



Looking north along Gorge Plateau and the alpine fault down the Cascade River, with clouds spilling over from the Jackson River. Photo: Les Molloy

curiously out of date in its failure to appreciate that most of the lands of the Crown that are involved in the proposal will now be administered by the new Department of Conservation. Consequently arguments such as excluding the Pyke Valley from the national park in order "to avoid dual administration" (Forest Service/Lands and Survey) just don't apply any more.

The departmental report does not cast any doubt on the NPRA's view that the land in question is of national park quality. It concludes that the "bulk of the study area is suited only to protective and recreational uses," and that "a high level of protection is appropriate for this large part of the study area". On the basis of the known interest group constraints and preferences, it evalu-

ates seven possible boundary options; unfortunately six of them result in additions smaller than the 27,000 ha proposal. Nowhere does the report objectively try and assess whether a larger addition involving state forest (such as, including the Skippers Range and Awarua Bay) would be preferable.

Society members can make up their own minds on the ideal boundary for the proposed addition. The scientific and recreational points of interest in the proposal addition are summarised opposite. Submissions on the report should reach the Commissioner of Crown Lands, Department of Lands and Survey, P.O. Box 896, Dunedin, by 23rd February 1987. Late submissions will be accepted. ✎

References

- Lands and Survey, Department of, 1986: A Resources Report on the Red Hills, *NP Series No. 35*, 33pp.
- Lee, W. G., Mark, A. F., Wilson, J. B., 1983: Ecotypic differentiation in the Ultramafic Flora of the South Island. *N. S. Journal of Botany* 21: 141-156.
- Molloy, L. F., 1977: Red Mountain - National Park or Asbestos Mine? Supplement of *Forest and Bird* (August 1977), 16pp.
- Molloy, L. F., 1979: Outdoor Recreation on the West Coast, Federated Mountain Clubs of NZ, Wellington, 122pp.
- Molloy, L. F., 1983a: How much longer before Red Mountain is protected? *Forest and Bird* 14 (2), 17-24.
- Molloy, L. F., 1983: "Wilderness Recreation in New Zealand", proceeding of the 1981 Wilderness Conference, FMC, Wellington, 148pp.

A Unique Landscape

The term "ultramafic" is used to describe the geology of unusual areas where the rocks contain high concentrations of magnesium and iron. These ultramafic rocks are often associated with deposits of minerals containing the metals chromium, nickel, cobalt, and platinum; hence the interest of the mining industry in ultramafic deposits.

Chromite deposits are found on Red Mountain, and indeed, were mined earlier this century on Dun Mountain, beyond Nelson, but no metallic deposits of economic importance have been found on Red Mountain. However, recent and present prospecting has concentrated on deposits of a non-metallic magnesium-bearing mineral — chrysotile asbestos. Whereas the other minerals appear to be diffused thinly throughout the entire ultramafic belt, the asbestos is more localised, with the most important deposit lying on the slopes of the Little Red Hills Range above the upper Pyke River. Today Dun Mountain in Nelson and

Red Mountain in South Westland stand at opposite ends of the Southern Alps axis, providing one of the most interesting markers of our geological history. Hundreds of millions of years ago the Red Mountain ultramafic belt was intruded from deep within the Earth's mantle at a point where the Pacific and Indian-Australian crustal plates were grinding past each other. We now know of this great zone of geological contact as the Alpine Fault of the South Island. Of major scientific and education significance is the lateral movement that has occurred along the Alpine Fault over these hundreds of millions of years to the extent that this ultramafic rock has been wrenched apart a distance of 500 km.

The soils derived from ultramafic rocks are generally stony and shallow. In addition to these factors, which adversely affect plant growth, there are levels of exchangeable nutrients (particularly magnesium) which are toxic to many plants. Consequently, ultramafic soils support very distinctive flora. The striking transition from mature silver beech

forest on the surrounding schist to "serpentine scrub" or a depauperate tussock/herb field on the ultramafics can occur over just a few metres. Such a contact zone is particularly obvious in Simonin Creek, which follows the Livingstone Fault.

The Red Mountain area provides the opportunity to study ultramafic vegetation over the widest altitudinal range within New Zealand (nearly 1400m). Most strikingly, ultramafic vegetation is stunted and has a limited range of species. The Red Mountain ultramafic belt supports only about 50 percent of the species growing on the adjacent schist and growth rates are only about two-thirds of that on the schist. (Lee *et al*, 1983).

Investigations so far have not identified any plants that are endemic to the Red Mountain ultramafic belt, unlike the Dun Mountain region, which supports two endemic plants. However, populations of the streamside Portulacaceae (*Montia australasica*) and the woodrush, *Luzula crinita* var. *petriana*, are genetically adapted to the ultramafic soil conditions in the Red Mountain area. (Lee *et al*, 1983).