

CONSERVATION RESOURCES REPORT

FOR THE COMMISSIONER OF CROWN LANDS

GLENCOE PASTORAL LEASE

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PART 1: INTRODUCTION

Glencoe Station is a pastoral lease comprising 8464.89 ha situated on the southern end of the Crown Range. The Arrow River and Soho Creek form the western boundary and the Cardrona River the eastern boundary. 640 ha of freehold land on the Crown terrace is run in conjunction with the pastoral lease.

Glencoe Station is located in the Shotover Ecological District. No comprehensive Protected Natural Areas Programme survey has been carried out in this ecological district. However, a variety of specialists from the Department of Conservation have visited this property as part of this tenure review exercise.

It is of some significance that while tenure review investigations are being conducted, Cardrona Ski Resort Ltd is seeking to expand their operations from their existing skifield over the ridge into the headwaters of Soho Creek on Glencoe Pastoral lease.

PART 2 : CONSERVATION RESOURCE DESCRIPTION AND ASSESSMENT OF SIGNIFICANCE

1. LANDSCAPE

A formal landscape investigation has not been conducted as part of tenure review investigations. However much of the property clearly contains exceptional landscape qualities.

The majority of the pastoral lease is run as an extensive pastoral operation with few fences and farm tracks. Grazing management is achieved principally through frequent mustering by horseback. This practice has minimised the visual impact of grazing on the landscape. Above approximately 1100 metres a.s.l there is an almost completely intact cover of *Chionochloa* species (predominantly *C.rigida* which grades into *C.macra* at higher altitude) creating an homogenous landscape which conveys a great sense of space. Lower cultivated and OSID country grades into tussock grasslands without an abrupt visual demarcation.

2. LANDFORMS AND GEOLOGY

2(a) Topography

The broad scale topography of Glencoe is relatively simple. The Crown Range peaks of Crown Peak (1735 m), Mt Sale (1708 m) and Mt Cardrona (1938 m) form the backbone of the property. On the eastern side of the range three major catchments drain into the Cardrona Valley (altitude 680 m).

In the west, Brackens Gully is the largest catchment draining into the Arrow (480 m). Four smaller catchments drain into the upper portion of Soho Creek. The majority of the property comprises fairly uniform moderately sloping terrain; however the lower portion of Soho Creek and the Arrow are gorgy and very rugged. Flat or gentle areas are confined to the upper Soho Creek valley floor and a small area at the head of New Chums Gully.

2(b) Geology

The underlying geology of Glencoe is well foliated quartzo-feldspathic schist. Underlying weaknesses in rock structure and glacial movements have greatly influenced the topography of the pastoral lease. During a glaciation earlier than the most recent one, an ice tongue of the Wakatipu Glacier “extended for some distance down the Kawarau River, and subsidiary tongues pushed inland up the Arrow and Wakatipu Valleys” (Barrell, DJA; Riddolls, PM; Thomson, R .1994. Surficial Geology of the Wakatipu Basin, Central Otago. NZ. Institute of Geological & Nuclear Sciences. Science Report 94/39). Evidence remains in the form of glacial till, remnant river terraces, (the largest being the Crown Terrace), lake sediments deposited when the ice tongue damned the Arrow river and some of its tributaries (including Brackens and New Chums Gullies) and the ice sculptured topography of German Hill. Partly collapsed solifluction slopes occur on steep faces above the Crown terrace and Cardrona Valley.

An area within the Cardrona Catchment (Grid Reference NZMS 260 Series F1/ 909 783) has been identified as a Geopreservation Site (Geopreservation Inventory compiled by the Geological Society of New Zealand inc (1988)). This site in Maori Gully (see Map 2) comprises the “only Central Otago example of late Quaternary faulting being positively identified within landslide deposits. Trenching has exposed a reverse fault with attitude 020°30'NW. The .5km trace crosses a composition fan surface and landslide. At least two events have occurred on the fault, as the scarp varies from 2 to 4 metres across younger and older fan surfaces”.

2(c) Soils

Soils of the property are typical of the region. Alpine steepland soils are found above 1650 m, Dunstan steepland and Carrick soils on slopes above 1000 m, and Arrow steepland soils dominate below 1000 m in the Arrow and Cardrona Valley. Naseby and Gladstone soils are found on terraces and lower faces in the valleys.

2(d) Erosion

As the majority of the property is well vegetated, active erosion is minimal despite some 80% of the property having a land use capability classification of 7. Small areas of class 8 country are present at high altitude.

The intact nature of the landscape contributes to the areas exceptional landscape qualities.

3 CLIMATE

The homestead receives approximately 710 mm of rainfall per annum, while the tops and catchments receive considerably more. Much precipitation falls as snow on the Crown Range during winter months. The flanks of the Crown Range behind Cardrona skifield are snow covered for up to seven months of the year. Periods of fine frosty winter weather and warm dry summers are the norm. The climate contributes to the areas tourism/recreational appeal.

During summer months thunder storms are not uncommon in the hills. These events can cause the Arrow River to rise rapidly, cutting off farming and recreational access.

4 VEGETATION

Some 5500 ha of the 8500 ha which comprises Glencoe pastoral lease supports predominantly indigenous vegetation.

The flora of the property can be divided into four major communities:

Shrubland: This community is largely confined to the western part of the property below 800 m a.s.l. The steep sides of the Arrow and Soho rivers and the lower sections of New Chums and Brackens Gullies support a dense mosaic of shrubland with scattered areas of trees. This shrubland is dominated by *Rosa rubiginosa* (sweet brier) and *Discaria toumatu* (matagouri). Other shrub species include *Coprosma* spp., *Coriaria abovea* (tutu), *Carmichaelia arborea* var. *arborea* (NZ broom), *Rubus ciscoidioides* (bush lawyer) and *Hebe salicifolia* (koromiko). Interspersed are a variety of exotic species including, lupin, gooseberry, blackberry, apple trees, pine trees, plums, elderberry, sycamores and black poplars. In some areas, especially along the face above the Arrow and around Tobins Track, sycamores and black poplars dominate the landscape. New Chums Gully below the shearing shed is almost completely covered by exotic trees.

The more inaccessible gullies have acted as refuges for a diverse range of native shrubs that were probably widespread before they were displaced by an increasing frequency of disturbance (primarily fire) associated with European settlement. A narrow gorge at the head of New Chums Creek is a typical example of such a refuge. Native species present include *Dracophyllum uniflorum* and *D. longifolium* (turpentine scrub), *Astelia nervosa*, *Olearia nummulariifolia* (shrub daisy), *Carmichaelia petrei* (native broom), *Gaultheria antipoda* (bush snowberry) and *Hoheria lyalli* (mountain ribbonwood).

Areas of more modified remnant shrublands are present throughout the lower slopes of the property. Of particular note is the presence of *Sophora microphylla* (kowhai), behind the homestead. In the Cardrona Valley the lower catchments support a mix of brier and matagouri on the lower terraces, fans and along stream margins. The upper reaches of Soho Creek often support an attractive fringe of mountain ribbonwood, *Phormium cookianum* (mountain flax) and *Olearia odorata* (scented daisy tree).

Modified Low - Mid Altitude Grassland: This broad vegetation zone essentially occupies land below 1000-1100 m. Approximately 2000 ha of the zone has received AOSTID at some time, although large areas have not been maintained in recent years. The freehold land and some of the pastoral lease near the homestead has been intensively farmed for many years.

The upper portion of the zone is predominantly vegetated by a mosaic of short and tall tussock (*Chionochloa rigida* - narrow leaved snow tussock) with tall tussock forming a greater component on cool aspects. With decreasing altitude short tussock species (primarily *Festuca novae-zelandiae* - fescue tussock) increase in dominance. Inter tussock species include *Hypochoeris radicata* (cats ear), *Trifolium repens* (white clover), *Anthoxanthum odoratum* (sweet vernal), *Agrostis capillaris* (browntop) and *Wahlenbergia albomarginata* (harebell). *Hieracium pilosella* (mouse-ear hawkweed) is locally common on sunny dry areas, especially on west facing aspects at the southern end of the property which have been subject to a series of documented accidental burns over past decades. *Hieracium lepidulum* (tussock hawkweed) is present on damper sites, primarily at the northern end of the property. Scattered throughout this lowland grassland are *Cassinia leptophylla*, *Melicytus alpinus* (porcupine shrub), brier and matagouri shrubs.

An area of particular note is the eastern flank of Mt Beetham which supports a strong cover of *Poa cita* (silver tussock) and a vigorous inter tussock cover of introduced herbs and grasses..

In the upper Soho Creek area, narrow-leaved snow tussock cover extends as low as 800 m a.s.l. Remnant plants are scattered on the flats.

Montane/Alpine Tall Tussock Grassland: The majority of Glencoe (in excess of 4000 ha) is clothed in a strong cover of narrow-leaved snow tussock. While tussock stature and density varies with aspect and altitude, in general cover is exceptional and reflects a farm management regime orientated towards maximising vegetative cover. In many areas few inter tussock species are present under a dense tussock canopy. Between 1300 and 1400m a.s.l, narrow-leaved snow tussock gives way to *Chionochloa macra* (slim snow tussock). Extensive hybridisation occurs between the two species within the transition zone. A continuous cover of slim snow tussock extends to the crest of the Crown Range in many areas.

Within what appears from a distance to be an homogenous tall tussock landscape, various sub-communities occupy sites where tussock cover is sparse or absent. These sites are probably of both natural and induced origin; for example areas with poor drainage, poorly developed or eroded top soils, favoured grazing sites and sunny aspects subject to past burning. Drier ridges tend to support a cover of *Poa colensoi* (blue tussock) and extensive mats of *Dracophyllum uniflorum*, *D. prunum* and *D. muscoides*. Numerous other species, whilst forming little cover, are common amongst the tall tussocks. These include *Brachyglottis bellidioides*, *Wahlenbergia albomarginata*, *Chionohebe densifolia*, *Celmisia lyallii* (false Spaniard), *C. gracilentia* (dainty daisy), *C. densiflora* (mountain daisy) and *Hebe buchananii*.

Exotic grasses and herbs are largely absent from this zone although isolated hawkweed plants (*H. lepidulum* and *H. pilosella*) are widespread.

Woody native shrubs are scattered throughout the lower reaches of this zone. Species include *Cassinia leptophylla* (cottonwood), *Corallospartium crassicaule* (coral broom), and *Dracophyllum uniflorum*. *Aciphylla glaucescens* is scattered throughout the zone while *A. lecomtei* and *A. kirkii* occur higher altitudes. In the high basins under Mt Cardrona seepages and wet areas formed from the melt of late lying snow banks support *Shoenus pauciflorus*, *Craspedia* spp., *Gnaphalium mackayi* and *Psychrophila obtusa* (previously *Caltha*). Large tussocks resembling *Chionochoa flavescens* (broad leaved snow tussock) were observed in this area. Other grasses noted in this area were *Agrostis muelleriana*, *Poa colensoi*, *P. pygmaea* and *Rytidosperma pumilum*.

Cushionfield: Only small areas of cushionfield vegetation are present on Glencoe. Extensive cushionfields are mostly confined to the ridge above Blackmans Creek, northwards towards Mt Cardrona, and at the top of some high basins. The botanical composition of cushionfields is highly variable according to site. Common species observed were *Dracophyllum muscoides*, *Raoulia hectorii*, *Kelleria childii*, *Chionohebe myosotoides*, *Hectorella coespitosa*, *Lepinella goyeni*, *Luzula rufa*, *Celmisia laricifolia*, *Gaultheria depressa*, *Agrostis muelleriana* and *Abrotanella inconspicua*. Hollows surrounding the cushionfield contain *Chionochoa macra*.

In general the montane and alpine flora is in a very intact state. Much of the tussock grasslands (especially on neutral to shady aspects) alpine wetlands and cushionfields are in exceptional condition. Years of conservative management have resulted in a flora which is likely to resemble the vegetation cover which covered much of this ecological district prior to pastoral use.

5 FAUNA

Vertebrates: No distinctive or rare fauna are known from the area. Shrublands host blackbirds, sparrows, finches and tomtits. Quail are common around the shrubland margins, while grasslands host skylarks, keas, pipits and the occasional NZ falcon. Rivers and creeks are habitat to waterfowl including numerous paradise ducks.

Aquatic Fauna: Brown trout are common and are virtually the exclusive fish inhabitant of the main rivers, creeks and tributaries on Glencoe. The upper reaches of streams where brown trout are absent do retain intact native freshwater invertebrate communities. Koaro (*Galaxias brevipinnis*) were recorded from Maori Gully, a tributary of the Cardrona River.

Invertebrates - Entomological Values: Overall the western slopes of Mt Cardrona are significantly richer in insect species than the eastern side of the Crown Range. This is not just a reflection of the lack of ground disturbance in comparison to the slopes of Cardrona skifield. The wetter slopes of the darker faces naturally support a richer flora which has subsequently been subjected to less modification through burning, grazing and skifield development. A wide variety of microhabitats were noted to be in exceptionally pristine condition.

Numerous species of *Larentiine* moths (typically diurnal), were found on the property. Australasian mountains generally have a large fauna of these moths, comprising over 250 species. Larvae feed on various herbs. Examples from Glencoe Station are:

| | |
|--------------------------------|----------------------------|
| <i>Paranotoreas brephosata</i> | <i>Asaphodes declarata</i> |
| <i>Arctesthes catapyrrha</i> | <i>Asaphodes exoriens</i> |
| <i>Dasyuris catadees</i> | <i>Asaphodes clarata</i> |
| <i>Aponotoreas insignis</i> | <i>Asaphodes omichlias</i> |

The highlighted species are not found on alpine areas further east, including the eastern Cardrona slopes. They are characteristic of the Richardson Mountains and west Otago alpine areas.

The larger diurnal *Hepialid* moth *Aorau senex*, a circum Lake Wakatipu endemic is common on Glencoe. Grey and gold males were common over wetlands while the black and white flightless females lay bedraggled on the ground amongst sedges and mosses.

Another nine diurnal moth species were found. The presence of the tortricid, *Ascerodes prochloru* is of biogeographic significance as it is a western species.

Among the aquatic caddis and stoners, the orange *Tiphobiosis fulva* and brown *T. montana* are uncommon caddis with predatory larvae. The former is known from very few sites in western Otago but is extremely common on Glencoe over *Schoenus* wetlands (which were noted to be in excellent condition). The flightless stoner *Zelandoperla pennulata* (endemic to Central Otago mountains) is also common. Other stoners observed were the recently named *Zelandobius macburneyi* and *Z. patricki*, the presence of which is indicative of near pristine alpine streams.

In general the invertebrate fauna and aquatic fauna in the upper reaches of streams reflect an environment where natural ecosystems are in an exceptionally intact condition.

6. HISTORIC VALUES

6(a) Maori History

No Maori archaeological sites are known on Glencoe pastoral lease; however the Cardrona Valley would have been an important route between Lakes Wanaka and Wakatipu.

6(b) Pastoral History

The historic structures on the run which are not associated with mining include the Glencoe farmstead as a whole, centred around a stonemason's hut. The latter was built by Peter Henderson in the 1870s, and local informants consider that the house and farm buildings were not built until around 1906. William Paterson and his family farmed the Glencoe run from Ayrburn on the Arrowtown Lake Hayes Road from 1874 to 1913, and would not have required a big house on the run. A woolshed, stables and a cottage for workers would have been useful, and some of the farm buildings could have been built in the nineteenth century.

The buildings are not legally protected in any way but are valued by their owner. The farmstead is an important component of the local landscape as seen along the edge of the terrace. Under the draft district plan it lies in an area of landscape importance (Queenstown Lakes District Plan, Map 11b). The plan provides objectives and policies for managing the impact of structures in such landscapes (Part 4, Sec 6).

The only other farm buildings on the lease are the pair of musterers' huts in Soho Creek, one an old stone hut which still has its roof and the other a simple corrugated iron hut which is still habitable. They are of only moderate historic value in their own right, but like the farmstead have landscape value.

6(c) Gold Mining History

The catchment of the Arrow River lying on the western half of Glencoe is covered by a network of races which link the gold workings in the Arrow itself, Brackens and New Chum Gullies and those on the Crown Terrace. The Cardrona gold field is geographically separate, and consists of a long string of small workings, with a small coal pit worked to fuel dredges working the Cardrona River.

The most important historic sites on Glencoe Station are the workings left by the early gold mining of the 1860s and 1870s. Gold rush sites are relatively uncommon, usually having been destroyed by later sluicing, modern gold mining or farming activities. The earliest sites are in the Arrow River, especially near the confluence of Soho Creek and at Rule Britannia Terrace, in Brackens and New Chum Gullies, and in the Upper Cardrona.

The mining on Glencoe can be divided into four periods ---

- 1) The gold rush of October 1862 to March 1864.
- 2) Early mining from 1864 to 1877.
- 3) Tunnelling and hydraulic elevating from 1888 to 1910.
- 4) Subsidised mining during the 1930s depression.

The bed of the Arrow River must have been completely worked over in the 1860s, except for the silted-up area above the Falls which was mined around the turn of the century. Very large amounts of gravel deposited by floods have covered nearly all traces of mining on the river bed and the lower terraces, leaving only the 700 metres of terrace on the true left below the Soho Creek confluence, Rule Britannia Terrace, and MacGregor and Low's terrace near Arrowtown. Coopers Terrace has been damaged more by bulldozing than by the river. It is very unlikely that any of the gold rush workings have survived, but there are several sites which represent the second and third periods. Depression sites are likely to exist but they are almost impossible to separate from the earlier mining.

The workings in the Arrow below Soho confluence include very early workings, work which continued into the 1870s, activities ancillary to the Arrow Falls claim in the river bed, and 1930s

workings. The material worked was old river bed gravels left by the Arrow on terraces which were sluiced leaving complex tailings. Also in among the gravels at least three lodes were tunnelled, both in the early phase by the Sons of Fortune Company near the irrigation intake and by men employed by William Paterson in the 1930s. These tunnels were not relocated. A large stand of trees marks the use of the area for habitation during all four periods.

Nearby on the site of the irrigation intake, a major and successful tail race tunnel was driven through hard rock below an old slip which had created a cascade referred to as the Arrow Falls. The slip dammed the river which silted back upstream for two kilometres with 60 feet of overburden. The tunnel, 925 feet long, took eight years to build, but it enabled miners to sluice away the river bed upstream, work which took another 17 years to complete. The manager of the whole scheme was David Miller, whose brother James bought the almost completed tunnel at a mortgagee's sale. Begun about 1887, up to 10 men were constantly employed, and they must have formed a long-lived settlement in the stand of trees below Soho Creek, known as The Billy. (The old name of Soho Creek was the Roaring Billy.) The only substantial house ruin is a stone house perched on a shelf of rock near the intake. It has not been dated, but it most likely belonged to the eight years of tunnelling. A rock-walled garage beside the road may have been built to house the steam crane used to build a massive wing dam up the centre of the river above the tunnel entrance. The tunnel itself has been buried and its location is not known.

The race and reservoir systems for all these workings, though damaged by erosion, are still discernible. The visible ones most likely belong to the period around the turn of the century. A major race was brought out of Soho Creek and carried right down the true left of the Arrow to provide pressure for hydraulic elevating on the flats beside Arrowtown in 1899. About 10 companies tried and failed to reach down to the bed of the Arrow on these flats, and when the last one gave up in 1903, they sold the Soho Creek race to the Arrow Falls scheme up the river. This four mile long race at about 640 m a.s.l is double for most of its length and originally included nearly a mile of fluming and four major siphons. Tunnels and revetments are visible all along its length.

Rule Britannia Terrace at the big meander of the Arrow has well defined, stacked tailings on a high terrace, known to have been worked from 1866 to 1876. In among the tailings, there is a prominent but very damaged stone chimney of a medium sized house. It is an unusual hybrid, projecting from the back wall on one side only, as if the builder did not quite have the skills to build within the thickness of the wall. Big Beach below the terrace in the curve of the river was worked over before 1866 but has been washed flat by the river. An hydraulic elevator worked the beach from 1901-1903. Scoles tunnel had been put through a point just upstream of the terrace in 1888, and elevated the river bed gravels using a race built before 1868 from Brackens Gully. The 1901

elevator also used the Brackens Creek race, but neither venture was successful, though Scoles tunnel has survived and is still open. The race from Brackens Gully was used by the Smiths in 1932 and sold to the Crown, which may still hold the license (2759Ar). The terrace workings are clearly visible from the Macetown Road, and, since they are not as overgrown as other tailings, they are pointed out to tourists going to Macetown.

Downstream the only trace of workings are a few damaged tailings on McGregor and Low's terrace, which do not look like gold rush pot holes but later sluicings and stacked tailings. McGregor and Low were co-discoverers of the Arrow gold along with Fox who is commemorated on a cairn further downstream.

The other great works in the river are the road and the irrigation pipeline. The road was started in 1881 and completed in 1884, involving much revetment work where it climbs the sides of the gorge. It was built to provide access to the big quartz mines at Macetown, and has never been surveyed. The irrigation pipeline was built between 1923 and 1931, and the trucks used to carry the pipes were the first motorised transport on the road. The weir for the intake was built at the head of the cascade known as the Arrow Falls.

On the Crown Terrace an agricultural leasehold area belonging to a man called Baker was found to still have gold bearing deposits and, having been resumed for mining in 1892, was worked for about three years. The workings are a set of complex sluice hollows cut into white gravels, with some stacked tailings, using at least the 1872 race (1032Ar) and maybe some of the other five which are part of the present live race system (Appendix 1). The Baker workings are on Glencoe freehold land, though surrounded by pastoral lease, and are included here because they used the system of races on the pastoral lease. The water was fed to a substantial reservoir suitable for ground sluicing. By 1910 the race was extended past the Baker workings, along the edge of the terrace to elevator workings on the Arrow flats beside and below the town. Fealy and Hay are known to have used water off the Crown Terrace in 1904, and it may have been used by the other elevators on the flats in the 1890s. It is still used as an irrigation race and is based on six different historic mining licenses.

The Baker workings are protected under the Historic Places Act. They are not particularly significant as ground sluicings but, along with their race systems and reservoir and the races running to Arrowtown, they form part of an historic landscape that is readily accessible to visitors to Arrowtown.

The last two or more periods of glaciation have produced a complex topography in New Chum and Brackens Gully, resulting in gold bearing deposits lying at 900 metres a.s.l. It is considered that an

ice tongue of the large Wakatipu Glacier pushed up into the Arrow River, damming several tributaries. Lakes or low energy streams developed in the heads of the tributaries, and became places of active gold deposition under finer white sediments. The surface deposits of Brackens Gully are important in understanding the glacial geology of the area. The creek in Brackens Gully changed course so suddenly that it left a spectacular narrow rock rib to one side, standing 60 m high.

The human history of New Chum Gully is complex. In the gorge near its confluence, the mark of a siphon for the big race from Soho Creek to the Arrow Flats, built about 1899, is visible on the true right. On the true left there is an adit and small water race which may belong to efforts in 1864 to mine a lode which runs through to Arrowtown itself. Where the gully flattens out on the edge of the Crown Terrace, the farmstead for Glencoe is tucked behind the shelter of Mt Beetham. On the south side of Mt Beetham is the ruin of a large stone cottage, built in 1869 by Gilbert Mackie one of the first farmers on the Terrace. Strategically placed on the pack track into Brackens Gully, the large fireplace was used by Mrs Mackie to bake bread for the miners.

Continuing up New Chum Gully there are medium to large sets of tailings, one at the foot of the upper gorge and one above the cliffs at the entrance to the gorge (both on the true right), and a complex of mound and hollows, sluice faces, tailings and short races in the head of the gully. The site at the foot of the gorge may be the one mentioned by the goldfields warden as worked in 1876. Running up the true left of the gorge is a neatly benched pack track, probably dating from the 1860s.

The sites in the head of the valley are mostly 1860s to 1876, but the buildings of a small hamlet have been used until recently. A wooden shed which appears to have been a stable, probably dates from no earlier than the 1930s depression mining. A stone mound close to it marks a house site. Further north there is an impressive chimney of similar design to Mackie's chimney with the remains of a forge in its curtilage. The chimney stands within stone lines marking the foundations of a large and complex house, and the forge is a simple stone platform within the foundations of a small sod hut. Numerous metal objects lie about the forge and chimney. Most are from pipelines, and the only domestic objects are buckets and the front of a coal range inscribed Richmonds Portable Range 1869. Both house sites are associated with the remains of old apple trees. There is plenty of space for tent sites and cob huts which may have weathered away. The live race, which is associated with the Baker sluicings and the elevator workings on the Arrow Flat, runs round the hillside above the hamlet. The upper section of it was built around 1864, and extended to the Crown Terrace but may not have followed the course described in license 1032Ar until the 1890s. Though the line of the race could be said to be an archaeological site, the profile of the race will have been cleaned out and changed since 1900.

The workings in Brackens Gully seem to have been continuous but are divisible into three periods—

- 1) The gold rush workings using only the run of the river from late 1862 to March 1864,
- 2) The early period using short races from 1864 to 1877 when even peat, let alone scrub, for firing ran out,
- 3) The high level workings from about 1877 to about 1910 when large and high races were used to remove large volumes of overburden.

Workings are relatively concentrated in an area of about 2 x 1 kilometres. They show a clear gradation from gold rush mining to settled mining and hydraulic sluicing until around 1910, in an integrated landscape of race systems and workings, with the rock rib providing extra drama. The workings most likely to belong to the gold rush period include the confused mound and hollow tailings alongside the creek on the level terraces upstream and downstream of a prominent rock rib.

A group of stone fireplaces close to the New Chum pass could mark tent sites, typical of the gold rush. The Meander site further upstream may also belong to this period, but the presence of four or five clearly defined hut sites with stone chimneys suggest that it may belong to the second phase. A hut revetted into the hillside is likely to be earlier than two free-standing huts of mud mortared stone, one upstream and the other downstream of the rock rib, the later being more likely to belong the 1870s.

The most distinctive workings of the 1870s lie near the rock rib. The earlier course of the river between the hillside and the rock rib was partially filled with finer sediments. These have been washed away using water from a high race brought round from a side gully. A description of the work of Platow and party in a deep gutter with a "bluff reef" rising 200 feet in front of the claim fits the site well. Platow's claim was worked in 1876, and easier ground back from the creek edge against the hillslope would have been worked earlier. Well-revetted tail races were built through the old tailings out to the creek.

The miners probably did not turn to the higher terraces lying east and north of the river flats until after 1876. They first had to harness every scrap of water, lead it high along the hillsides to a series of reservoirs and dams before blasting out the deep overburden of fine white sediments. The classical C-shaped earth reservoirs are 30-50 m long, and a stone dam up to 4 m high was used to block a gully. Judging by the race systems, the terrace was divided into three major claims on three major spurs, which would fit the warden's report of three sluicing claims of three or four acres at a time being worked for thirty years. A large grove of poplars on the centre spur, no doubt planted to solve the firewood problem, enclose the remains of about five hut sites. There is one lone house site on the southern spur.

The sites in New Chum and Brackens Gullies are easily reached by the pack track which is of interest in itself. The sheltered house sites on New Chum saddle provide an excellent focus for a

picnic and interpretation area. The two gullies probably provide the most visible evidence of the nature of gold rush mining west of Murphys Flat at Macraes. It would be reasonably easy to argue that all the river edge workings and the pack track are pre-1900 and protected under the Historic Places Act, except for the hut ruins, but it would be more difficult to argue that the high terrace workings and their water races are pre-1900. The rock rib is an impressive landscape feature, but not geologically significant. The finer white sediments are significant because of their bearing on the glacial geological history of the area, and further work is needed to determine their exact origin.

The small and heavily overgrown tailings in the Upper Cardrona Valley include true gold rush sites. Most of them are very irregular mound and hollow tailings, which used either the run of the creek or else short side races. The bed of the creek was diverted by narrow ridges from side to side. The workings on the Glencoe side stretch from opposite Tyre Gully to Maori Creek, and tend to be concentrated at and downstream of the confluences of major tributaries. A coal mine, used to supply dredges further down the valley at the turn of the century, lies at 1000 - 1060 m a.s.l. in the head of Coal Creek. It was worked just like gold sluicings, using two high level races.

Though overgrown, these sites are fully visible from the Crown Range Road, and very little damaged. As far as could be ascertained, they are all pre-1900 and protected under the Historic Places Act. They are under threat from the widening of the Crown Range Road, both from the road formation itself and from casual quarrying as has already happened. The coal mine in Coal Creek at 1030 m may be post 1900 and unprotected. It is not a spectacular site, and is comparable to the one on Coal Pit Saddle south of Gibbston at the same altitude.

In summary key historic features are the network of races and gold workings in the Arrow River, New Chums Gully and Brackens Gully, the most important sites being those which date back to an early mining era between the 1860's and 1870's.

7 EXISTING LAND STATUS/ STATUTORY MATTERS

Current land status is depicted on Map 1.

7(a) Marginal strips

Only the Arrow River below the Soho Creek confluence has a surveyed marginal strip. This strip extends below the Glencoe boundary and forms the western boundary of Runs 25/39. The strip hugs the river edge, which is most unlikely to have moved since it was surveyed. The marginal strip has an easement for the Arrow Irrigation Scheme pipeline (Otago Draft Conservation Management Strategy, Vol 4: F41 124), and there is an easement in the Glencoe pastoral lease for the short section of the pipeline that crosses Rule Britannia Terrace.

Upon survey, Soho Creek, the Cardrona River and some other creeks on the property may qualify for marginal strips under Part IVA Conservation Act.

7(b) Roads

Formed legal roads on the pastoral lease are: Tobins Track and the Glencoe Road from Tobins track to State Highway 89.

Formed roads with no surveyed legal line include: the farm road into the homestead from the gate (where it joins Tobins Track) and much of the road into Macetown up the Arrow River. There is no trace in any records of a separate legal strip for the Macetown Road, which is well away from the river's marginal strip between the Soho Creek confluence and a point about 500 m below Rule Britannia Terrace. The obligation of the Queenstown Lakes District Council to maintain the road must depend on the fact that the road was formed and maintained with ratepayers' money by the Arrowtown Borough Council (Transit New Zealand Act Sec 43 (1)). Queenstown Lakes District Council does not receive any subsidy for it, and describes the financial arrangements for it as "loose" (Queenstown Lakes District Council staff). There is no easement for the road on the Glencoe pastoral lease, a requirement under the Act if it is to be a legal road (it and its stone walls and revetments are listed as protected place No.6 in the Draft District Plan). There is a surveyed road line to Macetown but it passes over Big Hill.

When a pastoral lease was issued over Mount Soho in 1982, the Crown reserved the right to adjust boundaries of the pastoral lease without compensation, one reason being to allow for the eventual establishment of a walkway into the Motutapu valley.

Partially formed or overgrown tracks which approximate legal roads are: the old pack track into Brackens Gully via Glencoe freehold and the head of New Chums Gully and the original pack track over the Crown Range into the Cardrona Valley which runs from State Highway 89 along the southern boundary of the pastoral lease (the formation of this track varies significantly from the cadastral lines).

Legal unformed roads are: a route to the northern end of the Crown Range which originates in the Gala Burn and ends on the range crest and a route which climbs onto the southern end of the Crown Range from the Crown Terrace.

In 1977 the Lakes County Council promoted a scheme to open up a route between the Crown Terrace and Wanaka via the Motutapu Valley. This route would have passed through New Chum and Brackens Gully, as a low level alternative to the Crown Range Road (Brian Ahern:per.comm). The line was surveyed and promoted as a less hazardous route in winter. The 'Conservation Management Strategy' identifies as a management issue the development of the potential for a high use walking and mountain biking track linking Wanaka and the Wakatipu Basins via the Arrow valley with overnight accommodation. This is a very different matter from the 1977 scheme, but neither are on road lines with legal status. At present the Queenstown Lakes District Council is negotiating to have the Crown Range Road declared a national highway (Orago Daily Times 4/7/96:13).

7(c) Run Plan

A run plan was prepared for the property in the early 1980s. The plan targeted Glencoe for further subdivision and increased stocking. An extensive 33 km fire-break along the crest of the Crown Range was proposed. This proposal was also never completed, although a farm track was constructed between Crown Peak and Mt Sale.

7(d) District Plan

Glencoe lies within the Queenstown Lakes District. A draft district plan has been prepared for the Council. This plan is currently undergoing a lengthy submission process. In the mean time the transitional district plan remains the principle planning document although council must also have regard for the draft plan.

(i) **Transitional Plan.** Under the transitional plan Glencoe pastoral lease is zoned Rural B. The zone statement for rural B reads "Soils found in this zone have limited cropping value and are suitable for pastoral use. The land in this zone is generally stable hill country and high country which forms a scenic backdrop to the Rural A Zone. It is anticipated that extensive pastoral farming will continue to be the major rural activity in this zone with some commercial forestry."

"The committee policy with respect to hill and stable highcountry land is to maintain and support its function of providing extensive grazing in conjunction with lower lying fertile land in the Rural A Zone. Other uses compatible with scenic values and land stability will also be permitted in the Rural B Zone." Uses specified include a full range of rural industries/community facilities, outdoor recreation and commercial forestry.

(ii) **Draft Plan.** Under the proposed plan Glencoe lies within the rural upland zone. Controlled activities (permitted subject to conditions) in this zone include buildings, earthworks, tree planting and mineral exploration. Discretionary activities include buildings in zones of high landscape importance, mining and commercial recreation activities. Non complying activities include power generation facilities. There are no prohibited land based activities within the zone.

The council may consider applications on a non notified basis for certain activities including all controlled activities.

Much of the Crown Range within Glencoe lies within an 'area of landscape importance' (within the Rural Upland zone). This area includes an area of land running from the lower Arrow river to the crest of the Crown Range.

7(e) Current Protection Status of Conservation/Historic Values

The only formal protection for conservation values on Glencoe is that afforded by the Arrow River marginal strip.

The only sites of any historical importance within the Arrow River marginal strip are the house ruin at the intake and some of the steep sluice faces north of Rule Britannia Terrace. Only the Rule Britannia Terrace workings, excluding the hut ruin, have certain protection under the Historic Places Act. All other sites could include 1930s workings.

8 RECREATION/ACCESS

Glencoe's close proximity to Arrowtown and Queenstown generates a high demand for public recreational use. Based on current trends/predictions, demand for recreational access will greatly increase. Public use is creating problems for farm management on the property. Tenure review provides an opportunity to manage recreational use to the benefit of public and the runholder.

8(a) Access

The marginal strip up the Arrow River receives heavy public use. A 4WD track winds its way up the Arrow River crossing between the river bed, the marginal strip and Glencoe pastoral lease. This track is an extremely popular 4WD, mountain biking, walking and running route for recreationists/tourists visiting historic Macetown and the gold workings of the Arrow and Sawpit Gully. A farm track branches off near the Arrow River/Soho Creek junction and accesses the Motatapu Valley via Soho Creek. This route does not lie within a legal road or marginal strip.

Sections of the marginal strip on the lower Arrow below Arrowtown are subject to varying levels of recreation activity from walkers and picnickers. Tobins Track (a legal road) is a popular route for walkers, mountain bikers, runners and 4WD vehicles up on to the Crown terrace and the Glencoe road. This route allows for return trips back to Arrowtown.

Public access along the old pack track into Brackens Gully along the legal roadline is normally on a "by permission only" basis. This track links in with a 4WD farm track which zigzags up a spur onto Crown Peak and beyond to Mt Sale. The lower section of this track is not legal road. Common users are 4WD vehicle owners, walkers, mountain bikers, parapenters and some skiers. Skiers also gain access to the tops via the old pack track (legal road) which runs up the southern boundary of

the pastoral lease from the upper Cardrona Valley near Foxs Gully. There is no documented use of an unformed legal road which runs from Glencoe Road onto the southern end of the Crown range. Farm tracks onto the Crown Range have potential for both commercial and non commercial use.

8(b) Uses

Many recreationists do not confine their activities to legal roadlines or marginal strips. People commonly use the Glencoe Road and drive, walk, run or mountain bike past the Glencoe Homestead and yards. Some turn around, while others proceed onto the 4WD track which crosses New Chums and descends into the Arrow River. Permission when sought is normally granted.

Two old pack tracks, water races and sluicings on the front face above Arrowtown are frequently visited. People often scramble along the ridge above Arrowtown to observe the view. The face is also frequented by parapenters and hang glider pilots who take off from the vicinity of the Crown Range lookout, fly along the face and land on the Crown Terrace to be picked up by vehicles. These activities have resulted in considerable stock disturbance and damage to paddocks. This area has been used as a venue for competitions in the past. Parapenters have also been granted access onto the range behind the Crown terrace for their activities.

The Crown Range itself offers a variety of recreational opportunities. It is accessible from the Crown Range Saddle and Cardrona Valley road. During winter months a few people climb on to the range to ski the faces and basins. To the north the Cardrona skifield road provides ready access to 1600 m, creating opportunities for summer and winter traverses of the Crown Range. Terrain is generally gentle and views spectacular. Mt Cardrona on the property boundary is another destination for walkers and skiers. The basins below Mt Cardrona on Glencoe provide interesting skiing terrain and untracked snow for ski tourers and heli skiers. Cardrona skifield has recently sought permission from the lessee of Glencoe pastoral lease to expand their operation into this area. This is the first step towards obtaining necessary consents.

The Arrow River, as outlined in the access section, is well utilised by the public. While most public uses are confined to the road, gold workings and river, a few people do wander up the hill through the brier and matagouri, either to seek a view or to fossick and look at the water races which traverse the steep hill slope above.

Access up Soho Creek is currently blocked by a very secure locked gate. Legal access beyond the gate into upper Soho Creek, the Motatapu Valley and down to Lake Wanaka has long been sought by recreationists. Recreational access requires permission from the lessees of Glencoe, Mount Scho

and Motatapu pastoral leases. The first 1.5 km of the track above the Soho/Arrow junction is very rough. As the valley opens out the going becomes easier. While the Soho - Motatapu route represents a long walk (2 days) it can be mountain biked in less than one day. Legalisation of this route would represent a major attraction to the area.

Hidden from view from the lower Arrow valley behind steep, gorgy and very rough stream beds are the New Chums and Brackens Gully gold workings.

New chums Gully contains remains of stone cottages which are infrequently visited. These remnants provide an insight into what the main Arrow Valley may have been like today if the access track and water pipeline modifications had not occurred.

An old pack track sidles along a steep gorge to the north of Mount Beetham into the head of Brackens Gully where water races, sluicings and house sites can be found in a semi-remote park-like setting. Considerable potential exists here for site interpretation and direction of visitor use. As discussed under access, the pack track is also an ideal link to the 4WD farm track which gives access onto the Crown Range.

8(c) User Issues

Issues relating to recreational activities on Glencoe are complex and dynamic. Managing existing and future use, whilst retaining the Glencoe lessees privacy and ability to effectively farm represents a challenge. Tenure review provides an important opportunity to achieve this goal.

The Arrow River track with its numerous fords, requires constant maintenance. Maintenance is currently carried out by pastoral lessees and agencies with an interest in the area. There is a need for the erection of signposting warning users of potential hazards. Mountain bikers, horses, 4WD vehicles, motor bikes and walkers are all confined to a narrow one lane track, with tight bends and blind corners. Recreationists often cause disruption to farming activities, particularly around the homestead, woolshed and yards.

Whilst the Arrow River track provides a superb route for 4WD vehicles, there are some serious issues relating to track maintenance. A relatively minor increase in use would result in a considerable increase in track maintenance costs. Conflict between mountain bikers and motorised vehicle users is also an issue. While 4WD use is largely confined to the track, trail bikes can readily traverse areas adjacent to the track causing damage to wetland areas, stream banks and disturbance to stock and fauna.

The unformed legal road between Glencoe Road and the Brackens Gully is not a practical route, both in terms of ease of public access and because its use stands to disrupt farming operations on the Crown Terrace. Tenure review provides an opportunity to establish a practical route away from the existing legal road lines.

Cardrona Skifield Ltd has applied to the Commissioner of Crown Lands and to the Queenstown Lakes district Council to extend their operations into the northern most basins of Glencoe pastoral lease. If approved this development stands to impact on the natural character and present recreational opportunities of the area. Impacts associated with skifield development include tracking, slope modification, snow grooming on shallow/variable snow packs, introduction of exotic plant species for slope stabilisation and loss of backcountry skiing opportunities. In later years the skifield may wish to construct a road up the Arrow, linking Arrowtown to the Cardrona skifield, this development would have a major impact on the character of the area.

9 MANAGEMENT CONSIDERATIONS

9(a) Wild Animals/Pests

Rabbits are common at lower altitudes. At current levels they do not appear to be adversely affecting natural values. Pigs and goats are present throughout the property. Both species impact on ecological values. Recreational shooting controls pigs while goats are subject to periodic wild animal control by the Department of Conservation. Goats are also spreading out from Glencoe onto adjoining pastoral leases to the north which is why DOC is undertaking control activities. Chamois and the occasional deer have been shot on the Crown Range.

9(b) Plant Pests

Problem plants are largely confined to the Arrow River faces, where a mix of exotic trees have spread to cover the low steep faces. A management strategy for these plants is desirable and would require public consultation. Briar and blackberry are widespread in the Arrow, making access to historic sites difficult. Areas of pines occur on the periphery of the property, and occasional wildings are scattered over a wide area. These could be readily removed. Cover of Hieracium species should be monitored and grazing should be managed to minimise future spread.

9(c) Fire

As Glencoe and surrounding properties support a mix of intact tall snow tussock grasslands and shorter induced exotic/native grasslands, there is potential for large destructive fires to occur. Under a worst case scenario, a large hot fire during the dry summer months could cause serious environmental damage, from a conservation, soil and water and productive viewpoint. Such a fire could travel a considerable distance under favourable conditions. The use of burning as a farm management tool on nearby properties and the high degree of recreational use in the area compounds this risk. Maintenance of strategic tracks and the provision of fire fighting facilities requires careful consideration.

Queenstown Lakes District Council is the rural fire authority.

9(d) Landscape Considerations

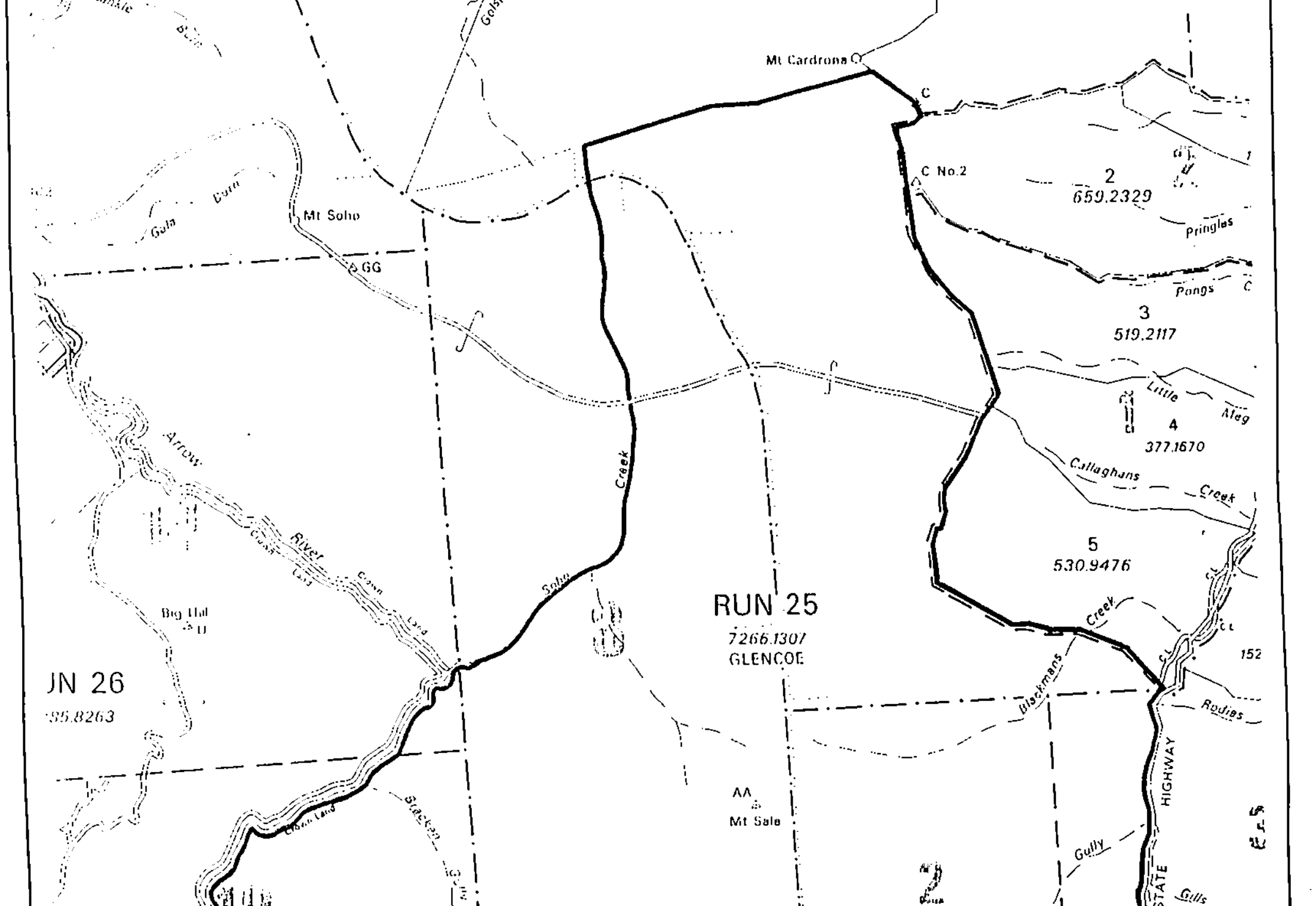
Separation of proposed land uses by fencing may have an undesirable effect on the landscape, however it would allow for more active stock management.

The neighbouring Cardrona skifield currently has some impact on Glencoe. Unsightly snow barriers are visible from Soho Creek and surrounding basins. Some rubbish has blown into the Glencoe basins from the skifield.

PART 3: CONSULTATION

An early warning meeting was held with NGOs in May 1995. Key issues raised were:

- need for public access into Brackens Gully and on to the Crown Range
- need for public access from the Crown Range Saddle to Crown Peak via over Mt Scott (Eastburn).
- need for public access up the Arrow and Soho Creek, for walkers, mountain bikers and horses. The majority of NGO's present believed vehicles should be excluded from Soho Creek.
- NGO's were generally comfortable with concept of continued grazing over much of the property - although reserved judgement until nature of a possible lease was presented to them in more detail.



Mt Cardrona C

Mt Soho

C No.2

2
659.2329

Pringlas

Pongs C

3
519.2117

Little Aleg
A

377.1670

Callaghans
Creek

5
530.9476

Creek

RUN 25

7266.1307
GLENCOE

152

Blackmans
Creek

Rodrigs

STATE
HIGHWAY

Gully

Gills

AA
Mt Sale

JN 26

55.8263

Big Hal
A B

Arrow
River

Soho
Creek

Blackmans
Creek

Gala Burn

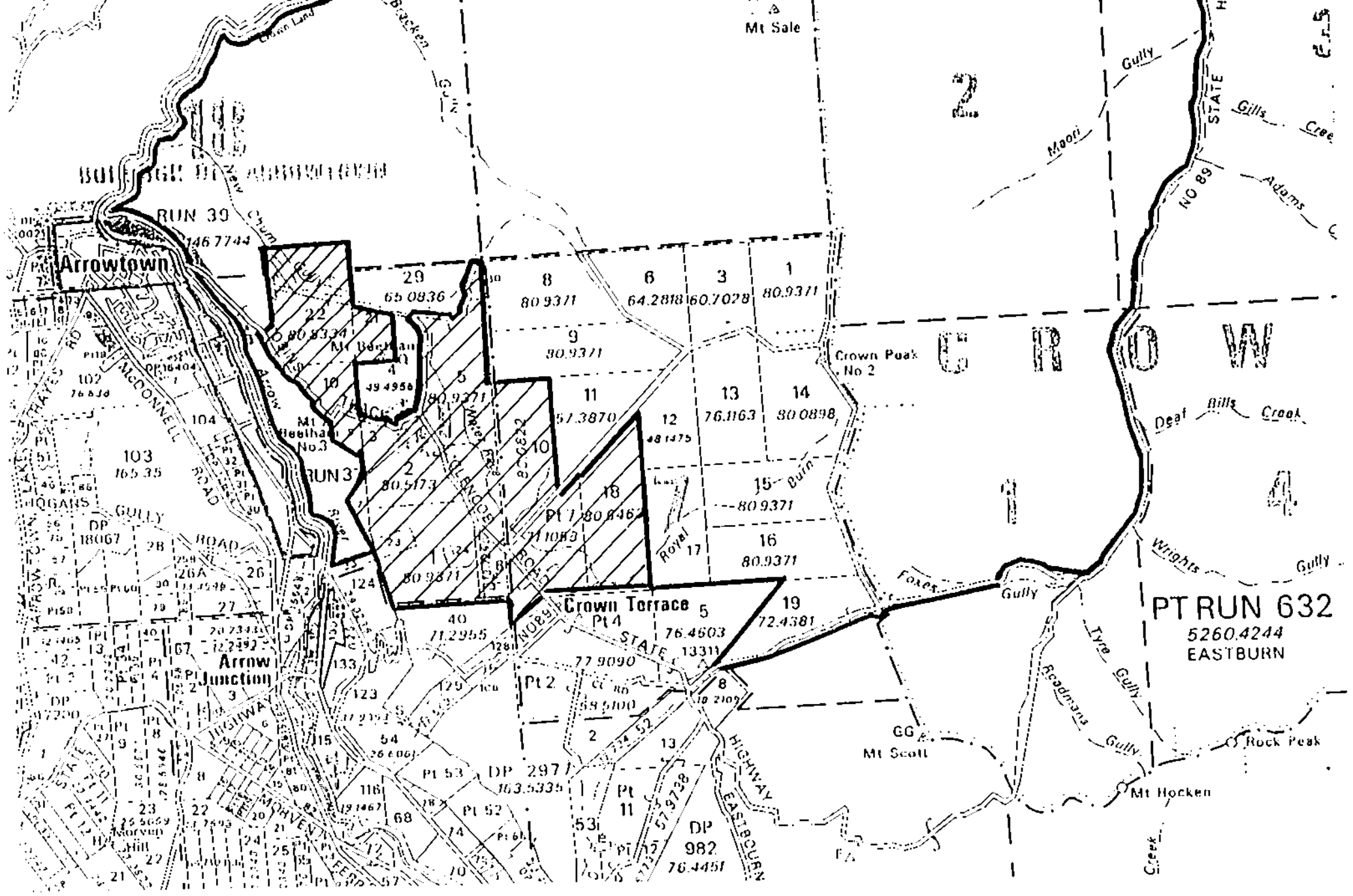
Burn



Gobbs

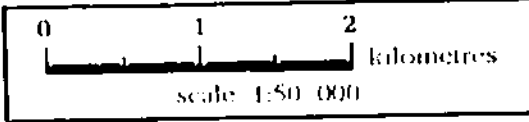
Burn

2
Gully

E.S.

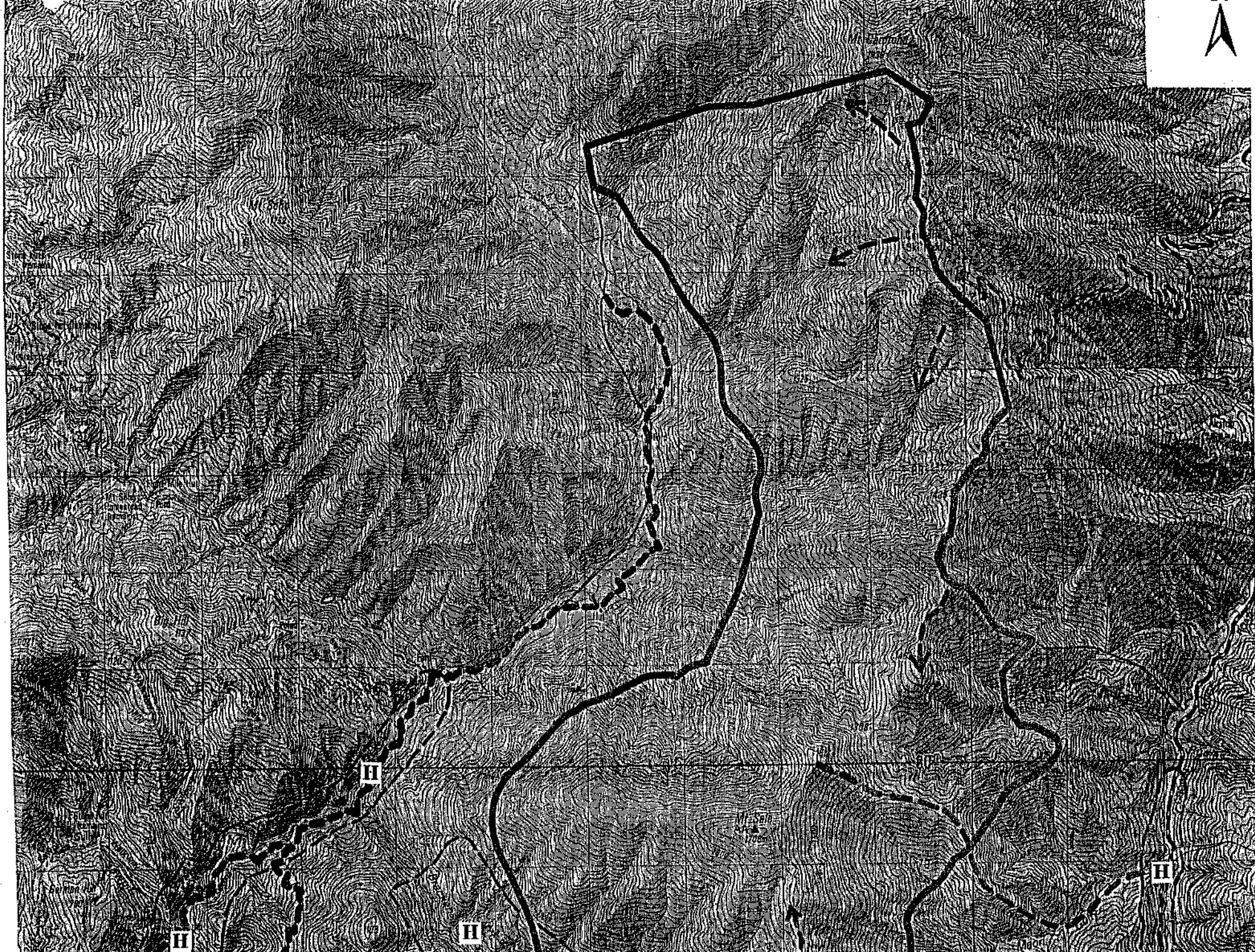


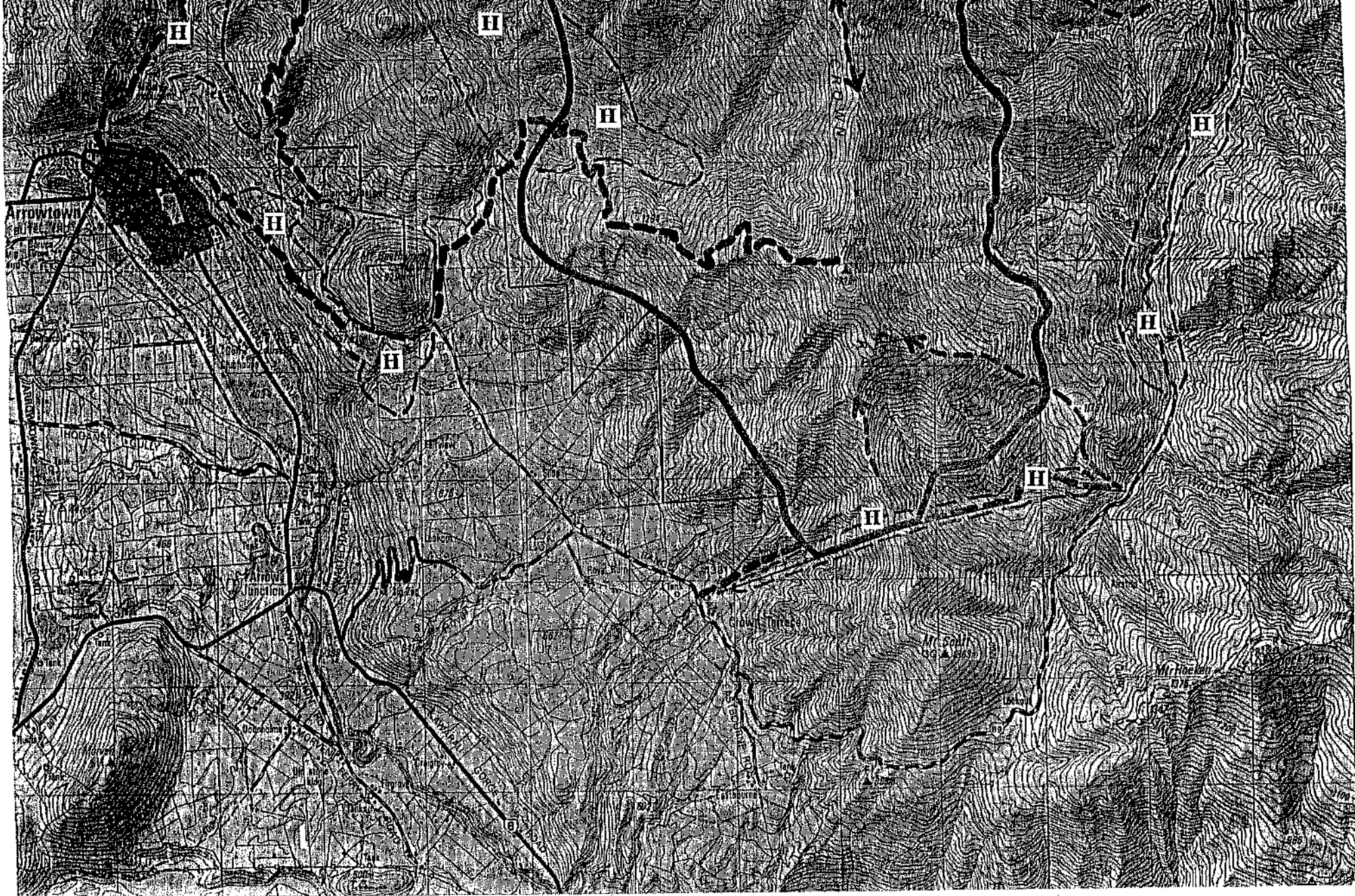
-  Pastoral Lease Boundary
-  Freehold farmed in conjunction



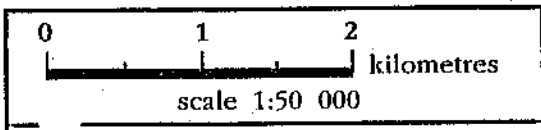
MAP 1
GLENCOE PASTORAL LEASE
 ORIGINAL







- H Historic Sites
- Ecological
- Recreation



MAP 2
G'ENCOE PASTORAL LEASE
CONSERVATION VALUES

