Toitu te Land whenua Information New Zealand

Crown Pastoral Land Tenure Review

Lease name : Wyuna

Lease number : Po 299

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 November 2002

WYUNA PASTORAL LEASE
CONSERVATION RESOURCES REPORT

INTRODUCTION

The lessee of Wyuna Pastoral Lease has applied to the Commissioner of Crown Lands for tenure review. This report is part of the Crown investigation and describes the conservation resources identified on the property. It comprises resource information drawn from departmental files, published reports and material gathered by DOC staff during a field inspection undertaken during February 1995.

Wyuna is a large property of 11 940 ha of pastoral lease. Several areas of DOC land covering approximately 210 ha are occupied and the majority of these occupations are licensed for five year terms. The DOC lands are located adjacent to the shores of Lake Wakatipu and the mouth of the Buckler Burn and comprise extensive areas of improved pasture utilised for winter feed production. Their existing and potential use for conservation, especially recreation use for the community is discussed in this report. The future ownership and use of these lands are expected to be integral to a successful tenure review.

Wyuna is located on the Glenorchy-Queenstown road, approximately 3 km south of Glenorchy. The property extends from the shores of the lake and straddles the Richardson Mountains and a back boundary at upper Stony Creek, adjoining Mount Aurum Recreation Reserve in the Shotover River catchment. Approximately 8900 ha of the back country has been retired under an Otago Catchment Board run plan.

Scheelite mining has occurred extensively in the Mt Judah/Mt McIntosh area in the past. There is no current mining activity.

1 ECOLOGICAL FEATURES

a Physical Description

i Geology and Landform

The main physiographic feature is the spine of the Richardson Mountains, running north-south which divides the property. This rugged range rises to several notable high points, ie, Mt Larkins (2300 m asl), Mt Butement (2104 m asl) and Mt Buck (2035 m asl).

There are two major and several smaller catchments draining westwards, namely, Precipice Creek and the Buckler Burn. Several unnamed similar sized minor catchments drain eastwards into upper Stony Creek.

Permanent snow and ice occupy the higher south and east facing slopes.

The westward dip of these schist mountains is reflected by smooth, slabby western slopes and deeply dissected precipitous eastern faces with rocky outcrops.

The soft and friable schist bedrock is very easily eroded and may account for the relative scarcity of obvious glacial features. Cirques occur at higher altitudes with the best developed examples facing east.

riglacial features are extensive. Areas of solifluction debris on wet south facing slopes are characterised by a ripply landscape. There has been major post-glacial erosion resulting in V-shaped valleys with deep gorges.

ii Climate

The region has a semi-continental climate, but not as extreme as the drier areas of Central Otago. The area falls under the influence of the north-wester, and rainfall varies from 1015 mm near the lake to over 2300 mm at higher altitudes. There are large daily and seasonal temperature extremes and relatively high sunshine hours. Precipitation above 1000 m asl is now during winter, although snowfalls can occur at any time during the year.

b Vegetation

The property is located within the Richardson Ecological District which has not been covered by a PNAP survey. Vegetation has been partially mapped and described by Wardle, 1966. DOC staff have updated this information.

All areas over 1000 m have a very good native cover, primarily snow tussock, and a high degree of naturalness with few exotic species except in a few small spaces such as some lower flush areas and along stream banks where nutrients and disturbance respectively are higher. Below about 1100 m exotic species become more prominent. These are mainly the grasses, browntop *Agrostis capillaris* and sweet vernal *Anthoxanthum odoratum*, but native grasses such as hard tussock *Festuca novae zelandiae*, blue tussock *Poa colensoi* and scattered snow grass *Chionochloa rigida* are at least co-dominant down to about 900 m. Generally below this altitude, except where beech forest still survives, exotic grassland takes over with fewer native grasses, although small native shrubs and herbs such as *Raoulia subsericea, Leucopogon fraseri, Wahlenbergia albomarginata, Luzula rufa, Anisotome flexuosa, Celmisia gracilenta* and *Gaultheria "novae zelandiae"* are common right into the pasture land. At this lower altitude also native shrub species often become prominent. They include manuka *Leptospermum scoparium*, matagouri *Discaria toumatou, Coprosma propinqua, C. rugosa, C.* aff. *parviflora, Olearia odorata* and *O. bullata.*

Plant Communities

i Mountain Beech Forest

The lower Buckler Burn, Wallers Creek, Stone Creek and Stony Creek all contain areas of mountain beech forest *Nothofagus solandri* var. *cliffortioides*. The most extensive area is contained in the very steep and dissected Stony Creek catchment adjacent to Mount Aurum Recreation Reserve. Regeneration is occurring in all areas but especially in the Stony Creek where young trees grow not only along the forest edge but also scattered across tussock slopes. The forests of the eastern catchments are generally at their natural treeline limit (about 1100 m) while western catchments have been affected by fire and are depressed below natural limits except on some south facing slopes. Other species found here are *Griselinia littoralis* (broadleaf), *Podocarpus hallii, Coprosma propinqua, C.* aff. *parviflora, Pseudopanax colensoi* var. *ternatus*, various climbers, ferns, herbs and grasses. All forest areas are worthy of protection.

ii Shrublands

The lower altitude shrubland has already been mentioned. Above the natural bushline can be found some subalpine shrubland. This was most noticeable in the Buckler Burn, but also in Stone Creek and in Stony Creek. In the former two this community was confined to the colder, damp south faces. Species include mountain toa toa *Phyllocladus alpinus, Brachyglottis cassinioides, B. revoluta,*

acophyllum longifolium, Cassinia vauvilliersii, Hebe anomala, Coprosma ciliata, C. cheesemanii, Gaultheria crassa, Aciphylla "lomond", Astelia nervosa, Chionochloa rigida and small herbs, grasses and ferns. Many of these species could be found in small patches at higher altitudes also and scattered through the tussockland. On rocky slopes or ridges and knobs where the soil is shallow, *Dracophyllum uniflorum* forms almost pure communities.

iii Tall Tussock Grassland

Most of the land above 1000 m is dominated by tall snow tussock, *Chionochloa rigida* generally to about 1600 m with *C. macra* above but in places *C. pallens* appears, particularly on the slopes above Stony Creek. Patches of *Chionochloa crassiuscula* can be found in the upper and mid slopes in the Wallers Creek catchment. *Chionochloa rigida* is scattered through the lower grassland also but above about 1000 m becomes increasingly dominant, taking over from the hard tussock *Fescue novae zelandiae* browntop and sweet vernal sward below. The snow tussock varies in cover from 50% with many inter-tussock species - such as *Raoulia subsericea, Poa colensoi, Rytidosperma pumilum, Geranium sessiliflorum, Lycopodium fastigiatum, Ranunculus multiscapus, Brachyglottis bellidioides, Epilobium artiplicifolium, Luzula rufa, Viola cunninghamii, Carex wakatipu, Gaultheria "novae zelandiae", Leucopogon fraseri, Celmisia gracilenta, C. lyallii, Hypochoeris radicata* and others. Taller shrubs such as *Hebe anomala, Gaultheria crassa, Dracophyllum uniflorum* and *Cassinia vauvilliersii* are scattered throughout as is the large speargrass *Aciphylla "lomond"* - to 80% with dense litter and few inter-tussock species. The tussock can be up to 1.4 m tall in sheltered sites but is generally between 800 mm to 1 m tall.

iv Wetlands

Wetlands are only a minor community occurring on some slopes, in small, shallow gullies and along stream edges. Rushes, sedges, grasses, small herbs and mosses are found here, most are specialised plants of wetlands and include *Oreobolus pectinatus, Utricularia monanthous, Drosera arcturi, Prasophyllum oligantha, Epilobium komarovianum, Gonocarpus micranthus* and others.

v Rock Faces and Scree Slopes

Rock outcrops occur on many slopes but particularly on higher ridges. Most of the scree slopes occur along the higher ridges. These also have specialised plants such as *Celmisia hectori, Chionohebe planopetiolata, C. densiflora, Hebe petriei, Leptinella willcoxii, Pachycladon novae zelandiae, Gentiana divisa, Polystichum cystostegia, Raoulia youngii, Aciphylla kirkii, coprosma niphophylla, Haastia pulvinaris*, and others plus many lichens and mosses.

vi Cushionfields

On exposed stable ridge tops and rocky areas cushion plants are found. Species here include *Hectorella caespitosa, Chionohebe thompsonii, Ourisia glandulosa, Raoulia grandiflora, Abrotanella inconspicua, Raoulia hectori, Colobanthus buchananii, Agrostis muelleriana, Luzula pumila, Anisotome imbricata, Epilobium tasmanicum, Dracophyllum muscoides, Pratia macrodon, Leucogenes grandiceps, Euphrasia* sp. cf. *petriei, Myosotis pulvinaris* and others.

vii Snowbanks and Hollows

Along the upper ridges where snow lies for long periods specialist plants are found. As well as many of those plants listed under cushionfields the following also occur. *Chionochloa oreophila* the snow patch tussock, *Celmisia haastii, Raoulia subulata, Phyllachne colensoi, Carex pyrenaica* var. *cephalotes, Kelleria croizatii, Coprosma perpusilla, Plantago lanigera* and *Celmisia sessiliflora*.

Overall most of the land over about 1000 m has high botanical values with a good range of plant communities and species. Valley forests and shrublands are also worthy of protection.

c **Fauna**

i Vertebrates

The New Zealand Wildlife Service Fauna Survey Unit had surveyed beech forest remnants in Precipice Creek and the Buckler Burn. Both forests were ranked as moderate for habitat value and contained common native bush bird species such as bellbird, yellowbreasted tit, silvereye, rifleman, grey warbler, brown creeper, fantail and introduced species, eg, blackbird and thrush.

Forest margin and open space species included harrier, dunnock chaffinch, yellow hammer and goldfinch. Kea and New Zealand falcon have been recorded in low numbers on the property.

Of particular note are historical records for rock wren at Mt McIntosh and confirmed sightings on Teds Spur during the DOC inspection. This species is endangered.

The Downs Lagoon, the only water body of significance on the property hosted at the time of inspection a variety of water-fowl and aquatic species including paradise duck, grey duck, black swan, scaup and black shags. Noteworthy is the presence of grey duck, a species becoming scarce. This water body and the small wetland that drains into it from the north is ranked as being of moderate value for wildlife management and complements the larger Glenorchy Lagoon Wildlife Management Reserve north of the township. Cattle are causing extensive pugging and fouling of the wetland and lagoon margins.

ii Invertebrates

The steepness and fragility of the Richardson Mountain means that there is a sharp contrast between the fauna of the sharp dry high-alpine crests and ridges and the wet, sometimes broad valley floors such as the upper Buckler Burn.

High-alpine cushionfield and short grassland 1800-1950 m is characterised by a variety of small weevils, abundant native blowflies, bug and diurnal moths such as *Notoreas ortholeuca, Tawhitia glaucophanes* and *Scoparia panopla*; the last-named species only rarely recorded though abundant here. A small but distinctive fauna.

The alpine zone has more insect species reflecting a richer flora on the many level terraces and hollows (1400-1800 m). Black butterflies are numerous over accompanying scree and the diurnal moths *Aponotoreas orphnaea* and *A. insignis* over the dense snowgrass.

Although only reasonably rich in terms of fauna, these zones are in near natural condition as far as fauna is concerned and contain a distinctive fauna, a transition between the western mountains and Central Otago, so therefore they are of high conservation value.

In contrast, the upper Buckler Burn valley floor is a complex of broad wetlands, waterfalls, ice caves, snowgrass and herbfield areas. A rich insect fauna accompanies these features with such local species as *Zelandobius montanus* and *Z. unicolor* (stoneflies), *Philorheithrus lacustrus, Tiphobiosis childi, Hydrobiosis johnsi* and *H. torrentis* (caddis), *Microchorista philpotti* (scorpionfly) and *Asaphodes exoriens, A. oraria, A. periphaea* and *Orocrambus scoparioides* (moths). A large, more widespread terrestrial and aquatic insect fauna is also present underlining the quality of the ecosystem and large variety of habitats present at 1200-1300 metres. For *H. johnsi, Z. montanus* and *A. exoriens* this area is close to the type locality adding to the importance of protection of these populations.

ense snowgrass surrounds the valley floor on slopes and also has a rich insect fauna with a species mix unlike areas further west or east.

Management

Both the Buckler Burn Valley floor and the surrounding slopes have such a high degree of naturalness and significant biological values that they should not be disturbed by grazing of any domestic animals. Goats and chamois should also be controlled or eliminated. From an aerial inspection these values exist further down the valley to at least 1000 metres altitude and adjacent steep slopes also are in excellent condition. Fencing out of adjacent farmland would be important.

As valley floor ecosystems are much more threatened than steep slopes and ridges, the Buckler Burn is of the highest priority for protection.

iii Aquatic Fauna

Electric fishing was undertaken at several locations in the mid and upper parts of the Buckler Burn and Stony Creek during the February 1995 inspection.

Fishing commenced in the Buckler Burn at map reference E41 548E 887N and several sites upstream and downstream were sampled. No fish of any species were found.

Bottom fauna was abundant (mayflies, stoneflies and caddis) in the stretches fished on the flat. However, downstream of the gorge section and particularly below a small very steep and unstable tributary on the true left the channel of the stream was very unstable and virtually no bottom fauna was present. This tributary was also carrying a high load of sediment and appeared very turbid, despite the long dry settled period of weather that had been experienced.

The condition of the surrounding grassland appeared good, with little evidence of grazing pressure, although fresh goat tracks were found in the area.

Several sites were fished in Stony Creek at about map reference E41 612E 866N and once again no fish of any kind were found, although the habitat appeared good and bottom fauna was abundant. Some goat sign was seen on the river bank.

Earlier survey work has resulted in the discovery of the galaxiids in the lower reaches of the Buckler Burn (koaro) and Stony Creek (probably koaro, although the samples taken have not yet been positively identified).

Conclusions

- No fish were found in the headwaters of either stream fished. It is likely that impediments to fish passage exist between the points fished and the lower reaches of these streams.
- Vegetation and catchment condition in these streams appeared good - although the Buckler Burn headwaters did show evidence of erosion and sedimentation in at least one tributary.
- The headwaters and riparian areas of these streams should be protected to ensure protection of the native fish habitat in the lower reaches of both streams.

Landscape Assessment

i Landscape Context

This pastoral lease is located at the head of Lake Wakatipu where it forms the backdrop to the township of Glenorchy and then extends further inland through broken hill country into precipitous mountainland. The highest point of Wyuna is found along the crest of the Richardson Mountains with Mt Buck being at 2035 m.

Due to the inaccessibility of much of the back country of Wyuna an overview was undertaken from the air.

ii Landscape Description

Wyuna contains a diversity of landforms which are covered by a mixture of vegetation types. However, for this exercise the property has been divided into three broad landscape units, these being:

- the high mountainlands with dissected valleys;
- broken gorge country; and
- the front hill country and stepped terraces.

Landscape Unit 1:

The dominating natural feature of this unit is the sawcut ridgelines along the crest of the Richardson Mountains which are deeply dissected by steep-sided gulleys which form the source of the Buckler Burn on the western side and upper Stony Creek on the eastern side. Noticeable features of these rangelands are the long scree slopes, fellfields, rocky outcrops, and the sparseness of vegetation.

The overall impression of this landscape unit is that of a fragile natural environment where natural processes are still very active and that any changes in the existing equilibrium could have detrimental effects on soil and water quality. This large block of pastoral land has outstanding wilderness qualities which would make it desirable for back country recreation pursuits.

Landscape Unit 2:

This landscape unit contains the mid-altitudinal broken country which is characterised by deep gorges with incised drainage patterns. The unit is a mixing zone of numerous vegetation types with dense snow tussock being predominant on the upper slopes while mixed shrublands dominate the lower slopes and deep gorges. A continuous ribbon of beech forest is found in the Buckler Burn and Wallers Creek. The warm northern faces of Mt Judah would appear to be where most concentrated grazing occurs, with the native vegetation being modified on the sunny benches.

The overall visual impression of this unit is of enclosure with spectacular views looking up towards the Richardson Mountains, and an occasional glimpse of Lake Wakatipu. There is a strong sense of human occupation over the whole unit with conspicuous tracking zig-zagging up most prominent ridgelines to small scheelite mines. Scattered around these disused mines are numerous mining relics, with many of these sites still intact. This cultural overlay provides this unit with numerous historic industrial features that are worthy of protection and should form the basis of public attraction in the future (possibly a similar interpretation exercise as at Bendigo could be considered).

ndscape Unit 3:

This unit encompasses the rounded hill country and lake terraces at the front of Wyuna. In many places the vegetation has been heavily modified with short/hard tussock and a mixture of exotic grasses being the prominent cover. Many of the deep gorges and mining workings are covered with broom, the incised Buckler Burn Gorge has continuous beech forest along it.

In landscape terms this unit's importance is primarily as a visual resource, as much of Wyuna's front country provides the backdrop to Glenorchy, as well it forms the foreground to the broad scenic vista when approaching Glenorchy from Queenstown. The combination of elevated terraces, azure water of the lake, braided river valleys and mountain backdrop are the main essence that makes this area an internationally known tourist destination. It should be accepted that much of this unit is conducive to further intensive development which is probably essential to make the property a viable farm if most of units 1 and 2 come to conservation.

Conclusion

Wyuna contains a diversity of landscape types, each with a different capacity to absorb change without affecting physical/visual character. Landscape unit 1 is a fragile environment where further use should be orientated towards conservation, especially to protect soil and water values. A range of various back country recreational pursuits would also be compatible with the nature of this country. Landscape unit 2 is more robust and therefore can absorb some further land use changes without affecting its existing natural character. These changes would probably occur on the warm sunny faces which can accommodate more intensive and regular grazing, any further internal fencing should not be obvious from the mountainlands. Landscape unit 3 is both visually and potentially important as a local recreational resource. From a landscape perspective the status quo should be retained on existing land use and activities between the Glenorchy Road and the lake's edge, hopefully this will be fully recognised in the district plan. During the negotiation phase, the local community's aspirations for protection of open space should be recognised, and that an integrated and comprehensive management plan for all the parcels of land between the road and lake be developed after consultation with all interested parties.

2 CULTURAL FEATURES

The Richardson Mountains are known to Maori as Whakaari which means "to hold up to view".

a Archaeological and Historic Features

A comprehensive investigation and report covering Wyuna Station is appended to the conservation resources report. Limited extracts only are reproduced here and are confined to comment on maori occupation, a brief history of gold mining, a brief history of scheelite mining (the most extensive grouping of historic sites present) and conclusions section covering key points of these groups of sites and their future management.

i Introduction

The Wyuna pastoral lease at Glenorchy was surveyed for historical sites over a four day period; two days during December 1994 and a further two days in February 1995.

Because of the steep nature of most of Wyuna and the large number of, often small, scheelite mines not all such sites could be visited during the site survey. However an effort was made to record all the major (in terms of longevity of production and output) workings.

Maori Occupation

Some 30 recorded pre-European sites are known to exist within a 20 kilometre radius of Glenorchy (Ritchie 1980). This is in marked contrast to most of the interior of Otago where such sites are widely distributed but in low densities. The relatively high density of sites around the head of the lake may be associated with the presence of valuable nephrite sources in the Dart River and the Routeburn.

Only one Maori site has been recorded on Wyuna, an early occupation site (New Zealand Archaeological Association site number S123/1) on the northern boundary with the neighbouring Koch property (see fig. 1). Two other Maori sites have been recorded nearby. A large oven (S123/7) was recorded on the edge of the lagoon just north of S123/1.

Both S123/1 and S123/7 were test excavated in the late 1960s by Dave Simmons, then of the Otago Museum. The first site contained flaked knives and Moa Hunter style adzes and was carbon dated to approximately 1400 AD. The oven site was dated to approximately 1600 AD (Simmons 1973:175).

No further Maori sites were identified during the survey, primarily because the survey concentrated on the rugged hill country where the scheelite mining was carried out. However, given the presence of three sites in the immediate vicinity of Glenorchy there is a high probability of similar sites existing on the conservation lands south of the Buckler Burn, in particular at Blanket Bay which offers some shelter from winds blowing down the lake.

iii A Brief History of Gold Mining

The discovery of gold in the Buckler Burn and the other streams and rivers running into the head of the lake probably occurred in late 1862 or early 1863 as miners from among the thousands who rushed to the rich finds in the Arrow and Shotover Rivers spread out and prospected the surrounding area.

However the gold returns from the head of Lake Wakatipu were insignificant in comparison with those east of the Richardson Mountains and only small numbers of miners ever worked the Buckler Burn. By the 1880s several Chinese were also mining gold in the area. It is not possible to attain a fuller picture of the gold mining in the Buckler Burn during the 19th century due to the absence of references to the area in the main historical source; the Appendices to the Journals of the House of Representatives (AJHR). This neglect reflects the relative unimportance of the head of the lake as a gold mining area.

Despite this gold mining in the Buckler Burn persisted into the 20th century. The AJHR of 1910 (C3:38) records that alluvial mining for gold was still being carried on the Buckler Burn terrace. The onset of the depression in the early 1930s saw a resumption in interest in gold mining in many areas as the Government paid a subsidy to many miners. Some working of the bed of the Buckler Burn by subsidised miners took place during this period (AJHR 1934-35 C2:35, AJHR 1937-38 C2:45). The bed of the Buckler Burn above the junction with the Bonnie Jean Creek (henceforth referred to as simply the junction) was worked for gold and scheelite during the Second World War. Hydraulic elevating for gold and scheelite was also carried in the Buckler Burn in the vicinity of the present road bridge in 1944 and 1945 but with only limited success as the returns fell off quickly below the mouth of the gorge (AJHR 1945 C2:20, 1946 C2:32). In recent years the bed of the Buckler Burn in the gorge has continued to be worked on a small scale on occasions.

iv A Brief History of Scheelite Mining

Scheelite (or calcium tungstate CaWO4) is an important ore of tungsten which is primarily used for filaments in light bulbs and as an additive to steel to increase the hardness and strength of such things

tool edges, dies, gun barrels and armour piercing projectiles. It was its importance to the armaments industry which was the controlling factor in the history of scheelite mining at Glenorchy.

The presence of scheelite in the streams around Glenorchy was known in the 1860s to the alluvial gold miners. They referred to the cream coloured alluvial scheelite that sometimes filled their sluice boxes as "white maori" (Mutch 1969:3). The Glenorchy scheelite lode (or reef) was discovered in 1884 (ibid.). With the prompting of George Watson, the local storekeeper, a company was formed to exploit the discovery. A road was constructed from the reef to Blanket Bay to allow the scheelite to be shipped out. This road is essentially the same one that still climbs the lower slopes of Mt. Judah (ibid.).

Initially the company extracted the scheelite from the quartz reef by hand but as the scheelite lower down in the reef was too finely distributed to be worked by hand quartz crushing equipment was installed. This consisted of "two stone breakers, four double acting jigging machines, a series of classifiers and a 25 horse power turbine (pelton wheel) for motive power" (Prof. Ulrich in AJHR 1892 C3:105). To power this equipment an existing two mile long water race from Stony Creek was purchased from Chook Quong, a Chinese miner, in May 1886 (Queenstown Wardens Court Applications).

The only market at this time for the scheelite was in Hanover, Germany, and initially £23 - £29 per ton was being paid. But soon after the crushing equipment was installed prices dropped to £20 - £22 per ton and then still further to £17. Costs involved in production and shipping amounted to more than £12 per ton and profits were to slender to sustain production and the mine was closed with the water race being surrendered in December 1890 (Ulrich in AJHR 1892 C3:105, Mutch 1969:3).

In 1906 the mine was reopened by George Reid and Robert Lee, as the Glenorchy Scheelite Syndicate, who installed a five stamp battery and a wilfley table to process the ore and concentrate the scheelite, 14 tons of which were produced in the first year of operation. The price for scheelite climbed quickly during the pre - World War One years; by 1910 it was bringing £93 a short ton (2000 lb) in Hamburg (AJHR 1911 C3:11). The success of these miners stimulated further interest in scheelite and over the next few years mines were opened up on Mt. McIntosh and Mt. Alaska. By 1909 seven mines at Glenorchy are listed in the Mines Department report (AJHR 1910 C3:38). Most of these mines sent their ore for treatment to the Glenorchy Scheelite Syndicate's (renamed Glenorchy Scheelite Mining Co. in 1911) battery although the Bonnie Jean Scheelite Mining Co. had their own battery which they had brought from Bannockburn (AJHR 1909 C3:40, 1912 C2:55).

The outbreak of World War One in 1914 was of vast importance to the scheelite miners. Sales to Germany which had previously been the major customer ceased to be replaced by the Imperial (British) Government which in September 1915 requisitioned all supplies of tungsten ores in the British Empire. The price was fixed at £2. 15s (later raised to £3. 8s) per unit of tungstic acid (WO3). A unit being 1 percent of tungstic acid in the sample, a sample not to contain less than 65 units (AJHR 1916 C2:26). By the end of the war the Glenorchy Scheelite Mining Co. and 15 small parties of miners were mining scheelite in the Glenorchy area - most on Wyuna (AJHR 1919 C2:34).

With the cessation of the war in November 1918 demand for scheelite largely ceased, stockpiles built up and the price collapsed to £1. 10s per unit in 1919 and production of scheelite wound down (AJHR 1920 C2:20). By 1920 only the Glenorchy Scheelite Mining Co. was actively mining but only on a small scale. Even then the 12 tons produced in that year was retained in the hope of a rise in the market (AJHR 1921-22 C2:30). In 1921 production ceased altogether (AJHR 1922 C2:26).

There was a slight surge in scheelite prices in the late 1920s and the Glenorchy Scheelite Mining Co. resumed small scale mining although another dip in prices in 1930 meant that production costs were not being met and only two men were employed in 1931 (AJHR 1932-33 C2:33). However prices

se again, perhaps in response to increasing tension as the world lurched towards World War Two, and by 1935 the Glenorchy Scheelite Mining Co. had increased production and several other mines had been opened (AJHR 1936 C2:45).

The outbreak of war in September 1939 had the same impact on the industry as the First World War. Initially, late in 1939 export of scheelite was prohibited and then all production was sold under contract to the Imperial Government at a price of £6 per unit until December 1944 (AJHR 1940 C2:34, 1941 C2:13). In order to increase production the Government gave financial assistance to miners to improve roads and purchase equipment (AJHR 1941 C2:13). But output actually decreased between 1940 and 1941 and in order to further increase production the Government took over the Glenorchy Scheelite Mining Co. which owned the largest mine on Mt. Judah (and the Paradise Scheelite Mine) and operated the main treatment plant, at the end of January 1942 (AJHR 1943 C2:17). In 1943 14 mines were operating in the valley of the Buckler Burn (AJHR 1944C2:19). By 1945 the Imperial Government had accumulated large supplies of tungsten and the last war time sales were made at £3. 15s per unit. The New Zealand Government ceased production at its mines in January 1945 having produced 100 tons of scheelite. As a result of the Governments operation of the mines it concluded that there was no possibility of large scale mining given the patchy distribution of scheelite and the usual price of scheelite during peace time (AJHR 1946 C2:14).

Following the end of the war the price did not collapse to the same degree as it did following the first war and many of the mines operating during the war continued to be worked with the Government mine being worked by miners on tribute (a system where the mine is essentially rented for a percentage of the out put). However despite the good prices that prevailed after the war (almost £500 per ton in 1947) production decreased, mainly as a result of the exhaustion of payable ore in many mines (AJHR 1949 C2:20) Production increased in the early 1950s in response to demand generated by renewed armaments programmes overseas and the high prices generated (AJHR 1952 C2:22). But in 1953 prices again collapsed (AJHR 1954 C2:31) discouraging prospecting and only allowing old established mines to remain in production. Prices continued to decline during the 1950s and into the early 1960s. In 1960 only four mines were operating but only one actually produced any scheelite (AJHR 1961 C2:30). Prices recovered somewhat as the 1960s progressed but the number of mines being actively worked remained low with only four being in production in 1967. By this stage most mining was being carried out with bulldozers with very little under ground mining being carried out (the price at this time was $42 per ton) (AJHR 1968 C2:17-18).

Between 1968 and 1971 ACI Minerals Ltd. carried out an extensive evaluation programme on the Buckler Burn scheelite resource including flying drilling rigs onto Mt. McIntosh. Treatment plant was set up to treat ore, mainly from the Government mine (AJHR 1971 C2:20). But ultimately the results were not encouraging and operations were wound down in October 1971 (AJHR 1972 C2:22). Throughout the 1970s scheelite continued to be mined (1972 price $15 per ton) but production was low with only five parties actively mining in 1977 (AJHR 1978 C2:15). Small scale mining by individuals continued during the 1980s but at the current time (1995) no mining is being carried out.

v Conclusions

It is vital that the one recorded pre-European site (S123/1) on Wyuna remains undisturbed. The site is protected under the 1993 Historic Places Act (as are all sites which date to before 1900) but past experience has shown that this is not always sufficient to protect sites especially where there are no surface indications of a site's presence, as in this case. All forms of ground disturbance must be excluded from the area of the site. The continued grazing of stock ,however, will have little or no impact on the long term preservation of the site.

Only three main gold workings were recorded during the survey. Only one site is old enough to be protected under the 1993 act. Site 1 and the associated water race are probably of 19th century

igin. While such sites are common elsewhere in Central Otago it represents the only example of well preserved ground sluicings and associated tailings in the immediate vicinity of Glenorchy. Therefore some consideration should be given to further protection of this site.

The workings adjacent to the main road bridge (site 2) are possibly of a similar age to site 1 but they have been badly damaged by road construction and do not merit special protection. The deep sluice hollow (site 3) is of indeterminate age but is possibly of 20 the century origins and therefore not protected under the 1993 act. Nor is it sufficiently important to warrant special protection.

The only scheelite mine that is old enough to qualify for protection under the Historic Places Act is the State mine which was initially worked in the 1880s. However ninety years of subsequent mining has obliterated all signs of these early workings. All other scheelite mines on Wyuna date to 1906 or later.

However the Wyuna mines are historically important both at the local and national levels. Not only were they a significant source of employment to the Glenorchy region they were almost from their inception the major producers of scheelite in New Zealand. The other large scale producer of scheelite in Otago was the Macraes Flat area but many of these mines have been destroyed (or soon will be) by the current large scale mining in the area. It is therefore important that some effort be made to give protection to at least some of the mines.

The recorded sites may be broken down into two broad categories on the basis of the way they were worked. There are those mines which were worked from the surface either by sluicing away the overburden from the quartz reef or in later years by bulldozing. These mines essentially appear as scars on the landscape. They do not represent good options for long term protection as the steep faces and bulldozed spoil heaps are unstable. Nor do they represent good sites for public interpretation as there are few features which are easily interpreted.

The second class of sites are those that were partially or entirely worked by underground mining. These include the State mine and the Bonnie Jean mine among others. These sites consist of adit entrances, tram lines, spoil heaps, cableways and, in some cases, associated buildings which offer better prospects for both long term preservation and public interpretation should public access occur.

High country farming has had almost no impact on these sites, the only perceivable threat is a resumption in mining. As the experience of the Government during the war, and subsequently ACI Ltd. in the late 1960s demonstrated, large scale mining for scheelite is not likely to occur. Any renewal in mining will probably be on a small scale. Such mining in the recent past has only had minor impact on the historic landscape.

Should a public walkway up the Mt. Judah be considered sites 5, 6, 9, 10, 13, and 14 are possibilities for public interpretation as they represent both types of mining, as well as battery sites. All are easily accessible from the Mt Judah road. With the exception of sites 5 and 6 (the Government battery and mine) they have not been worked for several decades and are not likely to the subject of renewed mining.

b Recreational Values

There are six land areas with significant recreational values that require consideration as part of the Wyuna tenure review. Some of the issues involved with these areas will have significant bearing on conservation and recreational interests and the tenure review negotiations, ie:

Richardson Range

Extending from Shepherds Hut Creek north to Precipice Creek and east into the Skippers country, the pastoral lease has large tracts of land of which are retired from grazing and contain significant conservation and recreational values.

ii Little Stony Creek

The lower watershed status is part Recreation Reserve D - leased to Wyuna Station for grazing.

iii Shepherds Hut Creek

At the southern boundary of Wyuna Station, the lower true right side of the creek forms part of the Recreation Reserve D held under grazing licence by Wyuna Station.

iv Glenorchy Airstrip

Lies entirely within the northern portion of Recreation Reserve D. Currently this part of the reserve, including the airstrip, is grazed under licence by Wyuna.

v Recreation Reserve C - Lake Terraces

The ancient lake alluvial terraces between Buckler Burn and Stony Creek are recreation reserve lands which are currently grazed under several licences held by Wyuna Station. This reserve adjoins lake foreshore and a freehold property at Blanket Bay.

vi Glenorchy Lagoon

Pastoral lease land immediately adjoining the Glenorchy Lagoon Wildlife Management Reserve forms an integral part of the buffer around and public access to the lagoon reserve.

c Descriptions of Values

i Richardson Range

The extent of recreational activities currently undertaken in this land unit are comparatively modest. Persons wishing to move into the area are hindered because there is no recognised right of access. The Judah Mines road is the usual entry way, but it is not a legal road, thus permission must be sought on an individual use basis.

Access permission has usually been readily available, and a number of pursuits do occur, eg:

- horse trekking;
- goat hunting;
- day walks - up the Judah Mine road;
- mountain scrambling - Mts Alaska, Larkins, Judah, McIntosh, and Black and Stone Peaks;
- historical fossicking around the numerous scheelite mining sites;
- limited scope trail bike and mountain cycling;
- parapenting; and
- gold fossicking - recreational mining licences are currently held on the Buckler Burn Gorge.

Two heliski runs have been identified and used intermittently but no commercial operation has been licensed by the Commissioner of Crown Lands. Some commercial horse trekking occurs on the

t Judah road and DOC reserves at the Buckler Burn. The operator has lodged an application for conservation over the DOC reserves which is being considered.

Formalising public access on to the Richardsons through tenure change would create an increased opportunity for recreational use.

Logically, the best option would be to legalise public foot, mountain bike and horse trekking access over the Judah road, with a realignment from the road bridge to the old state battery around the rim of the Buckler Burn Gorge, thus diverting people away from the Wyuna Homestead.

Unrestricted public access could provide for the following new opportunities:

- Secured opportunities for short walks from Glenorchy township up the Judah road.
- Extended cross-country tramping, including following the old miners' routes from Glenorchy to the Skippers country via Monument Saddle or Moonlight Saddle into the Shotover.
- Overnight tramping trips to miners' huts on:
  - McIntosh;
  - Bonnie Jean; and
  - Larkins.
- Historical interpretation of the scheelite mining and old miners' trails.
- Naturalist trips - geology, botany and ornithology.
- Encourage back country goat and chamois hunting.
- Horse trekking - Judah/McIntosh trails.
- Mountain biking - Judah/McIntosh trails.

ii Little Stony Creek

The potential recreation values of the Little Stony Creek area lies in its strategic position to the Glenorchy road and the lake's edge. This is one of the very few sites on the entire road where close easy access is afforded to the lake foreshore. The attractive ness of the delta area is enhanced with good off-road parking for a number of cars, sheltered picnicking and safe wandering for children.

Little Stony Creek in the adjacent Recreation Reserve D contains a gully of beech trees surrounded by secondary native shrubland which has suffered through a number of past land clearance burns in the area.

There exists an opportunity to create a 1400 m walk from the foreshore parking area, through the beech/shrublands on an easy rising ridge of 180 m elevation to Trig G at 532 m which affords excellent views both up and down Lake Wakatipu.

iii Shepherds Hut Creek

Although no current need has been identified, it would be desirable to seek an easement or create a marginal strip for foot access along the true right bank of the creek to access the higher lands of the

storal lease which are likely to gain conservation status, and in doing so, establish a southern access point to the Richardson Mountains through Wyuna Station.

iv Glenorchy Airstrip

The Glenorchy airstrip is a Civil Aviation Authority licensed facility and is also in part held under a grazing licence to Wyuna Station.

The present recreational use, apart from aircraft landings, is horse riding (including concession trekking) and foot access to the adjacent lake foreshore and Blanket Bay by picnickers and anglers.

v Recreation Reserve C - Lake Terraces

The terraces have until recently experienced minimal public use, the cause of which is attributed to the "farm-like" appearance which discourages "public" access to and across them.

Consequently, public use of the reserve has been limited to:

- horsetrekking; and
- local school picnic and sports days.

vi Glenorchy Lagoon

The status of the body of water immediately north of Glenorchy is designated wildlife management reserve, and abuts Wyuna.

The views of the lagoon and river flats are panoramic and much photographed by travellers from the Routeburn road.

Present recreational use involves:

- angling;
- water-fowl hunting (seasonal);
- limited opportunities for wander at will; and
- photography.

The community walkway project currently under construction will introduce many more people to and across the reserve by means of a raised boardwalk across the wetland and water body.

The present reserve boundary on this side lies too closely to the water's edge to allow good public access. High water levels make it difficult for people to walk within the legal boundary. Stock (cattle and sheep) have unimpeded access to the water's edge.

An adjustment to the reserve by extending the boundary an additional 20-40 m up the side of the hill would allow:

- erection of a practical fenceline for stock exclusion; and
- sound foot (walk standard) access through the reserve.

The Downs Lagoon is periodically used for water-fowl hunting.

Recreation Access (Refer to Map A)

There are formed legal roads, ie, the Glenorchy-Queenstown road and the Glenorchy-Paradise road which provide access to the lower parts of the property. An unformed legal road branches off the Glenorchy-Paradise road and terminates on the lease boundary midway between Trig C and Precipice Creek. This road could provide public access to any land retained by the Crown for conservation purposes in the Precipice Creek area.

There are no unformed legal roads within the lease boundaries.

The only watercourse currently with a marginal strip is the upper Stony Creek in the Shotover catchment. Shepherds Hut Creek, Little Stony Creek, Stone Creek, Buckler Burn and Precipice Creek all warrant consideration for marginal strips.

3 MANAGEMENT CONSIDERATIONS

a Wild Animals

i Goats

There is a medium to high population of goats in the Precipice Burn and Buckler Burn catchments. During a recent helicopter monitoring run in good conditions (late summer, fine weather) 100 goats were counted in 12 minutes' flying time through the upper catchments of the above creeks. In April 1995, a DOC search and destroy helicopter operation accounted for more than 700 goats in the Buckler Burn in three hours' flying time. Recreational shooting (at the discretion of the runholder) has helped controlled goats in the lower regions of this property, but has forced goats in more difficult country and into the buffer zones around Mount Aspiring National Park.

Goats occupy the whole of the property except for the lower country around the road faces. they also inhabit the Buckler Burn and Precipice Burn Gorges. Goats have been seen at 2000 m during monitoring operations. This area is periodically monitored due to its closeness to the buffer zone.

ii Deer

A small population of fallow deer inhabit the lowland flat areas around Stone Creek. Fallow deer occasionally occur in the Buckler Burn bush areas. Fallow deer are not a high country deer and prefer low, parkland type habitat. The population would need to be monitored and controlled, if necessary, in the bush areas of the Buckler Burn.

Red deer occur infrequently in this area but are not in sufficient numbers to require monitoring.

iii Chamois

Chamois are scattered throughout the Richardson Mountains and are monitored in conjunction with the goat control operations. They could be controlled by helicopter operations and recreational hunting.

Animal Pests

i Rabbits

Rabbits occur in most of the lower regions of this station. Rabbits are presently increasing in the Glenorchy area. Control measures would depend on the type of country DOC might acquire from completion of tenure review.

ii Possums

Possums inhabit most of this country and some commercial fur trapping has kept numbers in check. However, possum damage in the regenerating beech in the Buckler Burn is quire prominent and this is linked to limited food sources during winter and possum density. Any increase in possum numbers in this catchment would lead to retardation of the regenerating beech through die-back and allowing disease and fungi to attack the beech trees. This pattern, coupled with stock and goats, would inhibit the natural cycle of the beech forests and could also cause the forest area to shrink.

The small forests of beech on the Richardson Mountain range are under threat from this type of pattern, more so that the western side of Lake Wakatipu where forest remnants tend to be much larger.

iii Hares

Hares are prevalent over the whole area, but not in the numbers evident on the western areas.

iv Predators

The visual variety of predators are present and numbers are generally low. However, they could increase following any increase in the rabbit population. Cats, stoats and ferrets could be targeted if they become a Tb threat.

Summary

Problem animals for this station would be goats and possums.

Animals could be controlled by inclusion of the area in the upper Shotover buffer zone and helicopter operations could be extended to cover this area. This would also assist in the monitoring of chamois and fallow deer.

Possums will need to be monitored and commercial trapping encouraged. A small poisoning programme within the beech forest could be another option.

c Plant Pests

The major problem plant is broom, which is extensive around the lower terraces, especially where mining activity has occurred, eg, Buckler Burn and Precipice Creek. It is unlikely to pose any serious threat to conservation interests as these interests in these locations tend to be limited to beech forest margins.

Wilding pines are scattered lightly over the terraces south of the homestead and are unlikely to constitute a problem of any consequence.

potential problem plant species is Spanish heath. Whilst relatively localised at present, monitoring of any spread that may affect conservation features should be undertaken.

Manuka and bracken are the main problem species for agriculture and control often involves burning.

d Fire

The property can have a high fire risk during dry periods in summer. Any burning of vegetation for farming purposes in close proximity to beech forest remnants needs to be undertaken with care. DOC is the rural fire authority for reserves and other conservation lands, but most of the property is administered by the Queenstown Lakes District Council. Burning within 1 km of state areas, ie, conservation lands, requires a permit from DOC.

e Catchment Board Run Plan

In June 1974, a soil and water conservation plan was approved for Wyuna. A condition of the plan was that 8900 ha of Class VII and Class VIII land was to be destocked and surrendered from the pastoral lease. provision was made in the run plan for 150 cows to be grazed behind the retirement fence in the Buckler Burn and Wallers Creek for three months. This was later agreed to be reduced to 110 cows for three months. Because of the practical difficulties of getting cattle into this area, the grazing utilisation was changed to 1400 dry sheep for two summer months between late January and mid April in periods of critical feed shortage caused by prolonged drought. This emergency grazing was to have been authorised by way of a section 67(2) Land Act special lease following surrender.

Surrender was subsequently found to be legally unenforceable and no special lease was issued. The land remained as pastoral lease but retired with provision for the above emergency grazing.

f District Plan Zoning

The property is covered by the combined Queenstown Lakes district plan and is located within two zones:

i Rural H (Historical) Zone

This zone covers that part of the property east of the Richardson Mountains main ridge and contained within the Shotover catchment. The zone recognises areas of major historical interest and significance in the district and the zone policy emphasises preservation and protection of historic features by limiting human activities to farming and mining under certain conditions.

Whilst the historic significance of the Shotover is not disputed, the Wyuna portion of the catchment does not appear to contain any historic sites.

ii Rural (RMA) Mining Zone

This is a special zone which recognises the scheelite mining activity in the Glenorchy area and includes the balance of the property west of the Richardson Mountains. Mining may be a predominant or conditional use depending on the scale of the operations proposed. It is acknowledged that some land contained within the zone would be subject to the conservation controls of the Rural C zone if the RMA zone had not been applied, and that the physically sensitive areas will be protected by the land administering agency.

predominant uses ordinances limit the size of any mining activity, control any roading proposals, protect bush areas from disturbance and ban stockpiling of tailings in natural watercourses and provide for the applicant to rehabilitate land.

g Future Use of DOC Lands Occupied by Wyuna

A pre-condition of the lessee agreeing to enter pastoral lease tenure review is the requirement for some certainty and security of occupation of these lands. The DOC lands are all at low altitude and are located close to the centre of farming activity. Due to their location, topography and betters soils, they have largely been extensively developed, some to the point of having well established shelterbelts and high producing pastures for production of winter feed and finishing stock. They are currently an integral and essential part of the Wyuna farming enterprise. The balance of the easier downlands on the property are being progressively developed and will in time reduce the reliance, at least in part, on the DOC lands. Several buildings, eg, a hay barn, are located on DOC land, as is the Glenorchy airstrip. The latter has basic facilities only, namely, a cleared strip, windsock and access road, but is recognised as meeting the local community's needs. The farm manager's house is located on a separate title within Recreation Reserve D. This title has no legal access and an easement for access over the reserve land is likely to be required.

The DOC lands are located in close proximity to Glenorchy township.

The Glenorchy community recreation needs have outstripped the ability of the township domain to provide for the variety of existing activities that occur there. The community needs have occasionally been met by use of some of the Wyuna occupied DOC reserve lands and there is mounting pressure for some recreational areas to relocate. An expansion of recreational interests is developing in line with the growth of the township. There are virtually no alternative locations for community recreation other than the DOC lands occupied by Wyuna.

In order to enable the pastoral lease tenure review negotiations to proceed, it will be necessary for DOC to carefully consider resolution of competing interests for these lands and establish a position with regard to the future use of these lands. A separate exercise has been done by DOC to identify existing and potential recreation requirements involving these lands as well as any other conservation values present.

Areas involved include the following:

i LGR 677

Stewardship land being part bed of Buckler Burn adjoining Section 17 and 18 and part Run 346, Block IV, Glenorchy survey District. Area - 14.54 ha. Licence expired.

ii R 49

Part Recreation Reserve D between Buckler Burn and Section 16, Block IV, Glenorchy Survey District. Area - 29.441 ha. Licence expires on 31 December 1995.

iii R 48

Part Recreation Reserve D, Blocks IV, V and VII, Glenorchy Survey District. Area - 150 ha. Licence expires on 31 December 1995.

S 23

Section 23, Block IV, Glenorchy Survey District. Area - 4.315 ha. Unlicensed but occupied.

LS 158

Stewardship land between Recreation Reserve D and Buckler Burn, Block XXI, Town of Glenorchy. Area - 3.4398 ha. Licence expired but running on.

NB: There is an additional area of approximately 8 ha occupied and grazed but not licensed, being part Recreation Reserve D, located south of the airstrip, ie, the balance of the terrace between the lake and the Glenorchy road.

4 CONSERVATION PROPOSALS (Refer to Map B)

There are a number of key areas of conservation interest located within the pastoral lease that are described in various sections of the above report. In summary, these are as follows:

a Richardson Mountains Retired Land

High landscape, recreation and nature conservation values.

b Mt Judah/Mt McIntosh

Cultural and natural landscape, recreation, historic - especially sites 5, 6, 10, 13 and 14.

c Beech Forest/Shrubland Remnants

Notably in Precipice Creek and Buckler Burn Gorges and smaller pockets along Shepherds Hut Creek, Little Stony Creek and Stone Creek.

Recreation, landscape, historic and nature conservation values.

d Wetlands

The Downs Lagoon and associated wetland drainage system - conservation of wetland and wildlife management.

Glenorchy Lagoon - widening of lagoon margin for recreation/interpretation and buffering from stock damage.

e Moa Hunter Site

Importance to iwi, archaeological value.

f Goldmining Site

Historic, recreation.

g Recreational Access

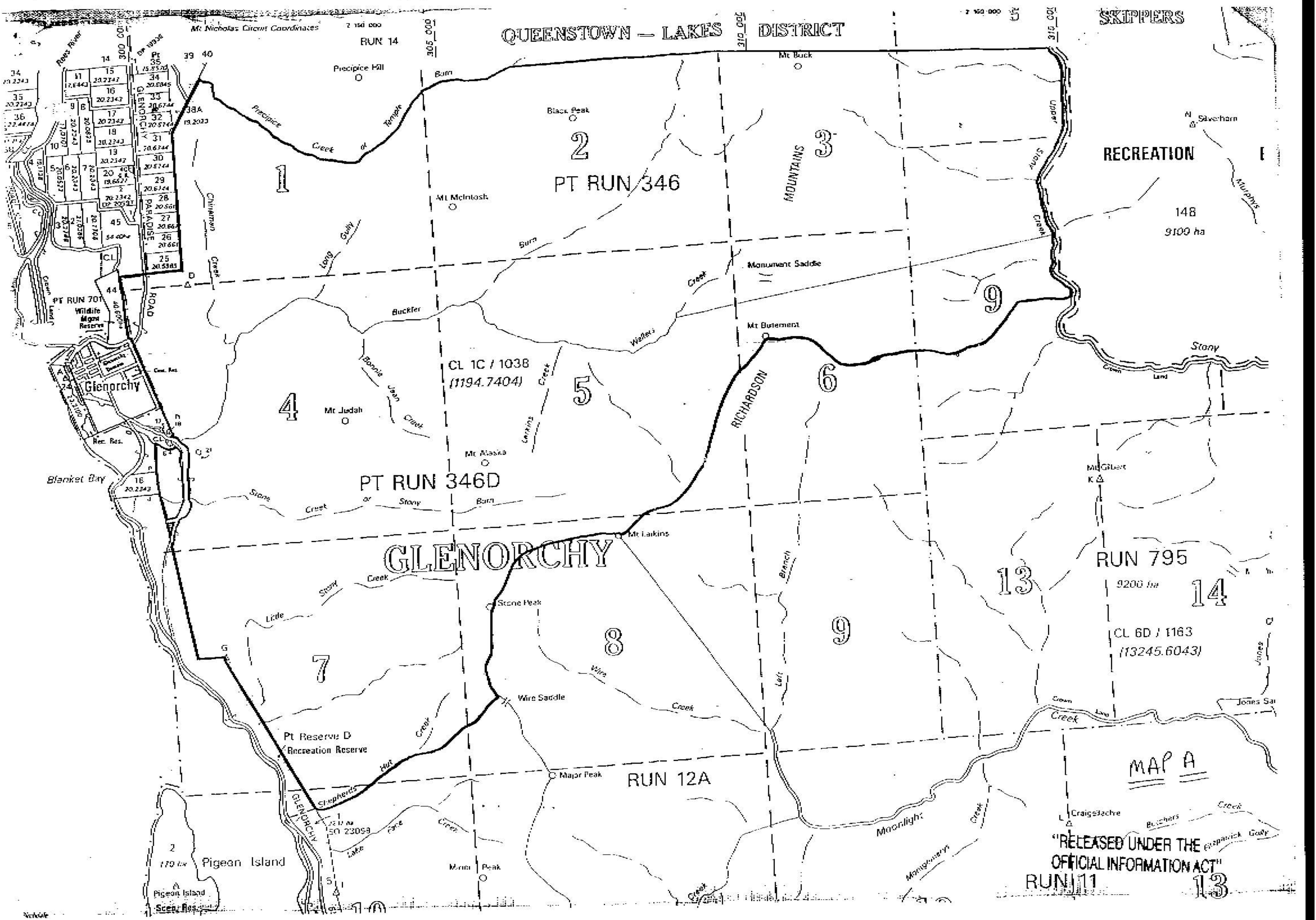
Marginal strips required along all watercourses over 3 m wide:

Mt Judah road possibly with a realignment of the section from the Glenorchy road to the state battery; and

- easements where marginal strips are inappropriate to provide access to any of the above (except for the moa hunter site).

Negotiations on pastoral lease tenure review should endeavour to achieve protection and public access where indicated to these areas of conservation interest.

T Perrett
Manager PNAP/Pastoral
for Regional Conservator



QUEENSTOWN — LAKES DISTRICT
SKIPPERS
Mt Nicholas Circuit Coordinates
RUN 14
Precipice Hill
Mt Buck
Black Peak
PT RUN 346
MOUNTAINS
RECREATION
148
9100 ha
Silverhorn
Murphys
Upper Stony Creek
Precipice Creek or Temple Burn
Mt McIntosh
Long Gully
Chinaman Creek
Monument Saddle
Walters Creek
Buckler Burn
Mt Butement
CL 1C / 1038
(1194.7404)
Bonnie Jean Creek
Larkins Creek
Mt Judah
Mt Alaska
PT RUN 346D
Stone Creek or Stony Burn
RICHARDSON
Stony
Crown Land
Mt Gilbert
Mt Larkins
GLENORCHY
RUN 795
9200 ha
CL 6D / 1163
(13245.6043)
Stone Peak
Little Stony Creek
Left Branch
Wire Creek
Wire Saddle
Jones Sa
Crown Land Creek
Pt Reserve D
Recreation Reserve
Hut Creek
Shepherds
Major Peak
RUN 12A
MAP A
Craigsdache
Butchers Creek
Moonlight Creek
Lake Face Creek
Minor Peak
Pigeon Island
170 ha
Pigeon Island
Scenic Res
"RELEASED UNDER THE
OFFICIAL INFORMATION ACT"
RUN 11
SO 23059
Glenorchy
PT RUN 701
Wildlife Mgmt Reserve
Rec. Res.
Blanket Bay
ROAD
GLENORCHY PARADISE
Rees River
1
2
3
4
5
6
7
8
9
9
13
14
13
10