

Crown Pastoral Land Tenure Review

Lease name :Quailburn

Lease number :PO 336

Conservation resources report

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

The report attached is released under the Official Information Act 1982.

Copied October 2002

**DOC CONSERVATION RESOURCES REPORT ON TENURE REVIEW OF
QUAILBURN PASTORAL LEASE**

PART 1

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OFFICIAL INFORMATION ACT

1.1 INTRODUCTION

Quailburn Pastoral Lease consists of two runs – Pt Run 556 (Quailburn) and Run 671 (Glen Eyrie Downs). Quailburn, located on the southern part of the Ohau Range and extending out to the terraces of the Ahuriri River consists of 4876.4 ha of land. Glen Eyrie Downs covers 2537 ha of outwash plains south of Lake Ohau (the “Ohau Basin”). The station buildings are located at Glen Eyrie Downs on the Quailburn Road approximately 15 km north west of Omarama.

Land adjoining to the north of Quailburn is the Ohau Conservation Area, to the east is Tambrae freehold, to the south is Ribbonwood Pastoral Lease and to the west across the Ahuriri River is Ben Avon Pastoral Lease. Between Quailburn and Glen Eyrie Downs are sections of Tambrae and Ribbonwood, while to the north-west and north of Glen Eyrie Downs is Shelton Downs, and Ohau Downs, to the east is Benmore, south east is Riverside and to the south-west is Bendhu.

The property lies across two ecological districts – Omarama and Ahuriri Districts, within the Mackenzie Ecological Region. The Omarama Ecological District is characterised by glacial till, outwash and basin fill covered in scattered fescue tussock grasslands with a significant proportion of exotic inter-tussock cover and many areas converted to pasture. The part of the property in this District is the flats and rolling low hills of Glen Eyrie Downs. The Ahuriri Ecological District is mainly glaciated mountain ranges with large river valleys (eg. Ahuriri River) with tall tussock grasslands above about 1200m, and extensive oversowing and topdressing of lower slopes. This covers the Ohau Range and the terraces of the Ahuriri River.

Both of these districts have been surveyed as part of the Protected Natural Areas Programme in 1982/83. Four whole or part RAPs were identified on the property – part of Omarama 6 (Glen Eyrie Downs tussock), Omarama 7 (Serpentine Creek), Omarama 8 (Wairepo Lake – Glen Eyrie Downs) and Ahuriri 7 (Mid Ahuriri, opposite Ben Avon Station). The three Omarama District RAPs were reassessed during the preparation and submission on the Waitaki District Plan and the boundaries have been modified because of the deterioration of natural values since the survey.

There are no protected areas within the boundaries of the Quailburn lease – although Quailburn Bush has been proposed, surveyed and agreed to by a previous owner as a QEII covenant but was never registered.



PART 2

INHERENT VALUES: DESCRIPTION OF CONSERVATION RESOURCES AND DISGUISED SIGNIFICANCE

2.1 Landscape

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2.1.1 Landscape Context

Quailburn/Glen Eyrie Downs lies within a broad landscape character type referred to as the Waitaki/Mackenzie "Range and Basin" landscape, made up of the Diadem/Ohau Range and the "basins" of the Ohau flats and the Ahuriri Valley. A characteristic of this landscape character type, particularly in the basins, is that the geomorphic processes that have shaped the landscape are highly legible. This is particularly so on the flats of Glen Eyrie Downs and on the Ahuriri River terraces which still show the physical form of moraines, hollows, and outwash streams and resultant changes in patterns of vegetation.

The property itself is not physically distinguishable from its neighbours except by some management induced changes such as shelter belts and the different development history of a neighbouring property.

2.1.2 Landscape Character - Description of Property

Although Quailburn is part of the one landscape character type it can be divided into four separate **topographic land units** for descriptive purposes. These units relate principally to changes in landform, rather than distinct landscape units.

The topographic land units are:

1 Ohau Basin Flats

Comprises all of the flat to undulating farmland on Glen Eyrie Downs. Here the landscape has been partly transformed into improved pasture and paddocks. Otherwise the "undeveloped" landcover is very broadly scattered hard tussock, with extensive Hieracium and scattered low matagouri on rolling moraine. Between the low hummocky moraine are a number of depressions, some containing water, but for most of the summer months, dry with a low turf vegetation of tiny plants. Across the middle of the Glen Eyrie flats is the winding Wairepo Creek flowing from west to east across outwash gravel. Surrounding the "upper reaches" of the creek on Glen Eyrie Downs, up against the Ribbonwood boundary, are some reasonably extensive areas of red tussockland.

Because of the low vegetation cover over most of the flats the natural landform pattern of moraines, depressions and outwash gravels is clearly visible. In the north-western corner of the property this visibility is slowly being transformed by a thickening sward of *Pinus contorta* which is extending south and impacting on natural and landscape values.

The farm buildings and yards are not visible from the road but are sited next to a barrier of mature exotic trees and wildings alongside the Quailburn Road.

2 *Ohau Range*

This section of Quailburn consists of the broad gentle sloping saddle between the Ahuriri River catchment and the Ohau Flats and the low to mid-altitude slopes of the Ohau Range. The boundaries of this unit are the East Branch of the Ahuriri in the west and the property boundary of Quailburn in the east.

The most obvious feature of this unit is the broad gentle sloping saddle, rising north and merging into the steepening mountain slopes of the southern Ohau Range. Cut into the saddle surface are a number of small, steep-sided streams draining west into the East Branch of the Ahuriri or east into Quailburn Stream. Snow tussock is the dominant land cover above about 950m, particularly on the more gentle sloping sites or on shady faces. The tussock cover is reasonably intact and in visual terms appears as extensive tussock grassland, although there is little diversity of species and many of the intertussock species are introduced, particularly around the saddle area. Areas of rocky scree extend down into the snow tussock along the upper edge of the property (along the boundary with public conservation land above). Below 950m scattered short tussock, matagouri and briar interspersed with extensive hieracium are on the lower altitude slopes of the Ohau Range above the East Branch of the Ahuriri. However, on a steep site in the "lower" catchment of Quailburn Stream shrublands, and a patch of beech forest remain amongst blockfields.

With the exception of the old woolshed, staff buildings, and a small area of exotic trees and yards at the end of the Quailburn road there is little sign of direct human habitation on the property, and even this area is obscured from view.

Views from the saddle across the Mackenzie Basin and towards Lake Ohau are expansive and visually impressive.

3 *East Ahuriri mountain block*

The unit covers the mountain slopes draining into the East Branch east of the broad ridge marked AA (at 1446m) to the river itself and includes "Egg Lake" the large tarn perched at 1170m above the river. Tussock is the dominant vegetation cover with small patches of snow totara on gravel or around blockfields. Below about 1100m hawkweeds becomes increasingly dominant between the snow tussock, particularly on sunnier faces. Below about 1000m snow tussock is commonly replaced by hard tussock. There are no roads or buildings on this block at all, and once up around Egg Lake it very much has a remote back-country feel.

4 *Ahuriri camelbacks and Ahuriri terraces*

Known locally as the camelbacks, two mountain blocks stand up above the Ahuriri River terraces at the far western end of the property. With tussock tops and prominent

tongues of scrub and scree on their sideslopes they are clearly visible from the "Birchwood Road" in the Ahuriri Valley. At the base of this slope are a series of outwash flats terraces and hummocky moraine extending out to the Ahuriri River itself. Sparse short tussock, mouse-ear hieracium and exotic grasses are the main low level ground cover on the dry terraces and moraine surfaces, but in intervening depressions are a series of flushes and ponds including a relatively big pond above the Ahuriri River about 400m in diameter and two tarns in a deep trench to the east of the camelbacks.

2.1.3 Visual and Scenic Values

Quailburn has a mix of visual and scenic values. The main visual values on Glen Eyrie Downs are related to its place within the wider landscape. Views out to surrounding ranges and peaks are impressive, as they are from many other parts of the McKenzie and Ohau basins where views are uninterrupted by trees. There are however, no individually outstanding natural landscapes or features on the flats themselves, except the remaining natural landform patterns of moraine and depressions, particularly the water filled depressions, which have not been obscured by trees.

Quailburn, however, particularly the back of the property as seen from the Ahuriri Valley has high visual and scenic values. It is part of a wider landscape context of the Ahuriri valley and is a setting of regional significance i.e. the Canterbury Regional Landscape Study (Boffa Miskell and Lucas Associates) identified the Ahuriri Valley as regionally outstanding. Once you are on the property the Ahuriri River, the natural landform patterns of rolling moraines and intervening depressions and ponds bring diversity and visual interest.

Also important is the Ohau Range as part of the enclosing ranges of the Ohau Basin and as a backdrop to the camelbacks in the Ahuriri Valley. From the Ohau Basin the saddle area linking the Diadem Range to the Ohau Range is considered visually significant. Visually it forms part of the Ahuriri East Branch and is contiguous with the mountain landscape of the Ohau and Barrier Range rising to the north. It has a moderately high degree of intactness with natural patterns of landform and vegetation cover relatively unmodified with no sign of tracking or human habitation. Also an important aspect of visual and scenic values on the saddle area is the outstanding views out from the saddle and slopes above.

2.2 Landforms & Geology

The bedrock on Quailburn and Glen Eyrie Downs is moderately indurated greywacke and argillite of the Torlesse supergroup. Accentuated by up-faulting, the highly eroded Ohau Range is predominantly colluvial greywacke whereas Glen Eyrie Downs is principally made up of thick deposits of greywacke outwash gravels with some glacial till and subdued moraine deposits. The outwash gravels were formed down-valley from the terminal of the glacier when water was abundant with glacial melt and the glacier-eroded material was carried forward by outwash rivers, building up material below the terminal moraines. Downcutting often followed the retreat of the glaciers,

terracing the outwash gravels. The resulting topography is gently rolling hummocks and intervening depressions, often water filled in late winter and spring, but progressively drying out over summer.

The Ahuriri River terraces are made up of Pleistocene till deposits with extensive, more recent alluvial gravels on lower terraces. Along the northern section of terraces this is particularly evident where a series of parallel hummocky ridges of lateral moraine, are aligned and decreasing in height down-valley, with stream courses, flushes and ponds filling intervening depressions.

2.3 Vegetation

Introduction

There is a diverse range of vegetation communities found on these two properties, reflecting the varied topography, landform types and altitude. It includes a large variety of wetland types, from tall sedgelands, bogs, tarns and ephemeral wetlands; to sub-alpine lakes. Scree and boulderfield are numerous. Shrublands and tussock grasslands are the dominant plant community across the property. Forest is scarce, but a small remnant of mountain beech (*Nothofagus solandri* var *cliffortioides*) remains. Sizeable areas of Quailburn/Glen Eyrie Downs are very modified, either through improvement with oversewing and topdressing, or through degradation and weed invasion, in particular *Hieracium* species. However, the property retains an indigenous character over much of its area, often to low altitudes, which is now an uncommon situation in the Mackenzie Basin.

The main plant communities are described below. Particular emphasis has been given to those with natural values.

Improved pasture

The main area of improved pasture occurs on the moraine country on Glen Eyrie Downs. White clover (**Trifolium repens*), brown top (**Agrostis capillaris*), sorrel (**Rumex acetosella*) and mouse-ear hawkweed (**Hieracium pilosella*) dominate the cover.

Degraded short tussock grasslands

This is a common community on Quailburn Station. It tends to dominate the dry river terraces, moraines and outwash plains, but is also common on some lower hillslopes, especially on sunny aspects. *Hieracium* species, in particular mouse ear hawkweed, is common in these communities and often forms the dominant cover of up to 40%. Hard tussock (*Festuca novae-zealandiae*) cover is typically sparse, rarely above 10%. Other common species include *sheeps sorrel, blue tussock (*Poa colensoi*), *Coprosma*

• Asterix denotes introduced species

petriei, dwarf heath (*Leugopogon frazerii*), sweet vernal (**Anthoxanthum odoratum*), and matagouri (*Discaria toumatou*).

Hillslope and gully shrublands

This is a major plant community of the lower to mid altitude mountain slopes over much of the property. It often forms a continuous cover from the bottom of the hillslope to around 1100 meters, until giving way to snow tussock grassland. Two distinct shrubland types are found in these areas; one dominated by grey scrub species, and the other a snow totara dominant shrubland. Often these two shrubland types form a grey scrub-snow totara mosaic across extensive areas of hillslope.

Grey Scrub

Grey scrub is prevalent on the western hills of Quailburn Station, particularly around the camelbacks and close to the eastern boundary near Quailburn bush. It tends to occupy the lower more moist sites, often on broken coarse substrate and scree. It regularly forms impenetrable thickets of small leaves shrubs and climbers (although cover can be sparse on screes). Dominant species include matagouri, *Coprosma propinqua*, mountain wine berry (*Aristotelia fruticosa*) and *Corokia cotoneaster*. All are in approximately equal proportions. The climber's *Rubus schlemiedes*, *Muehlenbeckia complexa* and *Clematis marata* are common and the dwarf mistletoe (*Korthasella clavata*) is also locally abundant on mountain wineberry and *Coprosma propinqua*. Other species present in lesser proportions include mountain totara (*Phyllocladus alpinus*), porcupine shrub (*Melicytus alpinus*), *Melicytus* sp, tauhinu (*Ozothamnus leptophylla*), *Hebe subalpina*, *H. salicifolia*, *Coprosma cheesemani*, *C. "taylorii"*, coral broom (*Carmichaelia crassicauli*), the mat *Coprosma petriei*, speargrass (*Aciphylla aurea*), snow totara (*Podocarpus nivalis*) and the hybrid between snow totara and hall's totara (*Podocarpus hallii*).

Bare screes of rock, patches of fescue tussock (*Festuca mathewsii*), and snow tussock (*Chionochloa rigida*) are present throughout. Degraded areas dominated by exotic grasses and herbs, such as sweet vernal, brown top and mouse-ear hawkweed (*Hieracium pilosella*) are also present, as are seepage areas dominated by bog rush (*Schoenus pauciflorus*), maori onion (*Bulbinella angustifolia*) and chewings fescue (**Festuca rubra*). Woody weed species include briar rose (*Rosa rubiginosa*), which is common, with the occasional gooseberry (*Ribes uva-crispa*) and pine (*Pinus contorta*).

Grey scrub diversity is higher close to stream edges and on rock bluffs where a number of species, in addition to those above, are found. These include the shrub daisies (*Olearia bullata*, *O. aviceniifolia*), *Helichrysum intermedium*, *Coprosma ciliata*, *Hebe salicifolia*, and the native broom (*Carmichaelia australis*). A small population of the threatened whipcord hebe (*Hebe cupressioides*) also occurs in the riparian grey scrub zone, and the occasional bog pine (*Halocarpus bidwillii*) is also found.

Snow Totara Shrublands

This is the most extensive shrub community on the Quailburn Station and is found throughout its mountain areas. It forms an extensive zone between the higher areas dominated by snow tussock and the grey scrub communities in the gullies and on the lower slopes, but can also occupy entire hillsides. It tends to occupy open dry areas of fine scree and substrate, but can also be the dominant plant on coarse screes and boulderfield. It is commonly associated with other low shrubs, such as porcupine shrub, speargrass, *Coprosma cheesemanii*, *Pimelia traversii*, occasional turpentine shrub (*Dracophyllum pronum* and *D. uniflora*), as well as scattered snow tussocks (*Chionochloa rigida* and *Chionochloa macra*). Sub-shrubs and herbaceous species associated with these sites include the mountain and dwarf heath (*Leucopogon colensoi*, *L. fraserii*), mat Coprosma (*Coprosma petriei*), snowberry (*Gaultheria depressa* var. *novae-zealandiae*) and *Gaultheria parvula* (formerly *Pernettya nana*).

Snow Tussock Grasslands

Two species of snow tussock dominate the snow tussock grasslands on Quailburn Station. The narrow leaved snow tussock (*Chionochloa rigida*) is the dominant species below 1000m. Above this, slim leaved snow tussock (*Chionochloa macra*) takes over until giving way to higher altitude screes and boulder field. However, snow tussock also penetrates to lower levels where historical burning has not resulted in its removal. Often these occur as tongues between shrubland, but also dominate more extensive areas where woody plant growth and regeneration has been limited.

Snow tussock cover varies depending on aspect and altitude, with there generally being more cover on the southern slopes and higher aspects, although there is obvious depletion of the tussock grasslands across the entire property. This is especially pronounced on the sunny slopes and lower altitudes where tussock cover is sparse, often less than 15%. Weed species, in particular mouse-ear hawkweed and king devil hawkweed (*Hieracium praelum*) dominate the ground cover in these depleted sites.

Despite a degree of depletion, these snow tussock grasslands contain a reasonable diversity of associated native plant species and are predominately indigenous in character. Typically, above 1100 meters, at the very top of the lease, slim-leaved snow tussock cover is about 25% to 30%, but on better sites can be greater than 50%. Associated species include mountain fescue (*Festuca mathewsii*), speargrass, snow berry, *Leucopogon colensoi*, *Anisotome flexuosa*, club moss (*Lycopodium fastigiatum*), *Raoulia subsericea*, king devil hawk-weed, mouse-ear hawkweed, most are up to 5% cover, but in many places the hawkweeds are between 5 and 10% cover. Other species commonly present, but usually in minor proportions include, blue tussock, *sheep sorrel (*Rumex acetosella*), hare-bell (*Wahlenbergia albomarginata*), woodrush (*Luzula rufa*), mountain daisies (*Celmisia gracilentia*, *C. lyallii*, *C. densiflora*), *Leucopogon fraserii*, *Helichrysum bellidoides*, *Bracyscome sinclairii*, *Kelleria villosa*, (**Hieracium lepidulum*), *Rytidosperma pumilum*, native daphne (*Pimelea oreophylla*), bidibid (*Aceana caesiiglauca*), mat Coprosma (*Coprosma petriei*), *Gaultheria parvula*, woolly heads (*Craspedia uniflora*, *C. incana*, *C. lanata*), *Lobelia linnaeoides* and the orchids *Thelymitra longifolia*, *Microtis oligantha* and *Prasophyllum colensoi*.

Bare, loose ground is a feature of these areas, regardless of aspect, and is often up to 30%. On the most exposed harsh sites, bare ground is commonly colonised by mat plants, such as *Phyllacne colensoi*, *Anisotome flexuosa*, *Raoulia hectorii*, and *R. grandiflora*. Other less common plants can also be found in these sites, such as *Kirkinella novae-zealandiae* and *Leptinella pectinata* subsp. *villosa*. Litter and the woolly moss (*Racomitrium lanuginosum*) can occasionally make up a significant proportion of the ground cover locally, but rarely exceeds 5%.

Wetlands

Two main areas of wetlands occur on Quailburn Station; on the true left of the Ahuriri River between the East Branch of the Ahuriri and Snowy Gorge Creek; and on Glen Eyrie Downs. Combined, these two areas contain a large variety of wetlands types, from bogs, streams, ephemeral kettleholes, tarns and lakes.

Kettle Holes and turflands (Glen Eyrie Downs)

Amongst the depleted short tussocklands covering the moraines on Glen Eyrie Downs are over 20 depressions or kettle holes. The depressions vary considerably in size, the largest being approximately 20 ha, but most are small. All at some stage hold water, either permanently or seasonally. At the time of the survey most of the kettleholes on the higher moraine were dry, with only the larger depressions retaining water. In the base of these depressions is a rich flora of very small sub-aquatic herbs forming a turf vegetation around their margins. Typically several distinct zones are obvious in the depression, differing in width depending on the gradient and the consequent changes in water levels or degree of inundation.

Plant species diversity is high and different patterns of species dominance exist on different wetlands. Most remain remarkably weed free (although the edges are encroached upon by weeds, in particular mouse ear hawk-weed and brown top). Some of the dominant turf species found in these areas include; *Leptinella maniototo*, *Galium perpusillum*, *Hypsella rivalis*, *Juncus pusillus*, *Crassula sinclairii*, *Glossostigma elatinoides*, *Epilobium angustum*, *Carex gaudichaudiana*, *Eleocharis acuta*, *Gnaphalium mackayi*, *G. traversii*, *G. deliticum*, *Agrostis muscosa*, *Lachnagrostis filiformis* and *Plantago triandra*. These species often form extensive patches.

Other common species include; *Parahebe canescens*, *Hypericum japonica*, *Hydrocotyle sulcata*, *H. hydrophila*, *Neopaxia australasica*, adders tongue (*Ophioglossum coriaceum*), *Pratia angulata*, *P. perpusilla*, *Poa lindsayii*, *Stackhousia minima*, *Limosella lineata*, *Coprosma perpusilla*, *Carex flaviformis*, bog rush, and bladderwort (*Urticularia monanthos*).

Two threatened species, *Isolepis basilaris* and *Luzula celata*, are occasionally found growing around the margins of some of these wetlands.

Introduced species are present, especially around the margins, but are also found sporadically though out drier areas. Mouse-ear hawkweed, brown top, sweet vernal,

and white clover (*Trifolium repens*) are the main introduced species, but suckling clover (*Trifolium dubium*), orange foxtail (*Alopecurus aequalis*), jointed rush (*Juncus articulatus*) toad rush (*Juncus bufonius*), soft rush (*Juncus effusus*) and *Juncus conglomeratus* are also locally present. However, weed invasion is predominately limited to the margins and the majority of these wetlands remain overwhelmingly indigenous in character. A further point about these wetlands is that the presence of a taller sedge and rush zone appears vastly reduced due to the effects of prolonged grazing.

Wetlands on Quailburn

The wetlands on Quailburn occur primarily as a series of wetland hollows, streams or seepages on alluvial flat, or as landslide or moraine dammed ponds; or ponds or flushes in depressions amongst moraine.

1. Wetlands on alluvial river flat (around GR G39 440420 at 710m)

A valley-floor flat of around 100 ha (c. 2.5 x 0.6 km) holds a series of parallel wetland hollows - as either elongated hollows or as streams amongst extensive sedge grasslands. These sedge grasslands cover the majority of the flats and are mainly browntop (60%), Fescue tussock (*Festuca novae-zelandiae*), sweet vernal* Yorkshire fog*, bog rush, catsear (*Hypochoeris*), *Hieracium caesitosum* and *Polytrichum* moss (5%). In damp parts occasional patches with *Carex sinclarii* (probably once more common), *Carex coriacea*.

The main wetland patterns within this flat - out from the hillsides towards the river are:

- a. seepages off the toe of hillslopes: made up of bog rush (*Schoenus pauciflorus*) sedgeland where the bog rush is about 35% cover, soft rush (**Juncus effusus*) (5%), *J. articulatus* (20%), meadow grass (**Poa pratensis*)(5%), *Carex coriacea* (10%), sweet vernal (5%), Yorkshire fog (5%), *Carex gaudichaudiana* (5%), mosses 10% - hummocky cattle grazed and trampled.
- b. Spring streams emerging from hill base, springs 1-10m width with stony beds, and apparently constant water flow. The stones are surrounded by *Montia fontana* and some *Lemna* (duckweed). Stone crests are lichen covered. Stream margins have mossy bog fringe with liverworts (*Marchantia*), bladderwort (*Utricularia*), sphagnum moss, *Gonocarpus micranthus*, then bog rush clumps.
- c. The main stream flowing through this wetland is about 1-2m wide, 0.5 - 1m deep with a steady flow. Associated with the stream is aquatic *Myriophyllum triphyllum*, red pondweed (*Potamogeton cheesemani*), and *Lilaeopsis*. A few stream islands hold large *Carex secta* tussocks that have escaped fire and grazing, or *Carex sinclarii* tall sward, now much modified across valley floor flats. Stream margins fringed with *Hydrocotyle sulcata*, *Myosotis caespitosa*, *Montia*, *Lemna*, then *Carex gaudichaudiana* short sward on banks.

2. Amongst a series of parallel hummocky ridges of moraine south of Snowy Gorge Creek are a number of stream courses, flushes and ponds in depressions. The main vegetation types amongst these moraines are:
 - a. hard tussock-Hieracium vegetation on the dry soils of ridges and gentle moraine slopes is
 - b. Cushion vegetation, on gentle slopes, slightly moist but neither wet nor inundated ground, hummocky surface, in patches to several tens of metres across. Typical composition is *Pentachondrda pumila* (50%) cover, *Oreobolus pectinatus* (15%), blue tussock (15%), *Erythranthera pumila* (5%), *Celmisia gracilentia* (5%), and *Racomitrium* moss (5%). Various other plants are common locally eg. *Bulbinella* (up to 50%) cover, red tussock (to 20%), *Dracophyllum pronum* (to 15%). This cushion vegetation grades into both hard tussock (no. 1 above) and bog (no. 3 below)
 - c. Bog - near at least one of the tarns there is bog vegetation, upon infertile peat, comprising for example *Sphagnum cristatum* (30%), *Oreobolus pectinatus* (40%), *Carex echinata* (10%), sundew (10%), *Gonocarpus micranthus* (5%) and *Erythranthera pumila* (5%).
 - d. *Schoenus* sedgeland is the main vegetation of flushed ground in wide bands along each stream course. *S. pauciflorus* reaches 70% cover, often with lower clumps of *Carpha alpina* (10-20%). Depending on the minor patterns of soil moisture and surface ponding, there are mosaics where the other sedges such as *Carex gaudichaudiana*, *C. flaviformis*, *C. echinata* or *Eleocharis acuta* are the principal plants.
 - e. *Tarns and kettleholes*. There are perhaps 6 tarns that might hold permanent water, and about 12 kettleholes or similar, temporarily inundated and fairly small. Among the few kettleholes seen on the ground, two types were noted. (i) firstly ones that are probably wet for considerable periods of time, with turf of *Leptinella moniototo*, *Hypsela*, *Galium*, *Glossostigma*, *Crassula* and *Epilobium angustum*. (ii) the other type, usually small and perched high on ridges, has a plant assemblage apparently tolerant of only short periods of inundation: *Polytrichum* moss, browntop, *Gnaphalium traversii*, *Deschampsia novae-zelandiae* and *Hieracium praeltum*. Around the edge of this sort of moist depression is a zone of *Oreobolus* cushion laced with *Pernettya nana*, *Gonocarpus micranthus* and *Juncus novae-zelandiae*.

These wetlands are different from others in the valley, principally because of the bog and cushion vegetation types. They are, like others, varied in flora, plant communities and are in good condition.

3. Tarn and kettle wetlands - within a hillside cleft to the east of the alluvial flats described under 1, is a sequence of five depressions. They illustrate the great variety of size, water fluctuation pattern and vegetation of tarns and wet depressions including small rocky turfy dry hollows with a base of moraine boulders, to swampy depressions, tarns with 1-2m of permanent water, silty turfy tarns and large bog-filled depressions. To the south-east of the alluvial flats are two turf hollows on the inner edge of outwash terrace.

Red Tussock

A moderate sized remnant of red tussock (*Chionochloa rubra*) is found along Wairepo Creek near the boundary of the property with Ribbonwood. This was once an extensive community extending across a number of properties, but has now been fragmented and modified. Tussock cover is patchy, with the densest cover of up to 80% occurring on the wettest sites, although these sites form a minority of the total area. Elsewhere red tussock cover is more open, commonly less than 50%, until fading out around the edges. There is a high proportion of exotic weed species present, in particular chewings fescue, brown top, sweet vernal, yorkshire fog (*Holcus lanatus*), lotus (*Lotus major*) and jointed rush, all of which can be up to and often higher than 5% cover. Wilding pines (*Pinus contorta*), which surround this wetland, are also present within and pose a significant threat to its long-term viability.

Native species present in this wetland include *Carex coriacea*, *C. geminata*, *C. flaviformis*, *C. gaudichaudiana*, *C. diandra*, *C. geminata*, the moss *Sphagnum cristatum*, bog rush (which can be locally dominant), the buttercup *Ranunculus glabrifolius*, *Gonocarpus micranthus*, *Potentilla anserinoides*, maori onion, *Celmisia gracilentia*, and *Lagenifera petiolata*. Weed species in addition to those above include *Carex ovalis*, *Stellaria graminea*, californian thistle* (*Cirsium arvense*), *Hieracium praelatum*, *Epilobium ciliatum*, *Myosotis laxa* subsp *caespitosa*, toad rush, soft rush and *Juncus conglomeratus*.

Despite this wetland being modified, it is still representative of what was a once common ecosystem across the Mackenzie basin.

Serpentine Creek also contains a remnant red tussock wetland (once recognised as a Recommended Area for Protection - RAP 7, Omarama Ecological District, Mackenzie PNAP Survey). This area is now highly modified, with native wetland species a minority among a dense exotic sward, in particular chewings fescue, brown top, jointed rush, Yorkshire fog and **Carex ovalis*. Wilding pines (*Pinus contorta*) are also well established throughout this area. Some small pockets of red tussock and bog rush remain and other smaller native species, such as *Ranunculus glabrifolius*, *Gnaphalium limosum*, *Carex gaudichaudiana* and *Eleocharis acuta* are found around stream margins and ox bows, but these sites are a minority.

Beech Forest

"Quailburn Bush" is the only significant remnant of forest on Quailburn Station. It is one of a few remaining remnants representative of the very dry mountain beech forest in the Mackenzie Basin, and was once considered for QEII covenant. This forest is small, less than 30 ha. It has a fairly closed canopy up to 20 meters high. Species diversity is low with in the forest, with the ground layer typically dry, bare and rocky. Large rock bluffs occur throughout.

The greatest species diversity is found along the stream margin, which also includes a significant amount of weeds. Mountain wineberry, *Coprosma propinqua*, *C. taylorii*, *C. rhamnoides*, *C. depressa*, *Corokia cotoneaster*, with the occasional *Helichrysum lanceolatum* and *Hebe salicifolia* are present in the understory, as are the climbers

Rubus schmidelioides and *Muehlenbeckia complexa*. Woody weed species include gooseberry, red current (**Ribes rubrum*), with silver birch (**Betula pendula*) and douglas fir (*Psuedotsuga menzeii*) present around the edges at the lower end. Native herbaceous species include the prickly shield fern (*Polysticum vestitum*), the bladder fern (*Cystopteris tasmanica*), *Asplenium terrestre*, *Blechnum penna-maria*, *Oreomyrrhis ramosa*, *Anisotome aromatica*, *Helichrysum bellidioides*, *Ranunculus* sp, and *Poa imbecilla*. Herbaceous weeds are common and can be the dominant ground cover in places, especially tussock hawkweed (*Hieracium lepidulum*), which forms extensive patches. Other common herbaceous weeds include lotus, white clover, ragwort (*Senecio jacobaea*), chickweed (*Cerastium fontanum*), yorkshire fog, self heal (*Prunella vulgaris*), yarrow (*Achillea millefolium*), sweet vernal, brown top, and meadow grass (*Poa pratensis*).

Of interest is a large and healthy population of the threatened red and yellow mistletoes *Peraxilla tetrapetala* and *Alepis flavida*, which are found through out this forest.

Discussion

The conservation values of Quailburn station have been recognised in the past. In particular the Mackenzie Protected Natural Areas report (1984) listed several Recommended Areas for Protection (RAPs) on Quailburn Station. These included:

- RAP 6 - Glen Eyrie Downs Tussock. Omarama Ecological District. Recognised for its red tussock wetland and tarn edge vegetation.
- RAP 7 - Serpentine Creek. Omarama Ecological District. Recognised for its red tussock community.
- RAP 8 - Wairepo Lake. Omarama Ecological District. Recognised for its tarn edge vegetation and for habitat for water fowl
- RAP 7 - Mid Ahuriri. Ahuriri Ecological District. Recognised for its scrub and grassland communities over an altitude gradient.

Significant changes have occurred to some of these sites since the initial PNAP survey was undertaken 16 years ago. This is especially evident in red tussock communities, which are now vastly reduced in size, fragmented and weed infested. Serpentine Creek is almost modified beyond its original description.

On the other hand, the shrublands and tussock grasslands retain their values as originally listed. The extensive grey and snow totara shrublands, interspersed with screens, fescue grasslands, and snow tussock remain and retain their indigenous character despite degradation caused by past burning and grazing (recognising that large areas were induced through burning). It would appear however, that weed invasion has increased since the PNAP survey, especially with *Hieracium* species and wilding pines. Nevertheless, native species still dominate structurally and compositionally, suggesting that these communities could recover in the absence of grazing animals.

Most of the tarns remain in remarkably good condition, most containing extensive and diverse turf communities. This is partly due to a lack of over-sowing and top dressing, but also due to the absence of cattle which severely damage wetland margins. Conversely, the tarns identified in RAP 8 are now highly modified from fertiliser and seed input, resulting in encroachment and dominance by exotic species, in particular sweet vernal, suckling clover, white clover and brown top.

Despite some changes and degradation, Quailburn Station maintains an indigenous botanical character over vast areas, often to low altitudes. This is now unusual in the Mackenzie basin. Today few extensive areas below 900 m remain predominately in native plant communities, as most of the lower hill slopes in the Mackenzie basin are either highly degraded and/or dominated by exotic grasses and weed species. Another unusual feature of Quailburn Station is that it is virtually unscarred by 4WD tracks, a feature that enhances the areas visual appeal.

2.4 Fauna

As a result of a faunal survey undertaken in January 2000 and from previous visits 47 bird species have been recorded from Quailburn Station. This comprises 17 endemic, 14 native and 16 introduced species (see for a list in appendix).

There are 6 main faunal habitat zones on Quailburn:

2.4.1 Birds

1. *Wairepo Creek*

This is a slow moving, gravelly bottomed stream which flows initially through red tussock thinning out downstream to short tussock grasslands. This type of habitat is no longer common in the Mackenzie Basin, being reduced throughout by pastoral development and wilding tree spread. Important wetland bird species that are known from this area are brown bittern and marsh crake.

2. *Glen Eyrie Downs Tarns*

This area has two large, but shallow, water filled depressions ("tarns"), a number of ephemeral wetlands, seepages and wet flushes, surrounded by depleted short tussock grasslands. This area is an important feeding area for a number of key bird species, such as black stilt, wrybill, black-fronted tern, shoveller duck and a host of other wading and wetland birds. These areas are important as a refuge for wading birds, such as black stilt, when the Ahuriri River is in flood. There are no freshwater fish in these tarns, mainly because of the lack of inlet/outlet streams and the shallow and ephemeral nature of the water.

3. *Ahuriri River wetlands*

This zone is a large area covering a wide variety of habitats within its boundaries. Most of this zone, comprises a series of ponds, wetlands, and seepages either by

the river, on near-by terraces or amongst moraines.

These ponds and wetlands are important for waterfowl and waders, including key bird species of black stilt, wrybills and black fronted tern, banded dotterel, marsh crake, bittern, N Z shoveler duck and N Z scaup.

In the scree and rocky areas on the low hills to the east of here there is habitat for common skink.

4. *East Branch of the Ahuriri River*

This habitat zone has two distinct parts to it. The first one is the East Branch of the Ahuriri River, and the second part is a relatively large tarn, high up in the sub-alpine zone at 1160 m. two key fresh water fish present – koaro and the alpine galaxiid. The large tarn has a large population of koaro, seemingly in the absence of trout, which is unusual, although not guaranteed.

5. *Quailburn Bush*

This zone centres on a small mountain beech pocket. The key bird species to be found here are bellbirds which feed on the nectar of the beech mistletoe *Paraxilla tetrapetala* and are important in pollinating the flowers. Other birds present in the remnant include silvereyes, tomtit, grey warbler, pied fantail, and rifleman. New Zealand falcons can also be seen here flying around above the forest remnant.

2.4.2 Freshwater fish

Sampling of freshwater fish was carried out by electric fishing and snorkel observation at selected sites on both Quailburn and Glen Eyrie Downs in January 2000. This information was supplemented by existing data obtained from the New Zealand Freshwater Fish Database. The survey was not comprehensive, but, it is considered that it has provided a good indication of the freshwater fauna within the lease.

Serpentine Creek on Glen Eyrie Downs

This zone is a slow moving, gravel-bottomed stream that flows parallel to the Quailburn Road and the Glen Eyrie Downs boundary eventually into the Ahuriri River. Electric fishing at two sites in Serpentine Creek showed koaro, Canterbury galaxias and upland bully to be common. The abundance of these species and the upland bully (*Gobiomorphus breviceps*) tends to suggest that introduced trout, that are prey on these fish, are either very rare or are not present in this stream, making this an important area for native freshwater fish. No eels were found, not unexpectedly because of the downstream blockage to fish passage caused by the series of hydro dams downstream

Invertebrate fauna was dominated by mayflies and cased caddis, indicating conditions of good water quality. The Wairepo Creek nearby was not fished, but it is most likely the fauna resembled that found in Serpentine Creek.

Ahuriri River East Branch

The East Branch is a clean braided river which was fairly extensively surveyed by the Ministry of Fisheries which showed upland bully, alpine galaxias, Canterbury galaxias, koaro and brown and rainbow trout fingerlings to be present. Large adult rainbow trout up to 4kg were also caught by fly fishing, although these were present in low densities. The invertebrate fauna was dominated by mayflies and caddis.

Snowy Gorge Creek which borders the north western margin of the property was not sampled but it seems likely the fauna resembles that in the East Branch. If conditions permit the upstream passage of trout from the Ahuriri mainstem, it seems likely that there may be trout spawning occurring in this stream in addition to the East Branch.

Tarns and Outlet Streams

Three tarns on Quailburn - "Egg Lake" above the East Ahuriri (at GR G39 495444), "Yellow Lake" (at Grid ref. G39 460425) and "Green Lake" at the Snowy Gorge end of the lease (at Grid ref. G39 445467), and their outlet streams, were sampled by electric fishing their margins, by snorkelling and by observations made from the bank.

Egg Lake the largest and deepest tarn is completely landlocked. Koaro were the only species recorded including some large specimens up to 140mm, the fish were abundant in the coarse substrate around the margins and snorkel observations showed some smaller fish out in the open in the sub-littoral zone. The lake has dense beds of large plants (macrophytes) which appeared principally to be species of *Myriophyllum* and *Isoetes*. There were a large number of Canadian geese on the tarn and very significant quantities of faeces deposited in the water. Water visibility was less than 2m, disappointingly poor for a high country tarn of this type. This is very likely a consequence of nutrient enrichment by geese faeces leading to algal bloom development. The ongoing presence of geese may lead to a continued reduction in water quality and algal bloom development to the extent that the ecology of the ecosystem is irreversibly changed and conditions may become unsuitable for koaro. As there is limited inflows and an absence of an outlet control of geese should be considered a priority.

The tarn near the confluence of Snowy Gorge Creek and the Ahuriri River (at GR G39 445467) contained a low density population of smallish koaro (60-100mm). Observed from the bank were 15 adult brown trout and large numbers of brown trout fingerlings (70-100mm). The outlet stream contained large numbers of brown trout fingerlings (presumably spawned there) and a few larger koaro.

"Green Lake" the tarn at GR: G39 460425 contained very few koaro with just one small fish recorded, upland bully were also found particularly in and around the outlet

stream with rainbow trout fry and one adult recorded. In the tarn itself several large adult rainbow trout were sighted.

Other smaller wetland areas and ponds on the valley floor within the lease were not sampled. The composition of these communities is, however, likely to consist of the same core species found in the sampling elsewhere on the lease depending on the frequency of flooding and interconnectedness of waterways which would provide intermittent opportunities for recruitment.

2.5 Historic

Quailburn was originally part of the vast Benmore run which was taken up in 1857. It seems that it only became a run in its own right in 1916. Before that, however, there is documented evidence that a route from the East Ahuriri over the Quailburn Saddle to "Quailburn" was utilised to bring stock to the Benmore yards in 1874 and that a married shepherd lived at Quailburn in 1878 or 1879. By 1885 Benmore had 140 km of fencing with posts having been cut from Quailburn and Lake Ohau bush areas. A breeding establishment for ferrets was established at Quailburn (also at Benmore Homestead and Dismal Swamp (Sutherland Creek lower reaches), in August 1888 for rabbit control.

It appears that there was a Benmore out-station at Quailburn from the 1870's and some farming operations were based in the locality from then on. Currently there are nine buildings at the road end and evidence of a further building having been sited in the area. The buildings consist of (i) a modest weatherboard 4 roomed cottage. (ii) A large 7 stand woolshed with wool room and some covered yard space complete with yards drafting race and a pot dip. (iii) Six bunk room/office/storage buildings of various designs and periods. (iv) Horse stables and corral. Adjacent to the creek crossing at the start of the route to the saddle is the remains of a trap or gig. Further up this gully there are a number of rough concrete steps placed in the creek bed to assist travel.

The building site west of the weatherboard cottage is probably the original cottage site and possibly dates from the 1870's when a married shepherd was located in the area. This site apart from some concrete pads is clear and little evidence as to its construction is available. There is an old rubbish dump nearby and a small piece of china has the mark "*Paldin*" China, *E Hughes & Co, Staffordshire, England*. An old rose was present at this site on an earlier visit, but could not be relocated in January 2000.

The weatherboard, matched lined, corrugated iron roofed cottage is estimated as having been built at about the time Quailburn was split from Benmore in 1916. Although the cottage has been allowed to run down it is in surprisingly good condition even though water has entered one of the rooms. Wallpaper on scrim is still present and a "Miner 4" wetback coal range is located in one of the front rooms. Adjacent to the cottage there is evidence of outbuildings paths and a tree-lined drive from the lower building/woolshed area.

The seven stand woolshed is constructed of a combination of beech poles and milled

timber on totara piles. It has been added to on three sides at a later period and appears to have been reclad with second hand corrugated iron. It is difficult to estimate when it was constructed and again it would seem to date to the 1916 period. There are no early shearers' names and dates present to confirm the sheds age. The yards and pot dip alongside may belong to a different period as they are some 60 odd meters from the woolshed.

The row of six buildings east of the woolshed sitting parallel to the creek are an interesting combination with only two being almost identical, one being the "Head Shepherds Office" and the other a bunk room. Both are single roomed on stone piles and possibly were relocated to the site. The oldest of this group of buildings is a 3 roomed rusticated weatherboard building on totara piles. There is a Shacklock "501" coal range in the kitchen area and a bathroom addition at the rear. Beside this is a two roomed bunkhouse with an addition, sitting on limestone piles. There is a "Miner" wetback coal range in one of the rooms. Adjacent to this is a washhouse/boiler house and the most easterly building is a one-roomed bunk-house on limestone piles. The 1969 edition of NZMS 1, S108 shows only three buildings present, two of which would be in the row (marked on the true right of the creek) and the third the woolshed.

The stables are beech pole corrugated iron and are in poor condition. Associated with the stables is a beech pole corral.

The buildings are an interesting collection of the basic requirements for a pastoral run in what would have been an isolated location in the 1870's and even in 1916. There is no evidence of other service buildings such as implement shed or haybarn, nor are there any cattle yards, indicating that the run was stocked with sheep only.

2.6 Public Recreation

2.6.1 Physical Characteristics

According to the FMC guidelines Quailburn would be mainly within an "open space" recreational experience zoning. For open space the descriptors are semi-natural grasslands under extensive grazing, accessible by roads, off-road vehicles and foot tracks.

According to DOC's recreation opportunity descriptors Glen Eyrie Downs has the primary characteristics of a back-country environment - primarily "4 x 4 drive in". This means that the property is a modified environment but one that is generally dominated by natural vegetation or landscapes and is natural looking. It is accessible to all terrain vehicles and is traversed mainly by ungravelled roads, or 4 x 4 access. Obvious elements of modification include roads and areas of farming or forestry. Quailburn would be better described as a "walk-in" back-country environment which is predominantly a natural environment where walking is the main access, and it is generally more than 1 km from formed access.

2.6.2 Legal Access

There is legal access along the southern boundary of Glen Eyrie Downs and to the Quailburn boundary along the legal road which follows the formed Quailburn Road from the Twizel-Omarama highway. The only other legal access to Quailburn is the marginal strip along the Ahuriri River providing difficult foot access along the western boundary of the property.

2.6.3 Activities

The current main recreation use of Quailburn is fishing, particularly along the Ahuriri River, and as access route into the Snowy Gorge and East Branch of the Ahuriri by trampers, and horse riders, although many use the adjacent road on Ribbonwood. The lease, however, is adjacent to Ohau Conservation Area and provides convenient access to the southern part of public Conservation land with a high potential for recreation.

The main tramping/walking route is through Quailburn Bush from the end of the Quailburn Road which follows a track beside the stream through to the low saddle and provides easy access into the East Branch of the Ahuriri. This is an easy, enjoyable walk with great views from the saddle. This is also part of a two day walk which follows the East Ahuriri River upstream and through to Freehold Creek in the Ohau Conservation Area.

Another route that is sometimes used by trampers is along the north-western boundary of the property in Snowy Gorge Creek which is part of a two to three day walk to the Maitland Valley. The first part of the walk is either on Quailburn or Birchwood, depending on which side of the river you choose to go on.

The open tops and basins of both Quailburn and the Ohau Conservation Area give a wide range of trackless tramping. Numerous tarns are scattered along the range, which provide ideal camping sites. These tops are also ideal ski-touring country, either accessible from the Ohau skifield, Freehold Creek or from Quailburn Bush, depending on the snow conditions.

There is potential for horse-riding on Quailburn via the saddle, but mountain biking is very limited because of the lack of 4 w.d. tracks. Passive recreation such as photography, artistic painting, or easy botanising is a little bit more limited because of the need to walk anywhere on the property.

PART 3

CONSULTATION AND OTHER PLANS

3.1 Consultation

There has been no NGO meeting to discuss this property as the CCL had not officially included this property in the programme at the time of reporting.

2 District Plans (Matters of National Importance)

Quailburn is in the Waitaki District. The Waitaki District Proposed Plan was publicly notified in December 1996. Under this plan Quailburn is zoned RS (rural scenic). The Rural Scenic Zone contains areas of the District which have significant scenic values - the high country, rangelands and inland basin areas.

There are no significant sites identified on Quailburn by the Council in the plan i.e. none of the RAPs identified on Quailburn in the McKenzie PNA survey or any SSWI's from Wildlife Surveys have been recognised in the plan and, for that matter, very few anywhere else in the Waitaki District have been recognised.

In this 1996 plan there are controls on buildings, earthworks, indigenous vegetation clearance and forestry - in areas within 20m of a lake, river or wetland. There are also some controls on earthworks (including tracking) on slopes greater than 20° and controls on clearance of indigenous bush.

After calling for submissions and going through a series of hearings the Council has just released its Proposed Plan Amended by Decisions. These decisions have deleted controls on activities on land over 900m, clearance of indigenous bush, and earthworks within rivers and lake beds. The Department of Conservation, along with several other submitters, has referred these matters to the Environment Court advocating the inclusion of 4 sites in the plan. Until this is settled (possibly 1-2 years away) both versions of the "proposed" plan have some status in law.

3.3 Conservation Management Strategies

The Waitaki section of the CMS has several sections relevant to tenure review on Quailburn. Under Waitaki Ecosystems and species an objective is to protect a representative range of indigenous biodiversity of the Waitaki unit, and to negotiate with landholders to protect areas of native vegetation/wildlife habitat. For Project River Recovery the objective is to improve the range of viable riparian habitats for indigenous species and to implement this they have recommended seeking the gazettal of key areas of Crown riverbed with high wildlife value as conservation areas. Relevant recreation objectives include providing new facilities where natural and historic resources are not compromised and to liaise with adjacent landowners to help resolve conflicts regarding access to land managed by the Department of Conservation for recreation.