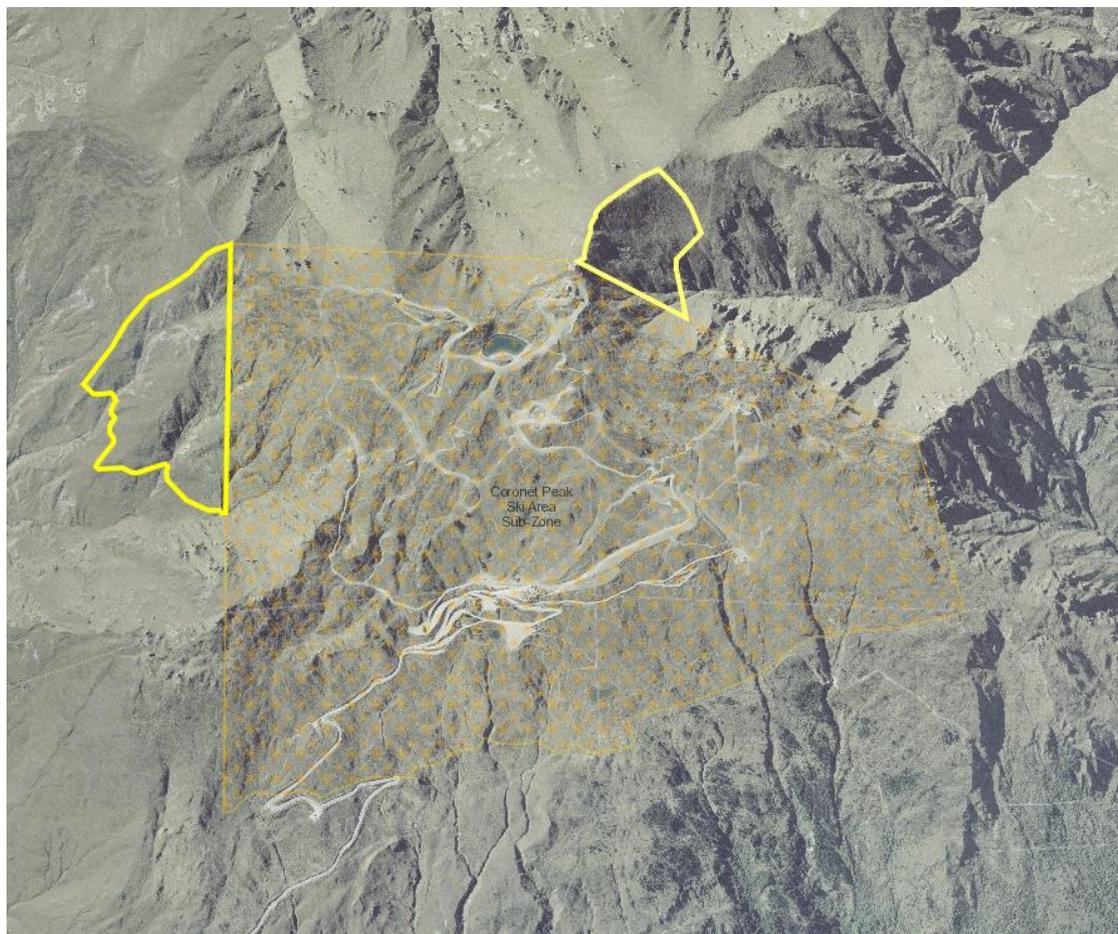
- 5.11** As this area falls with the "DOC land" exemption in Rule 33.5.10 **[CB22]** (whether above or below 1070 masl), there would be no need for a consent through the PDP provided the standards in Rule 33.3.4.4 are met. If the DOC land standards were not met, clearance of indigenous vegetation above 1,070 masl would require a discretionary activity consent, thus allowing full consideration of the effects of clearance.
- 5.12** As such, I consider that expansion of the SASZ, and allowing Ski Area Activities as a permitted activity into the area adjoining the Central Otago District would be adequately addressed by the PDP rules. The clearance of indigenous vegetation would have the status of a discretionary activity or if on land administered under the Conservation Act 1987 and the standards were met, DOC would have already considered the purpose for which the land is held (conservation of natural and historic resources) in its decision-making, and acceptance by the Council would depend on the quality of the application information provided. Given the extensive areas of very sparsely-vegetated

boulderfield and scree, there should be scope to avoid effects on the more vegetated habitats.

5.13 Therefore overall, I do not oppose the extensions to the SASZ at the Remarkables sites.

## 6. CORONET PEAK SKI AREA SUB ZONE

6.1 **Figure 6** below shows the areas sought to be extended by NZSki Limited (572). This figure is taken from Ms Banks' second statement of evidence.



**Figure 6:** Proposed SASZ Extension at 'Dirty Four Creek' (left of image) and the 'Back Bowls' (right of image)

## **NZSki Limited (572)**

- 6.2** NZSki has sought that the SASZ for Coronet Peak is extended to include two areas of land, known as 'Back Bowls' (14.8 ha) and 'Dirty Four Creek' (35.21 ha), at the western and eastern margins of the notified SASZ, respectively.
- 6.3** None of the subject land is land administered under the Conservation Act 1987.
- 6.4** The Back Bowls area occurs on slopes from 1,300-1,600 masl at the head of Coronet Creek. The indigenous vegetation in these areas is relatively intact with exotic plant species at low abundance. Three distinct areas of habitat are present within the area (**Figure 7**).



**6.5** On stable slopes in the north-eastern part of the requested rezone area, tauhinu (*Ozothamnus vauvilliersi*) and *Hebe hectori* are common while slim snow tussock is occasionally present (**Figures 7 and 8**), along with a wide range of indigenous inter-tussock herbs and grasses. The exotic grass browntop and exotic herbs such as mouse-ear hawkweed (*Pilosella officinarum*) and catsear (*Hypochaeris radicata*) are present, but at low

abundance. This vegetation is broadly similar to that which occurs within the existing (ODP) SASZ.

- 6.6** In the central-southern part of the requested SASZ extension area, prominent rock tors are present on steep upper slopes, and steep gullies below these bluffs have eroding margins (**Figures 6 and 8**). Habitat diversity is high in this area, with some areas dominated by inaka and some by narrow-leaved snow tussock. Additional very steep slopes and open gravel areas provide habitat for a distinctive suite of indigenous plant species, including *Rytidosperma setifolia*, *Raoulia apicinigra*, *Acaena saccaticupula*, *Epilobium glabellum*, *E. porphyrium*, *Agrostis muelleriana*, *Celmisia laricifolia*, *Coprosma niphophila*, *Leptinella pectinata* subsp. *villosa*, *Colobanthus strictus*, *Anaphalioides bellidioides*, *Gunnera monoica*, *Uncinia divaricata*, *Koeleria cheesemanii*, *Argyrotegium mackayi*, and the alpine form of *Cardamine* aff *bilobata*.



**Figure 8:** Slim snow tussock grassland (foreground), with steep, naturally eroding landforms from upper left to lower right, and stable narrow-leaved snow tussock-inaka grassland at upper right.

- 6.7** The southern corner of the requested SASZ extension area occurs on stable landforms that are dominated by dense slim snow tussock grassland (**Figures**

**7 and 8**), with *Celmisia lyallii* and *Coprosma cheesmanii* prominent in the intertussock vegetation.

- 6.8** I was informed by ski field staff during my site visit that the Back Bowls area does not hold sufficient snow for skiing in every year.
- 6.9** In my opinion the Back Bowls area should not become part of the SASZ, as indigenous vegetation, habitats, and species on the steep landforms in the central part of the requested rezone area would be vulnerable to clearance, modification, and accelerated erosion caused by higher impact ski area activities such as road and ski lift construction, smoothing of slopes, and visitor accommodation. Anthropogenic disturbance in this area would favour increased domination of disturbed sites by exotic plant species such as browntop, as has occurred within the current ski field area. Accelerated erosion on these steep slopes would also result in loss of indigenous vegetation cover.
- 6.10** The site is also located at the top of the catchment of Coronet Creek, and it is likely that some effects of Ski Area Activities, such as erosion and increased sedimentation, would propagate downslope and downstream. It would be difficult to avoid, remedy, or mitigate the effects outlined above. Lower impact activities that do not involve much disturbance of vegetation and habitat, such as those required to reduce avalanche risk, would be unlikely to generate significant adverse effects, as they would only occur under high snow loadings when the base snow pack would protect underlying vegetation from damage.
- 6.11** The proposed SASZ extension area in Dirty Four Creek comprises broad spurs between two incised streams, and ranges from 1,200-1,600 masl. The area is predominantly vegetated in narrow-leaved snow tussock-inaka grassland, with local areas of inaka dominance (**Figure 9**). Intertussock species include blue tussock, slim snow tussock, tauhinu, browntop, *Festuca matthewsii*, *Acaena saccaticupula*, *Anisotome aromatica*, *Celmisia laricifolia*, *Dracophyllum muscoides*, and *Celmisia lyallii*. Locally, browntop dominates in areas that were probably former stock camps. The exposed ridge top provides habitat for *Hebejeebie densifolia* and *Acaena saccaticupula*. Shingly areas around eroding rock outcrops are mostly restricted to the south-east sides of the main gullies within the area, and provide habitat for *Rytidosperma setifolia*, *Epilobium porphyrium*, *Raoulia apicinigra*, *Hierochloe equisetata*, *Gingidia*

*decipiens*, *Dracophyllum muscoides*, *Luzula pumila*, *Ourisia caespitosa*, *Brachyscome sinclairii*, *Hebe epacridea*, *Blechnum penna-marina*, and *Anaphalioides bellidioides*. Seepages occur locally in gullies, and are dominated by bog rush. Other species include *Viola cunninghamii*, *Uncinia divaricata*, *Coprosma niphophila*, *Acaena fissistipula*, *Dolichoglottis lyallii*, and *Anaphalioides bellidioides*.



**Figure 9:** *Narrow leaved snow tussock-inaka grassland on stable landforms in the requested rezone area within Dirty Four Creek.*

**6.12** The upper part of the Dirty Four Creek catchment is within the existing SASZ, and contains ski field developments including roads, snow-making machines, and smoothed trails. The lower part of Dirty Four Creek, below the proposed rezone area, is becoming increasingly infested with wilding conifer species.

**6.13** I do not oppose the extension of the SASZ over the part of Dirty Four Creek catchment as requested, because the Dirty Four Creek catchment has already been modified, and developments on the broad spurs would more easily accommodate ski field activities with less potential for propagation of adverse

effects. Because the requested area is located above 1070 masl (Wildland Consultants GIS staff have determined it ranges from 1,094 masl to 1,504 masl), clearance of indigenous vegetation would be a discretionary activity and QLDC would therefore be able to fully consider the potential adverse effects of any activities likely to result in vegetation clearance, and proposals to avoid, remedy, and mitigate them. In addition, the QEII Trust would have a role in determining what activities could take place due to the overlying QEII open space covenant.



**Kelvin Lloyd**  
**10 March 2017**