

Crown Pastoral Land Tenure Review

Lease name : MICHAEL PEAK

Lease number : PO 330

Conservation Resources Report

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.

March

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DOC CONSERVATION RESOURCES REPORT ON THE REVIEW OF MICHAEL PEAK PASTORAL OCCUPATION LICENCE

PART 1

INTRODUCTION

1.1

The Commissioner of Crown Lands has commenced a review prior to the expiry of Michael Peak Pastoral Occupation Licence. As part of the review process the Director General of Conservation is required to provide the Commissioner with an assessment of the inherent values present within the licence area.

The 21 year licence expired in December 2001 and since that time has been renewed pending this review for a further non renewable term expiring .

The 3340 ha licence area is situated on the eastern flanks of the St Bathans Range in the upper reaches of the Manuherikia River catchment and its west branch.

Altitude ranges between 700m on the Manuherikia Valley floor and 2088m on the crest of the St Bathans Range.

The licence comprises a small area of river flats, relatively gentle terrace country below 1000m, steep faces between 1000 and 1300m and a gentle alpine basin in the headwaters of Hut Creek.

The licence is located in the St Bathans Ecological District (ED). No Protected Natural Areas Programme (PNAP) survey or other formal biological survey of the ecological district has been carried out.

No parts of the licence are currently subject to protection for conservation purposes. The title does contain a provision for public foot access up the southern and western boundaries to the summit of Mt St Bathans. The licence contains a provision stating that 404 hectares of high altitude scree country shall not be grazed and that a maximum of 330 wethers shall be grazed in the Hut Creek Block for no more than four months.

Nine hectares of conservation land (Conservation Unit H40101) comprising river flats is fenced into and farmed with the licence immediately below the junction of the west and east branches of the Manuherikia River.

An inspection of the licence was undertaken between 18-22 March 2002 by a multi-disciplinary team of seven people. Resource information gathered from a previous inspection has also been drawn upon.

**PART 2
INHERENT VALUES: DESCRIPTION OF CONSERVATION RESOURCES AND
ASSESSMENT OF SIGNIFICANCE**

2.1 Landscape

Methodology

For this assessment the licence has been divided into five landscape units (LU's). Boundaries are defined principally by changes in aspect and land cover. The following assessment criteria were applied to each unit to determine its distinctive character and landscape values.

Landscape Character Description

This section of the assessment explains the overall appearance of the LU using common descriptive terms to help create a "mental picture" of the primary elements, which include:

- Landform – which reflects the topography and natural processes such as erosion and weathering.
- Land cover – which covers vegetation and water bodies.
- Land use – which reflects cultural and social processes such as farming.

Assessment Of Landscape Values

The criteria used to assess and evaluate each of the landscape units is based on the following attributes.

- Naturalness – which is an expression of the degree of indigenous content of the vegetative cover, and the extent of human intervention.
- Legibility – which is an expression of the clarity of the formative processes and how striking these physical processes are.
- Aesthetic values – which includes the concepts of memorability and naturalness. Aesthetic factors which can make a particular landscape vivid include simplicity in landform, muted colours and fine textured ground cover.

Other Values

Other values that may be assessed when considered appropriate include:

- Transient values – ephemeral events such as the occasional presence of wildlife.
- Landscapes commonly valued – quintessential landscapes reflected in popularity through photographs, art work, tourism and recreation.
- Historical values – areas containing high heritage importance.

Visual Values

Visual values is a sub set of landscape values and relates to the visibility of a particular landscape/or natural feature as seen from key viewing locations such as regional highway system, viewing points within a township, tourist routes and recreational areas.

A term frequently used is “visual amenity” which is basically the value of a particular view in relation to what is seen and how people respond to it.

Potential Vulnerability To Change

This is a measure of each landscape unit’s susceptibility to further modifications. In general terms the less modified an area is, the more vulnerable to further change as a result of human activities that unit is likely to be.

Landscape Unit 1

Description

This unit extends from the summit of the St Bathans Range at 2,088m down to approximately 1,500m. The northern and southern boundaries of the unit are well defined by parallel ridgelines that stem out from the main axis of the rangelands. This unit comprises a high alpine basin, contained by side slopes and characterized by the near complete exposure of the underlying rock (primarily eroded greywacke). This exposed weathered rock takes the form of fellfields and long narrow scree faces that can span a wide distance, commonly from the summit to the base of the slopes. Alternating between exposed rocks are areas of patterned ground, comprising compacted soil covered by alpine vegetation.

The head basin forms the source of the Hut Creek, which is a major tributary of the West Branch of the Manuherikia River.

Vegetative cover is generally sparse, confined to individual plants wedged between fragments of stable rock. Plant form is typically cushion-like. Within this high alpine zone there are scattered solitary tufts of tussock.

Prominent man-made elements are a diagonal track and a bull–dozed fence line, both of which extend to the summit of the range.

Landscape Values

This unit has a high landscape value being dominated by a landform where the weathering of the underlying geology is highly legible. The landscape character is therefore a direct expression of natural processes and forces.

The fragmented nature of the ground cover reflects the harshness of the mountain climate with the sparse alpine flora concentrated amongst stable rock and on leeward slopes. As with the landform, vegetative cover is a direct expression of the severity of the mountain climate with the tussock cover having a “ragged” appearance, occupying ground that has not recently been affected by wind erosion or frost lift.

In aesthetic terms, the colorations found in the weathered rock and vegetation types, contrasts markedly with the lower country, which is clad in a constant sward of yellow tussock.

(c) Visual Values

This unit has a high visual resource value principally due to the fact that it contains Mt St Bathans, which is a prominent landmark that can be viewed from the local roading network and from many parts of the Maniototo basin.

Potential Vulnerability to Change

The activities and land uses that could adversely affect this unit include:

- Insensitive earth disturbances associated with tracking or bulldozed fencelines across the thinner soils and fragile fellfields where rehabilitation is practically impossible.
- Attempts to utilize fellfields and sparse tussocklands for summer grazing.
- Any siting of utilities and communication installations that would compromise the landscape integrity of these mountainlands.

Landscape Unit 2

Description

This unit forms the mid section of the Hut Creek catchment, which projects out from the St Bathans Range towards the West Branch of the Manuherikia River. The highest point of the unit is just below 1,500m.asl., descending in an even gradient to about 950m.asl, at which point a major tributary feeds into the creek from the north.

Constant elongated slopes characterise the valley that is bound to the north and south by corresponding ridgelines, which separate Hut Creek from adjoining valley catchments. The side slopes are irregularly broken by smaller gullies, many of which contain watercourses that drain into Hut Creek. The cross profile of the valley changes with the top section being comparatively v-shaped, while the bottom section contains a narrow valley floor over which the creek's channel meanders.

The north facing slopes have a light vegetative cover that is often interspersed by patches of barren ground and isolated areas of wind erosion. The dominant species on these drier slopes is the narrow – leaved snow tussock supplemented by blue tussock, fescue tussock and pasture grasses which are more prevalent at a lower altitude. On the opposite darker faces and within the side gullies snow tussock is generally in a better condition, with an abundance of golden spaniard. The channel of the Hut Creek is lined with *Coprosma*-matagouri shrublands, which regularly extend to the mid-slopes of the scree faces.

This mid section of the licence has been subdivided into a number of grazing blocks.

Landscape Values

This unit has moderately high landscape values as it contains intact ecosystems and processes and provides the valley with an altitudinal linkage extending from the low alpine to sub alpine zone. In a landscape context, this unit is the “middle ground” which helps provide the high country with its distinctive spatial qualities. These qualities are reinforced by the series adjoining valleys that extend out from the St Bathans Range. The neighbouring Rocks and Boundary Creeks are particularly significant.

Visual Values

This unit has moderate visual resource value being enclosed by the high parallel ridgelines which emphasize the unit's sense of solitude and backcountry appeal. From the corresponding ridgelines restricted views can be obtained of the Manuherikia Valley.

Potential Vulnerability to Change

Activities, land uses and occurrences that could adversely affect the unit include:

- Further subdivisional fencing that would be intrusive on the existing simple vegetative cover.
- Further tracking, especially on drier north facing slopes where rehabilitation would be difficult to achieve.
- Encroachment of opportunist species such as hawkweed into naturally barren ground.
- Wilding tree spread.

Landscape Unit 3

Description

This unit comprises a large block of high hill country that tilts out towards the Manuherikia River and its West Branch. The boundaries of the unit are well defined in the south and east by the base of the hill slope. The western limit is the ridgeline that physically separates the hill country and the adjoining Rocks Creek catchment. The higher northwest boundary follows the ridgeline overlooking Hut Creek valley and traverses across this valley at about 1,110.m.asl. The bottom section of Hut Creek bisects this band of undulating hill country.

The landform varies, with the relief being disjointed and steeper on the northern side of Hut Creek. South of Hut Creek the terrain becomes more rolling and subdued with intricate gullies etched into the land surface. Many of these gullies are substantial, especially Flume and Painkiller Creeks which extend to the western boundary of the licence area. The steep rock studded slopes overlooking the West Branch tend to have rounded shoulders.

As with the topography, vegetation within this unit changes with altitude and variation in aspect. Over the higher more dissected hill country north of the Hut Creek valley the condition of the snow tussock varies depending on aspect. Narrow-leaved snow tussock dominates on the darker slopes while drier sunny slopes are clad in a mixture of depleted tall and fescue tussock with a strong presence of pasture grasses and hawkweed.

Across the more subdued rolling hill country south of the Hut Creek valley the grasslands become more constant with a uniform coverage of tall and fescue tussock interspersed with exotic grasses and legumes.

The floor and lower slopes of the larger gullies are clad in continuous *Coprosma*-matagouri shrublands which frequently extending out to cover the faces overlooking the West Branch.

This large block of hill country has been subdivided into a number of smaller blocks.

Landscape Values

This unit has moderate landscape values principally due to the overall impression of uniformity of the indigenous grasslands being overlaid on a rolling landform. Furthermore this hill country forms a transitional area that both physically and visually links the high country with the lowlands. The repetition of the natural elements and boundless qualities contained within this unit combine to make an important contribution to the Manuherikia Valley.

In aesthetic terms the vegetation has a narrow tonal range that helps to reinforce the strong sense of coherence. These characteristics are most prevalent in the south eastern portion of the property.

Visual Values

This unit which forms the edge of the hill country that wraps around the Manuherikia Valley has a moderately high visual resource value.

Potential Vulnerability to Change

Activities, land uses and occurrences that could adversely affect this unit include:

- The decline in stature and density of the existing snow tussock communities.
- Further encroachment of fescue tussock into the snow tussock.
- Spread of wilding pines.
- Further infestation of hawkweed.
- Siting of tracks and sub divisional fences over conspicuous faces.

Sub Unit 3(A)

Description

This sub unit comprises an expansive depression perched above the Manuherikia River valley. This depression has been assessed as a separate entity as its physical characteristics are different to the hill country that encircles it.

The landform has a dish-like profile indented by irregular swales containing watercourses, which drain directly into the river by the way of narrow gullies.

Vegetation composition varies depending on the ground water table. Damp hollows support wetland/turf communities surrounded by red tussock, while in well drained areas red tussock tends to grade in to narrow leaved snow tussock with an abundance of golden spaniard. Aerial over sowing and topdressing has resulted in white and suckling clover being widely distributed amongst the tussock.

Landscape Values

This unit has high landscape values. Despite a high degree of homogeneity, it contains qualities arising from subtle variations in tussock grasslands laid over subdued topography. The unit has boundless qualities, however its remoteness characteristics have been slightly compromised by a bulldozed track that leads to an airstrip on an adjacent knoll.

Visual Values

Due to the inherent characteristics of the landform, this sub unit has limited visual resource value as it is generally out of view from other parts of the POL.

Potential Vulnerability to Change

The activities and land uses that could adversely affect this unit include:

- Any attempt to drain the wetter depressions.
- Further loss and decline in the red tussock community.
- Trampling and damage to wetland/turf communities by cattle.
- Fragmentation of this coherent landscape through further subdivision.

Landscape Unit 4

Description

This unit encompasses all of the Manuherikia River flats above and below the West Branch confluence, as well as the lower section of Hut Creek. Within this lower section of the licence area the river meanders across a bed-load of alluvial gravel. In some places the channel is confined to a single thread, while in other places it is multi-channelled. The river channel is bordered by a flood plain that intermittently is replaced by a low terrace formed by the accumulation of river gravels and silts. The cross profile of the river valley alternates from being a constricted gorge, while in other sections the river valley is wider.

Periodic flooding and stock pressure have influenced the vegetation. The original short tussock community has been replaced by introduced grasses with the occasional remnants of short tussock still surviving. Over more stable ground and along abandoned water channels, there is a scattering of matagouri, *Coprosma* and sweet briar. On the terraces between the Manuherikia River and along the Hawkdun Runs Road, mats of hawkweed have replaced the native short tussock in many places.

The river valley forms the physical setting for numerous historic elements, especially the Scandinavian water race, which has its head works within a confined rocky gorge. This water race contains outstanding examples of dry stone revetment.

Landscape Values

This unit has only moderate landscape, value forming the interface between the more modified land along the river valley and the extensively grazed hill country.

Visual Values

This unit has only moderate visual resource value, being enclosed by high corresponding ridges that mean that the valley is only visually accessible within a very restricted area.

Potential Vulnerability to Change

The activities and land uses that could adversely affect this unit include:

- The continual replacement of the native grasslands by woody weeds.
- Vehicle damage to the banks of the West Branch.
- Damage and modifications to historic artefacts.

Significance of Landscape:

This area's high landscape values are an important component of the natural landscape character of the St Bathans Ecological District. The stunning landscape of the Manuherikia forms an integral part of one of New Zealand's "largest landscapes" which is enjoyed by travellers in many parts of the Maniototo. This evocative landscape has been captured by the Central Otago landscape artist Grahame Sydney in a number of paintings. The area also forms a backdrop to recreationists travelling up the Manuherikia Valley and to those venturing onto the St Bathans Range.

2.2 Landforms & Geology

Basement rock is composed of the Rakaia Terrane, which in turn is part of the much larger Torlesse composite terrane (which includes much of the South Island). The Rakaia Terrane has a granitic provenance and a distinctive quartzofeldspathic geochemistry (Forsyth 2001). On the St Bathans Range, including Michael Peak textural zone I (sandstone or greywacke) occurs at lower altitude, down to the Manuherikia River, and there is a transition to IIA (semischist) over the summit of the range (Forsyth 2001).

Extensive deposits of scree and glacial till are present in all of the east facing valleys of the St Bathans Range, including Hut Creek, and there are a number of well defined cirques on the eastern face. Below the summit of Mt St Bathans on the eastern face there are rock glaciers and other solifluction deposits which are striking in appearance. This landform is uncommon in New Zealand but not unique to this area (McCraw 1959).

The valley of Dunstan Creek and St Bathans Range is controlled by the active Blue Lake fault system which runs to the east of the creek (I. Turnbull, *pers. comm.*). Minor faults also occur to the west of the creek. The main Blue Lake fault runs along a line of saddles east of the Dunstan Creek gorge, and descends to the base of the St Bathans Range hillslope in the upper basin of Dunstan Creek.

Uplift on the eastern (St Bathans Range) side causes the contrast in elevation and slope gradient on either side of the creek.

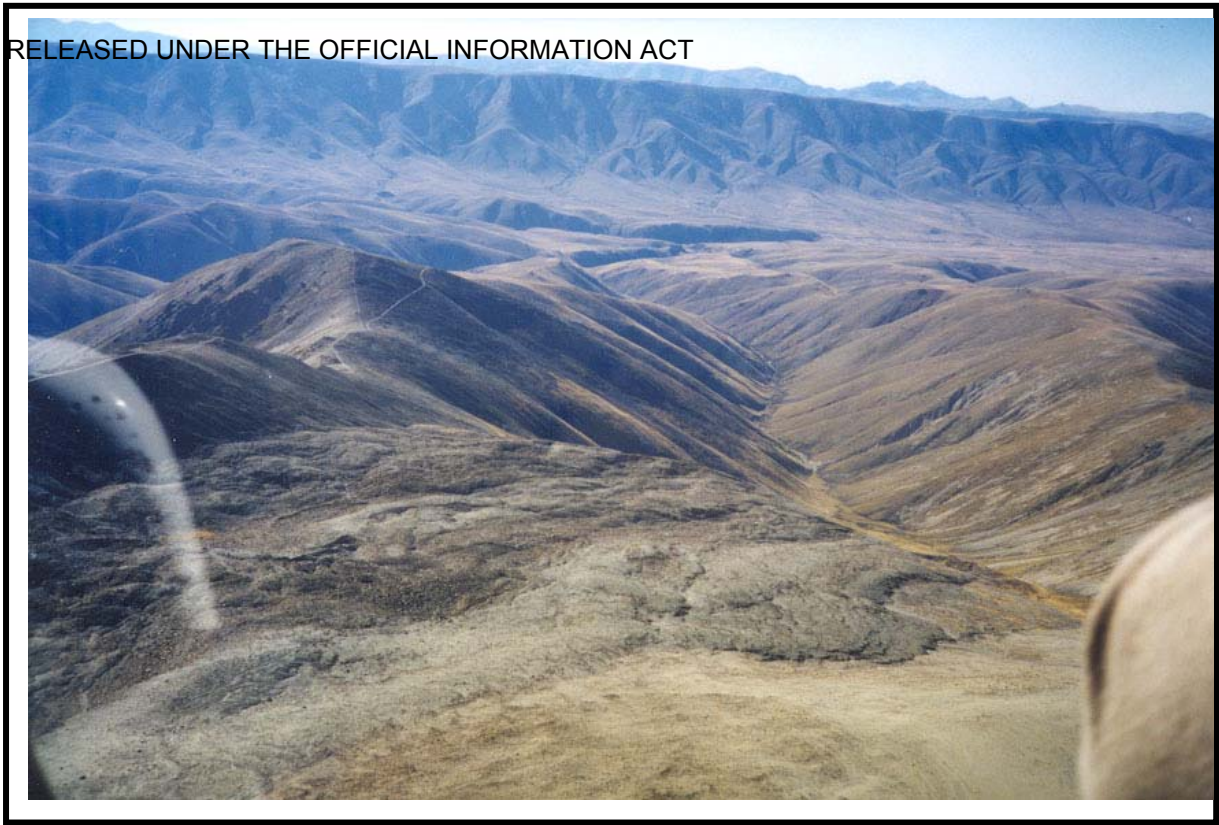


Photo One. Rock Glacier Formation in Headwaters of Hut Creek

2.3 Climate

The climate is generally typical of Central Otago although rainfall is higher than average due to the elevated nature of the entire property. Annual rainfall is at its minimum (c. 700 mm per annum) on the Manuherikia River flats in the south eastern corner and probably exceeds 1400mm on the crest of the St Bathans Range. Much of the precipitation at high altitude falls as snow. Snowbanks may persist throughout the summer on shady aspects.

2.4 Vegetation

Two land units are identified for the purpose of describing the vegetation. These are the large unnamed catchment of the Manuherikia River West Branch between Boundary Creek and Rocks Creek (known locally as Hut Creek), and small unnamed catchments in the south-east of the property.

Vegetation Description

Hut Creek

This catchment extends from the summit of Mt St Bathans at 2088 metres down to the creeks confluence with the Manuherikia River West Branch at 760 metres. Four bioclimatic zones are recognised, namely montane, subalpine, low-alpine and high-alpine.

The top basin beneath Mt St Bathans is an extensive area of mostly stable blocky scree showing classic "rock glacier" features. Apart from lichens, no vegetation is apparent until approximately 1800 metres where occasional *Hebe epacridea* is present. By 1600 metres

Dracophyllum pronum is the dominant species of what is still a sparse vegetation cover. Other species present are *Hebe epacridea*, *H. buchananii*, slim snow tussock (*Chionocholea macra*), alpine hard fern (*Blechnum penna-marina*), *Leptinella pectinata* and *Phyllachne colensoi*.

Slim snow tussock provides approximately 50 % cover at 1500 metres along with *Celmisia viscosa*, *C. laricifolia*, *C. angustifolia*, *C. lyallii*, *C. densiflora*, *Anisotome aromatica*, *Pentachondra pumila*, *Myrsine nummularia*, and *Aciphylla montana*. Between 1300 - 1400 metres are patches of low shrubland, closely appressed to the rocky terrain, which include porcupine shrub (*Melicytus alpinus*), *Olearia cymbifolia*, snow totara (*Podocarpus nivalis*), *Phyllocladus alpinus*, *Leucopogon suaveolens* and *Pimelea traversii*. Narrow-leaved snow tussock largely replaces the higher altitude slim snow tussock. The banks of small, fast flowing water courses have much *Ourisia caespitosa*, Maori onion (*Bulbinella angustifolia*), golden spaniard (*Aciphylla aurea*) with occasional king devil hawkweed (*Hieracium praealtum*).

Many of these shrub species are also present on the finer, more mobile screes on the valley sides. The most active screes have a distinctive herb component including the threatened *Senecio dunedinensis*, *Ranunculus crithmifolius*, *R. haastii*, *Stellaria gracilentia*, *Epilobium pycnostachyum* and introduced sheep's sorrel (*Rumex acetosella*).

At 1200 m narrow-leaved snow tussock predominates with a range of shrubs including low stature matagouri (*Discaria toumatou*), *Olearia bullata*, *Hebe lycopodioides*, and *Dracophyllum uniflorum* on south-facing slopes. Exotic species are restricted to occasional tussock hawkweed (*Hieracium lepidulum*) and king devil hawkweed. This community extends down to the valley floor, with patches of browntop (*Agrostis capillaris*) and clover (*Trifolium* spp) appearing on creek terraces at about 900 metres. Dry terraces are dominated by golden speargrass, hard tussock (*Festuca novae-zelandiae*) and mouse-ear hawkweed (*Hieracium pilosella*).

From about 900 metres down the remainder of the catchment are patches of grey shrubland, mostly riparian but also extending along the lower colluvial slopes. The main species are matagouri and mingimingi (*Coprosma propinqua*) with occasional *Olearia odorata*, desert broom (*Carmichaelia petriei*), mountain wineberry (*Aristotelia fruticosa*) and, at lowest elevations, *Coprosma intertexta* and *Corokia cotoneaster*.

Significant aspect differences are apparent in the middle and lower valley. Valley sides with a southerly aspect have a generally intact narrow-leaved tussock cover with short tussock and sweet vernal (*Anthoxanthum odoratum*) becoming increasingly prevalent on lower slopes. North-facing slopes are generally dry and display a patchwork cover of tall tussock, short tussock and shrublands with varying degrees of intactness indicative of past burning. Golden spaniard is locally very common. Some very dry, rubbly mid valley slopes have *Pimelea traversii*, *Hebe pimelioides*, *Kirkianella novae-zelandiae*, *Festuca novae-zelandiae*, *Plantago novae-zelandiae* with abundant king devil hawkweed and mouse-ear hawkweed. Higher areas of sparse shrubland/grassland with 30 % bare ground have *Raoulia subsericea*, *Pimelea oreophila*, haresfoot trefoil (*Trifolium arvense*), hard tussock and occasional *Elymus rectisetus*.

Small catchments in the south-east of the property

This unit comprises several small catchments that drain into the Manuherikia River. Two well defined stream gullies penetrate the high western corner at nearly 1300 m but most of the unit comprises rolling hill country 800 - 1100 metres. Two terraces in the extreme eastern corner of the unit lie at approximately 700 metres.

Narrow-leaved tussocklands predominate over the unit, although red tussockland (*Chionochloa rubra* subsp. *cuprea*), montane shrubland and short tussockland/pasture also have localised occurrences. Within the tall tussockland, aspect differences are notable. Dry north-facing slopes have considerable bare ground and rock evident with a light to moderate cover of narrow-leaved snow tussock. Other common indigenous species include hard tussock, matagouri, porcupine shrub, desert broom, *Pimelea traversii*, *P. pseudolyallii*, golden spaniard, *Geranium sessiliflorum*, *Leucopogon fraseri*, *Asplenium flabellifolium*, *Acaena caesiiglauca* and alpine hard fern. The dwarf broom *Carmichaelia vexillata* is locally common. Common exotic species include mouse-ear hawkweed, tussock hawkweed and sweet vernal. Exotic species are more pronounced in the lower half of the northern of the two major catchments in this unit.

Damper south-facing slopes generally have a dense narrow-leaved tussock cover with tussock litter and indigenous ground cover species providing almost total cover. Common indigenous intertussock species include *Gaultheria depressa*, *Pimelea pseudolyallii*, *Lycopodium fastigiatum*, *Huperzia australiana*, *Anaphalioides bellidioides*, *Brachyglottis bellidioides*, *Viola cunninghamii*, *Raoulia subsericea*, *Leucopogon fraseri*, *Lobelia linnaeoides*, *Kelleria villosa* and *Brachyscome sinclarii*. Tussock hawkweed, king devil hawkweed and sheep's sorrel are present but at low density.

Red tussockland occupies a shallow elevated basin southwest of the airstrip. Although browntop and lotus (*Lotus pedunculatus*) are patchily distributed, the area retains significant indigenous biodiversity reflecting a wetness gradient in the basin. Very wet depressions have sharp spike-sedge (*Eleocharis acuta*), *Juncus* spp, and the introduced oval sedge (*Carex ovalis*). Damp clearings and channels amongst the red tussock contain Maori Onion, *Schoenus pauciflorus*, *Gonocarpus aggregatus*, *G. micranthus*, *Plantago triandra*, *Hydrocotyle* sp, comb sedge (*Oreobolus pectinatus*) and *Gaultheria parvula*. Better drained tussock areas on the flanks of the basin have occasional shrubs of coral broom, desert broom, and *Olearia bullata* with an understorey including *Gaultheria macrostigma*, *Anisotome aromatica*, *Ranunculus multiscapus*, *Luzula pumila*, *Stackhousia minima*, *Deyeuxia avenoides*, *Scleranthus uniflorus* and *Helichrysum filicaule*.



Photo Two. Red Tussocklands Occupying a Shallow Basin Southwest of the Airstrip

Montane shrublands are present at the narrow gorgy exits of the two largest catchments in this unit, and along the steep frontage to the Manuherikia River. Common indigenous species are mingimingi, mountain wineberry, *Olearia odorata*, *O. bullata*, porcupine shrub, desert broom, matagouri, *Corokia cotoneaster*, and *Hebe rakaiensis*. Sweet briar is present at low density. The lianes *Clematis marata* and bush lawyer (*Rubus schmidelioides*) commonly drape the shrublands, with *Muehlenbeckia complexa* on rock talus. Rocky bluffs and outcrops have much coral broom and desert broom.

The most southern of the two larger catchments has a particularly well developed shrubland in its lower reaches, comprised of species mentioned above, which extend across the narrow stream terraces and overhang the stream itself. Above this a narrow ribbon of *Olearia bullata* extends along the valley floor, along with mountain flax (*Phormium cookianum*), *Blechnum novaezelandiae* and prickly shield fern (*Polystichum vestitum*).

Small stream-side terraces in this and the large parallel catchment are either stony and well drained, or have impeded drainage. Dry terraces are dominated by the exotic mouse-ear hawkweed and native heath species such as *Gaultheria macrostigma* and *G. parvula*. Other common species include *Raoulia subsericea*, *Leucopogon fraseri*, *Lycopodium fastigiatum*, *Gaultheria depressa*, *Luzula* sp and sheep's sorrel. Wet terraces have *Carex coriacea*, *Gonocarpus aggregatus*, Maori onion, *Shoenus pauciflorus*, *Euchiton* spp, *Pratia angulata*, *Ophioglossum coriaceum*, and *Celmisia gracilentia*. Wet valley bottoms have a similar range of wetland species with the addition of *Juncus* spp, red tussock, *Carex sinclairii*, sharp spike-sedge and *Leptinella squalida*.

A large stony terrace between the main access track and Manuherikia River bed is covered in low herbaceous plants with a scattering of taller shrubs (matagouri and desert broom) and both short and tall tussocks. Ground cover is dominated by mouse-ear hawkweed but several indigenous species are present including *Scleranthus uniflorus*, *Muehlenbeckia axillaris*, *Colobanthus brevisepalus*, *Leucopogon fraseri*, *Raoulia subsericea*, *R. australis* and *Acaena inermis*.



Photo Three. Shrublands on Lower Manuherikia Faces.

Problem Plants

Apart from ubiquitous hawkweed there are few weeds of conservation concern. At least three species of hawkweed are present (*Hieracium pilosella*, *H. lepidulum* and *H. praealtum*) although the latter two species are quite localised. With the notable exceptions of elevated dry stream terraces, occasional spur crests, and dry degraded midslopes, it does not reach densities where it significantly competes with or excludes indigenous species. A grove of conifers is present on the flats near the southern boundary. This and other conifer sources in the district are a potential source of wildings requiring ongoing vigilance to prevent their establishment. Sweet briar is a minor component of most montane shrublands and does not appear to significantly compromise their integrity. Elderberry trees present in shrublands represent a potential long term threat.

Significance of Vegetation

This property is remarkable for the overall good condition of the major vegetation communities present and the high degree of natural character they impart at a landscape scale. Its position on the eastern flanks of the St Bathans Range from range crest to valley floor, encapsulating a variety of landforms and aspects, suggest it is likely to be highly representative of the St Bathans Ecological District. While the lack of a definitive PNAP survey of the district constrains such an assessment, recent botanical surveys carried out in the upper Manuherikia Valley have given considerable basis to this assertion.

High alpine, low alpine and subalpine communities are well represented and show little evidence of recent disturbance from pastoral activities. The slim snow tussocklands of the upper basin beneath Mount St Bathans and high on the valley slopes are good examples of this community. Highly palatable slim snow tussocklands, which in Otago occupy a generally narrow altitudinal zone between the upper extent of narrow-leaved tussocklands and alpine communities, are vulnerable to overgrazing. Such slim snow tussock communities once covered the crests of the main Central Otago block mountains, but have undergone substantial retreat following pastoralism.

The belt of subalpine shrublands containing snow totara and occasional celery pine is very significant in the context of relicts of a previously more widely distributed woody shrubland cover. Surveys to date indicate celery pine in particular is very rare in the St Bathans Ecological District and of very localised occurrence in the adjoining Hawkdun Ecological District.

Narrow-leaved tussocklands are the dominant vegetation of the montane bioclimatic zone and show increasing degradation down the altitudinal gradient. Superimposed on this are distinct aspect differences with tall tussocklands being replaced by short tussocks and introduced pasture grasses and weeds on dry north-facing slopes. Notwithstanding this, the overall condition of these tussocklands, taking into account stature, density and composition, is better than most at a comparable altitude and aspect in the district and beyond. This community is also a significant habitat for several threatened plants including coral broom, dwarf broom and *Kirkianella novaezelandiae* f. *novaezelandiae*.

The red tussocklands of the shallow basin west of the airstrip, although small in extent, are important given the large degree of fragmentation and modification which typify those remaining examples on the surrounding Manuherikia terraces. They have added significance derived from their contiguity with an altitudinal sequence of less modified indigenous vegetation types extending to the tops of the St Bathans Range.

Montane shrublands fall into two categories. Those dominated by short-statured matagouri are the first stage in the transition back to a woody cover following early fires. Their spread and vigour has probably been enhanced by the application of fertiliser and their conservation significance is moderate. More diverse shrublands on rubbly talus slopes in stream gorges are highly significant as remnants of woody cover with a species mix that reflects the likely pre-extensive burning state. They include several shrub and liane species now recognised as threatened. Future restoration and rehabilitation of the woody shrub cover in this part of the landscape will require nucleus seed sources such as these.

The large stony terrace adjoining the Manuherikia river bed in the south eastern corner is a complex mix of vegetation communities reflecting a high disturbance regime and subtle terrain patterning resulting from old river braids. While exotic herbs are dominant, the terrace in its uncultivated state still retains many indigenous herbs, grasses and shrubs representative of that landform.

2.5 Fauna

(a) Invertebrate Fauna

The invertebrate fauna of this property has not been formally described prior to this survey although the nearby Hawkdun Range (neighbouring Hawkdun Ecological District) was surveyed in the early 1990's (Patrick 1994). As a result, there are very few invertebrate records from this ecological district. Patrick (1994) noted that the invertebrate fauna of the Hawkdun Range was not as diverse as that found in the schist block mountains, but did include a number of notable characteristics. He found that some of the invertebrates collected were typical of both the Central Otago and South Canterbury regions suggesting that the area is an important cross over point. He also recorded a number of nationally rare species such as the weevil *Lyperobius* spp. and the geometrid moth *Asaphodes ida* occupying the Hawkdun

Range. It is reasonable to suggest that the neighboring Micheal Peak property (St Bathans Ecological District) supports an invertebrate population with similar characteristics.

Methods

Due to time constraints, hand searching, sweep netting and light trapping were the only methods used to collect invertebrates.

Four primary sites were visited on the property:

Site 1 – this gully was situated at the south-eastern end of the property (H40 2264183 5599122) with an altitude of 817 m. The base of the gully contained a diverse flora including: matagouri, *Melicytus*, *Carmichaelia*, *Hebe*, *Coprosma*, and *Celmisia* spp.

Site 2 – was on the eastern boundary of the property and adjacent to the Manuherikia River (H40 2264804 5601087). Sampling took place at the base of a small creek that did not contain a substantial flow of water. The creek contained a small remnant of native vegetation that had probably been disturbed during recent times by the river and by the construction of a small water race along the rocky cliff nearby.

Site 3 – was also on the eastern boundary of the property and was adjacent to the lower reaches of the Manuherikia River West Branch and a small stream which fed into this river (H40 2263195 5599132). The altitude of the site was 819 m. This was a relatively small, but open valley which contained native shrub remnants (similar to those found elsewhere on the property) along the riparian edges of the stream.

Site 4 – was a large valley that ranged in altitude from 800 m to 2088 m. The valley ran from the north-eastern boundary to the north-western boundary of the property. Invertebrates were collected from the highest areas and from the valley floor at a range of different altitudes. A range of flora was encountered including *Aciphylla*, tussock, *Carmichaelia*, *Muehlenbeckia*, matagouri and *Olearia*.

A table containing a complete species list of invertebrates found on the property is presented in Appendix one.

Key Invertebrate Habitats

Tussocklands.

Many of the invertebrates associated with these habitats such as the tussock butterfly, cicadas, crane flies, diurnal moths and grasshoppers were collected and observed at various sites on the property. The property supports large areas of tussockland at varying altitudes. Much the tussock has been modified by grazing and burning, but still contains the major faunal elements associated with this type of habitat. Large numbers of *Aciphylla* plants were observed on the property. These plants offer habitat and floral resources to a number of weevil species. Invertebrates of this size are at risk of predation by birds and rodents. Although no weevils of known conservation value were collected during this survey, Patricks (1994) survey of the adjacent Hawkdun Range located several species of large weevils (*Lyperobius* spp.) in the vicinity. A key area of intact tussock was observed on the eastern

side of the property, above the airstrip (H40 2263500 550000). Although weather conditions were not suitable for collecting invertebrates at this site, the wetland area associated with this tussock grassland is likely to provide ideal habitat for invertebrates such as crane flies which require damp conditions for larval development.

Shrublands

There were several native shrubland remnants on the property, however, these had been largely modified by stock. The remnants often contained a diverse range of species including *Carmichaelia*, *Muehlenbeckia*, Matagouri, *Olearia* and *Coprosma*. It is likely that these remnants once contained a wide diversity of plants that would have hosted a range of invertebrate species. Many of the remaining plants are likely to support a number of invertebrate species but due to their isolated nature and lack of connectivity with other shrublands, it is unlikely that they will contribute greatly to the overall diversity of the area in the future.

Large areas of grey shrubland were encountered in the valley at the north side of the property (site 4) and it is likely that this habitat provides essential over-wintering sites and resources required by female insects for reproduction. Matagouri is often occupied by adult invertebrates as its foliage is rigid, but open, allowing invertebrates such as cicada and moths to attract mates without risking predation by birds. Matagouri also hosts several species of beetles, including *Odontria striata* (Coleoptera: Scarabidae), which was collected during this survey.

Alpine and scree habitats.

A number of invertebrates were collected during this survey that are typical of sub-alpine and alpine habitats. These included grasshoppers, cockroaches, ground beetles and weta. The collection of *Migadopinae* (Coleoptera: Carabidae) was an important indication that the alpine habitat on this property is largely intact and is likely to provide habitat for a wider range of invertebrates than were collected during this survey.

Aquatic Habitats

Invertebrates were collected from stream habitats on the eastern side of the property by hand and use of a UV light trap. The diversity of aquatic invertebrates recorded was reasonably high, and included several species of mayflies and caddisflies. These families of invertebrates are often used as indicators of stream quality as they are particularly sensitive to pollution. The diversity of aquatic invertebrates collected in this study suggest that the streams were in average condition but more extensive sampling of aquatic habitats is necessary to accurately determine the condition of the streams. The diversity of aquatic invertebrates and water quality is often enhanced in areas where there is native vegetation covering stream margins. A majority of the streams visited during this survey had little or no dense vegetation remaining on stream margins.

Significance of Invertebrates

Elements of the invertebrate fauna collected support the findings of Patrick (1994) that this area is important as a transitional interface between Canterbury and Otago regions.

Due to the limited range of collection techniques used during this survey, only a subset of the invertebrate fauna occupying this property was collected. A majority of the invertebrates collected during this short survey are endemic to New Zealand, but are widespread and commonly collected in the South Island. Several of the invertebrate species collected are considered to be rare and restricted in their distribution. *Cermatulatus nasalis* (Hemiptera: Pentatomidae) is thought to have a disjunct distribution in the South Island High Country and there is little else known about the species *Notoreas* spp. (Lepidoptera: Geometridae) moths are regarded as being distinctive and of conservation value. Most *Notoreas* species are found in association with *Pimelea* spp. (Thymelaeaceae) but not all species have been fully described. *Gynoplistia* sp. (Diptera: Tipulidae) was collected in the large valley on the northern side of the property (Site 4) and was a new record for this region. This species of crane fly has been previously collected in the Old Man Range and mountains close to the Main Divide and is thought to be a flightless alpine species and is therefore vulnerable to any large scale habitat changes. A species of ground beetle *Migadopinae* (Coleoptera: Carabidae) was also collected from this site. This species has only recently been discovered and is undescribed. This group of beetles is thought to be restricted to alpine scree habitat and has been collected from similar habitats at Mt Bitterness and the St Mary Range. Some of the invertebrate species collected during this survey have not been well studied and there is insufficient information to determine their conservation value.

There are a number important habitat types available to invertebrates on Michael Peak. These include open tussock grassland at variable altitudes, scattered shrublands with locally common plant species and alpine scree habitats. Small streams and rivers provide important habitat for invertebrates that inhabit aquatic habitats during juvenile life stages.

(b) Herpetofauna

“Site locations of rare and endangered herpetofauna are recorded in the original report. Herpetofauna of this nature is at risk of illegal activities including damage and removal through unlawful interference and disturbance. Accordingly, information regarding the locations of any such herpetofauna has been deleted from this version of the report. The Department of Conservation has put in place mechanisms to ensure that such information can be released for genuine scientific and research purposes. Please contact the Department of Conservation directly to determine whether the information can be released.”

Previous Work

Lizard surveys were carried out in the Dunstan Mountains and St Bathans Range during “22 February – 3 March 1989” (Whitaker and Loh 1990). Parts of Michael Peak were included in this survey. Although scree skinks (*Oligosoma waimatense*) and green skinks (*O. chloronoton*) were not found on Michael Peak, they were reported from the Rocks Creek catchment, which is adjacent to Hut Creek, and above Dunstan Creek on Mt St Bathans. Green skinks have been reported in the upper Manuherikia Valley near the junction with Boundary Creek (ARDS database (Amphibian and Reptile Distribution Scheme– DOC)).

Tenure Review Inspection

A survey of a gully revealed good habitat for five lizard species, the skinks (*Oligosoma nigriplantare polychroma*, *O. maccanni*, *O. chloronoton*, *O. inconspicuum* and gecko

Hoplodactylus spp (probably *H. "Southern Alps"* or *H. "Otago"*). Habitat included rocky slopes above the stream, blocky screes below small bluffs and dense shrubland with large *Melicytus alpinus*. Only one lizard species *O. maccanni* was seen, but the weather was cool and lizards were not likely to be active.

A slope covered in extensive shrubland and rock represents good potential habitat for the five species of lizards previously listed.

In the lower reaches of a stream there are patchy rock outcrops and exotic grass with some shrubland but no significant areas of scree. *O. nigriplantare polychroma*, *O. maccanni* and *Hoplodactylus spp* are likely to be present here.

The upper reaches of Hut Creek, have extensive screes. This area represents potential habitat for *O. waimatense*.

Significance of Herpetofauna.

Scree skinks

Although scree skinks were not seen, time did not permit extensive survey for these elusive skinks and the weather was inclement and unsuitable for lizard; however, given the presence of *O. waimatense* in the adjacent catchment of Rocks Creek and 6 km south above Dunstan Creek in similar habitat (Whitaker and Loh 1990), it is reasonable to expect that this species may also be present in the upper catchment of Hut Creek. These endemic lizards have a threat status of "gradual decline" (Hitchmough 1997), and occur only in Marlborough, Canterbury and Otago. Genetic studies to date suggest that Otago scree skinks may be distinct from those in Canterbury (Daugherty and Kappers and Tocher and Kappers 2002). It is prudent to manage the Otago scree skinks as a separate group. 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) and the Blue Duck Creek catchment (ARDS database, McQueen 2000). Those in the Mt St Bathans area are at the western limit of known distribution for the species in Otago. Protection of habitat for scree skinks will also provide good habitat for other lizards such as geckos and skinks commonly found in Otago.

Green skinks

Again although green skinks (*Oligosoma chloronoton*) were not seen on Michael Peak, from presence of good habitat and proximity of known sightings in the past it is reasonable to assume that this species is present.

Green skinks are found only in Southland and Otago and considered to be in gradual decline (Molloy *et al.* 2001). The taxonomy of green skinks is not clear, although they are distinct from *O. lineocellatum* found north of the Waitaki River (Whitaker *et al.* 2002). Although only one species is currently recognised in Otago and Southland it has been suggested that a complex of more than two species is present, some of which may be seriously threatened (R. Hitchmough *pers. comm.*). Southland green skinks differ in appearance and habitat use to those at Falls Dam (L. McFarlane *pers. comm.*) and other green skinks in Otago use a variety of habitats (M. Tocher *pers. comm.*, ARDS database).

The distribution of green skinks is patchy. Apart from the population at Rocks Creek / Dunstan Creek/ Mt St Bathans area (Whitaker and Loh 1990) and upper Manuherikia Valley (ARDS database) the only other known population in west Otago is at Falls Dam. The former population is at the north-western limit of the known distribution for this species.

(c) Avifauna

The following birds were recorded during the property inspection (with the exception of black fronted terns which are an historic record):

Table 1.

SPECIES	LOCATION	STATUS	SIGNIFICANCE
NZ falcon	Mid Altitude Hillslopes	Protected rare threatened endemic	New Zealand Falcon have a “Gradual Decline” Status (Hitchmough 2002)
Harrier hawk	Throughout Montane and lower altitude country	Native, Protected	Not a priority
Blackbird	Lower country	Introduced, Unprotected	Not a priority
Skylark	Montane and lower country	Introduced, Unprotected	Not a priority
Paradise Shellduck	Valley floors	Partially Protected Endemic	Not a priority
New Zealand Pipit	Montane and lower country	Native, Protected	Not a priority
Silvereye	Low altitude shrublands	Native Partially Protected	Not a priority
Grey warbler	Low altitude shrublands	Native, Protected	Not a priority
Greenfinch	Low altitude	Introduced, Unprotected	Not a priority
Spur-winged plover	River flats	Protected common self introduced native	Not a priority
Magpie	Lowlands	Introduced, Unprotected	Conservation Pest
Canada Goose	Lowlands	Partially protected introduced species	Not a priority
Black Shag	Valley floors	Partially protected native	New Zealand Falcon have a “Gradual Decline” Status (Hitchmough 2002)
Black fronted tern	Manuherikia Valley	Native, protected, threatened	The Black fronted tern have a “Serious Decline Status (Hitchmough 2002)

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(d) Aquatic Fauna

The Manuherikia West Branch and the Manuherikia River proper run along the eastern boundary of the licence area and are in the Clutha River Catchment. The Manuherikia River flows all year and experiences low summer flows of less than one cumec. Falls Dam approximately 11 km downstream of this property, stores water to augment the river flow for irrigation purposes has been in place since 1935. This dam creates an upstream and downstream barrier to the passage of all fish.

Other streams within the license are typically small, steep gradient streams draining the eastern slopes of the St Bathans Range from 1500 metres asl. Some are seasonally dry.

The Freshwater Fish Database (Table 1) and Department of Conservation archives were searched for records of freshwater fauna.

Four sites (Table 1) were fished on 18 March 2002 using a Kaianga backpack electric fishing machine. At each site approximately 30 m of surface water was fished with one pass of the machine. A Freshwater Fish Database form was completed at each site. All fish collected were readily identified on site and returned to the stream.

The smaller watercourses downstream of the Manuherikia East and West branch confluence were dry at the time of the survey.

Of the four sites fished, three had brown trout (*Salmo trutta*) and one had no fish (Table 1).

Five records were located in the NIWA Freshwater Fisheries Database for waters on or near the property fished in 1985. The introduced brown trout (*Salmo trutta*) and brook char (*Salvelinus fontinalis*) were recorded at two sites. The native upland bully (*Gobiomorphus breviceps*) was recorded at one site.

Table 2. Combined Freshwater Fish Records for Michael Peak POL.

<i>Location</i>	<i>NZMS 260 Grid Ref.</i>	<i>Date</i>	<i>Fish Species</i>	<i>Data Source</i>
Manuherikia River	h40 22651 56006	1985	Upland bully	NIWAFFDB
Manuherikia River	h40 22651 56006	1985	Brook char	NIWAFFDB
Manuherikia River	h40 22651 56006	1985	Brown trout	NIWAFFDB
Manuherikia River	h40 22659 55983	1985	Brook char	NIWAFFDB
Manuherikia River	h40 22659 55983	1985	Brown trout	NIWAFFDB
Boundary Creek	h40 22605 55942	2002	Brown trout	DOC
Manuherikia West Branch tributary	h40 22618 55024	2002	Brown trout	DOC
Manuherikia West Branch tributary	h40 22608 55010	2002	None	DOC
Manuherikia River tributary	h40 22635 55989	2002	Brown trout	DOC

Significance of Aquatic Fauna.

Only one native freshwater fish, the upland bully has been found on this property. This species is probably the most common and widespread bully in the South Island (McDowall 1990) and is also found in the lower North Island. It occupies a wide variety of habitats from lakes to swiftly flowing streams from sea level to high altitudes (McDowall 1990). It is not considered threatened.

The habitat these streams probably supported non migratory galaxiids in the past. This is based on known distribution and the inability of these fish to co-exist with introduced salmonids (Allibone 1997). These fish have gone from the sites of have been replaced by salmanoides; especially brown trout which were abundant and widely distributed in the waterways on the property.

The streams on the property are typical of many in Central Otago above 700m generally being shallow, relatively low volume, experiencing large seasonal variation in flows and unconstrained flooding. The water quality in all the streams on the property was high which is reflected in an abundance of invertebrates including mayfly (*Coloburiscus*, *Deleatidium*), caddis (*Olinga*, *Pycnocentroides*) and stonefly (*Zealandobius*, *Zealandoperla*).

Streams of this quality are not uncommon locally but can be affected by continuing land development. The invertebrate communities that these waterways support would benefit from the maintenance and enhancement of the native riparian and catchment vegetation.

(e) Problem Animals:

Rabbits have historically reached high numbers on low lying and sunny country. Hares are present at a moderate density throughout much of the property. Possums are present in low numbers. Pigs historically inhabited the area, but in recent years have probably been eliminated. Stoats, ferrets and cats are present and represent a serious threat to lizard populations. A low and mobile population of red deer inhabit the St Bathans Range and surrounding country.

2.6 Historic

There are no recorded Maori sites on the licence area. The main historic features are two major water races associated with the St Bathans gold field. The largest is the Scandinavian water race which dates to 1865. This race starts near the junction of Boundary Creek with the West Branch of the Manuherikia River. The race is notable in its upper reaches for the extensive use of stone revetting to carry it around the hillside. It is also significant for its prolonged period of use as it was operating until the 1930s. The race was built by the Scandinavian Water Race Company which was one of the major players in the mining history of St. Bathans. For many years the company was managed by John Ewing who was the major figure in the goldfields in Central Otago in the late 19th century (Nicolson-Garrett 1977).



Photo Four. Revetted Section of the Scandinavian Water Race

The second race is the Otago Company race which commences in the West Branch just above the junction of the two main branches of the Manuherikia River. In comparison to the Scandinavian, little is known about the history of this race.

There are also the ruins of two stone huts that may be associated with the water races. One is at the junction of the West Branch with an unnamed creek at GR H40 621026 and the second at the junction of another unnamed creek at GR H40 638017. An old survey map from 1881 (SO 1543) also shows a hut located on the flat below the junction of the two branches of the Manuherikia River.

Significance of Historic Values.

All of the historic features are archaeological sites under the Historic Places Act. This Act makes it an offence to destroy or modify an archaeological site older than 1900 without an authority from the Historic Places Trust.

The Scandinavian Races is of high inherent value because of its association with the St Bathans diggings, the Scandinavian Water Race Company, and John Ewing, and it demonstrates well the technology used in supplying water to the goldfields.

2.7 Public Recreation

2.7.1 Physical Characteristics

The property's spectacular and remote location provides a setting for a range of recreational opportunities.

In 1992, DOC compiled a Recreation Opportunity Spectrum for the entire conservancy whereby all areas regardless of land tenure, were classified and mapped according to setting, activity and recreational experience characteristics.

The Upper Manuherikia River was zoned "Backcountry 4WD Drive-In" which is characterised by a feeling of relative remoteness from populated areas". "The highly natural setting is a valued part of the experience and may be associated with motivations of "escape from town", education and nature appreciation". "Four wheel drive vehicles are desirable to give access to high country tussock grasslands and block mountains and more rugged remote areas."

2.7.2 Legal Access

A marginal strip is present on the Manuherikia River below the confluence of the East and West Branches. A legal road which appears to coincide roughly with a formed 4WD track follows the west (TR) bank of the Manuherikia and extends beyond the confluence up the West Branch. The license title contains a provision for public foot access up the southern and western boundaries to the summit of Mt St Bathans.

2.7.3 Activities

The most popular activities within or immediately adjacent to the licence are four wheel driving, trail biking, mountain biking and horse trekking up the Manuherikia Valley and fishing the Manuherikia River. The property also receives some use by trampers, hunters and backcountry skiers, some of whom venture to the crest of the St Bathans Range

PART 3

OTHER RELEVANT MATTERS & PLANS

3.1 Consultation

Conservation resources on Michael Peak were discussed at a meeting with “umbrella” recreation and conservation groups (NGO’s) in Alexandra on 12 December 2000.

Key points raised at the meeting were in relation to this property were:

- Majority of licence area to become conservation land with no provisions for grazing.
- Lower country including flats could be freeholded.
- Right of Way boundary needs to become a less restrictive easement – move onto track and provide for as of right foot, mountain bike and possibly horse access.
- Access up Manuherikia Valley needs to be sorted out i.e. fully legalized if it is not already.
- Require formalized public access to point 1046m in the lower reaches of the property.

3.2 Regional Policy Statements & Plans

Not applicable to this property.

3.3 District Plans

The property is located within the Rural Resource zone of the Central Otago District Plan. The eastern boundary of the property, being the Manuherikia River and its West Branch, is subject to a requirement for esplanade provisions upon subdivision. In general, the proposed Central Otago 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. Resource consent is required for excavations or tree planting within specified distances of a water race or irrigation pipeline, and for development work within 10m of any water body. Resource consent is also required for tree planting of evergreen species with wilding spread capabilities.

There are no registered historic sites, or areas of significant indigenous vegetation and habitats of significant indigenous fauna and wetlands as set out in the schedules of the plan. Protection is limited to the controls set out above.

3.4 Conservation Management Strategies & Plans

The Otago Conservancy of DOC has prepared a Conservation Management Strategy (CMS) which was approved by the New Zealand Conservation Authority in August 1998.

The CMS identifies 41 special places of conservation interest in Otago Conservancy. Michael Peak lies within the St Bathans–Hawkdun–Ida Special Place.

The CMS objective for the St Bathans–Hawkdun–Ida Special Place is:

The key implementation methods relevant to Michael Peak are:

***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***

(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) 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.

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.

Also of relevance is the general CMS statement (Chapter 14 – page 469) that “ the vision for Otago sees all kinds of natural indigenous communities thriving, and this being done, in the

main, by ensuring the retention of representative samples of all classes of natural ecosystems.”.

Michael Peak contains the following broad ecosystem classes identified in the CMS as being present in the Otago Zone:

- Dry
- Rivers
- Tussock Grasslands
- Shrub Remnants
- Cushion (lowland)

3.5 Freshwater Fisheries Plans

Under Preparation.

PART 4

MAPS ETC.

4.1 Additional information

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