MANAGEMENT OF PROTECTION FORESTS IN WESTLAND

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SYNOPSIS

Over 60% of the total land area of Westland, New Zealand, is mountainous country bordering the narrow coastal plain. The mountains rise to heights of 1,200 to 3,650 m in as little as 12 km from the sea. Over thirty major rivers run down through the coastal plain. These mountains are largely forest-clad up to about 1,000 m. The forests and other vegetation are subject to damage from browsing and grazing animals and, to a less extent, fire. The prime objective of management must be to stabilize mountain soils and regulate river flows, to minimize flood and erosion damage to downstream areas. Management for scenic, tourist and recreational use is becoming an increasingly important secondary objective. Thus, while the forests must be maintained in a condition in which they can fulfil their primary protective function most efficiently, their value as scenery, and their use for recreation and sport must also be considered. In addition, the role of commercial meat hunters in contributing towards animal control must also be taken into account. It is important that the primary objective does not become obscured because of pressure from sectional groups in their own particular interests.

MANAGEMENT CONSIDERATIONS

About 64% of the total land area of Westland, over one million hectares, consists of rugged mountainous country bordering the narrow coastal plain for the whole length of the province. Peaks rise to altitudes of 1,200 to 3,650 m above sea level, sometimes at distance of only 12 to 16 km from the coast. The mountain chain is dissected by over thirty major river catchments, which run down through the coastal plain.

The land classified as protection forest is administered largely by two Government departments—the Lands and Survey Department and the New Zealand Forest Service—and the National Parks Authority through the various National Park Boards. Tenures are:

State Forest land	481,000 ha
Crown land (unalienated)	409,000 ha
Crown land (leased)	8,000 ha
National Parks and Reserves	114,000 ha
Total	1,012,000 ha

Thus, State Forest land is only some 44% of the total area, but the Forest Service, while administering State Forest land under the Forests Act, is also responsible for the adminis-

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tration of the Forest and Rural Fires Act and the Noxious Animals Act over the whole area. Divided authority for high country creates some administrative problems, particularly in relation to leases, privileges and public access.

The country is largely steep and broken (Fig. 1); soils are poor and the climate rigorous. A large part of the area can be described as forest-covered; trees become stunted as altitude increases, and forest gives way to alpine scrublands, then alpine tussock grasslands, and eventually fell and herb fields at the upper limits of vegetation. The whole complex of mountain vegetation, covered broadly by the term "protection forests" is of obvious importance in Westland because of its function in stabilizing soil and in regulating flow of water from mountain river catchments down through the coastal plain. Despite a high rate of normal erosion and high rainfalls (760 to 1,000 cm annually), the protection forests, in an undisturbed state, demonstrate their capability in maintaining an efficient mountain vegetative cover in balance with this rate of erosion.

Accelerated erosion in Westland would have a serious effect on such downstream values as farming, production forestry,

FIG. 1: *Typical Westland protection forest country, showing the upper limits of rata-kamahi forest, alpine scrub, tussock grasslands, herbfields and permanent snow. This view is taken from the Price Range, looking towards the main divide, with the Butler River valley in the upper left.*
N.Z. Forest Service photo by J. H. G. Johns, A.R.P.S.

and communications, but if it occurred on any scale it would adversely affect all other values. Consequently, management of this land must always be for the prime purpose of soil conservation and river control despite all other considerations. There are three National Parks in Westland (Arthurs Pass, Westland, and Mount Aspiring National Parks) where additional values have to be protected, and throughout the whole area the importance of scenery preservation and the provision of recreation is increasing.

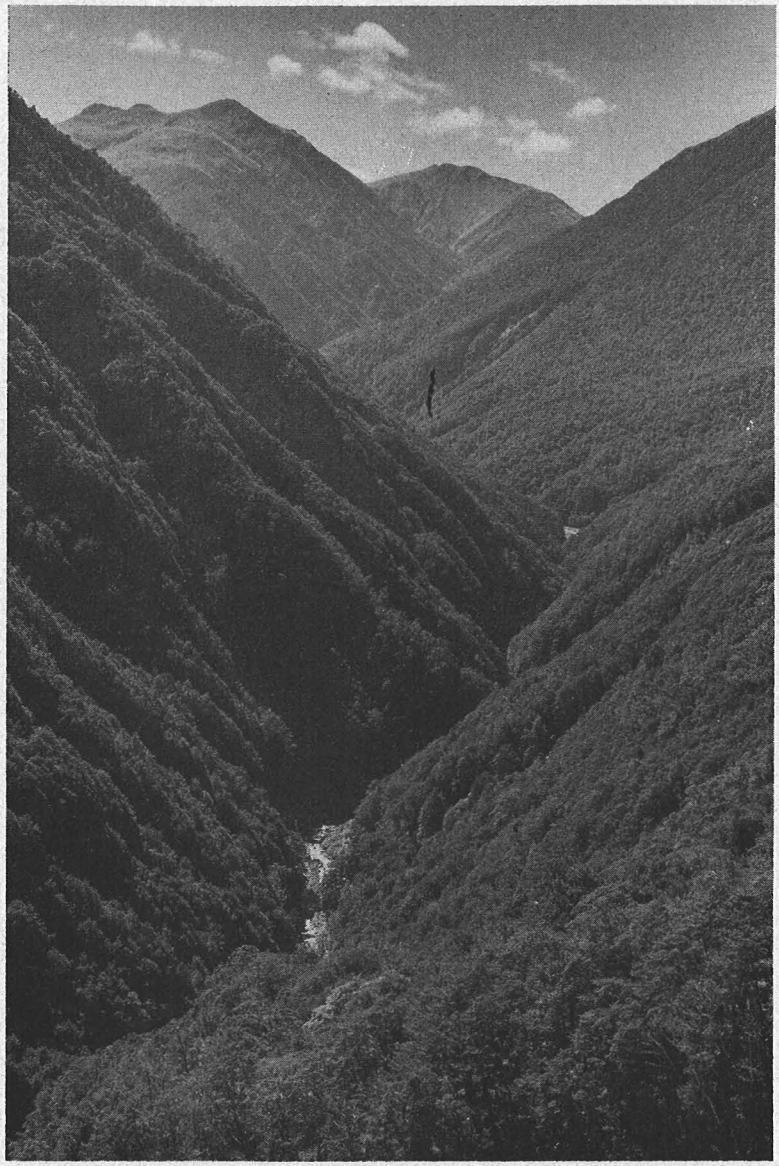
Some of the greatest changes that have occurred in these forests are the result of the introduction of grazing and browsing animals. There are still areas of virgin forest in Westland where colonization by red deer, thar and opossums is still taking place, and it has been amply demonstrated that these animals can cause drastic depletion and modification of the mountain vegetation in a relatively short period. In some instances the repair of such damage may not be feasible; at best it is certainly long term and costly. Consequently, protection forests, in the foreseeable future, must be subject to one broad management prescription to ensure their health and perpetuation, that is, to reduce and maintain animal numbers at a level where this can be achieved. In some areas there is an additional need to control animals so as to protect adjacent headwaters of major rivers flowing eastwards into Canterbury and Otago. Rivers such as the Waimakariri and the Waitaki are of major national importance because of high downstream values. Their catchments have largely been deforested and the soils tend to be unstable, resulting in a situation in which very few browsing or grazing animals can be tolerated.

The second most potentially damaging agency is fire. The increasing public usage of the back country could lead to increasing danger of uncontrolled burns, because sub-alpine scrublands and tussock grasslands are highly inflammable in summer, and because of the obvious difficulty of suppressing fires in this steep and inaccessible country. Special equipment will have to be developed for this purpose, and some thought needs to be given to the much wider use of helicopters and other aircraft for both protection and for suppression of high-country fires.

CONTROL OF ANIMALS

Very broadly, the protection forests can be divided into two major types—beech (*Nothofagus*), and rata-kamahi (*Metrosideros-Weinmannia*). The first type is found in the northern and southern areas, while the second occupies a larger central region. Various animals, whether singly or in combination, present different problems in these forest types. In beech forests the major animals are deer, chamois and thar, while opossums are of lesser importance. In the rata-kamahi forests, where both major canopy species, and a large proportion of the associated understorey species, are highly palatable to both opossums and ground-browsing animals, control of opossums is of major importance. This is particularly so where a combination of opossums and ground-browsing

animals (for example, red deer) each appears to improve habitat for the other; opossums kill the canopy trees leading to an increase in slips and open areas, while deer open up the forest floor and dense understorey scrub, and by making tracks increase the mobility of opossums.



Beech protection forest looking east towards Cannibal Gorge, from the Westland side of the Lewis Pass.
N.Z. Forest Service photo by J. H. G. Johns, A.R.P.S.

Control operations, principally against red deer, commenced in Westland in the 1930s, but there was no serious effort until about 1949. From then to 1956, shooting operations against deer, chamois and thar were undertaken over the whole mountain area of Westland. In 1956 the responsibility for animal control was transferred from the Internal Affairs Department to the Forest Service, and a system of national priorities was drawn up so that control operations could be concentrated in the most important areas. In Westland, intensive operations were thereafter confined to the Hokitika River catchment, commencing in 1959. Up to that date some 80,000 animals (red deer, chamois and thar) had been destroyed by official hunters in north Westland alone, with little noticeable decrease in populations or effect on forest recovery. Ground browsing animals have been hunted on foot and by helicopter, but poisoning offers the only available method of achieving opossum control over large tracts of steep and inaccessible country, and some 2,000 tonnes of carrot bait have been dropped by air. Since 1959 some 25,000 ungulates have been destroyed during hunting operations. The result has been that, within the Hokitika River catchment, there are relatively few animals, and there has also been quite marked recovery of vegetation. Management of this area now involves the maintenance of a low level of animal numbers, allowing the vegetation to recover further.

Elsewhere in Westland some control of animals was achieved by the encouragement of private hunters and trappers. Although confined to the more accessible frontal country, many thousands of animals were destroyed. By 1964 there was increasing interest in obtaining game meat, mainly venison, for export, and helicopters have since been commonly used as a means of transport. Large numbers of deer had by that time built up undisturbed in south Westland, and the potential of helicopter-borne hunters to find, shoot and recover deer carcasses in large numbers was quickly realized. A number of game meat companies commenced operations, mainly in the Haast region, and by 1967 export earnings were quoted as some $3 million for that year for the whole country. This is the equivalent of about 90,000 deer, of which a large proportion was obtained in south Westland. Latterly, both thar and chamois have been recovered in increasing numbers, so that helicopter hunting eventually extended over almost all the South Island high country. In addition, the price of venison increased sufficiently to attract many hunters to pursue game meat recovery as a full-time occupation, using all types of transport, including jet boats and fixed-wing aircraft. These activities are now part and parcel of the back country scene throughout Westland.

Probably the peak of large returns from helicopter hunting has now passed with the reduction of large herds of animals on the open alpine grasslands, but there has been increasing hunting from the ground in the more workable bush country, the hunters being supported by helicopter operations. The current rate of recovery probably still accounts for some 15 to 20,000 animals annually in Westland, and it is apparent that

commercial hunting can be expected to continue in the back country for some time to come.

With the increasing demand for recreational and sporting use of the mountain lands, there is inevitably some conflict with these interests, and objections to the commercial use of helicopters. While recognizing the recreational values of the mountain country, it would be fair to say that private hunters are unlikely to contribute to animal control to any great extent in the near future in Westland, owing to their limited numbers and to the inaccessibility and remoteness of the headwaters of the river systems where most deer and other animals are to be found.

There is also some opposition, from both sporting and commercial interests, to the implementation of policies aimed at reducing animal populations, particularly where this involves the use of poisons. However, it is doubtful whether commercial helicopter hunting can be undertaken in those critical catchments where it is necessary, for forest recovery, to reduce animal numbers to low levels. At the same time, increased efficiency could well lead to a much greater use of helicopters for animal control operations.

A great many of the longer-term problems in protection forest management in Westland involve an understanding of the complex relationships between animals and vegetation, and it is likely that solutions can be found only by sustained research. While it seems probable that many areas will be capable of sustaining a certain population level without serious detriment, this safe level has yet to be determined. The achievement of a natural balance may take very much longer than the relatively short period during which the animals have been present. On the basis of the scientific evidence available at present, there are generally too many animals in these forests, and to err on the side of having too few, rather than too many, is in the interim the safer course.

CONCLUSION

The primary objective of management in the protection forests of Westland must be to maintain them in a condition in which they can fulfil their primary function of control of water and conservation of soil most efficiently. The scenic, recreational and sporting values of these forests must also be taken into account. A major aspect of management is control of damaging animals, in which sporting and commercial interests can play a part. It is important that the primary objective does not become obscured from time to time by pressure from various sectional groups in their own particular interests.