

# THE PRESS FEATURES

## Botanists warn against conifers taking over the high country

The first of two reports by DERRICK ROONEY. The second will be published tomorrow.

High-country forestry has been one of the success stories of New Zealand pastoral endeavour, but evidence has accumulated in the last few decades that conifers in some places are a mixed blessing.

Now, a note of caution against future widespread tree-planting in mountain lands has been sounded by a group of scientists in the Botany Division of the D.S.I.R. at Lincoln.

The botanists fear that because of the demonstrated ability of exotic conifers to colonise New Zealand's mountain lands up to, and beyond, the limits of the natural forests, there is a real danger to large areas of New Zealand's landscape, and to some of the most rare native plants and plant communities.

They cite such areas as the central North Island and the Amuri Range, in North Canterbury, where escaped conifers are causing serious problems for pastoral land users, as demonstrating the need to take great care with conifers.

Though the botanists acknowledge that exotic hardwood trees such as sycamore, ash, hawthorn, and alders may spread to adjoining lands, they believe that exotic conifers present a greater threat to native plant communities.

The botanists — Dr Brian Molloy, Mr Bill Sykes, Dr David Given, and Dr Peter Williams — emphasise that they are not painting a picture of high-country forestry as herds of exotic trees

Marching like triffids across the ranges.

But they say that enough evidence has emerged of the "weed potential" of conifers to suggest that all new plantings for mountain revegetation and erosion control should be treated as suspect until guidelines have been laid down for State and private agencies in the use of exotic tree species in New Zealand's mountain lands.

The D.S.I.R. scientists lack of competing land use, protection for remnants of our primary vegetation, and the increasing risk of conifers invading important second-growth native plant communities in hill country.

"It is time for the country to look at the whole rationale of high-country tree-planting," Dr Molloy says.

"We should be asking ourselves, 'Does it achieve our aims?' We are getting close to the stage at which the only acceptable place for conifers is as timber trees. There is strong evidence that they have no place in mountain erosion control or in our mountain landscape.

"I would be fine if pines stopped floods, and stopped single slides, and stayed in place. But it is now clear that trees have only a minimal effect on soil loss. The evidence in support of tree plantings in eroded mountain-land is fragile. There is no reliable evidence that any downstream benefits can be

obtained from revegetation.

"I would go so far as to say that the great body of scientific thought is now against revegetation of our mountain lands as a practical objective."

The scientists do not argue for a blanket ban which would prevent conifer plantings for production purposes in tussock or mountain lands. They merely argue for greater care and consideration for the possible consequences before new plantings are made.

"There is no doubt that on a dry-matter basis conifers can show a higher return on marginal lands than other forms of agricultural endeavour," Dr Molloy says. "The Forest Research Institute has shown what can be done in its trials at Craigieburn."

"I have no doubt that there is a useful place for conifers in the production of dry matter, especially if the Government begins planting energy forests, as perhaps it will have to do eventually. But someone must take responsibility for the forests."

"Plantation owners must know that conifers will spread and may become weeds on neighbouring lands. That is a well documented scientific fact. It has been demonstrated time and again — at Waioaru, in the Amuri Range, at Lake Coleridge, and elsewhere. Tree owners must accept the responsibility.

"The Crown has the major responsibility most of the revegetation plantings have been made on Crown land under the control of the Department of Lands and Survey and the Forest Service. Private owners and local bodies also have a responsibility.

"There is nothing new in this warning," Dr Molloy adds. "The Botany Division has been warning about the dangers of conifers for 20 years or more."

Asked for specific examples where planted conifers had spread, either to become pests or to threaten precious native plant communities, the botanists name a large number of areas from the Gumlains in the far north to the Catlins area at the bottom of the South Island.

Dr Given, who has made a special study of New Zealand's rare and endangered plants, and recently published a book on the subject, singles out the scrub communities of the North Cape Gumlains as an area of special concern. Huge pine forests are being planted in this district, many of them in the extensive areas of second-growth scrub which contains rare and localised species, including some orchids, several pomadouras, and a yet-undescribed prostrate species of corokia.

Much of the area is light, sandy country, ideal for the growth of pines, not unlike

the Bottle Lake area of Christchurch, where pine seedlings regenerate so thickly it is impossible to walk through them.

Once pines form a canopy in such an area, the natives will be pushed out and will be unable to return.

The scientists say New Zealand should be thinking very hard about the future of second-growth areas — scrub communities which have replaced old forests that have been felled or burnt. Typical second-growth species include such plants as kanuka, manuka, pitosporum, and various small trees, shrubs, and herbs.

New Zealand has large areas of this type of vegetation, largely as a result of milling and fires — some lit by Polynesians, some by colonising Europeans, some from natural causes.

More thought should be given to the management of these areas, which are not well represented in the parks and reserves network, and which would be threatened by conifer plantings — can be serious debate.

"We believe that some of these areas should be treated on a biological district basis so that a rational appraisal of our natural resources can be made."

In the meantime, the Botany Division scientists would like to see an immediate halt on all aerial seeding of pines and other conifers, and perhaps a halt, too, to the planting of pine seedlings in alternative areas.

"The 'vulnerable areas' include the botanists say, not only the Gumlains communities already mentioned, but also areas below 2000 feet in Marlborough Sound.

"The Moawhanga River catchment is in the rain shadow of Mt Raukapa and is one of the driest areas of the North Island. It is also, from a floristic viewpoint, the North Island's richest botanical area — for example, it is noted for its fine flowering forms of the North Island kowhai."

Five years ago, in a report on "Pinus contorta in North Island mountains," Dr Ian Atkinson, of the D.S.I.R. Botany Division at Lower Hutt, concluded that within two decades most of the botanically-rich Ruahine tussock-land may well disappear under pines.

"The widespread aerial seeding and planting of Pinus contorta that has already occurred in the Kaweka Range makes it doubtful whether anything can be done to prevent the species from becoming a permanent part of this mountain landscape," Dr Atkinson reported.

On the contention, made in support of pines, that Pinus contorta would act as a "nurse crop" for native trees which would eventually replace it, Dr Atkinson commented that, at lower altitudes this had not been con-

vincingly demonstrated. At higher altitudes, above the native tree-line, it was clearly impossible.

"In any case, the argument misses the point that it is concerns for the loss or impending loss of presently treeless subalpine and alpine landscapes that is troubling many mountain users," he wrote.

A South Island area in which the seeding from the air of pines has caused concern is at the head of Waipoua Valley, in Marlborough, where pines are invading a kanuka community which botanists consider to be important.

Numerous South Island areas can be found where conifers are threatening scientific, scenic or agricultural values. One is the Nelson mineral belt, where, the botanists say, is "open to colonisation" by conifers.

Already at risk is a unique plant community in the Dun Mountain area. In the Mt Patriarch area, a rare local species of Hebe Hebe gibbisi — which occurs on open slopes among rubble and scrub, is very vulnerable and may become extinct as a wild plant.

Some conifer plantings in Nelson and Marlborough have been made in what botanists call "critical ecological areas." One is the



The view across the Hamner River valley, looking north-north-west to the Hamner State Forest from Polo Hill in the Amuri Range. The trees in the foreground are Corsican pines which have seeded from the forest. North Canterbury Catchment Board photograph.

steep faces and in deep gullies the trees seem almost ineradicable.

To some it might seem sensible to accept their presence and treat them as a crop which can eventually be turned into timber — and one farmer in the Amuris has done so. But, in most of the ranges cropping the self-sown trees is not practical, because they are in stands of mixed ages and mixed quality, and it is not economic to mill them. Corsican pine timber has little market value.

The Amuri Range, across the river flats from the Hamner State Forest, on the line of the north-west wind, has already been invaded by conifers, and one species, the Corsican pine, is causing major headaches for farmers there.

Two years ago the Corsican pine was declared a noxious plant in the Amuri Range, making its control eligible for a subsidy. But some rangelanders feel they might be fighting a losing battle with the species, which has now reached the top of the range and begun to spread on the lee side.

Felling and burning, followed by pasture reseed, uprooting, and periodic mow stocking is giving good control of the trees on the easier slopes, but on the

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The species has now colonised an area of some 5000 hectares in the Amuri Range. In Central Canterbury, an area of some 1500 hectares of tussock grassland in the Rakai Valley has been invaded by Corsican pine seedlings from early shelter plantings.

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## Foresters disagree

Some forestry scientists do not agree that Northern Hemisphere conifers have the ability to create new permanent forests extending above the natural timberline in New Zealand.

At Craigieburn Forest Park, the main New Zealand centre for high-altitude revegetation research, experiments by the Forest Research Institute have shown that it is possible to extend the natural timberline upwards about 170 metres by handplanting, but according to a scientist associated with the studies, there has been no seedling growth above the timberline.

He says it is apparent that the timberline in New Zealand's mountains, which is lower than that of Northern Hemisphere mountains, is determined by a combination of climatic and geological circumstances in which a significant factor is the destruction of young seedlings by frost in winter.

No success has been reported in attempts to establish pines by direct seeding above the natural timberline, and there is no intention in forestry circles to extend the timberline.

Forestry scientists also disagree with the assertion that conifer forests will be permanent. They say there is evidence from research already done that conifer forests would favour the growth of native understorey species such as five-fingers and manuka, and that there will be a natural succession from conifers to hardwoods.

Botanists agree that this would happen in parts of the North Island, but say that the native species cannot compete with conifers in the dry South Island mountains.

The stated policy of the Revegetation Section of the Forest Research Institute is to encourage replanting in areas where there has previously been forest, and where the soil is clearly at risk from erosion.

F.R.I. scientists say there is demonstrable evidence of the "downstream benefits" of planting in these eroded areas and of the ability of trees to check erosion, even if they cannot reverse it.

It is in this area that their views diverge from those of the Botany Division scientists.

"There are two elements to think about in these areas," says a forestry scientist. "There are the plants which are important, I don't dispute that; and there is the soil. The latter is just as important as the former, and once lost is irreplaceable. I think that if we have an obligation to protect native plants we have an equal, perhaps stronger, obligation to protect the soil."

"There is no doubt that a forest, with its huge canopy of leaves and their ability to hold up large amounts of water, is the most efficient type of plant community to reduce soil loss. It's all comes back to the question of what is the best use of the land. Forestry is not necessarily the best option in the long term but it is the best way to protect the soil while we decide, or future generations decide, on its ultimate use."

Matters on which there seems to be no disagreement at all between forestry scientists and botanists are the susceptibility of tussock land to invasion by conifers, and the need to protect and preserve wide-ranging and representative areas of New Zealand's tussock landscape.

But in forestry circles conifers are not seen as the major villains in the piece. "It is true that the tall tussock would disappear if invaded by conifers," a forestry scientist says. "But the biggest, single threat to our tussock lands are not trees but increased pastoral production. There are pressing demands at present for increased agricultural production, and the pressure on tussock lands is increasing. The pressure will become more intense if the Government allows these lands to be freehold."

Oppressing and overusing with exotic grasses from the air was going on at altitudes up to 1300m, he adds. "That at present is the real threat to our tussock lands."

This vista of young pines near North Cape gives an indication of the scale of pine plantings in the far north. D.S.I.R. botanists say several rare plants are threatened by pine forests in Northland. D.S.I.R. photograph.