

# HIGH COUNTRY HIGH HOPES



*In 1984 Forest and Bird launched its High Country Campaign, seeking greater protection for the landscapes, and unique plants and animals of this much celebrated region. Regional field officer Mike Harding reports on the campaign's progress to date.*

*Above: The first runholders encountered tall, thick tussock grasslands with a variety of uncomfortable plants. Widespread burning eliminated spectacular 'spaniards' (Aciphylla spp.) from all but the most inaccessible or alpine sites. Photo: Mike Harding.*



**S**TRETCHING FROM the broken greywacke ranges of Marlborough and Canterbury to the rounded schist summits of Otago, the South Island high country is a special part of the natural and cultural heritage of New Zealand. The legendary names of Molesworth, Mesopotamia, Mackenzie, and Mavora evoke images of dramatic open landscapes, tawny tussock grasslands, and a rugged back country life. But a century of pastoralism has taken its toll on this unique and fragile land, and now the survival of these native tussock grasslands, and the fine wool industry based upon them, is seriously threatened.

The South Island high country spans over 3 million hectares of the South Island's eastern flank - 10 percent of New Zealand's land area. Spreading between the low country of the hills and plains and the broken snow-capped ranges of the Southern Alps, this spectacular landscape has been sculptured by glaciers

and cut by great rivers. Its distinctive vegetation is conditioned by the extremes of a harsh inland climate.

Windswept snow tussock grasslands, fragile cushion bogs and other wetlands, rich native shrublands, and beech and totara forests are its characteristic images. But today stark bright squares of green pasture stand out where there was once an unbroken sward of tussock. On the barren flats of the dry inland basins, native wildlife has been displaced by sheep and rabbits.

### Country in crisis

There is a crisis in the high country. The main problem areas are the grasslands of the dry basins of Central Otago, the Mackenzie and Molesworth. Dramatic changes in management, attitudes, and expectations are required to prevent these areas turning into permanent wastelands, to protect their natural features, and to ensure a long term future for

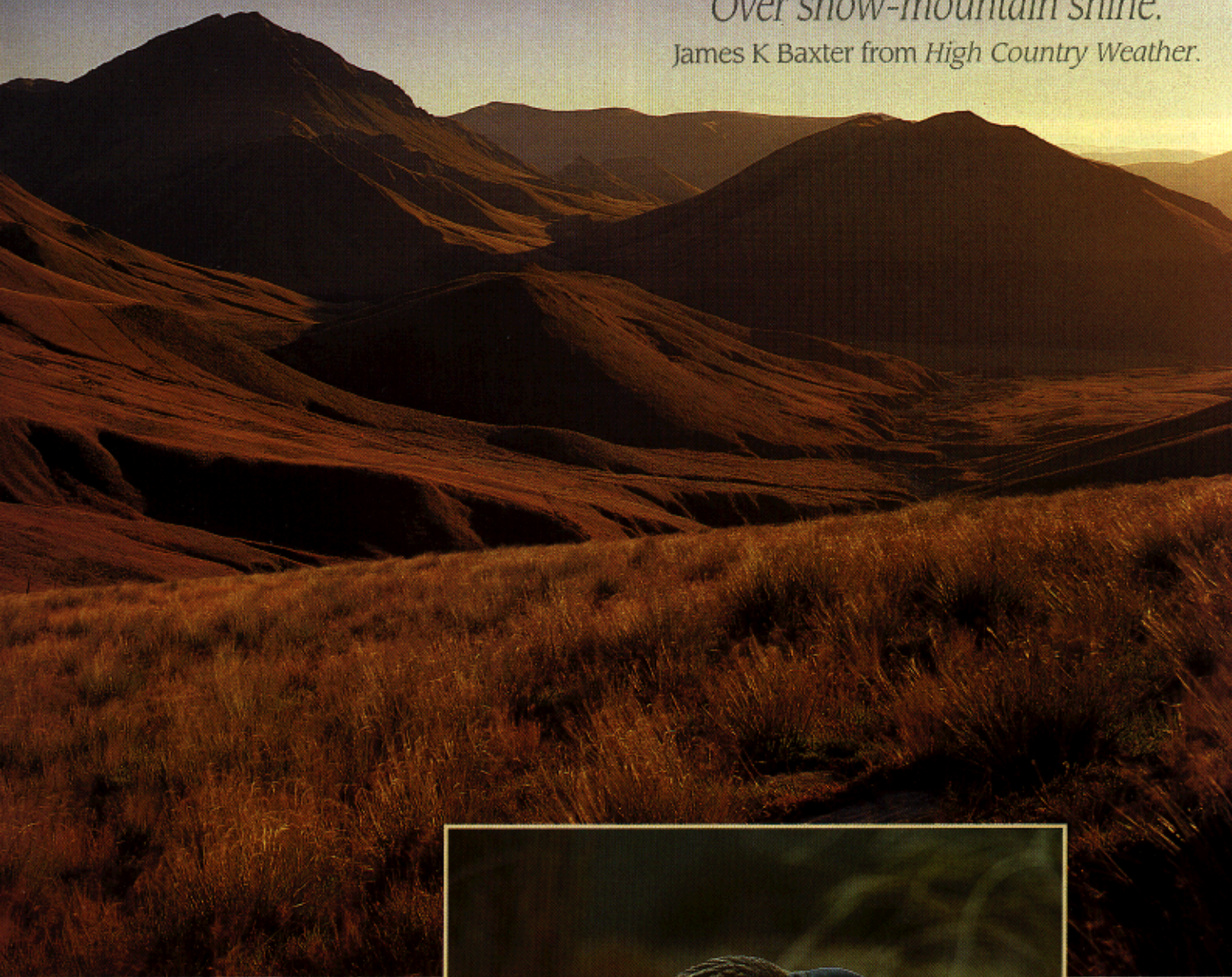
pastoralism.

Native tussock grasslands once covered millions of hectares, predominantly in the eastern South Island high country, the alpine tops of the main divide, and on the volcanic plateau and axial ranges of the North Island. Thousands of years of evolution has adapted the tussock grasses to the harsh conditions of the high country climate. The long-lived bunched tussock grasses can cope with strong winds, snow, periodic drought, fire and extremes of temperature. They are as characteristic of the New Zealand flora as the cabbage tree or the kauri.

Tussocks flourished in the eastern South Island high country, dominating the main grassland communities. Their natural distribution was determined by rainfall, temperature, soil fertility, and past disturbance, reflecting the phases of vegetation change dating from the last glaciation. Metre-high snow tussocks formed extensive grass-

Alone we are born  
And die alone;  
Yet see the red-gold cirrus  
Over snow-mountain shine.

James K Baxter from *High Country Weather*.



lands on moist alpine or montane sites.

Now narrow-leaved snow tussock (*Chionochloa rigida*) is mainly found south of the Rakaia river; slim snow tussock (*Chionochloa macra*) is dominant north of the Rakaia, and at higher altitudes on the South Canterbury and flat-topped Central Otago mountains. Broad-leaved snow tussock (*Chionochloa flavescens*) is widespread on rubbly slopes of the Canterbury mountains. Further west, on the wet Main Divide mountains, mid-ribbed snow tussock (*Chionochloa pallens*) and curled snow tussock (*Chionochloa crassiuscula*) dominate above the treeline. More widespread is red tussock (*Chionochloa rubra*) which favours damp valley floors or poorly drained rolling country and old moraines. Once covering most of the Southland Plains, it has now been all but eliminated from lowland sites. Short (fescue) tussock grasslands, dominated by *Festuca*, but often with *Rytidosperma* and *Poa* species, are pre-



sent on low altitude or well drained sites such as basins, riverbeds and plains.

The distribution of tussock grasslands today results from a complex history of succession following the retreat of the glaciers, widespread fire, and then accelerated change through the development of pastoralism. Botanist Colin Burrows' analyses of pollen and macro fossils from deposits near Cass in Canterbury show that tussock grass-

The high country is home to the world's only alpine parrot, the inquisitive kea. In the last 140 years sheep have invaded the kea's habitat, causing tensions to rise between environmentalists and runholders when the birds are shot for harrassing sheep. This adult bird yawns after feeding on flax nectar.

Photo: Mike Harding



Restoration in action: monitoring of the 220-ha Black Rock Scientific Reserve over 18 years has revealed the dramatic recovery of narrow-leaved snow tussock and the demise of mouse-ear hawkweed once the sheep had been removed. Photo: Alan Mark.



Introduced plants such as sweet brier and self-sown pine trees are spreading rapidly through the high country, overwhelming native plants, displacing grazing, and marring the famous high country scenery. Photo: Mike Harding.

## Land Act review

**C**RITICISM OF the Land Act has not gone unanswered. A review of the Act has been drafted by Government officials and is awaiting the green light from the Minister of Lands. It proposes that pastoral lease land be reassessed and placed in one of three categories: *Conservation Land*: areas with predominant conservation or recreation values;

*Restricted Use Land*: areas available for grazing but with significant natural values that must be conserved; *Farmland*: modified areas of productive farmland with no conservation values.

This categorisation process would be based on an exchange of interests between the lessee and the Crown. The lessee would gain the right to freehold the significantly modified, and generally most productive, areas in exchange for relinquishing the grazing rights to important conservation areas. A revised lease for the restricted use land would allow continued grazing but within strict limitations, so that other values were protected, including the sustainability of resource use.

Categorisation would encourage rationalisation of the land held within pastoral leases, and ensure that land inappropriate for grazing passed to the public conservation estate. It would also provide an opportunity to include clear performance standards and environmental monitoring in a revised lease.

The high country is the only large area of Crown land remaining in New Zealand that has not been separated into production or conservation land. The task will not become any easier. With the lack of protected areas in the high country, and the sustainability of pastoral farming under scrutiny, now is the obvious time to determine the appropriate tenure for this vast resource.

land was the main vegetation type for 4000 years after the retreat of the ice age glaciers. These grasslands were gradually colonised by bog pine, celery pine, and hardy *Coprosma* shrubs. As the climate warmed, larger podocarps such as miro, matai and Hall's totara became established and eventually, about 7000 years ago, beech became the dominant forest type. Native grassland, however, persisted on recent river terraces and flats, and in the cold dry basins.

In the last 1000 years fire has disrupted the natural vegetation pattern. There were certainly early fires, triggered by lightning during warmer and drier periods, over at least parts of the high country. These would have eliminated areas of forest and shrubland and favoured the development of tussock grassland. We have a better record of fires over the last thousand years, from oral histories, and from buried wood and charcoal.

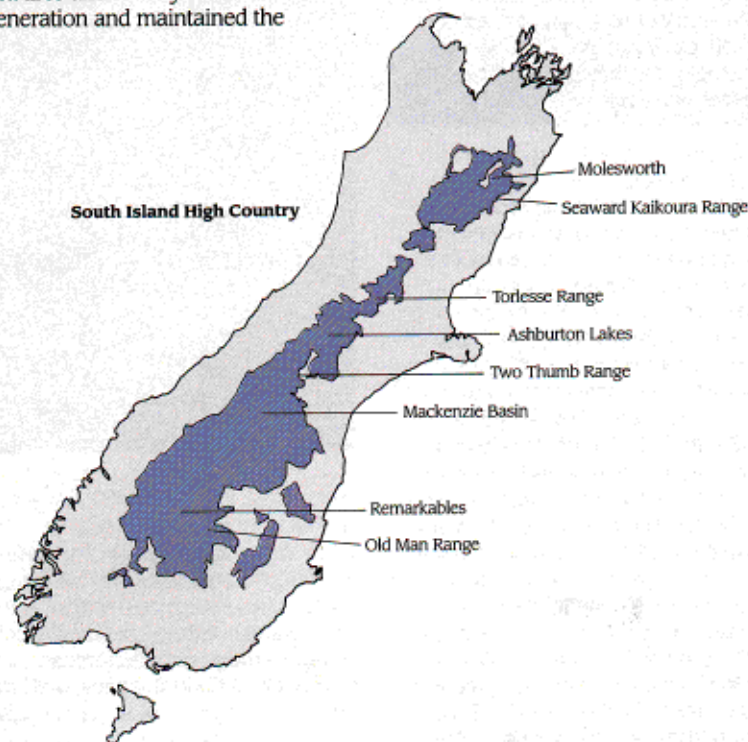
### Devastating fires

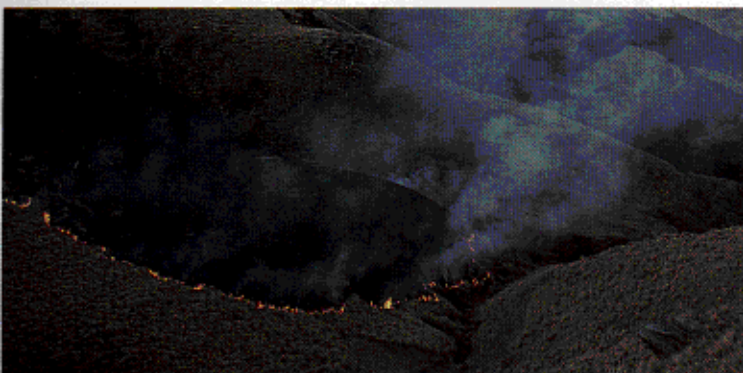
About 600 years ago devastating fires, associated with Maori settlement of the east coast, burnt from south Otago to north Canterbury. Vast areas of forest were destroyed and replaced by tussock grassland. Subsequent intermittent fires and the dry climate hindered forest regeneration and maintained the

tussock dominance.

Over the last 150 years, European farming practices have devastated the natural grassland ecosystems. The present remnants of the magnificent tussock grasslands are a sorry reminder of their former extent. The vast red tussock grasslands of the Southland Plains have been reduced to a few small patches. Snow tussocks have steadily retreated from montane slopes, to be replaced by short tussock, and much short tussock grassland has been lost to cultivation, particularly in the lowlands.

Over three-quarters of the pre-European area of tussock grassland has been destroyed. In addition to the direct loss of native grassland, the health of the remaining tussocklands has suffered from extensive grazing, the invasion of introduced plants and declining soil fertility. These dramatic changes have not been given the attention they warrant because of the conventional beliefs that pastoralism can co-exist with tussock grasslands. But it is not surprising that the slow-growing perennial native grasses, whose most significant natural herbivores were grasshoppers, have been unable





"The exceeding joy of burning", as Lady Barker described firing tussock in the 1860s, continues to have its attractions for some present day runholders. Fire has now been implicated as one of the major causes of degradation in the high country. While tall tussock can withstand occasional fire, the combined effects of burning and grazing will eventually kill the tussock plants.



Much tall tussock grassland has been reduced to short, fescue tussock through repeated burning and grazing. Now the native short tussock, such as this on Molesworth Station, is threatened by continued pastoralism and introduced weeds and pests. Photo: Mike Harding

to tolerate the combined effects of grazing mammals and repeated burning.

### Complex Ecosystems

Individual tussocks can be decades old. The grassland communities they form can have a complex structure and support a rich diversity of species. They have often been compared with forest. The late DSIR botanist Lucy Moore said of tussock grassland in 1956: "Because its dominants are perennials with very long lives, it has many of the characteristics of a forest and few of those of a short rotation pasture. Like a forest, it is the product of long slow development, and like a forest it is much easier to destroy than rebuild."

Yet when early European graziers entered the high country, little value was placed on intact tussock grasslands. The first act was often to set fire to the dense waist-high grasslands to remove awkward plants like the spiny 'wild irishman' (*matagouri*) and the sharp pointed 'spaniard' (*Aciphylla* spp.). Standing at their homesteads many miles away, runholders measured workers' progress in exploring new sheep country by the dense plumes of smoke. The "exceeding joy of burning" was described by Lady Barker in her book *Station Life in New Zealand*. "It is a very exciting amusement ...and the effect is beautiful, especially as it grows dusk and the fires are racing up the hills all around us. The immediate results of our expeditions are vast tracts of perfectly black and barren country, looking hideous and desolate to a degree hardly to be imagined."

Because the nutritional value of tall tussock grasses is low, it was common in the early days of high country farming to burn the grasslands regularly. Burning removed the accumulated dead leaves and litter, promoting a flush of fresh growth that was highly palatable to sheep. Professor Kevin O'Connor of Lincoln University estimates that stock units in Central Otago increased by 247 percent between 1861 and 1871, reaching a high of 11.3 million sheep in 1878. These very high stock levels were achieved by effectively mining the native tussock grasslands. O'Connor estimates that by 1950 "unimproved" rangelands of Central Otago supported only 10 percent of the stock carried in 1880.

While tussock burning is less frequent today (about 20,000 ha is burnt annually), visitors to the high country in spring are still greeted by dense palls of smoke as whole hillsides burn from valley floor to snowline,

under Department of Conservation and regional council-approved permits. Scientists have now shown that repeated burning and grazing of unimproved snow tussock grassland depletes nutrient reserves, reduces the height of the tussocks, opens up the tussock sward to invasion by introduced weeds, and can eventually lead to its replacement by short tussock. Tussocks will slowly recover from burning, but repeated burning or burning followed by grazing can be lethal.

It is now acknowledged that there are several advantages in retaining tall tussock on pastoral lands. Tall snow tussock grasslands on the eastern and Central Otago block mountains yield more water, through reduced evaporation and interception from fog, than grazed tussock, or even bare soil. Tussock grasses can act as heat conductors: melting and breaking up snow, thereby freeing the shorter intertussock plants from the cover of winter snow. Tussocks are adapted to exploit seasonal surges in mineral nitrogen, released by the freezing and thawing of the subsoil layers, capturing valuable nitrogen into the grassland system. On many runs snow tussock still provides useful shelter and emergency forage for stock.

Fire, grazing and introduced weeds and

pests have taken their toll. Burgeoning rabbit numbers have forced land out of production in the driest parts of Central Otago and the Mackenzie Basin. Bait shyness is causing major headaches for landholders and regional councils (see box). To complicate the problem, invasive introduced hawkweeds (*Hieracium* spp.) are spreading at an alarming rate through the dry tussock grasslands (see box). Both rabbits and *Hieracium* are having a serious impact on the viability of pastoral farming and the survival of native species.

### Rabbit plague

Large areas of the high country are badly degraded with a loss of soil organic matter, fertility, soil moisture, and soil structure. Degradation has been obvious in the dry tussock grasslands for over 100 years, with earlier crisis periods in the 1890s and 1940s coinciding with periods of high rabbit numbers. Many still remember the rabbit plagues and scabweed of the 1940s and are familiar with the rescue of Molesworth Station by the Government.

A recent review by the Parliamentary Commissioner for the Environment, Helen Hughes, concludes that traditional pastoral-



Otago skinks bask on the open schist of Central Otago. The unique lizard fauna of Central Otago has been decimated by habitat loss and predation. Photo: Ian Southey

## Gone to rabbits and ruin



The now-barren flats of the Mackenzie Basin are a sorry reminder of what were once spectacular short tussock grasslands. They have now succumbed to the combined effects of grazing, rabbits and Hieracium. Photo: Mike Harding

**O**PINIONS VARY over the causes of the recent explosion in rabbit numbers. The most commonly cited reason is that efforts to control rabbits were reduced following the removal of taxpayer subsidies during the 1980s.

Rabbits now thrive in the drier basins and valleys where conditions are particularly favourable, resulting in uncontrolled overgrazing of grasslands. About 280,000 hectares of high country land is regarded as 'rabbit prone' and 100,000 hectares of this is considered to be severely infested.

Calls for the introduction of myxomatosis led the Parliamentary Commissioner for the Environment to recommend, in 1987, that a five-year integrated programme of rabbit control and land management be established. The Rabbit and Land Management Programme has targeted rabbit-prone properties, establishing integrated land management methods through property plans. It is too early to judge its success but it has arrested and reduced rabbit numbers in some areas and sown the seed of future sustainable land use. Most importantly, it has changed attitudes towards pest control and land management.

It is now clearly acknowledged that rabbits are a symptom, rather than the cause, of a much wider problem of land

degradation. Any response to high pest numbers must also address the decisions that led to the high population in the first place.

The cost of rabbit control, and the development of bait shyness in some areas, has led to renewed calls for the introduction of myxomatosis. But, as Morgan Williams, Director of the MAF Rabbit and Land Management Programme, puts it, "The real debate is not about the kindest way to kill a rabbit. It is about how we prevent the death of a fragile piece of New Zealand. We will leave future generations the corpse of an entire region if we continue to argue about which painkiller to use on a near terminal patient when what is needed is some swift medical surgery followed by a change of lifestyle."

Regional councils and high country farmers have teamed together to apply for the introduction of myxomatosis, a process which will involve feasibility studies and an Environmental Impact Report. There is no guarantee that it will be effective, and its introduction would be about three years away at the earliest. Myxomatosis is only another control method, not the solution to the problem. In the end land management techniques will have to be adopted that do not favour rabbits. We may as well start now.



Rabbits are a major pest in the drier areas of the high country. Mismanagement of the land through stock overgrazing has created the ideal rabbit habitat. Photo: Andris Ape (MAF Technology)

ism may no longer be feasible in many areas. Anyone visiting the Mackenzie Basin today could not help but agree that we are now witnessing land degradation on a scale not seen before in this country.

Burning and grazing have not been the only causes of change in the high country. Many of the more fertile productive flats and terraces have been cultivated for pasture or cropping, often accompanied by irrigation and shelter belts. Grasslands on montane slopes have been oversown with introduced grasses and legumes, and topdressed with fertiliser, promoting a green flush across the golden tussock slopes. Wetlands have been drained or damaged by unrestricted stock access, leading to enrichment of water bodies and the loss of habitat for fish and water birds. Exotic trees have been planted for shelter or commercial forestry; large areas of tussockland are now threatened by uncontrolled wilding tree spread.

Gigantic hydro-electricity schemes have transformed the Mackenzie Basin and Clutha Valley, and there is increasing pressure for tourist development at key scenic and recreation sites. These changes have been at great cost to the native vegetation and to the distinctive high country landscapes.

Native grasslands, forest remnants and shrublands have been destroyed and populations of rare and endangered plants and animals threatened. Central Otago lizards have been decimated by modification of their habitat and predation by introduced cats and ferrets. Bog pine shrublands and rare plants found within them, such as *Hebe armstrongii*, are now confined to very small areas. Specialised plants of limestone substrates, such as the Castle Hill buttercup, a variety of *Ranunculus crithmifolius*, and delicate turf plants have, in many places, been browsed or trampled to death.

The whole tussockland ecosystem has been, and continues to be, altered by the introduction of plants and animals. No longer is there the proliferation of ground birds that the Maori and early runholders spoke of, or the extensive wetlands supporting an abundance of eels and other fish. Continued landscape modification by thoughtless design and insensitive development is creating a clashing patchwork of contrast, and gradually consuming a scenic landscape unique to New Zealand.

### Sadly neglected

Protection of the great tussock grasslands of the high country has been sadly neglected. The sweeping high country scenery, so frequently painted and photographed, is gradually disappearing in many areas.

The problems of sustaining pastoralism and yet protecting the natural values of the high country have been with us since the first runs were taken up about 140 years ago. Most high country land is Crown land, owned by the people of New Zealand, and leased for grazing under the Land Act 1948. In 1990 this totalled 2.85 million ha, contained in 349 pastoral leases and 29 pastoral occupation licences.

Pastoral lease tenure gives the lessee the exclusive right of pasturage within prescribed stock limits, exclusive rights of occupation, and perpetual rights of lease renewal. The leases are administered by Landcorp, on con-



Above: Droplets of water collect on this slim snow tussock (*Chionochloa macra*) in a dense cool fog. Research carried out on the Otago Block mountains has shown just how important intact tussock grasslands are for collecting water in this way. Photo: Mike Harding.



Left: This magnificent wetland and the surrounding slim snow tussock grassland on the southern Old Man Range are now protected as the 4500-ha Bain Block reserve, based on PNA survey recommendations. Photo: Alan Mark.

tract to the Department of Survey and Land Information, with the Department of Conservation retaining oversight for conservation and recreation values.

Under the Land Act, consents are required for developments such as roading, cultivation, tree planting, burning, wetland drainage or commercial recreation. These activities are privileges, and are not allowed as of right. But over time, these restraints have been increasingly ignored or challenged by runholders. The Act also requires land to be "properly farmed" in a "diligent and husbandlike manner" (s.99). Contemporary concepts of species diversity, representativeness, and ecological sustainability are not contained in the 1948 Land Act - a major constraint in tackling the current land degradation crisis.

Crown revenue from the leases, about \$670,000 in 1990, is less than the cost of administration. The Land Act and its administration has become increasingly ineffective and a review of the Act is long overdue.

Some attempts have been made to ratio-

nalise pastoral lease land. Widespread concern for soil erosion and water quality in the 1940s led to the Soil Conservation and Rivers Control Act 1941, and later a government policy of retiring steep, erosion-prone land from grazing. Under this Act many lessees negotiated Conservation Run Plans which subsidised the development of lower altitude parts of the run in exchange for the retirement of the upper slopes from grazing.

Millions of taxpayers' dollars poured into these 'conservation' plans which, in many instances, were little more than subsidised development programmes. Land unsuitable for grazing, such as high open tops, steep scree and rock slopes, and sensitive alpine cushion bogs and herbfields, was retired from grazing, while lower altitude land, some of which also had high conservation values, was 'improved' with subdivision fencing, shelterbelts, irrigation, cultivation, oversowing and topdressing. Moreover, in a number of cases the retired land was not surrendered back to the Crown as required and the runholder retained occupation rights.

The major nature conservation underway at present is the Protected Natural Areas (PNA) Programme. This programme identifies priority areas for protection covering the full range of plant and animal communities in each ecological district. A number of ecological districts in the high country have been surveyed and the formal protection of the identified areas is receiving greater attention. But, despite the Department of Conservation's hard work, progress is frustratingly slow, and few worthwhile representative reserves have been protected.

DoC recently protected two large areas in Central Otago. One is the Bain Block of 4,500 ha on the southern Old Man Range with a representative altitudinal sequence from 1600m to 760m. The other is 1,400 ha of high altitude *Chionochloa macra* grassland with associated wetlands on the northern Dunstan Mountains. But many negotiations are on the basis of continued grazing, despite increasing evidence of the detrimental effects of current land management practices on natural values.

The major constraint on the PNA Programme is the difficulty in negotiating valuable conservation land out of pastoral leases, even if the land has negligible grazing value. Individual lessees have shown goodwill and come to valuable agreements, but the implementation process has been effectively stalled by the reluctance of most lessees to relinquish land from their leases. The focus of the programme has been also too narrow to protect the full range of conservation values in the high country. Its original emphasis on the very best areas has ignored the wider ecological, landscape, historic and recreation values.

Recent responses to the loss of natural values and the doubtful sustainability of grazing in the South Island high country have made the need for change very convincing. The need to protect the high country's natural values and to maintain agricultural productivity are issues of national significance.

### Land degradation critical

Land degradation is now so critical in the dry intermontane basins that there will soon be little left for either nature conservation or farming. There is a pressing need to define sustainable land use and implement it in a practical and equitable way. It is also vital that

representative areas of tussock grasslands are protected.

The lack of secure tenure and ignorance have been blamed for the early land degradation. Yet the security of tenure provided by the renewable leases and legal restraints of the 1948 Land Act has not prevented the continued degradation we are witnessing today. The call for secure tenure is still being used to downplay the important effects of economics, speculation and unsustainable farming practices. Wholesale freeholding of these fragile public lands is unacceptable to most people and will not solve any problems. The suitability of much of the high country land for freeholding has always been questioned and the arguments against freeholding are even stronger today, when the sustainability of pastoralism itself is in doubt.

Performance standards are required for high country pastoral lands management. Enforcement of lease and licence conditions is essential, but this will only be effective if comprehensive ecological monitoring is undertaken. Research and advisory bodies must change their emphasis from the promotion of increased production to the encouragement of sustainable land use.

Accompanying the greater control and accountability must be rationalisation of all land contained within pastoral leases and licences. Mountain peaks over 2000m, sensitive alpine cushion fields, snowbanks and herbfields, extensive rock screes, wetlands, forest and spectacular tussock grasslands are contained within grazing leases.

Changes in land tenure, to protect these areas as conservation land and rationalisation of run boundaries, is required. This could be achieved under a new modified Land Act through the proposed process of categorisation (see box) or through a similar exchange of rights between lessees and the Crown.

It must also be accepted that there are magnificent natural high country areas outside pastoral lease land, including the University of Canterbury's 77,000 ha of endowment lands. The objectives of sustainable land use, the protection of conservation and landscape values, and the provision of public access should apply to these lands as well.

The grand high country scenery so eloquently described by generations of poets and writers, and the diversity of special plants and animals which make up such this unique part of our natural heritage, are seriously threatened.

The devastation of the tall North American prairie, the desertification of Australia's semi-arid lands prompt our criticism. Yet our own unique tussock grasslands are being destroyed before our eyes. We have a national and international obligation to protect this important part of our heritage, for the sake of the species that live there, the joy and inspiration we derive from its magnificent landscapes, and for future generations of New Zealanders.

### References

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P.J. McKendry and K.F. O'Connor, *The Ecology of Tussock Grasslands for Production and Protection, Unpublished Report for the Department of Conservation, June 1990.* ♣

## Hieracium – goodbye tussock



The "creeping grey hand" of ground-hugging hawkweed (*Hieracium pilosella*) forms an unbroken sward at the expense of all other plants. Photo: Mike Harding.

**I**N THE 1940s it was scabweed that invaded the high country grasslands. In the 1990s it is the introduced *Hieracium*. Landholders now talk of the "creeping grey hand of *Hieracium*", and despair over how to respond.

Large areas of grassland have been eliminated and replaced with this ground-hugging mat plant of little value for grazing, and disastrous for landscape or nature conservation. First recorded in the country over 100 years ago, it has only become prevalent in the high country in recent years. It now forms more than 50 percent of the plant cover over at least 500,000 ha, in places forming an even sward at the expense of all other plants.

Of the four main species, mouse-ear hawkweed (*Hieracium pilosella*) is the most dominant on pastoral lands, particularly in the 400-600mm rainfall zone. Its spread is clearly influenced by grazing, though there is debate over which factors are most important. It is well adapted to arid and infertile areas and has thrived in areas of modified or short tussock grassland. Spreading predominantly by stolons and efficiently exploiting soil moisture, *Hieracium* has out-competed, and perhaps displaced, other grassland plants including native tussock seedlings.

The spread of *Hieracium* has alarmed runholders and conservationists alike.

No land in the dry zones appears exempt from its invasion, particularly in the presence of uncontrolled grazing by rabbits. Mouse-ear hawkweed's cousin, the aptly-named king devil (*Hieracium praealtum*), has become a major species on disturbed infertile sites in the wetter western mountains.

Both species have been recorded in Arthur's Pass, Mt Cook, and Mt Aspiring National Parks, and the presence of *Hieracium* has significantly downgraded important areas identified for protection by the PNA Programme.

Ready solutions are not apparent. In moister areas the application of fertiliser allows other species, such as oversown legumes, to outgrow *Hieracium*. This is often uneconomic or unsympathetic to nature conservation values. The search for a biological control agent is underway but initial results do not look promising. Rusts and fungi being investigated are likely to only reduce the vigour of *Hieracium* slightly and are probably five years away.

Concern has been expressed that *Hieracium* is all that remains to hold the soil in place in some areas, and that its removal would be disastrous for soil conservation. As with rabbits, we cannot simply blame *Hieracium*. The plant is clearly a successful opportunist, colonising country that has been bled of its nutrients by animals and fire.