

Crown Pastoral Land Tenure Review

Lease name : SOLDIER SYNDICATE

Lease number : Oo 091

Conservation Resources Report - Part 1

As part of the process of Tenure Review, advice on significant inherent values within the pastoral lease is provided by Department of Conservation officials in the form of a Conservation Resources Report. This report is the result of outdoor survey and inspection. It is a key piece of information for the development of a preliminary consultation document.

Note: Plans which form part of the Conservation Resources Report are published separately.

These documents are all released under the Official information Act 1982.

July

02

**DOC CONSERVATION RESOURCES REPORT ON
TENURE REVIEW OF**

**SOLDIERS SYNDICATE
PASTORAL OCCUPATION LICENSE**

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PART 1

INTRODUCTION

1.1

Soldiers Syndicate was inspected on the 20 -23 November 2001 as part of a review of the pastoral occupation licence (POL) tenure. The tenure review is being undertaken under the provisions of the Crown Pastoral Land Act 1998. As part of this process, a range of specialists in inherent values have visited the property and have contributed to this report.

Soldiers Syndicate comprises 4450 ha and is located on the Hawkdun and associated Ida Ranges, off the Mt Buster Road, 20km from Nasbey. Access is by 4WD track through the adjoining Kyeburn Station.

Soldiers Syndicate POL is held by a syndicate of farmers from the Maniototo Plain who jointly utilize the area by grazing sheep through the mid to late summer period.

The property is in the Waitaki Ecological Region and the Hawkdun Ecological District. A Protected Natural Areas Programme survey report has been completed for this ecological district. The survey recommended areas for protection which included RAP 11- Mt Buster and RAP 13-Near Undaunted, which lie wholly and partly (respectively) on the POL.

PART 2**INHERENT VALUES; DESCRIPTION OF CONSERVATION RESOURCES AND ASSESSMENT OF SIGNIFICANCE****2.1 LANDSCAPE****Methodology:**

Soldiers Syndicate POL is divided into two landscape units (LUs). For each unit a landscape character description is provided along with a description of the key visual and scenic attributes present. An evaluation summary is then presented using a range of criteria to assess each unit and assist with determining the significance of each unit's inherent values. These criteria include:

Intactness: - refers to the condition of the natural vegetation, patterns and processes and the degree of modification present.

Legibility: - refers to its expressiveness - how obviously the landscape demonstrates the formative processes leading to it.

Aesthetic Factors: - include criteria such as *distinctiveness* - the quality that makes a particular landscape visually striking. Frequently this occurs when contrasting natural elements combine to form a distinctive and memorable visual pattern. A further criteria assessed under aesthetic factors is *coherence*. This is based on characteristics including intactness, unity, continuity, and compatibility. Intrusions, alterations, disruptions tend to detract from coherence.

Historic Factors: - refers to historically valued attributes in the context of a high country landscape

Visibility: - refers to the visibility from public places such as highways, waterways or local vantage points.

Significance: - is the significance of the characteristics and features, or combination of characteristics and features within individual units. If they are locally, regionally or nationally significant.

Vulnerability: - is a measure of each landscape unit's susceptibility to further ecological deterioration, which would impact on landscape values.

Landscape Units:

Overall the whole of the POL (and beyond) is relatively similar in landscape character and is considered to be one landscape unit. There are, however, some differences and for descriptive purposes the POL is divided into two-sub landscape character units:

- West of Blue Duck Creek and
- East of Blue Duck Creek.

Landscape Unit 1 (LUI) - West of Blue Duck Creek

Character Description:

This land area closely resembles the adjoining Mount Ida Conservation Area. Broadly it can be described as a rolling upland plateau landform dissected with steep sided gullies and gorges.

Tussock is the dominant vegetation, however diverse and dense shrublands occur on the banks and surrounding slopes of the lower reaches of major streams. Alpine shrubs are conspicuous above 1200 metres within tussock grassland.

Sheet and gully erosion is a feature of the whole of Soldiers Syndicate notably on exposed north and west faces and reflects the inherent fragility of the land and the extreme climatic conditions. Also common on exposed ridge crests are grey pavement areas of rock and scree which has the effect of creating a lunar-like landscape. The gully systems of Blue Duck Creek and Boundary Creek are very steep, and rugged.

On ridges and sunny faces above Boundary Creek and Blue Duck Creek, tussock cover is reduced in stature and density, while on some sunny faces above Boundary Creek tussock is severely depleted or absent. *Hieracium pilosella* has gained a foothold in these locations and imparts its characteristic grey-mat appearance.

Overall natural values are high, with wilderness and remoteness being the key characteristics. The scale of this landscape is vast with huge, varied and rugged landforms, big sky and outstanding natural vegetation patterns.

Key Visual & Scenic Values:

This unit has high visual values derived from-

- The scale, vastness, and grandeur of the landscape.
- Forming part of a large upland tussock plateau.
- The unifying and strong visual effect of the dominant tussock cover.
- The spectacular views across unmodified tussock ridges to ranges and basins beyond.
- The contrasting natural patterns of tussock, shrubland, alpine wetland, rock outcrops, and rock and scree pavements.

The dominant tussock and native plant communities are characterised by a high level of intactness and continuity. The only visually discordant elements are the modified sunny faces where tussock cover is depleted. This detracts to some extent from visual values in these localised areas.

The rocky/scree pavements and rock bluffs are visually impressive. The major tributary catchments of Blue Duck Creek and Boundary Creek are very rugged and also visually very impressive.

Evaluation Summary:
Table 1

Criteria	Value	Comment
Intactness	High	Natural characteristics intact
Legibility	High	Landform patterns and processes very legible
Aesthetic Factors	High	Visually very coherent apart from modified sunny faces. Very distinctive and impressive
Historic Factors	Low	Extensive pastoralism main cultural influence
Visibility	Low	
Significance	High	Part of a large and important tract of South Island tussock grassland. Composite area straddling greywacke/schist interface
Vulnerability	High	Threatened by land use that would impact on naturalness eg burning, tracking, effects of uneven grazing

Landscape Unit 2 (LU2) - East of Blue Duck Creek

Character Description:

This unit includes the broad and aptly named Long Spur east of Blue Duck Creek (which dissects the POL), the series of tributaries west of Blue Duck Creek and the plateau area on the southeast boundary. The main distinction between this unit and LUI is the series of long and narrow northeast trending valley systems. These are generally smooth colluvial slopes with narrow ridge lines and valley sides that are less steep and rugged compared to those west of Blue Duck Creek.

Long Spur is a massive rounded landform rising steadily from Boundary Creek up to the Mt Buster ridge. Vegetation varies considerably and is dominated by tall tussock but includes short tussock and inter-tussock species and a percentage of bare ground. The northern (lower) end of Long Spur forms a broad northeast sloping spur. A small localised feature is a wetland located in a hollow with its associated bog plants.

Chionochloa macra occurs on upper broad ridges and is identifiable by its characteristic lighter sheen. Isolated and highly weathered rock outcrops occur on the upper (southern) end. These are cloaked in an array of colourful lichens.

Views of the Maniototo Plain and Strath Taieri open up to south and to the north the distinctive St Marys Range, and to the east Mount Kyeburn.

The east face above Blue Duck Creek is very steep with extensive sheet erosion. A feature of the tributaries east of Long Spur is the even and continuous tussock cover from ridge to valley floor from one tributary to the next. Tussock provides a strong unifying element, which contributes to the distinctiveness of this tract of tussock landscape.

Wetland systems associated with watercourses occur within the valley floor systems of the eastern tributaries.

Man-made features are limited to access tracks, musterers huts of various ages and condition, and a complex of historic mining water-races. The water races start in upper catchment areas below Mount Buster and hug the contour above the valley floor. Time has healed any disturbance so that these man-made interventions are at one with the landscape.

The only fenced boundary is the southwest boundary (either side of Mount Buster). The steep access track west of Mount Buster and side track descending down to a hut and holding paddock has however created an unsightly scar.

The far south east of the POL consists of gently rolling plateau with mainly good tussock cover apart from a belt next to the boundary which is more modified. This contrasts to the remainder of the POL. This more modified and opened-up tussock extends along the eastern boundary to Guffies Creek.

As with LUI west of Blue Duck Creek, wilderness and a sense of remoteness are an inherent part of the character of this unit.

Key Visual & Scenic Values:

East of Blue Duck Creek has equally as high visual and scenic values, as west of Blue Duck Creek. These values are derived from a similar combination of characteristics as LU1. These include the following:

- The impressive scale of the landform and vastness of the plateau as a whole;
- The intactness, uniformity and relative naturalness of the tussock cover;
- The distinctive colour and texture of the dominant tussock extending over a wide area; and
- Views out to surrounding ranges across broad and continuous sweeps of tussock clad landforms.

As with LU1, the modified and more opened-up tussock on the eastern fringe detracts to some extent from visual values but the effect is minor in the context of the whole unit.

Evaluation Summary:

Table 2

Criteria	Value	Comment
Intactness	High	Natural characteristics intact.
Legibility	High	Landform and formative processes very legible.
Aesthetic Factors	High	High level of unity and continuity derived from dominant tall tussock grassland extending from ridge to valley floor. The scale and grandeur of the landform is very distinctive and impressive.
Historic Factors	Medium	Disused mining water race complex within gullies east of Long Spur provide cultural overlay.
Visibility	Low	
Significance	High	Part of a large and important tract of Otago upland landscape. Straddles schist/greywacke interface.
Vulnerability	High	Vulnerable to change to vegetation from outside influences.

Significance of Landscape:

The Soldiers Syndicate POL is an integral part of the large upland Hawkdun Plateau. The area as a whole is an outstanding natural tussockland landscape. The entire land area of Soldiers Syndicate is identified as having high inherent landscape values.

In summary these values are derived from, a combination of-

- Very high (to moderately high in a few places) degree of naturalness and intactness.
- High degree of legibility and coherence over the whole area, with associated high visual values.
- Wilderness and remoteness characteristics contained within the area as a whole.
- The scale and diversity of landform and features ie: rounded high ridges and plateau, deeply dissected gullies and gorges, rocky bluffs and outcrops, rocky and scree pavement areas.
- Diversity of vegetation patterns - a wide variety of tussock species (short and tall), herbfield, shrublands and alpine wetlands.
- The historic water-race complex east of Long Spur.
- The impressive scale, vastness and grandeur of the landscape.

An important part of the significance of this area in landscape terms is the sheer scale and vastness of the natural landscape (within and beyond the POL boundary) and the condition of the native plants communities in particular the tussock grassland.

2.2 LANDFORMS & GEOLOGY

The Hawkdun Ecological District (and Waitaki Ecological Region) is transitional between the mountain ranges of Canterbury and Central Otago, both in terms of physical location, and geology and landforms. Much of the District is on greywacke terrane, with the steep scree slopes characteristic of the Canterbury mountains. However the District owes its origins to the same processes which formed the Central Otago ranges: block-fault uplifting of an ancient peneplain. This geological history is revealed by the extensive flat-topped spur and ridge crests of the Hawkdun Plateau.

Geological history described from the uplift of the Rangitata Orogeny, was followed by a long period of erosion and relative tectonic stability beginning in the late Cretaceous which resulted in the eventual formation of a peneplain (ie: a broad terrane of low relief). Disruption of the late Cretaceous - early Tertiary peneplain commenced during the Kaikoura Orogeny when the fault-block mountains of Central Otago started to rise. This process resulted in the formation of distinct physiographic provinces in the Otago Region, each containing a segment of the former peneplain. East of the Hawkdun Ecological District, the St Marys Range rises from the lowlands of the Waitaki Valley. South-west of the St Marys Range the headwaters of the Otematata River are entrenched in the Hawkdun Plateau, a well-preserved peneplain remnant.

Patterned ground covers the spur and ridge crests of the Hawkdun Plateau above c. 1450m, a characteristic feature of periglacial conditions. Extensive scree slides are a feature of the mountain scarps of the Hawkdun and Ida Ranges and the entrenched stream gullies in the greywacke portion of the Hawkdun Plateau. At one time these greywacke scree and areas of bare ground were thought to be an artifact of anthropic erosion. However, it is now considered that they are the product of long established high rates of natural erosion with an added, but relatively minor component of anthropic erosion over the last 1000 years (McSaveney & Whitehouse, 1989).

Soldiers Syndicate lies in the head of the Otematata catchment which feeds the Waitaki River, between 900 and 1455 m asl. The southern boundary of the POL is the crest of the Ida Range. The eastern part of the POL is on schist terrain. A broad, gently dipping planar spur line runs north from Mt Buster with stream gullies on each side. A narrower spur line to the west of Mt Buster runs north, then northeast, this being the approximate western boundary of the schist terrane. The eastern boundary of the POL (and also the Hawkdun Ecological District) follows the Mount Buster Road past the exposed quartz gravels of the old gold workings in the adjacent St Marys Ecological District. Clark's Gully arises to the west of the gold workings and heads west to join the streams running north off Mt Buster. The rounded ridge crests, flat spur crests and gently dipping spur slopes are all part of the Schist Plateau land system. Below 1180m the stream gullies carve steeper side slopes of 15- 25 degrees gradient, part of the Steeplands (Brown Soils) Land System. In the middle of the POL, Long Spur heads north from the Ida Range. The planar spur crest is at an altitude of c. 1450m, a part of the Greywacke Plateau Land System. Stone nets and stripes are widespread and

extensive on the spur crest. The remaining narrower spur and ridge crests are part of the Steeplands Land System. The western side of the POL is bounded by Boundary Creek, being deeply incised with steep side ridges. Rock outcrops are common, especially near ridge and spur crests and scree slopes are numerous and extensive.

The main Hawkdun and Ida Ranges are non-foliated thick bedded greywacke tending to strong foliated schist, further east toward the St Marys Range.

Significance of Landforms and Geology:

Geologically this area is distinctive as it forms the boarder of the Schist of Otago and the Greywacke of Canterbury. The gradation of different rock types has been reflected not only in landform, features typical of this phenomenon, but also in the character of the flora and fauna. The geology is responsible for the rich diversity of vegetation and insects which are a mix of species of those normally found in both Otago and Canterbury.

2.3 CLIMATE

Mean annual precipitation is estimated at 1500 mm much of which is snow, that lies until early summer on southerly faces. Most winters, snow lies up to a metre deep on the higher parts of the peneplain area. Summer days are hot and dry, with little shelter from desiccating north-westerly winds. The growing season is short with frosts about seven months of the year.

2.4 VEGETATION

Vegetation Description:

Vegetation has been described in two land units, Guffies Creek tributaries and Boundary Creek tributaries as follows:

Boundary Creek Tributaries:

A small remnant of greywacke peneplain, of which more obvious examples exist in the adjoining POL to the north, separate Blue Duck Creek from the main stem of Boundary Creek. Ranging in altitude from 1347 - 1454 metres it has gentle eastward dipping slopes. This plateau is covered in dense slim snow tussock (*Chionochloa macra*) with occasional shrubs of *Hebe lycopodioides* and *Dracophyllum pronum*. Inter-tussock sub-shrubs and herbs include *Raoulia grandiflora*, *Phyllachne colensoi*, *Lycopodium fastigiatum*, *Gaultheria depressa*, *Luzula pumila*, blue tussock (*Poa colensoi*), moss and lichen. Rocky pavements around the highest points have a dense cushionfield comprising *Dracophyllum muscoides*, *Raoulia petriensis* and *Kelleria dieffenbachii*.

Slopes below the plateau with a north or north-westerly aspect have much bare ground and/or litter with a low density cover of narrow-leaved snow tussock (*Chionochloa rigida*). Intertussock species are also sparse but include the shrubs *Leucopogon suaveolens*, *Pimelea traversii* and *Gaultheria depressa*. Herbs and grasses present include *Vittadinia australis*, *Anisotome flexuosus*, *Raoulia subsericea*, golden spaniard (*Aciphylla aurea*), *Craspedia*

lanata, blue tussock and hard tussock (*Festuca novae-zelandiae*). Sheep's sorrel (*Rumex acetosella*) is a common exotic herb in this community, less frequent are mouse-ear hawkweed (*Hieracium pilosella*) and catsear (*Hypochaeris radicata*). Scree slopes overlooking Boundary Creek have localised occurrences of vegetable sheep (*Raoulia eximia*) and *Ranunculus haastii*.

Hill slopes with a southerly or southeasterly aspect generally have denser cover of narrow-leaved tussock and/or shrublands comprised of *Dracophyllum pronum*.

At lower altitudes, on bouldery talus slopes, are many good examples of diverse shrubland. Dominant species are matagouri (*Discaria toumatou*), *Olearia odorata*, porcupine shrub (*Melicactus alpinus*), *Coprosma propinqua*, *C. ciliata*, and desert broom (*Carmichaelia petriei*). Often associated with these are narrow-leaved tussock, golden spaniard and alpine hard fern (*Blechnum penna-marina*). Rocky gorges also have shrublands but these are dominated by *Helichrysum intermedium*, coral broom (*Carmichaelia crassicaule*) and *Hebe buchananii*. Common herbs associated with this habitat are *Anisotome brevistylus*, *Brachyglottis bellidioides* and *Celmisia densiflora*.

Stable wet streamsides have a lush and diverse array of mostly herbaceous plants. Common species include *Ourisia caespitosa* var. *gracilis*, *Viola cunninghamii*, Maori onion (*Bulbinella angustifolia*), *Ranunculus* sp, *Acaena* sp, everlasting daisy (*Anaphalioides bellidioides*), *Schoenus pauciflorus* and moss. More active, frequently inundated gravel terraces have *Carex petriei*, *Leptinella squalida*, *Raoulia tenuicaulis* and *Neopaxia sessiliflora*.

Well drained elevated stream terraces are a feature of Blue Duck Creek and some of its minor tributaries. Although heavily dominated by mouse-ear hawkweed they still retain a wide range of species tolerant of semi-arid conditions, including uncommon species. Common species include hard tussock, *Raoulia subsericea*, *Scleranthus uniflorus*, *Geranium sessiliflorum*, *Muehlenbeckia axillaris*, *Leucopogon jraseri*, *Brachyscome sinclairii* and *Gaultheria depressa*. Uncommon species present are *Carex muelleri* and *Raoulia parkii*.

Guffies Creek Tributaries:

Two distinct landforms are present in this block. Most of the block is part of the greywacke plateau land system (although plateau remnants are not as well preserved as in the Boundary Creek block). The south-eastern corner however, comprising rounded ridge crests, flat spur crests and gently dipping spur slopes, is part of the Schist Plateau land system, with its own distinctive plant communities.

The highest exposed ridges and spur crests support alpine cushionfield and fellfield communities with the most extensive examples present on Long Spur. These areas have sparse low vegetation comprised of cushion plants such as *Raoulia hectorii* and *Dracophyllum muscoides* and scattered clumps of blue tussock, slim snow tussock and alpine hard tussock (*Festuca mathewsii*). *Raoulia petriei*, a generally uncommon plant of the district, is locally abundant. The scree buttercup, *Ranunculus crithmifolius*, is locally common in both fellfield and scree habitats.

As in the Boundary Creek block, aspect differences below the ridge crests are reflected in species composition. Sunny slopes are dominated by narrow-leaved snow tussock but considerable bare ground may also be present. Common intertussock species include

Pimelea traversii, golden speargrass, blue tussock, *Raoulia subsericea*, *R. grandiflora*, *Gaultheria depressa*, *Lycopodium fastigiatum* and *Kelleria laxa*. Very dry spur crests have *Leucopogon suaveolens*, *L. fraseri*, *Craspedia lanata*, *Pentachondra pumila*, *Thelymitra longifolia*, *Colobanthus* sp, *Myrsine nummularia* and occasional dwarf broom (*Carmichaelia vexillata*).

Shaded side slopes have a much denser and taller cover with slim snow tussock predominating at higher elevations and narrow-leaved snow tussock further down slope. Intertussock species are similar to those described for sunny slopes.

Numerous small shrub remnants occur at the base of bouldery slopes alongside Guffies Creek and its small tributaries (950 m - 1100 m). Those at lowest altitude are similar to the Blue Duck Creek shrublands and are dominated by matagouri and *Olearia odorata*, with the notable addition of the uncommon *Coprosma intertexta*. At higher altitude, stream-side talus slopes beneath large rock outcrops have *Gaultheria crassa*, *Dracophyllum uniflorum*, *D. longifolium*, matagouri, golden speargrass and occasional large *Hebe lycopodioides*. Wet seepages and stream banks amongst this support *Dolichoglottis lyallii* and *Ourisia caespitosa* var. *gracilis*.

Sub-alpine bog-tussocklands are extensive in the southeastern corner of the property around Mount Buster. The flat ridge crests and gentle slopes support both narrow-leaved snow tussock and hybrids with copper tussock (*Chionochloa rigida* xc. *rubra* subsp. *cuprea*). Other common taller-statured components of this community include blue tussock, alpine hard tussock and Maori onion. Intertussock ground cover species reflect the mix of dry and wet habitats and include comb sedge (*Oreobolus pectinatus*), *Gaultheria parvula*, *G. depressa*, *Ranunculus graci/ipes*, *R. foliosus*, *Raoulia subsericea*, *Geranium sessiliflorum*, *Kelleria laxa*, *Lagenifera cuneata*, *Celmisia alpina*, *Deyeuxia avenoides* and *Deschampsia novae-zelandiae*. The small number of exotic species present at generally low density include mouse-ear hawkweed, catsear, sweet vernal (*Anthoxanthum odoratum*) and browntop (*Agrostis capillaris*).

Steeper gully sides support similar tussockland but with increasing dominance of narrow-leaved snow tussock as drainage improves. Common intertussock species include blue tussock, alpine hard tussock, *Schoenus pauciflorus*, *Ranunculus* spp, *Geum leiospermum*, *Gaultheria depressa*, *Pimelea oreophila*, *Acaena caesiiglauca*, *Anisotome aromatica* and everlasting daisy. Mouse-ear hawkweed, sweet vernal and sheep's sorrel are the main exotics present.

Problem Plants:

Apart from ubiquitous hieracium there are few weeds of conservation concern. At least three species of hieracium are present (*Hieracium pilosella*, *H. lepidulum* and *H. praealtum*) although the latter two species are relatively uncommon. Mouse-ear hawkweed (*Hieracium pilosella*) is present over the entire property but is more prevalent east of Long Spur. With the notable exceptions of elevated dry stream terraces and occasional spur crests, it does not reach densities where it significantly competes with or excludes indigenous species. Occasional wilding pines (*Pinus* sp.) are present. This area will always be subject to invasion from wildings and ongoing vigilance will be required to prevent their establishment.

Significance of Vegetation:

Bisecting the property is the interface where the Torlesse greywackes typical of Canterbury grade into the Haast supergroup schists of Otago. This underlying geology is reflected in the wide range of plant communities present from alpine fellfield at highest altitude to montane shrublands at lowest altitude. The area also encompasses a wide range of topographical features. Although the current vegetation pattern reflects the area's fire history, the vegetation is of a highly natural character, representative of the southern portion of the Hawkdun Ecological District.

The slim snow tussocklands of the flat to gently rolling range crests are outstanding examples of this community. Highly palatable slim snow tussocklands in Otago, which are vulnerable to overgrazing, occupy a generally narrow altitudinal zone between the upper extent of narrow-leaved tussocklands and alpine communities. Such slim snow tussock communities once covered the crests of the main Central Otago block mountains but have undergone substantial retreat following pastoralism. Slim snow tussocklands on this property are of high quality with little sign of recent disturbance from pastoral activities.

Another community well represented is wetlands in the southeast of the property. The schist geology around Mt Buster is reflected in the moist gley soils and bog-tussockland. Soils here have favoured a proliferation of red tussock x narrow-leaved snow tussock hybrids which are more abundant here than anywhere else in the ecological district. These sub-alpine wetlands are floristically more diverse than the lower altitude montane wetlands of the district. The special nature of these wetlands was recognised in their inclusion in Recommended Area for Protection 11-Mt Buster in the Hawkdun Protected Natural Areas report.

Fellfield communities, particularly those on Long Spur, have abundant *Raouliapetriensis*, a range restricted species limited to South Canterbury and North Otago. Montane shrublands are well distributed along the major valley systems. Those on bluff and gorge systems include the threatened plants *Hebe buchananii* and coral broom. The incised gorge of Blue Duck Creek in particular supports a large population of coral broom, protected from browsing animals. Some shrublands on lower slope bouldery talus have the threatened plant *Coprosma intertexta*.

2.5 FAUNA

2.5.1 Invertebrates:

The PNAP Report (Grove 1994) identified the following significant invertebrate fauna on the property:

- Two large alpine wetas; *Hemiandrus jocalis* and *Deinacrida connectens*. *H. focalis* was identified as a species widely distributed in the Otago Block mountains while *D. connectens* was described as being typical of the Canterbury mountains and reaching its southern limit in the nearby Kakanui Mountains.
- The black cicadas; *Maoricicada claitans* and *M. phaeoptera*. *M. claitans* is widespread in Otago north of the Clutha River/Mata-au and *M. phaeoptera* is a South Canterbury species reaching its limit here and on the Kakanui Mountains.

- Two alpine grasshopper species; *Sigaus australis* and *Brachaspis nivalis*. *S. austialis* is widespread in Otago and *B. nivalis* is restricted to the greywacke ranges of North Otago and Canterbury.
- Two undescribed giant alpine weevils from the genus *Lyperobius* were recorded as present. Both are dependent on *Aciphylla* species.
- A new species of flightless chafer (now named *Prodontria patricki*), initially recorded from the Danseys Pass area it was subsequently recorded in the Mt Buster part of the POL. The species was considered to be an important part of the jigsaw in understanding this southern New Zealand genus.
- Autumn emerging tortricid fauna dependent on wetland areas. These species have flightless females and day flying males.
- A new undescribed species of case moths which feed on algae.
- Well developed diurnal (day flying) moth fauna living on the high alpine screes and rocky ridges. Species included were: *Dasyuris hectori*, *Percnodaimon merula*, *Orocrambus melanopetrus*, *Scoparia sideraspia* and *Orophora unicolor*.

The PNAP Report identified RAP 11 - Mt Buster as having a distinctive insect fauna that shared many species with Central Otago alpine areas. It noted that the schist- greywacke geological boundary gives this area special significance for invertebrates.

Invertebrates were collected in November 2001 at the following locations:

Boundary Creek

A range of predatory ground beetles such as *Metaglymma tibiale*, and *Mecodema* sp. were present. Sap sucking weevils; *Lyperobius patricki*, *Cyttalia* sp. and *Sargon* sp were found. These species are dependent on speargrasses (*Aciphylla* sp.), for their food. Also present was a good range of moths in particular the uncommon *Tmetolophota micrastra* and *Notoreas parapetpha*. The widespread grasshopper, *Sigaus australis*, was also present.

Long Spur

This site had an invertebrate community similar to Boundary Creek, in addition Carabid beetles, moths and grasshoppers were collected.

Guffies Creek

This site had an invertebrate community similar to Boundary Creek, in addition the rare scarab, *Prodontria patricki* was collected in this area.

The values identified in the 1994 PNA report for the Mt Buster RAP are still present. The criteria summary that identified this RAP as a key site for insects is still appropriate (*Special Feature: Key Area for insect conservation*)

Significance of Invertebrates:

The invertebrates collected during this and previous surveys are from a wide range of functional groups. Carabid beetles are predators and the ones identified on this property

occupy a number of niches. Grasshoppers are key indigenous grazers in the tussock grasslands while moths and butterflies are key pollinators. The flies collected on Long Spur and Boundary Creek (see Appendix 1) are representative of a number of ecological niches (eg: house flies are detritivores while therevid flies are predators). The range of invertebrates found indicates that an intact grassland ecosystem is still present.

The presence of the scarab *Prodontria patricki* on the property, extends the known range of the species from the Danseys Pass area. Many of the invertebrates recorded from this property over the years have very close links to a single plant species or genera. An example of this are the weevils, which are dependent on speargrasses.

For some species Soldiers Syndicate is at the southern limits of their distribution. For example the large weevil *Lyberobius patricki*, extends down from South Canterbury to the North Otago Mountains.

Many of the species collected indicate that the tussock grassland community present on this property is in good condition. Particular examples of this are the presence of the predatory carabid, *Metaglymma tibiale*, the moth, *Notoreas paradelpa*, and the weevil's; *Sargon* sp. and *Cyttalia* sp.

2.5.2 Herpetofauna:

During the November 2001 survey McCanns skinks (*Oligosoma maccanni*) and a gecko, probably *Hoplodactylus* 'Southern Alps' were seen at several locations between loose rock and tussock, to the east of Long Spur. In the Boundary Creek catchment McCanns skinks were numerous and one Scree skink (*Oligosoma waimatense*) was found in suitable scree (active greywacke scree with equidimensional, angular fragments mostly up to 200mm in diameter). McCanns skinks were numerous along the true right of Blue Duck Creek. There were large areas of suitable scree habitat present in this catchment but no skinks were seen.

In the Guffies Creek catchment in the east of the property Common skinks (*Oligosoma polychroma nigreplantare*) were present.

Significance of Herpetofauna:

Scree skinks are an endemic lizard that have a threat status of "gradual decline" (Hitchmough, R. [compiler] in press). They occur only in Marlborough, Canterbury and Otago, although genetic studies to date suggest that Otago scree skinks may be distinct from those in Canterbury (Daucherty in Kappers and Tocher 2001). It is prudent to manage the Otago scree skinks as a separate group until this is resolved. The Otago scree skinks are the southern-most populations of the currently recognised species.

Scree skinks have a limited distribution in Otago. Previous records are only from Mt St Bathans (Whitaker and Loh 1990) and the Little Mt Ida / upper Wether Burn/ upper Ida Burn area (ARDS database), the Blue Duck Creek catchment (ARDS database, McQueen 2000). Those in the Mt St Bathans area are at the western limit of the known distribution for the species in Otago. Protection of habitat for scree skinks will also provide good habitat for other more common geckos and skinks commonly found in Otago.

The amount of potential scree skink habitat present on Soldiers Syndicate is large and it would be expected that with repeat surveys good populations of this species could be recorded.

2.5.3 Avifauna:

The following birds were recorded during the inspection: black-backed gull, skylark, New Zealand falcon, harrier hawk, pipit and yellowhammer. A breeding colony of black-backed gulls was recorded in a tributary of Guffies Creek. New Zealand falcon was recorded above Boundary Creek in the west and also in Guffies Creek in the north east part of the property. This latter record was of a breeding pair.

Significance of Avifauna:

New Zealand falcon is a threatened species and classified as "Gradual Decline" in terms of Hitchmough, R. (in press). Falcon range over large distances and will use the entire Soldiers Syndicate area as previous research has shown that falcon have a home range of around 50 square kilometres. The presence of a breeding pair in the lower Guffies Creek is also of note, and this pair in the north east part of the property could be using the whole of the POL on an almost daily basis.

2.5.4 Aquatic Fauna (Freshwater Fish):

All the streams on Soldiers Syndicate drain into the Otematata River which is a tributary of the Waitaki River. The streams on this property are typically small, steep gradient streams draining the eastern slopes of the Ida Range from 1500 metres asl. All streams fished appeared to be permanent water with good flows at the time of survey and there are no upstream abstractions of water.

Five sites were surveyed for freshwater fish using a backpack electric fishing machine on 20 November 2001.

All five sites contained only the common river galaxias (*Galaxias vulgaris*). The identification of these fish is made on key diagnostic features and known distribution, samples have been sent to Otago University for genetic analysis to confirm this.

Table 1. Freshwater Fish Sampling Sites for Soldiers Syndicate POL.

Locality	Grid. Ref
Guffies Creek	1412292055875
Guffies Creek tributary	141 22912 55890
Blue Duck Creek	H41 22891 55884
Boundary Creek	H41 22874 55891
Guffies Creek tributary	1412291455863

Galaxias vulgaris was found at all sites fished.

The NIWA National Fresh Water Fish Database was searched and there were no records for this property.

Native freshwater fish records for this property are limited to one species, (*Galaxias vulgaris*). These fish were abundant at all the sites fished and there is extensive habitat for them in the streams on this property. Of significance was the absence of introduced brown trout (*Salmo trutta*) at the survey sites. This was unexpected as they are known from nearby localities and there are no obvious barriers to their passage into the streams sampled.

The common river galaxias is found almost exclusively east of the Southern Alps, from the Wairau River in the north to tributaries of the Waiau and Oreti Rivers in the south (McDowall 1990). Recent work that describes a complex of galaxiid species once thought to be *G. vulgaris* is likely to reduce this range considerably especially in Otago and Southland. (See Allibone 1997, Wallis 2002).

The common river galaxias is a fish of moderately swift flowing waters, in gravelly or bouldery streams. The fish are solitary and cryptic in habit. The entire life cycle of this fish is spent in freshwater and they feed on a diverse range of small invertebrate aquatic fauna. (McDowall 1990).

The water quality in all the streams on the property was high, with good riparian vegetation along most stream margins. Typical common invertebrates present were mayfly (*Coloburiscus*, *Deleatidium*), caddis (*Olinga*, *Pycnocentodes*), and stonefly (*Zealandobius*, *Zealandoperla*).

Streams of this quality are common locally but are declining as land development continues. The invertebrate communities these waterways support, would benefit from the maintenance and enhancement of the native riparian and catchment vegetation.

Significance of Aquatic Fauna:

The common river galaxias is not considered threatened (Hitchmough, R[compiler] in press) and does not require any independent protection initiatives. Having said this, streams containing galaxiids without trout or other introduced species are important, and any measures that maintain the native riparian and catchment vegetation will benefit these fish. The maintenance of the native vegetation will support the full range of invertebrate species, help maintain the current high water quality, provide good in-stream habitat cover and shading.

2.6 HISTORIC

A large double water race system traverses the southern edge of the POL, running to the high altitude Buster Diggings. The races are both wide and deep and other than some bulldozing near the head, still intact. A dilapidated wooden hut near the head of the race might be the remains of a race keeper's hut, but it does not look particularly old. Within Clarkes Gully there is heavy tussock which is thought to conceal some workings (M Clare, pers. Comm.).

The Buster Diggings include sluicings and claims running from Clarkes Gully to at least Sergeant Garvie's Cairn, mostly on Kyeburn Station. Long races run to them from both east and west. Within the POL there are presumably workings in Clarkes Gully, since the first record of finds in 1864 describes the opening of Clarkes Gully at 3000 feet on Mount Burster

(later Mt Buster) (Otago Votes and Proceedings 1864: 143). Clarke had found the field in 1863 and did very well working the very shallow ground in the gully. Later miners had to work east into deeper ground where the gold was more difficult to obtain.

The government geologist, Alexander McKay, visited the diggings in February 1883, and noted that the formation was unusual in that it was the same set of beds as those occurring only a few miles away at Kyeburn but 2000 feet lower in elevation. The beds varied in thickness from 40-100 feet of which 6-8 feet at the bottom were the richest. These were silts with quartz boulders in them. Since the beds lie at an elevation of 4000 to 3000 feet (900-1200m) it was difficult to get water to the workings (McKay 1884).

McKay found three groups of miners working in 1883, and these had declined to two groups by 1889 - Guffie and Inder (Guffies Creek was known as Deep Creek at first and was presumably renamed after the miner) and a smaller and shorter lived group known as Cornish and Scotch Co. Guffie and Inder had built the long, deep pair of races coming in from the west during the 1870s and this was the main supply to the field. The races were described as essentially snow catching races which ran to large dams, and the amount of work done during the summer was very dependent on the amount of winter snowfall.

In 1889 the inspector of mines, H A Gordon, visited the field with either Guffie or Inder and was told that they were averaging seven to eight pounds per man per week, working ground up to 65 feet deep using 10 heads of water for hydraulicizing on a large scale (McKay, 1884). Their main claim was right up on the saddle and the other workings further downstream to the north are presumably earlier and less successful workings. In the 1891-92 season they took 400 ounces of gold, mostly because they were able to work for eight months. Part of this time though they had to tunnel through the snow along the race to get water to their claim (AJHRC-4:71). Cornish and Scotch were adjacent to Guffie and Inder and gave up about 1893. Guffie and Inder worked until about 1900, and tributaries were still working small patches in 1906 (Calvin, 1906).

Significance of Historic:

The Mount Buster field was relatively long lived, having been found early and worked through well into the 1900s. It lies in a spectacular setting and is fairly accessible by 4WD tracks. It is a relatively intact high altitude field, and only the Criffel and Carrick races compare in size and altitude with its major race from the west. It is unfortunate that the line of the races has been partly bulldozed at the head.

There is some uncertainty as to the workings in Clarkes Gully. Since this is where the earliest workings were, it is important that they be properly surveyed. As they were worked at an early stage, (ie; the 1860s) they could be a valuable type site for vegetation dating of tailings, which is likely to depend on lichen measurements. They are so remote that it is unlikely that they were reworked in the 1930s. Like the race they should be fully protected from earth disturbance.

2.7 PUBLIC RECREATION

2.7.1 Physical Characteristics:

The main access route is via the Mt Buster road, through the adjoining Kyeburn Station. The gate at the bottom of the track below Mt Buster is locked, having a permanent sign restricting public access due to extreme fire danger. Public vehicle access is reportedly available at most times by request to the runholders (Lessees and Licensees who have an interest in the various properties up the track) who hold a key. The track, although in part on legal road line, is maintained by runholders.

With permission, the public often use the various private musterers huts to stay on Soldiers Syndicate. The huts include a substantial new corrugated iron hut "The Soldiers Hilton" half way along Long Spur, as well as two in fair condition known as "Blue Duck Hut" and "Long Promise Hut".

Within the property vehicle access is confined to a 4WD track on the Ida Range crest, past Mt Buster and then down Long Spur to the boundary of the Mt Ida Syndicate POL. A round trip is possible via Guffies Creek (on Kyeburn Station).

2.7.2 Legal Access:

The Mt Buster road being the only practical access to Soldiers Syndicate is off line in places. As this road is not on the POL, it is not a matter that can be addressed via this review.

A legal road forms the eastern boundary of Soldiers Syndicate which is sited along a ridge running down to Guffies Creek and is an extension of the Mt Buster road. A formed track approximates this route and is only partly on the legal line. Further work would be required to determine the legality or otherwise of the track. However, this matter has more relevance to the adjoining Kyeburn Station tenure review as all but one offline portion appears to be on this property. There are no legal roads within Soldiers Syndicate POL.

There are no existing marginal strips on the property. These will be laid off as a result of this review (on any qualifying margins that are not to be conservation land). The three major streams, Boundary Creek, Blue Duck Creek and the **headwaters** of Guffies Creek, would attract marginal strips, up to points where their average width becomes less than 3 metres.

2.7.3 Activities:

Most public use is by hunters, 4WD enthusiasts and those wishing to view the unique Buster Diggings. The annual Otago Cavalcade (large organized horse trek) has on occasion traversed the property.

Recreational hunting of wild pig and chukar are the most popular activities. Pigs are widespread throughout the area and provide regular sport, mainly for residents of the Maniototo. Red deer are seen occasionally.

Summer tramping has mostly centred on climbs from the Maniototo Plain to the crest of the Ida Range, on the boundary of Soldiers Syndicate POL. The climb up Tourist Spur from the Naseby State Forest is relatively popular over the Christmas holidays.

The Mount Buster Road provides an easy walking/mountain biking route to Mount Buster and the gold sluicings, again along the property boundary. There is potential for longer distance through-tramps to Otematata and Awakino. All the crests within the property are suited to cross-country skiing during winter, with convenient foot and ski access via the Mount Buster Road. Currently there is moderate use of the Buster Diggings, to Mount Buster and along the crest of the Ida Range. As this sport grows in popularity so too will the activity in this area, especially as it is within day trip range of Dunedin. There is considerable potential for long distance through or circuit trips over the extensive Hawkdun Plateau, utilising Mount Ida and Soldiers Syndicate POLs, and adjacent conservation land. Long Spur is an interesting but not strenuous through route for cross-country skiers.

PART 3

OTHER RELEVANT MATTERS & PLANS

3.1 Consultation:

An early warning meeting with NGOs was held on the 12 December 2000. The following points were made:

- The property should become conservation land.
- The question was asked how the property related to the proposed Oteake Conservation Park and the CMS objective to use tenure review to advance this proposal.
- The historic values of Mt Buster were noted.
- Should follow the CMS / Oteake proposal if appropriate.

3.2 Regional Policy Statements & Plans:

Under the Canterbury Regional Land Plan (Vegetation Burning) any burning would be subject to performance standards relating to topdressing and spelling from grazing. The burning of wetland vegetation is not permitted.

3.3 District Plans:

The property is located within the Rural Scenic zone of Waitaki District Plan. In general, the proposed Waitaki District Plan (amended to incorporate Council decisions) does not act as a trigger for the protection of tussock grasslands and smaller wetlands and forest areas. No indigenous vegetation clearance or exotic tree planting is allowed within 20m of a water body or in any wetland. There are effectively no provisions that protect scenic values.

There are no registered archaeological sites, or areas of significant indigenous vegetation and habitat of significant indigenous fauna as set out in the appendices of the plan. Protection is limited to the controls set out above.

3.4 Conservation Management Strategies & Plans:

Soldiers Syndicate POL lies within the Canterbury Conservancy of DOC and covered by the Canterbury Conservation Management Strategy (CMS).

The CMS has specific objectives for the Waitaki area as follows:

- To identify, maintain and seek to enhance the natural landscapes and natural landscape values of the Waitaki unit.
- To use a range of effective methods to protect the indigenous biodiversity of the Waitaki unit.
- To protect and enhance the viability of priority threatened species' populations and their habitats in the Waitaki unit.

- To provide new recreational facilities and opportunities by the Department and other organizations and concessionaires where natural and historic resources and cultural values are not compromised.
- To negotiate with Crown pastoral leaseholders, directly or through tenure review, to protect natural values.

Although Soldiers Syndicate is located in the Canterbury CMS area, the Otago CMS recognises it as being part of one of the 41 special places of Otago.

The St Bathans - Hawkdun - Ida area is listed as special place no 17.

The objective for this area is - To protect on an extensive scale, the high altitude landscape, nature conservation and historic resources of the area, principally by acquiring adjoining lands of high natural, historic and recreational value, through pastoral lease or occupation licence tenure reviews, to link existing areas of land administered by the department thus providing for more recreational opportunities, better protection of values and efficient integrated management of those values.

3.5 New Zealand Biodiversity Strategy:

The New Zealand Government is a signatory to the Convention on Biological Diversity. In February 2000, Government released the New Zealand Biodiversity Strategy which is a blueprint for managing the country's diversity of species and habits and sets a number of goals to achieve this aim. Of particular relevance to tenure review, is goal three which states:

-Maintain and restore a full range of remaining natural habitats and ecosystems to a healthy functioning state, enhance critically scarce habitats, and sustain the more modified ecosystems in production and urban environments; and do what is necessary to:-

-Maintain and restore viable populations of all indigenous species across their natural range and maintain their genetic diversity.

The strategy outlines action plans to achieve this goal covering terrestrial and freshwater habitat and ecosystem protection, sympathetic management, pest management, terrestrial and freshwater habitat restoration, threatened terrestrial and freshwater species management, etc.

PART 4

MAPS ETC.

4.1 Additional information

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Appendices:

A1 Invertebrate Species List

A2 A3 Otago eMS: Special Place 17:- St Bathans - Hawkdun - Ida

A3 RAP 11 - Buster

A4 RAP 13 - Near Undaunted

A5 Photos

APPENDIX 1

INVERTEBRATE LIST: SOLDIERS SYNDICATE POL NOVEMBER 2001

ORDER & Family	Scientific name	Common name	Location	Altitude
BLATTODEA	<i>Celatoblatta quinquemaculata</i>	Cockroach	Boundary Creek	1300
COLEOPTERA				
Carabidae	<i>Metaglymma tibiale</i>	Ground Beetle	Long Spur	1260
	<i>Metaglymma tibiale</i>	Ground Beetle	Boundary Creek	1300
	<i>Metaglymma tibiale</i>	Ground Beetle	Long Spur	1300
	<i>Gregus aereus</i>	Ground Beetle	Guffies Creek	900
	<i>Gregus aereus</i>	Ground Beetle	Guffies Creek	1260
	<i>Gregus aereus</i>	Ground Beetle	Long Spur	1260
	<i>Mecodema sp</i>	Ground Beetle	Boundary Creek	1300
Coccinellidae	<i>Cyttalia sp.</i>	Weevils	Blue Duck Creek	1100
	<i>Cyttalia sp.</i>	Weevil	Guffies Creek	900
	<i>Sargonsp</i>	Weevils	Guffies Creek	900
	<i>Sargonsp</i>	Weevils	Blue Duck Creek	1100
	<i>Lyperobius patricki</i>	Weevils	Blue Duck Creek	1100
	<i>Lyperobius patricki</i>	Weevils	Guffies Creek	900
Scarabidae	<i>Prodontria patricki</i>	Chafer	Guffies Creek	1260
DIPTERA				
Muscidae	<i>Stomoxys calcitrans</i>	House Fly	Long Spur	1260
Therividae	<i>Anabarrhynchus sp.</i>	Therevid	Boundary Creek	1300
LEPIDOPTERA				
Crambidae	<i>Grocrambus corruptus</i>		Long Spur	1260
Geometridae	<i>Notoreas paradelpha</i>		Boundary Creek	1300
	<i>Notoreas n.sp.</i>		Long Spur	1260
	<i>Notoreas paradelpha</i>		Long Spur	1260
Noctuidae	<i>Graphania phricias</i>		Boundary Creek	1360
	<i>Tmetolophota micrastra</i>		Boundary Creek	1360
	<i>Ichneutica ceraunias</i>		Boundary Creek	1360
	<i>Metacrias huttoni</i>		Boundary Creek	1300
ORTHOPTERA				
Acrididae	<i>Sigaus australis</i>	Grasshopper	Boundary Creek	1300
	<i>Sigaus australis</i>	Grasshopper	Boundary Creek	1360
	<i>Sigaus australis</i>	Grasshopper	Guffies Creek	1260
	<i>Sigaus australis</i>	Grasshopper	Long Spur	1260

APPENDIX 2

Otago Conservation Management Strategy:

Special Place 17:- St Bathans - Hawkdun -Ida

10.17 ST BATHANS - HAWKDUN - IDA RANGES

CONS. UNIT NO.	NAME	STATUS	AREA
H40 107	Oteake (ex Two Mile PL)	Conservation Area	3,988.34 ha
-	Oteake (ex Blackstone Hill PL)	Conservation Area	3,197.00 ha
H 41 159	Allen Peaks	Conservation Area	1,413.57 ha
I 41 050	Mt Kyeburn	Conservation Area	437.00 ha
I 40 545	Little Domet	Conservation Area	1,760.00 ha
H 41 157	Mount Ida	Conservation Areas	1,415.00 ha
I 41 051	Danseys Pass	Recreation Reserve	6.20 ha
H 40 101	Upper Manuherikia River	Conservation Area	9.31 ha
H 40 105	Upper Manuherikia River	Marginal Strip	40.00 ha
H 41 072	Manuherikia River	Marginal Strip	15.00 ha

10.17.1 Ecological Districts

St Bathans, Hawkdun, St Mary

10.17.2 Local Authority

Central Otago District Council.

10.17.3 Land Administered by DOC

The department administers large tracts of alpine land along the flanks and crests of the Ida and Hawkdun Ranges plus the summits of Mt Kyeburn and some peaks in the St Marys Range. Some tracts extend down to river terraces (Allen Peaks) while most are strictly high alpine. The lands listed above are those on the Otago side of the Otago-Canterbury Conservancy boundary.

10.17.4 Other Land

Neighbouring land, in pastoral lease or pastoral occupation licence, also has high landscape, recreation, natural and historic values.

10.17.5 Description

The St Bathans-Hawkdun-Ida-St Marys Ranges form a substantial barrier of dissected mountainous land between Central Otago and South Canterbury and essentially form the broad transition zone between the Otago schist and Torlesse sandstone of Canterbury. They are characterised by steep scree slopes rising to 2,134 metres on the St Bathans Range, but with many other peaks over 1,800 metres on the Hawkdun and St Marys Ranges. A heavily dissected alpine plateau north of the Ida-Hawkdun crests is drained to the north by many creeks including the Otematata River while the southern flanks drain via the Manuherikia River and Kye Burn. Cirques and associated wetlands are a feature of the Hawkdun Range.



Middle cirque basin, Hawkdun Range.

Mount St Bathans is the highest peak in Central Otago.

Private four wheel drive tracks traverse some of the high peaks and most of the crests of the area with key access points on the Mt Buster, Awakino Valley skifield and Omarama Saddle tracks. The metalled Danseys Pass (930 metres) public road provides magnificent views of alpine country of the St Marys Range and Kyeburn Valley.

A private skifield exists on the St Marys Range on pastoral lease in the Awakino Valley below Kohurau, the highest point (2,010 metres). This area is in Canterbury Conservancy and is just outside the scope of this CMS.

A large exposure of bare quartz gravels near Mt Buster mark an early mining site, at amongst the highest altitude of any in Otago. The extent to which the gravels are composed almost entirely of river-worn, white quartz pebbles, at 1,300 metres, is both spectacular and remarkable.

The towns of Naseby, Ranfurly, St Bathans and Oturehua are adjacent to the area, and are already or are growing in importance as holiday centres.

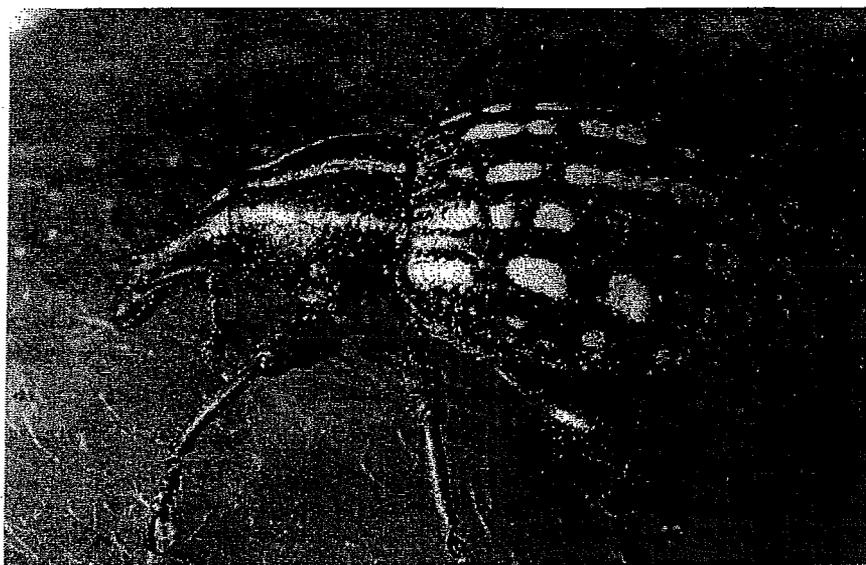
10.17.6 Values

The predominant values of this large mountainous area are its natural and historic resources. At high altitude the biota is almost totally indigenous and forms a continuous uninterrupted system from the St Bathans to the St Mary Ranges. The summits of the various ranges are characteristically scree or fellfield with often dense snow tussock covering the flanks. There is an impressive development of patterned ground (caused by freeze/thaw activity) on the summit, which is currently active. The cirques of the Hawkdun Range are a special feature and have tarns and large wetlands. Fellfield crests and the extensive screes of all the ranges are also special features and contain distinctive biota. The Hawkdun Range was surveyed under the PNAP in 1992 and 13 areas were recommended for protection. Four areas or parts of them have now been protected.

The expansive, remote character of this landscape is highly valued by those seeking solitude. The area forms the northern backdrop of Central Otago. There is limited scarring from farm tracks on the range faces. The Hawkdun, in

particular, is essentially unmarked. The near level summit ridgelines of the St Bathans and the Hawkdun Ranges, when viewed from a distance, are striking landscape features.

Altitudinal sequences on the southern flanks of the Ida and Hawkdun Ranges encapsulate a diverse grassland flora and fauna with important shrubland, scree and rockfield components.



Lyperobius hudsoni, one of the giant weevils of these mountains.

The transitional nature of the geology of the area has led to a distinct biota. Apart from the usual range of native plants and animals, an assemblage of species endemic or characteristic to the zone is found including a whipcord daisy *Raoulia petriensis*, a giant undescribed weevil *Lyperobius* n.sp. and a diurnal moth *Notoreas* n.sp. Additionally other species are found that are rare or local in occurrence include good populations of scree skinks, the only ones in Otago, the herbs *Swainsonia novae zelandiae*, *Ranunculus haastii* and *Aciphylla gracilis* and the giant weta *Deinacrida connectens*.

That same transitional geology has resulted in two sites of international geopreservation significance being located in the area. The entire Dansey's Pass area contains the transition from metagreywacke to schist, and a more localised site of bedding structures in zone 3A schist, which is very rare, is found on the true right bank of the Kye Burn. Neither site is considered vulnerable.

The Otago galaxias (*Galaxius anomalus*), newly "resurrected" as a species, is found in tributaries of the Kyeburn as is a new species of galaxid yet to be named. The latter species has only been found in the Taieri system whereas the former is also found in the Nevis catchment. These kinds of fragmented populations seem to occur only in tributary streams protected from brown trout invasion by impassable waterfalls and cascades.

Recreation values are also high with vast areas suitable for cross-country or nordic skiing provided permission is obtained where necessary. Summertime four wheel driving and tramping are popular with a variety of mountain passes and routes available. Privately owned huts, are sparse, and mostly on pastoral lease land, as are many of the tracks. The recreation settings are back country drive-in (4WD) and walk-in, surrounding a core of remote mountain land that is

very difficult to access in the winter. Parts of the ranges are used for upland game bird hunting.

Historic resources are present near Mt Buster, the site of a high-altitude gold mining venture. Dams, pipes and exposed quartz gravels are visible although nature has camouflaged much of the workings. The Mt Buster dry weather road is still in use. The area is fringed on its lower southern flanks by the large Mount Ida water race, which is still operated for irrigation and town supply purposes. Remains of other races criss-cross the slopes on their way to the Naseby gold workings.

At both lower and higher altitudes there are tracts of copper tussock grassland, albeit modified and much reduced from its former extent at low altitude. The Kai Tahu name for the area, Maniatoto (toto = blood) reflects the colour of this landscape. Oteake is a traditional name also associated with the area.

10.17.7 Management Issues

- Implementation of the findings of the Hawkdun PNA survey.
- At present the department manages disparate conservation units that do not facilitate easy management, and some contiguous areas are divided by conservancy boundaries.
- There are key POLs in this area, the future of which is unresolved.
- Ongoing fence maintenance - stock exclusion problems.
- Public access at key points is lacking, particularly from Naseby.
- Grazing of lands administered by the department as part of transitional tenure review arrangements.
- Wilding conifers from Naseby and other forest plantations, eg, Falls Dam area.
- Siting of hill top installations and access roads.
- Commercial tourism and recreation, and use of ORVs in fragile areas.
- Wild animal control for goats, pigs and deer.
- The possibility of trout invasion of galaxid habitat.
- Grazing damage to eroding slopes.
- Possible adverse effects on galaxid habitat of mining, gravel extraction, roading, farm tracking and unsustainable land uses in catchments.
- Applications to mine on sites previously mined.

Objective for St Bathans - Hawkdun - Ida Ranges

To protect, on an extensive scale, the high altitude landscape, nature conservation and historic resources of the area, principally by acquiring adjoining lands of high natural, historic and recreational value, through pastoral lease or occupation licence tenure reviews, to link existing areas of land administered by the department thus providing for more recreational opportunities, better protection of values and efficient integrated management of those values.

Implementation

- (a) Wilding conifers will be controlled on lands administered by the department and cooperation and advocacy directed at preventing their spread from neighbouring lands.
- (b) Tourism and recreation concessions may be allowed where the proposed activities can be shown to have no adverse effect on identified values, including the remoteness of the range crests in winter, or where conditions can be attached to a concession to adequately or reasonably avoid, remedy or mitigate any potential adverse effects.
- (c) The development of additional prominent access roads or mountain top facilities are likely to have an adverse effect on natural and landscape values and is considered inappropriate. Potential developers of facilities will be encouraged to better utilise existing facilities by co-siting.
- (d) Pastoral lease and occupation licence tenure review on adjacent properties will provide opportunities to negotiate the acquisition of areas of similar or complementary natural and historic values and significant recreational opportunities. Overall management of these new areas, together with existing conservation areas, will confer net conservation and management benefits.
- (e) Integration of management of large contiguous areas administered by the department will centre on the concept of a conservation park. The park will be named "Oteake Conservation Park".
- (f) Signs will be erected at key access points once cohesive units of estate and access have been acquired/negotiated.
- (g) Appropriate wild animal control work will be carried out, including feral sheep.
- (h) Advocacy, management and further survey work will be directed at protecting the special galaxid populations in the streams in terms of water and habitat quality and continued exclusion of trout.
- (i) The protection of significant natural and historic resources of the area will be advocated through Resource Management Act and other statutory processes.

Priorities for St Bathans - Hawkdun - Ida Ranges

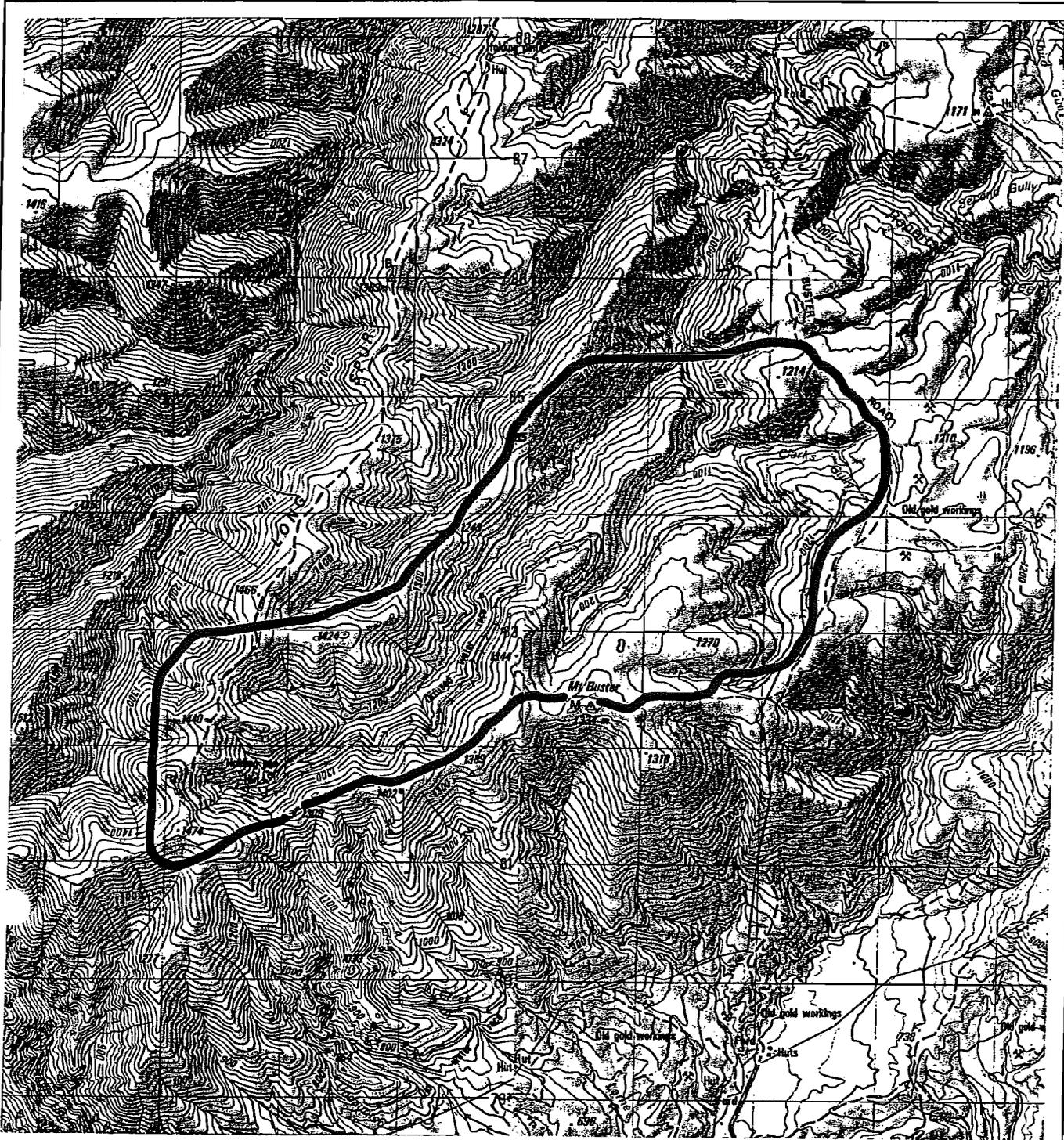
Pastoral lease and pastoral occupation licence tenure review negotiations will be the priority method for implementation of the objective, along with continued vigilance with regard to the spread of wilding trees.

APPENDIX 3

RAP 11 - Buster

RAP 11 : MT BUSTER

MAP No 3/11



GRID REFERENCE CENTRE : I41 / 900 833

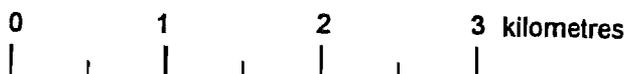
AREA : 1270 hectares

ALTITUDE RANGE : 1030 - 1500 metres

TENURE : Pastoral Occupation Licence

SAMPLE SITES : 14-16, 227, 233

Map Licence No 1991/42



HAWK 11

MT BUSTER

141 900 833

Area : c.1270ha
 Altitude Range : 1030m-1500m
 General Aspect : North
 Land Systems : Schist Plateau; Steeplands (Brown Soils); Greywacke Plateau (patterned ground).
 Plot Cards : 14-16, 227-233.
 Quadrat Groups: Group 6 (s15,16,233);
 Group 7 (s232);
 Group 8 (s228,229,231);
 Group 11 (s14,227);
 Group 14 (s230).
 References : "Biological Values of the Soldiers Syndicate POL", B. Patrick draft report.
 Tenure : Pastoral occupation licence.

Vegetation type

Low-alpine tussock-cushionfield
 Subalpine to low-alpine bog-tussockland.
 Subalpine tussockland.

High-alpine cushionfield and fellfield.
 High-alpine tussock-cushionfield.
 Low-alpine to subalpine *Chionochloa macra* tussockland.

Subalpine to low-alpine *C. rigida* tussockland.

Landform

Rounded spur crest.
 Gently dipping spur slope.
 Moderate to steep spur slope and side slope.
 Exposed sites on planar spur crest.
 Planar spur crest.

Sheltered spur/ridge crests and shady side slopes.
 Valley floor and sunny spur/ridge side slopes.

VEGETATION AND FLORA

The eastern half of Mount Buster RAP is dominated by subalpine to low-alpine tussocklands and bog-tussocklands. Low-alpine *Chionochloa rigida* tussockland is found on the ridge crest around Mt Buster itself, on the southern boundary of the RAP, but most of the RAP's area lies within the subalpine bioclimatic zone.

A flat spur crest site at 1220m on the eastern boundary of the RAP contains a mixture of bog, tussockland and cushionfield plant species. *Chionochloa macra* is present here although the surrounds are dominated by *C.rigida*. *Schoenus pauciflorus* and the exotic grass *Agrostis capillaris* are the only other species taller than 10cm. Over 75% of the cover is made up of low herbs and cushion and mat-forming plants. Species associated with a moist habitat are: *Celmisia sessiliflora*, *Oreobolus pectinatus*, *Abrotanella caespitosa*, *Coprosma perpusilla*, *Pernettya nana*, *Ranunculus gracilipes*, *Euphrasia zelandica*, *Plantago uniflora*, *P.novae-zelandiae*, *Celmisia alpina*, *Kelleria laxus*, *Isolepis aucklandica* and the moss *Polytrichum juniperinum*. Plants usually found in a high-alpine cushionfield but present here include: *Dracophyllum muscoides*, *Phyllachne colensoi*, *Luzula pumila*, *Raoulia grandiflora*, *Cladonia* spp. lichens and the moss *Racomitrium lanuginosum*. Typical tussockland species present are: the grasses *Rytidosperma pumilum*, *Deschampsia novae-zelandiae* and *Agrostis*

subulata; low shrubs of *Pentachondra pumila*, *Gaultheria depressa* and *Leucopogon fraseri*; and the herbs *Epilobium alsinoides*, *Luzula rufa*, *Geum leiospermum*, *Kelleria dieffenbachii*, *Anisotome flexuosa*, *Lycopodium fastigiatum* and *L. scariosum*.

Subalpine bog-tussocklands are extensive in the eastern half of the RAP on flat crests and gently dipping (<10 degrees) spur slopes. *Chionochoa rigida* and *C. rigida x rubra* hybrids are co-dominant in this community, some *C. macra* are also present. *Festuca matthewsii*, *Poa colensoi*, *Schoenus pauciflorus* and *Bulbinella angustifolia* are all abundant. The ground layer shows a mixture of tussockland and bog species, their relative proportions varying with the moisture gradient: *Oreobolus pectinatus*, *Pernettya nana*, *Gaultheria depressa*, *Ranunculus gracilipes*, *R. foliosus*, *Plantago uniflorum*, *Raoulia subsericea*, *Geranium sessiliflorum*, *Brachyscome sinclairii*, *Kelleria laxa*, *Hydrocotyle heteromeria*, *Lagenifera cuneata*, *Celmisia alpina*, *Deyeuxia avenoides*, *Deschampsia novae-zelandiae*, the club-moss *Lycopodium fastigiatum*, and the mosses *Polytrichum juniperinum* and *Dicranoloma* sp. A few exotic species are present at low abundance: *Hieracium pilosella*, *Hypochoeris radicata*, *Anthoxanthum odoratum* and *Agrostis capillaris*.

Steeper (15-25 degree) gully side slopes hold a subalpine *C. rigida* and *C. rigida x rubra* tussockland, with the abundance of the hybrids decreasing further away from the wetter sites. *Festuca matthewsii*, *Anthoxanthum odoratum*, *Poa colensoi* and *Schoenus pauciflorus* are plentiful; in the ground layer are *Ranunculus foliosus*, *R. gracilipes*, *Luzula rufa*, *Geum leiospermum*, *Raoulia subsericea*, *Pimelea oreophila*, *Gaultheria depressa*, *Acaena caesiiglauca*, *Anisotome aromatica*, *Helichrysum bellidioides*, *Hieracium pilosella* and *Rumex acetosella*.

In the western half of the RAP, from approximately 1km west of Mt Buster itself to beyond Long Spur, the vegetation pattern is one of high-alpine cushionfield and fellfield communities on spur and ridge crests most exposed to the prevailing west and southwest winds; less exposed spur crest sites have a tussock-cushionfield or low-alpine *Chionochoa macra* tussocklands. This tussockland community extends down side slopes of shaded aspect. *C. rigida* tussocklands are present on the valley floor and extend up side slopes of sunny aspect. The high-alpine communities have a low vegetation cover, usually 20-30%. Scattered *C. macra* and *Festuca matthewsii* tussocks may be present, but the predominant vegetation is *Poa colensoi* and the cushion plants *Dracophyllum muscoides* and *Raoulia hectorii*. The fellfield species *Raoulia petriensis* is plentiful on Long Spur in these communities. While found occasionally in other parts of the District, it is here that *R. petriensis* is most common. The scree plant *Ranunculus crithmifolius* is also present on Long Spur. Low shrubs found in the area include *Hebe epacridea*, *H. buchananii* and *Pimelea traversii*. Lichen cover is approximately 5%; common species are *Cetraria islandica*, *Alectoria nigricans* and *Cladonia* sp.

Below the crest on shaded side slopes are dense (>90% cover) *C. macra* tussocklands. Abundant species in this community are *Poa colensoi*, *Festuca matthewsii*, *Rytidosperma pumilum*; the low shrubs *Gaultheria depressa* and *Dracophyllum pronum*; the herbs *Raoulia subsericea*, *R. grandiflora*, *Lycopodium fastigiatum*, *Epilobium alsinoides*, *Kelleria laxus* and *Viola cunninghamii*.

Sunny side slopes have a *C. rigida* tussockland community extending up from the valley floor. While the tussocks themselves appear vigorous, these side slopes are about 50% bare ground. The speargrass *Aciphylla aurea* and the shrub *Pimelea traversii* are more common on the sunny slopes but most of the sub-tussock species of this area (eg *Craspedia lanata*, *Luzula rufa*) are equally common in the *C. rigida* and *C. macra* communities.

The subalpine tussocklands have several other shrub species present in low numbers: *Dracophyllum uniflorum*, *Cassinia leptophylla* and *Leucopogon colensoi*.

LANDFORMS

The southern boundary of the RAP is the crest of the Ida Range. In the eastern half of the RAP, on the schist terrane, the ridge crest is rounded with Mt Buster (1334m) as its highest point. A broad, gently dipping planar spur line runs north from Mt Buster with stream gullies on each side. A narrower spur line to the west of Mt Buster runs north, then northeast, this is the approximate western boundary of the schist terrane. The eastern boundary of the RAP (and also the Ecological District) follows the Mount Buster Road past the exposed quartz gravels of the old gold workings in the adjacent St Marys Ecological District.

Clark's Gully arises to the west of the gold workings and heads west to join the streams running north off Mt Buster. The northern-most point of the RAP is a spur crest at 1214m above Clark's Gully.

The rounded ridge crests, flat spur crests and gently dipping spur slopes are all part of the Schist Plateau land system. Below 1180m the stream gullies carve steeper side slopes of 15-25 degrees gradient, part of the Steeplands (Brown Soils) Land System.

In the western half of the RAP, Long Spur heads north from the Ida Range. The planar spur crest is at an altitude of c.1450m, a part of the Greywacke Plateau Land System. Stone nets and stripes are widespread extensive on the spur crest. The remaining narrower spur and ridge crests are part of the Steeplands Land System.

West of Mt Buster, the Ida Range within the RAP undulates between 1310 and 1470m. Beneath the crest is a moderate to steep north-facing side slope. The spur side slopes to the east of Long Spur have a similar gradient (18-25 degrees) and a range of aspects from northeast to south. Side slopes reach the valley floor at about 1180m. A stream flows northeast down the valley.

West of Long Spur, a north-flowing stream gully departs off the Ida Range, a tributary of Blue Duck Creek.

FAUNA

The wetlands, streams and damp grasslands of this RAP contain a distinctive insect fauna that shares many species with Central Otago alpine areas such as the diurnal *Eudonia xysmatias*, *Orocrambus dicrenellus* and a new genus and species of autumn-emerging tortucid. The rare noctuid, *Tmetolophota* n.sp. and uncommon *Aletia sollennis*, both southern species, are also present here. The Otago alpine caddisfly *Psilochorema cheirodes* and scorpionfly are found in streams here also.

The schist-greywacke geological boundary gives this area special significance for invertebrates. Firstly, the undescribed flightless chafer beetle in the genus *Prodontria* (endemic to north Otago) is present on schist around Mt Buster and further east to Mt Kyeburn and Dansey's Pass. Secondly, fauna typical of greywacke areas and found extensively in the Canterbury mountains such as the giant weta *Deinacrida connectens*, the scree grasshopper *Brachaspis nivalis* and moths of the genus *Notoreas* are found on the greywacke side of the boundary and further west into the Hawkdun Range. Streams and seepages in this area support two undescribed stoneflies and caddisflies, with some species having Otago mountain affinities and others more typical of Canterbury. This dichotomy of fauna reflects the tectonic situation present and is an important and valuable fauna/geological association.

DISCUSSION

The Mt Buster RAP is unique in the District, being the only one located within the Schist Plateau Land System. The boundary between the schist and greywacke terranes runs approximately north-south in this area and crosses the Ida Range about 1km west of Mt Buster itself. The Schist Plateau Land System extends eastward across the Mt Buster Road into the adjacent St Mary's Ecological District.

The underlying schist geology is reflected in the moist gley soils and bog-tussockland vegetation which covers the eastern half of the RAP and also extends into the St Mary's District. The soils have favoured a proliferation of red tussock x snow tussock hybrids which are more abundant here than anywhere else in the District. These subalpine wetlands are floristically more diverse than the montane wetlands at the base of the southern slopes of the Ida Range, and are habitat for a distinctive insect fauna.

The western half of the RAP is on greywacke terrane and this geological difference is reflected in the soils, vegetation and fauna. Long Spur holds the largest population of *Raoulia petriensis* seen in the District and the surrounding tussocklands are good examples of their type, grading into the bog-tussocklands east of Mt Buster.

The RAP is traversed by disused water races built to supply the nearby gold diggings. The quartz gravels of the diggings in the St Mary's District are a distinctive landmark but do not extend into the RAP. The RAP excludes a small area in the southeast corner of the Soldier's Syndicate POL where concentrated stock grazing has all but eliminated the tussock cover. The schist-greywacke geological boundary is also an important ecological boundary as demonstrated by the change in flora and fauna as one travels west from Mt Buster. Overall, the habitat is in near pristine state with natural processes operating. The Mt Buster RAP adjoins Near Undaunted RAP in the southwest corner and is complementary in terms of aspect and geology.

CRITERIA SUMMARY : HAWK 11 - MT BUSTER

Representativeness	H	Representative of vegetation, fauna and landforms across a geological boundary in the Ida Range.
Diversity	M	Limited number of vegetation types but high species diversity within some of these communities
Naturalness	M,H	Adventive plant species in sub-canopy.
Special features		Key area for insect conservation.
Viability	H	
Buffering	H	RAP surrounded by areas of similarly high naturalness.
Threat	L	Burning, excessive grazing, hawkweeds.
Landform		Rounded crests and gentle dip slopes of Schist Plateau Land System; steeper side slopes of Steeplands Land System; planar spur crests of Greywacke Plateau Land System.