

RICHARDSON and Harris Mountains

1. Landforms

This large area of mountain country of over 230,000 ha lies between Lakes Wakatipu and Wanaka. It is bounded by the Matukituki Valley to the north, the Rees Valley to the north-west, Lake Wakatipu and the Arrow Basin to the west and south respectively, and the Cardrona Valley to the east.

Within such a large region there are several physiographic units —the Richardson Mountains as a rugged spine along the west, the large Shotover catchment, the Harris Mountains, Arrow catchment, and the officially unnamed 'Cardrona Range' between the Motatapu and Cardrona Valleys.

The Richardson Mountains rise from less than 1800 m in the south to 2500 m in the north. The major peaks are Mt Ferguson (2484 m), Centaur Peaks (2518 m), Lochnagar (2299 m) and Cleft Peak (2231 m). The Shotover-Matukituki divide falls in elevation eastwards from Mt Tyndall (2457 m) to the northern Harris Mountains at Craigroyston Peak (2213 m), Sharks Tooth (2094 m) and Fog Peak (2225 m). Permanent snow fields occupy the higher south- and east-facing slopes.

The Harris Mountains south of Black Peak (2283 m) are considerably less rugged than the Richardsons. Crest-heights range from 2073 m at Treble Cone in the north, to 1646 m at Coronet Peak in the south. The 'Cardrona Range' varies from 1600m to 1934 m.

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

Three major parallel faults traverse the Shotover catchment; the Moonlight, Shotover and Polnoon faults which are generally on a north-south axis. These faults, with their subsidiary fractures and associated crush-zones are responsible for much of the present topography.

The soft and friable schist bedrock is very easily eroded and may account for the relative scarcity of obvious glacial features. 'The Island' at the mouth of the Polnoon is one good example of ice-contoured terrain. Most of the moraines and other glacial features are relatively fresh in appearance because the last ice advance occurred only 18,000 years ago. Cirques commonly occur at higher altitudes with the best developed examples facing east.

Periglacial features are extensive. Areas of solifluction debris on wet south-facing slopes are characterised by a rippled, hummocky texture. These occur up to depths of 30 m as a result of a history of freeze and thaw action, with fracturing and slumping of the weak underlying schists.

There has been profound post-glacial erosion causing deep V-shaped valleys and alluvial terraces which are up to 60 m above present river levels. The lower Shotover and Moonlight Valleys show many classic examples not only of high-level terraces, but of 'valley-in-valley' forms.

Many of the lower valleys have lengthy gorges. The spectacular Shotover Canyon is nationally renowned for its scenic qualities. In contrast, many upper catchments are more open, often with wide, braided river flats. Vistas from these flats of distant

Mt Aurum from Aurum basin, Left Branch Skippers Creek.

Photo: Bob Entwistle



snowy peaks are in marked contrast to the confinement felt within the deeply dissected landforms that predominate throughout the region.

There are few lakes or tarns within these mountains. Lochnagar in the headwaters of the Shotover is a notable exception being a mountain lake dammed by a landslide. It is in an amphitheatre almost encircled by peaks rising 900-1200 m directly from its shores. Lakes Luna, Dispute and Moke in the southern Richardsons occupy smaller glaciated depressions.

2. Vegetation and Wildlife

2.1 Vegetation

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 nor-wester, with diminishing rainfall towards the south-east. These ranges are very wet compared to the Central Otago mountains, receiving between 2500-8000 mm per year. This, and geology, has a major bearing on erosion rates (see also 3.6). There are large daily and seasonal temperature extremes and high sunshine hours. As 80 percent of the region is above 1000 m, much of the precipitation is snow during winter, although snow-falls can occur at any time of the year.

The vegetation is predominantly tussock grassland, but there are also considerable areas of sub-alpine shrubland, beech forest, and high-alpine vegetation. Mountain beech appears to be a relict of a much more extensive, possibly continuous forest cover under wetter climatic conditions. It is now largely confined to shady aspects and in gullies. The presence of widely scattered stands of silver beech is another indicator of relict status. Pre-European fires, burning of adjacent grasslands, and timber extraction for mining and domestic purposes has reduced forest to less than 2 percent of the region. Under grazing pressure from both feral and farm animals, the future of many of these forests is precarious.

Considerable areas in the upper reaches of the Shotover are subalpine shrubland. Steep, rocky ground, particularly towards the west, is favoured by *dracophyllum* species. Matagouri grows on river flats where there is adequate soil moisture. Shrubland areas are vulnerable to depletion by fire and grazing, and most have been modified by pastoral activity.

Manuka occupies extensive areas of the eastern part of the lower Shotover and in the Moonlight catchment. This species appears to be an invader from the Lake Wakatipu faces as a consequence of the depletion of low altitude hard tussock grasslands by burning. Since the introduction of blight there has been a considerable reduction in its extent.¹ In several localities beech forest is rapidly invading manuka when left undisturbed by fire.

Bracken fern grows as a dense low altitude belt along the Lake Wakatipu and lower Rees faces of the Richardsons, and along the Matukituki faces. It appears to have succeeded from forest destroyed by fires dating back to pre European times.

Alpine fellfield and shingle scree are extensive at higher altitudes in the Richardsons, in some places extending well downslope. These normally only support sparse vegetative cover. Alpine cushion communities are more localised. Tall tussock grassland dominated by the narrow-leaved snowgrass is the dominant vegetation above 900 m on sunny faces, or 600 m on shady faces, and may grow up to 1900 m on stable slopes. Sub-dominant species may include varying proportions of hard tussock, blue tussock, *dracophyllum* species and alpine herbs.

At lower altitudes pastoral activity has either partially destroyed or replaced tall tussock grassland with hard tussock or in places silver tussock. Exotic sward grasses such as browntop and sweet vernal have become dominant on many valley floors, terraces and sunny faces, as a result of the depletion of low altitude short tussock grassland.

Localised exotic forests are establishing themselves over sluiced tailings and hillsides at Skippers and over the Queenstown faces of Ben Lomond. European larch and Douglas fir are colonising short tussock grassland and shrublands, dramatically altering the landscape in these areas. Problem species are *Pinus contorta*, Corsican and Scots pines, larch, sycamore, and Douglas fir. In 1986 it was estimated that 1500 ha in the Queenstown-Lakes district was covered by wilding exotic trees, by far the largest infestation in the South Island high country.² The Department of Lands and Survey undertook eradication and containment programmes on Ben Lomond, Queenstown Hill, Closeburn, Bobs Peak, Coronet Peak, and Skippers. This is being continued by DOC. The ending of subsidised work schemes has severely limited control efforts. Substantial areas of exotics were planted in upper Skippers Creek during the 1970s, to assess whether such plantings would reduce the amount of river sediment. Despite Forest Service and MWD assurances at the time that these trees would be removed, they remain. Unless they are removed the trees will spread, severely affecting reserve areas and ultimately the Mount Aspiring National Park.

The area reviewed in this chapter encompasses the Shotover, Richardson, and part of the Wanaka districts of the Lakes Ecological Region.³

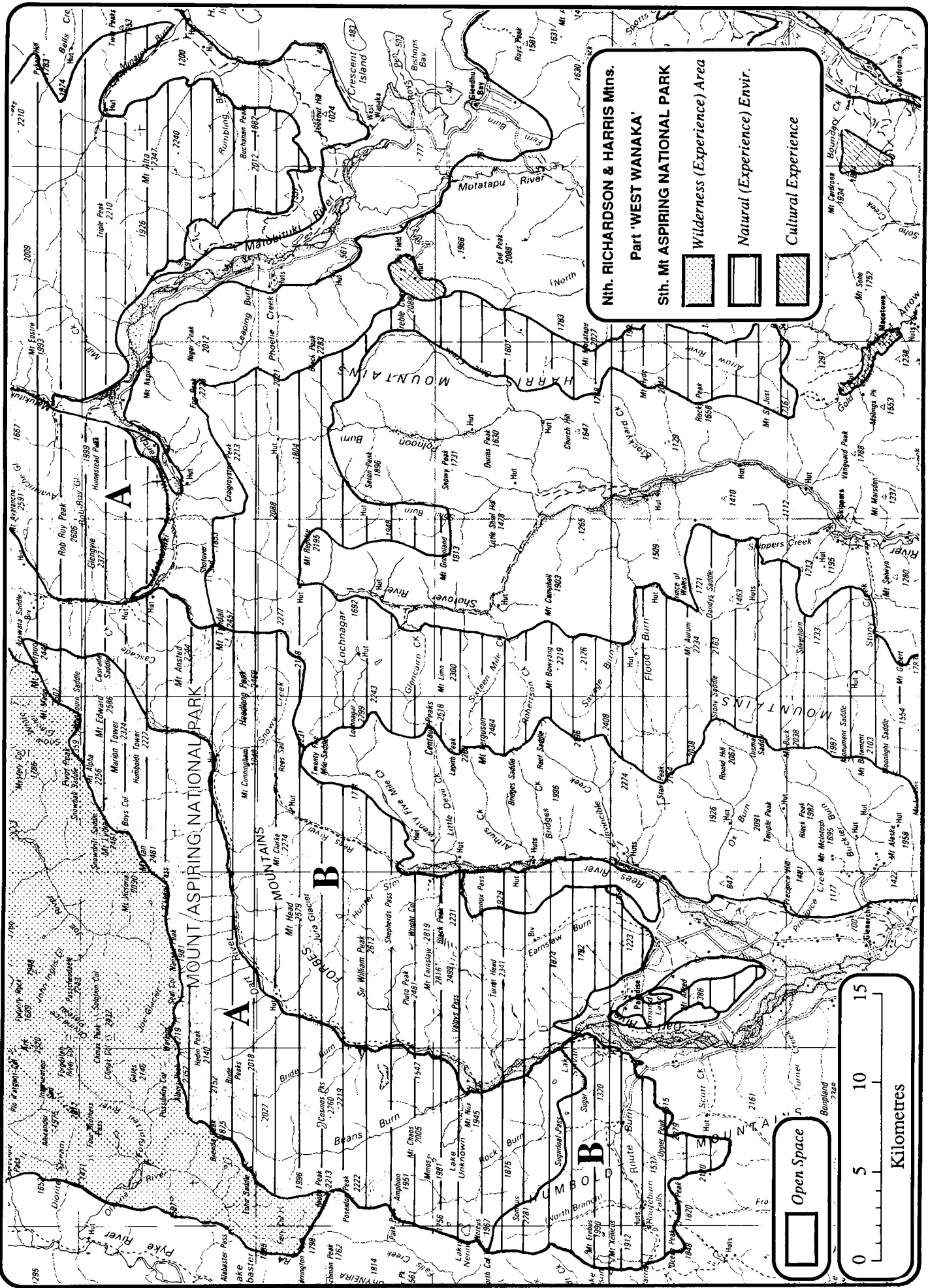
2.2 Wildlife

As a predominantly modified grassland habitat with few wetlands the region is relatively devoid of native birdlife. Small numbers of Paradise shelduck are to be found along river flats. The only rare species known to occur, consists of a pair of grebe on Lochnagar.⁴

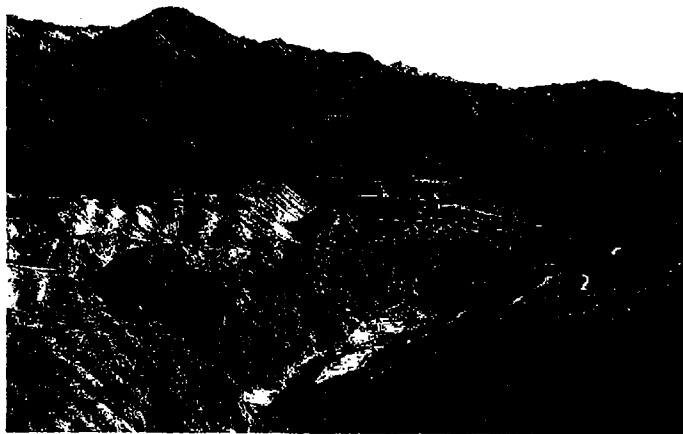
Game birds, including chukar, are not present in sufficient numbers to be attractive to shooters. Due to high silt content, most rivers provide poor trout fishing.

Goats were introduced to the Shotover and Arrow by gold miners to provide meat and milk. Frequent escapes, a fast breeding rate and favourable terrain and climate led to a rapid increase in feral populations. Control operations began in the 1920s and are continuing. There are low numbers overall but localised higher populations still persist. The Forest Service considered total extermination to be impossible, even when combined helicopter and foot hunting is used. In view of their explosive reproductive potential it is highly desirable that these animals are confined to the Richardson and Harris Mountains.

Deer moved into the region from the north during the early 1930s, with their population peaking in the mid 1960s. Red and fallow deer only reached high numbers locally and were rapidly reduced by helicopter operations. Deer are now scattered in very low numbers over the greater portion of the region. Low populations of fallow deer are present throughout the Richardsons, being derived from a liberation at Bob's Cove in 1904.⁵ Whitetail deer range from the Dart forests to the Rees Valley flanks of the Richardsons, but are present in very low numbers.⁶ Chamois have colonised the region recently, generally being found above 1000 m. Up until 1982 they had not been seen south of Polnoon Creek in the Harris Mountains and have been controlled by foot and helicopter hunting.



Possoms are scattered throughout the region in moderate numbers with their range known to extend up to 1300 m during summer for browsing of sub-alpine vegetation. Hares are found in moderate numbers from river flats up to 2000 m in all seasons. The habitat generally favours hares rather than rabbits which are largely confined to terraces and lower hill slopes. Although their numbers were in plague proportions in the 1880s, even up to high altitudes, rabbits are now more confined to scattered pockets of moderate density.



Skippers —sluiced terraces and the Shotover River from Maori Point Saddle.

3. History and Land Use

3.1 Goldfields

Despite an extensive survey of the Shotover catchment 7 no pre-European archaeological sites have been located. It is unlikely that this high mountainous area was particularly attractive for Maori visitation.

Although first runholder William Rees' sheep run extended into the Shotover, it was not grazed. Nor were most of the Richardson and Harris Mountains for several years after the first European settlement in the Lakes region. As a direct result of gold discoveries in 1862, in both the Arrow and Shotover, Rees' lease over his 40,000 ha run was cancelled. Pastoralism was therefore a late starter in the region in comparison to adjacent mountain ranges.

A westward quest for new goldfields characterised Otago's provincial affairs after Gabriel Reed's 1861 Tuapeka discovery. Two major gold discoveries in the Wakatipu region resulted in the area being over-run by diggers. In October 1862 it was widely rumoured that a miner named Fox had found a goldfield in some remote and unknown region, surpassing in richness all previous finds. A small number of parties under Fox's enforced 'commissionership' successfully concealed the site of their mining for over a month, securing for themselves incredible riches. Of three parties, one obtained 480 oz of gold in two weeks, another 984 oz, and the third 1320 oz in four weeks, of which 109 oz was cradled in one day! 8

'Hunting the Fox' became a provincial obsession. Ultimately the secret lair was discovered in the lower Arrow gorge. The ensuing rush saw the Arrow and its tributaries thoroughly prospected. However Arrow returns were quickly surpassed by an

even richer find a few km westward. In November 1862 Thomas Arthur and a companion obtained 200 oz of gold in eight days work at the mouth of the Shotover canyon. Unlike Fox, Arthur made no attempt to conceal his discovery, and when the facts were known a tremendous rush saw thousands of men pour into the precipitous Shotover country in search of riches. The most famous Shotover discovery was on the river beaches at Maori Point where two Maoris found one of the richest claims in New Zealand, winning 300 oz in one day. By the end of 1862 the valleys, ravines and river beds of the Lakes district were alive with restless humanity, whereas only a few months previously the area had been largely unknown except to a few shepherds and their wandering flocks.

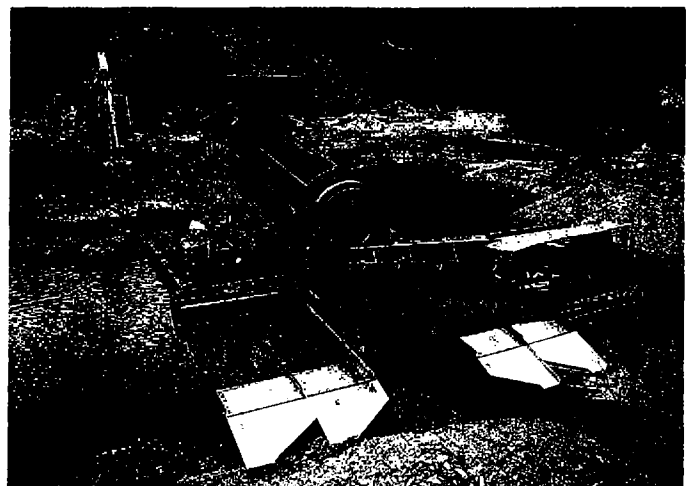
Soon the river claims became exhausted and the mining population declined dramatically. Gold-bearing quartz reefs in the Shotover and Arrow had been found as early as 1863, but they were not developed while alluvial mining remained payable. From the late 1860s to the 1920s large scale hydraulic sluicing operations took place on many high-level terraces, creating striking new landscapes. River gravels were re-worked by hydraulic elevator, and, in the case of the Shotover, also by dredge. These mechanical monsters were in their heyday in the 1890s with the last traditional dredge operating in the 1930s. A number of ambitious river diversions were devised by means of massive channels and tunnels. There was no shortage of entrepreneurial zeal which was more often than not rewarded by failure.

The Shotover and Arrow continue to yield gold, with considerable lengths of the Shotover and its tributaries being reworked by modern dredges/pontoons (see also 3.5). Evidence of past alluvial mining can be found today in most of the lower Shotover, Arrow and Motatapu catchments. Hundreds of km of water race traverse rugged hillsides, and massive sluiced terrace faces, early pack tracks, and sites of former settlements (now marked by poplars and stone walls) remain.

It was the quartz mining ventures, however, which left the most mechanical relics. Reefs were opened up in the mid-1870s, with the largest mines operating intermittently at Bullendale and Macetown over a span of fifty years. The difficulty of transporting heavy crushing machinery into such remote, rugged country has also discouraged its removal. Generally the impact of underground mining on the landscape has been very localised in comparison with that of the extensive sluicing operations.

Modern gold mining plant in Skippers Creek.

Photo: Ewan Paterson





16 Mile Gorge stock bridge—Shotover River. Mt Lima rear. Bob Entwistle

3.2 Pastoralism

After the first wave of miners had departed, available land was taken up by runholders from 1867 onwards. Many of the original holdings were too small or lacked sufficient winter grazing to be run as separate units, leading to later amalgamations. Most present-day properties consist of two or more of the original runs.

Sheep flocks built up rapidly to a peak in the mid 1870s. A severe winter in 1878, when snow blanketed the whole district, resulted in very high sheep losses. By 1880 rabbits had reached the upper Shotover, reducing stock carrying capacity by almost half. This factor and poor wool prices tended to keep sheep numbers low until 1905, with a steady improvement until the 1930s, when numbers again declined through to the late 1940s. A shortage of labour and increases in goat and rabbit numbers during the war years was responsible.⁹⁻¹¹

Effective wild animal control and rising wool prices saw increasing sheep numbers into the 1960s. Then came a trend of replacing sheep with cattle. The net effect of this change has been to shift grazing pressure to the lower altitude country and valley floors, reducing pressure on fragile high altitude lands.

3.3 Tenure

Most of the area is held under pastoral lease and special lease, with the balance being UCL, reserve and freehold.

Within the pastoral lease lands substantial areas of the Richardson Range, between Lake Luna and the Buckler Burn, have been retired from grazing under soil and water conservation plans. Similarly the Twelve Mile Creek face of Mt Crichton, Mt Cardrona and Middle Peak above the Cardrona Valley.

Ben Lomond Station is under special lease for pastoral and tourism purposes, although the latter activities have not been undertaken for many years. Treble Cone skifield is also on special lease. Another special lease, containing rights of public foot use, has recently been issued over a large area of the Shotover headwaters, onto the Matukituki divide. This is in place of an expired pastoral occupation licence (POL). Between Mt Motatapu and Treble Cone is UCL as are the headwaters of the Polnoon. The latter area was initially considered for inclusion in the Mount Aspiring National Park but being an area isolated from the rest of the proposed park remained as UCL.

Three types of reserves occur in the region: recreation, scenic and historic. Most of Mt Aurum Station is now recreation reserve,

with the balance being incorporated into the Branches pastoral lease. A substantial area on the south-east face of Mt Cardrona is the only high altitude land within the region which is freehold.

There is an almost continuous strip of recreation reserves along the shoreline of Lake Wakatipu between Glenorchy and Queenstown, comprising some 2000 ha. These reserves extend above and below the Queenstown-Glenorchy Road and include heavy bracken, remnant beech and regenerating broadleaf forest. Rationalisation of boundaries with pastoral lease has consolidated the reserve largely between the road and lake shore. These shoreline reserves have potential for a variety of active and passive recreation activities.

Two thousand eight hundred ha of the Twelve Mile Creek catchment containing a large remnant of beech forest and alpine grasslands, being formerly within pastoral lease, has been agreed for addition to the Lake Wakatipu reserves complex, with the intention of scenic reserve classification.¹² A Crown land strip encircles the shores of Moke Lake. Along with further areas acquired from leasehold, this is intended as a future recreation reserve. A recreation reserve encircles the smaller, nearby Lake Kirkpatrick.

A substantial recreation reserve runs up the tussock covered south face of Coronet Peak, with the Mount Cook Group leasing the upper half for skifield purposes and the whole 600 ha reserve licensed for grazing. The vegetation and landscape in this reserve has been severely modified by ski trail construction and slope grooming. A 470 ha scenic reserve of long standing on the Queenstown face of Ben Lomond includes beech forest, shrubland, tussock grassland, self-sown pines and fir.

Historic reserves incorporated into the Otago Goldfields Park occur at Macetown and at the Invincible Mine above the lower Rees Valley. The 145 ha Macetown Historic Reserve includes the former town site and two quartz-crushing batteries in the Rich Burn. Another two small historic reserves include the former Invincible Mining Company's mine and gold concentrating sites in the Rees. A small recreation reserve at the Oxenbridge Tunnel in the lower Shotover is also managed as part of the goldfields park.

3.4 Land Use Capability

Land use capability within the region is predominantly Class 8 and 7. These lands are unsuitable, or have severe limitations for grazing. The only areas well suited for grazing (Class 6) are on valley floors and along lake or lower valley flanks. This is only 18 percent of the region.¹³

The Otago Catchment Board (OCB) has recommended that most of the Richardson and Harris Mountains, and the Shotover catchment, be managed for watershed protection with grazing as a secondary use confined to minor, more stable areas. On high altitude valley floors restricted cattle grazing is seen as the only safe long term use.¹⁴

3.5 Present and Potential Land Use

The predominant land use is extensive grazing of native grasslands. The catchment authority sees potential to double the area of developed hill pasture to approximately 10 percent of the total region, within the limitations of farm economics.¹⁵

In view of the importance of the Shotover catchment to water quality for the Clutha, the OCB advocates watershed protection for the entire catchment, involving extensive retirement from grazing, and only limited grazing on the more stable slopes and

valley floors. Improvement in the vigour of the tall tussock grasslands of the Harris and 'Mt Cardrona' ranges, to obtain greater summer water yields for irrigation in the Arrow Basin and Cardrona Valley, is a fundamental objective.¹⁶

Production forestry potential within the Shotover catchment was investigated by the Forest Service which considered it to be technically possible but undesirable. To justify the high development costs, commercial forestry is considered realistic only on a relatively large scale (5-10,000 ha).¹⁷ On the lower slopes of Coronet Peak a consortium of local authorities is establishing plantations of Oregon and Douglas fir. Their potential for spread throughout the adjacent tussock grasslands is high.

Gold or scheelite mining continues in the Shotover, Arrow, and Buckler Burn near Glenorchy. Numerous mineral rights are held over extensive areas of mountain side and riverbed. Alluvial gold is being won by using temporary river diversions, mobile screens and excavating machinery. The visual impact of alluvial mining is minor when confined to riverbeds which experience regular floods. As gold is widespread the Mines Division insists that the whole area must be kept open for mining interests "at all levels."¹⁸ However, the potential impact of unrestrained mining, both on-site and through the construction of access roading in rugged terrain, could be severe on water, soil, landscape, historical and recreational values.

Head of Shiel Burn, Upper Shotover.

Photo: Bob Entwistle



3.6 Shotover Sediment

The Shotover has long been known as a major source of sediment in the Clutha system. In 1980 the OCB quantified the average annual deposition in Lake Roxburgh at 1.8 million tonnes, of which the largest source (1.08 million tonnes) was the Shotover.¹⁹ Lake Dunstan will provide a new sediment trap for the Shotover River.

The sediment source is the schist bedrock which is readily eroded by frost and water action. The MWD identified the primary sediment production from river reworking of bedload, erosion of river banks, and the toes of generally deep-seated slips.²⁰ The steeply inclined bedrock provides an ideal slip-plane for the overlying solifluction debris and soil, or for slabs of the rock itself.

Below the alpine zone, the overall vegetative cover in the region is reasonably intact, with slight to moderate exposure of bare ground and only localised pockets of severe erosion.²¹ Density of vegetative cover compares favourably with that of the Central Otago block mountains. While acknowledging that a complete grasslands and shrublands cover is desirable for soil and water conservation it cannot be claimed, as has been suggested from time to time, that large-scale exotic afforestation would have any significant effect on sediment loads. Rather, localised vegetative treatment where practicable, river-bank stability works, and limitations on future mining detritus in waterways should have the greatest effect. The systematic excavation and processing of bedrock by present day gold mining ventures in the Shotover riverbed was not considered in the 1975 Shotover Sediment Sources Survey. The report concluded that the combined effect of all practicable preventative measures would be only a 30-35 percent reduction in river-borne sediment, stating that the sediment load "is due predominantly to high rates of geological erosion" rather than human induced causes.²²

Localised treatment, if sensitively planned and executed, should have only a limited impact on recreational and scenic values. In marked contrast however, construction of debris dams on the Shotover would have only a limited life and would destroy one of New Zealand's top ranking wild rivers. The MWD investigated dam sites at the Sixteen Mile Gorge and Saddle Creek Flat in the upper Shotover, at Branches Flat, and at Tucker and Big Beaches in the lower reaches. The Branches site would have 62 percent of the catchment's sediment sources upstream and an expected life of 300 years, whereas the dams downstream from Arthurs Point would have all sediment sources upstream but have individual lives of only 40 to 50 years.

The impact on recreational and landscape values would be extreme if the lower river dams were built. At best the white water as far back as the Moke Creek confluence would be destroyed and at worst the entire canyon below Deep Creek.

3.7 Shotover-Mt Aurum Management Plan ²³

In 1977 the Department of Lands and Survey purchased the pastoral lessee's interest in the 12,600 ha Mt Aurum Station for "the primary objective of soil conservation and water management," following the 1975 MWD sediment sources survey.

The station was destocked, however over 2000 ha was placed under POL and later incorporated into the adjacent Branches pastoral lease.

In 1982 a management plan was published for the Crown land in the total Shotover catchment. While acknowledging that the Skippers and Stony Creek catchments are among the largest

contributors of sediment to the Shotover, the report concluded that "this erosion is basically a natural geological phenomena which cannot be prevented by present methods of control." Greater stock and wild animal control were considered the most effective means of improving soil and water condition.

Provided these concerns were satisfied, the report advocated integration of historic site preservation, landscape aesthetics, recreation, pastoral use and mining on Mt Aurum. The report recommended a substantial reserve for the management of recreational use and historic site protection, consistent with soil and water values. This was implemented with the 9100 ha Mt Aurum Recreation Reserve being approved in 1985. It is the first major public reservation in the heart of the high country within this region.

In 1985 a draft management plan for the reserve was released.²⁴ This discussed the appropriate classification for the reserve and opted for a 'recreation' classification overall until such time as there was a suitable delineation between 'scenic' over the greater reserve area, and 'recreation' on the relatively high-use Skippers terraces. However such a course is inconsistent with the resource information contained in the plan which sees the reserve as encompassing "one of New Zealand's more notable landscapes which merits protection and sensitive management." A diversity of recreational opportunities were identified in the plan however it was acknowledged that the "retention of historic and scenic values is fundamental to recreational enjoyment..."

Concerted local opposition to a 'scenic' classification has seen both DOC and the Otago National Parks and Reserves Board reverse their earlier support for 'scenic' classification. The primary case advanced by opponents of a scenic reserve is that this would inhibit or prevent recreational use. This is a spurious argument as Section 19 of the Reserves Act 1977 (which defines scenic reserves) would allow the continuation of the range of recreational activities currently enjoyed in the area. Recreation reserve status does not give adequate protection to the natural values that most visitors appreciate. In contrast, recreation reserves (S.17) give primary importance to sporting activities and facilities, with biological and landscape values secondary. This designation is more befitting a race course or sports ground than "one of New Zealand's more notable landscapes." Experience within scenic reserves throughout the country has clearly established that recreational use and historic site management can be harmoniously accommodated within a 'scenic' classification. In the view of FMC this should also apply to Mt Aurum, or alternatively a higher status of 'conservation park' in the future.

4. Recreational Opportunities

4.1 Recreational Opportunity Spectrum

The region provides settings for the most diverse range of outdoor recreational activities in Otago, even when considering the existing national parks and reserves. A powerful combination of striking scenery, rich history, continental climate, and close proximity to major holiday centres provides a focus for year-round, at times intensive recreation. It is a resource of major significance, providing outlets for Otago and Southland residents as well as for other New Zealanders and overseas visitors.



Hells Gate, Skippers Road.

Photo: Mark Hanger

4.2 Historical Attractions

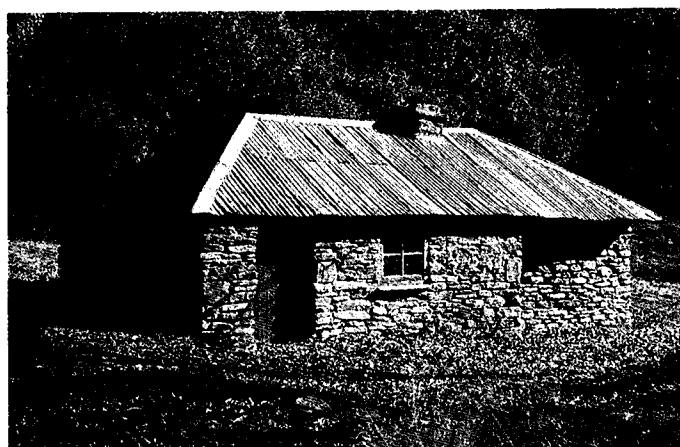
This is an historic goldfields resource without parallel in Otago, for its large scale and the existence of so many relics. Goldfields sites are centred on the lower Shotover and Arrow catchments, with lesser areas in the Motatapu and Rees Valleys. Although intensive mining took place in the Cardrona Valley, its impact was almost entirely confined to the valley floor with little effect on the mountainous regions under discussion in this volume.

Historic sites fall within the categories of alluvial and quartz mining areas, settlements, and trails: both roads and pack tracks.

4.2.1 Roads. The Skippers and Macetown roads, which date from the 1880s, provide a unique recreational experience in themselves as well as the means of viewing many of the historic and scenic features within these valleys. The roads are notable for being single lane with easy grades, being designed for horse and buggy rather than the motor-vehicle. This necessitated large cuttings across rock faces, with substantial supporting rock walls.

The position of the Skippers Road, up to 150 m above the Shotover River, provides spectacular views of river canyon, steep dissected faces and massive terrace sluicings. The Skippers suspension bridge gives access across vertical canyon walls to the Mt Aurum Reserve. This bridge was completed in 1901, but unfortunately for the quartz mining interests who pressed for its

Restored Needhams Cottage, Macetown.





Macetown 1897.

Photo: Lakes District Centennial Museum

construction, it was too late to be of great benefit. An even narrower road continues up valley from Skippers as far as the Branches Flats.

The Macetown Road traverses the Arrow Gorge for 15 km to the town site of Macetown. Twenty two fords restrict vehicle use to 4WD and trail bike. The road is also very popular for walkers.

4.2.2 Pack Horse Tracks. These were quickly established to the newly discovered goldfields. Traces are still to be found between the Arrow and Shotover goldfields. Despite slips and lack of use, in some cases for over 100 years, they provide natural walkways through difficult terrain. The major through tracks are the Skippers Track (1863), Big Hill track to Macetown (1864), Roses Saddle-Motatapu, Arthurs Point-Moke Creek-Ben Lomond, and Moonlight-Lake Luna. Other pack and dray tracks lead to individual mines such as Bullendale, up Skippers Creek, and the Advance Peak sledge formation. Numerous other mines had their own horse or dray access and tramway formations.

4.2.3 Town Sites. The former town sites of Macetown and Skippers Point are major attractions. Whereas at the time of first settlement these sites were bleak and treeless, they are now studded with larch, poplar, sycamore, spruce and fir, providing pleasant park-like settings for present day visitors.

Few complete buildings remain. However stone walls, headstones and building ruins provide sufficient evidence for historical appreciation. On-site interpretation by means of a guide book²⁵ provides a stimulating insight into the isolation and hardships at Macetown during its heyday in the 1890s. Expansion of interpretation and site preservation activity in the Otago Goldfields Park is providing a relatively easy means of maintaining and utilising this historic resource for public benefit.

There are numerous stone-walled miners' cottages scattered throughout these goldfields, many in isolated and unexpected places. These all add greatly to the charm and character of the region.

4.2.4 Alluvial Workings. Huge sluiced faces remain as stark reminders of the era of company mining spanning from the 1870s to the 1950s. The immense scale of these operations was responsible for the deposition of tailings into river beds, to the extent that the first Skippers Bridge had to be abandoned due to frequent flooding. Major sludge channels or tail-races and tunnels often had to be constructed for the disposal of tailings from terraces. Many of these are still visible today. The largest sluicings are to be found at Moonlight No. 1 and 2, in the greater length of the Shotover Canyon, and to a lesser extent in the lower Arrow. The Shamrock Company's workings above the Arrow and the Moun-



The Mountain Terrace sluicings, Skippers Creek.

tain Terrace workings above Skippers Creek are notable examples of high-altitude sluicings conducted under difficult conditions. The lack of nearby water supplies obliged these companies to construct lengthy water races through very difficult terrain, using piped siphons, and metal fluming in one instance suspended from an overhanging rock-face. There are hundreds of km of long-abandoned water races traversing hillsides throughout this goldfield, often with three or more different levels of race on the same hill. They are a distinctive feature of the area.

Many ingenious schemes were devised to win riches from the Shotover and Arrow Rivers. These involved major river diversions by open cuts or tunnels through spurs, leaving sections of river bed 'dewatered' and accessible for mining. Many such ventures were defeated by floods, incorrect levels or simply a lack of gold. However such set-backs failed to prevent even more ambitious schemes from being attempted. Several river diversions remain as monuments to an enterprising era. These include Scoles Tunnel (1887) in the Arrow, Oxenbridge Tunnel (1907-10), New Channel (1864), Sandhills Cutting (1926-31), and the Polnoon Tunnel (1935-37) in the Shotover. The Sandhills Cutting was excavated by sluicing away over one million cubic m of detritus. Unfortunately for its constructors, the river could not be permanently diverted into the cutting. A 250 m tunnel still diverts the Polnoon into the lower Shiel Burn. The Oxenbridge's insides are inspected daily by the patrons of several rafting companies.

From the 1880s to the 1930s the Shotover Canyon saw sporadic gold dredging activity. Frequent and sudden floods, bedrock obstructions, and difficult access provided major operational problems. Only one relic dredge from the 'historic' era remains, that of the unsuccessful Maori Point suction dredge (1926-27) which is viewed by rafters and canoeists in the canyon. A modern multi-million dollar dredge was swept away by a flood in 1988, providing an obstacle for rafters. This was salvaged and is now operational again.

4.2.5 Quartz Mines. With increasing depletion of easily-won alluvial gold, attention turned to the reefs in the late 1860s to mid 1870s. Prospecting was encouraged by the Otago Provincial Government offering £1000 bounties for the discovery of payable reefs.

Skippers and Macetown were two of the major quartz mining districts of Otago. However, despite substantial overseas investment in mine development none contributed more than a small proportion towards the total gold returns for the province. The continued existence of relics from this era provides a consider-

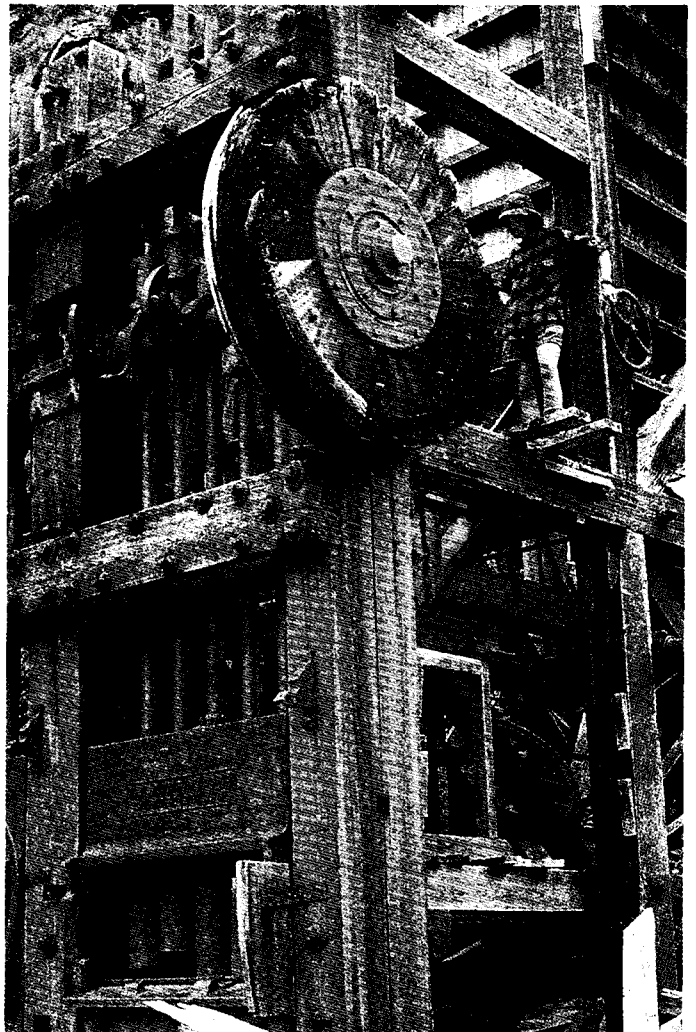
able recreational attraction, consisting of mine complexes, machinery and tramlines in many remote and rugged locations.

Under the shadow of Mt Aurum (2234 m), Bullendale saw intermittent activity over a period of 33 years commencing in 1868. Heavy crushing machinery was hauled to the site over fragmentary tracks, to be abandoned when the ventures finally failed. Much of this equipment can still be found, along with mine entrances, despite Bullendale become overgrown with scrub and beech forest. At its peak Bullendale boasted a population of 200 inhabitants.

In the left branch of Skippers Creek is the site of the first hydro-electric plant in New Zealand to be used for motive power. This was installed in 1886 to provide power to the Phoenix Company's 30-stamp battery at Bullendale. To commemorate the centennial of this nationally significant event, a partial reconstruction of the generating machinery was undertaken in 1986.

Battery remains at smaller mine sites are scattered over the Mt Aurum Reserve. These include five batteries which range from 2 to 10 stamps in size. Most of these are within a short walking distance of Skippers, yet are unknown to the vast majority of visitors. Their presence, along with an array of other historic sites on Mt Aurum, provides an unequalled opportunity for a site preservation and interpretation programme within a relatively compact area. This much neglected resource could become a major visitor attraction.

'Homeward Bound' battery, Macetown.



Within the Richburn catchment above Macetown is another cluster of mine complexes and associated machinery. The Premier and Tipperary Mines were the largest and most successful ventures in this area. A number of small companies operated over a period of forty years, with the last mine closing in 1914. Within the Richburn and even high on Advance peak (1737 m), mine entrances, batteries, mullock heaps, tram and sledge tracks, and aerial cableways are to be found. There are five batteries the largest of which, the Homeward Bound, is a massive structure.

The size and diversity of the Shotover and Arrow quartz mines provides an opportunity to manage them for a variety of recreational experiences. While one battery at Macetown is accessible by vehicle, and the largest is only thirty minutes walk from the road end, others are less accessible up steep hillsides or gullies. The former Lands and Survey Department's policy of not publicising the location of all such sites at Macetown deserves support, as it maintains a diversity of recreational opportunity for those wishing to be guided to some batteries, as well as for others who wish to 'discover' some sites for themselves. Visitation and awareness of the Macetown sites is currently higher than in the Shotover and is increasing as the features of the Macetown Historic Reserve become better known to the public. The visitation pattern may change if there is active management of the Mt Aurum Reserve. Its larger size will permit 'remote' historical experiences at some sites.

The Invincible Mine is an outlying complex in the lower Rees Valley. Dating from 1879 it is unusual for the technology employed at the time and also for the relic machinery remaining on-site. A pleasant climb through beech forest leads to the mine site at the bush line. The remains of a battery, water-wheel, and seven heavy iron 'berdans,' used for ore grinding and gold saving, are to be seen. Magnificent views of Mt Earnslaw and the upper Rees Valley peaks are an additional attraction. On the valley floor a 7.9 m diameter concrete 'buddle' remains from a successful process to win residual gold from the battery tailings. Both sites receive moderate visitation, this increasing since inclusion in the goldfields park.

4.2.6 Scheelite Mines. In the early 1860s gold was found in the Buckler Burn near Glenorchy, but difficulty was experienced in saving it due to an unidentified mineral filling the sluiceway riffles. This was later identified as scheelite (a tungsten mineral) and led to its mining in a belt between Mt Crichton and 25 Mile Creek in the Rees. A lode was discovered on the crest of Temple Peak (2091 m) which became the highest mining operation in New Zealand.

Mining activity has been intermittent and closely related to world prices. Most activity occurs during wars when scheelite is in demand for the hardening of steel. Small scale underground mining continues. Visitor interest tends to be local and does not have the same general appeal of abandoned gold mines, despite the presence of extensive physical evidence.

4.2.7 Historic Site Management. Within the Arrow and Shotover, the significance of historic goldfield sites has been recognised by the District Scheme and its extensive 'Rural H' (Historical) zones. The entire Shotover Canyon, Mt Aurum Reserve, upper Moonlight and Skippers Road are included in one large zone, while Macetown is protected by another zone over the Rich Burn catchment.²⁶

As already noted, historic reserves have been gazetted at the Invincible Mine and Macetown. The Mt Aurum Reserve provides the major opportunity in the region for historic goldfields protection and public presentation.



'Homeward Bound' aerial tram, Macetown.

4.3 Scenic Attractions

The striking landscape of the region is a major component of the total recreational experience. A notable example is the view of the Shotover Canyon from the Skippers Road. The scenery generally, coupled with a sense of history and a unique motoring experience provides wide appeal. The few larger lakes and their surroundings provide the other major attractions.

The main landscape characteristic which differentiates this region from Central Otago and the Southern Alps, is the ruggedness and diversity of forms in relation to the former, and a general absence of forest to obscure the stark line of rock, river and angular ridge. Compared to the rest of the Lakes district, there is a general absence of lakes, and an overall sense of confinement in deeply entrenched V-shaped valleys. Unlike the adjacent Wakatipu and Wanaka basins there are few vistas available outside of the immediate locality. As a scenic landscape it is in a distinct class of its own.

4.4 Picnicking, Camping, Gold Fossicking

Closely associated with roadends and vehicle access, intensive day-use activities occur during the summer holiday period. Skippers, dependent on road conditions, is steadily used by day visitors for picnicking, as is Macetown. The lower Arrow Gorge, Arthurs Point and Moke Lake areas at times receive intense use.

Despite 'Closed Fire Seasons' during summer, accidental fires in these peripheral areas are a constant cause for concern



DOC guided party in southern Richardson Mountains. Mt Crichton left.

Photo: Neill Simpson

with occasional outbreaks in the lower Arrow and at Skippers. The provision of safe facilities coupled with explanatory sign-posting, is the most likely means of fire prevention close to roads. Away from roads it appears that there are no substantiated cases of accidental fires caused by trampers in recent years. Miners, aircraft crashes and 'controlled' burn-offs have proved to be the greater causes of escaped fires.

Informal camping occurs along the Skippers Road, normally by arrangement with private land owners. At Skippers fluctuating numbers of holiday campers use the tree-sheltered Burkes Terrace; a major limiting factor is the scarce water supply and an absence of toilet facilities. These users, along with occasional longer-term campers, compete with day visitors for the limited sheltered areas most suitable for picnicking. The opportunity exists to separate campers from day visitors by providing basic facilities and tree shelter for campers in a separate area, for instance on the adjacent Londonderry Terrace.²⁷

Less intense camping pressure occurs at Macetown, but indiscriminate camp location can, at times, degrade the historical setting for the much larger number of visitors who have historical appreciation in mind.²⁸

Widespread fossicking of historic sites has occurred in the recent past, with many sites intensively turned over by bottle hunters despite official discouragement of this practice.

Fossicking for gold is a major attraction for many visitors. In the lower Arrow fossicking pressure is intense, fortunately it has little or no permanent impact on river or banks. Commercial prospecting and mining operations are an on-going source of

conflict with recreational miners. The granting of mining licences over extensive reaches of river bed has led, in some instances, to the exclusion of amateurs. Such conflicts in the past led the Lake County Council to apply for public mining licences over five areas near Queenstown, Arrowtown and Cardrona. This met an unfavourable response from the Mines Department. However there remains a need to recognise that recreational prospecting is a legitimate use of the Crown's minerals. The setting aside of readily accessible areas for public fossicking is a high priority in the Arrow-Queenstown district.

4.5 Off-Road Recreation

4.5.1 Walking. Within the environs of Queenstown and Arrowtown there are many walks available for the public to reach viewpoints, scenic and historic features. To a lesser extent, a number of walks are available near Wanaka. Large tracts of spectacular mountain country suitable for family walking, immediately adjacent to major holiday centres, must be regarded as a major recreational asset.

Even though most of the region is not park or reserve, a lengthy history of public use of the leasehold properties has evolved. Formal arrangements for accessways such as walkways have only been initiated in recent years. A network of short walkways has been established around Queenstown and in the lower Arrow. Only limited opportunities exist around Wanaka, largely confined to lake side walks. There is considerable scope for further walkways, both of short and overnight duration. Efforts should be made to retain an informal, low-key approach

to walkway development and promotion. In reaction to the intensely commercial nature of Queenstown, a survey of the majority of visitors to Macetown²⁹ showed their preference for banning commercial tours. Such a view should be taken into account by the administering authorities when considering applications for commercial concessions which impinge on walkway users.

The more energetic day-walks include Ben Lomond, Queenstown Hill, Macetown via the Arrow Gorge or by Big Hill, Invincible Mine and Roys Peak (unofficial walkway) near Wanaka. Walkway status is warranted from Arthurs Point to Moke Creek and the Bowen Saddle, providing a longer day-circuit from Queenstown. Similarly, a track from Arthurs Point to Lake Johnson and Frankton would link with a low-level circuit and connection onto the existing Frankton Arm walkway.

The original pack track to Skippers, dating from 1863, provides an excellent opportunity for foot access to the Mt Aurum reserve. As an easy but higher route than the Skippers Road, excellent views of the Shotover Canyon are obtained. This could be promoted as an easy overnight walk or long day trip each way.

Successful operation of walkways over private and leasehold lands in this district indicates that recreational walking can be easily integrated with farming. Further expansion of walkways in this region should be a high priority. Defined rights for the public, and legal protection for land occupiers, are the basis for their success.

4.5.2 Tramping. The Richardson Mountains provide an almost unbroken obstacle for access to the west, with most tramping activity tending to be confined to the Shotover and Arrow catchments. The main extended through routes are from the Moonlight to Lake Luna and Mt Creighton Station, Rees Valley via Sixteen Mile Creek-Duncans Flat-Cashes Flat-Twelve Mile Creek, the West Matukituki via the Shotover or 'Tummel' Burn Saddles, and Glendhu Bay via Roses Saddle and Motatapu Valley. The upper Shotover in particular provides considerable potential for interesting tramping, with spectacular alpine scenery at the head of many tributaries. Present usage is light due to the attraction of more accessible alpine country in the adjacent national park.

Commercially guided parties have tramped from Mt Creighton Station to Arthurs Point via Lake Luna, taking 2-3 days for the trip. There are no concessionaires operating regular tramping trips in the region, although operating rights have been held over the Mt Aurum reserve and guided services advertised for such destinations as Bullendale and Lochnagar. It appears that with the option of free tramping in relatively easy terrain, there is little demand for these commercial services.

As part of a proposed north-south link of a national walkway, the Walkways Commission approved a 'route' category walkway between Arrowtown and Glendhu Bay, but has deferred establishment. The route selected follows a four-wheel drive track the length of the Motatapu Valley and Golspie Burn, over the 880 m Billy Saddle and down Soho (or Billy) Creek to join the Macetown Road. Although the easiest route available, the saddle crossing and Golspie Burn provides relatively uninspiring walking with an absence of diverse terrain, or historic features. An alternative, using an old pack track over the 1280 m Roses Saddle is of equal length, but has the considerable attraction of Macetown on route plus a historic pack track to follow over the saddle. With adequate marking this should present few problems for

walkers. A direct link between the holiday resorts of Wanaka and Arrowtown could prove to be popular, provided it is of sufficient interest. As already noted there is also considerable potential for shorter walkways in the lower Shotover and Arrow catchments, following historical mining tracks and routes.

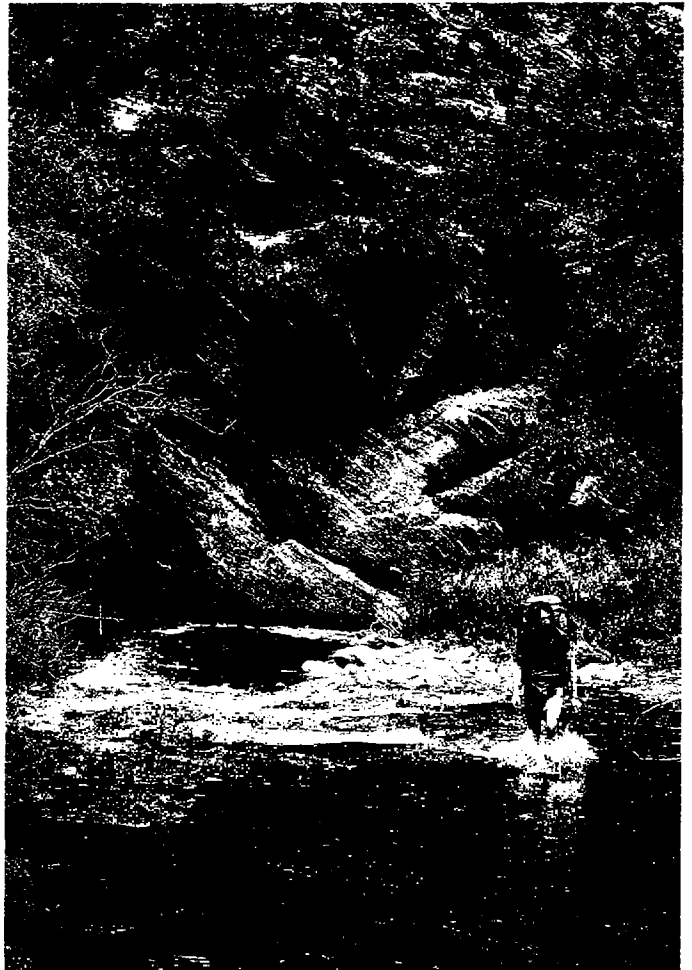
4.5.3 Climbing. The peaks in the northern Richardsons and along the Matukituki-Shotover divide receive attention from climbers, with access almost entirely obtained from the Rees or Matukituki Valleys. The Centaur Peaks, Cleft Peak, Tyndall, Sharks Tooth and Black Peak are the more usual objectives. In summer, most peaks provide broken rock and slab climbing, usually encountering only small snow fields on route. Tyndall is predominantly a snow climb.³⁰ Mt Aurum and Advance Peak are lower altitude scrambles from Skippers and Macetown respectively.

4.5.4 Horse Riding. The historic Moonlight Track has been used for commercial horse treks since 1962. During summer, daily excursions venture from stables at Arthurs Point, above the lower Shotover Canyon, and into the lower Moke Creek Settlement, now known as 'Seffer Town.' A more ambitious venture, involving an overnight stay in a lodge built specifically for the purpose, ceased several years ago.

More recently the Macetown Road has been used for conducted horse rides, despite heavy use by vehicles and walkers. The Motatapu Valley is used for guided tours between Glendhu Bay and Arrowtown.

Fording Skippers Creek.

Photo: Ewan Paterson



Throughout the easier country of the Shotover, Arrow and Motatapu, there is considerable potential for recreational horse riding, because of the presence of many pack tracks dating from the goldmining era, and the open and easily traversable country. However, riding for recreation has been sporadic and largely limited to occasional visits by clubs.

4.5.5 Competitive Events

During the last 9 years the region has hosted several 'Iron Man' endurance events. For 3 years competitions were held on End Peak and the lower Motatapu River, involving skiing, mountain running and kayaking. Since 1987 Mt Aurum has been the starting point for skiing, running to Skippers, and 20 km of gruelling kayaking down the Shotover Canyon, to finish with mountain biking via the Moonlight Track and Moke Lake to Queenstown. Helicopter support is essential for such events.

Moke Lake has also been the venue for two triathlons, involving swimming, running and mountain biking over challenging terrain. The latter activity is rapidly gaining in popularity in the Queenstown district. Due to the relative speed of these machines this activity creates a potential conflict with walkers on popular tracks.

4.5.6 Off-Road Vehicles

During summer holiday periods off-road vehicle pressure is intense around Queenstown and Arrowtown, causing considerable stress and conflict with residents, picnickers and other recreationalists. Noise from trail bikes in the lower Arrow river bed is such that some Arrowtown residents leave town during holiday periods. In marked contrast, the Richardson Mountains and other more rugged areas are not suitable for wheeled vehicles; here the only engine noise to be regularly heard is from aircraft.

Away from road formations the scope for 4WD use is limited. However, the upper reaches of some river valleys can provide suitable terrain. The main obstacle to their use above Branches Flat in the Shotover are numerous major river crossings. Shifting gravel and floods take a regular toll of four-wheel drive vehicles. By arrangement with pastoral lessees, a through trip over Billy Saddle is possible.

Trail bikes are much more free-ranging, but due to gorges and steep, broken terrain, they tend to be confined to the vicinity of roads or four-wheel drive tracks. River fords on the Macetown Road take a heavy toll of machines, particularly in the hands of inexperienced riders.

Several 4WD and trail bike rental firms operate in the region, hiring out large numbers of vehicles. In addition to considerable private ownership, the rentals have placed a major load on the relatively few areas legally available for their use. Runholders have responded by erecting locked gates or chains at key locations on their holdings, for reasons of security and privacy, and in one case to avoid conflict with horse trekking. However a number of runholders will give consent for vehicle use.

It is only in the more remote and robust environments such as the upper Shotover river bed that few conflicts arise. Major problems do occur at popular sites such as Skippers and Macetown with conflicting activity between bikers and walkers, sight-seers, or picnickers. Extensive physical damage occurs to historic sites, terrace escarpments and walking tracks. A survey at Macetown in 1976 determined that 94 percent of all visitors, including vehicle users, considered that some form of vehicle control was necessary.³¹

Vehicle barriers appear to have only a filtering effect on trail bikes, with the most determined riders either by-passing or negotiating these barriers. Four-wheel drive tours operate mainly on legal roads, or by arrangement with runholders. The Moonlight gold workings, 'Seffer Town,' Macetown, and the upper Shotover are areas that have been visited by such operators.

Recreational vehicle use is a major and legitimate activity in the region, being intimately related to family, group or individual participation. The problems that have occurred are largely related to physical restraints and a shortage of acceptable venues.

The district scheme³² identifies three areas as being suitable for trail bike riding in the vicinity of Queenstown and Arrowtown. Local government initiative in designating areas specifically for this activity is welcome. However, without active promotion of these areas, and discouragement from sensitive areas, the objective of reducing impacts on residents and other visitors is unlikely to be achieved. The variety of terrain in the designated areas, ranging from river bed to steep hills, will certainly provide adequate scope for local riders to gain riding skills. However, the more prevalent desire for unconfined access to a wide variety of hill country³³ cannot be satisfied by a few designated areas.

It is apparent from experience elsewhere that conflicts between recreational vehicles and other forms of recreation are usually resolved by the imposition of restrictions on the vehicles. This course will most probably be mirrored in this region as indiscriminate vehicle use becomes less socially acceptable.

4.5.7 Hunting. Localised pockets of goats in the lower Arrow and Shotover are an attraction for many, particularly youthful shooters. The population at any one time can vary greatly, depending on the control pressure by DOC. Rabbits are present in sufficient numbers to provide scope for casual shooters. The relatively small deer population attracts only local attention. Access with firearms onto run country is a frequent concern of runholders, and is often used as the basis for refusing access.

4.6 Canoeing, Rafting, Jet Boating

The region has the distinction of containing the best white-water river in Otago—the Shotover. It is one of the most popular rivers for canoeing and rafting, and has gained national prominence as one of only six rivers in New Zealand to have been ranked in 'Category A' for its "exceptional recreational and scenic values."³⁴

The unsuccessful Maori Point suction dredge (1926-27), Shotover River.





Rafting out of the Oxenbridge Tunnel, Shotover River.

The 20 km section from Branches Flat to Deep Creek is considered to be excellent for learner and experienced canoeist alike,³⁵ with the increasingly incised canyon providing superb scenery. This section receives considerable attention from canoeists and rafters. Relics from the goldmining era abound along the banks, including the 90 m high Skippers suspension bridge, and the steel pontoon and gantry of the Maori Point suction dredge.

In 1986 an application was made for commercial jet boating over this section of river. This brought with it an accompanying barrage of opinion against lifting the 5 km per hour restriction on the upper section of the river.³⁶ Primarily for safety reasons the restriction stayed. River recreation remains confined to drift boats.

The most impressive part of the canyon is entered at Deep Creek and extends 13 km down to Arthurs Point. Absence of road or easy foot access along this section provides an element of commitment and wildness. There are narrow, bouldery rapids with sharp corners, some of which are blind. At the Moonlight confluence the 'Mother Rapid' is encountered, consisting of confused white water in three drops over a km distance. This is the most difficult rapid on the Shotover, being graded by the N.Z. Canoeing Association as '4,' while the rest of the river has 'Grade

2-3' rapids.³⁷ In low water conditions in late summer, rafters can have difficulty negotiating some narrow, bouldery rapids.

The final part of the trip downstream to Arthurs Point used to consist of "Grade 2' and '3' rapids, but late in 1977 a jet boat company blasted boulders in these rapids, making them considerably less interesting for canoeists and rafters. This must rank as one of the most wilful acts of destruction of a recreational resource to have occurred in New Zealand. After an extended public outcry this unauthorised blasting was stopped. The Oxenbridge Tunnel just above Arthurs Point is negotiable in high water conditions by raft or canoe, with a spectacular exit down a 2 m drop.

Commercial rafting in the Shotover Canyon and on the Kawarau River has boomed in recent years. From just 3 operators in 1984, this increased to 7 in 1985. Up to 30 rafts can be on-river at one time.³⁸ Rafting is now a major year-round attraction, with thousands of visitors experiencing the thrills and spectacular scenery of the Shotover Canyon. Unfortunately the rapid growth in popularity was accompanied by a large number of mishaps, including fatalities. Through self-regulation and better operating standards the industry has settled down to respectability. The Canyon now disgorges large numbers of rafters, twice daily, most of the year round.

Commercial jet boat operations on the lower Shotover date from 1965, with one operator now carrying over 60,000 passengers per year. It is now regarded as one of the prime tourist attractions for Queenstown. However this has been at the price of commercial monopolisation of this reach of river and by the displacement of other recreational users. The level of commercial intrusion on waterways in the district is such that no section of the Kawarau or lower Shotover are free of commercial use and power boats. Many of these operations are also in conjunction with helicopter use, adding greatly to noise intrusion. Despite local calls for a readily accessible section of river being set aside for public "non-commercial" use,³⁹ and some official sympathy for such, until coordinated planning and control is instigated little progress towards this goal is likely to be achieved.

These conflicts between differing modes of white-water recreation are classic instances where the recreational opportunity spectrum approach should be adopted to equitably accommodate all interests. For canoeists and rafters the Shotover ranks very high nationally, but in its natural state the same cannot be said for power boating. It is clear that further 'easing' of rapids by blasting could open up the Canyon for jet boats, but would destroy the high value of the resource for unpowered recreation and make conditions unsafe for the latter — a clear case of one interest promoting itself at the expense of another.

The present compromise of separation of incompatible recreations between upper and lower rivers, to the reaches most suitable for each activity, is a workable arrangement. The exclusion of other craft from the lower reaches does not cause great loss of potential as this section presents few challenges for most canoeists and rafters. Conversely, the Shotover Canyon provides the only (as well as the best) opportunity for white-water canoeing and rafting within the region, whereas the whole upper Kawarau and lower Shotover is most suitable for jet boating. Further degradation of the Shotover Canyon white water and the introduction of jet boating would constitute a major loss in recreational opportunity.

Due to low flows and water abstraction for irrigation, the Arrow River is unusable for boating; however, it receives intensive use for bathing during summer. The lower Motatapu is popular for canoeing by commercial operators. Use of this river is confined to a 6 km section between narrow gorges, and by seasonal low flows, and willows.

4.7 Bungee Jumping

The Queenstown thrill scene has gone to new heights with the introduction of commercial bungee jumping. Thousands have flung themselves off the 43 m high Kawarau suspension bridge, restrained only by an elastic rope around their ankles. The even more scary 90 m leap off the Skippers bridge is now in vogue.

4.8 Skiing

4.8.1 Coronet Peak⁴⁰⁻⁴⁵

The first skiing to be actively promoted in the region was on the Crown Range in 1939. The Mount Cook Company located a shelter hut beside the road for use during winter excursions by its patrons who were transported by car from Queenstown. The following year attention shifted to Coronet Peak. The Company erected a hut not far above Skippers Saddle (at 900 m) but found that at that altitude there was insufficient snow. This required climbing on foot for an hour to find suitable slopes.



Skiing at Treble Cone.

Photo: Gregor Ronald

In 1947 the Company installed the first rope tow, providing 106 m of vertical lift from its lower terminal at 1067 m. A determining influence on its siting was walking time, as at that stage there was no road access off the Skippers Road. It was soon realised that the tow did not service the best slopes available. Higher snow-lines prompted the relocation of the tow in 1948. In 1949 two new tows were installed along a similar alignment to the existing double chairlift, providing a vertical lift of 450 m from 1190 m elevation. A road was constructed in 1949 and over a period of years the Company, then Government, upgraded this to the two lane sealed road of today.

Coronet Peak began to attract national and international visitors in 1962 with the introduction of daily air services from Christchurch and later, in 1964, by the installation of a double chairlift. Today it has two chair lifts, two poma lifts and one T bar, with a maximum uphill capacity of 4400 skiers per hour. Several ski clubs have substantial lodges on the mountain.

Since its inception as a skifield, Coronet Peak has been notable for its highly variable snowcover, with approximately one in five winters experiencing an interrupted ski season due to inadequate snow.⁴⁶ Records establish that this is not a recent phenomenon. As the lowest altitude skifield in New Zealand, with the winter snowline very close to the base of the field, it has to be expected that any variation in snowline and depth could have a major effect on skifield operation. As a region with relatively light precipitation there is little latitude for below average conditions. The only reason that Coronet Peak can be used for skiing is due to its favourable aspect, with its south-facing slopes having a low angle of incidence to winter radiation, permitting snow to accumulate. For obvious reasons the north faces of the mountain are not skied.

Unreliability of snow cover has, in recent times, provided the major justification advanced for new high-altitude skifield development in the Queenstown district, notably in the Rastus Burn of the Remarkables. However various proponents of this site have failed to acknowledge that higher altitude alone does not necessarily mean more snow; there has to be favourable slope aspect as well, preferably southerly.

There are no more suitable areas available for a new skifield within a similar road distance to that of Coronet Peak from Queenstown. Therefore the variability of conditions on Coronet Peak have to be accepted as long as it is required for skifield

operation. What is certain about Coronet Peak is that, with its usually adequate snow cover, its expansive and variable terrain provides some of the best downhill skiing in New Zealand for intermediate skiers.

Modern snow-making techniques could lead to practical solutions to periodic shortages of snowcover. The Mount Cook Group has continued with snow making trials and has begun investigations for a multi-million dollar snow making scheme for the mountain.

While predictions are being made that global warming will "wipe out" many existing ski fields by the year 2030⁴⁷ there is no certainty what regional and local consequences will result. Large localised variations from the norm in both temperature and precipitation could be expected. Existing seasonal fluctuations are masking any obvious trends in snowline.⁴⁸ Season-to-season variation will likely continue to be the major factor influencing ski field operation.

It is notable that the Mount Cook Group has accepted the feasibility of greater utilisation of Coronet Peak, as was advocated by opponents to its Remarkables scheme. In a major reversal of investment policy, during the last few years the company has increased lift capacity, enlarged the beginners' area and made major improvements to base facilities. The company now acknowledges that "it would have been cheaper to put snow making machinery into Coronet Peak" rather than invest \$14 million in the Remarkables.⁵⁰ There is little reason why Coronet Peak, within existing climatic limitations, cannot retain its national prominence as a ski field normally offering excellent skiing terrain and full supporting services. New lift developments on both existing lift-serviced and unserviced slopes, snow making, upgrading of existing facilities, and progressive management would help the field compete with newer ski fields elsewhere.

Year-round sightseeing has been a feature since the double chairlift was installed. Tourists travel to the summit for a panoramic 'million dollar' view, but this requires the lift to be run at half speed for loading of foot passengers. This now discontinued practice during the ski season had been a major contributor in the past to increased queuing time for skiers. Extensive bulldozing has greatly disfigured the slopes, which are snow-free for nine months of the year. Scarring is visible from throughout the Arrow basin.

In a move to increase summer trade, in 1983 the company installed a 600 m 'Cresta' slide as an additional, and very popular attraction. Sightseeing during the 9 month long non-ski season is a long standing major use. It is highly desirable that the non ski season impact of further development should be taken into account in the design and restoration of earthworks. Considerable emphasis is placed on award-winning architecture for base facilities, but little regard is apparently given to the aesthetics of the rest of the ski field.

The carpark at Coronet Peak is a regular take off point for hang gliding championships and informal use, with landings usually beside the Queenstown-Arrowtown Road.

The Mount Cook Group Ltd have a lease over 312 ha of recreation reserve, which is administered by the Department of Conservation.

4.8.2 Treble Cone

After several years of investigatory operation, in 1975 a new commercial ski field opened on Treble Cone overlooking the lower Matukituki Valley. Initially access was by 4WD and foot,

or by helicopter. A two-way road was later constructed through difficult terrain and resulted in an adverse impact on the landscape of the lower valley. Slope instability is resulting in major slip and road maintenance problems.

Treble Cone (Wanaka) Ski Fields Limited have a special lease over 770 ha of Crown land surrendered from pastoral lease. It includes the upper eastern face of Treble Cone and the headwater faces of the north branch of the Motatapu. The area developed to date consists of hummocky east-north-east slopes with an impressive outlook over Lake Wanaka. The gradients are predominantly suited for intermediate and advanced-intermediate skiers, with limited terrain for novices and beginners. Major earthworks have been undertaken to improve suitability for the latter. Two T-bars plus a double chairlift installed in 1983 have raised uphill capacity to approximately 3600 skiers per hour. The south-east Motatapu faces below the summit (2070 m) provide potential for longer ski seasons than are currently available in the region. A rope tow has serviced a small segment of these slopes. There is considerable potential for major increases in lift capacities on new as well as existing lift serviced slopes. An existing T-bar was relocated during 1989 to make use of upper slopes creating approximately 660 vertical m of serviced skiing.

4.8.3 Mount Cardrona⁵¹

In 1980 a new commercial ski field commenced operation in a south-east facing basin on Mt Cardrona (1933 m). The field is within an approximate altitudinal range of 1585 to 1830 m. The base area terrain consists of a gently undulating basin floor predominantly suited for novice and low intermediate skiers. Initial development consisted of a beginners' tow, and a main rope tow providing limited vertical lift. In 1983 the rope tow was replaced by a double chairlift to service the main learner terrain. Within 2 years, two additional chair lifts were added, opening up intermediate and advanced slopes. Cardrona now provides the largest lift capacity in the Southern Lakes region, able to handle 5,600 skiers per hour.

It appears that in comparison to Coronet Peak, this field receives substantially more snow and has a longer season. Both fields have similar aspects and snowlines and are generally dependent on the same cold fronts for their precipitation. However, due to a 'snow wedge' effect of increasing snow accumulation with increasing altitude⁵² the higher Cardrona field appears to have a more usable snow cover than Coronet.

Cardrona's extensive novice and low intermediate terrain provides much needed easier terrain which is in short supply on both Treble Cone and Coronet Peak. A full range of skier requirements can now be met in the region, with a strong guarantee of snow when it is needed.

The field is located on freehold land.

The development of Treble Cone and Cardrona ski fields have transformed Wanaka into a year-round resort.

4.8.4 Heli-skiing and Ski Touring

The Harris Mountains provide ideal terrain for heli-skiing. Two separate operations, based from Treble Cone and Coronet Peak respectively, have utilised these mountains since the late 1970s. In the northern Harris Mountains the headwaters of the North Motatapu, Polnoon and Blue Creek catchments are mainly used. The northern operation has extended to glacier skiing on Headlong Peak and the Tyndall Glacier since 1982, on the boundary of the national park. The number of heli-skiers in this one



Treble Cone (centre right) from Mt Motatapu, Harris Mountains.

Photo: Ian Turnbull

operation represent nearly half of New Zealand's heli-skiing market, making it the largest heli-skiing operation outside of Canada. (See also Mount Aspiring National Park 7.3).

Dependant on weather and snow conditions heli-skiing is run on a daily and half daily basis, with the major economic restraint being helicopter flying time from road side bases.²⁹

Black Peak (2283 m) is the venue for an annual 'Powder Eights' contest, involving the execution of perfect paired turns in deep snow. Vanguard Peak (1768 m), at the southern end of the Harris Mountains, provides the main venue for the Coronet Peak based heli-ski operation.

There is considerable scope for ski mountaineering and alpine ski touring within the Harris Mountains. However difficulty of winter access beyond the outer fringes of these mountains results in light visitation by ski tourers. The main Harris dividing ridge has been used for up to week-long traverses between Treble Cone and Coronet Peak, despite two low-level valley crossings being necessary. One guided alpine touring venture operated from Treble Cone for a short period. Due to their more dissected nature, the Richardsons and the 'Mt Cardrona' range provide more localised and limited scope for alpine touring.

There is very limited potential for cross country (nordic) skiing with the exception of the southern Harris Mountains above

Macetown. Ridge crests and gentler faces and basins on Advance and Vanguard Peaks are negotiable on nordic skis. Unlike most of the Harris Mountains this locality is open to foot access during winter. The more confined but accessible Crown Range is also suitable for short tours.

4.8.5 Potential Skifields

In terms of suitable snow covered terrain, the northern Harris Mountains in particular provide a large potential resource for future skifield development. The district scheme identifies two areas which may have potential for skifield development.³⁴ These are on Knuckle Peak and Mt Motatapu, although local expert knowledge favours the Motatapu slopes on End Peak and the Soho Creek basins on Mt Cardrona.³⁵ With the exception of End Peak, all potential new fields are distant from existing roads, and their high development cost is difficult to justify when established skifields are under utilised. Existing or expanded heli-skiing operations (with their inherent flexibility for daily conditions), provide the most appropriate commercial ski use of these slopes.

As previously noted, there is no scope within the immediate environs of Queenstown for a new skifield with more reliable snow conditions than Coronet Peak or the Rastus Burn (see also Remarkables-Hector Mountains 4.4.4). Consideration of further

developments within the medium term should be confined to established skifields and their immediate environs. Collectively these have the physical attributes to fully meet regional demands for many years. With the current uncertainty as to long term climatic trends it would be prudent to first enhance existing skifields rather than embark on new and very expensive developments.

4.9 Recreational Roads

The region is fortunate in possessing a number of historic roads through mountainous country. Their narrow and often tortuous routes provides unique motoring. As carriageways designed more for horse power rather than motor vehicle, they are distinctive for their general absence of steep grades. Modern use depends more on driving skills and nerve, rather than power.

4.9.1 Skippers Road

Thousands of private motorists, rafting clients, and bus passengers traverse the Skippers Road annually. This provides the high-point for many visitors' stay in the Wakatipu district. For non-rafters Skippers is the usual destination, with only a small number of vehicles venturing further on the single lane Branches Road.

4WD bus operators provide daily services which stop short of Skippers, due to weight restrictions on the Skippers bridge. Many private motorists find commercial users' vehicles intimidating and dangerous due to their size, speed, and an apparent lack of consideration for other motorists. As a narrow carriageway with an almost total absence of 'straights' there is, at times, little opportunity for approaching vehicles to use the limited number of passing bays that do exist.

The road has a limited capacity for increases in traffic density much above the peak loads currently experienced. Any attempt to increase the capacity by widening and straightening should be strongly resisted. 'Upgrading' would be self-defeating as it would effectively increase traffic densities and speed, and decrease the uniqueness of the motoring experience as well as the road's historical worth.

Inadequate maintenance is a more immediate, as well as longer term problem, with the limited capital spent by the Lake County Council going more towards corrective works such as road reopening, rather than regular preventative maintenance. The Council has attempted user-pay levies from mining and rafting companies without much success. The long term stability of much of the road, particularly where there are built-up rock formations, is questionable. Heavy loadings from buses and mining machinery is of concern. The road is regularly closed due to slips, snow or ice, with severe rutting at times due to heavy use by commercial vehicles in wet conditions. In recognition of its historical importance the Lake County has funded repairs to many of the distinctive stone wall barriers along the outer road edge.

4.9.2 Macetown Road

Although not negotiable by two wheel drive vehicle, the Macetown Road receives intense 4WD and trail bike use during holiday periods. The challenge created by a large number of river fords on route to Macetown appears to be a major element of the appeal. Due to the intensity, noise and excessive speed of many vehicles, use of the road either by vehicle, horse or on foot can be an unpleasant and hazardous experience.

Beyond the irrigation dam in the Arrow Gorge, there has been

little public road maintenance. Without regular attention to water tables and culverts, complete sections of road are liable to collapse due to water saturation. The cost of replacement in steep rock terrain would probably inhibit reopening the road for vehicular traffic.

4.9.3 Motatapu Road Link verses Crown Range

For several years the Lake County Council have advocated a new 'direct road link' between Wanaka and Queenstown, as part of a wider objective of expanding the roading network in the Lakes district. The District Scheme states that a road link through the Motatapu Valley is needed, and expresses the intention of investigating the feasibility of its construction.⁶

There are two existing road links between the two centres; State Highway 6 via the Kawarau and Upper Clutha Valleys and State Highway 89 via the Crown Range and Cardrona Valley. During summer State Highway 89 provides a considerably shorter link over a 1120 m saddle on the Crown Range. In winter, snow, ice and thaw conditions on the southern side of the saddle have caused difficulties for motorists, particularly for those unprepared for the conditions. In 1980 the County erected locked gates either side of the range and issued keys only to Cardrona residents and service operators. During the 1982 winter a brief trial opening for public traffic was conducted, dependent on daily road conditions. The simmering debate on this issue ceased in 1983 when the MWD ruled that road closure, for general safety reasons, was illegal. Agreement was quickly reached to keep the road open using additional maintenance funds, and to gradually upgrade it for all-weather traffic. Since then the road has been kept open year-round, with considerable improvements effected. The Cardrona skifield is dependent on the road being kept open. In the interests of regional skiing opportunity it is highly desirable that it be so. The Cardrona Valley section will soon be completely sealed. In view of these developments, there can be no justification for a Motatapu road link.

5. Zoning

5.1 Natural Experience

The eastern half of the Richardson Mountains and most of the Harris Mountains are zoned 'natural experience.'

The zone extends from the shores of Lake Wakatipu in the south, through the upper western tributaries of the Shotover up to the crest of the Richardsons, and as far north as the Shotover-Matukituki divide.

The Harris Mountains segment extends southwards to Advance Peak, to include the Arrow headwaters. The Polnoon, Blue Creek and Shiel Burn catchments are included in this zone.

Extensive beech forests in the upper Rees Valley, the western face of Twenty Five Mile Spur, and the Snowy Creek tributary of the Dart are zoned 'natural experience.' These areas are currently held in pastoral lease or are DOC stewardship area, but would more logically form part of the Mount Aspiring National Park. (see Mount Aspiring National Park 7.3).

Within the 'natural experience' zone, natural landscapes should be free of obvious developments or sophisticated facilities. To this end no vehicle track construction should be permitted, although air access for recreational purposes should be permitted.

Seasonal grazing may continue within the lower areas of the zone with controls to prevent stocking of Class 8 land. It is of

paramount importance that within the zone all exclusive rights of pastoral occupation be withdrawn to allow free-ranging public use. All commercial recreational activities must however continue to be controlled by permit systems due to potential impacts on the environment and on other recreational users.

5.2 Open Space

The western face of the Richardsons, the mid to lower Shotover catchment, Motatapu-Cardrona country, and the Matukituki faces of the Harris Mountains are zoned 'open space.' Within such a large and topographically diverse zone there are locality-specific management requirements to meet recreational needs.

5.2.1 Western Richardson Mountains.

This sunny face has been extensively modified by pastoral farming and scheelite mining, with roading and farm tracks extending well up many faces. Other than the higher peaks, Lake Luna, and the upper Rees Valley tributaries (eg 25 Mile Creek and tributaries), there are limited destinations of recreational interest within this area, but it provides numerous access routes to the main Richardsons and for through trips to the Shotover and Moonlight catchments.

Higher areas should become Crown land available for recreation, as retirement from grazing progresses through all the affected leases, with public foot access provided to these areas.

5.2.2 Shotover Canyon-Skippers Road-Queenstown environs-Lower Arrow.

This is THE area of prime recreational use within the region. Natural, cultural, primary production, and recreational values are interwoven within these areas, requiring integration by site specific land use controls and recreational management. It is here that the bulk of people and activity-pressure occur, and will increasingly occur as Queenstown develops as a tourist centre.

The degree of planning, consultation, and recreational management necessary to achieve integration, plus the area's national importance, indicates the desirability of a multi-agency approach.

5.2.3 Upper Shotover Valley.

Recreational use will continue to be relatively light with access confined to the main valley. Rights of public access to the head of the valley and the encircling natural experience zone is the major requirement.

5.2.4 Motatapu, 'Cardrona' and Crown Ranges.

Generally low intensity recreational use, with seasonal potential for skiing (cross country, touring, helicopter, and skifields), and for through tramping trips.

As higher elevations are retired from grazing these areas should become available for public recreation. More frequently used routes should become legally available. There is potential for new skifield developments which may be required in the future, depending on regional skier demands and climatic trends.

5.2.5 Matukituki Faces.

These steep, sunny faces have been considerably modified by a long history of fires and grazing.

The higher peaks of the Harris Mountains are of interest for climbing, and should become legally available for public use as the higher areas are retired from grazing. Legal access routes from the Matukituki Road are required.

5.3 Cultural Experience.

The established skifields and two historic goldfields are zoned 'cultural experience,' in recognition of their heavy emphasis on facility use or historic values.

5.3.1 Skifields.

Lift and service facility developments, slope modification, and groomed snow to suit high density skier traffic has resulted in greatly modified alpine settings.

Accepting that these slopes are under utilised and downhill skier needs are best met by new and upgraded facilities, further skifield development for the foreseeable future should be confined to the environs of the three existing fields.

5.3.2 Mt Aurum-Skippers and Macetown.

The two most concentrated groups of historic goldfields sites require management and presentation for public appreciation. The significance of both areas has in part been recognised by District Scheme 'Rural H' zoning and by reserves acquisitions, but requires greater effort in relic restoration and public interpretation.

6. Recommendations

Many detailed recommendations arise from the proceeding discussion and zonings and can be inferred from such. The major recommendations to be drawn from this chapter are:

6.1 The unique diversity in recreational opportunities within the region be maintained by retention of the range of settings (natural/open space/cultural) that are currently available. Expansion of recreational activities should be encouraged within these settings, where possible without adding to inter-activity conflict or narrowing the range of recreational opportunities available.

6.2 The recreational resources of the Shotover, Arrow and Queenstown environs be recognised by all authorities with jurisdiction as being of national importance. To achieve this a co-ordinated planning and management strategy needs to be developed involving detailed assessment primarily of the Crown land/leasehold bank by means of:

- the provision of additional public access ways;
- covenants over private land uses;
- reservations;
- public prospecting rights;
- district scheme planning controls.

6.3 Either the Mt Aurum Reserve be reclassified 'Scenic,' or be designated a higher status of 'Conservation Park' in the future.

6.4 The length of the Shotover Canyon, both river and environs, be protected as a nationally important wild and scenic river:

- the protection should be from damming, obstruction by mining operations, and alteration of natural channels through removal of bedrock or boulders;
- a national water conservation order be sought, despite legislative deficiencies, as the best means currently available to provide a measure of river protection;
- the setting for the river be protected by reserves or covenant agreements as appropriate, with tight controls

on roading or access tracking. This is particularly necessary for the vista from the river or Skippers and Branches Roads. Such measures could provide a broader level of landscape protection to that provided by the 'Rural H' (Historical) zone which is limited to the siting and design of non farming structures.

6.5 All exotic plant establishment trials in Skippers Creek and the upper Shotover be removed.

6.6 No further consents for new ski fields should be granted while considerable potential remains for further development of the three existing ski fields.

- the long term potential for new ski fields should be noted for future consideration, when and if sufficient skier demand exists and climatic change dictates.

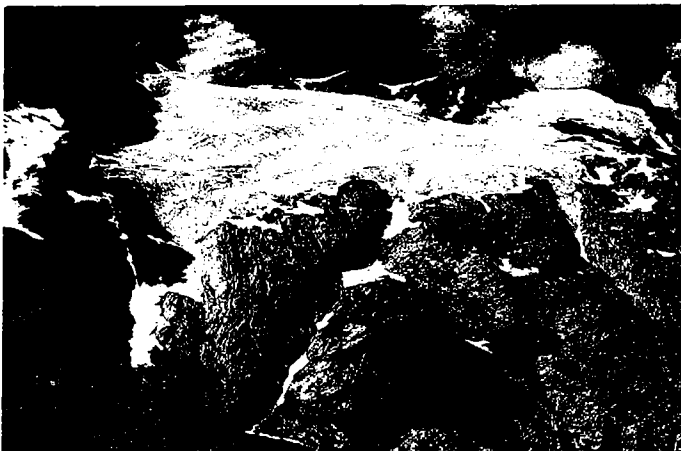
6.7 Further expansion of the region's roading network is not warranted at this stage, and should not proceed.

- State Highway 89 (Crown Range section) should be further upgraded and maintained for year-round use;
- regular maintenance programmes should be instigated for the Skippers and Macetown Roads.

6.8 The Rees Valley and Snowy Creek headwater catchments be incorporated into the Mount Aspiring National Park. (See Mount Aspiring National Park 7.3).

6.9 A Protected Natural Areas assessment be undertaken to determine representative ecosystems for reservation, as an adjunct to broader landscape protection and provision of public recreation opportunities.

Centaur Peak and glacier from head of Sixteen Mile Creek, Northern Richardson Mountains. Photo: Bob Entwistle



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