Toitu te whenua
Land Information
New Zealand

Crown Pastoral Land Tenure Review

Lease name : Mt GRAND

Lease number : PO 349

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.

February 06

DOC CONSERVATION RESOURCES REPORT ON TENURE REVIEW OF

MOUNT GRAND PASTORAL LEASE

PAL 14-04-349

CONTENTS

PART 1

INTRODUCTION

1.1 INTRODUCTION:

Mt Grand Pastoral Lease (PL) was inspected on the 14-17 February 2005 as part of a review of its pastoral lease tenure. This review was requested by the lessees of the property (Lincoln University) and is being undertaken under the provisions of the Crown Pastoral Land Act 1998. As part of the tenure review process, a range of specialists visited the property. Their reports, identifying the inherent values on Mt Grand, have been incorporated within this Conservation Resources Report.

Mt Grand comprises approximately 1974ha of pastoral lease and is run with 162 ha of other nearby freehold land. It is located on the Hawea Back Road approximately 5km from the township of Lake Hawea. The PL is bounded by Lake Hawea Station to the north, Glenfoyle Station to the south and Bargour Station to the east. Two small areas of conservation land adjoin the property being the 20.3 ha Lagoon Creek Scientific Reserve and a 0.15 ha strip of land in Hospital Creek is held under the Conservation Act 1997. Part of the Hospital Creek catchment is subject to 190.7 ha Reserves Act conservation covenant.

Cover over the whole of Mt Grand can be described as: approximately 64ha of cultivated land in pasture and lucerne, 1000ha of oversown and topdressed (OSTD) hill, 550ha of part OSTD snow tussock and 360 ha of steep eroded mountain sides.

The property is situated within the Lindis Ecological District along the western edge of the Central Otago Ecological Region. A Protected Natural Areas Programme survey report has been undertaken for the Ecological District (Grove 1994). It divided the region into distinctive land systems on the basis of "recurring patterns of landforms" and other ecological criteria. Mt Grand PL is part of the Grandview land system. In the report, 2 areas within the property were recommended for protection, being: 'Recommended Areas for Protection' (RAPs) A8 Hospital Creek, and B4 Grandview Tops. The south branch of Hospital Creek was recommended for protection for its diverse woody species and several uncommon plants, which is subject to the above covenant. RAP A9 Lagoon Creek, was originally in the property, but since the report it has been acquired and is now the Lagoon Creek Scientific Reserve. It protects a large population of kowhai, described as "by far the largest concentration of kowhai within the Lindis, Pisa and Dunstan Ecological Districts"(see 4.1.2 Appendix 1-2).

PART 2

INHERENT VALUES: DESCRIPTION OF CONSERVATION RESOURCES AND ASSESSMENT OF SIGNIFICANCE

2.1 LANDSCAPE:

Mt Grand PL contains two landscape types. The first is the inland lake basin type which includes the outwash and alluvial Wanaka/Hawea basin. The second is the Lindis/Breast mountain rangeland type which are uplands draining to east and south. Both landscape types are predominantly mountain lands vegetated with tussock and remnant shrublands.

Methodology:
The pastoral lease is divided into defined landscape units (LUs). These units reflect areas of similar landscape character. Landscape character is the quality that makes an area different from another and can be defined as follows:

'Landscape character results from a particular combination of characteristics formed by the interaction of natural processes and cultural (human) activities.'
NZ Institute of Landscape Architects

For each unit a landscape character description is included followed by a description of the key visual and scenic attributes. An evaluation summary is then presented using a range of criteria to assess each unit and assist with determining each unit's high inherent values. The 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 vulnerability to landscape degradation.

Landscape Units:
Mount Grand PL is divided into three landscape units (refer Map 4.2.2). These include:

LU1 Grandview (Mountain) Faces and Tributaries
(a) Cameron Gully
(b) Hospital Creek
(c) Lagoon Creek

LU2 Upper Grandview Creek and Crest

LU3 Camp Creek

Landscape Description:

Landscape Unit 1 (LU1) – Grandview faces and tributaries:

Character Description:

(refer Photos 4.3.1, LU1 - 1 to 15)

This unit includes the front faces and tributaries and forms the largest area of the lease comprising the three main catchments of (a)Cameron Gully, (b)Hospital Creek and (c)Lagoon Creek. These west and southwest flowing tributaries are all incised into the eastern wall of the Hawea-Upper Clutha valley. Minor areas of fans are also included in this unit.

(a) Cameron Gully

This northern and smallest of the gullies extends behind the Mt Grand homestead. A small section of fan at the base of the main slope is developed farmland subdivided into small paddocks with farm buildings and shelterbelts. The lower mountain slopes behind the homestead block are oversown and topdressed pasture mixed with scattered short tussock, patchy kanuka, matagouri and briar. The farm access track zigzags up the face on the sunny side of Cameron Gully. Snow tussock containing extensive speargrass, starts at about 1000m. Cameron Gully has been OSTD with pasture species between the snow tussock cover. Rock exposure increases above 1100 m.

(b) Hospital Creek

Hospital Creek forms a tight cluster of steep gullies deeply incised into the headwall. The unit also includes sunny north and west facing slopes south of Hospital Creek. Very steep derivative slopes are present on all aspects of the gully system. The upper slopes include the extensive slumped south-western face of Grandview Mountain and smaller smooth colluvial slopes. In its mid reaches, the stream is confined in a deep narrow gorge, with buttress outcrops and very steep ribs and gullies on both walls. The steep slopes are prone to sheetwash and gully erosion, and the stream carries a heavy sediment load.

Snow tussock is dominant on upper slopes especially on shady aspects. *Dracophyllum* and tussock hawkweed (*Hieracium lepidulum*) are also prominent. Below this, strongly modified short tussockland has been oversown clovers and grasses. The gorge supports a diverse mixed shrubland including Hall's totara, broadleaf, C*oprosma, Olearia* and *Hebe.*

Kanuka shrubland is a feature on sunny slopes. Below the gorge kanuka mixed with bracken contains the odd cabbage tree and some old kowhai trees.

The sunny faces (rising to 800m on the ridge) are similar to the lower slopes of Cameron Creek with patchy kanuka, grey shrubland, briar, scattered short tussock and pasture species.

(c) Lagoon Creek

Lagoon Creek has many similarities in character to Hospital Creek, but instead of being a series of tributaries, it comprises one main creek with a secondary tributary to the north.

The upper slopes of the main creek (above about 1100m) are predominantly vegetated in snow tussock, with tussock hawkweed a significant component. These faces have smooth rounded slopes descending steeply to a narrow gorge. The southern upper face (known as Bluenose) is a very distinctive rocky escarpment with very steep bluffs and crags shaped by ice action. Below is a significant area of kanuka shrubland associated with rock bluffs. As with Hospital Creek, mixed shrubland is a feature within the lower reaches of Lagoon Creek. The lower slopes and valley floor are mainly OSTD pasture. Willow is present on the lower creek margin.

Visual & Scenic Values:

The front faces form part of the eastern wall of the Hawea Flat and wider Upper Clutha Valley. The rocky and rugged upper faces are a distinctive and characteristic feature of the Grandview faces that extend north to include the backdrop to Lake Hawea. Though not quite as dramatic as Grandview Creek and other catchments to the north, it is part of the same glacial head wall. The bands of rock bluffs, prominent spurs and steeplands combined with tussock are a dramatic and significant visual feature. The Bluenose escarpment within the lease is particularly distinctive and impressive combined with kanuka shrubland, tussock and pasture.

Within Hospital and Lagoon Creeks, the mixed shrubland associations within the gorge and lower slopes are also visually important and contribute to local character and identity.

The lower and mid slopes are part of the enclosing mountain slopes of the Upper Clutha Valley. The natural character of the lower slopes has been considerably modified by grazing and burning.

The farm access track below Bluenose cuts across the slope and detracts from the overall visual setting.

Evaluation Summary:

Table 1

Criteria	Value	Comment
Intactness	Medium	Upper slopes more intact though tussock hawkweed is extensive
Legibility	High	Derivative slopes highly legible. Erosion processes also legible.
Aesthetic Factors	Medium	High value on upper slopes (derived from distinctive landforms and steeplands combined with dominant tussock and shrublands.) Lower slopes are less distinctive.
Historic Factors	Low	Pastoralism has shaped present day landscape mainly by changes to vegetation.
Visibility	High	Visible over wide area of the Upper Clutha Valley
Significance	High	Landforms, tussock and remnant shrubland are representative of pre- European natural landscape.
Vulnerability	Medium	Landscape vulnerable to intensification of farming practices or change in landuse.

Landscape Unit 2 (LU2) – Upper Grandview Creek and crest:

Character Description:
(refer photos 4.3.1, LU2 -1 to 16)
LU2 includes the upper northern slopes of Grandview Creek and summit crest area, and the upper south-east facing slopes of the headwaters of Camp Creek.

Upper Grandview Creek represents an important area with significant natural values. The Mount Grand PL segment extends from 1000m at the boundary fence to 1400m at the ridge. It includes moderately steep slopes, dominated by tall tussock and short tussock, speargrass and inter-tussock native species. The overall appearance is that of a reasonably intact and natural tussock landscape, though hawkweed is present and tussock is depleted in places. Rock stacks and outcrops are notable features providing contrast with surrounding tussockland. The rock stacks become increasingly more prominent towards the ridge to the north. On the ridge, clusters of rocky knobs surrounded by tussock and alpine herbfield are a dominant and distinctive feature. These extend beyond the boundary to form a remarkable alpine landscape.

The small area of upper south-east facing tussock slopes (headwaters of Camp Creek) are in reasonable condition. The access track linking with the Grandview track traverses these upper slopes.

Visual & Scenic Values:
The upper Grandview Creek faces are a part of the Grandview Creek catchment. This valley system represents a reasonably intact landscape with significant visual and scenic values. The more or less continuous tussock cover is an important component of the visual values.

The rock stacks and outcrops of the upper slopes combined with their tussock and alpine plant communities are visually impressive and memorable, and form part of a broader alpine crest landscape that extends to the north.

The views from the whole of this unit especially, those from the summit ridge area to Lake Hawea, with the Upper Clutha and the Main Divide in the distance are truly outstanding and are expressed in the name of Grandview Mountain.

Evaluation Summary:

Table 2

Criteria	Value	Comment
Intactness	Medium to High	High on upper slopes and summit area. Moderate on lower slopes.
Legibility	High	Formative processes legible
Aesthetic Factors	High	Very high on summit ridge area with snow tussock and rock tors. Distinctive and memorable.
Historic Factors	Low	Not significant
Visibility	High	Visible from Hawea and surrounding areas
Significance	High	Significant as part of Grandview Creek which as a whole has significant landscape values
Vulnerability	High	Vulnerable to landscape alteration

Landscape Unit 3 (LU3) – Camp Creek:

Character description:
(refer photos 4.3.1, LU3 - 1 to 9)
This unit forms the head of Camp Creek, a tributary of the Lindis River. Landform is mainly slumped ripply with shattered rocky terrain a feature towards the head (northern end) of the catchment.

Landcover is predominantly 'diminished' tall tussock with tussock hawkweed and native inter tussock species. Dracophyllum is notable at higher elevations. The reddish/brown mat forming dracophyllum contrasts in colour and texture with the dominant tussock cover. Hawkweed is extensive over wide areas. The yellow flowers at the time of the inspection imparted a yellow hue to the vegetation cover. Below about 900m has been OSTD giving a greener and more developed appearance to the land cover.

Rocky outcrops are localised and not extensive within Camp Creek. Large areas of open slopes have no rocky features.

Unlike lower sections of Camp Creek (outside the lease) shrubland is not as extensive. Small patches near the margin of the watercourse on the southern boundary of the lease are an exception.

Visual & Scenic Values:
This unit forms a reasonably coherent landscape typical of the upper Lindis headwaters. There are no particularly distinguishing or memorable features. Landforms are not special or significant, apart perhaps from the south face at the very head of the catchment. This has slump topography and rocky terrain with reasonably good tussockland/herbfield.

Overall the high hawkweed component and diminished state of the tussock grassland contributes to this unit not rating highly in visual terms.

Evaluation Summary:

Table 3

Criteria	Value	Comment
Intactness	Medium	Tussock stature diminished. High hawkweed component
Legibility	Medium	Typical
Aesthetic Factors	Medium	Not distinctive or memorable but reasonably visually coherent
Historic Factors	Low	
Visibility	Low	Not visible from public places
Significance	Medium	
Vulnerability	Medium	Vulnerable

Significance of Landscape:

Grandview Creek Faces and Summit Ridge:
The Grandview Creek north faces at the head of the catchment form a comparatively small part of Grandview Creek. The dominant tussock is in reasonably good condition and appears from a distance as a natural tussock landscape. The rock stacks and outcrops toward the upper part of the gully system are a notable and characteristic feature. Rock stacks and bluffs as well as distinctive rugged spurs, are a feature of Grandview Creek as a whole (especially the south facing slopes outside the lease). Within Mount Grand PL the rock stacks and outcrops that extend from the head of the valley up onto the summit area together with tussock and alpine herbfield plant associations are highly distinctive and memorable. This crest landscape extends well beyond the boundaries of the lease.

The catchment as a whole has significant landscape values forming a distinctive and highly identifiable part of the Hawea Basin. It is also a integral part of the greater Grandview Creek gully system.

The tussock slopes are also part of a continuum of the eastern glacial head wall of the Hawea/Upper Clutha Valley.

Hospital Creek and Lagoon Creek tributaries including gorges and steeplands:
The significant landscape values identified within Hospital and Lagoon Creeks form part of the Grandview glacial headwall that extends north to Lake Hawea.

As a whole the headwall forms a distinctive landscape feature and highly identifiable feature of the Hawea Basin (and wider Upper Clutha Basin). The very steep and often rugged slopes with bands of bluffs, craggy outcrops and distinctive spurs on the upper slopes are visually impressive, and highly expressive of both glacial and subsequent erosion processes. The vegetation cover of tall tussock and mixed shrubland are important contributors to landscape character and local identity. The mid and lower slopes though modified are an integral part of the significant landscape. The landform patterns and features remain distinctive and impressive regardless of the modified state of the vegetation on the mid and lower slopes.

2.2 LANDFORMS & GEOLOGY:

Landforms:
Mt Grand PL is a relatively small, primarily west facing property that rises from the Hawea Flats at about 420 m to Grandview Mountain at 1398 m. The highest point on the property at about 1445 m lies further back along the east boundary. The steep-sided and incised Hospital Creek, with several large erosion scars and steep, rocky ridges, drains the centre of the property. Its shingle riverbed is dry (except during heavy rain) at lower levels. To the south is Lagoon Creek, while the smaller Camerons Gully drains the northern part of the PL. Both creeks run more or less parallel to Hospital Creek. Further north again is Grandview Creek which is mostly located within the Lake Hawea Pastoral Lease, but its head is located within the Mt Grand PL. Camp Creek at the rear of the PL drains south and east into the Lindis River. Bluenose is a prominent and spectacular, rocky peak (1223m) high on the southern boundary.

Geology:
At a broad scale, the topography of Central Otago is dominated by a set of parallel fault-block mountain ranges and intermontane basins. The rock underlying most of the region is Haast schist, a metamorphic derivative of older marine sediments which are represented in a less reconstituted form as Torlesse and Caples greywacke rocks respectively in north-east and south-west Central Otago.

The schist is commonly exposed in tors (abrupt blocks of tower-like outcrops of platy laminated rock). These are a very distinctive feature, characteristic of Central Otago, seen both on summit ridges in the alpine zone and in the dry basins and lower slopes, where the planes of schistosity are nearly horizontal.

In the Lindis District the dislocation of the mid-tertiary peneplain responsible for Central Otago's large scale basin and range topography is expressed on a smaller scale and a different style. The old erosion surface is warped into a set of north-east trending folds, with traces of the overlaying Manuherikia group sediments. The district merges into the main uplift area of the Southern Alps to the north-west.

The glaciers which excavated Lakes Wanaka and Hawea penetrated well down the Clutha in the past and had a strong influence on the landform of the western part of the Lindis Ecological District, steepening the valley wall and leaving extensive moraines and outwash gravels modified by younger alluvial fans. Except for the effects of this externally derived glacier, the mountains of the Lindis district have been essentially unglaciated and retain characteristically smooth, rounded ridges and summits (Grove 1994).

The dramatic landform of the steep front faces of Mt Grand are a consequence of the over-steepening of the eastern wall of the Hawea – Upper Clutha Valley by the Hawea glacier in the Albert Town (and earlier) glacial advances and the relatively short time since then for rapid down-cutting and dissection.

There are no Geopreservation sites on the pastoral lease.

Soils are mapped as Gladbrook (75ha) on the flats, with Arrow Steepland (800ha) and Dunstan Steepland (1100ha) on the mountains.

2.3 CLIMATE:

Annual rainfall averages around 690mm at the adjacent Hawea Flat and around 1500 mm in the alpine areas of the property, with a tendency for an early summer concentration. Summer temperatures are high at lower altitudes. Winters are cold with severe frosts. Snow is common but lies only in higher areas for any length of time. There is a soil moisture deficit for much of the summer especially on sunny aspects. North-west and south-west winds can be severe at times.

2.4 NEW ZEALAND'S BIODIVERSITY PROTECTION NEEDS:

There are two databases that have been used to assess biodiversity protection (Walker et al. 2005).

1) Environmental distinctiveness has been assessed through the Land Environments of New Zealand (LENZ). This is a classification of New Zealand landscapes using a comprehensive set of climate, landform and soil variables chosen for their roles in driving geographic variation in biological patterns (Leathwick et al 2003). LENZ is a useful tool for measuring conservation initiatives against the New Zealand Biodiversity Strategy (see section 3.5). It is presented at four levels of detail containing 20, 100, 200 or 500 environments nationally. The most detailed is LENZ Level IV details of which are attached Appendix 3.

2) The area of unprotected indigenous cover in threatened land environments has been identified in the national land cover database (LCDB).

From the above databases, spatial data depicting indigenous cover and legal protection were overlaid on LENZ level IV environments to identify biodiversity that is most vulnerable (most likely to be lost). This provides a measure for: a) percentages of legally protected land and: b) percentages of remaining indigenous cover.

Based on these two criteria, five categories of threatened environments have been used to identify environments containing indigenous biodiversity at most risk of loss. They are classified as follows:

1. ***Acutely threatened***: <10% indigenous cover remaining
2. ***Chronically threatened***: 10-20% indigenous cover remaining
3. ***At risk***: 20-30% indigenous cover remaining

4. ***Critically underprotected***: >30% indigenous cover remaining and <10% protected
5. ***Underprotected***: >30% indigenous cover remaining and 10-20% protected
6. ***No threat***: >30% indigenous cover remaining and >20% protected.

Table 4 **- Mt Grand PL Land Environments** (See Plan 4.2.3)

THREAT_ CATEGORY	Area in lease	Lvl_4	%_IND_COVER_ REMAINING	%_ PROTECTED	IND_cover Change 97-02
Acutely Threatened	2.63	K3.3a	8.35	5.24	No change
Acutely Threatened	50.06	K3.3b	7.3	4.58	No change
Acutely Threatened	11.69	N5.1c	2.72	2.23	No change
Chronically Threatened	88.06	N4.1d	18.59	3.04	No change
Critically Underprotected	0.06	N4.1c	48.58	1.24	No change
Critically Underprotected	12.69	Q1.1b	77.1	8.43	Decrease
Critically Underprotected	42.56	Q2.1b	66.39	4.27	No change
Critically Underprotected	854.56	Q2.2a	39.92	3.91	Decrease
Critically Underprotected	7.13	Q2.2b	44.68	6.45	No change
Underprotected	802.13	Q1.1c	91.23	17.86	No change
No Threat Category	4.00	Q1.2a	98.99	37.2	No change
No Threat Category	72.81	Q1.1a	98.37	24.81	No change
No Threat Category	1.25	Q3.3a	96.91	25.62	No change
Total Area	**1949.63**				

Note that the above table does not show how much of Mt Grand is still in indigenous cover. This factor is critical in determining whether a particular threatened environment is worthy of protection. The above threat assessment coupled with the vegetation assessment below can provide information on the importance of areas within the property.

Significance of Land Environments of New Zealand:

The Lease has the following land environments that are significant because, on a national level the indigenous vegetation has largely been removed, and/or little of the environment is represented in lands protected primarily for conservation purposes:

- 3.3% of the PL has Level IV LENZ units that have less than 10% of their land area still in indigenous vegetation cover (whether protected or unprotected). These include three 'Acutely Threatened' units K3.3a, K3.3b and N5.1c.
- 4.5% of the PL has Level IV LENZ units that have less than 20% of their land area still in indigenous vegetation cover (whether protected or unprotected). These include one Chronically Threatened' unit N4.1d.
- 47% of PL has Level IV LENZ units that nationally have less than 30% of their land area still in indigenous vegetation cover and less than 10% of the unit is protected. These include five "Critically Underprotected" units N4.1c, Q1.1b, Q2.1b, Q2.2a and Q2.2b.

2.5 VEGETATION:

Overview:

Most of Mt Grand PL has been OSTD and much of the land below about 900 m has a vegetative cover primarily dominated by introduced grasses and herbs. Lower down native species are confined to a few ubiquitous species such as patotara (*Leucopogon fraseri*), *Geranium sessiliflorum* and harebell (*Wahlenbergia albomarginata*). By contrast, most of the upper basins, such as those of Grandview Creek, Camp Creek, Lagoon Creek and Hospital Creek south branch, contain good snow tussock cover albeit with much hawkweed present. In places along the top near Grandview Mountain the snow tussock, especially the slim snow tussock (*Chionochloa macra*), show signs of intensive grazing, being chewed right down and with much bare ground. Three species of hawkweed are common components of nearly all communities with tussock hawkweed (*Hieracium lepidulum*) particularly prominent and occurring over all the less developed country and on sheep camps such as that around Grandview Mountain. The highest parts of the property (the eastern corner) have a good range of subalpine and alpine communities including cushionfield, *Dracophyllum* shrubland and tussockland. Diverse shrubland occurs around Bluenose with extensive kanuka slopes below. Large areas of open kanuka grow on slopes above Hospital Creek while small areas of low forest with broadleaved species occur in the bottom of both Lagoon Creek and Hospital Creek with the relatively rare *Olearia fimbriata* also found in the latter. At the head of the North Branch Hospital Creek, just under Grandview Mountain, is a large population of the threatened shrub *Hebe cupressoides.*

Vegetation of the land below 900 m:

The dominant vegetative cover of land below about 900 m is grassland with scattered shrubs and patches of sweet brier (*Rosa rubiginosa*), matagouri (*Discaria toumatou*), kanuka (*Kunzea ericoides*) and *Coprosma propinqua.* The grassland is composed of pasture grasses with numerous introduced herbs, dry land grasses, clovers, three species of hawkweeds and a scattering of common native herbs and small shrubs. In places, particularly on sunny north and west faces and dry ridge tops this vegetation is found up to 1100 m to 1200 m but usually at this altitude the number of native species increases and includes hard tussock (*Festuca novae zelandiae*), blue tussock (*Poa colensoi*) and narrow-leaved snow tussock (*Chionochloa rigida*) as scattered plants or extensive patches. The exception to the above are the steep sided valley bottoms that contain a shrubland and/or low forest of kanuka and broadleaved species with willows, poplar, broom and matagouri in their lower reaches.

Valley bottom shrublands/forest:

The steep sided Hospital Creek contains good shrublands extending from the lower forks up both the north and south branches. The shrublands also extend 100 m to 250 m up the valley sides in places with introduced grassland. The main shrub species are matagouri, kanuka and sweet brier with *Coprosma propinqua, Carmichaelia petriei, Coprosma crassifolia, Hebe salicifolia, Hebe rakaiensis, Melicytus* sp., mountain wineberry (*Aristotelia fruticosa*) and the threatened tree daisy *Olearia fimbriata.* Small patches of *Coriaria angustissima* also occur. There are also small numbers of cabbage tree (*Cordyline australis*), Hall's totara (*Podocarpus hallii*), broadleaf (*Griselinia littoralis*), kowhai (*Sophora microphylla*), *Olearia avicenniifolia,* and the only record of three finger (*Pseudopanax colensoi* var. *ternatus* in the Ecological District (Pisa, Lindis, Dunstan PNAP report but not seen this survey). The climbers *Rubus schmidelioides, Muehlenbeckia australis, Parsonsia capillaris* and *Clematis quadribracteolata* are present with bracken fern (*Pteridium esculentum*) forming occasional patches. Buddleia (*Buddleia davidii*) is starting to fill the Shingley riverbed in the lower reaches and consequently red admiral butterflies are numerous. Goat sign is present here. The north face of the south branch of Hospital Creek contains an extensive kanuka shrubland.

Lagoon Creek has less extensive shrublands in the valley bottom but significant shrublands on the valley sides, particularly those falling from Bluenose. There are extensive kanuka shrublands or low forest through which the 4WD track zigzags. A large area of kowhai to the west of the main kanuka stand is fenced and protected as a scientific reserve. A small area of broadleaf with koromiko (*Hebe salicifolia*) and mountain flax (*Phormium cookianum*) occurs at the forks in Lagoon Creek.

Other species associated with the kanuka shrubland or low forest include matagouri, *Coprosma propinqua, Coprosma crassifolia, Coriaria sarmentosa, Helichrysum lanceolatum,* patches of silver tussock (*Poa cita*) in open gullies, *Elymus tenuis, Elymus* sp. "channel", *Trisetum tenellum* and kowhai.

Upper Shrublands:

Diverse shrublands are found above 1000 m on Bluenose and on the steep rocky ridges beneath Grandview Mountain. The shrubland communities include *Hebe buchananii, Leucopogon suaveolens, Pimelea traversii, Carmichaelia crassicaule, Gaultheria crassa, Pimelea oreophila, Olearia cymbifolia, Myrsine nummularia, Ozothamnus vauvilliersii, Carmichaelia petriei, Coriaria sarmentosa, Helichrysum lanceolatum,* matagouri and kanuka. Other plants here include the native grasses narrow leaved and slim snow tussock, mountain fescue (*Festuca mathewsii*) and *Elymus solandri* and herbs such as *Brachyglottis haastii, Stackhousia minima, Aciphylla aurea, Celmisia densiflora, Anisotome brevistylis* and *Craspedia lanata*. On the edge of open coarse scree slopes the rare nettle *Urtica aspera* occurs.

Dracophyllum shrublands are wide spread along the upper ridges above Lagoon Creek, head of Camp Creek around Grandview Mountain and above Grandview Creek. Low growing *Dracophyllum pronum* occurs with slim snow tussock, blue tussock, mountain fescue, *Rytidosperma pumilum, Celmisia angustifolia, Celmisia lyallii* and *Lycopodium fastigiatum*. *Carmichaelia vexillata* is common along the ridge tops while tussock hawkweed is present but not as dominant in this community as in most other communities.

Helichrysum intermedium is common on rock outcrops and *Anisotome cauticola* occasional on low-level outcrops. Other plants that occur on small areas of open ridge crests, open stony ground and around rock outcrops include *Raoulia grandiflora, Poa maniototo, Poa lindsayi, Stellaria gracilenta, Scleranthus uniflora, Raoulia parkii, Myosotis pygmaea* var. *minutiflora, Agrostis muelleriana, Dichelachne crinita, Koelaria novozelandica, Koelaria cheesemanii, Coprosma cheesemanii, Poa breviglumis, Hymenophyllum sanguinolentum, Leucogenes grandiceps* and *Colobanthus strictus*. *Aciphylla montana* is reported in the PNAP report as occurring here (not seen this survey) and as being uncommon in the Ecological District. The introduced hawkweeds, mouse ear (*Hieracium pilosella*), king devil (*Hieracium praealtum*) and tussock hawkweed are common as is lotus (*Lotus pedunculatus*) in places.

Cushionfield:

There is a very small area of a cushionfield community near Trig J. It contains *Dracophyllum muscoides, Abrotanella inconspicua, Phyllachne colensoi,* and *Chionohebe densiflora.*

Tussockland:

Above about 1200 m slim snow tussock is the dominant cover although in places it is very open and chewed down to about 20 cm in height. This was found primarily in the upper Burns block and may have been due to recent heavy stocking although there was up to 10% bare ground also. Parts of the lower Burns block carried a good tussock cover of 60 % to 80 % it being about 50 to 60 cm tall. Good narrow-leaved snow tussock occurs below about 1200 m with an area of hybrid plants where the two species meet. Dense slim snow tussock 50 cm to 70 cm in height occurs in the heads of Grandview Creek, Camp Creek Lagoon Creek and the south branch of Hospital Creek. It extends down to about 1200 m where it merges with narrow leaved tussock on sunny slopes and extends down to below 800 m in places. However it becomes less dense with more introduced grasses and hawkweed below about 1000 m and on north and west faces where it occurs as scattered plants with hard tussock. Other species present at higher altitudes include blue tussock, mountain fescue, *Aciphylla aurea, Celmisia lyallii, Bulbinella angustifolia, Pimelea oreophila, Anisotome flexuosus* and *Raoulia subsericea.* White clover (*Trifolium repens*), hawkweeds, sweet vernal (*Anthoxanthum odoratum*), brown top (*Agrostis capillaris*) and Chewings fescue (*Festuca rubra*) were also often present, becoming more prominent at lower altitudes.

Notable Flora:

Seven plants that are listed on the threatened and uncommon plants of New Zealand (de Lange et.al. 2004) list were found on the Pastoral Lease land during this survey.

***Table 5.* – Threatened Plants**

THREAT DIVISION		SPECIES	NOTES
Acutely threatened	Nationally Vulnerable	*Hebe cupressoides*	80 – 100 plants with young plants
Acutely threatened	Nationally Vulnerable	*Myosotis pygmaea* var. *minutiflora*	Several plants on rocky ridge
Chronically Threatened	Serious Decline	*Carmichaelia vexillata*	Common along the ridge tops
	Serious Decline	*Olearia fimbriata*	Small population both branches Hospital Ck
	Gradual Decline	*Carmichaelia crassicaule*	Uncommon, rocky places
At Risk	Sparse	*Urtica aspera*	Uncommon below Bluenose
	Data Deficient	*Elymus tenuis*	Common in places e.g. Kanuka slopes, Bluenose

Hebe cupressoides
A relatively large population of *Hebe cupressoides* was found in the valley bottom near the head of the north branch of Hospital Creek GPS 2219775 5611653. It is one of the largest populations remaining in the wild in New Zealand so is highly significant. About 80 to 100 plants were noted with young plants (<5yrs old) present so indicating a viable population. Scattered older plants occur on the slopes above and down stream on steep stony ground and on the edge of a boulder field at about 900 m below point 925 m at GR 193115. Other associated plants included matagouri, *Hebe salicifolia, Olearia cymbifolia, Coprosma propinqua, Coriaria sarmentosa,* hard and blue tussock, a few narrow leaved tussocks, sweet brier and a few buddleia.

Myosotis pygmaea* var. *minutiflora
This tiny plant was found at 1300 m on a bare soil bank under *Hebe buchananii,* (2 plants, one in flower) with a steep sheep track on each side and half a metre away on the edge of a sheep track (11 plants). The track followed down a steep rocky ridge off Grandview Mountain with a number of rock tors on it. The plants were all on bare soil in slim snow tussockland with small shrubs GPS 2220473 5611613.

Carmichaelia vexillata
This dwarf broom is relatively common along the ridge tops from near Grandview Mountain to Bluenose and eastwards to Trig J. It is commonly on stony ground with shallow soil with other low growing plants such as *Dracophyllum pronum, Celmisia lyallii, Celmisia angustifolia, Festuca mathewsii, Aciphylla aurea* and tussock hawkweed. In places it formed tight patches up to 25 cm across.

Olearia fimbriata
Olearia fimbriata occurs as small populations and scattered shrubs along both the north and south branches of Hospital Creek and on the slopes up to 150 m above the creek. Six or seven plants grow on the edge of coarse scree about 170 m above the south branch at GPS 2219378 5610899 with several plants on the creek edge below at GPS 2219126 5610850. Scattered plants occur up the north branch at least to GPS 2219595 5611430 at 755 m either in open grassland or associated with other native shrubs including matagouri, mountain wineberry, native broom and *Coprosma propinqua.* Sweetbrier is usually present also.

Carmichaelia crassicaule* var. *crassicaule
This thick-stemmed coral broom is uncommon on Mt Grand but single plants were seen in a number places, always on rock outcrops. Below Grandview Mountain with *Helichrysum intermedium* and below Bluenose GPS 2220972 5609094.

Urtica aspera
One small patch was seen on the edge of a rock scree beside the 4WD track under Bluenose at 996 m GPS 2221157 5609301.with narrow-leaved snow tussock, *Elymus solandri* and *Coprosma propinqua.*

Elymus tenuis
This plant was common along the track edge in the kanuka patches below Bluenose and in grassland in the Hospital creek area with *Epilobium atriplicifolium, Epilobium melanocaulon, Geranium sessiliflorum* and introduced grasses. Both areas are very stony with relatively sparse vegetation.

Significance of vegetation (see plan 4.2.4)**:**

The relatively small Mt Grand PL contains significant conservation values. Two areas were recommended for protection in the PNAP survey report. These areas still contain most of the values identified at that time. Although introduced species, particularly hawkweeds, are prominent (tussock hawkweed was in full flower during the survey) in most of the plant communities, the higher parts of the property are dominated by native plant species and communities that generally have a good cover with a diverse range of species.

The remnant forest species present in Hospital Creek and to a lesser extent Lagoon Creek are significant. Many of these species are on the edge of their range (being the edge of the drier part of Otago) particularly: cabbage tree, Hall's totara, broadleaf, kowhai, *Olearia avicenniifolia*, and three finger. The podocarp/ broadleaf forest remnant, regenerating valley shrublands, extensive kanuka is likely in its pre-human habitat.

The plant communities, particularly in Hospital Creek and below Bluenose, form altitudinal sequences of continuous indigenous vegetation from valley bottom to ridge top.

A number of plants on the Threatened and Uncommon Plants of New Zealand list occur around Bluenose and in Hospital Creek and also along the higher ridges. *Carmichaelia vexillata* is common along the upper ridges in open tussock and *Dracophyllum* communities, coral broom occurs sporadically on rocky sites, *Urtica aspera* is found in coarse scree beneath Bluenose and *Elymus tenuis* is widespread on the property. A significant but scattered population of *Olearia fimbriata* grows in Hospital Creek and highly significant population of *Hebe cupressoides*, one of the largest remaining in New Zealand. *Myosotis pygmaea* var. *minutiflora* grows on a high ridge in the Hospital Creek catchment.

2.5.1 Problem Plants:

Problem plants include buddleia, broom, pines and crack willow in the lower Hospital Creek which both cover relatively small areas at present. Buddleia is spreading along the various branches of Hospital Creek, mainly in the gravel bed and along the creek banks. It is capable of completely choking the creek bed and is considered a threat to the regeneration of the native shrubs especially to *Olearia fimbriata* and *Hebe cupressoides* both on the threatened plant list. Occasional plants were also encountered in steep gullies and faces amongst the bluffs high on the true left of the south branch.

Sweetbrier is widespread and scattered across much of the lower altitude land. It is a component of most shrublands.

Crack willow occurs in the lower reaches of all creeks and just past the second forks in Hospital Creek.

Hawkweeds occur throughout the property and all plant communities to some extent. Tussock hawkweed is the most widespread and prominent with mouse ear hawkweed common on the degraded lower and mid altitude country with king devil hawkweed slightly less common.

Wilding pines, including quite large trees, are scattered through the property, generally in areas with some degree of conservation value and will need to be eradicated.

2.6 FAUNA:

2.6.1 Invertebrate Fauna:

Survey Method:
On the Mt Grand PL inspection, the usual limitations on invertebrate sampling over a very restricted time-frame and at a single time of year applied. In general, late summer is not a good time for sampling invertebrate, especially insect, diversity. The weather was generally good for collecting, although windy, wet and quite cold overnight on the first night. Failure of the light trap to function reduced the potential catch considerably.

Invertebrate values were assessed primarily on the basis of habitats present. The steep and sometimes rugged terrain combined with available time meant that much of the property was not covered in detail, but all of it was at least viewed from various vantage points. One site not well assessed for invertebrate values was the upper slopes around Bluenose peak.

Areas/habitats on the property:
1. Rock tors and bluffs with reasonable vegetation and/or habitat diversity:
Rocky habitats are widespread on the property, with some more favourable for hosting invertebrate diversity than others. They include many series of high bluffs with rock 'castles' on the sides of the deeply incised valleys, scattered tors predominantly at higher altitudes and occasional associated rocklands. Several bluff systems hold woody plant communities, predominantly of moderately tall kanuka (south side of upper Hospital Creek; north-facing slopes below and northwest of Bluenose). Some of the smaller bluffs have quite diverse communities of smaller woody species (e.g. a small bluff system in upper Camp Creek, east of spot height 1147m). The values of these sites range from moderate to highest, depending on such features as their extent, diversity of habitats and their connectedness to other sites with significant value.

2. Riparian and lower gorge-side vegetation:
Within the property this habitat is almost entirely confined to upper Hospital Creek, especially the southernmost branch of the creek. This habitat features a diverse mix of tall woody vegetation, which will in turn host a diverse invertebrate assemblage. Of particular interest is the presence of scattered, large trees of *Olearia fimbriata*, which, in Central and Western Otago, is known to host a large suite of moth species (Patrick, 2000). These include small-leaved *Olearia* specialists such as the noctuids *Meterana grandiosa* and *M. exquisita*, both of which are currently listed as Category 5: Gradual decline in Hitchmough (2002). It is my view that these species will be found to be present at this site if searched for at an appropriate time of year.

3. Pasture and *Hieracium* dominated faces and more heavily grazed rocklands:
These areas are dominated primarily by pasture species and/or *Hieracium* or have been heavily grazed and/or generally have lesser value for invertebrate conservation.

Species:
Given the limited time to cover the property and failure of the light trap to work effectively, only a very small collection of specimens was made from the property. Species identified were generally common and expected to occur in this area. The richest invertebrate habitat on the property is the riparian and gorge-side vegetation of upper Hospital Creek with its broad range of woody plant species, including the small-leaved *Olearia fimbriata* which is known to host a rich moth fauna. This site will hold a diverse remnant of the invertebrate fauna which was once more widespread on the property.

Rocky sites on the property also have varying degrees of value as invertebrate habitat. The area of rockfield and tors (at the north-eastern corner of the property) and some of the larger bluff systems have acted as refugia for species such as the carabid beetle, *Holcaspis* following the loss of original woody cover.
Other bettles found were a number of chafer beetles (Scarabeidae), manuka beetles (*Pyronota* sp.), darkling beetles (Tenebrionidae *Mimopeus* sp. and *Artystona* sp).

At least two species of Megascolecid earthworms (presumably native) were found under rocks around areas of outcrop. One was large (c. 25cm long) with a well-defined clitellum covering segments 13-17; the other was a smaller, thinner species with no clearly identifiable clitellum.

The grasshoppers *Sigaus australis* is widespread and locally common in open areas in the montane to alpine zone.

The tussock cicada, *Kikihia angusta* was widespread. *Maoricicada campbell*, a common species often associated with riverbeds, occurred here on a rockfield in the north-east of the property. Another cicada found, *Maoricicada otagoensis*, is endemic to Otago and Southland, was originally described as only occurring south-west of the Clutha /Mata-au River.

The moths, *Graphania mutans, Graphania lignana, Tmetolophota atristriga, Tmetolophota propria* and *Rictonis comma,* were found and are common and widespread within their lowland and montane habitats. Their larvae feed on herbs and grasses.

Dasyuris anceps was found, which is a widespread and locally common diurnal geometrid (looper moth), inhabiting mainly low alpine areas. Its larvae is found on *Anisotome flexuosa* and its close relatives.

Tussock ringlet butterflies (*Argyrophenga* sp.) were commonly observed but no specimens were caught for positive identification. Other butterflies included red admiral butterfly (*Bassaris gonerilla)* and the blue butterfly (*Zizina oxleyi).* The latter is widespread in eastern and central South Island in lowland to montane areas with its larvae on prostrate *Carmichaelia* and clover flowers.

Ants were found under rocks in various parts of the property. These included *Monomorium* sp. (Myrmicinae), being of a genus that has a number of adventive and endemic species. Also found were the widespread and common endemic species complex *Monomorium antarcticum* and the native *Prolasius advena* which is normally associated with forested areas.

Significance of Invertebrate Fauna (refer plan 4.2.4):
Despite significant modification, the property contains potentially valuable habitat for invertebrate conservation. Sites on the property are of particular interest in lying within a rainfall gradient between the wetter and drier parts of Otago.

Lower altitude shrublands and forest remnants are under-represented in protected areas in Central Otago and provide refuges for abundant species representative of the Otago invertebrate fauna. The Hospital Creek site is especially important in having quite extensive shrubland/woodland contiguous with extensive bluff and scree systems with considerable natural character. The woodlands comprise a wide range of species which in turn will harbour a large representative fauna of Central Otago invertebrates. These will almost certainly include rarer species such as the *Olearia*-feeding moths *Meterana exquisita* and *M. grandiosa*. They will also display some overlap between wetter and arid area faunas.

Rocklands in the north-eastern corner of the property likewise provide refuge for higher altitude invertebrate species typical of colder, more exposed sites.

The bluffs and screes falling northwest from Bluenose are generally more modified and appear to have lesser plant variety than those above Hospital Creek, but nevertheless they retain a reasonable degree of natural character and cover a wider altitudinal range, providing refuge for a range of invertebrate species. Other bluff habitats on the property are smaller and/or more modified or more isolated but still retain some natural character and will retain suites of invertebrate species typical of the area.

2.6.2 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."

Introduction:
Over the search period the weather was generally suitable for locating most of the lizard species likely to occur on the PL.

Three species of lizards present in the Lindis ED have a "nationally critical" (acutely threatened) threat ranking; the Otago skink, *Oligosoma otagense*, the grand skink *O. grande*, and the so-called "Roys Peak" gecko, *Hoplodactylus* aff. *granulatus* "Roys Peak". Grand and Otago skinks are found on neighbouring properties to the north, south and east. All other species have been ranked "not threatened" (Hitchmough pers. comm. 2005); *H.* aff. *maculatus* "Cromwell Gorge", *H.* aff. *maculatus* "Southern Alps", *O. maccanni* and *O. nigriplantare polychroma*.

Previous work:
In 1986, a thorough herpetological survey was carried out over the Wanaka area which covered Mt Grand (Whitaker 1987). In addition a survey over part of the Chain Hills was carried out over the summer of 2003/04 and now seven lizard species are now known from this ED (Whitaker *et al.* 2002, T. Jewell pers. comm. 2005).

Methods:
Depending on weather, searches were made for both basking lizards and active lizards. Potential habitat was scanned with binoculars; before walking into the habitat watching and listening carefully for disturbed lizards. Searches were also made for sloughs, skeletal remains and for the distinctively large droppings (>2cm) produced by large-bodied skinks. In both good and bad weather, retreat sites were searched for inactive geckos and skinks by turning rocks and looking in crevices.

Current Survey:
Three lizard species were found on Mt Grand PL during this survey. The distribution and threat status for these lizards are summarised in table 2. Habitat for Grand and Otago skinks was located.

***Table 6* – Lizards found on Mt Grand PL.**

Species Name	Threat Status (Hitchmough pers. comm. 2005)	Distribution on Mt Grand PL
Hoplodactylus aff. *maculatus* "Southern Alps"	Not Threatened	Limited to above 1300m a.s.l.
Hoplodactylus aff. *maculatus* "Cromwell Gorge"	Not Threatened	Widespread and extremely common up to 1200 m a.s.l
Oligosoma maccanni	Not Threatened	Ubiquitous on the property

(refer plan Appendix 5 for locations)

Description:
Hospital Gully (170ha):
Grandview blocks (270ha) Bluenose block (130ha) and Black Knobs (235ha):
Hoplodactylus aff. *maculatus* "Cromwell Gorge" and the McCanns skink *Oligosoma maccanni* were common and widespread on Mt Grand, over all altitudes and vegetation types. Both species were common throughout areas of suitable habitat. In places *H.* aff. *maculatus* "Cromwell Gorge" reached extremely high densities. Potential grand and Otago skink habitat was located in the Hospital Gully block and extending into the lower reaches of the Grandview block (mostly within RAP A8; see attached plan Appendix 2).

Broadleaf block (185ha):

Hoplodactylus aff. *maculatus* "Cromwell Gorge" and the McCanns skink were common and widespread in the Broadleaf block on the SW faces near Lagoon Creek. Potential grand and Otago skink habitat was located over this same area.

Camp Creek block (255ha):
This area was not well surveyed but was viewed from the 4WD track; from this vantage point it was apparent that the best rock tor habitat was off the property in Camp Creek. *H*. aff. "Cromwell Gorge" and *O. maccanni* were common in rock tors.

Flats and all other blocks:
No searches were made of other blocks.

Threats:
The loss of indigenous vegetation negatively impacts on lizard communities although the mechanisms are not clearly understood and are no doubt species-specific (Whitaker 1996). Fire is known to seriously deplete lizard populations (Patterson 1984) and is known to accelerate erosion which can also reduce lizard habitat(I. Turnbull pers. comm. 2005).

It is likely that lizard populations on the Mt Grand PL are subject to predation by the full suite of introduced mammalian predators including cats, ferrets, stoats, weasels, rats, and hedgehogs. In addition, habitat disturbance through rock heaving during pig rooting, sheep/cattle fouling and trampling and herbivore of rock tor vegetation are threats to lizards on Mt Grand.

Most of RAP A8 and the lower part of the broadleaf block contain potential (although not high quality) Otago and grand skink habitat. These species are known to co-exist at one site in the Lindis (on Morven Hills PL) and are both ranked "nationally critical". Protection of these areas would benefit at least three other lizard species that are currently ranked "not threatened". Degradation of these areas will be accelerated by fire and sheep movement/browsing. Minimizing erosion (tors falling away) and allowing native vegetation (including fruiting plants) to recover would benefit lizards. Active conservation management will be required should Otago or grand skinks be eventually found in these areas the skinks are notoriously hard to find when they occur at low densities.

Significance of Herpetofauna (refer plan 4.2.4)**:**

Habitat for the "nationally critical" (i.e. acutely threatened) Otago and grand skinks is well understood (Roberts 1984, Whitaker 1996, McFarlane 1999) and includes prominent rock tors and ribs (see Appendix 3 in McFarlane 1999). Habitat in RAP A8 and in the lower part of the broadleaf block is similar, but judged to be inferior to that in nearby Camp Creek where Otago skinks are known to occur. The habitat on Mt Grand differs from habitat in Camp Creek and on the Morven Hills PL (McFarlane 1999) by consisting of rock "chimneys" rather than extensive ribs and tors; apparently the nature of the schist in this area does differ from that in Camp Creek (I. Turnbull pers. comm. 2005). Occasionally, good tors are to be found on Mt Grand, but areas considered to be "good potential Otago and grand skink habitat" were not extensive.

Habitat for the other acutely threatened lizard found in Lindis Ecological District, *Hoplodactylus* aff. *granulatus* "Roys Peak" is not well understood (Tocher & Marshall 2001, T. Jewell pers. comm. 2005), and given current understanding we believe suitable habitat was not obviously present on Mt Grand PL.

McCanns skink, and the Cromwell gecko are common throughout the ecological district and beyond. All are ranked "not threatened" (Hitchmough pers. comm. 2005) and of "low" conservation status in Otago (Whitaker *et al.* 2002).

The occurrence of parapatric populations of *Hoplodactylus* aff. *maculatus* "Southern Alps" and *H.* aff. *maculatus* "Cromwell Gorge" has potential significance for research into barriers to interbreeding between these two species.

2.6.3 Avifauna:

Current Survey:

Birds observed during the survey were magpie, chaffinch, pipit, yellowhammer, grey warbler, harrier, goldfinch, redpoll, Californian quail, magpie and silvereye. A New Zealand falcon was observed within the Grandview Creek catchment at G40 206 103.

Significance of Avifauna:
The New Zealand 'eastern' falcon is a threatened species, classified as 'Chronically Threatened' - 'gradual decline' (Hitchmough, 2002).

2.6.4 Aquatic Fauna:

Previous records:
The NIWA New Zealand Freshwater Fisheries Database was searched for previous records prior to the survey taking place. Existing records were from outside of the Mt Grand PL boundary and indicated the presence of brown trout (*Salmo trutta)* and rainbow trout (*Oncorhynchus mykiss*) in the lower reaches of Camp Creek as well as long finned eel (*Anguilla dieffenbachia*). There were no previous records found for Hospital Creek or Lagoon Creek.

Methods:
Selected sites were surveyed according to the methods outlined in the "Non-migratory galaxiid survey guidelines for streams and rivers" (Allibone, 1999). Sites were fished using a backpack electric fishing machine and stop net. Habitat measurements were taken and recorded on NIWA NZ freshwater fisheries database forms. In-stream invertebrates were noted and collected for identification, but no comprehensive collections were made.

Sites surveyed contained riffle, run, pool, rapid and cascade habitat with approximately 50m stretches being fished. Stream widths and depths were recorded. Substrate and riparian composition were visually estimated according to the NZ Freshwater Fisheries database form format. Site locations were recorded using a global positioning system (GPS) unit. Six sites were accessed via helicopter and two by 4WD vehicle.

Results:
Eight sites were inspected and recorded as shown in *table 7*. *Galaxias* sp. D. were found at three of the 8 sites. No fish were found at the remaining 5 sites. The largest population of galaxiids was found at a site in the lower section of Lagoon Creek (G40 180 084) where 38 fish were caught.

Lagoon Creek and Hospital Creek were narrow streams that had low water flows and may dry up during a dry summer. At one of these sites (G40 187 109) the water flow disappeared underground 20m below the fishing site.

Table 7: Locations sampled and fish species found.

Site	Map Sheet	Easting	Northing	Result
1. Lagoon Creek	G40	2218000	5608400	*Galaxias* sp. D
2. Lagoon Creek	G40	2219400	5609500	*Galaxias* sp. D
3. Lagoon Creek	G40	2219400	5609800	No Fish
4. Hospital Creek	G40	2220600	5610700	No Fish
5. Hospital Creek	G40	2218700	5610900	No Fish
6. Unnamed Creek	G40	2219500	5612800	No Fish
7. Lagoon Creek	G40	222 0600	5609500	No Fish
8. Camp Creek	G40	222 2200	5610500	*Galaxias* sp. D

Rainbow and brown trout do not appear to be able to access the headwaters of Lagoon Creek and Camp Creek where we found good numbers of *Galaxias* sp. D. This may be due to intermittent flows in these

small high country streams and the fact that some disappear completely underground during late summer creating a barrier for fish movement.

Good invertebrate life was found at Sites 1, 2, 3, and 7 with little or no invertebrate life found at the remaining sites. A sample of invertebrates identified included:

Ephemeroptera (May Fly)	-*Colorburiscus* (MCI score 9)
	-*Deleatidium sp.* (MCI sore 8)
	-*Nesamelatus* (MCI score 9)
Mollusca (Snail)	-*Potamopyrgus* (MCI score 4)

Significance of Aquatic Fauna (refer plan 4.2.4)**:**

The large population of *Galaxias* sp. D at site 1 in lower Lagoon Creek was unexpected, as there is a large pond/storage lake just a few hundred metres down stream where trout are almost certainly present. A further population of galaxiids was found in Camp Creek.

Galaxias sp. D is ranked 'Nationally Vulnerable' (Hitchmough, 2002) and is the fourth rarest fish in New Zealand. This species occurs in the Clutha River catchment and areas of the Catlins District. The species occurs as four clusters of populations: from Bannockburn upstream in tributaries of the Clutha and Lindis Rivers at Queensberry and in around the Chain Hills (Lindis); a small number are known from Rough Ridge; the tributaries in the mid reaches of the Pomahaka River; and a group in the Catlins, Tahakopa and possibly the Mokareta Rivers. Genetic data indicates that the different clusters, while all part of the *Galaxias* sp D group, are distinct. Protection of all populations throughout its range is required to preserve the present genetic diversity.

The non-migrating galaxiid recovery plan seeks 30 protected populations. The Mt Grand populations are part of the "Lindis genotype" and are considered important.

2.6.5 Problem Animals:

Rabbits have historically been a problem on this property, particularly at lower altitudes. Over most of the property numbers are now very low. Hares, possums, are present on the property.
Goats were seen on the bluffs below Bluenose. Goat sign was seen on the dividing ridge above the second forks in Hospital Creek.

2.7 HISTORIC

Maori sites:
There are no recorded Maori sites on Mt Grand PL though there is an old record of a large adze being found in the headwaters of Breast Creek at a location only three kilometres east of Trig J (Refer to plan 4.2.5). Lake Hawea was a favoured mahinga kai, with historically recorded settlements at the foot of the lake (Te Tawha o Hawea) and at The Neck in 1836 (Anderson 1998:177).

European history:

When John Turnbull Thomson first surveyed Otago, he used Mt Grandview as one of his major observation points (Refer to plan 4.2.6). He used high points such as this to take star observations in order to create triangles within which other points were determined by triangulation. Each survey sat on its own base, an innovative method of fast accurate surveying of large tracts of country which eventually won him the position of Surveyor General. He also drew in his sketch book and later created the first painting of Lake Wanaka, Mt Aspiring and nearby peaks as seen from Mt Grandview (Hall-Jones 1971: 64 and cover).

The first run holders in the area, the McLean brothers, took up Morven Hills station in 1856 and though they were slow to get their four runs stocked with sheep, the Mt Grand area would have been grazed from

about 1860 onwards. Mt Grand or Hospital Creek Run was split off Morven Hills at the big break-up sale in 1909. Duff (1998:49) gives its history as a succession of seven owners up to 1978.

Though the run is on the western side of an 1100 m high range of hills from the Morven Hill homestead, the most direct track to the Hawea basin ran across it. The 1882 Lands and Survey runs map shows Grandview Track leaving the Lindis Valley by two branches - one up Three Tree Spur and the other from opposite the homestead (Refer to plan 4.2.7). These join and run into Mt Grand over Trig J, run along the ridges over Grandview Mountain and down a spur to the north of Cameron Gully to Mt Grand homestead. Morven Hills Run had various outstation buildings, often built in stone, and probably had buildings on the site of the present homestead, which presumably became a functional farmstead for the Mt Grand run soon after 1909.

Sites:

Field checking showed that the only visible items of historic interest were two trig stations on Mt Grandview Trig D, (site record form G40/215) and Trig J (srf G40/216) (See photos 4.3). Both are early trigs with circular cairns and Grandview has the old metal bayonet with the letter D stamped on it. It also carries a standard, white, wooden, box structure with a black and white marker above and a stamped brass LINZ plaque has been attached to the boards. The cairn is very rough and the feet of the trig have been braced with waratahs, flat standards and a concrete block. Trig J is an unusual metal structure supporting a standard black and white marker. It does not have a bayonet but the circular plinth, 1.1 m high, is well built. LINZ is still maintaining these types of trigs has a policy of steady replacement of the tall markers with a smaller metal structure on which a GPS instrument can be placed. The larger structures hinder the accurate recording of a GPS reading over the centre point of the trig (Murray Body: pers.comm.).

Both trigs are shown on the 1882 Lands and Survey Map (Refer plan 4.2.7) and Thomson would have left a cairn on Grandview in 1858. The bases of both will be pre-1900, but since they are still in active use they are not generally considered to be protected by the Historic Places Act as archaeological sites. They do, however, both have historic value, Trig D on Mt Grandview in particular.

Significance of Historic:

The Mt Grandview trig D has significant historic values, in particular for its association with John Turnbull Thomson, and the stone plinth and bayonet trigs. Trig J has significant historic value for its stone plinth, but apparently its bayonet has vanished.

The line of the Grandview Track has significant historic value as a linkage in the wider historic landscape of early pastoralism. The profile of the original historic track has been modified within the Mt Grand PL, and is not part of the historic value.

2.8 PUBLIC RECREATION:

2.8.1 Physical Characteristics:

Mt Grand PL is located on the metalled Hawea Back Road, which has a number of creek fords. It is somewhat out of the way and mainly used by local residents. Although only a short distance from Lake Hawea township, its low use is likely to change with the rapid growth of the Wanaka-Hawea area. The presence of the nearby Nook Nursery has increased visitor numbers to the area.

Mt Grand PL is wedged between Glenfoyle Station to the south and Lake Hawea PL to the north. Glenfoyle has completed the tenure review process, which has provided for public horse, mountain bike and foot access via an easement traversing along the Grandview Range and meeting the Mt Grand boundary at Bluenose. On the Lake Hawea PL side there is also the possibility of continuing the route through to the Timaru River. A route of this length requires numerous side accesses to enable shorter trips. Mt Grand has a number of routes/tracks that could provide one of these.

With the above routes identified, Mt Grand is a part of a network of tracks that, if developed, would provide a significant recreational opportunity.

Within the property the lower gullies of Lagoon Creek and Hospital Creek provide easy access, but steepen considerably near their catchment heads. Conversely, ridges are generally easier at the tops but steeper lower down.

2.8.2 Legal Access(refer plan 4.2.1):

Roads
The legal Hawea Back Road contacts at various places along the front of the property. However just south of Hospital Creek it is unformed. A short extension of this road turning to the east into Mt Grand at Hospital Creek may not be legal, and its position, relative to the property boundary is unclear.

A further unformed legal road touches the Lagoon Valley corner of the property. This appears, without further investigation, to be unsuitable as a public access route due to its lack of formation and its close proximity to the Lagoon Valley homestead. The formed road that provides access to Lagoon Valley freehold farm, is well off line to the legal alignment, but as it has presumably been formed and maintained by the district council, it may mean that this road is also legal.

The historic Grandview Track is an unformed legal road that starts on the Hawea Back Road at about Bracken Ridge (freehold farm). It traverses along the northern boundary of Mt Grand PL before reaching the ridge crest and then descending down the other side to the Lindis Highway. On the Lindis side, two routes are legal, one down Three Tree Spur on the Bargour Station/Forest Range Station boundary and the other taking a more northerly route coming out near the Forest Range homestead.

We note that the legal road along the boundary of the PL does not conform to the old route which passed below Grandview Mountain and on to Trig J. From the route shown on the 1890 Lands and Survey runs map, it is assumed that this approximated the current track and therefore it might also be considered legal road – bridle track.

Marginal Strips:
File records indicate that the PL was inspected by LINZ in 1994 and that no streams were assessed as qualifying for marginal strips. Recent inspection reveals that Hospital Creek has a gravel bed which significantly exceeds 3m for most of its length. Therefore it will attract a marginal strip on the north and south branches right up to near its headwaters. This is not a result of the water it carries as it is mainly dry in the lower reaches, but due to the considerable erosion in the headwaters. This creek bed itself makes for easy foot travel when dry and will be valuable for public access into the Hospital Creek catchment. Alternatively the margin would also provide potential for access, but may need a track formation to be viable.

2.8.3 Activities:

Current activities are based around Grandview Mountain being seen as a vantage point that people can view the surrounding lakes and mountains. Moderate use is made of this, notably by 4WD groups on fund raising activities.

The wider recreational network described above, is likely to get moderate use by walkers, mountain bikers and to a lesser extent, horse riders. Organised horse events such as the Otago Goldfields Cavalcade, are likely to make some use of the route.

As a result of tenure review of the leasehold properties in the area, there will be a network of reserves, public conservation land and associated public access routes. The Mt Grand PL provides an important part of the route that will provide public access easements along the top of the Grandview Range.

PART 3

OTHER RELEVANT MATTERS & PLANS

3.1 CONSULTATION

a) An NGO early warning meeting was held on the 23 September 2004 with interested groups. The following views were expressed:
   - Foot, mountain bike, horse access to Grandview Mountain summit– key issue.
   - Access route to north Lindis groups and in the south through Bluenose to Glenfoyle.
   - Historic Maori route along Grandview track.
   - Botanical values at Bluenose.
   - Regular horse trekking operation already in use. Should be public use also.

b) The following views were expressed at an NGO report back meeting of 12/4/05.
   - This is a hot spot for biodiversity.
   - Suggested that access up Lagoon Creek would be good – but issues with getting to the property boundary.

c) Southern Lakes Branch of New Zealand Deerstalker Association made a written submission in May 2005 which covered a wide range of properties with some general views.
   - Concerned about lack of recognition given to hunting –which is cutting out a big proportion of recreationalists.
   - Provision needs to be made for access with firearms and dogs.

d) FMC made a written submission dated May 2005, which is appended (Appendix 6). The main points of this submission were:
   - A broad view of overall outcomes needs to be taken with consideration of the emerging network of recreation opportunities on the Grandview Range.
   - Public access to Grandview Mountain and use of the ridge tracks, north, south and east, together with protection of areas with high natural and landscape values are the main issues for this review.
   - Provision should be made for carparking.
   - The RAP areas and the area below Bluenose should be returned to full Crown ownership.
   - Protection of outstanding and highly visible landscapes should be achieved by way of covenant.

e) Forest and Bird, Upper Clutha Branch, made a written submission dated 25 May 2005, which is appended (Appendix 7). The main points of this submission were:
   - The areas identified as RAPS and the areas above 1000m which still support tall tussock should be retained in full Crown ownership.
   - Public access to the ridge tracks must be part of the proposal.
   - Good stands of Kanuka must be protected.

3.2 REGIONAL POLICY STATEMENTS AND PLANS:

The north eastern part of the property is subject to the Otago Regional Plan: Water rule which requires resource consent for suction dredge mining.

3.3 DISTRICT PLANS:

The majority of the property is located within the Rural General Zone of the Queenstown Lakes District Plan. Part of the property south east of Grandview Mountain is in the Rural Resource zone of the Central Otago District Plan.

The partially operative Queenstown Lakes District Plan requires resource consent for the clearance of areas of indigenous vegetation greater than 0.5 hectares, or above 1070masl or containing any threatened plants listed in an appendix.

Resource consent is required for subdivision and subsequent development, buildings, forestry and also ski area activities. No forestry shall be undertaken in an alpine area with an altitude greater than 1070m. Certain tree species with wilding potential shall not be planted.

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. The protected landscape provisions of the Plan are in the process of going through the Environment Court. However, it is likely that the portion of the PL within the QLDC area will be in an Area of Outstanding Landscape. Protection is therefore limited to the controls set out above.

As at 22 February 2005, the proposed Central Otago District Plan (amended to incorporate Council decisions) requires resource consent (with certain exemptions) for the clearance of areas of indigenous vegetation greater than 0.5 hectares or in the case of snow tussock grassland 10ha, or above 1080masl, or containing any threatened plants listed in a schedule. This requirement does not apply to land that has been freeholded under the Crown Pastoral land Act 1998.

Resource consent is required for tree planting using certain tree species with wilding potential, subject to certain criteria. 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. 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.

The protected landscape provisions of the Plan require resource consent for development of land over 900m, with an exclusion for land that has been freeholded under the Crown Pastoral land Act 1998.

3.4 CONSERVATION MANAGEMENT STRATEGIES AND PLANS

The Otago Conservation Management Strategy has a general objective regarding Central Otago ecosystems.

This is to recognise the distinctive contribution the ecosystems of Central Otago make to the diversity of New Zealand's flora, fauna, ecological communities and processes and to retain representative examples through protection at lower altitudes and more extensive protected areas at higher altitudes.

This objective is to be implemented by the following:

- The protection of representative examples of ecosystems including aquatic ecosystems on privately occupied land will be negotiated using a range of options including acquisition through tenure review, covenants, management agreements and land purchases or exchanges. Attempts to secure buffer zones and ecological linkages between areas will be included in this exercise.

- Survey of areas for the PNA Programme will be completed as access and resources become available and efforts will be made to negotiate formal protection for areas identified as a priority for protection.

- The value of tussock grasslands as a contributor to the character of New Zealand and its landscape and biodiversity will be promoted and retention of tussock grasslands advocated.

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- Survey of areas for the PNA Programme will be completed as access and resources become available and efforts will be made to negotiate formal protection for areas identified as a priority for protection.

- The value of tussock grasslands as a contributor to the character of New Zealand and its landscape and biodiversity will be promoted and retention of tussock grasslands advocated.

The Hawea – Lindis area is noted in the CMS as being part of special place 23.
It notes the covenant in Hospital Creek as being within this area.

The objectives for the area are:

To manage and enhance the recreational opportunities on lands administered by the Department in the Hunter-Hawea area to maintain the natural and historic resources of the areas while providing for an appropriate range of recreational activity of high quality.

To achieve permanent protection for areas of significant nature conservation importance in the area.

To maintain and where appropriate enhance the quality of aquatic habitats in the area.

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

ATTACHMENTS

4.1 Additional information

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4.1.2 APPENDICES

Appendix 1 - RAP A8

Appendix 2 - RAP B4

Appendix 3 - LENZ descriptions

Appendix 4 - Invertebrate species list

Appendix 5 - Lizard sighting records.

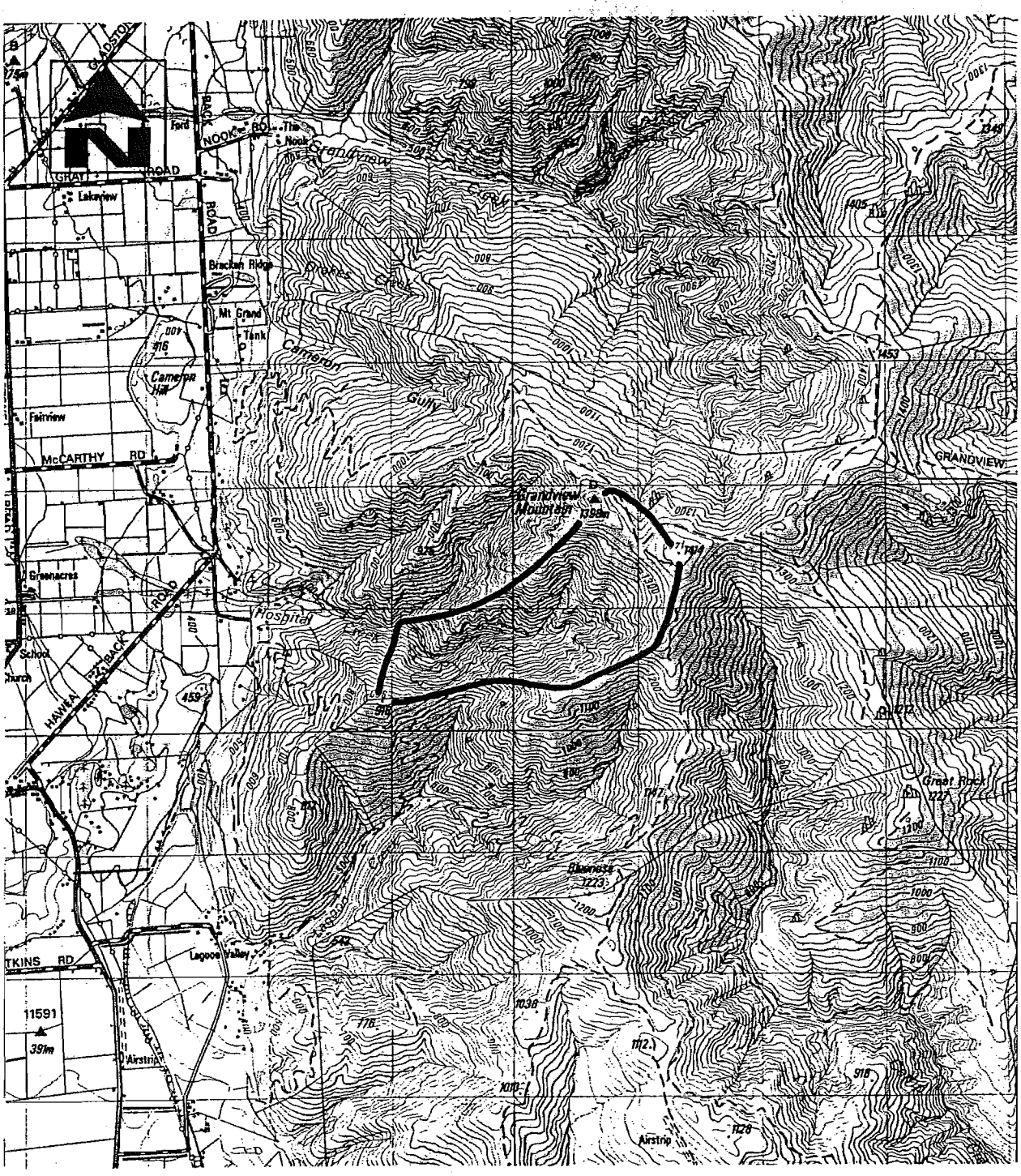
Appendix 6 - FMC submission

Appendix 7 - Forest & Bird submission

APPENDIX 1

LINDIS ECOLOGICAL DISTRICT PNAP REPORT – RAP A8

LINDIS - RAP A8 HOSPITAL CREEK



GRID REFERENCE : INFO MAP 260 G40 201 110

AREA : 230 hectares

ALTITUDE : 550m - 1400m

0 1 2 3 4

kilometres

LINDIS RAP A8 : HOSPITAL CREEK

Bioclimatic Zones Montane to low alpine

Ecological Units

Vegetation types	Landform types
Pod hal	in gorge
Kun eri	on derivative slope
Mixed shrubland	on riparian slope
Mixed outcrop vegetation	
Fes nov	on colluvial slope
Chi rig-Fes mat-Poa col	on colluvial slope
Chi rig-Fes mat-Poa col	on ripply colluvial slope
Dra pro	on colluvial slope
Dra pro	on ripply colluvial slope

Landform

The catchment of the south branch of Hospital Creek, deeply incised into the steep eastern wall of the Hawea - Upper Clutha Valley. The Haast Schist here dips gently, generally 10 degrees east-south-east, so that very steep derivative slopes are present on all aspects but mainly below 1100 m. The upper slopes include the extensive slumped southwestern face of Grandview Mountain and smaller colluvial slopes.

In its mid reaches, the stream is confined in a steep narrow gorge, with buttress outcrops and very steep ribs and gullies on both walls. The steep slopes are prone to sheetwash and gully erosion, and the stream carries a heavy sediment load.

Hygrous yellow-brown (Dunstan) steepland soils are predominant, grading into dry-subhygrous yellow-grey (Arrow) soils at lower altitude.

Vegetation

Ledges and crevices in the gorge support a sparse Hall's totara-broadleaf treeland with abundant *Olearia avicenniaefolia, Coprosma propinqua, Helichrysum aggregatum* and koromiko. A high diversity of native shrubs and herbaceous species is associated, however exotic species are predominant in the ground tier. Rock outcrops are frequently colonised by *Helichrysum selago, Hebe buchananii, Olearia cymbifolia, Melicytus alpinus, Celmisia densiflora, Brachyglottis haastii, Gingidia montana, Luzula banksiana, Stelleria gracilenta*, native broom and several ferns. *Dolichoglottis lyallii* is locally present on the moist stream bank.

Sunny derivative slopes above and adjacent to the gorge support kanuka - *Coprosma propinqua* matagouri shrubland or less diverse kanuka shrubland. Kanuka is invading the surrounding depleted fescue tussockland. The kanuka shrubland with bracken patches downstream of the gorge also includes cabbage trees and a few old kowhai trees.

Although scattered snow tussock is present on shady sites on the gorge walls, the surrounding tussockland is a strongly modified fescue tussockland with abundant exotics especially *Hieracium lepidulum* and oversown clovers and grasses. Narrow-leaved snow tussockland is predominant on upper slopes, above 900-1100 m on shady aspects. This community generally has good species diversity with abundant alpine fescue, blue tussock, *Leucopogon fraseri, Gaultheria depressa, Pimelea oreophila* and *Anisotome flexuosa. Dracophyllum pronum* is prominent on the higher altitude shady slopes behind Grandview Mountain.

Flora

Several uncommon species are present in the gorge including three finger (only record for the District), cabbage tree, mountain flax and *Gingidia montana.*

Discussion

This RAP shares several features with Lindis A7 (Grandview Creek), including good representation of the dramatic landforms of the northern Grandview land system and steepland altitudinal sequence of soils, diverse woody vegetation and tussockland. Here, however, Hall's totara is the dominant tree rather than beech, and the gorge community is unique. It includes the largest concentration of totara, broadleaf and several other species in the District.

As in Lindis A7, Hospital Creek includes features of the transition zone between the Central Otago and Lakes Ecological Regions, such as the southeastern limit of the cabbage tree / bracken association very typical of the Wanaka District.

The tussocklands retain important natural values, despite considerable modification. *Hieracium lepidulum* is prominent through the catchment, and most of the area has been oversown and topdressed, partly to improve ground cover for erosion control purposes. The erosion rate has been high in recent decades, as indicated by the aggradation of the streambed within the gorge which has killed a Hall's totara tree far larger than any surviving on the gorge walls.

Feral goats were noted in the gorge during the survey. Goats are particularly undesirable in this area, which is highly sensitive bot with regard to the erosion and because of the many palatable species (such as *Gingidia montana*) restricted to the gorge where they have survived on sites essentially inaccessible to sheep but at risk from goats.

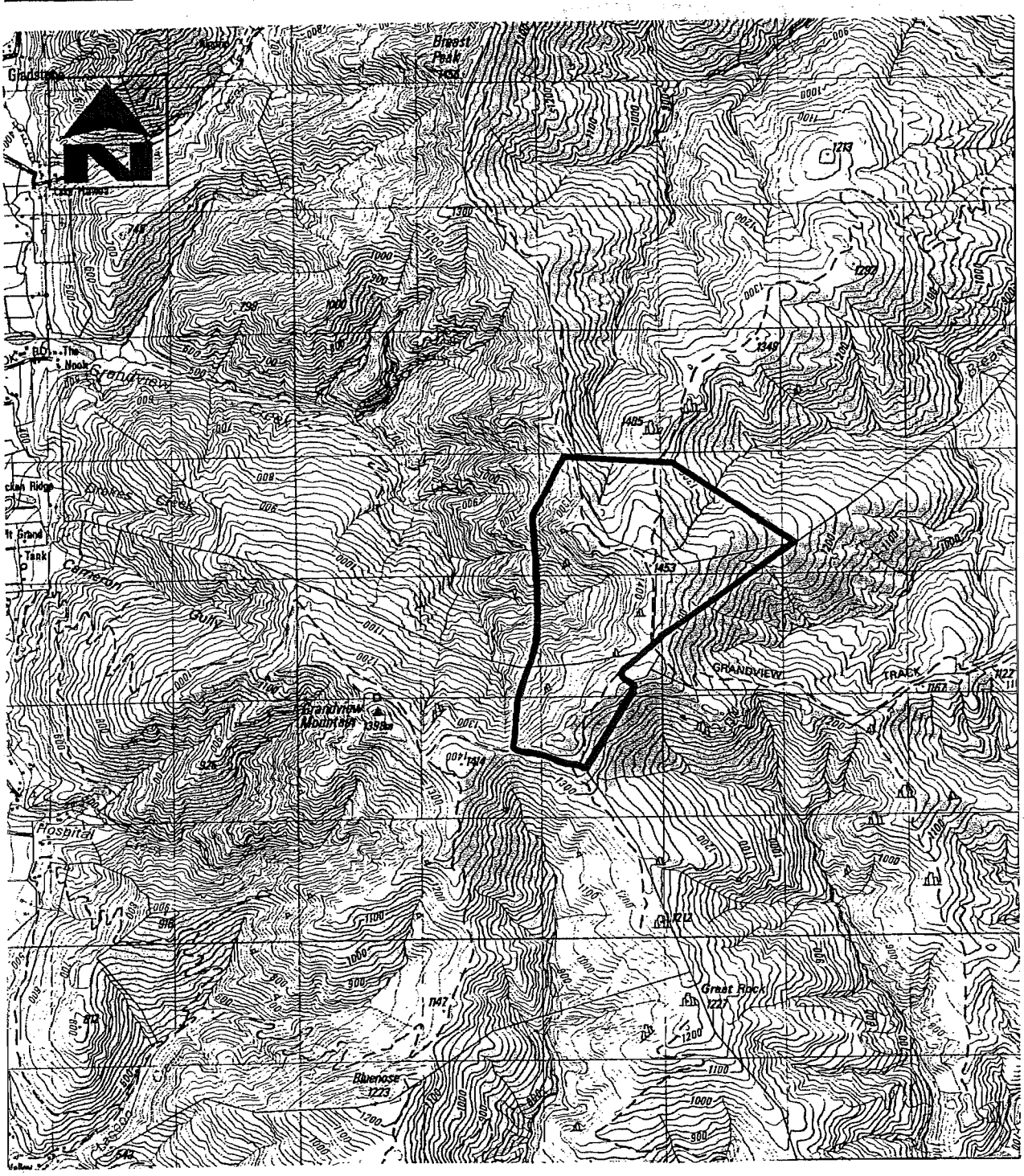
CRITERIA SUMMARY : RAP A8 - HOSPITAL CREEK

Representativeness	H	Altitudinal sequence of woody vegetation and tussocklands typical of NW Lindis District.
Diversity	H	A wide range of woody vegetation and tussocklands, with good species diversity.
Naturalness	M	Low naturalness in ground tier in and adjacent to most woodlands. Tussocklands variable: low, moderate and locally high naturalness.
Special Features	H	Many uncommon species, including large numbers of Hall's totara and broadleaf.
Viability	H	Regeneration of woody species (except three finger, kowhai) is good, but some ground species uncertain.
Buffering	H	Well defined catchment boundaries, gorge buffers upper catchment and provides its own protection to woody vegetation there.
Threat	M	Further exotic dominance of ground cover, erosional instability, goats.
Landform	H	Highly representative of the steep, deeply incised derivative slopes and slumped headslope topography of (northern) Grandview land system.

APPENDIX 2

LINDIS ECOLOGICAL DISTRICT PNAP REPORT – RAP B4

LINDIS - RAP B4 GRANDVIEW TOPS



GRID REFERENCE : INFO MAP 260 G40 228 128

AREA : 310 hectares

ALTITUDE : 1010m - 1460m

0 1 2 3 4

kilometres

LINDIS RAP B : GRANDVIEW TOPS

Bioclimatic Zones Subalpine to low alpine

Ecological Units	**Vegetation types**	**Landforms**
	Mixed outcrop vegetation	
	Chi mac-Fes mat-Poa col	on colluvial slope

Landform

A crestal area encompassing the heads of Grandview Creek in the west and Breast and Camp Creeks in the east. The broad ridge crest, with tor outcrops is a vestige of an old warped plateau surface. Schist dips abruptly ESE. The western edge of the ridge crest is abruptly defined by steep derivative slopes, whereas to the east the ridge merges into faces and shallow valley heads. Shady faces tend to be slumped ripply slopes.

Vegetation

Slim snow tussockland caps the broad ridge crest and extends on sunny slopes to 1420 m and on shady slopes to about 1300 m. It has a high species diversity including a small amount of cushionfield species with *Dracophyllum muscoides, Abrotanella inconspicua, Phyllachne colensoi* and *Chionohebe densiflora* along the ridge crest. narrow-leaved snow tussockland also in good or moderate condition surrounds the slim snow tussockland. *Hieracium lepidulum* is locally prominent.

Rock outcrops, including buttresses on the Grandview face and summit tors, are a notable feature of the area and carry a distinctive vegetation including *Olearia cymbifolia, Hebe buchananii, Coprosma cheesemanii, Helichrysum selago, Aciphylla montana, Poa breviglumis, Koeleria cheesemanii, Hymenophyllum sanguinolentum* and edelweiss.

Flora

A rich alpine flora, including species such as *Aciphylla montana* uncommon elsewhere in Lindis District.

Discussion

This area includes a diverse alpine vegetation in generally good condition, enhanced by the strong landform contrast across the boundary between the Grandview and Breast land systems. The slim snow tussockland is the best in the western Lindis district. There are larger areas to the east, but those in the Pass and Chain land systems are on different substrates, and slim snow tussockland around Little Breast Hill was not available for survey. Narrow-leaved snow tussockland is in abrupt contact with slim snow tussockland on a variety of aspects and landforms.

The main limitation of this RAP - that it is an alpine zone fragment of limited altitudinal range - could be remedied if it were linked to Lindis A7 nearby in the middle reaches of Grandview Creek. This would expand considerably the altitudinal sequence and representativeness of the Grandview Creek RAP.

CRITERIA SUMMARY : LINDIS RAP B4 - GRANDVIEW TOPS

Representativeness	H	Major communities typical of the NW Lindis District.
Diversity	M	Tussocklands dominate, limited altitudinal range though good species diversity.
Naturalness	H	Alpine communities in good condition, exotic species only a minor component.
Special Features	M	Several uncommon species on outcrop refuges.
Viability	H	Stable alpine catchments.
Buffering	H	Poor catchment boundaries, but buffered by altitude, steep terrain and extent of surrounding similar vegetation.
Threat	L	Fire, increase in exotics.
Landform	M	Representative of crestal slopes of Breast and Grandview land systems, but not of the lower slopes.

APPENDIX 3 : Characteristics of Land Environments of New Zealand (LENZ) Units on Mount Aspiring Lease. From: Leathwick, J., F. Morgan, G. Wilson, D. Rutledge, M. McLeod and K. Johnston. 2002: Land Environments of New Zealand. Technical Guide. Ministry for the Environment.

LENZ Level IV Environments	Characteristics
K3.3a	Gently undulating flood plains of Central Otago. Recent imperfectly drained soils of moderate fertility from schist alluvium and colluvium. 365m.
K3.3b	As for K3.3a but cooler temperatures, easy rolling flood plains.
N4.1c	Central Otago, Alexandra locations on rolling lower hill slopes and valley floors. Soils well drained on Schist and greywacke. Warmer winter temperatures and steep hills. 495m. Lower annual water deficits, steep hills.
N4.1d	Central Otago, Alexandra locations on rolling lower hill slopes and valley floors. Soils well drained on Schist and greywacke. 495m. Warmer winter temperatures and steep hills.
N5.1c	Located near Ranfurly, Wanaka and north-east Alexandra on very gently undulating plains. Imperfectly drained soils of mod fertility from a mixture of colluvium and loess from greywacke and schist. Warmer than average temperatures. 425m.
Q1.1a	Mountains of inland Otago; of strongly rolling mountainous terrain. Well drained soils of moderate fertility from greywacke, schist; 1095 m asl. Much colder temperatures, lower vapour pressure deficits, low monthly water balance ratios and slight annual water deficits.
Q1.1b	As for Q1.1a but only cold temperatures.
Q1.1c	As for Q1.1b, but of very steep mountainous terrain.
Q1.2a	South-eastern Hill Country and Mountains including Harris Mountains; of very steep mountains. Well drained soils of moderate fertility from greywacke rock, colluvium and basalt. 1305 m asl.
Q2.1b	Mountain ranges of inland Otago. Steep mountains, well-drained soils of moderate fertility from greywacke. 640 m asl. Much colder temperatures and higher annual water deficits.
Q2.2a	Steep mountain ranges of inland Otago. Well drained soils of moderate fertility from greywacke. 640m
Q2.2b	As for Q2.2a but much warmer temperatures, strong rolling mountainous terrain, moderately indurated.
Q3.3a	Undulating mountains of South Otago with imperfectly drained soils of moderate natural fertility from schist. 990m

APPENDIX 4

INVERTEBRATE SPECIES IDENTIFIED FROM TENURE REVIEW SURVEY

Earthworms

At least two species of Megascolecid earthworms, presumed native, were noted under rocks around areas of outcrop. One was large (c. 25cm long) with a well-defined clitellum covering segments 13-17; the other was a smaller, thinner species with no clearly identifiable clitellum.

Orthoptera (grasshoppers, etc.) (IDs by Brian Patrick)

Acrididae (short-horned grasshoppers)

Sigaus australis widespread and locally common in open areas from montane to alpine zone.

Hemiptera (bugs, etc.)

Cicadidae (cicadas) (IDs by John Dugdale)

Kikihia angusta widespread tussock cicada
Maoricicada campbelli widespread species, often associated with riverbeds, but occurring here on the rockfield in the NE of the property
Maoricicada otagoensis apparently endemic to Otago and Southland; originally described as occurring SW of the Clutha River, but apparently now known to be more widespread

Lepidoptera (moths, butterflies) (IDs by Brian Patrick except species marked *)

Noctuidae

Graphania mutans common, widespread in open areas and forest edge, lowland to montane - larvae on various herbs
Graphania lignana common, widespread cutworm of late summer, mainly lowland - larvae on grasses
Tmetolophota atristriga common, widespread in lowland to montane grasslands – native and exotic grasses
Tmetolophota propria common, widespread cutworm of montane to alpine grasslands - larvae on grasses
Rictonis comma common, widespread cutworm of lowland to montane areas - larvae on herbs and grasses

Geometridae

Dasyuris anceps widespread and locally common diurnal geometrid, mainly low alpine - larvae on *Anisotome flexuosa* and close relatives

Pieridae

*Pieris rapae** white butterflies were common throughout

Nymphalidae

Argyrophenga sp.* tussock ringlet butterflies were commonly observed but no specimens were caught for positive ID.
*Bassaris gonerilla** red admiral butterfly

Lycaenidae

Zizina oxleyi blue butterfly - widespread in eastern and central south Is, lowland to montane - larvae on prostrate *Carmichaelia* flowers and clovers

Crambidae

one species, three very worn specimens - maybe *Eudonia submarginalis* (widespread and common)

Coleoptera (beetles)

Carabidae (ground beetles)

Holcaspis sp. (the moderate ground beetles found in the south-eastern corner of the property)

Scarabeidae (chafer beetles)

Pyronota sp. manuka beetle

Tenebrionidae (darkling beetles and associated beetles)

Mimopeus sp. The dead larva of a darkling beetle was found in the bluff system above the tributary of Lagoon Creek.
?*Artystona* sp. this small species was widespread in rocky sites under loose rock, etc.

Hymenoptera

Formicidae (ants)

Monomorium sp. (Myrmicinae) this genus has a number of adventive and endemic species, including the widespread and common endemic species complex *Monomorium antarcticum*.

Prolasius advena (Formicine) a native species normally associated with forested areas

APPENDIX 5

Lizard sightings recorded on Mt Grand PL during the tenure review inspection of 14th -16th February 2005. Records include only actual sightings, not other signs of presence such as droppings or skin sheds.* tail collected and stored in 70% ethanol.

"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."

APPENDIX 6

FMC SUBMISSION

FEDERATED MOUNTAIN CLUBS OF NEW ZEALAND (Inc.)
P.O. Box 1604, Wellington.

PASTORAL LEASE TENURE REVIEW

Preliminary Report on the Recreational, Landscape, Historic and other Conservation Values, and Recommendations for Outcomes of Tenure Review

MOUNT GRAND

May 2005

Compiled for Federated Mountain Clubs (FMC) of NZ (Inc.)
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PRELIMINARY REPORT ON THE RECREATIONAL, LANDSCAPE, HISTORIC AND OTHER CONSERVATION VALUES, AND RECOMMENDATIONS FOR OUTCOMES OF TENURE REVIEW ON MOUNT GRAND

A Report for FMC based on Field Inspections and other research to assist in the Crown Pastoral Lease Tenure Review Process

May 2005

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12. There is an area of high natural and landscape value on the true left of Lagoon Creek, just below Bluenose. This area contains prominent rocky bluffs and significant kanuka shrublands which deserve protection. It is steep and rocky and not likely to be able to be managed for pastoral use in a way that is ecologically sustainable. It would be better to be returned to full Crown ownership and managed for conservation and recreation, together with the remaining LUC Class VII land above 1,000m in the head of Lagoon Creek catchment, and linked to RAP A8 Hospital Creek.

INTRODUCTION

This report has been prepared following the Early Warning Meeting in September 2004 at which the properties entering the tenure review process in 2004 were introduced. An inspections of the property was carried out in April 2005 with the kind permission of the runholder and manager. This report is based on that inspection and other material listed below. The report is offered as a contribution to the statutory consultation process undertaken by the Department of Conservation.

The report focuses on those features of Mount Grand which are important for public recreational interests. It should be noted that while some of this interest focuses on access, the natural values and landscapes of the place have a fundamental impact on the recreational value of the property and greatly influence the quality of recreational experience enjoyed. It is for this reason that reference is also made to both natural and landscape values in this report. The landscapes and views to be seen from the high country overlooking Lake Hawea and the Upper Clutha are outstanding and add greatly to the enjoyment of visiting this property.

Mount Grand is situated near the northern end of the 'Grandview Range' in a commanding position overlooking Lake Hawea (Figs. 1 and 2). It occupies the entire catchment of Hospital Creek and part of the catchments of Cameron Gully and Lagoon Creek (Fig. 3). The 'Grandview Range' is a name sometimes used for the ridge system which extends south over Glenfoyle to Sandy Point and Long Gully. At Trig O, the meeting point of Sandy Point, Long Gully and Deep Creek pastoral leases, the ridge system turns east to Lindis Peak and the Lindis Pass highway. It is because of its strategic position giving access to the northern end of this ridge system, and because there is also a link east (the Grandview Track) to the Lindis Pass (Fig. 4), that public interest in the outcome of this tenure review is quite high.

There are currently 6 pastoral leases, including Mount Grand, associated with the ridge system which are currently involved in the tenure review process. It is important that a broad view of the overall outcomes be taken as each lease is reviewed and consideration should be given to the emerging network of recreation opportunities. Recreational use in the future will depend on decisions made now, so it is important that adequate provision is made for public access.

Mason (1989) has described the general area as follows:- *"Between the Upper Clutha and Waitaki catchments lies an extensive tract of mountain country bounded by the Hawea Basin to the west and the Ahuriri Valley to the east. The Lindis Valley and Pass forms a southern transition between the high relief main ranges and the gentler block mountains to the south-east. It is also a transition between the strongly foliated Central Otago schists and Canterbury greywackes. Intricately dissected and relatively small scale hill country in the Lindis Pass area is quite dissimilar to the rest of the region... ... ...South of Timaru River the country drops to rounded crests at 1,600m on the Grandview Range, which falls almost imperceptibly southwards to only 1,200m north of Tarras. This easier topography is in marked contrast to the contorted forms to the north."*

Protected Natural Area (PNA) surveys conducted in the 1980s identified two areas on Mt Grand which were recommended for protection (RAPs). These were Lindis RAP A8 in Hospital Creek and part of Lindis RAP B4 Grandview Tops. These areas will be considered below in the section on significant inherent values.

METHODS OF SURVEY AND ASSESSMENT

A site visit and field inspection was carried out in April 2005, with the kind permission of the runholder and manager. This report is based on the field inspection and in part, on information gathered from other sources. The other sources include studies of topographical and Land Use Capability (LUC) maps, consultation with recreational user groups and a knowledge of the landscapes seen from the Lake Hawea area. A study of "Outdoor Recreation in Otago" was undertaken by Mason (1989) and published by FMC. Reference is made to this Recreation Plan for Otago in the recreation section below. The Conservation Management Strategy for Otago and the Survey Report for the Protected Natural Area Programme (1994) have also been used as sources of reference.

GENERAL DESCRIPTION OF MOUNT GRAND

Mount Grand is a small property of just 2,000ha, operated together with its neighbour Brackenridge, by Lincoln University. Only Mount Grand is undergoing tenure review.

M nt Grand is strategically located astride the ridge system which runs south from above Lake Hawea to Sandy Point/Long Gully before it turns east to Lindis Peak and the Lindis Pass (Fig. 5). This ridge system is sometimes referred to as the 'Grandview Range' because Grandview Mountain is one of the highest points along the ridge and because of its historic significance and association with Surveyor John Turnbull Thomson.

The property stretches from Hawea flats at about 350m to almost 1,400m on Grandview Mountain and occupies the entire catchment of Hospital Creek (Fig. 3) and parts of the catchments of Cameron Gully and Lagoon Creek which all drain the western flanks of the 'Grandview Range'. There are also small areas of high country in the headwaters of both Grandview Creek and Camp Creek (Fig. 4) which lie to the east of the summit ridge. Almost all of this part of the property (about 500ha in total) lies above 1,000m.

From the top of Grandview Mountain the upper part of Hospital Creek catchment appears almost sheer and it is indeed very steep above about 500m (Fig. 3), as is also the face below Bluenose at 1,223m (Fig. 6) on the southern boundary. At the foot of these steep slopes is a very narrow strip of more gently sloping land where the homesteads and farm buildings of both Mount Grand and Bracken Ridge are situated (Figs 1 and 2). The relatively gentle slopes also extend a short distance up the valley of Hospital Creek (Fig. 3).

Improved pastures extend along the foot of the front faces (Fig. 7) and along the lower slopes of Hospital Creek and Lagoon Creek. Most of the remainder of the property is still in a natural or semi natural state (Fig. 8) where the vegetation has been only partially modified by grazing and burning. Much of the high country has significant inherent landscape and natural values, thus providing an excellent setting for a range of recreational activities.

It is this unique geographic positioning, between the Upper Clutha and Lindis catchments, and near the northern end of the 'Grandview Range', providing recreational access to a much larger hinterland that is the key to understanding the recreational significance of Mount Grand.

The lower slopes and particularly the shady sides below about 900 to 1,000m are characterised by Arrow Steepland Yellow Grey Earth soils which have been classified LUC Class VI with medium suitability for pastoral use (Fig 7). On the drier and more eroded slopes in Hospital Creek and Lagoon Creek the same soils at approximately the same altitude have been classified LCU Class VIIe. Above about 1,000m there are still some areas characterised by Arrow Steepland soils but most is Dunstan Steepland Yellow Brown Earth classified LUC Class VIIe. There are about 600ha of Class VI land and 1,200ha of Class VIIe land. The steep eroded slopes (about 200ha) in the upper part of Hospital Creek catchment are also described as Dunstan Steepland but in this case are entirely unsuited for pastoral use (Fig. 3), and classified LUC Class VIII.

The lower slopes (Class VI land) have been oversown and topdressed (Fig. 7) and lie below about 1,000m, so this area should be capable of being managed in a way that is ecologically sustainable with appropriate maintenance to replenish nutrients removed in animal products (meat and wool). It should therefore be suitable for freeholding but wilding tree control will be required (Fig. 7).

The LUC Class VIII land in Hospital Creek is totally unsuitable for pastoral use, so it is clear that it cannot be managed in a way that is ecologically sustainable because of its topography and erosion (Fig. 3). It should not therefore become freehold. It will be seen later that for other reasons, return to full Crown ownership to be managed for conservation and recreation would be the proper outcome for this LUC Class VIII land.

In order for any land to be managed in a way that is ecologically sustainable in the long term, any losses from the soil of essential nutrients in animal products (meat and wool) must be replenished. The alternative is that sooner or later the ecosystem will be depleted and degraded. LUC Class VIIe land may not be capable of being managed in a way that is ecologically sustainable because it may not be justifiable economically to replenish (in the form of fertiliser) the nutrients which are lost through grazing and burning. On lower country where pasture growth rates are higher, topdressing is worthwhile, but at higher altitudes (above about 1,000m), pasture growth and hence response to fertiliser is limited by climate. Under these circumstances conservation values need to be assessed and considered as an alternative to unsustainable pastoral use.

Public access to Grandview Mountain and use of the ridge track east to the Lindis country, and south over G. foyle, together with the protection of associated areas of high natural and landscape values are likely to be the main recreational issues in this tenure review.

RECREATIONAL ACTIVITIES AND POTENTIAL

The recreational significance of Mount Grand lies in its strategic position giving access to the northern end of the Grandview-Tarras-Lindis ridge system. This ridge system leads south over Glenfoyle to Tarras, (Fig. 5) and thence eastwards to Lindis Peak and Lindis Pass. From the summit of Grandview Mountain, and indeed all along the Grandview Range, there are spectacular views (Figs. 9) to the mountains of Mt Aspiring National Park, including Mt Aspiring itself. It is views like this (Figs 9 and 10) that provide such an ideal setting for a range of recreational activities. Access over Mount Grand is also important because there is a link east to the Lindis Pass (Grandview Track, Fig. 4), so for a number of reasons public interest in the outcome of this tenure review is high.

In fact, there is an extensive network of ridgeline tracks between the Upper Clutha – Lake Hawea area, the Lindis Pass, and the Upper Clutha at Tarras. This was discussed in reports prepared in 1999 on Glenfoyle and in 2003 on Lake Hawea Station.

When those reports were submitted, it was recommended that opportunities for recreation should be considered in the broad context of the whole Hawea/Lindis area. This is even more appropriate now that there are a number of neighbouring properties undergoing tenure review. Lake Hawea Station, Glenfoyle, Sandy Peak, Long Gully, and Deep Creek are all at various stages of review while final outcomes have been agreed on Nine Mile. FMC has reported on all these properties. In 2005, we reiterate our recommendation that that because the network of recreational opportunities is spread over a number of pastoral leases, a broad view should be taken of the outcomes of all these reviews. Rather than treating each review in isolation, it is more appropriate to work towards outcomes which take account of all the opportunities in the wider Hawea – Lindis area.

The FMC report on Glenfoyle, for example stated:-

"Glenfoyle occupies an important position from a recreational perspective as it provides access to an extensive ridge system. This ridge system extends south from Breast Hill (overlooking Lake Hawea and the Timaru River valley), over Breast Peak and Grandview Mountain where a branch (Grandview Track) leads east to Bargour and the Lindis Pass Highway. The ridge system continues south over Bluenose and Glenfoyle to Trig Hill and encompasses the entire catchment of Camp Creek and its tributaries. The rim of this catchment carries the ridge system east to Lindis Peak and encloses an attractive mosaic of tussock, kanuka shrubland and rock outcrop landscapes.

This ridge system and its associated tracks provide easy travel and excellent views of the surrounding area as far afield as Mount Aspiring National Park, the Remarkables, Lindis Pass, and the St Bathans Range. It is ideal for tramping, mountain bike trips, and horse riding and should also be considered for 4WD use with the runholders consent. Through trips to the Lindis area should become available over time through tenure reviews of neighbouring properties. Nine Mile is one of a group of 6 properties currently in the tenure review process in the Lindis Pass area. It is therefore important to make appropriate access provisions at this stage at the Hawea end of the system (eg. Glenfoyle) so that provision for through trips can be completed as other tenure reviews proceed."

Mason (1989) had earlier reported that:- *"Recreational use of this area is almost entirely confined to the Hawea Flat approaches to the Grandview Range and Timaru River. Grandview Mount (1,397m) is an historic viewpoint, as impressive a panorama today as seen by Surveyor Thompson in 1857. The view extends from the Central Otago ranges, to the Remarkables, Mount Aspiring, the Wilkin peaks, including a striking perspective of Aeolus, and the McKerrow Range. This must rank as one of the most comprehensive views within the Southern Lakes region. A small number of holiday visitors make the 1,000m climb to the summit each summer."*

The FMC report on Sandy Point stated:-

"The significance of the track system from Grandview and Bluenose, to Trig Hill (on the northern boundary of Sandy Point) and beyond, is that it allows the recreational visitor to continue enjoying this panorama from

changing perspectives along the ridges. It provides a wide range of options for walkers, trampers, mountain
b. users and possibly horse riders and 4WD enthusiasts.

Bearing all these considerations in mind, it is important now that appropriate provision is made for public access on Mount Grand. There is significant potential for future recreational use either riding or on foot. It is envisaged that the most likely usage will be for mountain bike travel, given the distances involved. However, there are also precedents for equestrian use and there will certainly be trampers from Otago and further afield who are keen to explore the area.

The following trips are the most likely to become more popular:-

- Up to Grandview Mountain and the outstanding views over the Upper Clutha and beyond which were seen by Otago's first Chief Surveyor, John Turnbull Thomson (Fig. 5).

- Northwards along the ridge crest to Breast Hill or Breast Peak from where similarly outstanding views can be seen from a different perspective (Figs. 9 and 10).

- Eastwards to the Lindis Pass via the Grandview Track and Three Tree Spur (Fig. 4).

- Southwards over Bluenose and the ridge track system leading south to Tarras, or turning off towards Lindis Peak (Figs 5 and 6).

With regard to the bullet points above, the following should be noted: The fact that a right of way across other properties does not yet exist should not be a reason for not making provision for access over Mount Grand. Provision should be made now in anticipation of further public access becoming available through future tenure reviews or other access arrangements.

The possible use of the ridge track system for 4WD use was raised in the 1999 report on Glenfoyle. The problems with 4WD and trail bike use are twofold: they are incompatible with more passive forms of recreation and they have potential to do great damage to tracks and wetland vegetation. There is also the question of who should be responsible for track maintenance. Nevertheless, it is a valid form of recreation and consideration needs to be given to what places might be suitable, bearing in mind these problems. Existing farm tracks in drier areas present opportunities where the risks of environmental and track damage are less than elsewhere and Mount Grand together with Lake Hawea Station, Glenfoyle and other neighbouring properties, may have opportunities which should be considered. 4WD use up to, along the ridge track, and east to the boundary with Forest Range Station, with the runholder's consent, and the possible payment of reasonable fees to contribute to track maintenance, might be considered during tenure review. The number of vehicles using this track system might be regulated by some form of permit system.

An increasing problem for people wishing to make trips involving overnight stays in the backcountry is security of car parking at road ends. Consideration should be given during the tenure review process to making provision for car parking, where possible off highways, and in the most secure places possible near the start of new easements over land which becomes freehold through tenure review. In the case of Mount Grand parking space might be provided by the shelterbelt of trees at the foot of the zig-zag track to Grandview Mountain.

Finally, it is argued that the recreational significance of Mount Grand should be assessed not only on present usage but also on potential. This is because current usage is less than its potential for a number of reasons. Because of the current land tenure, and because access to the ridge system has not been easy in the past, the recreational use of the tracks described in this report is less than it might have been if access was freely available. There is significant potential for greater use, particularly by mountain bikes, and it is the full range of possibilities which should be considered during this tenure review.

In summary, this assessment indicates that there is considerable scope on Mount Grand for day walks and longer trips along and over the 'Grandview Range'. This is likely to include tramping, mountain bike trips and horse riding, in addition to forays into the steeplands and shrublands below Grandview Mountain and Bluenose.

SIGNIFICANT INHERENT VALUES AND THEIR IMPORTANCE FOR RECREATION

This report focuses on those features of Mount Grand which are important for public recreational interests. It should be noted that while some of this interest focuses on access, the natural values and landscapes of the areas concerned have a fundamental impact on the recreational value of the place and greatly influence the quality of recreational experience enjoyed. It is for this reason that reference is also made to both natural and landscape values of this pastoral lease.

The Protected Natural Area (PNA) surveys carried out in the 1980s recognised the significance of natural values and identified certain Recommended Areas for Protection (RAPs). On Mount Grand, two such areas were identified. One of these (Lindis RAP A8, Hospital Creek) occupies some 230ha in the upper parts of Hospital Creek on the extremely steep slopes below Grandview Mountain (Fig. 3). The other is Lindis RAP B4 Grandview Tops but in this case only part of the 310ha area lies within Mount Grand (Fig. 11).

The 310ha Grandview Tops (RAP B4) straddles the high ground between Grandview Creek and Breast Creek and represents a small fragment of the old warped plateau surface. The broad ridge crest is characterised by slim snow tussockland with a high species diversity including some cushionfield species. The landscape is of particular interest because of the contrast between the steep craggy face in the head of Grandview Creek (on Mount Grand) and the shallow valley heads which characterise the Breast Creek catchment on Lake Hawea Station.

The 230ha RAP A8 Hospital Creek has been ranked high (H) for Representativeness, Diversity, Special features, Viability and Landform and medium (M) for its Naturalness (Fig. 3).. Threats due to exotic dominance of groundcover, erosional instability and goats were ranked medium (M). The PNA survey report stated that RAP A8 demonstrates *"good representation of the dramatic landforms of the northern Grandview land system and steepland altitudinal sequence of soils, diversity of woody vegetation and tussockland. Hall's totara is the dominant tree and the gorge community is unique. It includes the largest concentration of totara, broadleaf and several other species in the* [Ecological] *District.*

Hospital Creek includes features of the transition zone between the Central Otago and Lakes Ecological Regions, such as the southeastern limit of the cabbage tree/bracken association very typical of the Wanaka District."

There is also an area of high natural and landscape value on the true left of Lagoon Creek, below Bluenose. This area contains prominent rocky bluffs and significant native kanuka shrubland and bush which deserves protection. It is steep and rocky and is characterised by Dunstan Steepland soils classified LUC Class VII so it is not likely to be able to be managed for pastoral use in a way that is ecologically sustainable. It would be better assessed for its natural and landscape values. Following on from the discussion above about the land resources of Mt Grand, it follows that the land which cannot be managed in an ecologically sustainable manner should instead be considered for its natural and landscape values.

The landscape and scenic values of the front faces of Mount Grand are very high because of their visibility to tourist traffic on the Haast Heritage Highway (SH 6) through the Upper Clutha area. These faces are part of the scenic backdrop to Lake Hawea. They deserve protection from the adverse effects of inappropriate tracking, fencing, or other development (such as afforestation) and the erection of structures. FMC does not accept that District Plans afford sufficiently robust protection for these important natural values. Protection under a landscape protection covenant registered on freehold title as an outcome of tenure review is recommended. The natural values of these steep and rugged faces would be enhanced by precluding any further burning which in the past has prevented regeneration of scrub.

AREAS TO BE PROTECTED

There are very significant inherent landscape and natural values which are important in their own right and also enhance the recreational value of Mount Grand. These should be protected for a number of reasons.

Two areas have been identified in PNA surveys as RAPs: Because of their highly significant inherent values which are briefly described above, these area (RAP A8, 230ha and part of RAP B4) should be returned to full Crown ownership and control to be managed for conservation and recreation purposes.

Tl. ɔ areas have already been identified which should be included in land recommended for return to full Crown ownership and control: Namely RAP A8 in Hospital Creek, RAP B4 at the head of Grandview Creek and the shrublands and steeplands on the true left on Lagoon Creek. It would be sensible to link these areas and include the remaining LUC Class VII land above 1,000m in the area recommended for protection. It is not clear if there are existing fences which would provide suitable boundaries. If not, a new fence might need to be constructed approximately where the 1,000m contour crosses the spur between Hospital Creek and Lagoon Creek catchments. The top boundary would be provided by the existing fence close to the track along the ridgeline.

The steep and craggy Hawea faces of Mount Grand have landscape values which are quite outstanding and highly visible from tourist routes through the area. If these front faces, or parts of them, are not included in the area to be returned to full Crown ownership, then some alternative mechanism for the protection of the entire landscape is required. FMC does not accept that District Plans under the RMA offer sufficiently robust or durable protection for such outstanding landscapes. Instead, FMC recommends that landscape values should be protected from the adverse effects of inappropriate development under a binding conservation covenant registered on any future freehold title. Burning should also be prohibited.

ACCESS REQUIREMENTS

The main issue in this tenure review is public access to, and along the ridge systems leading north to Breast Hill, east to the Lindis Pass, and south towards Tarras. There are four elements of access which require attention so that the requirement of the Crown Pastoral Lands Act, 1998 to secure *"public access to and enjoyment of reviewable land"* is met.

The four elements are as follows:-

- Up to Grandview Mountain and the outstanding views over the Upper Clutha and beyond which were seen by Otago's first Chief Surveyor, John Turnbull Thomson.
- Northwards along the ridge crest to Breast Hill or Breast Peak from where similarly outstanding views can be seen from a different perspective.
- Eastwards to the Lindis Pass via the Grandview Track and Three Tree Spur.
- Southwards over Bluenose and the ridge track system leading south to Tarras, or turning off towards Lindis Peak.

As well as these access provisions to enable the public use of the ridge system, other recreational issues need to be addressed: 4WD access and use of the ridge track system with the runholder's consent, and the possible payment of a modest contribution towards track maintenance, might also be considered. If numbers of vehicles using the tracks becomes a problem some form of permit system could be introduced.

CONSERVATION MANAGEMENT STRATEGY FOR OTAGO

There are important statements in the Conservation Management Strategy for Otago, in which the Hawea-Lindis area is recognised as a Special Place. The objectives for this area, which includes Mount Grand are:-

"To manage and enhance recreational opportunities on lands administered by the department in the Hunter-Hawea area to maintain the natural and historic resources of areas while providing for an appropriate range of recreational activity of high quality". And: *"To achieve permanent protection for areas of significant nature conservation importance in the area".*

It is particularly important that these objectives will be implemented through:-*"Negotiation opportunities presented by pastoral lease tenure review or land exchanges on the large pastoral runs in the area or Crown land allocation opportunities will be taken with a view to:-protecting areas of significant nature conservation value; linking and buffering existing lands administered by the department; improving public access and*

recreational opportunities on lands administered by the department; and protecting landscape qualities in the area particularly those of the visual catchments visible from the state highways".

These objectives and implementation statements accord very closely with the recommendations made in this report. Furthermore, it should be noted that the priority for the Hawea-Lindis Special Place is:-*"Consolidation of protected areas and protection of key habitats through tenure review negotiations, improving public access and animal and plant pest control activities will be priorities in this Special Place".*

CONCLUSIONS

The tenure review of Lake Hawea Station is a one-off opportunity to greatly enhance the recreational opportunities of the Hawea-Lindis area, and to increase the recreational value of those lands by recognising the very significant inherent values described above and in the PNA Surveys carried out in the mid 1980s.

1. It is because Mount Grand is situated in a strategic position, near the northern end of the 'Grandview Range' that gives access to the ridge system, and a link east to the Lindis Pass that public interest in the outcome of this tenure review is quite high. It is also this positioning which provides access to a large hinterland, that is the key to understanding the recreational significance of this property..

2. A broad view of overall outcomes of tenure review needs to be taken as each lease along the 'Grandview Range' is reviewed. Consideration should be given to the emerging network of recreation opportunities and adequate provision made for public access because future recreational opportunities depend on decisions made now.

3. The potential network of high level tracks and the significant inherent landscape and natural values, combine to providing an excellent setting for a range of recreational activities.

4. The lower slopes have been oversown and topdressed and classified LUC Class VI. With appropriate maintenance, this land should be capable of being managed in a way that is ecologically sustainable and therefore suitable for freeholding but wilding tree control will be required.

5. LUC Class VII land may not be capable of being managed in a way that is ecologically sustainable because it may not be justifiable economically to replenish the nutrients which are lost through grazing and burning. Conservation values need to be assessed and considered as an alternative to unsustainable pastoral use.

6. LUC Class VIII land in Hospital Creek is totally unsuitable for pastoral use and cannot be managed in a way that is ecologically sustainable. It should not therefore, become freehold.

7. Public access to Grandview Mountain and use of the ridge track both north and south, as well as east to the Lindis country, together with the protection of associated areas of high natural and landscape values are the main recreational issues in this tenure review.

8. From the summit of Grandview Mountain, and indeed all along the Grandview Range, there are spectacular views to the mountains of Mt Aspiring National Park and the landscapes of the Upper Clutha. Such views provide an ideal setting for a range of recreational activities.

9. There is significant potential for future recreational use either riding (bike or horse) or on foot. The most likely usage will be for mountain bike travel, given the distances along the extensive network of tracks between the Upper Clutha and Lindis catchments.

10. To fulfil the requirement of the Crown Pastoral Lands Act, 1998 to secure *"public access to and enjoyment of reviewable land"* guaranteed public access (at least for foot horse and mountain bike) will be required as follows:-

- Up to Grandview Mountain..
- Northwards along the ridge crest to Breast Hill or Breast Peak.

- Eastwards to the Lindis Pass via the Grandview Track.
- Southwards over Bluenose and the ridge track system leading south to Tarras.

11. The fact that rights of way may not yet exist across neighbouring properties should not be a reason for failing to make provision for access over Mount Grand. Provision should be made now in anticipation of further public access becoming available through future tenure reviews or other access arrangements.

12. Consideration should be given to making provision for car parking off the highway near the start of new easements over land which becomes freehold through tenure review. In the case of Mount Grand parking space might be provided by the shelterbelt of trees at the foot of the zig-zag track to Grandview Mountain.

13. The recreational significance of Mount Grand should be assessed not only on present usage but also on potential. This is because current usage is less than its potential for a number of reasons including ease of access in the past.

14. PNA recognised two RAPs on Mount Grand: Lindis RAP A8 (230ha) in Hospital Creek, Lindis RAP B4 (part of the 310ha area on Grandview Tops). These areas should be returned to full Crown ownership and control.

15. There is also an area of high natural and landscape value on the true left of Lagoon Creek, below Bluenose. This area contains prominent rocky bluffs and significant native kanuka shrubland which deserves protection.

16. Three priority areas have been identified for return to full Crown ownership: namely RAP A8, RAP B4, and the shrublands and steeplands on the true left on Lagoon Creek. It is recommended that these three areas should be linked with the remaining LUC Class VII land above 1,000m, and this whole area should be returned to full Crown ownership and control.

17. The steep and craggy Hawea faces of Mount Grand have landscape values which are quite outstanding and highly visible from tourist routes through the area. These values require protection from the adverse effects of inappropriate development. FMC does not accept that District Plans under the RMA offer sufficiently robust or durable protection for such outstanding landscapes. Protection under a binding conservation covenant registered on any future freehold title is recommended. Burning should also be prohibited.

18. The outcome of the tenure review of Mount Grand, could contribute significantly to the achievement of the objectives declared for the Hawea-Lindis Special Place in the Conservation Management Strategy for Otago.

ACKNOWLEDGEMENTS

FMC is grateful for assistance from authorities in making the assessment possible. The site inspection was carried out in April 2005and FMC is grateful to the runholder and manager for co-operation and granting permission for access, and to QV staff for making the appropriate arrangements. We are also grateful to DTZ New Zealand for making LUC Capability maps available for consultation.

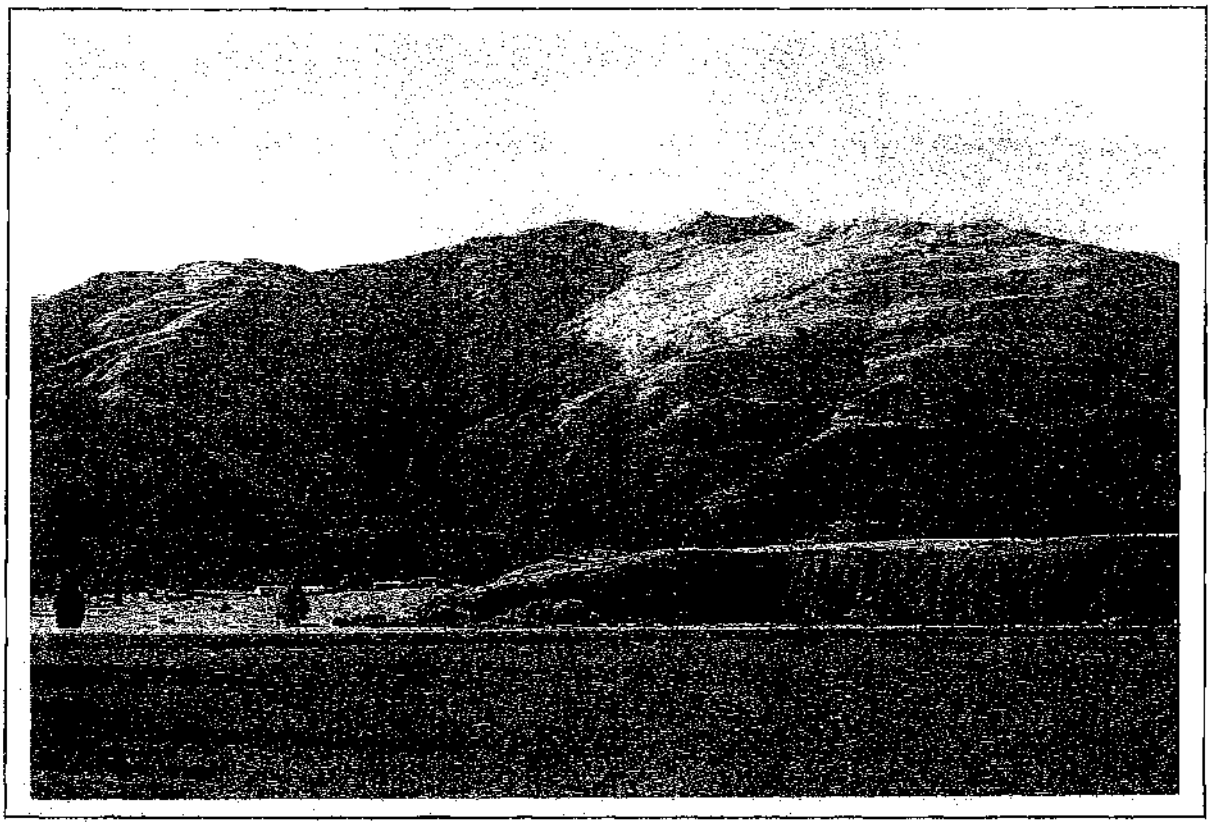

Fig. 1. Mount Grand is situated in a commanding position near the northern end of the 'Grandview Range'. The homesteads of both Mount Grand and Bracken Ridge nestle at the bottom of Cameron Gully while Mount Grand property extends up to 1,400m on Grandview Mountain. There is a zig-zag track up the face which provides a popular day walk for locals.

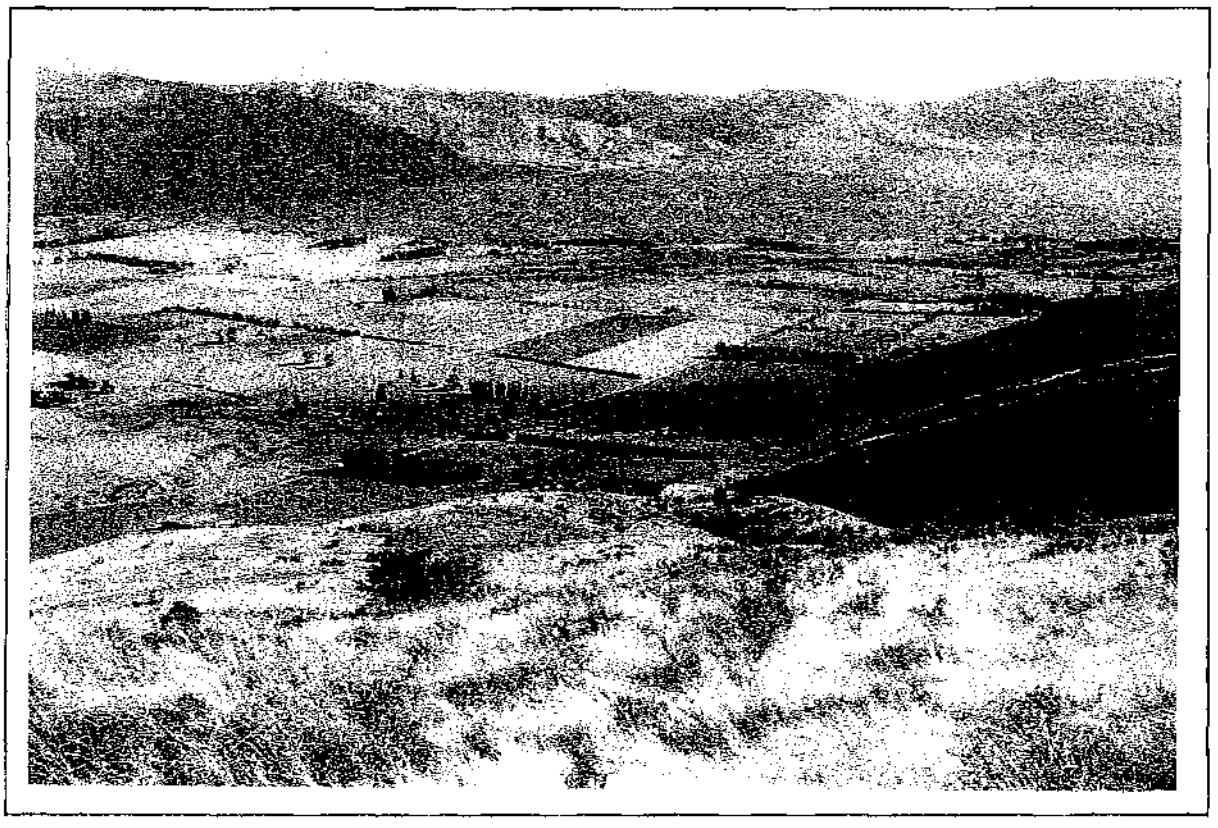

Fig. 2. Mount Grand overlooks the Hawea flats, Lake Hawea and the Haast Heritage Highway (SH 6) on the far side of the lake. Because of the landscape values of the 'Grandview Range' and its high visibility from all the places it overlooks, secure protection from the adverse effects of inappropriate developments is required for the front faces of Mount Grand.

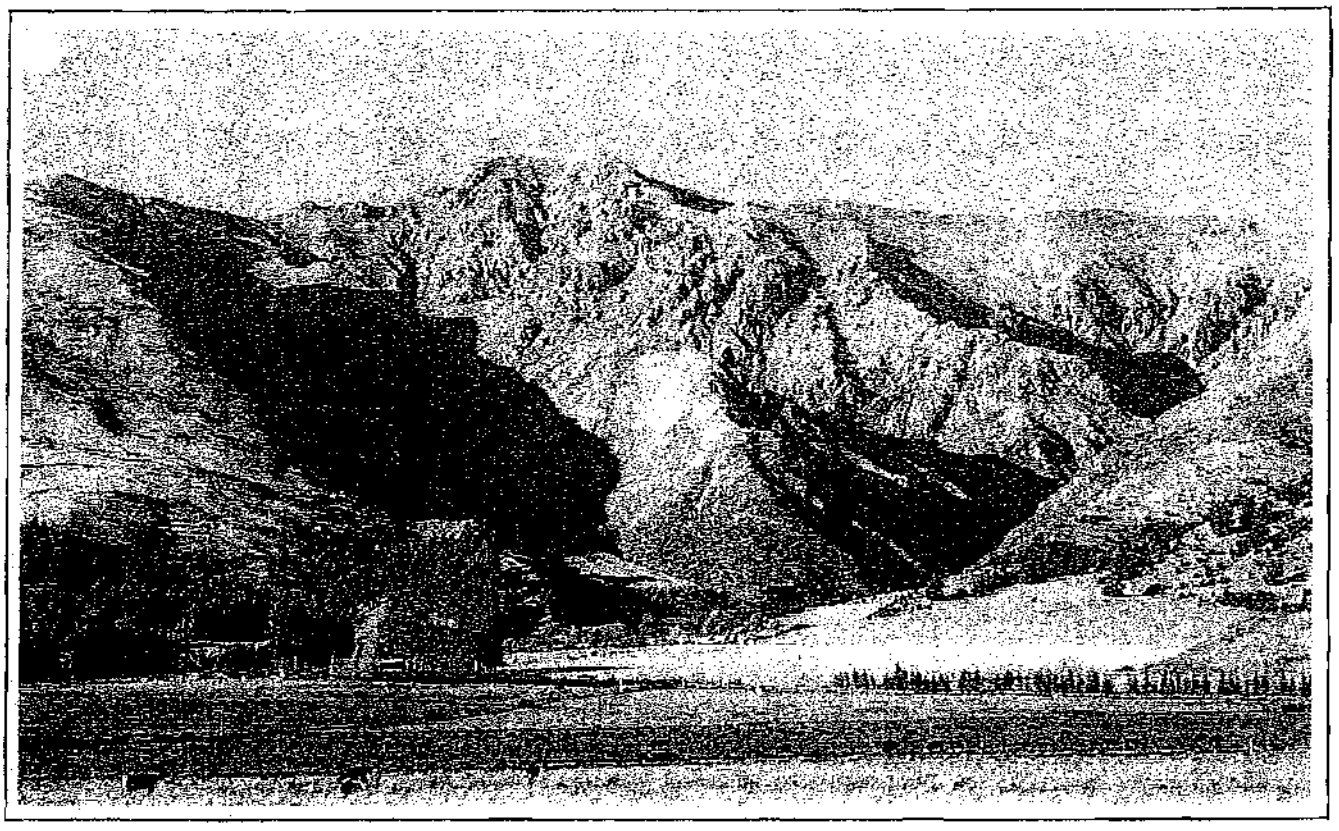

Fig.3. Mount Grand lease occupies the entire catchment of Hospital Creek and also parts of Cameron Gully and Lagoon Creek. It extends from about 350m on the valley floor to the summit of Grandview Mountain, the highest point at the head of the Hospital Creek catchment. The steep, rugged, eroded face below Grandview Mountain is entirely unsuitable for pastoral use but, because of its high natural values, it was recommended for protection by the PNA survey.

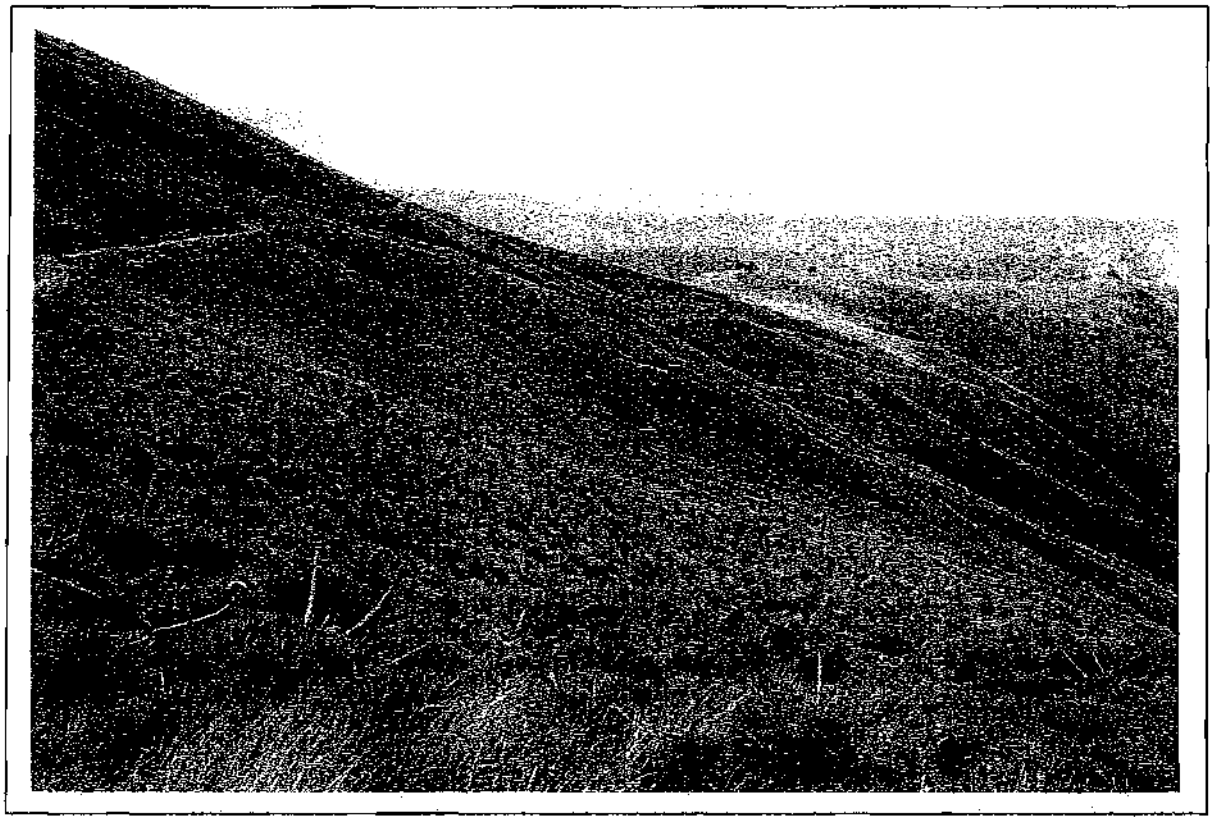

Fig. 4. On Mount Grand there are also small areas of high country in the headwaters of both Grandview and Camp Creeks. The view here is looking into the head of Camp Creek, which is part of the Lindis River system. This illustration also shows part of the Grandview Track heading east over Three Tree Spur to the Lindis Pass highway (SH 8).

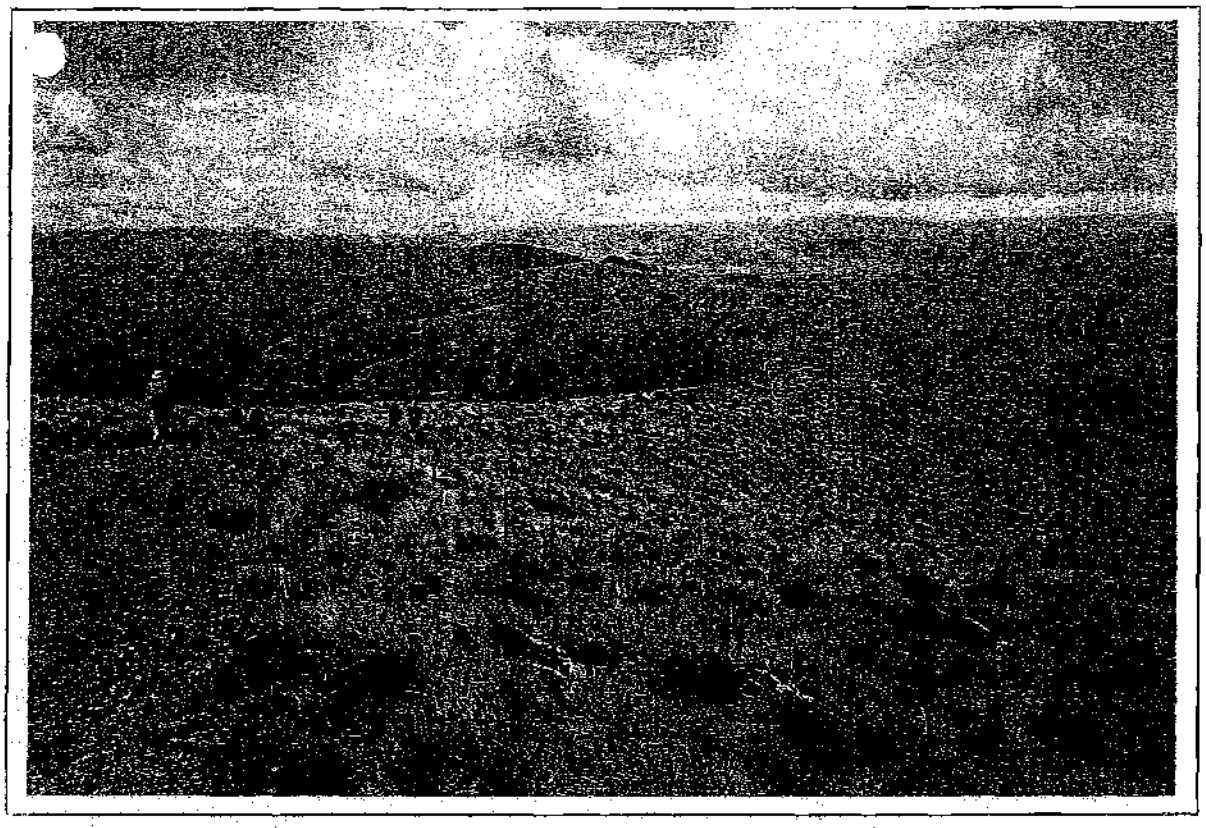

Fig. 5. The ridge system carries a track which leads south from above Lake Hawea, over Grandview Mountain and Bluenose to Sandy Point and Long Gully, before it turns east to Lindis Peak and the Lindis Pass. The section seen here between Grandview and Bluenose is only part of a network of tracks (between the Upper Clutha and Lindis River valleys) which is becoming increasingly important for recreational use by walkers, mountain bike enthusiasts, horse riders and 4WD vehicles..

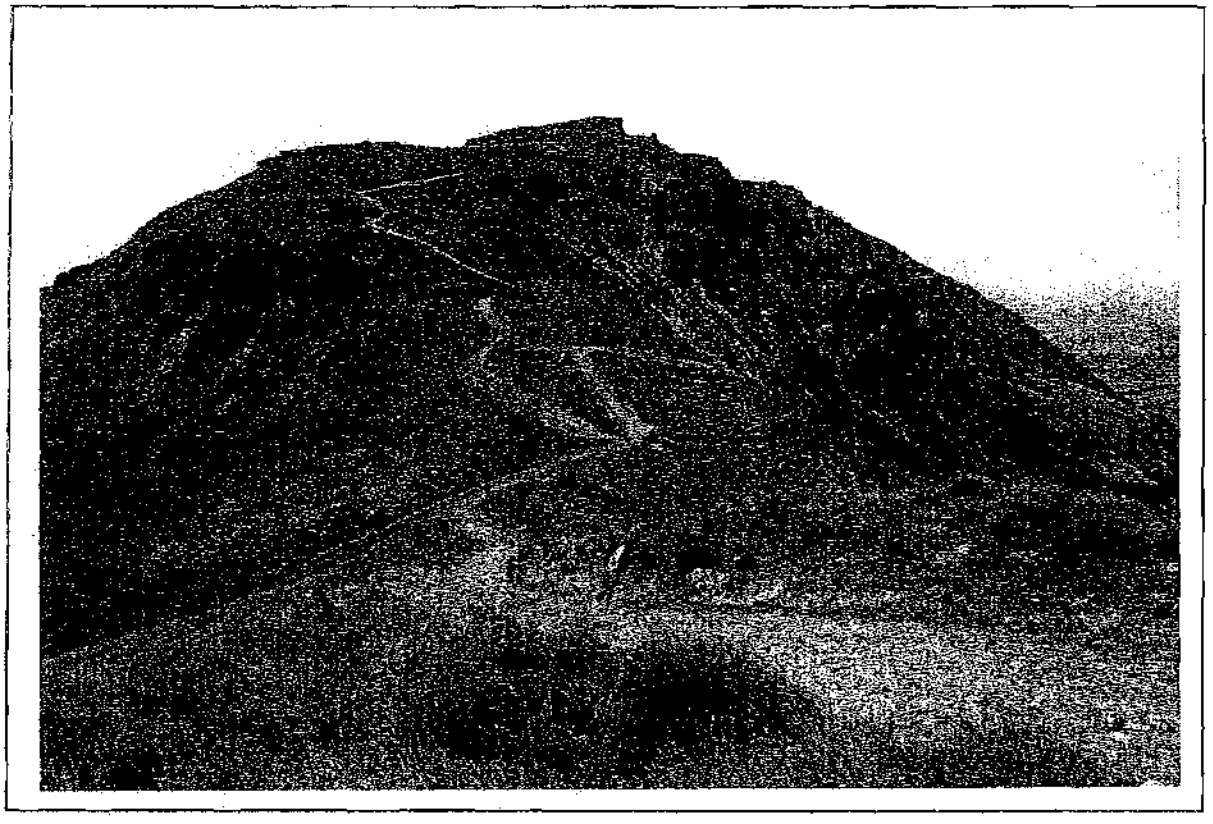

Fig. 6. The steep, rugged and bluffed slopes below the summit of Bluenose (1,223m), like those below Grandview Mountain, appear almost sheer and more valuable for their landscape and natural values than for pastoral use. Indeed, the slopes below Grandview were classified LUC Class VIII and recommended for protection by PNA survey. The slopes below Bluenose should be treated similarly.

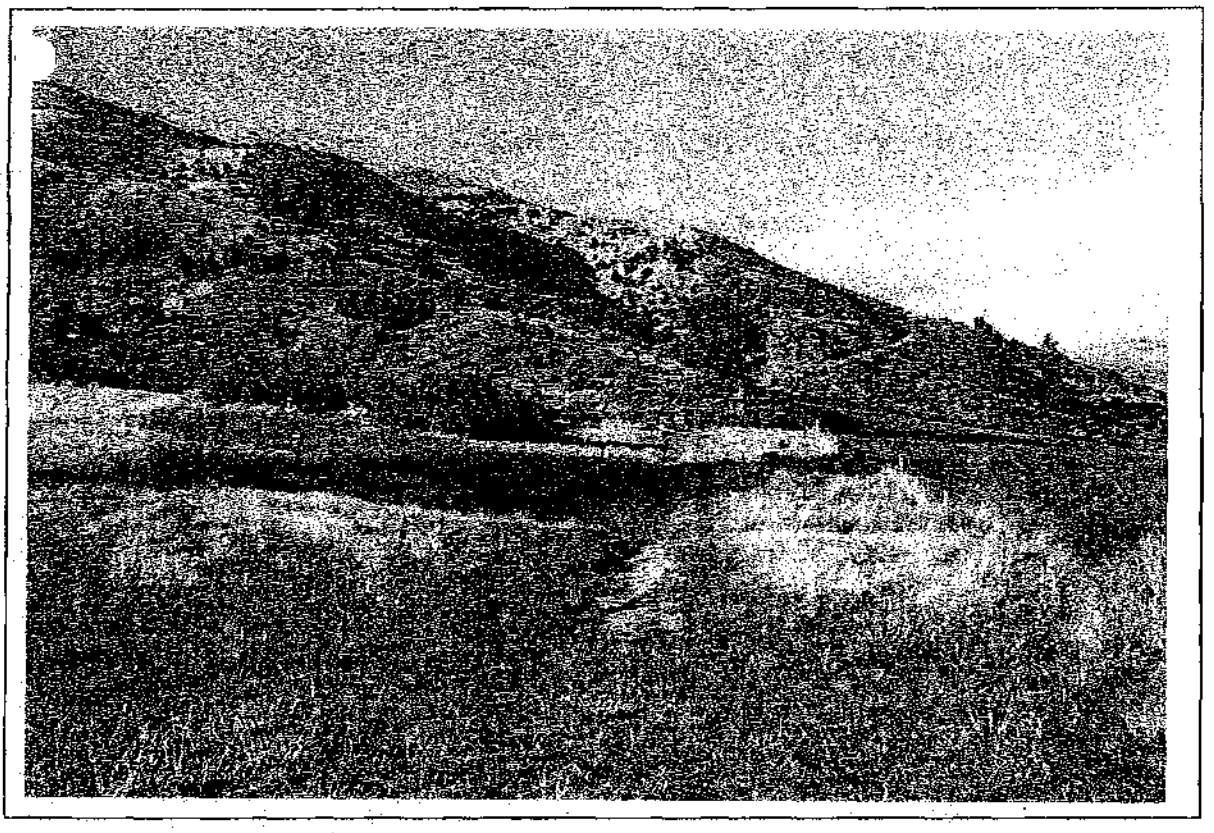

Fig. 7. Much of the lower and more gentle slopes carry improved pastures on LUC Class VI soils which have medium suitability for pastoral use. With appropriate maintenance, such land should be capable of being managed in a way that is ecologically sustainable, and should therefore be suitable for freeholding. Wilding tree control will be required.

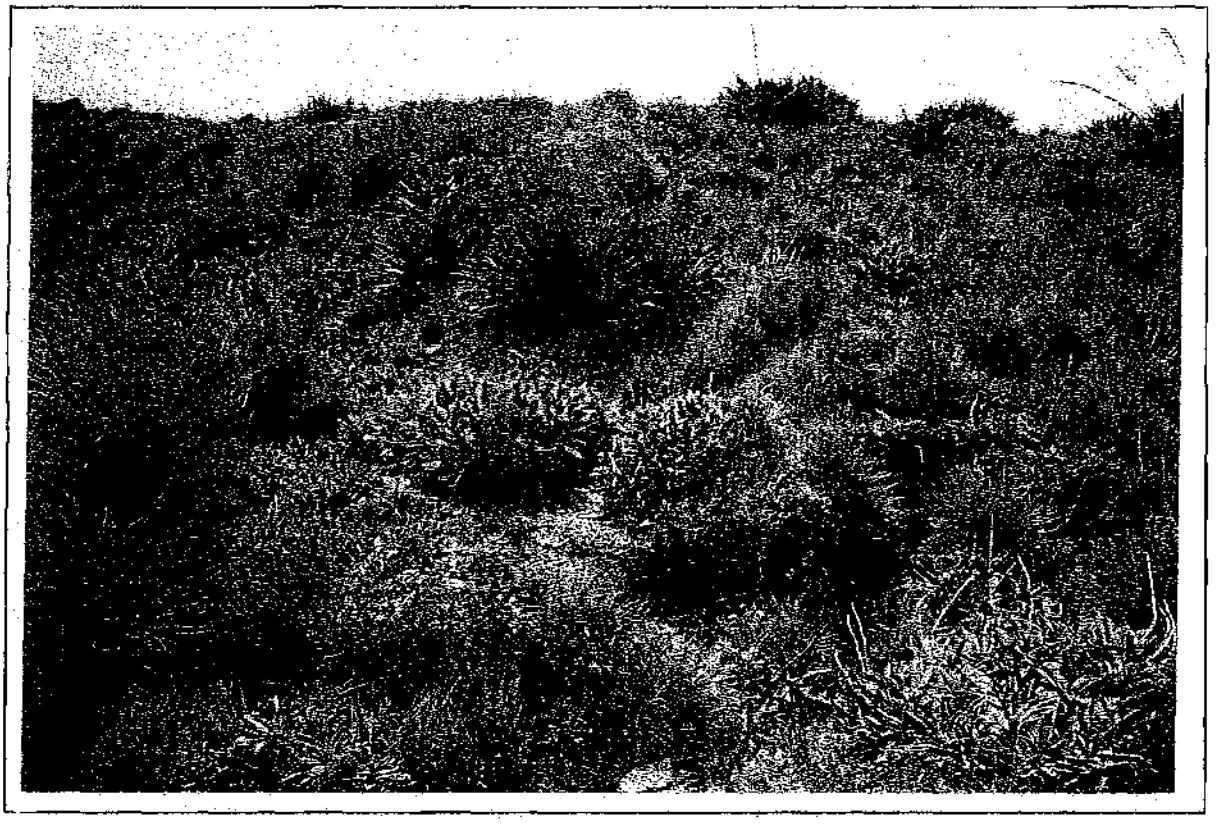

Fig. 8. Most of the high country (above about 1,000m) on the property is still in a natural or semi-natural state where the vegetation has been only partially modified by grazing and burning. The land has been classified LUC Class VII and its natural values are higher than its value for pastoral use. Indeed, it is doubtful if such land could be managed for pastoral use in a way that is ecologically sustainable.

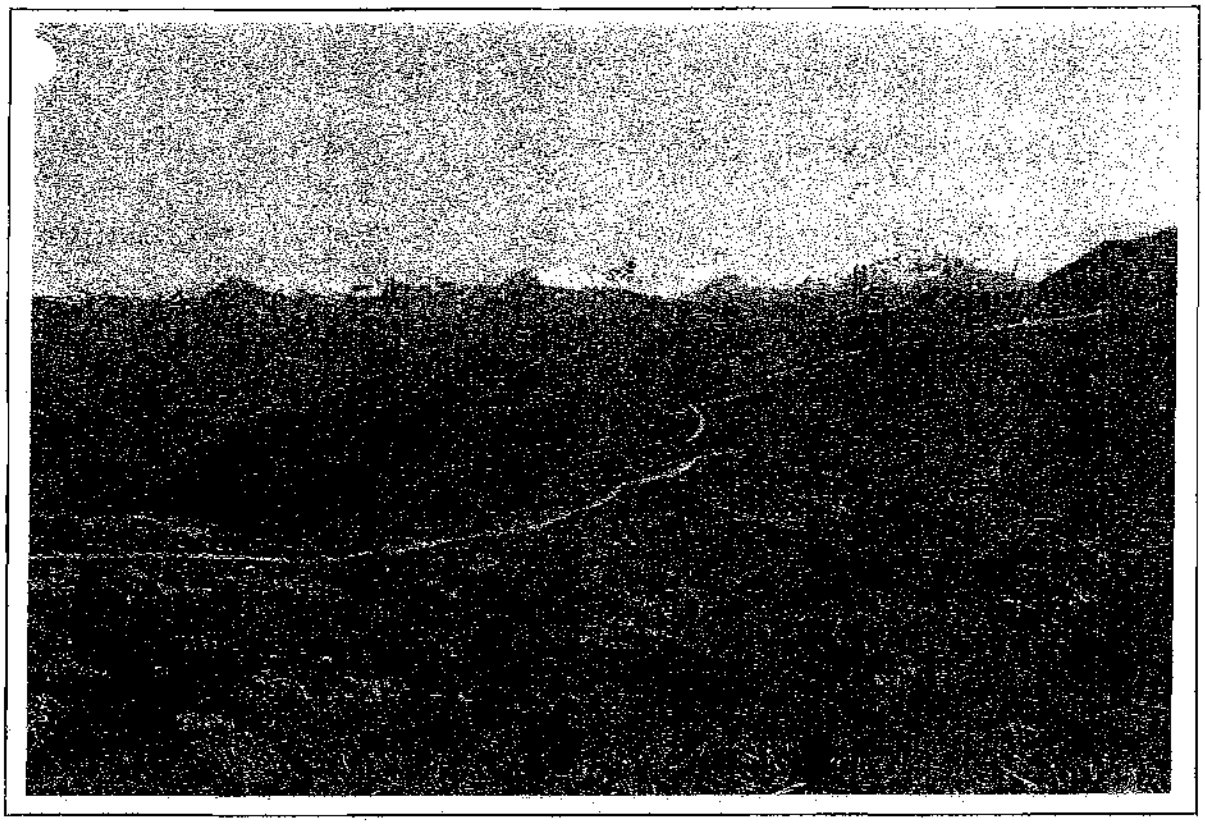

Fig. 9. From Grandview Mountain, a track which is a continuation of the ridge track along the Grandview Range, leads to Breast Peak and Breast Hill (1,578m) on Lake Hawea Station. At many points along this track there are superb views to the mountains of Mount Aspiring National Park and the Main Divide. Such views are the reward for effort expended by trampers and mountain bike riders in getting to these heights.

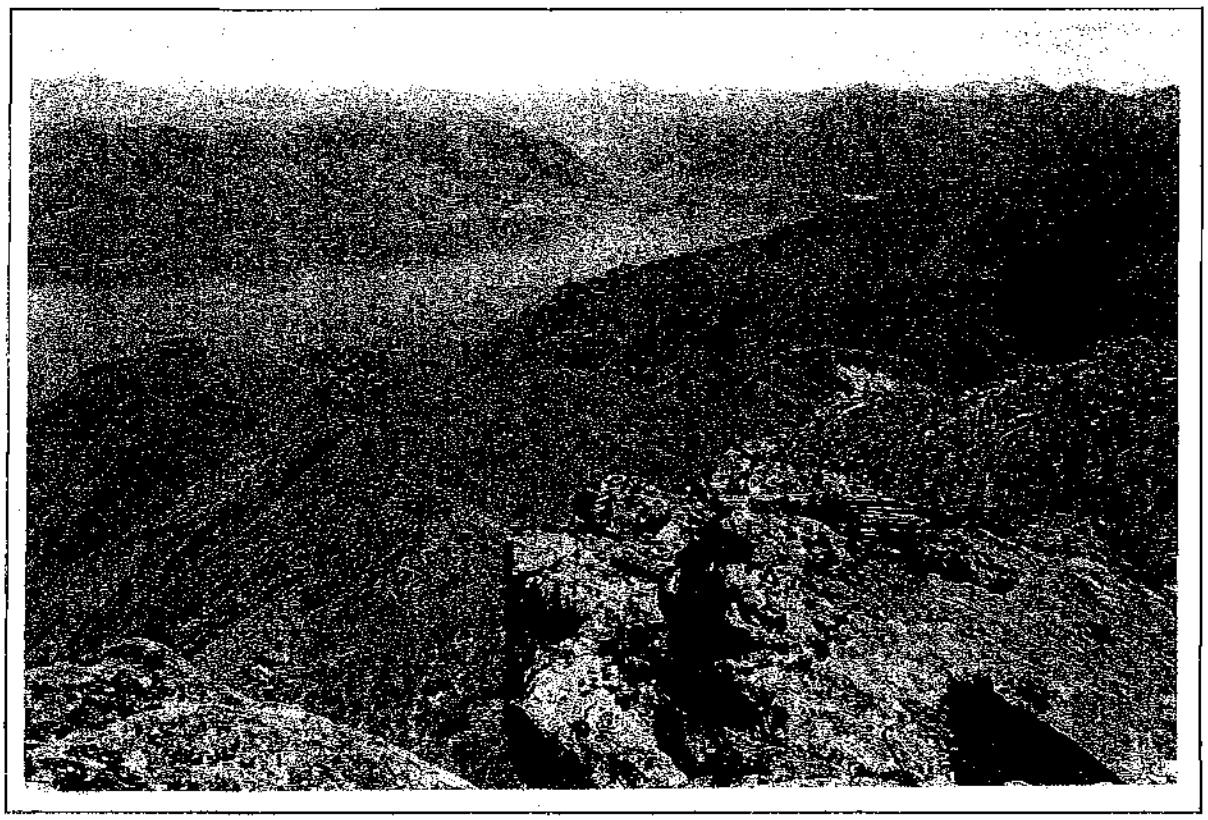

Fig. 10. The enjoyment of recreational travel along the ridge is enhanced, not only by great views of the mountains, but also by the spectacle of rugged country in the foreground (as here on Lake Hawea Station) and by Lake Hawea itself in the middle distance.