Although the interests of foresters are predominantly in trees and forests, it is almost impossible to look at protection forests as an entity divorced from other forms of land use and separate from other types of vegetation. The grasslands and shrublands that in some cases precede or follow forest development are a part of a much wider system than the narrow confines remaining of our protection forests.

It has never been very satisfactory to look at forests or grasslands simply as vegetation units. The working unit is the ecosystem — where the full interplay between plant, micro-organisms, animals, climate, soil and geology creates a recognisable and describable unit of the landscape.

The forested ecosystem is unique in the amount of biomass accumulated. It is many times that of grassland or shrubland ecosystems, and as a consequence of this we associate forests with stability, and look to trees as a longer-term answer for slowing down erosion.

Within broad associations of forest there are ecological niches that fit certain plant species. These niches may occur as a part of a normal, primary succession; or they may be consequent upon an ageing and deteriorating ecosystem, or be due to a localised catastrophe in the forest. Such niches, while occupying only a small part of the whole forested region, can be highly sensitive areas in terms of either the redevelopment of true forest or the wasting of the existing ecosystem.

The protection forester is therefore faced with forests that vary in age from a few to many thousands of years, with soils that are sometimes developing, are often deteriorating, and are frequently polygenetic, and with animals that span different ecosystems and interact with the vegetation and soils.

Our attitudes towards these complex protection forests and grasslands, and generally towards land use in New Zealand, have been entrenched, traditional and primitive. Until recent times we were almost in danger of saying that the classic answer to all New Zealand's problems was to run more sheep.

*Forest Research Institute, P.O. Box 31-011, Christchurch. This Comment was presented as an invited paper to the Institute's 1978 Annual General Meeting at Te Anau.
To do this the forest or scrub was burnt and bashed and grazed until the only species left were those that withstood the constant chewing and trampling. The two species that best withstood that treatment were ryegrass and white clover.

In our land use we thus shifted the balance from a native forest geared to carbon fixation to a grassland geared to nitrogen fixation — the end product was meat and wool and high levels of nitrogen were needed for the protein in the animals. In order to maintain the legume we had to graze severely at times, and spread the animals to get an even spread of dung and urine. There was no place for trees in this system because they caused the congregation of animals, and a consequent poor distribution of nutrients.

To clear native forest and replace it by pasture became, for two or three generations of farmers, a doctrine that would no doubt have been taken further but for constraints of access, or limiting water or nutrients.

If one looks at exotic forestry development in New Zealand, the past pattern follows a failure in some system of farming — from cobalt deficiency in the central North Island to water deficits on stony soils in Canterbury, and from slope stability problems in Gisborne to weed problems in Nelson and Marlborough. Forestry has had to pick up the tab when the farming system broke down.

Over the last hundred years we have stumbled over sensible land use and have, almost by chance, ended up with most land production coming from three plants — ryegrass, white clover and radiata pine. Our attitudes are conditioned by the growth of these species, and there is almost a tribal instinct for their preservation.

Sandwiched between the two systems of farming and forestry, and in reality a relict of both, are the protection forests and grasslands.

Traditionally, we have looked at these areas not for what they protect on site but for what they protect off site. Jargon such as “downstream values” and the “cost-benefit analysis” of revegetation projects only reinforce in the public mind the idea that the protection areas are there to protect the productive land, our houses, hydro schemes, and so on.

We seriously need to develop a protection ecology (even a predictive ecology) that is compatible with our production enterprises but not subservient to them; which faces the reality of botanical, animal and soil change with time, and which is adapted to the many uses of a continuously changing society.

The rata/kamahi forests are an example of a particular problem. Most of these forests exist in very wet areas on
steep terrain that is held together by a vigorous vegetation. The two main tree species, rata and kamahi, are both palatable to opossums, and the early seral species, like fuchsia, are also prone to opossum damage. In short, the opossum is virtually hitting this ecosystem at both ends. On top of this there are the deer which have their own preferred species in the forest. Notwithstanding the fact that botanical change is inevitable, the relatively short history of animal use in these forests has been nothing short of disastrous. We can see in them the early stage of a replacement of forest by a savannah of grasses and unpalatable shrubs and ferns that could affect real forest development for hundreds of years. There is no guarantee that these areas will necessarily ever change back to solid forest, even if we were to completely eliminate wild animals.

Currently, we make out that the problem is erosion control; but the fact is that the rata/kamahi forests themselves are at risk, not the country below them. The real problem is the forest itself.

In the beech forests we have trees that seed sporadically and spread only very slowly over time, possibly less than 50 metres in 100 years. Most of the beeches, and particularly mountain beech, appear to be a true forest climax — there is no other native tree species to take their place if they die. These forests may be at greatest risk when they are in their most uniform state. Small, local catastrophes like blow-downs, or snow-break, or controlled felling may be desirable to keep a flexible uneven-aged stand in existence.

Twenty or thirty years ago it looked as though we were facing a disaster in the beech forests. The forest floor was open, owing to natural factors and deer or goat browsing. But following the control of these animals there has been a resurgence of regeneration, which has changed many forests into thickets.

The situation now is that we could manage beech forests in the presence of deer, provided that we maintained stable and productive grassland and shrubland close to the forest edge. However, present control of deer (using helicopters) tends to take animal grazing pressure off the grasslands and concentrate the animals in either the dense forest or on the seral associations which usually occur on erosion-prone sites. In the future, quite selective animal control operations may be needed to ensure that true forests can develop amongst these seral associations.

This selective management, which faces all protection foresters, is anathema to some land managers; but there is no doubt that long-term production will depend on maintain-
ing reasonably stable vegetation on unstable ground. It is un-
fortunate that protection forests have been allowed to be
destroyed in the name of increased animal production. It is
unfortunate that slipping is occurring on 10% or more of
the land area of some hill country farms, and equally un-
fortunate that grazing is allowed on native grasslands with
70% or less ground cover. But it is calamitous that we accept
it. No amount of tinkering with the erosion surfaces after
they develop can replace sound vegetation and soil manage-
ment as a means of modifying erosive forces.

In the future there will be increasing demands on land for:
living, recreation and production, and it seems that although
many arguments can be raised for multiple use there will
still be very large areas that are managed primarily for their
protective function.

The existing protection forests are changing and will change
further, but there is an urgent need for new protection forests
within the farming scene. It is no longer sufficient that we
develop land-use options on the basis of a few years' projec-
tion. We need to project uses over a few hundred years, and
to allow for (and hopefully modify) the inevitable cata-
strophi...