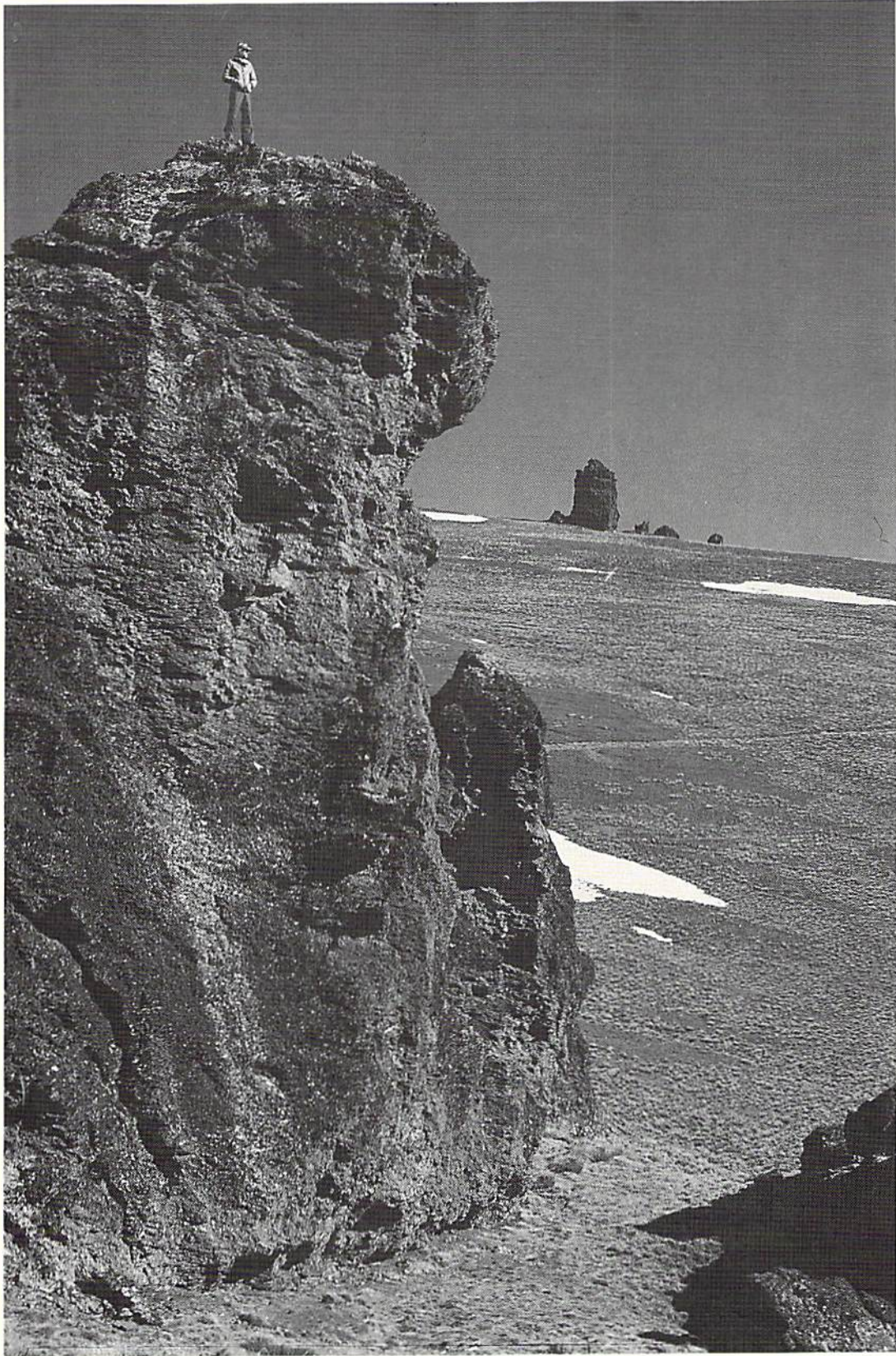


# OUTDOOR RECREATION in OTAGO

A Conservation Plan

Bruce Mason



Volume One:  
CENTRAL OTAGO'S  
BLOCK MOUNTAINS



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*Pisa trio.*



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BLOCK MOUNTAINS

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Dedicated to the Memory  
of

Peter Child  
1923 - 1986

*Tramper, mountaineer, naturalist,  
and lover of Central Otago*

## PREFACE

This work is the first of two volumes to cover the high country and upland recreational resources of Otago, east of the main divide.

*Outdoor Recreation In Otago* has been long in the gestation (eight years) and follows from the well-received *Outdoor Recreation On The West Coast* by Les Molloy. This was published by FMC in 1979. The latter work was a broad-brush exercise to quickly identify the extent and location of differing categories of outdoor recreational areas, most of which were directly administered by State agencies, but were in imminent danger of large-scale loss to the demands of the timber industry.

The Otago series adopts a similar approach to the West Coast volume, however a more in-depth assessment of the settings in which recreation occurs has been necessary. This is primarily due to the prevailing pastoral land-use and land tenures. Crown pastoral leases cover the greater extent of the land reviewed, with only relatively small areas away from the main alps under direct state control. The solutions required to achieve an integration of recreation with pastoral production involve an intricate mix of social/legal factors, and political and statutory decision-making. This is a situation peculiar to these leasehold lands.

The need for recreational assessments in the high country could not have been more apparent than during the recent debate over moves to alienate pastoral leases from State control. That battle was won, but it was quickly followed by perhaps the greatest carve-up of Crown lands this century. Fortunately most high country lands were hauled back from the brink of corporatisation and privatisation. History demonstrates that alienation of the public interest is rarely, if ever, reversed. The risk is greater while natural and recreational values remain undocumented, and not widely recognised within government or the community at large.

The Protected Natural Areas (PNA) Programme has made important beginnings in documenting remaining natural areas in the South Island high country, however such efforts must be paralleled by recreation and landscape assessments so that the total public interest of nature conservation-recreation can be properly satisfied. The recommendations in this volume need to be integrated with those of PNA surveys, where these are completed, and used as a basis for the Crown exercising its rights as landlord, and for negotiation with pastoral lessees.

*Outdoor Recreation In Otago* is a first attempt to take a composite view of high country Otago as a recreational resource. It is not intended that it removes the necessity for further assessment, in particular of individual localities.

In September 1986 Cabinet charged the yet-to-be-established Department of Conservation with the 'key tasks' on pastoral lands of 'the protection of native plants and animals, the unique high country landscape, soil and water conservation, and negotiating increased opportunities for public recreation.' Specific information on all these concerns is the essential ingredient for furtherance of these objectives. This plan has been prepared in the earnest hope that official initiatives in this field can be expedited. Economic and pro-development forces

have been well catered for by the present system; there is not too much time left if non-material recreational values are to have an effective influence.

This plan focuses on those recreational activities which the Federation feels it is competent to address. That is, foot and ski orientated activities of which its members have first-hand experience. It generally excludes low country rural lands where different recreational activities and perspectives apply. Where other activities do coincide however, they are noted for completeness of record. FMC does not attempt to be an authoritative source on these, and commends consultation by decision-makers with user groups such as acclimatisation societies. One extensive *open space* not covered in this plan should not be overlooked. This is the Manorburn - Rough Ridge - Lake Onslow uplands. Although not generally used for foot recreation, there is considerable potential for reserves, and for protection of historic sites and trails. Parts are intensively used by anglers. Development pressure on these lands would indicate a high priority for PNA assessment.

A qualitative rather than quantitative approach has been taken with this work. Putting aside the considerable resources required to accurately quantify recreational activity, the essence of wildland recreation is the quality of the experience obtained by participants, whatever the actual activity pursued. Besides, projections of future use on a quantifiable basis are exceedingly difficult, if not impossible.

The Recreational Opportunity Spectrum (ROS) approach to allocating lands of recreational significance has been adopted. This entails zoning for different, desirable 'experiences', rather than along the historic model of land condition, as widely practiced by most existing land management strategies. The ROS approach has necessitated a comprehensive documentation of the physical and social settings in which various recreations occur; while this is intended to be useful resource data, it should be viewed as of secondary significance to the qualitative judgements implicit in the Federation's zonings.

The real strength of this exercise lies in the detailed field knowledge of all who contributed information and comment. This plan is an expression of individual values - values which are derived from many memorable experiences over a broad span of years. These perceptions may differ from others with enthusiasm for commercial opportunities or the status quo, or who actively participate in non-compatible recreations. It is the intention of this work to provide a documented basis for the on-going debate over the many pressing issues in the high country.

In places the text is critical of State agencies and land use practices. For over the fifty years of the Federation's existence, it has always shown that it is prepared to contribute ideas and to engage in dialogue with the managers and other users of mountain lands. Any criticisms are made in a spirit of constructive commentary, which, with dialogue, must contribute to the long term well-being of the land resource on which so many different interests depend. It must be acknowledged that despite frequent recommendations in this work for rights of public access, the majority of runholders allow public recreation on their holdings. Unfortunately there are enough unreasonable obstructions to access to cause on-going irritation for the recreational community. Apart from these cases, the approach of FMC is not one of 'picking' on individuals, but rather of countering increasing commercial

incentives for 'locking out' the general public as well as pressures for widespread freeholding.

The views expressed are intended to reflect FMC's position. As author I accept responsibility for the interpretation of FMC's objectives and policy, and for the views expressed. Having stated this, FMC endorses the publication as a considered contribution towards improving the future management of Otago's recreational landscape. This work is part of an evolutionary process, as physical and political realities confront many perceptions and stances from the past. This situation applies to all parties to the high country debate. While FMC is clear in its objectives for these lands, it accepts the need for some flexibility in the attainment of these objectives.

This volume devotes nine chapters to Central Otago's block-faulted mountains. A second volume will deal with Dunedin's hinterland and north-west Otago. This will address the Silver Peaks region, the eastern half of Mount Aspiring National Park, and the Lakes district from the Hector Mountains in the south, to the Ahuriri Valley in the north.

## Acknowledgements

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Brian Turner readily accepted final editorship, and was responsible for layout and seeing this volume through to the printers, John McIndoe Ltd.

The following provided comments at various stages, however they cannot be held responsible for presentation, or views expressed:

Hugh Barr, Cathy Brumley, Paul Chapman, Arne Cleland, Peter Child, Dave Craw, Dave Henson, Marjorie Mason, Brian Patrick, Stuart Mathieson, Rob Munster, Mark Stirling, Peter Strang, and various members of the N.Z. Alpine Club, Otago Tramping and Mountaineering Club, Central Otago and Hokonui tramping clubs.

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B.M. December 1987.

## INTRODUCTION

### An Overview

#### 1. The Character of Central Otago

Several distinct elements contribute to the character of Central Otago as a setting for outdoor recreation:

##### 1.1 Landscape

Otago is a geographic mosaic of landscapes, extraordinarily diverse and quite different from the rest of New Zealand.

Inland Otago presents a lonely vastness or spaciousness unmatched by most other regions. Mountaineer-essayist T.H. Scott observed this is 'a vast kind of land, whatever its size on the map, giving a sense of great distance...'<sup>(1)</sup>

The Otago region is one of the largest in New Zealand, spanning the broadest part of the South Island. It is distinctive for its steep-faced mountains, glaciated lake basins and large glacier-fed rivers, extensive ranges away from the main alps, and for an absence of large, continuous areas of lowland.

Central Otago provides a unique heartland. It is divided by a reoccurring pattern of alternating block-faulted ranges and basins. Striking features are bare, tor-studded crests and craggy faces of some of the ranges and tablelands. Deeply incised river gorges cut through many of the ranges, following courses older than the uplands they drain.

It is generally a region of subdued landforms, perceptions of which alter with the season, and the hour. The long shadows of late summer afternoon and evening create smouldering purple and blue castes over the landscape, intensifying relief and lengthening distances. As writer-recreationalist Brian Turner phrases, there is a 'brooding sensuality' about Otago's hills.<sup>(2)</sup> Golden autumns among the deciduous poplars of the basins, and the pungent fragrance of fields of flowering thyme are vivid banners of the seasons. Penetratingly cold valley fogs, hoar-frosts, extreme atmospheric clarity, and snow caps on the tops distinguish winter from the other seasons.

The skyscape can be as imposing as the land. Westerly cloud patterns mirror landforms, with wind-sheared nor-west arches positioned to the lee of the ranges, which themselves can wear caps of contour-hugging cloud.

##### 1.2 Tussock Grasslands

The unifying element over most of the high country is the tussock grasslands. As Scott observed<sup>(1)</sup> '...here (is) a plant happily suited to plain, hill or mountain - the tussock - of which the earth nor eye could tire. It seemed to me a plant of



the spaces - the sprightly silver tufts and the great rusty bushes alike suited to some eternal wind sweeping over an endless land, to an ancient sun beating down or to a biting inland winter. A plant that could people, rather than cover desolate places.' The form of the land remains apparent under the tawny mantle.

The wind is master of the tussocks - its power and its patterns dominate. 'They nod and sway like enraptured beings', observes Turner.<sup>(2)</sup>

The high country leaves many visitors spellbound. These desolate places are as much a spiritual resource as they are a physical reality. Turner writes<sup>(2)</sup> that 'it is impossible to explain precisely the attraction the high country holds for many people, yet it seems to embody our need for some understanding of and kinship with the land that slopes up towards the high hills and mountains which are the nearest thing we have to shrines in this country.' However it has to be admitted that - 'to a large proportion of the population the "wide open spaces" are little more than scenery, sometimes pretty, sometimes desolate, boring or barren.' These are individual responses coloured by culture or personal experience; by living or actively recreating within the high country very different perceptions can arise.

### 1.3 Climate

Central Otago's climate is particularly striking. Arid 'barrens' co-exist beside the largest river in New Zealand, which drains glaciated alps only a relatively short distance to the west. Clear skies result in high sunshine hours and daily temperature extremes. This is as close to a continental climate as can be found in New Zealand. There are also great climatic differences between altitudes. The basin depressions can swelter with the highest temperatures in New Zealand, while adjacent range crests are among the harshest alpine environments in the country.

### 1.4 History

No sooner had the first pastoralists established their runs over vast tracts of country, then startling discoveries of gold, first at the Tuapeka in 1861 and then at the Dunstan, drew thousands of prospectors in to the sparsely inhabited interior. The goldrush era has largely determined the settlement pattern of today, with most towns strategically located near the goldfields. Communications links became quickly established through difficult terrain, the many ranges and gorges proving to be major obstacles. The roading pattern remains substantially unaltered today.

Gold projected Otago in to economic prominence in New Zealand. The gold era spanned a 40 year period of sluicing, quartz mining, and dredging. The cultural legacy of this era, in terms of historic trails, workings, and cob and stone buildings is a distinctive characteristic of the region.

What isn't generally appreciated is the effect of Polynesian culture on the grasslands setting of today. While much of the district, excluding the driest basins, was probably covered by forest before the arrival of man, almost all was burnt off, either intentionally or unintentionally, since the arrival of the Maori in A.D. 900. Widespread totara logs, successive layers of soil charcoal, and preserved pollen in bogs, provides generally accepted evidence that the tussock grasslands and shrublands of Central Otago that first greeted the pastoralists had succeeded

forest. Most deforestation occurred from the 10th century onwards and is generally assumed to be associated with moa hunting activity.<sup>(3)</sup>

### 1.5 Pastoral Runholding

Of universal impact on the high country has been the effects of extensive pastoralism. Over the first 20 years stock numbers increased greatly on the native pasturage to reach peaks in the 1870's and 1880's. The high stocking proved to be unsustainable, and numbers declined erratically, through snow losses and rabbits, until the 1950's when it was only 10 per cent of the 1880 level.<sup>(4)</sup>

The widespread practice of burning to induce new growth and to control scrub, in conjunction with grazing, has caused major changes to the composition and vigour of plant communities. The semi-arid Central Otago basins and low altitude sunny faces suffered the greatest. Overseas commentators have observed this to be one of the most dramatic examples of severe land degradation to have occurred globally with the expansion of European pastoralism during the 19th century.<sup>(5)</sup> An explosion of rabbit numbers, after sheep numbers had peaked, greatly accelerated the process of desertification. A mosaic of short fescue grasslands and shrublands was replaced by bare earth, scabweed, exotic herbs, and more latterly by adventive, low producing exotic grasses. At the time of first settlement runholder Watson Shennan described the Manuherikia Valley as 'a land well grassed and watered, a very land of promise'. He found the country as far as where Clyde now stands 'all well grassed and watered, sufficient scrub for fuel for many years, but no bush or timber.'<sup>(6)</sup> In 1868 Alexander Bathgate observed an abundance of tussock and grasses in the now 'bare and barren' Cromwell Gorge.<sup>(6)</sup> On the ranges the upper and lower limits of tall tussock retreated under the impact of burning and grazing.

### 1.6 Wildlife

Changes in the fauna of Central Otago have been equally drastic during historic times, leaving Central Otago relatively undistinguished for its variety of native species. Botanist J. Buchanan described the Maniototo Plain in 1862<sup>(6)</sup>: 'The Taieri was a bright translucent stream, and at every bend of the river there was a bank of clean small gravel, and on these flocks of waders and other birds disported themselves including dotterel, golden plover, pied stilts, pied oystercatchers, and swarms of terns sitting around or whirling over the river. In the swamps and lagoons were a good many pukeko, and along the river not infrequent bitterns: on the open plains large flocks of paradise ducks. On the lagoons and river-bends grey ducks, shovelers, and teal were numerous. Weka were plentiful among the rocks and scrub in the gorge near the Styx, as were blue duck, an odd kingfisher, and a few fantails and tomtits. The little grebe (dabchick) was not uncommon in the quiet reaches of the river or deeper lagoons. The grass on the hills swarmed with grasshoppers, and cicadas were abundant, as also were lizards.'

Wild dogs were a major problem for the early runholders, as were swarms of rats and mice. Native quail were plentiful; they completely disappeared within a few years of settlement.

After 130 years of habitat destruction and modification, by farming and mining, the number and diversity of native species is now greatly reduced.

Loss of wetlands and lower water quality has adversely affected

wading birds. Weed encroachment on to riverbeds is an ongoing problem. Dry terraces and alpine herbfields with low, cushion vegetation now provide the more significant habitats for waders. Acclimatised fish and ducks are plentiful and have replaced most native species in remaining wetlands.

Within the extensive montane basins formerly rich insect fauna has been virtually eliminated. It is only on rocky outcrops and in salt pan areas that islands of biological richness survive. However some saline plants and animals are in extreme risk of extinction. Lizards are abundant in dry, rocky environments with Central Otago providing the richest lizard fauna in mainland New Zealand. Eleven species of geckos and skinks are recorded.<sup>(7)</sup>

The alpine zones retain the greatest diversity and richness of native insect and bird species within the region.

### 1.7 Hydro-electric Development

The upper Clutha power scheme currently under construction is drastically changing the character of basin-floor Central Otago. Coupled with irrigation development, expanding horticulture, and population increases, more intensified and diverse settlement patterns are emerging.

## 2. FMC's Objectives

In addition to FMC's national role in the promotion of active recreation and mountain safety practices, the Federation actively promotes public access to mountain lands and the conservation of these environments. FMC's particular goals in the South Island high country are:

- \* the protection and improvement of public recreational opportunities;
  - \* the conservation of natural landscapes and ecological values, as important components of the recreational setting.
- To achieve the above goals, the Federation seeks:
- \* the removal from pastoral leases and licences of high land unsuitable for grazing, and the making available of these lands for public recreation through more appropriate tenures;
  - \* the evolution of tussock landscape management systems, and the identification, for protection, of typical and special landscapes throughout the high country;
  - \* completion of the PNA programme to achieve a representative network of protected areas, with reserve status where significant opportunities for public recreation exist;
  - \* improved public access through leasehold land to public land within or beyond. Where recreational use is random and of low intensity, the Federation generally considers that informal arrangements are adequate. For regular access routes, and areas of regular recreational activity, formal arrangements for public use are sought;
  - \* allocation and management of recreational resources through local and regional planning, by application of the ROS concept.

## 3. Outdoor Recreation Demand

### 3.1 Patterns and Preferences

Several national recreation surveys and a few local surveys have been undertaken since the mid 1970's. These are usefully summarised in the N.Z. Council for Recreation and Sport's

*Policy for Outdoor Recreation in New Zealand.*<sup>(8)</sup> The surveys establish that at the national level:

- \* most people are involved in a variety of activities;
- \* active outdoor pursuits are significant to, and positively pursued by nearly half New Zealand's population;
- \* participation in active outdoor activities is increasing at the expense of sports;
- \* approximately 10 per cent of the population participates in 'traditional' outdoor activities such as tramping and mountaineering;
- \* there is a growing multiplicity of specialised activities as developments of old ones. eg. ski touring and heli-skiing;
- \* skifields, with good road access, have attracted thousands of people in to the mountains who might never have gone there otherwise;
- \* conversely, 'big game' hunting is diminishing along with the resource.

At the local level (in 1977)<sup>(9)</sup>:

- \* among Dunedin residents 'walking for pleasure' ranked as the 6th most popular recreational activity, with universal popularity among all age and occupational groups;
- \* tramping ranked as 22nd in relative popularity, but 5th as an ambition.

### 3.2 Influencing Social Factors

Leisure time and discretionary income have a major bearing on recreation participation, with lack of facilities ranking third.<sup>(8)</sup>

Increasing imbalance of wealth in New Zealand is not conducive to increasing participation in recreational activities by all socio-economic groups.

Most commercial activities and developments in the high country are tailored towards 'up-market', well-healed clientele, particularly among overseas visitors. eg. heli-skiing, heli-hiking, lodges/condominiums, guided fishing and hunting. Conversely the high cost of transport, accommodation, and service charges are turning away an increasing number of domestic visitors from the more popular destinations.

### 3.3 The Recreational Land Resource in Otago

Scenic quality and grandeur are important attributes for most recreationalists, however areas around population centres, whether or not of great scenic attraction, can have high recreational value due to proximity and ease of access. More distant areas have significance as holiday and tourist destinations.

In Otago there is a relatively short history of formal provision for outdoor recreation, with protected areas clustered around the western and eastern extremities of the province. It was not until 1964 that the Mount Aspiring National Park was established, this being confined to the western alps. Scenic reserves around Dunedin, and on the south-east Otago coast, have only been actively managed for the last 10 or so years; these providing native forest settings for recreation.

Within the broad expanse of Central Otago there are almost no areas formerly available for public outdoor recreation. The Otago Goldfields Park, dating from the mid 1970's, is the only reserves system, consisting of a scattering of small historic sites. Only a handful Crown Land management plans exist with provisions for public recreation in the high country. There will be new opportunities for lake orientated activities after Lake Dunstan fills in 1989. However wild and scenic river values will be lost as a consequence.



The great potential for increasing recreational activities for the general public lies on the one million hectares of pastoral leasehold land in Otago, that is provided compatible farming practices are adopted and trespass rights currently held by lessees are withdrawn over areas of recreational significance. The range of recreational activities possible on these lands cannot be adequately accommodated elsewhere. Formal provision for public recreation on these lands would add significantly to recreational opportunities regionally.

### 3.4 The Future - A Changing Resource ?

Predictions of permanent changes to the earth's climate due to a 'green house' effect, may have a direct bearing on recreation potentials over most of the areas reviewed in this work. Higher average temperatures, and possibly reduced snow precipitation, will have a direct impact on skiing in the medium to long term. In the absence of large-scale snow making, marginal skifields will cease to exist, and even some of the better areas for snow cover may suffer due to changed snowfall patterns. Consolidation of future development at the better existing skifields may be prudent before embarking on new developments.

In the absence of major capital investments, cross country skiing, and to a lesser extent heli-skiing, is very flexible as to venues. The extent and reliability of skiable terrain may reduce. This will exacerbate present winter-to-winter

variations, however a sizable, if variable, ski resource can be envisaged for the foreseeable future.

## 4. Planning For Outdoor Recreation

Prior to the early 1970's, for rural-backcountry New Zealand recreation planning was unknown. With relatively few mountain recreationalists and 'lots of resource', official efforts were directed more towards mitigating localised, undesirable effects of recreational activities on the environment. Management planning within national parks and reserves, and more latterly in state forests, have attempted to grapple with the vexed question of how much and what uses of our protected lands is appropriate. Much effort has gone in to quantifying use, and its impacts, rather than towards understanding the processes at play; more often the management of individual parks has tended to reflect the managers' perceptions of users' requirements, in the absence of a coherent overview of regional needs.

Warning noises were made during the 1970's, to the effect that the historically 'infinite' resource was no longer so. Cries of 'wilderness diminishing'<sup>(10)</sup>, predictions of 'back country booms'<sup>(11)</sup>, and calls for more planning were heard.

Several national and regional conferences have occurred during

the last decade, which have attempted, from differing approaches, to identify the problems, the conflicts, and the legislative barriers in the way of change. Important shifts in government policy were a consequence of the debate, although so far they have largely remained 'paper' policies. The principle of maintaining a broad spectrum of recreational opportunities became generally accepted, however the problems, from the administrators' point of view, seemed too insurmountable or remote to warrant redirecting scarce planning resources away from more immediate tasks.

In many respects, back country recreational planning has lagged behind that undertaken in many urban and some rural settings. Leading local and regional authorities have been developing sophisticated profiles of their recreational clientele and their needs, and documenting the resources available to them; this has been to a considerably greater extent than has occurred on many nationally managed lands.

The first attempt at a regional overview of recreation was a pilot study of recreational planning processes in Marlborough.<sup>(12)</sup> This documented recreational activities and demands, and was derived from extensive public consultations. This ambitious effort has not been repeated.

An important benchmark for recreational planning was the publishing of profiles, needs, behaviours, and wants of mountain land recreationalists in New Zealand.<sup>(13)</sup> This signalled a recognition that user understanding and input is essential for any meaningful planning to take place, a point also stressed by the Marlborough study.

The first official regional planning exercise in the high country that had direct recreational consequences, was the *Central Southern Alps Crown Land Management Strategy* of 1981.<sup>(14)</sup> This established recreational zones over wide areas and applied Land Settlement Board (LSB) policies over the Unalienated Crown Land (UCL) between Arthurs Pass, and the Mount Cook and Westland National Parks.

The Canterbury United Council has used the ROS concept to review the recreational resources and potential of the Canterbury region.<sup>(15)</sup>

The culmination of national policy development for outdoor recreation was in 1985, with the completion of the *Policy For Outdoor Recreation In New Zealand*.<sup>(8)</sup> This document embodies:

- \* philosophy and principles reflecting societal values which should be taken in to account;
- \* goals, and more specific objectives.

The Policy is intended to provide the framework for further policy development, and implementation. It is commended as a sound basis for official action. The concerns of user groups, including FMC, should be well addressed if the principles it advances were consistently applied throughout the country.

This plan had its origins back in 1973 when the Land Use Advisory Council approached FMC for its views on a broad zoning of New Zealand's outdoors in to categories of recreational activity.<sup>(16)</sup> The resulting *Outdoor Recreation On The West Coast*<sup>(17)</sup> was one of the first attempts in New Zealand at rationing recreational resources on a regional basis. This was by broadly identifying *wilderness, natural, recreation, multiple use, and open space* areas.

## 5. Policies for Outdoor Recreation

Several government land management policies have a direct bearing on recreational availability and treatment. All Crown land tenures in Otago are affected.

The National Parks and Reserves Authority's (NPRA) *1983 General Policy for National Parks*<sup>(18)</sup> sets out criteria for accommodating recreation and tourism, and the framework for management plans and zoning.

The NPRA's *Draft General Policy For Reserves* <sup>(19)</sup> provides management requirements according to reserve classification, and criteria for preparation of management plans. This draft policy is being applied, pending ratification or further amendment due to administrative reorganisation. A series of *Guidelines and Policies* have also been prepared by the Department of Lands and Survey on aspects of reserves management.

A framework of principles and goals for all high country lands is provided by Government's *1979 High Mountain Resources Policy*.<sup>(20)</sup>

UCL and pastoral leases and licences are subject to the LSB's *1984 High Country Policy*.<sup>(21)</sup> This contains a *nature conservation policy*, plus policies for the regulation of land uses that require Crown consent (bush clearance, burning, roading, drainage, cultivation, afforestation, and stock increases; there are also powers of resumption, forfeiture, reservation, variation of covenants, and reclassification). The High Country Policy's provisions for recreation and tourism have been superseded by the *1985 Commercial Recreation and Public Recreation policies*.<sup>(22)</sup> There are also *Wellands, Rural Landscape, Principles of Crown Land Management, Public Participation, Game Management, and a Joint Policy: Skifields On Lands Of The Crown* among others.

Government has endorsed a joint Nwasca/LSB *1985 Destocking and Surrender Policy*<sup>(23)</sup> for the identification and removal of 'significant areas of Class 8 and severely eroded Class 7 lands' from pastoral leases.

Establishment and management of walkways is subject to the Walkways Commission's *1984 Policy Statement*.<sup>(24)</sup>

Former state forest lands, now generally conservation lands under DOC, are still subject to Government's *1977 Management Policy for New Zealand's Indigenous State Forests*,<sup>(25)</sup> despite being overtaken by the Conservation Act 1986. Management plans over State Forest Parks now only apply in so far as they are consistent with the Conservation Act. The Forest Service's *1983 Recreation Policy* <sup>(26)</sup> has not been adopted by DOC.

DOC is preparing a corporate plan for the management of all DOC administered lands which will cause review of all existing departmental policies. Review of the role of the NPRA during 1988 will no doubt generate further reviews of its policies.

## 6. The Recreational Opportunity Spectrum

The zoning model used in this work is an application of the ROS concept.<sup>(27)</sup>

# A RECREATIONAL OPPORTUNITY SPECTRUM FOR THE OTAGO HIGH COUNTRY

RECREATIONAL EXPERIENCE ZONING					
	WILDERNESS	REMOTE	NATURAL	OPEN SPACE	CULTURAL
<b>SETTINGS</b>					
NATURAL - CULTURAL SETTING	Large tracts of unoccupied land, native forest and grassland; alpine, lakes, rivers.	Settings and activities same as for wilderness, but with minor incompatibilities. eg. smaller size, presence of a hut, less adequate buffering etc.	Unoccupied native forest and grassland; alpine, lakes, rivers.	Semi natural grasslands.	Facility orientated. May have natural landforms, but be highly modified. In mountain, forest, grassland, rural, coastal situations.
PREDOMINANT LAND USE	Wilderness recreation.		Nature conservation.	Extensive grazing.	Farming, forestry, hydro lakes, recreational facility areas/skifields.
ACCESSIBILITY	Physically inaccessible with unroaded buffer zone. No defined routes within. No Recreational air access.		May have foot tracks, bridges, roads/vehicle tracks. May have legal restraints on public use, but generally available. Variable air access.	Roads, off-road vehicles, foot tracks, horse trails. Aircraft use.	Roads throughout, defined walking and vehicle tracks.
SOCIAL SETTING	Very low density use. Minimum impact practices. No, or at most, very brief inter-group contact. No visual or audible contact with motorised craft. Legal rights of use.		Low to high use and inter-group contact. Density depends on degree of resource protection required. Minimum impact practices encouraged. Variable rights of use.	Low to moderate use and inter-group contact. Some sharing of space and facilities. Few rights of public use.	High density use. Heavy social and technological interaction. Use actively encouraged. Variable legal rights.
COMMERCIAL RECREATION	Very low density/negligible. Only under one-visit permits to avoid over-promotion and over-use: under same physical limitations as other users. ie. no facilities or aircraft or vehicle access.		Nil to moderately high intensity/highly variable. Activities and facilities excluded from some areas; otherwise under licence, subject to protection of environment and other users' rights.	Generally low intensity. With landholders, and official consents where required.	High to very high intensity. No restraints, other than land ownership and planning controls; official consents on lands of the Crown.
DEVELOPMENT & FACILITIES	None, except temporary facilities for management.		Variable; depending on management priorities, or policies to maintain diversity of recreational opportunities.	Some, confined to specific activity sites.	Considerable developments; sophisticated facilities.
MANAGERIAL SETTING	No Discernible management presence. Pre-entry education. No overt promotion of use. Free-ranging, unconfined use.		Management may be obvious: signs, rangers, but generally low-key. Some user group conflicts. Zone may be subdivided in to different intensities of use and management.	Informal use. No recreational management. User group conflicts.	Obvious signs of use, control, and promotion. Emphasis on visitor services. Separation of activities within defined areas.
<b>ACTIVITIES</b>	Mountaineering, ski mountaineering, cross country skiing, deer stalking, tramping, rafting without air access, fishing.	As in wilderness.	As in wilderness plus: Primitive camping, walking, canoeing, rafting, sailing, fishing; variable use of recreational aircraft.	Heli-skiing, cross country and ski touring, tramping, walking, horse riding, fishing, game bird hunting, off-road vehicles, informal camping, picnicking, sailing, rafting, power boats, aircraft.	Outdoor education and accomodation centres, camping grounds, picnic areas, skifields, walkways, horse riding, off-road vehicle trails, power boating, sailing, may be restraints on recreational aircraft.



The basic assumption underlying ROS is that quality recreational experiences can be best assured by providing a diverse set of recreational opportunities; these are defined in terms of the **activities** in which people participate, the **settings** in which they participate, and the **experiences** they derive from participation.

ROS provides a framework for outdoor recreation managers and policymakers, who must answer questions concerning both the allocation and management of opportunities for recreation. It does not provide a prescribed formula for providing recreation opportunities. It does however provide a systematic approach for looking at the actual distribution of opportunities and a logical procedure for assessing possible management actions. The zoning approach implicit in the concept recognises that all areas cannot be all things to all people. Regionally however all needs may be catered for.

Providing a range of settings, varying the level of development, access, managerial control etc. ensures that the broadest segment of the public will find quality recreational experiences, both now and in the future. The setting is a combination of physical, biological, social and managerial conditions that give value to a place. In the Otago situation the physical and biological settings are extremely diverse.

It is acknowledged that the specific experiences derived are a function of an individual's past experience, expectations, and present state of mind, and cannot be predictably engineered by recreation managers. However the provision of a diversity of opportunity maintains the individuals' freedom of choice. It follows that managing recreational opportunities to promote a diversity of experiences is crucial for social equity. Failing to provide diversity of opportunity invites charges of favouritism, elitism and discrimination. Some discrimination must be exercised however for certain high-impact activities such as trail biking or skifield developments, where use for these purposes must be matched to environments that can withstand their impacts. The actions of land developers, recreation managers, and commercial recreation activities can cause reduction in overall opportunities, by displacement (economic or by preference), and by exclusion in the latter situation.

Maintenance of diversity of opportunity ensures the flexibility necessary to mitigate changes or disturbances in the recreation system stemming from such factors as social or technological change. In this plan, regional diversity has been sought by identifying *remaining* opportunities within Otago's high country settings. Changes are recommended in managerial actions and land use to best maintain the diversity identified.

Opportunities at the cultural or facility-orientated end of the spectrum are increasingly common, particularly in the peri-urban and lowland rural settings not directly addressed in this work, but increasingly rare at the wilderness end of the spectrum. Careful stewardship of the few remaining wilderness-remote experience areas is essential if a full diversity of opportunity is to be maintained.

Natural and semi-natural settings, providing mid-spectrum opportunities, are under considerable encroachment from land development pressures. Recommendations are made to harmonise existing and anticipated land uses so that recreational opportunities are not needlessly lost.

The following recreational experience zones are adopted in *Outdoor Recreation In Otago* (see table):

- \* wilderness experience;
- \* remote experience;
- \* natural experience;
- \* open space;
- \* cultural experience.



## References and Selected Bibliography

### Geography, Literature

- BROCKIE, W. 1973. *The Otago Tors - a review*. In: Guidebook for Excursion 6, 9th INQUA Congress, Christchurch: 137-140.
- LISTER, R.G. and HARGREAVES, R.P.(Eds). 1965. *Central Otago*. Misc. Series No. 5. N.Z. Geographical Society.
- (2) ROBERTS, GORDON and TURNER, BRIAN. 1983. *New Zealand High Country Four Seasons*. Millwood Press, Wellington.
- (1) SCOTT, T.H. 1962. *Landfall Country, Work from Landfall, 1947-61 chosen by Charles Brasch*. The Caxton Press, Christchurch.
- SUGGATE, R.P.(Ed). 1978. *The Geology of New Zealand*: 289-97, 613-14. N.Z. Geological Survey, Wellington.

### General and District Histories

- BEATTIE, J.H. 1948. *Otago Place Names*. The Author, Waimate.
- DUFF, GEOFFREY, P. 1978. *Sheep May Safely Graze*. The Author, Tarras / John McIndoe, Dunedin.
- HAMILTON, G.A. 1952. *History of Northern Southland*. Southland Times Co. Ltd., Invercargill.
- LOVELL-SMITH, E.M. 1931. *Old Coaching Days in Otago and Southland*. Lovell-Smith & Venner, Christchurch.
- McLINTOCK, A.H. 1949. *The History of Otago, The Origins and Growth of a Wakefield Class Settlement*. Otago Centennial Historical Publications, Dunedin.
- OLSSSEN, ERIK. 1984. *A History of Otago*. John McIndoe, Dunedin.
- PARCELL, J.C. 1951. *Heart of the Desert*. Otago Centennial Historical Publications, Dunedin.

### Pre-history, Exploration, Settlement.

- ANDERSON, ATHOLL. 1983. *When all the moa ovens grew cold: nine centuries of changing fortune for the southern Maori*. Otago Heritage Books, Dunedin.

- BEATTIE, HERRIES. 1947. *The Pioneers Explore Otago*. ODT and Witness Newspapers Co. Ltd., Dunedin.
- \_\_\_\_\_. 1947. *Early Runholding In Otago*. Ibid.
- ELDRED-GRIGG, STEVAN. 1980. *A Southern Gentry*. A.H. and A.W. Reed, Wellington.
- HALL-JONES, JOHN. 1971. *Mr. Surveyor Thomson*. Ibid.
- HOWARD, BASIL (Ed). 1947. *The Mapping of Otago*. N.Z. Geographical Society, Dunedin.
- KOOYMAN, B.P. 1985. *Moas and Moa Hunting: An Archaeological Analysis of Big Game Hunting in N.Z.* Unpublished Ph.D. thesis, University of Otago, Dunedin.
- RITCHIE, NEVILLE A. 1982. 'The Prehistoric Role of the Cromwell Gorge, N.Z.'. *N.Z. Journal of Archaeology* 4: 21-43.

### Goldfields Era

- DON, ALEXANDER. 1936. *Memories of the Golden Road*. A.H. and A.W. Reed, Wellington.
- FIELD, TOM and OLSSSEN, ERIK. 1976. *Relics of the Goldfields, Central Otago*. John McIndoe, Dunedin.
- GALVIN, P. 1887. *Handbook of New Zealand Mines*(1906). Government Printer, Wellington.
- GILKINSON, ROBERT. 1930. *Early Days In Central Otago*.(1978). Whitcoulls Ltd., Christchurch.
- GLASSON, H.A. 1957. *The Golden Cobweb*. Otago Daily Times Co. Dunedin.
- HEARN, T.J. and HEAGREAVES, R.P. 1985. *The Speculator's Dream, Gold Dredging in Southern New Zealand*. Allied Press, Dunedin.
- HUTTON and ULRICH. 1875. *Report on the Goldfields and Geology of Otago*. Mills, Dick & Co., Dunedin.
- MURRAY, J.S. and R.W. 1977. *Costly Gold*. A.H. & A.W. Reed.
- PYKE, VINCENT. 1887. *A History of Early Gold Discoveries In Otago* (1962). ODT Co., Dunedin.
- SINCLAIR, R.S.M. 1962. *Kawarau Gold*. The Author-Whitcombe & Tombs Ltd., Dunedin.
- WOOD, JUNE. 1970. *Gold Trails of Otago*. A.H. & A.W. Reed, Wellington.

### Natural History, Conservation, Land Use

- ASHDOWN, M. and LUCAS, D. 1987. *Tussock Grasslands Landscape Values and Vulnerability*. N.Z. Environmental Council, Wellington.
- BARR, H. 1982. 'Need for reserves in South Island pastoral leasehold country'. *Forest and Bird* No. 224: 2-7.
- (6) BATHGATE, A. 1922. 'Some Changes in the Fauna and Flora of Otago in the Last Sixty Years'. *N.Z. Journal of Science and Technology* Vol.4(6): 273-283.
- BLAKE, H. et al. 1983. *Pastoral High Country: Proposed Tenure Changes and the Public Interest, A Case Study*. Lincoln Papers in Resource Management No. 11. University of Canterbury and Lincoln College.
- BUCHANAN, J. 1875. 'Sketch of the Botany of Otago'. *Transactions of N.Z. Institute* Vol. 1:181-212.
- CLAYTON, W.G. et al. 1982. *Crown Pastoral Leases and Leases In Perpetuity*. Report of the Committee of Inquiry, Wellington.
- DEPARTMENT OF LANDS AND SURVEY. 1984. *Register of Protected Natural Areas in New Zealand*.
- EVISON, HARRY C. 1986. *Ngai Tahu Land Rights and the Crown Pastoral Leases Lands in the South Island*. Ngai Tahu Trust Board, Chistchurch.
- FEDERATED MOUNTAIN CLUBS OF N.Z. 1983. *The Future of Pastoral Leasehold Lands: Seminar Proceedings*. FMC, Wellington.

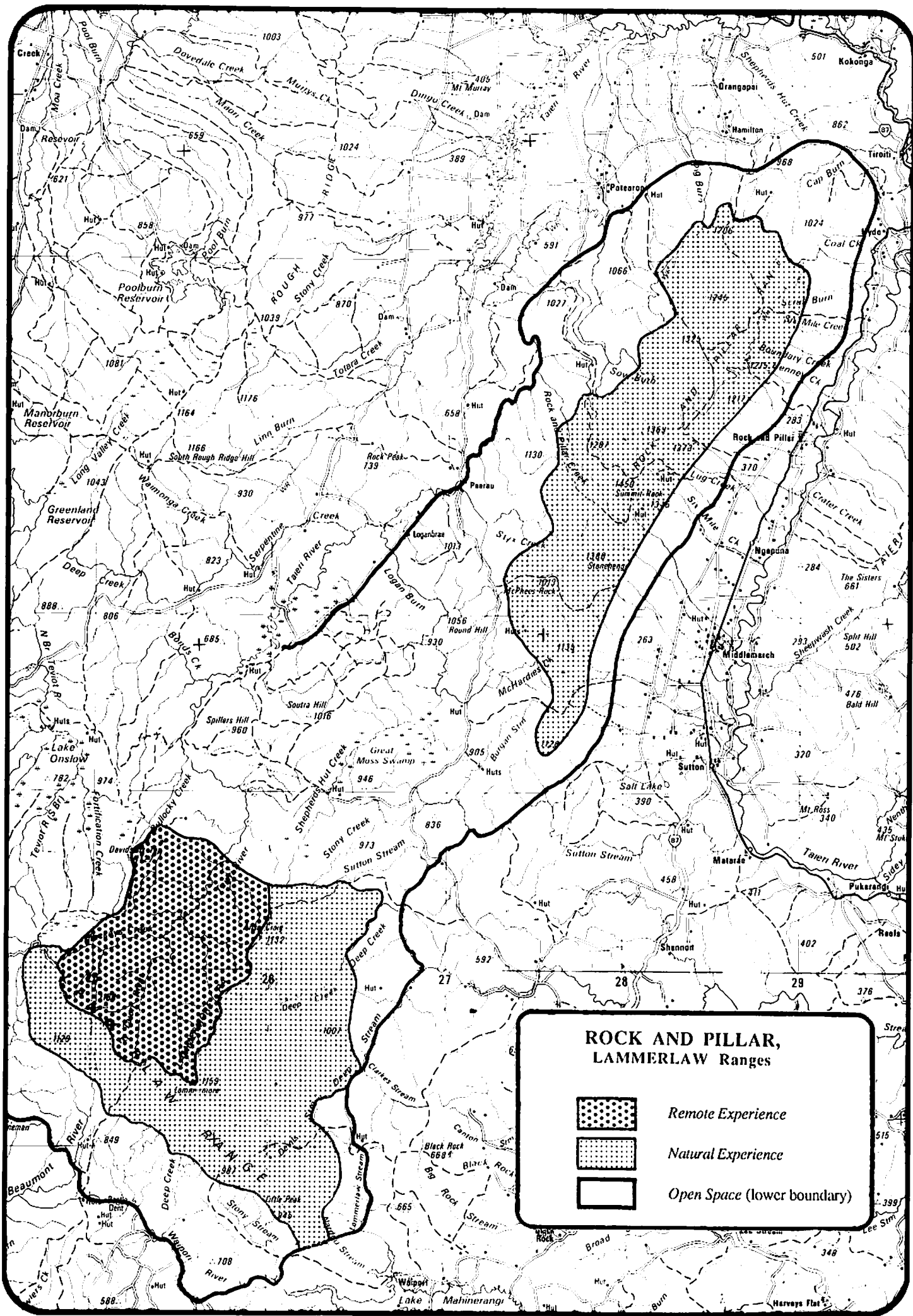
- HUTCHING, GERARD. 1986. 'High Country, high drama'. *N.Z. Listener*, March 1: 14-16.
- JOHNSON, P.N. 1986. *Plants At Risk in Otago, Southland and Stewart Island Area*. Botany Division, DSIR, Dunedin.
- \_\_\_\_\_. 1986. *Wildflowers of Central Otago*. John McIndoe, Dunedin.

- (7) LOH, G. 1987. Personal communication.
- LUCAS, DIANE. 1985. 'The High Country - Philosophical and Practical Landscape Management Issues'. *The Landscape* 24: 15-17.
- \_\_\_\_\_. 1987. 'High Country Landscapes, too much change, too fast'. *Forest and Bird* No. 246: 6-8.
- McSWEENEY, G. and MOLLOY, L.F. 1984. 'New Zealand's Tussockland Heritage'. *Forest and Bird* No. 234: 2-5.
- (5) MATHER, A.S. 1982. 'The Desertification of Central Otago'. *Environmental Conservation* Vol. 9(3): 209-216.
- MARK, A.F. and BLISS, L.C. 1970. 'The High-Alpine Vegetation of Central Otago, New Zealand'. *N.Z. Journal of Botany* 8: 381-451.
- \_\_\_\_\_. and ADAMS, N.M. 1979. *New Zealand Alpine Plants*. A.H. & A.W.Reed, Wellington.
- \_\_\_\_\_. 1980. 'Progress in Tussock Grasslands Research Since Cockayne's Day'. *Proceedings of the Royal Society of N.Z.* Vol. 108: 122-142.
- MOLLOY, B.P.J. et al. 1963. 'Distribution of Subfossil Forest Remains, Eastern South Island, New Zealand'. *N.Z. Journal of Botany* 1: 68-77.
- (4) O'CONNOR, K.F. 1981. 'Changes in the Tussock Grasslands and Mountain Lands'. *Review* 40: 47-62.
- \_\_\_\_\_. 1982. 'The Implications of Past Exploitation And Current Developments to the Conservation of South Island Tussock Grasslands'. *N.Z. Journal of Ecology* 5: 97-107.
- OTAGO REGIONAL WATER BOARD. 1980. *Clutha Catchment Water Allocation Plan*, 2 Vols. ORWB, Dunedin.
- OTAGO CATCHMENT BOARD AND REGIONAL WATER BOARD. 1983. *The Taieri River - A Water Resources Inventory*. Ibid.




### Recreation: history, planning, policy

- (13) AUCKERMAN, R. and DAVISON, J. 1980. *The Mountain Land Recreationalist in New Zealand*. Lincoln Papers in Resource Management No. 6. Tussock Grasslands and Mountain Lands Institute, Lincoln College.
- BURRELL, RAY(Ed). 1981. *Fifty Years of Mountain Federation 1931-1981*. FMC, Wellington.
- (15) CANTERBURY UNITED COUNCIL. 1983. *Informal Outdoor Recreation*. Report 287.
- (27) CLARK, R.N. and STANKEY, G.H. 1983. 'The Recreation Opportunity Spectrum: A Framework for Planning, Management and Research'. *N.Z. Parks and Recreation* Vol. 5(9): 417-425.
- CRAWFORD, SCOTT A.G.M. 1978. 'A Social History of Nineteenth Century Sport in N.Z.'. In: *The Nature and Meaning of Sport in New Zealand*: 35-39. The Centre for Continuing Education, University of Auckland.
- (12) DEPARTMENT OF LANDS AND SURVEY. 1977. *Outdoor Recreation Planning: Marlborough pilot study*. Information Series No.3. Department of Lands and Survey, Wellington.
- EGARR, G.D. and EGARR, J.H. 1981. *N.Z. Recreational River Survey*, 3 Vols. Water and Soil Misc. Publications Nos. 13-15. NWASCA for the N.Z. Canoeing Association.

- KENNEDY, L.D(Ed). 1977. *Moir's Guide Book, Northern Section*. 5th Edition. N.Z. Alpine Club.
- (11) MASON, B.J. 1975. *Back Country Boom*. National Parks Series 1975/2. National Parks Authority, Wellington.
- (16) MOLLOY, L.F. 1976. *An Outline for an Assessment of the Recreational Value of the New Zealand Outdoors*. FMC, Wellington.
- (10) \_\_\_\_\_ 1979. 'Wilderness Diminishing'. *N.Z. Alpine Journal* 29: 65-75.
- (17) \_\_\_\_\_ 1979. *Outdoor Recreation On The West Coast: a conservation plan*. FMC, Wellington.
- \_\_\_\_\_ (Ed). 1983. *Wilderness Recreation in New Zealand*. Ibid.
- N. Z. Alpine Journals*.
- (8) N.Z. COUNCIL FOR RECREATION AND SPORT. 1985. *Policy for Outdoor Recreation in New Zealand*.
- N. Z. FOREST SERVICE. 1981. *Rural Outdoor Recreation Inventory - Otago and Southland*. Unpublished report. NZFS, Invercargill.
- N. Z. GOVERNMENT. 1979. *Wild and Scenic Rivers Policy Statement*.
- New Zealand Tourism: Issues and policies, a Discussion Report*. 1980. Tourism Council and Tourist and Publicity Department, Wellington.
- (9) PANETT, PHILIP. 1977. *Dunedin's Recreational Preferences, Dunedin City and Region*. Recreational Study Series Report 1. Dunedin City Planning Department.
- SMITH, J., DAVISON, J., GEDEN, B. 1980. *The Public Mountain Land Resource for Recreation in New Zealand*. Lincoln Papers in Resource Management No. 7. Tussock Grasslands and Mountain Lands Institute, Lincoln College.
- Land Use Policy**
- (14) ALEXANDER, D.J., TAYLOR, K.R., CLIFTON, N.M. 1981. *A Management Strategy for Central Southern Alps Crown Land Area*. Department of Lands and Survey.
- DEPARTMENT OF LANDS AND SURVEY. 1983. *Otago Goldfields Park Policy Statement*.
- (25) N.Z. GOVERNMENT. 1977. *Management Policy for New Zealand's Indigenous State Forests*.
- (20) \_\_\_\_\_ 1979. *Deciding The Use Of High Mountain Resources*. Department of Lands and Survey, Wellington.
- Land Act 1948 and Amendments*. Government Printer, Wellington.
- (21) LAND SETTLEMENT BOARD. 1984. *High Country Policy*. Department of Lands and Survey, Wellington.
- (22) \_\_\_\_\_ 1985. *Commercial Recreation Policy*. Ibid.
- (22) \_\_\_\_\_ 1985. *Public Recreation Policy*. Ibid.
- (18) NATIONAL PARKS AND RESERVES AUTHORITY. 1983. *General Policy for National Parks*. Ibid.
- (19) \_\_\_\_\_ (undated). *Draft General Policy for Reserves*.
- (26) N. Z. FOREST SERVICE. 1983. *Recreation Policy*. NZFS, Wellington.
- (24) N. Z. WALKWAY COMMISSION. 1984. *Policy Statement*.
- (23) NATIONAL WATER AND SOIL CONSERVATION AUTHORITY and LAND SETTLEMENT BOARD. 1985. *Review of Policies for Destocking and Land Surrender - South Island High Country*. N.W.A.S.C.A. & L.S.B., Wellington.

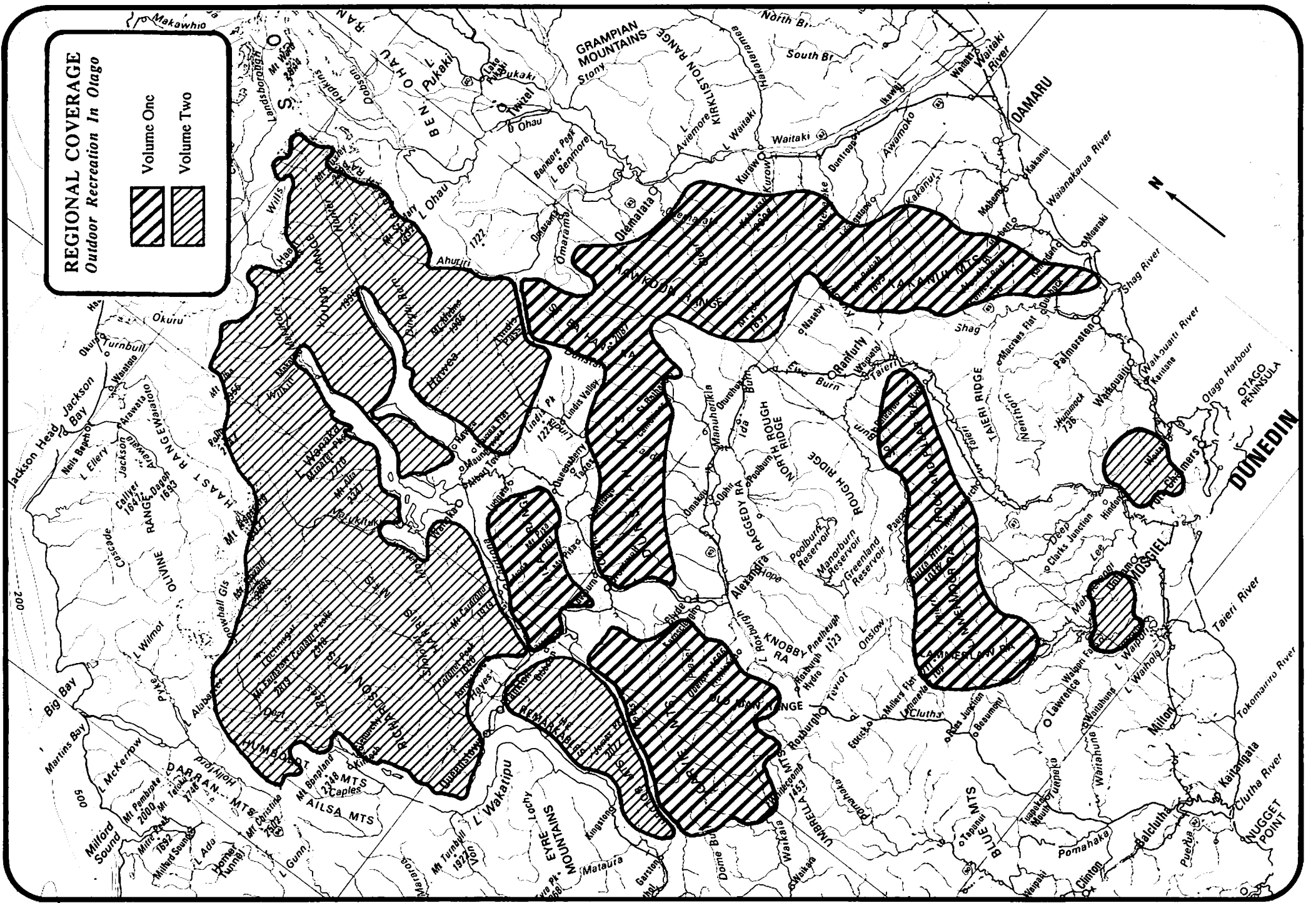
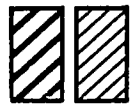


**ROCK AND PILLAR,  
LAMMERLAW Ranges**

-  *Remote Experience*
-  *Natural Experience*
-  *Open Space (lower boundary)*

**REGIONAL COVERAGE**  
*Outdoor Recreation In Otago*

- Volume One
- Volume Two





# ROCK AND PILLAR, LAMMERMOOR and LAMMERLAW Ranges

## 1. Landforms

The **Rock and Pillar Range** is the easternmost Central Otago range, being a fault-bound block mountain. The Hyde Fault forms the boundary between the moderately steep eastern escarpment and the Strath Taieri basin. The western back-slope is gentle but considerably dissected at lower elevations above the Maniototo basin. The broad, gently rounded range crests average 1370 m above sea level, with the summit at 1450 m. This is notably lower than other Otago block mountains.

Clusters of shaft and block tors of schist bedrock litter summit crests in random fashion; Stonehenge and 'Castle Rock' are among the more spectacular and better known examples. Small nivation cirques (caused by snow-patch erosion) developed along the lip of the leeward scarp during the Pleistocene, leaving short, steep headwall faces. Periglacial patterned ground features include earth hummocks, miniature stone stripes and nets, solifluction terraces and sliding boulders. A unique ice wedge tarn occurs in the vicinity of the summit.

The **Lammermoor Range** is a distinct but lower southern extension of the Rock and Pillar block mountain, rising to an average of 1100 m along its crest. The range crest is over 10 km broad, gentle, and intricately dissected by small valley systems. Steep faces only occur on the eastern escarpment above Deep Stream and in the upper Taieri Gorge. The Lammermoors abut the **Lammerlaws** at right angles at their highest point (1158 m), the latter extending eastwards into the Waipori catchment, and north-westwards to gradually descend into the vast Teviot uplands. The Lammerlaw range crest tends to be more narrow and undulating than the Lammermoor crest. The Taieri River begins its circuitous course from the upper slopes of the Lammerlaws on an inland route through the Maniototo, around the northern end of the Rock and Pillars, and finally southwards through the Strath Taieri and Taieri Gorge to the sea. Relatively short, steep catchments drain the southern flanks of the Lammerlaws into the Clutha and Waipori Valleys.

An extensive upland occupies the transition between the Rock and Pillars and these southern ranges. Crest elevations range between 600 and 1000 m. Distinctive landforms in this area consist of craggy tors and gullies, and huge blanket bogs such as the Great Moss Swamp, now largely inundated.

## 2. Vegetation and Wildlife

### 2.1 Climate

A distinctive feature of the Rock and Pillar Range, in comparison with other Central Otago ranges, is the relatively low elevations at which high-alpine vegetation occurs (1200 m). Similar environments occur at increasingly higher elevations further inland, reflecting increasing continentality.<sup>(2)</sup> Comparison of climatic data with that from the Old Man Range indicates that the Rock and Pillar crest experiences

similar low temperatures (an annual average of close to freezing point) and high average wind velocities despite the lower elevation of the latter.<sup>(3)</sup>

Snow lies on the crests and uppermost flanks of these ranges during the winter and can persist for up to 6 months of the year, with considerable redistribution by wind into drifts in depressions and leeward gullies. Precipitation is heavier on the Lammermoor-Lammerlaw massif with a markedly lower winter snowline than on the Rock and Pillars. This probably reflects the greater coastal influence on the former.

### 2.2 Vegetation<sup>(3,4,5)</sup>

**2.2.1** The existing vegetation of the **Rock and Pillars** exhibits similar modifications and zonations to that found on other schist block mountains in Otago.

On the montane basin fringes the grassland is dominated by common hard tussock with matagouri and silver tussock on more favourable sites. Oversewing of exotic grasses and clovers has largely displaced inter-tussock native grasses over extensive areas. Forest remnants, chiefly of broadleaf but with some Hall's totara are concentrated in the deepest gullies on the lower eastern slopes. Between approximately 750 and 1100 m, the narrow-leaved snow tussock dominates the grassland but at 1100 m it merges with a narrow, discontinuous zone of mixed scrub up to one metre tall in which *Hebe odora* and locally, snow totara, bog pine and mountain toatoa are dominant. This shrubland zone appears to be unique for Central Otago block mountains. This zone is particularly vulnerable to damage from fires.

The high-alpine zone extends beyond the shrubs, with a herbfield community dominated by *Celmisia viscosa* and blue tussock covering most of the remaining 200 m below the summit plateau. The most exposed environments are covered by mosaics of extremely dwarfed cushion species, patches of herbfield, and snowbank communities in moist depressions. Isolated plants and patches of the narrow-leaved and slim snow tussock on the summit plateau are probably remnants of a formerly extensive alpine snow tussock grassland. The western faces of the range tend to be drier with less extensive snow tussock. Mixed fescue snow tussock grassland occupies a broad mid-altitudinal zone. Towards the southern end of the range there are several blanket bogs which are actively accumulating peat.<sup>(6)</sup>

**2.2.2** The broadly crested **Lammermoor-Lammerlaw** massif provides the core of probably what is one of the largest



Tall tussock grasslands, Lammermoor Range.

contiguous areas of tall tussock grassland left in New Zealand. A combination of high precipitation and poorly drained soils has, until very recently, reduced the impact of extensive pastoralism to the extent that vigorous narrow-leaved snowgrass can reach chest height in some areas. Along the mid Lammerlaw crest, on the Beaumont River - Taieri River divide, is a particularly attractive and vigorous alpine grassland with New Zealand's largest mountain daisy, *Celmisia semi cordata*, vying for dominance with waist-high tussock. Within the snowgrasses along the entire length of the Lammermoors there are a myriad of moss and cushion bogs containing small ponds. These provide one of the most distinctive features of the area. An intensification of burning, subdivision, oversowing, and cattle grazing is making major in-roads into the natural condition of these grasslands.

The intricate gully systems harbour diverse and dense stands of shrubs and snowgrass, being most vigorous in the Taieri River gorge where stock cannot easily penetrate. Tributaries of the Clutha support remnants of silver beech forest, usually in association with manuka shrublands.

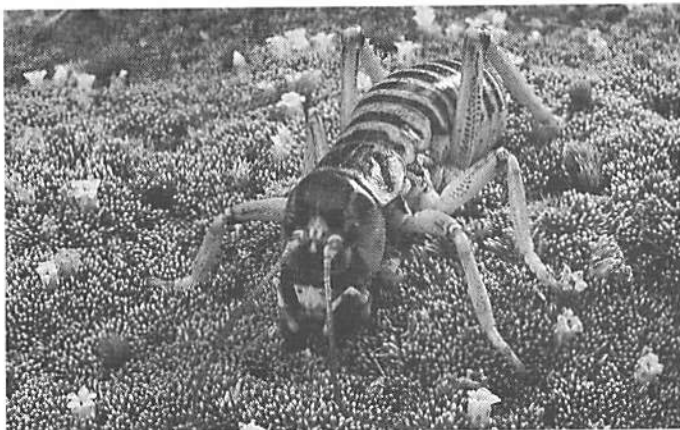
2.2.3 Between the Rock and Pillars and Lammermoors, the Great Moss Swamp until recently occupied an area of 20 square km and was surrounded by *Sphagnum* moss peat bogs in tributary valley heads. Filling the Logan Burn reservoir in 1984 has destroyed one of the largest Otago high country wetlands. A similar fate had already befallen the extensive swamps at Lake Onslow. The Teviot, Red and Fortification Creek swamps are now the only remaining major upland swamps in this district.

2.2.4 The Rock and Pillar Range forms its own district of the Central Otago Ecological Region. The Lammermoor-Lammerlaw massif is part of the Waipori district of the Lammerlaw Ecological Region.

### 2.3 Wildlife

Wetland areas provide the focus for a variety of fauna, therefore the Lammermoor-Lammerlaw massif provides more favourable habitats for bird life than most of the drier Rock and Pillars. Mallard, grey, shoveler and paradise duck, and grey teal are generally present in large numbers at major wetlands, with large numbers of pied stilt and banded dotterel breeding in wetland environs during summer. Pied oystercatcher, black shag, white-faced heron, and bittern are also present. The New Zealand falcon ranges throughout all the tussock grasslands.

Californian quail and chukar are in moderate to low numbers on lower, scrubby country.



*Hemideina maori*. Photo: Ken Mason

Entomologically all three ranges are of interest. Two undescribed moths are found only on the Lammermoors, while six more species occur in that area but not on the Rock and Pillars.<sup>(7)</sup> The latter range's claim to fame however, is a striped alpine weta (*Hemideina maori*).

The Taieri headwaters provide important spawning and rearing habitats for resident brown trout populations, as do major Taieri tributaries draining the western slopes of the Rock and Pillars. Most Clutha tributaries on the Lammerlaws hold resident populations of brown trout, eels and native fish.<sup>(8)</sup>

## 3. History and Land Use

### 3.1 Pastoral Settlement

Four depasturing licences were first issued over the Rock and Pillar Range in late 1858. At the same time another three licences were issued on the Lammermoors-Lammerlaws. It was another year before the last unclaimed 'pasturage' was to be selected. This was in the extensive Taieri headwaters and on the Lammerlaw tops.<sup>(9)</sup>

Over the next century of pastoral occupation there was considerable subdivision of the original four large runs on the Rock and Pillars, creating approximately 30 of the smallest high country runs in Otago. The southern flanks of the Lammerlaw Range were also subdivided into smaller units, particularly in the Mt. Teviot district.

### 3.2 Land Tenure

Substantial areas of the Lammerlaws have been reclassified from Pastoral to Farm Land in recent years, resulting in the issuing of renewable leases and subsequent freeholding. In 1972 over 6500 ha of Beaumont Station was reclassified, including some beech forest, and manuka associations down to the banks of the Clutha River. During the 1979-81 period of Government's mandatory reclassifications, another six runs at the Teviot end of the Lammerlaws were reclassified.

Three runs on the northern end of the **Rock and Pillars** above Hyde became Farm Land during this same period. Two further reclassifications occurred on this range's eastern face; one a partial reclassification and another a complete reclassification up to 1100 m above sea level.

There are currently 22 pastoral leases on the Rock and Pillars and one block of Unalienated Crown Land (UCL), being an expired pastoral occupation licence. The huge Rocklands pastoral lease covers the Lammermoor Range, with Beaumont and 5 other pastoral leases on the Lammerlaws. As already noted, the western end of this range, the Mt. Teviot area, is now renewable lease or freehold. The Waipori Farm Settlement occupies part of the eastern Lammerlaws and the Waipori River headwaters. The most eastern extent of the Lammerlaws, up to 910 m, is deferred payment licence - a legacy from former small grazing runs which carried the right to freehold.

There are three areas earmarked for reservation on the eastern Lammerlaws. 210 ha in lower Stony Stream will become scenic reserve, and at least 990 ha of mid- to high-altitude tussock grassland in the Nardoo and upper Devils Stream catchments is intended for scientific reservation. 145 ha of mid-altitude tussock grassland at the head of Lammerlaw





*Early winter. Taieri headwaters, Lammerlaw Range.*

Stream is awaiting gazettal as the Black Rock Scientific Reserve.<sup>(10)</sup> These areas have been set aside from farm settlement blocks. A further 248 ha south of Lake Mahinerangi is historic reserve, being part of the Otago Goldfields Park.

### 3.3 Gold Rushes and Mining

Gabriels Gully to the south of the Lammerlaws was the scene in 1861 of the first major gold rush in Otago. Once the initial pandemonium had subsided, the need for adequate water supplies for sluicing away cemented conglomerates at the head of the gully prompted the construction of lengthy water races. By the end of 1865, 380 km of race fed into the gully, some from as far away as the southern slopes of the Lammerlaws and upper Waipori catchment.

A lengthy history of hydraulic, quartz and dredge mining in the Waipori district also resulted in extensive water race construction, tapping most upper catchments on the eastern end of the Lammerlaws. The 'OPQ Gully' at Waipori has the distinction of being the site of the first underground quartz mine in Otago.

Further north the Dunstan Road, between the Lammermoors and Rock and Pillars, became established as a result of the 1862 Dunstan gold rush. This high, direct and desolate route

to Central Otago was used by thousands of miners in preference to the more circuitous Pigroot and Clutha Valley. For many years it was also the quickest route for escorted gold coaches to carry bullion and criminals to Dunedin. At Styx (Paerau), being the half-way point on the journey, a hotel and goal were built for overnight accommodation.

Around the toe of the Rock and Pillars auriferous alluvium was worked for many years by hydraulic sluicing and elevating. At Hyde, Hamiltons, and Patearoa extensive workings were undertaken, requiring the construction of numerous water races to intercept distant catchments. There are major race complexes in the Sow and Pig Burns, plus a 20 km race from near the summit of the range, across the crest and along the eastern face to above Hyde.

There were several shallow gold workings in the Lake Onslow area, and in the lower Deep Stream catchment which was also the site of a short-lived dredging venture.

The southern end of the Rock and Pillars provided the route for the first telephone link between the Strath Taieri and Maniototo. Stone huts were constructed along the route but maintenance difficulties due to snow and isolation, brought about the line's replacement by today's lower-level route which circumvents the range entirely.

### 3.4 Hydro-electric and Water Development

In 1890 a rock dam was built on the upper Teviot River to provide water storage for sluicing operations near Roxburgh. The water rights were acquired for hydro-electric generation on the lower Teviot River in 1921, with the crest height of the dam progressively raised over the years. A new dam was completed in 1982 which doubled the area of Lake Onslow, and provided four times the storage. The total Teviot scheme now has a 9.4 megawatt generating capacity.<sup>(11)</sup>

In 1984 the Logan Burn dam was completed as part of a combined hydro-electric and irrigation scheme for the upper Maniototo, flooding most of the Great Moss Swamp in the process.

In 1936, as the first major augmentation of Dunedin's water supply from a distant catchment, a 64 km pipeline was completed, drawing water from Deep Creek to Dunedin. In 1977 the larger and adjacent Deep Stream was tapped with a new scheme, the combined supply now providing over 40 per cent of the city's water requirements.<sup>(12)</sup> Water from these Lammermoor sources is given greater chemical treatment than the city's other sources, due to it being highly coloured by peat stain.

No land use controls that might affect water quantity and quality are exercised over both catchments. Deep Creek and most of Deep Stream are extensively grazed, however increasing areas in the lower Deep Stream catchment are receiving intensified farming use arising from cultivation. A large proportion of the Lammermoor-Lammerlaw massif is now utilised for Dunedin's water requirements.

The Department of Lands and Survey zoned the upper eastern Lammerlaws and Deep Stream catchments, which are within the Waipori Farm Settlement, for 'extensive grazing'<sup>(13)</sup> however this area is now proposed as a scenic reserve.<sup>(14)</sup>

In 1984 the Dunedin City Council diverted part of Deep Stream by means of a 1.5 km tunnel, for the purpose of increasing power output from its Waipori generators.

A further hydro-electric scheme has been proposed recently, involving a 60 m dam above the Taieri Falls in the river's headwaters. No approvals have been granted for construction to commence.

Summer water resources in the upper Taieri are now heavily committed, with shortages of supply for irrigation. Changes in land use, combined with increased irrigation and potable water abstractions will have major implications for the whole Taieri catchment.<sup>(4)</sup>

### 3.5 Scientific Research

All three ranges have provided convenient field laboratories for several government agencies and university researchers, who have concentrated on a variety of agronomic, hydrological and alpine ecological studies over the last 20 years. The impact on water yields from replacement of tussock grasslands with exotic pasture and forests is a continuing focus for these studies. While no conclusive results are yet broadly applicable, it appears that net precipitation gains through fog interception by tussock provides a very significant contribution to flows from higher elevations (i.e. above 800 m).<sup>(15)</sup> The implications of stock damage to peat bogs and broad-scale tussock removal on water yields, low flows, peak flows, and

snow storage are yet to be faced up to in land use decision making.

There are also socio-political obstacles in the way, which assume expanding pastoral production to be a paramount objective over the need to conserve areas as 'controls' for monitoring agricultural impacts in the wider area, let alone for the preservation of nature. The scientifically well supported case for reserving a complete catchment (the Nardoo) on the Waipori Farm Settlement met unyielding resistance from farming interests, and from the LSB. While prepared to reserve higher elevations, the Board was not prepared to forego development potential on 400 ha of the lower catchment.<sup>(16,17)</sup>

### 3.6 Land Use Capability

The greater bulk of the uplands are Class 7, with severe limitations for pastoral production brought about primarily by the cold climate. The steep upper eastern face and summit plateau of the Rock and Pillar Range is Class 8. The lower flanks of the ranges are Class 6,<sup>(18)</sup> much of which has been developed by oversowing and topdressing. The extensive Class 7 uplands along the Dunstan Road have also seen large-scale oversowing and topdressing, greater subdivision and stocking in recent years.

The Otago Catchment Board (OCB) sees potential for intensive pastoral oversowing and subdivision along all the lowest eastern and southern flanks of the ranges, and for semi-intensive pastoralism through the extensive Great Moss Swamp basin between Sutton Stream and Paerau.<sup>(4)</sup> The Lake Onslow catchment is similarly identified as having development potential, however the Board considers it essential, in this area at least, to conserve tall tussock, swamps and stream courses by controlling grazing.<sup>(19)</sup> In relation to the Class 8 lands on the Rock and Pillars the Board considers that the special features on these lands can only be protected by total destocking.<sup>(20)</sup>

### 3.7 District Scheme Zoning

The area is divided between three territorial local authorities:

The Silverpeaks County Council has zoned the upper crests of the Rock and Pillar Range Rural D (High Country Protection), with retirement from grazing, re-vegetation, soil and water conservation works, periodic grazing, huts, and vehicle tracks as predominant uses. Forestry, farming, recreation (to ensure compatibility with conservation objectives), and buildings are conditional uses within this zone. The Deep Stream catchment, to the crests of the Lammermoors and Lammerlaws is designated as Dunedin City Water Catchment with an underlying general zonation of Rural B 2.<sup>(21)</sup>

The western Rock and Pillar and Taieri River headwaters to the crest of the Lammermoors-Lammerlaws is within Maniototo County. A Rural B (High Country Protection) zone covers the remainder of the Rock and Pillar summit plateau. Retirement, revegetation, soil and water conservation works, periodic grazing, and huts are predominant uses. Vehicle tracks are a discretionary use, for reasons of landscape protection. Forestry and reserves are conditional uses. The balance of the high country is within the County's general Rural A zone.<sup>(22)</sup>

The southern side of the Lammerlaw Range is within

Tuapeka County's general Rural A zone which is subject to review.<sup>(23)</sup>

### 3.8 Rock and Pillar Pastoral Lands Assessment

In 1982 the Department of Lands and Survey undertook a trial assessment<sup>(24)</sup> of the recommendations of the Clayton Committee<sup>(25)</sup> regarding freeholding of Crown pastoral lands. This was one of three such assessments undertaken simultaneously throughout the South Island.

After rather severe criticism from different quarters of the terms of reference, as well as of the assessment team's initial performance, a much revised report was made for Land Settlement Committee and Board consideration. In April 1983 the Board resolved to not proceed with implementing any of the trial assessments. It did however, acknowledge that the Rock and Pillar assessment was a valuable exercise, with the report having 'value as a resource document, but not as a basis for action'.<sup>(24)</sup>

The final report recommended that approximately 30 per cent of the study area be retained in Crown ownership, compared to an initial 20 per cent, with provision of foot access and retention of legal 'paper' roads to these areas. Of the 'Crown retention area', some 6000 ha of summit crests plus two tussock grassland altitudinal sequences were designated as **potential reserves**. Special features represented within the reserves would include: silver, hard and snow tussocks at a range of altitudes and aspects; unique subalpine shrublands; alpine herbfield, cushion and snowbank vegetation; rare and endangered plants; mid to high altitude wetlands; soils and fauna associated with all vegetation types; geological and periglacial features; and a range of areas of high summer and winter recreational value.

Another 5000 ha immediately west and south of the summit crests was earmarked as **multiple use 'range' land**, containing wetlands, high-altitude snow tussock and herbfield, with considerable potential for cross country skiing. Management of such areas was to include long term leasing for primary production, with provision for public use.

2,200 ha of **multiple use 'public' land** was identified on southern crests, reflecting its 'limited agricultural value and considerable botanical and recreational values.' Management of such an area could entail limited grazing on a permit basis.

The balance of the range, being some 32,000 ha, would then become available for **permanent alienation** (i.e. freeholding) subject to public access easements, laying off of riparian Section 58 strips, and a historic protection covenant at Styx.

It is clear that in terms of the biological and recreational features *that were identified* within a very severe time constraint for the assessment, the central areas of nature conservation and recreation value were adequately accommodated within the areas recommended for retention of Crown ownership. The tenures appropriate within this area will remain a subject of continuing debate, dependant largely on refinement of management objectives, the nature of landholders' occupation rights, and the policies under which conservation and recreation values are administered.

In terms of the 70 per cent of the area that would have been made available for freeholding if the assessment report was

adopted, systematic evaluation by a Protected Natural Areas survey may identify further localities requiring special protection. Additionally, the major flaw in the terms of reference to exclude water and soil conservation values from consideration would have to be fully rectified in any future tenure decisions.

The nature conservation and recreation values that were identified in the assessment exercise have not disappeared from public consciousness merely as a result of the LSB's decision not to proceed with implementation of the final report. The report will remain as a starting point for the future allocation of such Crown lands to achieve integration of a multiplicity of uses on a *best-fit* basis.

## 4. Recreational Opportunities

### 4.1 Skifields

The Rock and Pillars are the *home ground* for club skiing in Otago.

Recorded winter usage goes back to 1932 with the formation of the Otago Ski Club (OSC). An existing stone hut at the base of the range provided accommodation, with the necessity of a daily climb of 1000 m uphill on foot carrying skis, and returning each evening. This was the usual pattern of use until 1938 when a small stone hut, accommodating 28 people was built on the crest of the range. By 1947 growth in membership resulted in a larger hut being built beside the earlier one. It accommodated 70 skiers.

The next few years saw heavy use of the range until skiing techniques improved to the stage that the slopes became too gentle for an increasing number of proficient skiers. From 1948 a portable tow was periodically operated in 'Big Gully' on the western side of the range crest, and on the 'Home Run' near the hut. However, patronage at Coronet Peak grew at the expense of the Rock and Pillars. The attractions of better weather and access, facilities and terrain were telling. In 1958 a final effort was made to reinvigorate use of the range. A rope tow with 180 m vertical lift was installed on the steeper eastern face below 'Castle Rock', with vehicle access constructed up to the snowline. Accommodation was provided by a relocated Otago University Ski Club hut which became known as the '*Leaning Lodge*'. This field was intermittently used until 1965 when it was finally abandoned and the tow removed.<sup>(26,27)</sup> The club and its downhill skiing membership had basically outgrown all that the Rock and Pillars had to offer.



'Leaning Lodge', with Middlemarch below. Photo: Ewan Paterson



**Daybreak.** Slowly, very slowly, the first slender rays of light filter thinly through the one window. Gently fades the gloom, and in its place appears a picture of orderly chaos as the various objects vaguely assume their shape. Orderly, indeed, for the hut rules and regulations have been widely circulated and carefully followed; chaos, too, for it could not be otherwise with such a mass of human bodies and personal gear within this limited space. By the window, the most clearly defined object in sight, a large table with its trim shelves and tins of food sets the standard - "a place for everything". Beside it, on one side, is the cooker which provides so many a welcome hot drink for parties arriving wet and cold, or late at night; on the other side, thirty pairs of skis are neatly stowed away in their wooden rack. The distant, dark side of the hut also becomes slowly visible, and is shown to be entirely filled with two great wooden shelves, on which are sardined together a mass of shapeless forms. Twenty-eight is the official maximum capacity of these benches, though it is whispered that an extra one or two have sometimes squeezed in, either beside, or on top of, their fellows. ....And from mutual warmth and individual sleeping bags, we have all slept so warm and comfortably through the coldest winter night. The end positions are, of course, the worst, for the man there has on one side of him only the cold, roughly unyielding wall of rock and clay from which the hut has been built. But there are no complaints.

Due to the present-day requirements for skifields being greatly different from those of the 1930's and 40's, there is no potential on any of the three ranges for a modern lift-serviced skifield.

## 4.2 Cross Country Skiing

4.2.1 The excellent touring potential of the Rock and Pillars was quickly utilised by OSC members. 'One popular eight mile journey (*in heavy snow years*) is to cross over to the Styx where there is a small but comfortable hotel.'<sup>(28)</sup> The first recorded ski traverse the length of the Lammerlaw and Lammermoor ranges was completed in 1941, but the intention of continuing on to the Rock and Pillars eluded the Gilkinson-Craig party.<sup>(27)</sup>

In addition to slalom and downhill competitions on the Rock and Pillars, the OSC held langlauf (cross country) competitions over a 20 year period. The club's prominence in this field is indicated by the production of seven national title holders over the period 1938 to 1959. Ski jump competitions were also a regular feature from 1951 to 1959.<sup>(27)</sup>

With the OSC shifting its organised activities to Coronet Peak, only a few of the club's Rock and Pillar stalwarts continued to visit the range for ski touring. Throughout the 1960's and 70's however, regular use of the range was made by other Dunedin mountain clubs for snowcraft instruction as well as for limited touring on alpine skis. This latter activity tended to be erratic due to the weight of modern downhill equipment to be carried uphill to reach snowline. Easier alternatives were available.

By 1976-77 increasing availability of light-weight cross country ski equipment resulted in rapid growth of this activity within mountain club membership. The large (1947) hut and 'Leaning Lodge' now provide convenient bases for cross country skiing. Long distance traverses between the Dunstan Road, the summit, and Hyde, as well as day touring around the summit plateau are now undertaken by a growing number of enthusiasts.

However conditions for cross country skiing, as on other Central Otago ranges, are highly variable. Strong and frequent

winds tend to redistribute snow cover off the summit plateau and into leeward gullies. Snow conditions range from wind-packed powder, to sastrugi, knobby and sheet ice. Towards the spring, conditions generally become more consistent with higher day temperatures producing granular corn snow.

The summit plateau has a truly *arctic* environment during winter, with broad expanses offering little in the way of shelter from the prevailing westerlies. Experience in alpine navigation and knowledge of survival techniques are necessary prerequisites for winter recreation on any of these ranges. Proximity of the Rock and Pillars to Dunedin is a major factor in the relative importance of this range for winter activities, in comparison to other ranges. It is only 80 km on sealed highway to the base of the range.

There is now some interest from commercial operators in the range, however the inhospitable climate and unpredictable snow conditions mitigate against operation. Despite these limitations one operator has purchased an oversnow vehicle in anticipation of official approvals for ski tours. Such a mechanical intrusion above snowline will conflict with the low impact approach of other winter users.

4.2.2 Length of access to the higher country means that the Lammerlaws and Lammermoors receive less frequent attention from cross country skiers. In winter conditions this whole large upland has a *remote experience character* due to the absence of habitation for a considerable distance beyond the skiing country, and a general absence of fencing along the crests. Traverses of 35 to 50 km are possible in favourable conditions, although there can be logistical difficulties in arranging transport either end. All the range crests, with the exception of the eastern Lammerlaws, are traversed by bulldozed fire-breaks. Were it not for the presence of these, the area would present a very wild scene for the traveller on foot or ski. Further tracking is under construction for fire control (*and the use of fire*). There are few huts near the range crests that could be useful for winter shelter, therefore tents or snow shelters are necessary.

## 4.3 Summer Recreation

Traditionally, summer recreational use of the Rock and

**Pillar Range** has been markedly less than in winter. Organised tramping on the range goes back at least to 1925, when an Otago Tramping Club party visited the summit.<sup>(29)</sup> There is however, increasing recreational interest in the mix of landforms and vegetation to be found over the summit plateau. Huts near the summit provide convenient bases for individuals and groups to explore alpine herbfields and snowbank areas, or to clamber over the weird forms of the schist tors. The 'Big Hut' and '*Leaning Lodge*' are now maintained by Dunedin tramping clubs. Views of the distant Mt. Aspiring, or of patterned ground underfoot, are additional attractions. Equivalent climate, scenery and vegetation are found only at much higher altitudes and at considerably greater distances inland. Some visitors appreciate the Rock and Pillars as a quiet weekend *get-away* from Dunedin.

In comparison, the **Lammermoors-Lammerlaws** is infrequently visited. The area does however, hold particular attractions for recreational naturalists and for those wishing to disappear from the sights and sounds of civilisation. The untracked upper Taieri has *wilderness values* but not with sufficient buffering or area to justify designation as a Wilderness Area.

Disorientation when out of sight of a track is relatively easy, even in fine weather conditions. The rolling, 'featureless' terrain, dissected by numerous multi-directional drainages has created a natural maze. This recreational challenge is there for anyone who wishes to take it up.



*White-out.* Photo: Ewan Paterson

Recreational vehicle use is heaviest on the Old Dunstan Road which is usable by two wheel drives during dry conditions. This is a distinctive motoring experience, although rapid pasture development, roadside fencing, and road upgrading is taming the wildland character of this upland. This historic route receives a significant level of vehicle use in summer. Traverses by horse or bicycle are also occasionally made. The Lammermoors and Lammerlaws are occasionally visited by off-road vehicle clubs, although there are considerable hazards for these activities due to extensive peat bogs, snow storms year-round, and the considerable distance from help if this is required.

Game birds are widely distributed (quail and chukar) but difficulty of access for shooters is the main limitation to hunting, although in the Lake Onslow and upper Taieri headwaters waterfowl and upland game bird hunting are currently among the main recreational activities. These areas are also important spawning and rearing habitats for brown

trout, with Lake Onslow being extremely popular as a recreational fishery, as is the new Logan Burn reservoir.

Red deer and pig are found throughout the area but since the advent of helicopter hunting the former have been reduced to low numbers. Runholder agreements with local Deerstalkers Branches were withdrawn in the early 1970's.

The historic hotel and jail at Paerau is a popular summer attraction for holiday visitors to the Maniototo. Goldfields sites in the vicinity of Lake Mahinerangi are relatively unknown and unvisited despite their proximity to Dunedin. Identification of one site by the Otago Goldfields Park has focused some attention on this area, however much more could be done with site preservation and interpretation to realise some of the area's recreational potential.

## 5. Zoning

### 5.1 *Natural Experience*

5.1.1 The crest of the **Rock and Pillar Range** above approximately the 1070 m contour is zoned *natural experience*. This includes the discontinuous sub-alpine shrub belt, alpine herbfields, and mountain tor landscape along the summit plateau.

Existing patterns and intensity of public usage, both summer



*On the summit plateau, Rock and Pillar Range.*

and winter, indicate that the natural qualities of this zone should be conserved for aesthetic appreciation, and as a setting for compatible recreation.

The management required within this zone should include:

- \* prohibition of soil disturbance by further farm or vehicle access tracking;
- \* prohibition of burning;
- \* landscape protection by controls over the siting and design of communications installations, wind powered generators, power transmission lines and scientific installations;
- \* controls on recreational developments, either buildings or tracks;
- \* prohibition of vehicle use off tracks, snowmobiles etc.

The existing pastoral lease tenure does not recognise the important recreational and natural characteristics of this zone, the low relative worth for grazing, nor provide for continuing public access and use.

A more appropriate status of scenic reserve-conservation area would allow more effective management of both land and public uses.

5.1.2 Approximately 25,000 ha of the Lammermoor-Lammerlaw massif is zoned *natural experience*. This contains the most extensive and least modified tall tussock grassland in eastern Otago, with limited pastoral potential overall. Although economic considerations might inhibit further development, reliance on such restraints is inadequate to ensure protection for the high natural values. The national interest is probably better served by management of the area for the combined functions of water harvesting and nature conservation, rather than for continued expansion of primary production. Compatible recreation can be a secondary use.

Management of these lands should be directed towards maintenance of natural settings and the avoidance of detrimental land uses and activities such as new vehicle track formations and off-road vehicle use. Extension of pasture development, and consequential increases in stocking rates, should be discouraged within the zone.

*During winter the whole zone has remote experience characteristics.* It is buffered from vehicle access to its boundaries by poor road conditions, with the nearest inhabitants a considerable distance from the boundaries.

## 5.2 Remote Experience

10,000 ha of the Lammermoor-Lammerlaws within the Taieri headwaters are zoned *remote experience*. At any time of the year this untracked valley head provides opportunities for foot recreation on a scale that is increasingly rare in inland Otago. Although this area does not approach the minimum requirements of Government's Wilderness Policy for formal identification as a 'Remote Experience Area', conscious retention of wildland values, during management for other purposes, is highly desirable. It is one of the last areas of unroaded tussock grassland in Central Otago.

## 5.3 Open Space

5.3.1 Below approximately 1070 m, the dip slope of the Rock and Pillar Range as far as the Paerau Gorge to the west, the eastern escarpment, and to the Dunstan Road in the south is zoned *open space*. This is contiguous with the Lammerlaw-Lammermoor *open space zone*.

Management requirements in this zone include:

- \* controls on the siting and revegetation of farm access tracks and roads to take into account prominent viewing directions from public thoroughfares, both from within and outside the zone (especially the steep eastern escarpment);
- \* designated public foot accessways through this zone to the *natural experience zone*. There is little need or attraction for active public foot recreation within the *open space zone*, therefore public use can be accommodated by legal roads and easements/walkways.

5.3.2 The extensive snow tussock grasslands on the Lammermoor-Lammerlaws, is zoned *open space*. This semi-natural pastoral high country provides expansive panoramas over moderate relief uplands, and provide the setting for more

popular recreational activities such as angling, and motoring along the Old Dunstan Road.

To retain the open and undomesticated landscapes which currently prevail will require sensitive placement of farm buildings and structures within sight of major public use areas, avoidance of fencing or other visual alienation along the Dunstan Road, and exclusion of forestry or farm woodlots.

## 6. Recommendations

### *Rock and Pillar Range*

6.1 The summit plateau, from the vicinity of McPhees Rock northwards, be designated Scenic Reserve. This should include adjacent upper slopes of the eastern escarpment that lie within the natural experience zone, and the headwater catchments of the Styx and Rock and Pillar creeks, and Sow Burn. Reservation should be achieved by progressive removal from pastoral lease of Class 8, and severely eroded Class 7 land (if any), and incorporation of the one area of UCL on the range.

6.2 The balance of the natural experience zone become a Conservation Area under DOC, with grazing and tenures determined through management planning procedures.

6.3 Management of the proposed reserve / *natural experience zone*, while it remains under pastoral lease, be in accordance with the considerations contained in 5.1.1.

6.4 Regularly spaced public foot accesses be provided from the Strath Taieri to the reserve, and from the Dunstan Road to McPhees Rock.

6.5 The OCB's free-burning zone on the eastern face of the range be revoked, so that all burning on pastoral lease can be subject to permit application, and DOC's oversight.

### *Lammermoor-Lammerlaw ranges*

6.6 The Crown exercises its jurisdiction over burning, stock limitations, cultivation, oversowing, firebreaking, and vehicle tracking within the *natural experience* and *remote experience zones* to prevent further degradation of natural values.

6.7 The Crown negotiate with the one private land owner in the eastern Lammerlaws to achieve the above objective.

6.8 No farm, firebreak, or other tracking be permitted within the Taieri headwaters which should be managed to retain *remote experience values*.

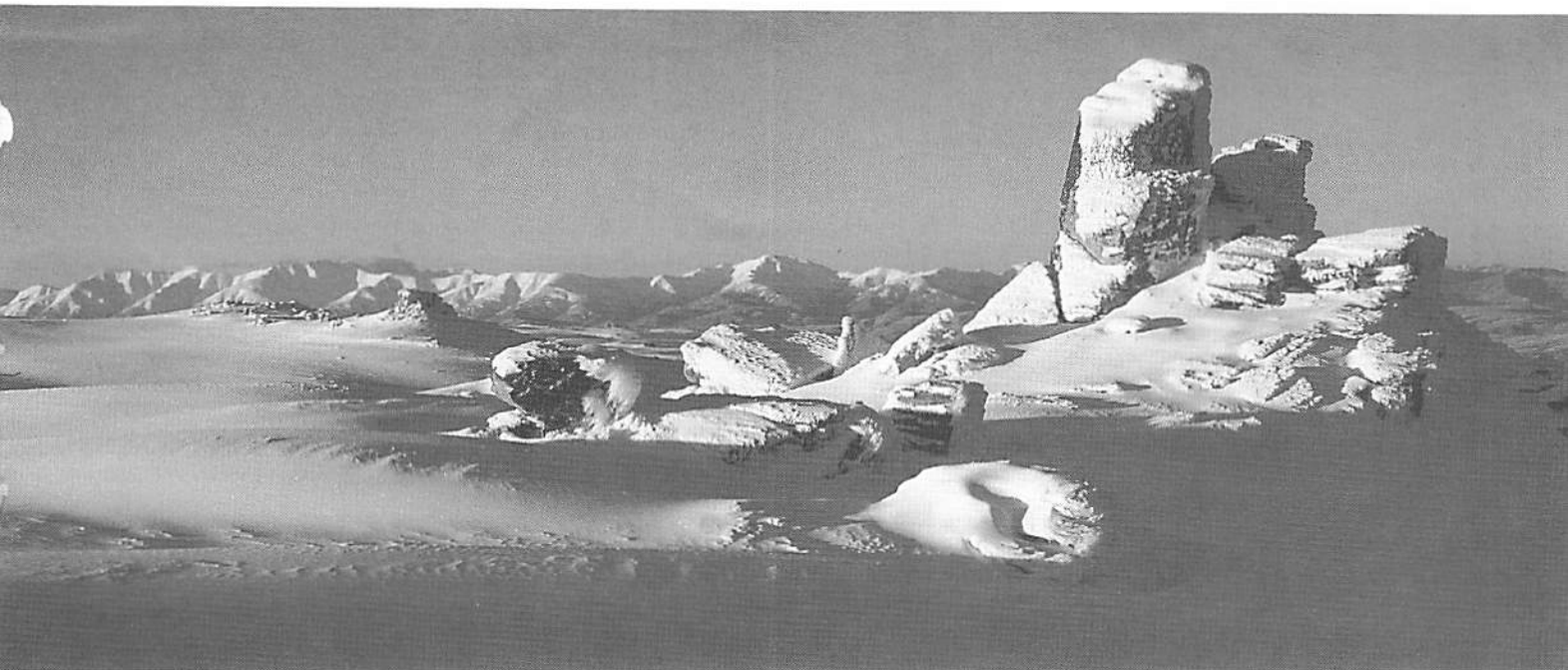
## References and Selected Bibliography

### Geology

- McKELLAR, I.C. 1966. *Geological Map of New Zealand, 1:250,000. Sheet 25, Dunedin.* D.S.I.R., Wellington.
- MUTCH, A.R. 1966. *Sheet 23, Oamaru.* Ibid.

### Vegetation

- (10) ALLEN, R.B. 1978. *Scenic Reserves of Otago Land District.* Biological Survey of Reserves, Report 4, 14-18. Department of Lands and Survey, Wellington.
- (3) BLISS, L.C. and MARK, A.F. 1974. 'High-Alpine Environments and Primary Production on the Rock and Pillar Range, Central Otago, New Zealand'. *N.Z. Journal of Botany* (12): 445-483.



Evening light from Rock and Pillar summit, towards Kakanui Mountains.

- (14) BRUCE, D.L. 1986. *Botanical Report, Proposed Deep Stream Scenic Reserve, Lammerlaw Range, Waipori Ecological District*. Botany Division, D.S.I.R., Dunedin.
- (6) DAVOREN, A. 1978. *Survey of New Zealand Peat Resources*. Water and Soil Technical Publication No. 8. Ministry of Works and Development, Wellington.
- JOHNSON, P.N. 1986. *Lammerlaw Range Wetlands; Botanical Report*. Botany Division, D.S.I.R., Dunedin.
- \_\_\_\_\_. 1986. *Great Moss Swamp; Preliminary Report On Botany and Proposed Reserves*. Ibid.
- (5) MARK, A.F. 1982. *Submission to Commissioner of Crown Lands, Dunedin on Pastoral Lands Assessment Report, Rock and Pillar Range, Otago*.
- (2) \_\_\_\_\_ and BLISS, L.C. 1970. 'The High-Alpine Vegetation of Central Otago, New Zealand'. *N.Z. Journal of Botany* (8): 381-451.
- \_\_\_\_\_. 1974. High-Alpine Environments and Primary Production on the Rock and Pillar Range, Central Otago, New Zealand. *N.Z. Journal of Botany* 12: 445-83.
- Wildlife**
- (7) PATRICK, B. 1984. Personal communication.
- (8) SOULSBY, R. 1984. Ibid.
- History**
- (11) ELLIS, A.E.M. 1972. *The Electric Canal, A Short History of Electrical Development in Central Otago 1922-1972*. Otago Central Electric Power Board, Alexandra.
- PATTERSON, AUDREY. 1980. *A Cornish Goldminer at Hamiltons*. Otago Heritage Books, Dunedin.
- (9) *Register of Pastoral Licences*. Hocken Library, Dunedin.
- Land Use**
- (25) CLAYTON, W.G. et al. 1982. *Crown Pastoral Leases and Leases in Perpetuity*. Report of the Committee of Inquiry. Government Printer, Wellington.
- COMMISSION FOR THE ENVIRONMENT. 1978. *Waipori Farm Settlement Environmental Impact Report. Audit and Submissions*.
- (13) DEPARTMENT OF LANDS AND SURVEY. 1977. *Waipori Farm Settlement Environmental Impact Report*. Department of Lands and Survey, Dunedin.
- (24) \_\_\_\_\_ 1983. *Pastoral Lands Assessment Report, Rock and Pillar Range, Otago*. Ibid.
- (12) JAMES, ARTHUR. 1984. Personal communication.
- (23) JOHNSTON HATFIELD ANDERSON & PARTNERS. 1986. *Tuapeka County District Scheme, Pre-Review Statement*.
- (22) \_\_\_\_\_ 1986. *Maniototo County District Scheme, First Review*.
- (21) \_\_\_\_\_ 1986. *Silverpeaks County District Scheme, First Review*.
- (17) MARK, A.F. 1980. 'A disappearing heritage - tussock grasslands of the South Island rainshadow region'. *Forest & Bird* No. 218: 18-24.
- (16) \_\_\_\_\_ 1982. 'The Tussock Grasslands Struggle-A case study from Otago'. *Soil & Water* 183: 4-9.
- (15) \_\_\_\_\_ ROWLEY, J. and HOLDSWORTH, D.K. 1980. 'Water Yield from high-altitude snow tussock grassland in Central Otago'. *Review* 38: 21-33.
- (18) MINISTRY OF WORKS AND DEVELOPMENT. 1978. *New Zealand Land Resource Inventory Worksheet, S153, Teviot*. Government Printer, Wellington.
- (20) OTAGO CATCHMENT BOARD AND REGIONAL WATER BOARD. 1983. *Submission to Commissioner of Crown Lands on Pastoral Lands Assessment Report, Rock and Pillar Range* (14 January).
- (4) \_\_\_\_\_ 1983. *The Taieri River, A Water Resource Inventory*.
- (19) OTAGO REGIONAL WATER BOARD. 1980. *Clutha Catchment Water Allocation Plan, Vol. 2*.
- PATRICK, B. 1984. 'Lammermoor-Lammerlaw, A Tussockland National Reserve in Eastern Otago?'. *Forest & Bird* No. 234: p. 7.
- Recreation**
- (28) *Australian and New Zealand Ski Year Book 1940* : p. 62.
- (27) BOYD, S.B. 1982. *A History of the Otago Ski Club (Inc.), The First Fifty Years*. Otago Ski Club, Dunedin.
- (1) GILKINSON, W.S. 1940. *Peaks, Packs and Mountain Tracks*. Whitcombe & Tombs Ltd.