

GUEST EDITORIAL: ALAN MARK

Alan Mark was born in Dunedin, completed B.Sc. and M.Sc. degrees at Otago University and a Ph.D. at Duke University, U.S.A. with the assistance of a Fulbright Grant. After a 2-year term as Ecologist with the Otago Catchment Board, Alan was the first Research Fellow of the Hellaby Indigenous Grasslands Research Trust and has been its Research Advisor since 1965. Professor of Botany (Personal Chair) at Otago University since 1975, Alan has wide ranging research interests - pure and applied aspects of the ecology of tussock grasslands, alpine lands, wetlands, shrublands, forests and lakeshores. His concerns for conservation have been reflected in several official roles (Chairperson of Manapouri, Te Anau Lake Guardians since 1973, National Parks and Reserves Authority, Otago Conservation Board, Land Settlement Board, Mountain Lands Committee, Wetlands Task Force), elected roles (Otago Catchment Board - four terms) and voluntary groups (Forest and Bird Protection Society - Executive Councillor and ex-President). A member of the Ecological Society since the late 1950s and a past Vice President and Councillor, Alan has a C.B.E. for his contributions to conservation, is a Fellow of the Royal Society of New Zealand and has over 100 refereed publications. including a book (co-authored with Nancy Adams) on New Zealand alpine plants.

ECOLOGICAL DEGRADATION

Despite New Zealand's reputation as an international leader in the fields of biological conservation and threatened species' recovery, this country is facing ever increasing threats of ecological degradation to both its conservation land and certain types of productive land. Indigenous forests virtually throughout New Zealand are being increasingly threatened and ravaged by brush tailed possum, *Trichosurus vulpecula* Kerr. Introduced first in 1868 to establish a fur industry, the total population is currently estimated to be at least 69 million and their consumption some 18 000 tonnes of vegetation daily or 6.6 million tonnes annually. The relatively intact indigenous forests of the Catlins Ecological Region and South Westland are now showing obvious signs of canopy mortality. We read in this issue of the extra funding recently made available by Government for possum control that should allow the onset of widespread ecosystem depletion in the South Westland forests to be contained. However, the price of these control operations is the increased threat to some rare bird species of the poisoned bait used for this control, as described by Spurr (1993). Extra effort is also being put into possum control in the Catlins indigenous forests by

the Department of Conservation. These efforts, however, will not provide a long term solution to the possum problem. Only an effective control technique, yet to be developed, can provide this. A claim at one of the Society's conferences, in the early 1980s I believe, of "Genocide to possums" with an effective control achieved through use of particular lures, in this case cinnamon, has not been fulfilled. It is clear that a major and fully co-ordinated research effort into effective control of possums remains a matter of great national urgency. Whether the competitive bidding system now in place for funding public-good scientific research among CRIs and universities can provide the necessary co-ordination, and deliver on the nation's urgent needs for resolution of this problem, is yet to be determined.

The situation in another of the country's major indigenous ecosystems, the tussock grasslands, which is also addressed in this issue of the *Journal* (McIntosh and Allen, 1993; Scott, 1993a, b; Scott and Sutherland, 1993), is sadly no brighter than for the forest systems. However, history was made in 1993 in an attempt to retain "the best of what remains" - slogan of the New Zealand Protected Natural Areas (PNA) Programme. The Minister of

Conservation took an unprecedented step, invoking the Resource Management Act 1991 and placing a "designation" notice on 1970 hectares of mid-altitude red tussockland on the "Little Valley" Crown pastoral lease in the Manorburn Ecological District of Central Otago. This step was taken in order to prevent the lessee from exercising a permit issued by the Otago Regional Council to burn and subsequently graze the tussockland, virtually without restriction. Such tussockland ecosystems have been seriously depleted and visibly degraded in most other parts of the country. This 1970 ha area of red tussockland had been identified in a 1989 PNA survey as the best remaining area in the Manorburn District (Fagan and Pillai, 1992). The identified area was ranked as high (i.e., 3 on a 3-point scale) for five of the six criteria for RAP (Recommended Area for Protection) designation - representativeness, diversity, naturalness, viability, and buffering - and medium (2) for threat. This was in recognition that burning and overgrazing would result in loss of tussock cover and/or invasion by adventive species, notably mouse-ear hawkweed, *Hieracium pilosella*, as has happened in many other parts of the District (Hunter, 1991; Fagan and Pillai, 1992).

The Department of Conservation was unable to consult with the Otago Regional Council on the unique ecological values of the area because of a decision of the Planning Tribunal in 1992 that, under transitional procedures of the Resource Management Act, all applications for burning consents are non-notifiable and therefore without rights of public involvement. Only the applicant had a right to be heard and call evidence at the hearing of the Council's Consents Panel which also had the final decision. The PNA report, however, was available to the Consents Panel which also was made aware by its staff of the high conservation values of this tussockland and the lack of substitute areas. Council's staff recommended to its Consents Panel that monitoring be a condition of any burning permit while advice to the lessee's lawyer from Landcare Research ecologist Dr Ian Payton was that there should be one and preferably two years of post-fire spelling. This was based on Dr Payton's assumption that the response of red tussock was unlikely to be very different from that of narrow-leaved snow tussock for which there was adequate information. Nevertheless, economic sustainability, stressed as being critical by the applicant, over-rode the decision of the Consents Panel which issued a permit on 1 July 1993 to burn the area any time between 1 June and 15 September of this year (with possibility of extension to 30 September), virtually without condition: spelling only until January, no

oversowing or topdressing required, and without any monitoring. On the day the permit was issued, DoC served on the Central Otago District Council and the lessee, a notice of the Minister's requirement for a "designation for a public work" over the 1970 ha RAP on Little Valley Station. The District Council in turn, called for public submissions and conducted hearings over five days in September 1993. Some 36 submissions were heard among the 212 received in opposition to the designation while 12 were heard among the 117 received in its support. The exercise revealed little disagreement on the conservation and scientific values of the area, both in their own right but also as a valuable baseline reference area to be assessed in relation to the extensive areas of degraded red tussockland now present in the Manorburn and other districts. As such a reference area, this tussockland being sought for protection has very considerable economic potential to the farming community, regionally and nationally as explained in general terms more than a decade ago by Professor Kevin O'Connor (O'Connor, 1982).

Among the wide range of comments made in submissions to the District Council, those of an agricultural economist from Lincoln University justify a response. Referring to tussockland research generally, he claimed that most scientists associated with it appear to be "green", even to the extent of having difficulty in making necessary subjective judgements without bias and of therefore being open to suspicion of fudging their data. Descending to this level of criticism without offering alternative information serves to discredit those using such tactics, but clearly some (though not all) runholders appear to share this perception of most tussockland scientists. It could reflect defensive reactions of some runholders to the general concerns that many scientists have been expressing for tussockland ecosystem degradation which has become clearly apparent over the relatively short period of their working lives. Most tussockland ecologists interpret the explosions of rabbits and hawkweeds in many tussockland areas as being symptomatic of a systems' failure, or collapse, of an unimproved pastoral ecosystem (Treskonova, 1991; Kerr, 1992; Hunter, Mason and Robertson, 1992), resulting from 150 years of exploitative pastoralism (O'Connor, 1982). Research effort into understanding the ecology of hawkweed invasion and persistence is increasing (Treskonova, 1991; McIntosh and Allen, 1993; Scott, 1993a, b; Scott and Sutherland, 1993), but greater co-ordination is desirable (Hunter, Mason and Robertson, 1992) and currently is being attempted by MAF Policy.

Landcare Research scientists are among those with particular knowledge of, and also concerns for, ecological degradation of the tussocklands but, because of the present public controversy over the burning of tussocklands a single official spokesperson has been appointed by their Chief Executive (Dr Andy Pearce, *pers. comm.*, August 1993). Dr Pearce has also given an assurance that the overview presented will take into account the full range of internal information and opinions. Such a measure may be considered desirable for Landcare Research to function effectively as a business, but I believe it is likely to stifle open debate and perhaps further clarification on this complex issue which clearly requires further research in several disciplines. We should certainly be wary that it does not develop into the situation that prevailed with DSIR scientists in the mid 1970s when other environmental issues were equally controversial. Indigenous forest utilisation was one such issue, prompting a notice from DSIR head office reminding their scientists of "professional ethics". It stated:

"As an employee, the modern scientist has very real responsibilities to his employer. Such a man might well regard the scientific institution that employs him in the light that a lawyer regards a group of which he is a partner, namely, that the professional relationship lies between the scientific institution and the client, and that it is the employee scientist's task to use this relationship to further the best interests of the client. What many scientists fail to realise is that they then have a duty to safeguard the client's interests, even if this may involve some conflict with their own interests. ... Wherever a DSIR scientist undertakes work for ... another department, it is important to first define the professional relationship. Where the work is being done in an official capacity then clearly DSIR ... is one party and the ... other department is the client. In such a situation a scientist must seek, through his employer, the permission of the client before he divulges details of the work to a third party. Such permission should be obtained even if the information is being written up for publication. In many instances the client's interests may well be protected by delaying publication for a short period."

That issue was a lively one until the late 1970s at least (Mark, 1979).

On the issue of degraded tussocklands, the land occupiers, in contrast to most tussockland scientists, interpret the situation quite specifically in terms of weed and pest problems to be addressed accordingly. Regardless of the cause(s), the immediate economic effect on the land occupiers is perceived as a substantial loss in income and also in the value of their properties. These losses are aggravated by recent substantial increases in pest destruction rates. Options for the occupiers are both limited and costly (Kerr, 1992). As Chris Kerr explains, the situation is not unique to New Zealand but should rank internationally with similar problems in the Sahel region of Africa as well as in most of the world's rangelands, as was revealed at the rangeland section of the XVII International Grassland Congress at Lincoln University in February 1993. The threat of degradation to tussockland dedicated to conservation is also serious. However, there are at least some areas, as with a mid-altitude snow tussockland reserve in the Waipori Ecological District, where non-interventionist conservation management, based on the exclusion of mammalian herbivores, over the last two decades has resulted in virtual elimination of a light infestation of hawkweed while the snow tussocks increased significantly in both height and cover (Dickinson, Mark and Lee, 1992).

Realisation of the significance of the lack of adaptation to mammalian herbivores in our indigenous ecosystems has been further highlighted in this issue of the *Journal*. The study by Fenner, Lee and Duncan (1993) complements results of the comparative study of takahe and ungulate grazing of mid-ribbed snow tussock *Chionochloa pallens*, revealed some years ago (Mills, Lee and Lavers, 1989). The generally low levels of silicification in leaves of all 11 species of southern upland snow tussock (*Chionochloa* spp.) tested by Fenner *et al.*, (1993) are interpreted by them as an evolutionary consequence of the absence of indigenous mammalian herbivores. This feature, combined with their nutritive values being in the low to mid range for pasture grassland, further explains the vulnerability of these indigenous species to mammalian grazers.

The long-term prospects for conservation and development of some of our major indigenous ecosystems, in relation to existing trends, are certainly far from encouraging. Whether the Resource Management Act can be realistically applied to New Zealand's rangelands to achieve sustainable management is still unclear. The fate of the designation notice on Little Valley Station may

not be irrelevant in this context. Assuming the issue proceeds to a formal legal hearing by the Planning Tribunal, as is almost certain if the Minister of Conservation so decides, there should be an important opportunity to critically debate important aspects of the legislation. In particular, adjudication on some potentially conflicting aspects of ecological/environmental, economic, social and cultural sustainability, that are claimed by some to be inherent in the legislation, will indicate its ability to provide for sustainable management of the country's natural and physical resources.

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