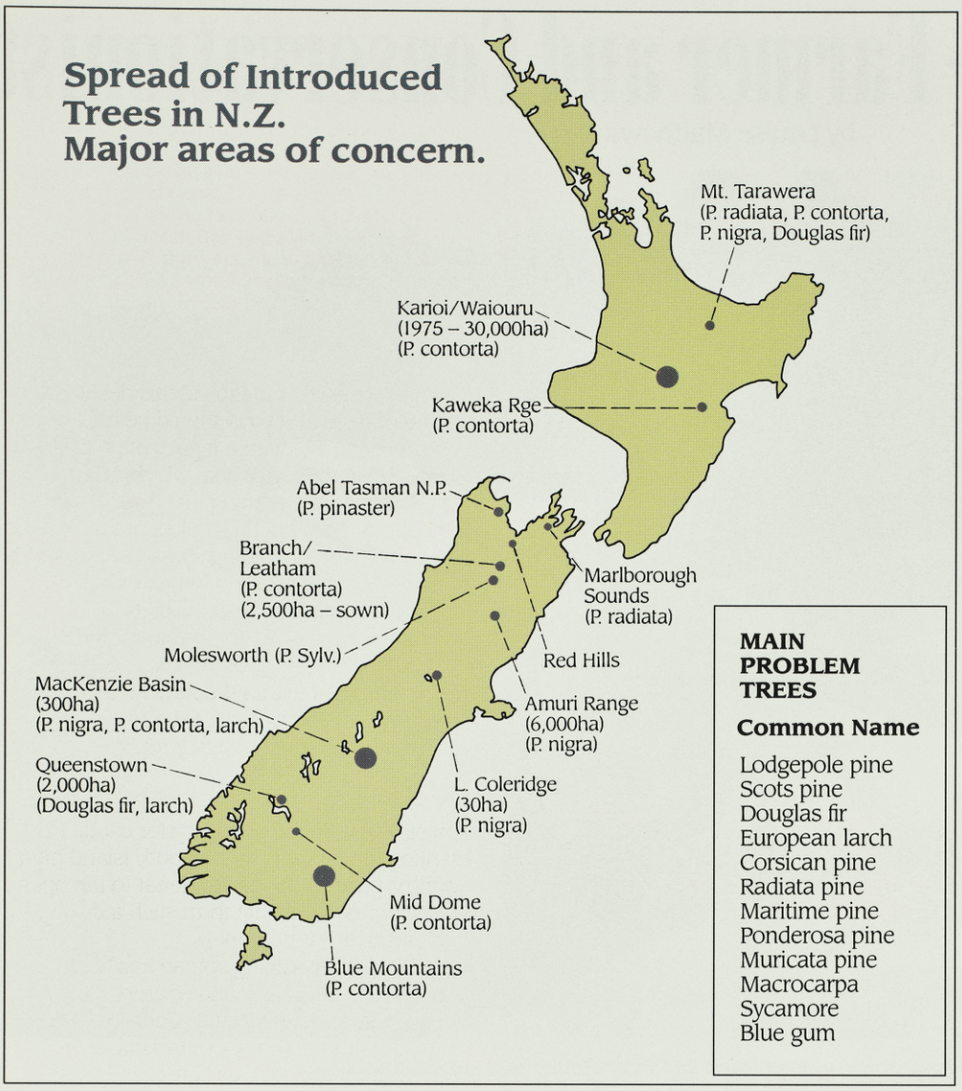

soil, the surface ripping away. The entire exercise seemed pointless."

Mob stocking and management of downwind areas are often cited as the best ways of controlling wilding spread. However mob stocking (the concentrated grazing of large numbers of animals) is just as likely to threaten the ecological values of native grassland or shrubland communities as is wilding spread. In such areas control is often limited to the physical control of trees. This has been carried out by volunteer groups from Forest and Bird branches for many years and involves pulling out seedlings by the roots. If the trees are so large that they have to be cut, all the green needles have to removed and the bark should be stripped to ground level. Sites should be checked again for at least five years for seedlings.

Tree age can be estimated from the number of whorls of branches. All wilding control efforts should be documented and landowners and local authorities lobbied to accept responsibility for wilding control. In some areas exotic conifers have been declared noxious weeds; funds may then be available for control.

Efforts to conserve the unique habitats that make this country so special are fraught with many difficulties. The introduction of exotic plants and animals has already wreaked havoc amongst vulnerable indigenous communities. The high mountains, forested hills, native grasslands, lakes and rivers, and scenic coastlines make up the landscapes that people see, the visual character of the land that makes this country distinctive from any other. The uncontrolled spread of exotic trees is one influence we can control – if we care enough.

Tongariro – A Case History

THE BEST documented case of wilding pine infestation in New Zealand is that of Tongariro National Park. Between 1927 and 1935 *Pinus contorta* was planted in Karioi Forest, on the southern slopes of Mt Ruapehu. Every summer – and this still occurs – seeds can travel 12 kms from the parent tree, aided by the fact that *Pinus contorta* seeds are very light and winged.

DSIR botanist Dr Ian Atkinson first alerted park staff to the magnitude of the problem in 1962. Unless action was taken, he said, most of the upper slopes of Mt Ruapehu between 1300 and 2000 metres would be covered by pine forest by the end of the century. Despite the opposition of foresters, park staff began an eradication programme; in 1967 volunteer pine weeders began arriving on a regular basis, usually either tramping groups or from conservation organisations. One tramping club's record would be hard to beat: it has not only supplied volunteers for weekends, but the club sets aside a week each year when its members carry out weeding. They have been doing so for the last 20 years.

Thanks to these efforts, the problem within the park has been contained. However, on the slopes below the park towards Karioi forest is a substantial area of Maori land which has also been infested. All the work in the park will be for nothing unless this other area is cleared. It is here that volunteers are now operating.

Pinus contorta's spread has not been confined to the park and its immediate environs. To the east, the military have also been learning to live with the weed. Some scientists view the military-controlled land around Waiouru as ecologically more significant than the park itself. This huge landscape of open vegetation – almost 100,000 ha – is much older than the area in the west, and is able to tell us about the evolution of New Zealand's plants and animals.

When *Pinus contorta* initially spread into the Army land, it was welcomed by some officers because of the shelter and shade it provided. However, once tanks found it difficult to move through the by-now dense pine shrub/forest, the Army saw the sense of eradication. But eradication is an expensive business. In 1987 the Army spent almost $500,000, and the programme is destined to go on well into the 1990s. One area providing a headache is the 2500 ha firing range, where the presence of live ammunition makes it dangerous for soldiers to enter by vehicle or on foot. Here, for the moment, *Pinus contorta* flourishes.

Tongariro National park ranger Rob McCallum with a juvenile Pinus contorta, *showing the long root system it produces to cope with the arid conditions on the eastern slopes of Mt Ruapehu. Contorta grows up to more than 2000 metres above sea level, higher than the natural treeline in the park.*
Photo: Gerard Hutching