NEW ZEALAND'S

Tussockland Heritage

by Gerry McSweeney* and Les Molloy†

Sandwiched between native forests and alpine herbfields, and spreading a tawny mantle across the South Island's eastern ranges, New Zealand's tussock lands rival the world's other great natural grasslands such as the prairies of North America, the pampas of Argentina and the steppes of Russia.

These tussock grasslands have evolved over thousands of years. In many ways these metre high bunch grasses resemble forests. The tussocks can be decades old and dwarf the tiny herbs growing on the grassland floor. Tussock grasslands contain a unique group of plants and animals adapted to temperature extremes, drought, heavy snowfalls, fire and even to erosion of the unstable mountain ranges.

Unfortunately these plants and animals have less successfully adapted to increasing pressures from agricultural development. Our tussocklands are under threat and are rapidly disappearing.

Subalpine tussocklands extend the length of the Southern Alps and along the North Island's axial ranges. The volcanic uplands of the Central North Island support fire-induced red tussock grasslands gradually reverting to shrublands. However by far the most extensive tussocklands occur east of the Southern Alps along a belt of montane country from Marlborough to Southland. They once covered nearly 5 million hectares, nearly 20 percent of New Zealand's land surface. Today they cover about half that area.

Natural and Polynesian fires shaped much of the eastern South Island tussock landscape, especially at lower altitudes. These fires destroyed beech, matai, totara and kanuka forests and allowed tussocks growing at higher altitudes and alongside streams and clearings to invade the formerly forested sites.

By the time of European settlement the tussockland pattern was as follows:

☐ Snow tussocks (*Chionochloa* species) occupied both the moister, high altitude areas and most of the montane zone. In eastern Otago these tussocks extended almost to sea level (some still survive in a small reserve at Shag Point, North Otago at 50 metres altitude).

☐ Short tussocks (*Festuca* and *Poa* species) covered the dry, low altitude areas including the dry basins and riverbeds of Otago, Marlborough, the Mackenzie Country and parts of the Canterbury plains.

☐ Red tussocks (*Chionochloa rubra*) were widespread on damp valley floors, poorly drained moraines and throughout the Southland plains.

Snow tussock grasslands — Danseys Pass North Otago.
Photo: Quentin Christie, Soil Bureau.

Changes since European settlement:

The extent of relatively unmodified tussockland remaining today can be determined from the New Zealand Land Resources Inventory (1). While the merging of tussockland into shrublands and pasture complicates this analysis, it appears that about half the original tussock grassland has now gone. At higher altitudes, there remains at least 1.5 million hectares of subalpine tall tussock and scrub mixture. At the other extreme there is probably only 650,000 hectares of lower altitude short tussock now remaining after a century of conversion to pasture grasses and overgrazing. In the intermediate montane zone, snow tussocks have

* *National Conservation Officer RF & BPS*
† *Soil Scientist, Vice President Federated Mountain Clubs.*

been modified by fire and grazing so that today only about 600,000 hectares remains in snow tussock cover.

Southland red tussock grasslands have almost entirely given way to exotic pastures. Less than 10 hectares of red tussock is reserved on the entire Southland plain. Fortunately, near Te Anau the proposed 3,100 hectare Gorge Hill red tussock reserve provides a last chance to preserve a small part of Southland's pre-European landscape.

Tussocklands under threat:

Places like the Mackenzie Basin, Lindis Pass, the Remarkables, the Shotover and Kawarau Gorges have long been celebrated by New Zealand's poets, painters and photographers. Their wide open spaces and stark solitude never fail to impress even the most jaded visitor.

Our tussocklands have always been seemingly unchanging elements in the New Zealand landscape. So much so, that earlier generations took for granted the tussocklands continued co-existence with extensive pastoralism.

However, dramatic changes in the high country landscape are now taking place. Extensive sheep farming is giving way to more intensive agriculture with pressures for freeholding of public pastoral lands. Massive hydro-electric developments are underway or already completed. There are pressures for irrigation development, exotic forestry, tourist villages and skifields.

Each new activity may be in itself be relatively insignificant, but collectively they represent a major assault on our surviving tussocklands.

Where are our tussockland reserves?

Efforts so far to protect tussocklands have been pathetic. Perhaps this reflects the widespread belief that extensive pastoralism did not threaten natural values. The runholder has been de facto caretaker of our tussockland heritage while the state has concentrated on managing forested national parks and reserves. There has also been a distinct lack of appreciation of the natural values of non-forested natural ecosystems. How else can we explain the incredible situation where in 1980 only 9 hectares of the former 1 million hectares of short tussock grassland in Otago was protected in scenic reserves?

We have been obsessed with reserving mountains and forests while the best (and often the last) remaining examples of lowland and montane tussock grasslands and their special plants and animals have been disappearing. Today's challenge is to identify where these grasslands remain and what stops them from being reserved.

Although most of our surviving tussocklands are on Crown-owned land, much of this land is under leasehold tenure with a right of perpetual renewal. Therefore the public interest in these Crown Lands can only be safeguarded by conditions that the Department of Lands and Survey (acting for the Land Settlement Board) can negotiate with the lessee.

In fact, pastoral lease provides considerable scope for the protection of natural and recreational values. However, rarely have such opportunities been taken — primarily because pastoral lease administration has focused almost entirely on farming.

Pastoral leases and the Land Settlement Board:

Ten percent of New Zealand is Crown land administered as pastoral lease. All of it is South Island high country, including tussock grasslands, peaks, glaciers, rivers, lakes and even significant native forests.

The Land Settlement Board (LSB), established under the 1948 Land Act, acts on the Crown's behalf. By its very name, the Board recalls an earlier era of pioneering and simpler land use objectives. Virtually everyone involved with the high country considers the LSB to be an anachronism — the settlement phase in New Zealand's marginal lands is largely past, and the Board (despite some sincere attempts to improve its policies) has failed to win the confidence of recreational, nature conservation and scientific interests. It overwhelmingly reflects the political, departmental and farming interests represented on it. However, no recent Government has been prepared to reconstitute the LSB into a more balanced "Crown Land Commission".

Obstacles to tussockland reserves:

To date it has proven extremely difficult to secure reserves in tussock grasslands. In addition to the legal obstacles outlined above, there are a number of institutional impediments:

☐ the considerable political power of the small group of influential high country runholders.

☐ the agricultural research establishment committed to increasing the pastoral productivity of the high

Central Otago's block mountains have acted like islands. Each mountain range has its own special insects such as the Rock and Pillar weta, *Hemideina maori* found beneath rocks on the summit of the range.
Photo: John Child.

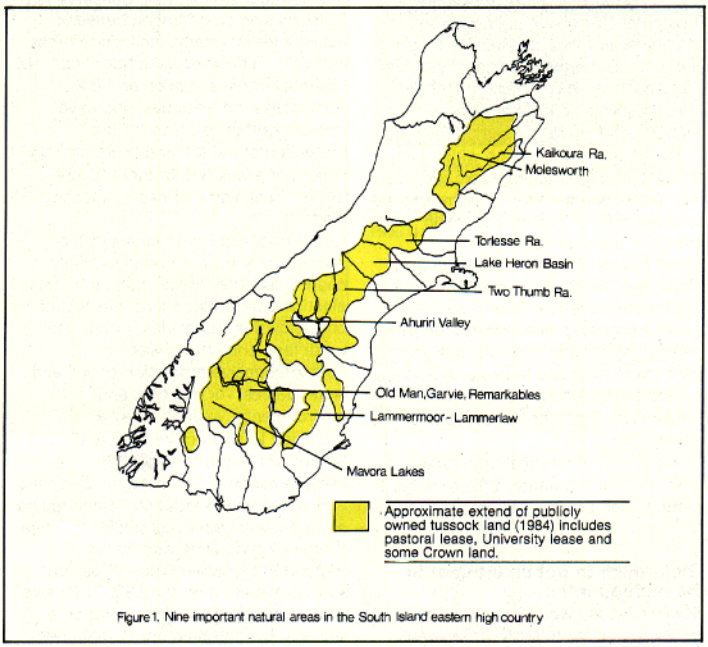

Figure 1. Nine important natural areas in the South Island eastern high country

Plants have adapted to the exposed alpine environment, with cushion forms common. Mountain daisy, *Celmisia sessiliflora*, Old Man Range.
Photo: Brian Enting.

Although traditional extensive sheep country, increasing numbers of cattle and agricultural intensification are changing the high country and modifying natural values. Romney-Merino cross wethers, Nokomai Station, Garvie Range.
Photo: Liz Brook.

country. This group, represented by the Invermay and Tara Hills research stations of MAF and the Grasslands Division of DSIR have been able to commit large research budgets to, in effect, eliminate tussock grasslands. In sharp contrast, the Protected Natural Areas programme operates on a financial shoestring.

☐ Forest Service research which has changed much of its emphasis recently from protection forestry to promoting the establishment of exotic production forests in the high country.

☐ the failure of the former National Water and Soil Conservation Authority to require the surrender from a pastoral lease of erosion-prone land retired from grazing. [Millions of taxpayer dollars were made available to pastoral lessees for alternative land development to compensate them for this steepland retirement.]

☐ the dearth of information on the scientific and recreation values of this pastoral high country.

The growth in public interest in the high country:

However, today we have cause for greater optimism regarding the eventual reservation of significant large areas of tussockland. The following reasons show why:

☐ greater public awareness of the values of open space in the high country, especially by active groups that are not so well catered for in our national and forest parks — canoeists, fishermen, horse-trekkers, 4-wheel drive parties.

☐ strong public interest in the protection of wild and scenic rivers.

☐ the momentum building up in support of the DSIR Protected Natural Areas programme and the good work of the National Parks and Reserves Authority in continually promoting the need for a system of reserves *fully representative* of our natural landscapes and biota.

☐ growing recognition that nature-oriented tourism can help conservation.

☐ increasing co-operation between public interest groups including Forest and Bird, Federated Mountain Clubs, NZ Deerstalkers Association and the Acclimatisation Societies who have joined together to press for the protection of natural and recreationally important areas before there is any further freeholding of pastoral lease land.

☐ the traditional sympathies of the Labour Party towards retaining high country as public lands. Labour's 1984 election policy stated that they would only allow the freeholding of pastoral lease land once there was "comprehensive protection of soil and water values, recreational and environmental values". They also promised to restructure the Land Settlement Board to ensure representation of recreational, scientific and conservation interests. Since taking office they have moved quickly to invite Professor Alan Mark and former Federated Mountain Clubs' President Alan Evans to sit on the LSB. They also have invited similar representation on regional Land Settlement Committees.

Priorities for tussockland reserves:

Some of the best opportunities for scientific reserves of low altitude tussocklands have now been lost. A landmark case was the Nardoo block of Waipori in eastern Otago outlined in detail by Professor Alan Mark in the November 1980 issue of *Forest & Bird*.

Here, the LSB successfully opposed the inclusion of low altitude snow tussock grasslands in the Nardoo reserve.

By contrast, reservation of the magnificent red tussock grasslands of Gorge Hill in Southland has been approved in principle by the LSB. Perhaps the tide is now turning. Visitors to the Fiordland National Park or the Mavora Lakes will now approach the forests and mountains on a scenic highway surrounded by red tussocks swaying in the wind.

The Protected Natural Area programme survey teams have begun to work through the high country identifying sites of special scientific interest and opportunities for representative reserves.

As well as reserves which protect some of the special scientific features of the high country, there are tussock landscapes which are worthy of particular recognition because they are landmarks which loom large in New Zealander's consciousness. In an earlier article (*Forest & Bird*, February 1982) one of us (LFM) suggested a number of possible candidates for National Reserve status — Old Man Range, Lindis Pass, and the Remarkables.

Other areas are clearly also suited as National Reserves to complete this list. If conservation, recreation and landscape values of the high country are to be preserved in the long term a range of protective mechanisms are needed including:

☐ strict *scientific* reserves, not necessarily large, to protect important examples of flora and fauna, soils or

geology (the Castle Hill Nature Reserve in Broken River Basin is a notable example).

☐ large *representative* reserves, where some extensive pastoralism may be managed along with recreation and soil, water and nature conservation objectives.

☐ ensuring that where possible development of high country land outside the reserve areas takes account of landscape and conservation values.

To show the diversity of tussockland landscapes and biota we have invited the following brief articles on six areas from Marlborough to Southland. The Torlesse Range, Lake Heron basin and Two Thumb Range in Canterbury also deserve consideration as National Reserves. Each area represents different facets of high country landscapes and ecology.

One of the greatest challenges we face in seeking protection for these outstanding areas is to first make people aware of these places. If this and other difficulties can be surmounted there is no doubt that a network of national reserves can be established through the South Island high country to rival even our National Park system. What a wonderful way to celebrate our 1987 National Park Centennial!

References:

(1) Blashke, P. M.; Hunter, G. G.; Eyles, G. O.; Van Berkel, P. R.; 1981: Analysis of New Zealand's vegetation cover using land resource inventory data. *N.Z.J. Ecology 4*: 1–9.

High country wetlands are threatened by agricultural development. The Lake Heron wetland shown here is part of the Mt Arrowsmith pastoral lease. Development assisted by a Rural Bank loan involved construction of this illegal drain (no water right), cultivation and mob stocking with cattle. The Cameron Fan wetlands are now protected by the Rakaia river draft conservation order and this drain should immediately be filled in.

Photo: G McSweeney.

Public or private interest? Pastoral lease land and the Land Settlement Board

Crown land is administered under the Land Act 1948 by the Land Settlement Board. There is currently around 5,500,000 hectares (22% of New Zealand's land area) of Crown land, including many of our finest natural areas.

The Land Settlement Board's composition is Chairman (Minister of Lands); 3 reps of Department of Lands and Survey; 1 rep each from Treasury, MAF, Valuation Department and Rural Bank; 4 private members all farmers. [N.B. Professor Alan Mark, and Alan Evans have just been invited to attend LSB meetings.]

Pastoral Lease high country of the South Island, the largest single category of Crown land, comprises 2,700,000 hectares (10% of New Zealand's land area).

The remaining 2,800,000 hectares of Crown land consists of Unalienated Crown Land (UCL), mostly mountain crests in the South Island, land development blocks and a variety of leased Crown land (for farm, urban and industrial purposes).

Pastoral leases confer the following rights and obligations on the lessee:

☐ a perpetually renewable lease, at 33-year intervals

☐ no right to freehold

☐ exclusive right to pasturage but *no* right to: soil and water, trees (and shrubs), wild, introduced animals, and scenery.

☐ de facto trespass control

☐ restrictions on stock numbers

☐ restrictions on burning and cultivation.

In 1983 there were 369 runs under pastoral lease; 15 in Marlborough, 122 in Canterbury,200in Otago and 25 in Southland –– the average run size being 6,850 hectares.

Crown income from this leasehold land is very low: $172,000 in 1982/83 (ie, 0.68¢ per hectare). The imposition of more realistic rentals has been widely criticised by lessees.

Unlucky lizards and other animals may fall prey to New Zealand falcon which range across the South Island tussocklands. Earnscleugh Station, Central Otago.

Photo: G Loh.

Vast areas of rock screes support specially adapted succulent scree plants and animals. The scree skink, *Leiolopisma otagense* var, *walmatense* is known from only a few localities, including the Clarence Valley in Marlborough shown here.

Photo: B W Thomas, DSIR Ecology Division.