



Section 5

Extended Discussion

This section provides more information on the topics covered in section 2 and is provided as an additional resource. Readers are encouraged to consider this material when thinking about the issues raised in section 4.

5.1 Biodiversity

Why is indigenous biodiversity important?

New Zealand's native plants and ecosystems have evolved over the last 80 million years in New Zealand and have developed a level of biological complexity and diversity that is not achieved by introduced exotic species. In general ecosystems native to their area are more resilient than introduced ecosystems and are known to be better at:

- providing protection of water resources
- formation and maintenance of soil structure
- nutrient storage and cycling
- the breakdown and absorption of many pollutants
- contributing to climate stability
- recovery from unpredictable catastrophic events.¹

Biodiversity is also endorsed at political and official levels. As noted in the report of the Ministerial Advisory Committee, biodiversity is now regarded "in a similar way to human health or education... As a nation, we do not debate whether public health is important (although we have frequent debates about how it might be delivered most effectively and efficiently). So it is with ecological health".²

New Zealand has invested considerable resources in meeting its international obligations under the Convention on Biological Diversity, and undertook a lengthy process of consultation to develop the New Zealand Biodiversity Strategy.³ Implementation of the strategy is influencing a wide range of environmental management areas, statutory developments and allocation of

significant additional resources for New Zealand's Oceans Policy Review process (revising marine management systems), the New Zealand Biodiversity on Private Land - the Policy Package⁴, and the current development of a National Policy Statement on biodiversity.

In addition, the maintenance and enhancement of biodiversity can be seen as a key indicator for achieving sustainable land use.

Assessing biodiversity

As with any concept as broad as biodiversity, there are a range of approaches to assessing and measuring it. Different assumptions about the most critical indicators for assessing the extent and robustness of biodiversity have shaped and influenced scientific debates such as:

- the level at which biodiversity is evaluated - at the genetic level, the species level, or with wider ecosystems and catchments
- the priorities for New Zealand's indigenous species and ecosystems relative to exotic species
- the biodiversity values of modified ecosystems
- appropriate indicators, quantitative and qualitative approaches, and assessment criteria for such indicators as resilience, integrity or vitality.

The Department of Conservation is developing a methodology designed to measure conservation achievement and track changes to New Zealand's natural heritage.⁵ The approach assesses the condition of natural habitats and ecosystems by estimating the level of impact on a site or ecosystem from a range of human activities and human-induced processes. These are:

- biomass removal from such activities as land clearance, hunting and fishing
- predation and competition from introduced animal pests
- competition from introduced plant pests
- light, nutrient, water and physical disturbance from land management and use
- isolation of indigenous flora and fauna caused by ecosystem fragmentation.

Biodiversity values

The values attributed to native plants on private land, and the judgements about what kinds of management might be appropriate, often depend on the perceived 'naturalness' of the vegetation. The common perception is that 'pristine' areas of native plants - areas that conform to a concept of the original ecological matrix, remnants of what was here before human arrival - have high values (intrinsic as well as other kinds of value) and contribute significantly to indigenous biodiversity. There is often a corresponding perception that areas that have been extensively modified, or include predominantly exotic species, will have little value now or in the future in supporting New Zealand's indigenous biodiversity goals.

Extending the occurrence of native plants beyond current distribution may not be given the same kind of priority or emphasis as maintaining examples of vegetation perceived to be 'original'. There is a need to explore the potential ecosystem service and ecological resilience gains that can be achieved by increasing biological diversity through the extension of native plants both in the form of natural associations (commonly referred to as restoration and enhancement) and in new associations within the contexts of forestry, farming, nurseries, and other productive sectors.

Biodiversity and native plants on private land

In order for New Zealand to meet its goals to maintain and enhance indigenous biodiversity, it is generally agreed that a focus only on the plants, animals and ecosystems on publicly managed lands will not be enough. The remaining 70% of New Zealand's landscapes - privately owned lands under a variety of management systems - will play an important role. Private lands often feature rare or high-value ecosystems (e.g. coastal wetlands and lowland podocarp forest) which are not represented adequately on Crown conservation lands. Furthermore, the viability of New Zealand's biodiversity will be increased by recognising and working towards a principle of ecological

connectedness that transcends the boundaries of ownership structures.

We need to move beyond a network of highly prioritised reserves and begin to look across the landscape to manage the ecosystems of which individual remnant vegetation is just a part.⁶

Integrating private lands within New Zealand's biodiversity efforts will require collaborative approaches and new ways to encourage and involve landowners, tangata whenua, councils and other interested parties. The Ministerial Advisory Committee considered that landowners are the "residential custodians of what we seek to protect," and therefore landholder "buy in" and participation will be necessary.⁷ Understanding landowners' motivations and choices, and the values they place on native plants and habitats, must be the starting point for developing structures and incentives for retaining and enhancing indigenous biodiversity. The extent to which sustainable use of indigenous biodiversity should be part of such systems was an issue flagged for further debate by the Ministerial Advisory Committee,⁸ and in relation to indigenous vegetation is central to this project.

5.2 Ecological significance

Processes for determining ecological significance require the development and use of appropriate evaluation methodologies. Different programmes for assessing ecological significance have worked with varying criteria, depending on their purposes and framing assumptions. For example the criteria used for DOC's Protected Natural Area Programme (PNAP) included representativeness, diversity and pattern, rarity and special features, naturalness, long-term ecological viability, size, shape and boundaries.

In terms of section 6(c) of the RMA, however, it has been asserted that the appropriate criteria are representativeness, rarity/distinctiveness, ecological context, and sustainability.⁹

- Representativeness - The area is representative

of a full range of biological diversity present in an area (in terms of ecological district, local district or nationally). Generally this is considered to be the overriding criterion and is the first criterion for both the PNA programme and Nature Heritage Fund.

- Rarity/Distinctiveness - The presence of particular species or groups of species within a site. This criterion does not necessarily require that the area be predominantly an indigenous habitat and could even include the presence of exotic species (i.e. giant weta and gorse).
- Ecological Context - Any area of ecosystem or habitat does not occur in isolation, but is part of the larger landscape. This criterion recognises the importance of the interactions and connections that occur between areas involving the transfer of water, soil, genetic material and energy.
- Sustainability- A measure of the ecological health of an area and the extent to which the ecosystems, habitats or species the area supports are able to sustain themselves over the longer term. This term is often referred to as viability. This is generally considered a secondary criterion as it is more a measure of the priority for protection management and of the type of management required.¹⁰

Those advocating the use of these types of processes expressed a strong view that the ecological evaluation process will not in itself determine appropriate management strategies for areas identified as significant. These strategies can only be determined through landowner and community consultation and agreement.

5.3 Preservation and conservation

Despite their similarities in meaning there have been strong disagreements in New Zealand over the terms 'conservation' and 'preservation'. The polarised positions that have developed around these disagreements are fundamentally important in any consideration of native plants on private lands. It is useful to look briefly at these concepts' evolution in the context of New Zealand's history of settlement and how this has influenced current thinking.

A history of arrivals

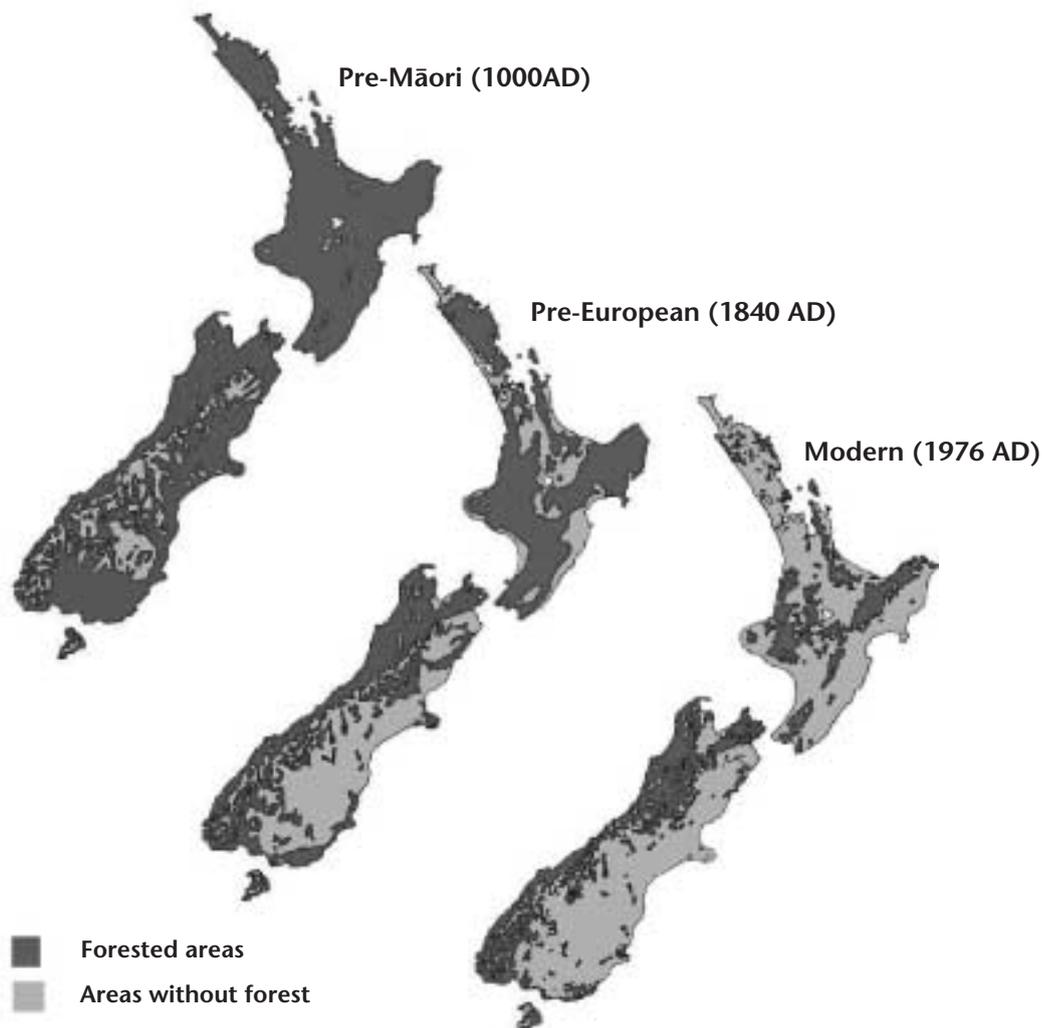
When people first settled the islands of the Pacific Ocean, including New Zealand, they were the first terrestrial mammal species to arrive (aside from a few species of bats). Nowhere else on earth were humans the first significant mammal to arrive on a major land mass. The impacts of people on the plants and animals, especially birds, that had evolved over millions of years with no need of defences against mammalian predators or competitors, was catastrophic. Fossil evidence indicates that hundreds of bird species became extinct over the centuries as different races established and expanded their cultures across the Pacific. Nevertheless the rich myths and legends that these cultures developed show that local animals, plants and sacred places came to have

special values for each society and helped to define their relationships with the natural worlds on which they depended so intimately for survival.

Over the centuries, with increasing knowledge and understanding, a variety of mechanisms were developed to regulate the level of use of important species. The parent cultures of Polynesia became tangata whenua in Aotearoa, and over many generations of practical experience, adaptations and losses (up to forty bird species extinct from over-hunting, habitat loss and fire) they learned the ways of new lands, new plants and animals.

The arrival of European settlers in New Zealand marked the beginning of another and far more

Figure 2 Change in New Zealand forest cover



intensive period of environmental shocks and losses. For example, the early European settlers to New Zealand perceived the unfamiliar forests as gloomy fearful places, barriers to establishing farms, of value only for exploitation and clearing. Colonisation brought the destruction of the great northern kauri forests and the introduction of domestic animals, rats, and many exotic plants.¹¹

The forests many New Zealanders now appreciate as magnificent remnants of the ancient super-continent of Gondwanaland were, to the settlers, diminished by the label 'bush', best suited for removal by axe and fire. And this they did. Forests covered about 78% of New Zealand when Polynesians arrived, including the entire coastline, and about 67% by 1800. Fires caused most of the estimated forest loss between 1000 and 1800. The loss of forest cover was more rapid during the 19th century. Forests were reduced to about 53% of the land area by the 1840s, following expansion of Māori agriculture and the activities of early European colonists. Widespread burnings during the 1850-1900 period destroyed a significant proportion of the remaining forests. Major losses occurred in lowland coastal forests, especially in the North Island. Today indigenous forests have been reduced to about 23% of the land area (see Figure 2).

As the ancient forests were reduced, so too were native animals, especially those bird species that had no defences against the introduced rat, stoat, weasel, ferret, cat and possum. About 42 species of New Zealand wildlife followed the moa to extinction in the nineteenth century, and others started declines that continue today.¹²

Changing views of 'nature'

The exploitation of natural places and the loss and diminishment of natural resources were also proceeding apace in other colonised countries during the second half of nineteenth century. In the United States there was increasing reaction against such processes, building the political climate that led to the creation of the world's first

national park in Yellowstone, Wyoming, in 1872. At the time a novel concept, the Yellowstone National Park was both a response to threats of commercial development and exploitation of the area, and a romantic recognition of grand scenery and wildlife in an appeal to national pride.¹³

The aesthetic and practical arguments for national parks as a device to protect special places had significant repercussions in New Zealand. In 1887 Ngāti Tuwharetoa rangatira Te Heuheu Tukino formally offered the peaks of Tongariro, Ngāuruhoe and part of Ruapehu as a national park to be preserved under the mana of Queen Victoria. The sacred peaks, plus surrounding areas, were finally gazetted as the Tongariro National Park in 1907.

*To a large extent the century-old history of national parks in New Zealand is the history of conservation, and the history of conservation is the history of the forests.*¹⁴

Conflicts amongst Europeans in New Zealand over 'setting aside' land from development, even with an eye to some future extractive activity, can be traced back to 1840. In that year the Royal Navy proposed reserving areas of kauri forest that it might use later for ship spars. One reason for the proposal was the threat to the kauri forests of wasteful use and burning. But the Royal Navy lost out to the prevailing official view that reserves would 'lock up the land' and hinder the spread of settlement.¹⁵

The predominant attitude of settlers and administrators to 'unoccupied Crown land' can be seen in the use of the term 'waste land' in the Waste Land Act 1854. These unoccupied Crown lands included forests and the motivation behind the Act was to freehold the lands so they could be put to 'productive' use. Despite changes to legislation with the objective of maintaining trees on steep erosion prone land the Department of Lands continued to consider it improper to leave trees standing on any land that might be farmable.¹⁶

During the second half of the 19th century, native plants in non-forest ecosystems were also badly affected by settlement practices. The more easily accessible coastal wetlands were filled in or drained as surrounding forests were converted to pasture. New Zealand now has less than 15% of its original area in wetlands; many of those remaining have been degraded by pollution, grazing and draining. Meanwhile, large flocks of sheep were grazing the delicate alpine and tussock communities of the South Island at intensities that these lands were unable to sustain. At least 1.5 million ha of tussock-dominated grassland have been degraded by sheep, rabbits and invasive weeds.¹⁷ During the last third of the nineteenth century an increasing number of amateur and professional naturalists noted with regret the decline in indigenous biota as landscapes became fragmented and the effects of colonisation more pervasive.

During the 1860s and 1870s there was a popular view, shared by government officials, that introduced species, both plants and animals, were stronger and more vigorous than the inherently 'weaker' native species and would inevitably displace them. Proponents appealed to Darwin's theory of evolution to provide a rationale for the rapid loss of unique native habitats and species, and the belief that eventual extinction would be inevitable. Darwin's views reflected and supported the moral and cultural superiority that many European settlers felt towards 'inferior' native species.

However, early during European settlement concerns were raised in some quarters that forest destruction was excessive. In 1859 the geologist Ferdinand von Hochstetter was complaining that the northern kauri forests were being "ransacked and ravaged with fire and sword".¹⁸ Concerns over the impacts of settlement on the land and the rate of forest loss were expressed in the New Zealand Parliament in the 1870s and were influenced by a developing conservation ethic in New Zealand. The Government did have timber

regulations in place over Crown land from the mid-1840s until the abolition of Provincial Governments in 1876, but given that the dominant social goal was to expand agricultural lands, the regulations protected the rights of the timber cutters rather than focusing on conserving forest resources.¹⁹ The forest regulations on Crown land did little to actually control the rate of deforestation. Prime Minister Julius Vogel attempted to slow the pace of forest loss with the Forests Act 1874, but the Act was widely seen as an obstacle to development and was repealed. Ironically, given the dominant use of fire over the axe, the products of the forests provided European settlers with important income before farming became self-sustaining in those early precarious years.

Government involvement

After 1876 the Government had little direct involvement in forestry until 1897 when a Forestry Branch of the Department of Lands and Survey was set up. In 1904, the Scenery Preservation Commission was established to recommend areas of scenic or historic interest for protection as permanent reserves as "an inalienable patrimony of the people of New Zealand".²⁰ In 1906 a Scenery Preservation Board replaced the commission. The work of this board was extensive; by 1920 it had, through scenery reservations, laid the groundwork for the national parks system and many more nationally significant reserves that remain today. But the focus was on scenery, not on protecting areas representing the ecosystems that were under most severe threat, such as lowland coastal forests. If the land suited settlement, then scenery preservation was not a sufficient priority. "The bias towards scenery and land [for parks] that was not useful for anything else shows today".²¹

A State Forest Service was established in 1919 with responsibilities for managing what remained of the loggable public forests as well as to protect four to five million hectares of steep-land forest for erosion and flood control. These protection forests

account for much of the native forest area remaining today. The Forests Act 1921 attempted to place indigenous forest management in particular on a sound footing. Only later in the mid 1920s did heightened concern about an impending timber famine cause the dramatic switch to extensive exotic plantation forestry by the State.²² With the switch to an emphasis on exotics went much of the subsequent focus on the efforts in silviculture, management and related research compared with similar efforts for indigenous species.

During the first two decades of the twentieth century, botanist Leonard Cockayne wrote a number of government reports documenting the decline of indigenous vegetation and wildlife habitat.

The conservation movement

In 1923, the New Zealand Native Bird Protection Society was founded, later to become the Royal Forest and Bird Protection Society. Its original objectives were to advocate “unity of control in all matters affecting wildlife”.²³ If special places were to be protected from use or exploitation, the Forest & Bird approach was to seek their ‘preservation’ as a national park or scenic reserve. About 1930 the Native Plant Protection Society was set up, their efforts resulting in the first Threatened Plant Lists and the passing of the Native Plants Protection Act 1934 (see section 5.10).

Over the ensuing decades the national park system was extended to include many of New Zealand’s finest natural landscapes. From one perspective ‘conservation’ became synonymous with ‘setting aside’ places for national parks or special reserves. In such places native plants and animals would be safe from exploitation. But some people viewed parks as areas that were not only ‘set aside’, but also effectively ‘locked up’ with negative connotations - the land and its resources no longer available for extractive use.²⁴

Yet in both ecological and economic terms national parks and other protected areas make

positive contributions which belies the lock-up perspective. For example, the World Heritage site, Te Wahipounamu, in south-west New Zealand has transformed the economy at Haast from dependence on logging and fishing to a growing economy centred on tourism activities. Protected areas are also providing vital ecosystem functions, from soil retention to water storage and purification.

While the ‘fortress park’ concept, where parks were sometimes imposed on local people, may have applied in past decades it is not the situation today. Over the past 30 years international attitudes towards parks and protected areas have evolved alongside the development of more sophisticated and integrated approaches to management and conservation. The issues now for protected area agencies include: building awareness; capacity-building and resources; the role of science in management; demonstrating the benefits of protected areas; and governance. Pressures on protected areas have increased, but at the same time there is recognition of their extra values as providing important ecosystem functions for people and as a form of ‘insurance’ against threats to biodiversity from global change. For example, they may be able to provide corridors for some species of wildlife and plants to shift or expand their range as the effects of climate change alter conditions for their survival.

While the protected areas system in New Zealand was expanding, tensions were also growing in the 1970s between a well-organised environmental movement and New Zealand Forest Service policy towards logging of native forests. There was wide public opposition over controversial plans to clearfell some 340,000 ha of beech-podocarp forest in the South Island, and the scheme was shelved in 1975. This was followed by other confrontations over Forest Service logging plans for individual forests, notably Okarito, Pureora, Waihaha, Whirinaki, Paparoa and Waitutu. The public imagination was captured by TV showing protestors perched high in the trees in Pureora

Forest, defying the bulldozers and chainsaws.

In more recent decades other options and pressures for protection of native plants have emerged. In addition to the public conservation lands managed by DOC there are now a range of other mechanisms whereby private landowners can opt to legally protect land and native plants, especially trees. These include the Queen Elizabeth II National Trust, Nga Whenua Rahui and Nature Heritage Fund (see section 5.16). In addition, concern that the existing protected area system did not represent the full range of ecosystems in New Zealand led to the establishment of the Protected Natural Area Programme and subsequent efforts to identify significant areas that were felt should be protected through acquisition or planning mechanisms.

5.4 Ecological sustainability

Ecological sustainability provides a context of environmental parameters within which the values, needs and goals of society and communities may be fulfilled.

Definitions of sustainability

Ecological sustainability encapsulates:

- managing resources so that they are not depleted
- maintaining ecosystems and natural processes over prolonged periods without them failing or being irreversibly compromised
- ensuring their character is not lost
- keeping them functioning continuously.

*Sustainability is simply a property of any activity, practice, process or institution that has the capacity to continue or be continued indefinitely.*²⁵

The World Commission on Environment and Development chaired by Gro Harlem Brundtland shaped the idea of sustainability within a development framework, on the principle that in order to alleviate poverty, economic growth would need to continue:

*Humanity has the ability to make development sustainable - to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs.*²⁶

The commission recognised the biosphere as limited in its ability to absorb the effects of human activities, and included notions of inter- and intra-generational equity of choices and opportunities.²⁷

The Brundtland definition, and societies' attempts to work towards sustainability, have been questioned. Some see the concept of management as anthropocentric, "sustaining the human environment in order to meet human preferences".²⁸ However, for many people, sustainability also requires the maintenance and enhancement of indigenous biodiversity for its own sake.

The word 'sustainability' can elicit sceptical responses. For some people it is an empty concept, over-used and overloaded with different interpretations and meanings. Such disenchantment with the term seems often to reflect confusion about its meaning in particular circumstances: *Sustainability is a deceptively simple word for an extremely complex idea. Complexity... often gets mistaken for vagueness.*²⁹

What is to be sustained? Why should it be sustained? Concepts of sustainability change over time with different social expectations, economic conditions, and increased knowledge of ecosystems and environmental processes.

Some contemporary discussions of sustainability focus on the 'triple bottom-line' - the incorporation of social (cultural), economic and environmental considerations in management systems and objectives. The three components are closely inter-related.

Recent commentary on 'triple bottom-line' frameworks has focused on concepts of 'weak sustainability' as opposed to some other form of sustainability that is said to be 'strong'. 'Weak' sustainability begins with economics, which

shapes the evaluation of ecological and environmental concerns.³⁰ Whilst some people judge as ‘weak’ the trade-offs that are often required to balance environmental, social and economic choices, others see this as a realistically achievable and acceptable goal. ‘Strong sustainability’ has at its starting point ecological imperatives such as ecosystem health, resilience and biodiversity, which dictate the parameters of economic and social considerations.

Different interpretations and applications of the concept of sustainability have tended to focus on the tensions between its components. Sustainable development is often seen as harbouring an internal conflict between values of utilisation and protection, or between economic and social returns and ecological constraints. In the context of New Zealand land uses, this is most often seen in the application of different assumptions and management ideals, to the lands used for primary production (pastoral, forestry, horticulture etc), as distinct from ‘protected’ lands used for the conservation of indigenous flora and fauna.

Development requires change through time: *sustainable development is not a fixed state of harmony, but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs.*³¹ Sustainability can be seen as a journey, as well as the destination societies and communities are working towards.

Sustainable development is about the processes of management. It is not static, but responsive to new knowledge, values, methods and technologies. This type of approach is often referred to as adaptive management. At its core is acknowledgement of the levels of uncertainty and risk involved in land use and native plant management (see sections 2.5 & 5.4). Effective monitoring and tight feedback of information enables management that minimises risk and allows for creativity and innovation.

Intergenerational equity

Economic literature examining the needs of future generations and intergenerational equity is rather theoretical, lacking in general consensus and provides little information on implementation. There is general agreement that humans’ responsibilities to the near future are strong, but debate exists over obligations to far future generations. This distinction may however be academic. Being concerned for future generations will require the development of decision-making horizons that extend far beyond current political and economic frameworks.

What are the ‘needs’ of future generations? Whilst specific future preferences or wants (as opposed to needs) may be hard to determine, it is reasonable to assume that basic goods such as food, clean water and energy will be future needs. Internationally, reasonably foreseeable needs have been recognised as including the right to life, property, culture, and health.³²

5.5 Managing for change and resilience

Dealing with complexity and uncertainty

In dealing with the natural environment and its management, the issues are often seen as dauntingly confusing. Environmental managers, policy-makers and the general public are increasingly aware of the complexity and interconnectedness of natural systems, the unpredictability of systems’ responses to change, and the limits of our knowledge in many critical areas.

In dealing with this complexity and uncertainty, policies and approaches have been developed that tend to have the following characteristics:

- single target or piecemeal policy (e.g. biodiversity, conservation, economic production)
- a single scale of focus, typically limited in space and time (e.g. the three year election cycle)

- no realisation that all policies are experimental (limited monitoring of policies and mechanisms to subsequently adapt management practices)
- rigid management with no priority to design interventions as ways to test hypotheses underlying the policies.³³

There may be difficulties in risk assessment when information is incomplete. However, it has been noted that where society is successful in managing a target variable, for example maximising the growth of certain types of crops, grasses or tree species, this invariably leads to less resilient and more vulnerable ecosystems. Other consequences include more rigid and unresponsive management agencies and more dependent societies.³⁴ As a result of this narrow focus in problem definition, changes in ecological variability, or an impending ecological crisis are often not noticed.

The PCE's report "Setting Course For A Sustainable Future" (1999) considered the implications of oversimplifying the management of natural systems in regard to the marine environment. Some approaches to fisheries management reduce the natural world to simple linear relationships. However, natural systems consist of more complex non-linear systems that have a tendency to move away from equilibrium into chaos.

Ecosystems and change

Ecosystems never stay still, and are always in a state of flux. Biodiversity within an ecosystem is constantly undergoing its own processes of change, such as regeneration, succession, and the inevitable ageing of a forest or individual plants. Concepts such as 'the balance of nature' have been replaced by an appreciation of change, perturbation and chaos, as normal aspects of ecosystem functioning.

Ecosystem resilience is the speed with which ecosystem properties recover to their more usual values after disturbance. In combination with resistance, i.e. the degree to which ecosystem properties are affected by disturbance, resilience can be used to represent ecosystem stability. The

concept is intuitively attractive to ecologists and conservation managers because it establishes a reference point from which to assess change in ecosystems.³⁵

All ecosystems are continually subject to a range of processes of disturbance at different scales. These can include both 'natural' disruptions (weather and climatic conditions, earthquakes, predation) and human-induced disturbances (vegetation clearance fragmentation, fire, harvesting). Disturbance can result in the loss of individuals or species; disturbances can alter the structure of the ecological community, by influencing the space or food resources available, or by changing the physical environment.³⁶

Science and complexity

Faced by complexity and uncertainty, decision-makers often turn to science for answers to these problems. In some environmental debates, it can seem that science is not so much a means of assisting in the management of uncertainties, but rather has been captured by those seeking certainty and solidly factual answers. However, science derived knowledge may not always provide solutions. Indeed, the questions themselves may not be able to be answered by science. Resolution of ethical or political questions - for example, whether a particular course of action should be taken, or whether a particular resource should be protected or utilised - will depend on values, ethics, principles, perceptions, policies and a range of other considerations. Even within science, there may be different modes of inquiry and criteria - for example, a reductionist³⁷ approach, or an integrated systems approach.

With increased appreciation of the principles of complexity and chaos it is becoming more evident that scientific approaches to environmental systems will frequently be incomplete. There will be gaps in knowledge, and consequentially, surprises. Faced with incomplete understanding, and the adversarial nature of many of the resulting debates, there has been some public concern and

mistrust over the 'science' of environmental issues.³⁸

Managing for stability and change

A number of approaches have been proposed to overcome the limitations of current reductionist approaches to environmental policy.

It has been advocated that management needs to evolve to incorporate a number of integrated policies that are both flexible and adaptive rather than a single focused policy.³⁹ Management and planning need to be oriented as much to learning as to economic and social outcomes. Monitoring regimes are needed that facilitate interventions, improve understanding and help identify remedies. Investment is required in science that integrates a broad range of disciplines and viewpoints, rather than more traditional scientific approaches based on narrow areas of specialisation. Finally there must be citizen involvement in the form of active partnerships, not just in the role of passive information receivers.

Other commentary has developed ideas of environmental management regimes as a durable symbiosis between economic production and ecological reproduction. Management would focus on investing in reproduction, renewal of habitats and the life-support systems that underpin economic activity. These habitats and systems are also invested with social and community significance.⁴⁰

In the agricultural region of Gatinais Nord Occidental in France there is a small forest of 50 hectares. The forest is highly modified, but has considerable biodiversity values; current management practices maximise this feature. Key factors in the management of this forest are:

- the importance of direct community involvement by the landowners (with various types of use rights), farmers on adjacent land, user groups who have access rights (hunters and walkers) and various local community groups

- an informal longer-term management vision based on the cultural traditions and the knowledge base within the community. This vision is evolving with the changing composition of the community as new people move into the area. Attitudes and expectations are expected to change reflecting the changing values of the community.

Extrapolating management regimes from landscapes with much longer histories of relatively unbroken human interaction can be risky. These landscapes are highly modified and these models may not be appropriate for areas in New Zealand that remain largely unmodified. However, they can demonstrate some of the successful features that could be adapted for areas in New Zealand that are already intensively managed.

5.6 Kaitiakitanga

The following discussion is offered as a contribution to advancing understanding on matters of importance for tangata whenua in relation to native trees and plants. This discussion does not have the status, nor should it be taken in place of, the statements of iwi, hapū and whanau on their own behalf concerning native trees and plants, traditional relationships with those taonga, their values and management, or any other issue.

Whakapapa

In the Māori world, issues such as the place of trees and plants will be approached from the basis of whakapapa, the framework for all existence. All living things are originally descended from the primal atua-ancestors, Ranginui and Papatuanuku, the sky and the earth. Their son Tāne is the atua responsible for forests, trees and plants. According to the stories of the evolution of te ao marama, Tāne was the only one of the children of Rangi and Papa with the determination and strength to separate his parents from their original clinging embrace. Thus the earliest stories recognise that the energies of trees and growing plants are critical to maintaining light, air and spaciousness in the world, and to the correct relationships and functioning of the elements.

Tāne went on to create many life-forms with various female supernatural forces: *...he had the tōtara with Mumuwahango, the rata and other climbing plants with Rere-noa, the tui with Para-uri... He also met Punga, the parent of ugly creatures, and with her he had the insects.* ⁴¹ Finally, after Tāne had brought all the trees, plants, birds and insects into the world, he created humans, making the form of a woman from the red earth of Hawaiki and breathing life into her.

Within the structures of whakapapa all the components of the natural world, including people, are connected back to the atua, and so linked together in the bonds and obligations of kinship.

Tikanga

The responsibilities of humans to the rest of the natural world are determined within the systems of kaitiakitanga and tikanga. Tikanga can be described as the correct way of doing things, and is based in the essential principles of mauri, tapu, mana and rangatiratanga.

Everything in te ao marama - including people, forests and plants, rivers and water, insects and fish, stones and birds - has its own mauri, the essential life force or distinctiveness that enables each thing to exist as itself, "the power that binds the spiritual and the physical".⁴² For the survival and well-being of each taonga, its mauri must be respected, healthy and strong. Mauri can be diminished or destroyed when a resource is damaged, corrupted or lost; it can also be restored and enhanced, through improved management and appropriate ritual.

Tapu is another elemental force on which the structures of reality depend. Tapu extends widely in many contexts, and can apply to people, places, forests, plants, resources and processes. It governs the propriety and dynamics of the relationships of people with each other and with things: *tapu [is] the power that preserved order in the community, and took the place of civil law. Tapu implies a prohibition which if violated would have calamitous consequences;*

*quite possibly, death...*⁴³ The converse quality to tapu is noa, or ordinariness. These aspects are an integral part of practical interactions with the environment:

The appropriate spiritual dimensions were crucial - for example the elaborate ceremonies performed when a large tree was to be felled, with the necessary rituals, fasting [and] karakia ... to ensure that the tapu was removed and that the work could be completed successfully. ⁴⁴

Rangatiratanga, confirmed and guaranteed under Article II of the Treaty of Waitangi, is often defined as self-management or self-determination - the right of iwi, hapū and whanau to make their own decisions about things that concern them:

*It is a dynamic not static concept, emphasising the reciprocity between the human, material and non-material worlds. In pragmatic terms, it means the wise administration of all the assets [of] a group for that group's benefit: in a word, trusteeship.*⁴⁵

Mana is closely linked with the practical expression of rangatiratanga. It is, like mauri, a gift from the atua - the status and authority enabling the necessary work to be done for the satisfactory fulfilment of kaitiaki responsibilities: *The imposition of European title, for example, cannot remove mana whenua from a tribe.*⁴⁶ The exercise of mana includes the principle that taonga should be managed in ways that are consistent with tikanga:

*Māori people [are] to be protected not only in the possession of their [taonga], but in the mana to control them in accordance with their own customs and having regard to their own cultural preferences.*⁴⁷

Kaitiakitanga is the ongoing necessity for tangata whenua to look after the taonga, both physical and intangible, that are their heritage. There are responsibilities to te taiao, the environment and natural resources, to ensure that they are managed sustainably, sensitively and wisely. There are obligations also to the continuum of past and future generations, to the ancestors, to present-day whanau, and to those who will follow and look back to us. Although based in ancient tradition,

kaitiakitanga is not static - it is continually evolving to provide solutions for contemporary environmental management challenges.

Te waonui a Tāne

Over the centuries, tangata whenua developed close multi-faceted relationships with the trees and plants of Aotearoa. These islands' forests, wetlands, coastal vegetation and other ecosystems were the foundations on which survival depended, both as rich resources themselves, and as habitat for birds, fish and eels.

Like any human society in any lands, Māori learned the capacities and thresholds of environmental sustainability through an ongoing cumulative process of learning, experimentation, and adaptation, through abundance, scarcities and losses. Many species, such as the moa, were taken to extinction. Fire had drastic impacts on vegetation patterns - whether accidental, or deliberately set for swidden gardens⁴⁸ or to encourage the growth of bracken fern, a food staple. Between ca 1350 and 1600 major changes were wrought to the original forest cover, especially in the drier eastern areas of both islands, the central South Island high country and Central Otago (see Figure 2).

However forests and the resources they offered were vital: *the natural forest cover of plains country, with slow-growing fruit-bearing trees like kahikatea, mataī and hinau, was kept intact because these rainforests were often a better source of food than cultivated land.*⁴⁹

All kinds of practical needs were met. Plant foods included berries, fernroot, kiekie fruit, nikau hearts, and the shoots and stems of cabbage trees. There was timber for buildings and other constructions, waka, tools and weapons. Fibre from flax, pīngao, raupō, cabbage trees and other plants went into sails, mats, clothing, kete and other containers, fishing nets, traps for eels and birds, roof thatching, and the intricate tukutuku panelling in the wharenui. Barks and mosses provided dyes; speargrass and other plants gave

scents and oils. Rongoā plants provided treatments for a wide range of ailments. And plants also served important symbolic and spiritual functions - the parekawakawa or wreaths of greenery worn as a sign of mourning, the boundary marker trees that established the territories of iwi, hapū and whanau, the delicate vegetation patterns decorating the kōwhaiwhai beams in the wharenui, and the trees planted to mark the burial-place of the afterbirth or whenua, connecting the newborn baby with his or her tūrangawaewae or ancestral landscape.

Over the generations, an extensive body of knowledge has been accumulated from the collective observations and experience of hapū and whanau. Matauranga Māori is a storehouse of detail on the characteristics and qualities of native trees and plants, and ecosystem dynamics and relationships. Matauranga also includes tribally and regionally distinctive information, and often interweaves 'hands-on' utilitarian knowledge with history, whakapapa and spiritual matters. Thus many aspects may be tapu, confidential or otherwise sensitive. There may be a reluctance amongst tangata whenua to reveal or share some information relating to native trees and plants and their uses and significance.

Practical management methods and techniques were also developed through time, based in the close familiarity of hapū and whanau with the resources of their rohe. These methods aimed to ensure ongoing sustainability, and took an integrated approach to all aspects of management and utilisation.

Seasonal cycles, the annual and lunar shifts in ecosystem dynamics, and behavioural patterns of birds and other species were carefully observed. Management could involve manipulating habitat for maximum productivity of a particular resource - for example, enhancing a wetland for its eels - or imposing a rāhui to restrict access or harvesting:

Rāhui are used for various reasons, including the conservation of a resource to be used for a specific

*purpose or occasion, [or] the cyclical spelling of a resource so that numbers or vitality can be built up again after heavy or prolonged use... the objective is to ensure the long-term viability of the resource for future use and harvesting.*⁵⁰

Kaupapa

For tangata whenua, the trees and plants of Tāne, and the diversity of birds and other life that shared these habitats, have both practical utilitarian values and a wide range of other kinds of value.

Today, the practical aspects of Māori relationships with forest and plant resources continue, including:

- customary uses of traditional materials, often for special purposes such as waka construction, the restoration of whareniui, or other carving projects
- use of harakeke, pīngao and other raranga materials for weaving work
- sustaining Māori culture and identity
- rongoā, to which increasing numbers of people are turning for natural health treatments.

One fundamental principle is the pragmatic expectation that nothing should be wasted - the usefulness of every component of the resource is assessed. Another core concept is that utilisation should be for the benefit of the community, shared amongst the whanau or hapū for the welfare and improvement of all. Decision-making is also a collective and consensual process, with accountability structures of trustees or representatives back to the hapū, whanau or multiple owners of a particular area (see section 2.7). The business of management is undertaken by the people and families of the area, living within the landscapes alongside the natural taonga.

For tangata whenua, the traditional values of native trees and plants continue in the present day and into the future. The other descendants of Tāne Mahuta are essential to sustaining Māori

culture and identity (see section 2.7). The practical and the esoteric, the physical and the divine are inextricably intertwined. As taonga tuku iho, native trees and plants combine both tangible usefulness in the here and now, and elemental connections to the gods, the ancestors and the eternal universe.

Māori landowners and trusts

Māori own the majority of the remaining indigenous forest on private lands; this has been estimated at approximately 80%.⁵¹ In the North Island, of the remaining 1,163,541 ha of privately-owned indigenous forest, 421,638 ha are owned by Māori.⁵²

*Māori have cause to feel caught in a double jeopardy. Land once left to them as having little productive worth includes some of the few remaining repositories of native vegetation now seen as being too valuable for commercial exploitation.*⁵³

There are also enormous areas of Māori-owned land with development potential: *Of 600,000 ha of undeveloped Māori land, more than two thirds is steep and therefore more suited for forestry than pastoral development.*⁵⁴

Many Māori landowners, incorporations and Trust Boards have undertaken commercial forestry projects with exotic species (primarily *Pinus radiata*), often in joint venture partnerships with large forestry companies and overseas investors. This is seen as the most financially viable option. Considerable efforts have been made to foster Māori involvement in exotic forestry.

Māori landowners are subject to the same imperatives as any other landowners or managers - the requirement to generate appropriate economic returns, to manage resources for the ongoing benefit of owners or shareholders, and to ensure the environmental sustainability of their operations. The expectation that Māori resources must be maximised to provide a viable economic base for hapū, whanau and shareholders is a particularly strong obligation. The priority to deliver economic returns from Māori lands and

investments is based in the duties of rangatiratanga and whanaungatanga, to provide for the needs and wellbeing of Māori communities, and “lift the living standards of our people”.⁵⁵ For Māori, the economic and social dimensions are closely integrated.

Environmental considerations are also critically important for Māori landowners and trustees (see section 2.7). Forest and land management is undertaken within a kaupapa of ecological and cultural sensitivity - for example, ensuring appropriate management for wāhi tapu or other important areas within a forest block; setting aside significant proportions of the overall land area for retention or regeneration of native vegetation; providing access for hapū and whanau for hunting or other purposes; providing for rongoā and traditional materials for carving or weaving work; and protecting wildlife such as kiwi and kereru/kukupu, which often necessitates intensive pest control projects such as the possum eradication work undertaken at Motatau Forest in the Taitokerau. And the Lake Taupo Forest Trust, which manages extensive forests in the central North Island, is currently seeking FSC certification (see section 5.8), acknowledging the advantages of such formal recognition of their sustainability kaupapa in marketing their product.

The idea of sustainably utilising native trees and plant species is not a new concept for tangata whenua. In discussions undertaken for this study, such a kaupapa was however, considered from the pragmatic perspective of contemporary economic realities. It was felt that opportunities for the sustainable harvest of existing native trees and other resources, and for purposefully planting native species for future harvest, would be enthusiastically embraced by many Māori landowners as an alternative to exotic forestry - but only on condition that there would be similar levels of economic return to current commercial ventures.

Constraints may also be imposed on Māori Trust Boards or incorporations by the structures under

which they operate. One proposal to develop a trial area of tōtara, to assess growth rates for prospective future planting over a wider scale, has not yet proceeded. The trustees for that area felt they were unable, under their formal mandate, to approve investment in such experimental initiatives where there could be no guarantee of a reasonable economic return from that use of the land to the tribal shareholders.

Māori are accustomed to thinking far ahead into the future, and a number of people acknowledge that working sustainably with indigenous trees and plant species would generate a wider range of benefits for tangata whenua than projects with exotic species, including:

- restoring landscapes and areas of traditional and cultural significance
- providing materials for rongoā and cultural purposes
- restoring and enhancing mahinga kai areas
- providing opportunities for educational and training programmes for rangatahi, and wānanga to sustain culture and matauranga
- encouraging bird life and helping the breeding and condition of nga manu with natural food sources
- eco-tourism potentials for Māori families and communities
- providing flexibility for owners and the increased security over the longer term of a more diverse portfolio.

5.7 Te Tiriti o Waitangi - the Treaty of Waitangi

The Treaty may be considered the founding document of New Zealand as a nation. It records the fundamental bargain between the Crown and Māori, seen in the relationship between the provisions of Article I and those of Article II of the Treaty - the exchange of the right of the Crown to govern (Article I), in return for confirmation of the rangatiratanga of tangata whenua, and the obligation to protect Māori interests (Article II). The Treaty did not convey any special rights to tangata whenua - rather it confirmed and

guaranteed their existing rights to land, forests and other natural resources, including rights in respect of intangible taonga. The Treaty has affinities with the Common Law doctrine of aboriginal title.

It is generally accepted that our understanding of the Treaty, and its implications for contemporary management of natural taonga and resources, is continually evolving. There is a constantly expanding body of case law on a range of environmental issues under the RMA and other statutes. The work and findings of the Waitangi Tribunal - established in 1975 to inquire into and make recommendations in respect of claims relating to the principles of the Treaty - also provide valuable interpretation on a wide range of matters, including specific recommendations for environmental management.

Some of the principles of the Treaty, as established by the Courts and enunciated by the Tribunal, that are relevant for issues relating to native plants on private lands (including Māori-owned lands) have been outlined in section 2.8.

Māori involvement in issues to do with the management of native trees and plants will also occur under the provisions of the RMA.

The RMA requires consultation to be undertaken with tangata whenua in the development of councils' plans and policy statements, and in fulfilment of the obligations of sections 6(e), 7(a) and 8.⁵⁶ It has been recognised by the Environment Court that it is good practice for applicants for resource consents to consult with tangata whenua if the proposed activity may affect the matters provided for in sections 6(e) and 7(a), ie. traditional relationships of Māori with taonga, and kaitiakitanga.⁵⁷ Iwi and hapū environmental management plans (which local authorities must have regard to in the formulation of their plans and policy statements) often outline a kaupapa for native trees, plant resources and habitats in the rohe, with recommendations to councils and other agencies for appropriate management of

such vegetation in the landscape. The new RMA Bill, reported back from the Select Committee to Parliament on 8 May 2001, strengthens the regard that must be had to iwi management plans. Many iwi proactively advocate the use of native species in a range of environmental contexts - for example, advising councils to use native plants rather than exotics for riparian restoration.

The WAI 262 claim

One claim currently being heard by the Waitangi Tribunal is the "indigenous flora and fauna claim", commonly referred to as WAI 262 (its number in the Tribunal's recording system). WAI 262 is a wide-ranging claim lodged with the Tribunal in 1991 by representatives of several iwi in regard to the "protection, control, conservation, management, treatment, propagation, sale, dispersal, utilisation, and restriction on the use" of native plants and animals, of the genetic resources inherent within these taonga, and the whakapapa, intellectual property and traditional knowledge associated with them. It is claimed that:

te tino rangatiratanga o te iwi Māori (the unqualified exercise of their chieftainship) was and is an absolute authority which incorporated and incorporates the right to determine intellectual and property rights in the knowledge and use of indigenous flora and fauna, in the preservation of biodiversity, and the ongoing development of a philosophy of eco-ethnic ethics...(Statement of Claim)

The claimants, who include practitioners of traditional rongoā, were concerned at a number of developments that were affecting natural taonga, including:

- multinational bioprospectors' and pharmaceutical companies' efforts to establish international property rights over New Zealand plants with traditional medicinal values (poroporo, mānuka and other species)
- New Zealand becoming a signatory to international agreements such as the GATT - TRIPs agreement - arrangements which give other nations rights of access to New Zealand

flora and fauna, and rights to commercial development of those resources

- the practices of some academic and scientific research projects in the treatment of taonga species (e.g. tuatara).

The Tribunal has given urgency to WAI 262 and has been conducting hearings on the claim since 1997. However, given the complexity and sensitivity of the issues involved, and the Tribunal's resourcing constraints, it is expected the process will take some years yet.

Clearly this claim, and its eventual outcomes - the report and recommendations of the Tribunal, associated material and reports commissioned by the Tribunal, commentary from iwi and others, and the Crown's subsequent response(s) to the Tribunal's recommendations - have enormous implications for the future roles and management of native trees and plants in the New Zealand landscape:

The claim is... massive in its scope and includes... all indigenous plants, animals, algae, fungi, lichens, bacteria and other organisms, and the knowledge of Māori associated with them. ⁵⁸

Whatever the outcomes of WAI 262 might be, it has been suggested that New Zealand's forest managers, landowners, official agencies and others involved with native plants and resources should take a proactive approach to this claim to "positively explore ways of addressing the issues raised... To wait until we are compelled by legislation to do this would inhibit the flexibility which may be essential to make progress". ⁵⁹

The Mataatua Declaration

In 1993 the iwi of Mataatua in the Bay of Plenty brought together over 150 representatives of indigenous peoples from around the world for a Conference on the Cultural and Intellectual Property Rights of Indigenous Peoples. The Mataatua Declaration arising from that hui was subsequently tabled in the United Nations (Working Group on Indigenous Peoples), but has yet to be formally recognised by the New Zealand government.

The Mataatua Declaration advances a number of important principles in relation to the management and use of natural resources such as native trees and plants:

- Indigenous flora and fauna is [sic] inextricably bound to the territories of indigenous communities and any property right claims must recognise their traditional guardianship (Recommendation 2.6)
- Commercialisation of any traditional plants and medicines of Indigenous Peoples must be managed by the Indigenous Peoples who have inherited such knowledge (Recommendation 2.7)
- A moratorium on any further commercialisation of indigenous medicinal plants... must be declared until indigenous communities have developed appropriate protection mechanisms (Recommendation 2.8)
- Companies [and] institutions both governmental and private must not undertake experiments or commercialisation of any biogenetic resources without the consent of the appropriate indigenous peoples (Recommendation 2.9)
- Ensure current scientific environmental research is strengthened by increasing the involvement of indigenous communities and of customary environmental knowledge (Recommendation 2.11).

5.8 Markets

Funding of biodiversity on private land

There is a perception that constraints on public funding mean only those forest remnants on private land with high conservation values will be eligible for funding for protection; therefore areas with lower ecological values may not receive adequate protection. The concern of some people and groups that such remnants or other areas have little commercial value, and if the landowner is not personally interested in their conservation, they may be at risk. For such areas it has been suggested that by allowing for some type of economic return, through the creation of market

mechanisms, landowners will have a financial incentive to sustainably manage these native remnants and thereby contribute to environmental sustainability and to biodiversity and landscape values.

These issues can be understood in the context of New Zealand's resources to publicly fund conservation of indigenous biodiversity and landscapes. Factors that are seen as impacting on conservation resources include:

- New Zealand's complex ecology and ecosystem dynamics
- proportionally large areas of reserves for a relatively small population
- hospitable environments for a large and increasing number of weeds, pests, and predators to become established
- prohibition of communities from living in reserved areas, and thereby delivering day-to-day management services.⁶⁰

There is a general perception that there will always be a gap between the funding available for establishing and maintaining reserves or covenanted areas on private land, and the demand for such support. The Ministerial Advisory Committee (2000) called this the 'gap of frustration' - the difference between what funding sources, both public and private, can provide for conserving native plants on private land, and desired levels of biodiversity-oriented work.

At present the Nature Heritage Fund has applications for acquisition of land to the value of approximately \$2,000,000. Its funding is currently \$600,000 per annum. The Nature Heritage Fund, Nga Whenua Rahui and QEII National Trust will over the next five years receive increased funding of \$37 million.⁶¹ Some of this funding will be directed into maintenance, restoration and pest and weed management of existing protected areas.

The limitations of markets

Some environmental groups argue that the existence of markets for products derived from native plants presents a risk in two ways. First, there might be no guarantee that the products being sold are sourced from lands managed under an ecologically sustainable regime. Secondly, it is feared that such markets might provide an incentive to illegally obtain native trees or plants from conservation lands.

Many people consider that economic markets do not take account of the complex diversity of values inherent within ecosystems, and cannot accurately reflect these values. The conclusion is drawn that markets must inevitably fail to fully reflect the in situ ecosystem values of indigenous trees and plants. Therefore, it is argued that these ecosystems and the benefits they provide will be undervalued resulting in their over-utilisation and exploitation.

Some individuals and conservation groups have suggested that the most appropriate response to the inherent limitations of markets would be to replace any utilisation of native timber with alternative products such as *Pinus radiata*, other exotic timber species, or synthetics such as plastic or carbon fibre. It is considered that such substitutions will reduce any economic incentive for landowners to adversely affect native ecosystems through unsustainable extraction practices.

Demand for high quality timber

In terms of demand the future price of native timber is the most important economic factor. Rimu provides interesting data on price changes as timber production between 1991 and 1999 dropped by more than 50 % from 100,000 m³ to 49,000 m³, and over the same period the price at the sawmill door of rimu increased from \$116 per m³ to \$317 per m³ (a 273% increase). It is uncertain how much further the price of rimu will increase as timber is a world commodity and prices are set on the international market.⁶²

The degree to which New Zealand will import high quality timber to replace domestic quality timber will also significantly impact on the price of native timbers. Import data of tropical timbers do not show an increase in volumes corresponding to the decline in native timber production. However, since 1993 the value of imports of wooden furniture has increased from \$30 million to \$80 million in 1999. There are no formal controls on where such products are sourced and it is likely that much of this furniture is derived from unsustainably managed forests.⁶³

Forest certification

Forest certification has been proposed as a means of ensuring recognition for sustainably derived timber products - in terms of product quality, and the reliability of systems that provide consistency and certainty for markets to maintain economic values. Certification is intended to provide a guarantee to customers that the timber was harvested in a sustainable fashion by providing a mechanism to trace the timber product from a specific certified forest right through the production process to the retailer.

There are a number of certification processes but that of the Forest Stewardship Council (FSC) is the most well known and generally considered to be one of the most ecologically robust systems. The FSC is an independent, non-profit, non-governmental organisation that assesses the environmental, social and economic dimensions of a forest's management.⁶⁴

As certification requires an intensive assessment process followed by regular performance audits, the costs of compliance, especially for small forest managers, are high. The benefits include access to 'green' markets and the knowledge that a landowner's forests are meeting set standards in sustainable management. At present there is one FSC-certified, privately managed native forest in New Zealand. FSC certification can also be given to exotic plantation forests; one New Zealand pine forest company has certification and others are

currently working to become certified.

Markets for non-extractive uses

Alternative markets for the conservation and establishment of areas of native vegetation on private land have also been proposed.

Landcare Research is exploring the potential of a brokerage service, the "Emissions/Biodiversity Exchange (EBEX) 21 Project". The EBEX 21 project is based on models developed by Landcare Research to estimate the amount of carbon sequestration that can occur on specific sites with different species. Carbon emitters who wish to negate their carbon 'footprint' can use the exchange to:

- assess their greenhouse gas emissions
- assist in reducing their operational emissions.

EBEX21 will work with landowners who are prepared to allow their marginal land to revert to native ecosystems to absorb carbon. The project will also assist in the restoration of native ecosystems using a range of management techniques and strategies can be developed to achieve zero net carbon emissions.⁶⁵

Another market concept is to create a tradeable habitat protection system, providing a credit to landowners who want to 'grow' biodiversity conservation and indigenous wildlife habitat on all or part of their land. Details of such models vary and are not without practical difficulties. The principle, however, is that if land uses or management choices result in the degradation of an area of native habitat, the landowner would be required to acquire an existing credit from another landowner, or create a new credit through the development of a new habitat on a different piece of land. Creation of a credit can be undertaken by another landowner, or the landowner responsible for the habitat deficit.⁶⁶

New establishments of native plants

In many respects the economic implications of establishing new areas of native plants are

different from those for existing areas of native plants.

Unlike ecologically sustainably managed existing forests the commercial viability of establishing a native forest will be determined by the discounted revenue arising from the first rotation. The longer the time before income is received the more this income is discounted. The shorter rotation period of *Pinus radiata* provides better returns as it reaches an age suitable for harvesting between 22 and 30 years. Other exotics such as Douglas fir take 45 - 50 years. Depending on site and silviculture practices, native species can range from 50 years (beech), 80 years (ricker kauri⁶⁷), 120 years (tōtara) and even longer (rimu).

The establishment costs for native trees is currently around \$15,000 per ha as compared to \$2,000 per ha for *Pinus radiata*.⁶⁸

It has been observed that the costs of establishment can be reduced and, while native timber species do grow more slowly than most exotics, current estimates are based on data gathered from a range of sites of varying quality in terms of such factors as soil, water, and protection from climatic extremes. These growth figures do not take into account the potential gains arising from good site selection, and the development and implementation of alternative silvicultural techniques.⁶⁹

Kauri planted on a sufficient scale can start to be harvested at 80 years and thereafter on 25 to 35 yearly intervals. The return on the 80-year rotation will be in the order of 3 to 4 percent per annum but subsequently the return will be as high as 17 percent per annum.⁷⁰

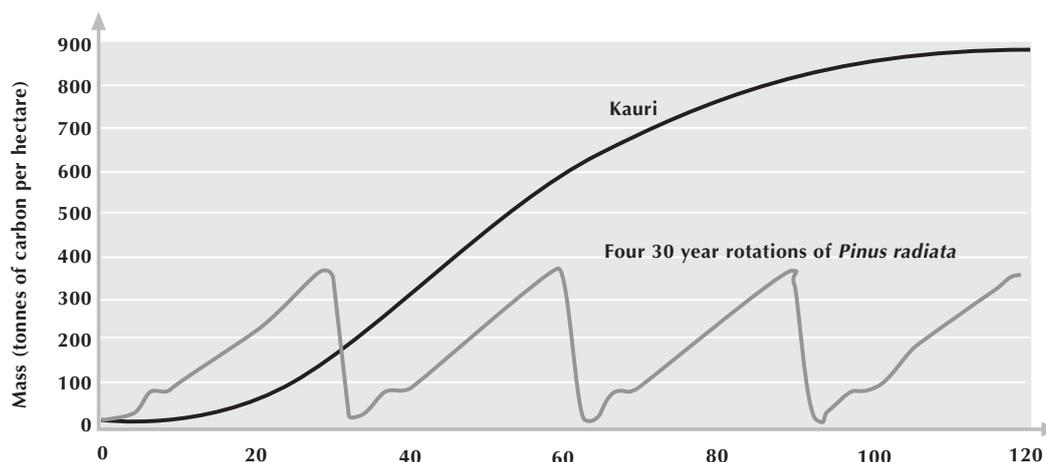
The conventional economic analysis is based on applying the silvicultural model used for *Pinus radiata* to native plants on private land. This model is based on typically large-scale forests and woodlots where economies of scale in establishment, silviculture and harvesting compensate for a relatively low quality product. Such forests only have one commercial value, the timber.

Economic benefits of other uses and services

The potential benefits of the combination of some or all of a diverse range of uses and services will influence landowners' decisions whether to plant native trees or exotic species. Some of these services, such as honey, tourism and recreation, can provide income within the longer rotation periods for native timber species, significantly changing the discounted return on the investment.

Determining the economic benefits derived from non-extractive uses of native plants, such as

Figure 3 Time Profile: carbon sequestration over 120 years



ecosystem services and carbon sequestration, are difficult to calculate. Environment Waikato has estimated the annual value of unharvested indigenous flora in the Waikato region at around \$1.8 billion for the soil and water benefits that it provides.⁷¹

Estimating the economic benefits of carbon sequestration is also difficult, and will largely depend on the international market 'cost of carbon'. Native ecosystems generally sequester much larger amounts of carbon than pine forests, but this occurs at a slower rate. Pine absorbs on average between 10 and 15 tonnes of carbon per ha per annum accumulating over a 28-year cycle.⁷² A kauri forest averages around 7 tonnes per ha per annum accumulating over at least a 120-year cycle (Figure 3).

Using reasonably conservative figures for native forests of between 2 to 5 tonnes per hectare per annum and carbon values of \$30 to \$100 per tonne of carbon will give annual returns of between \$60 and \$500 per annum per hectare. Landcare Research estimates that there are between 4 and 5 million hectares of marginal land that would be suitable for reversion to native forest ecosystems.

Honey production from native plant species is already an important part of New Zealand's honey industry. Popular sources of honey include rewarewa, kāmahī, pohutukawa, rātā, tawari, and mānuka; honeydew honey from southern beech forests is also important.⁷³

In terms of value, honey sourced from native plants presents a significant opportunity for higher returns for apiarists. For example, Canterbury mānuka honey is currently returning around \$5.50/kg and Canterbury honeydew around \$3.00/kg. East Coast mānuka, which has proven antibiotic properties, is returning around \$15.00/kg. In comparison clover honey currently returns around \$2.50 per kg.⁷⁴

However, there is some international concern at

the effects of honeybees on indigenous insect systems and their role in pollination.⁷⁵

Taxation regimes

The economic impact of central and local government taxation (e.g. rating, income tax) was often raised as a disincentive to both the protection of existing remnants and stands of indigenous vegetation and the establishment of new native plants on private lands. These issues apply whether native plant management is for purely protection conservation purposes with no expectation of future income, or where there is an intention of deriving income in the future.

Rates Relief

There is a range of views on the economic importance of rates relief for land that is committed to conservation through covenants or other means. Rating policy varies from council to council, and even where there was rates relief it was often considered by landowners to be an inadequate incentive. However, there has been acknowledgement that even the gesture of rates relief recognises landowners' efforts and was enough to encourage the protection of native remnants.⁷⁶

The issue of the affordability of rate relief was raised as a concern for some councils. Districts that contain many significant areas of native remnants are often those that also have a small rating base.

Income Tax Treatment

The impact of the current income tax treatment on activities and initiatives to promote native plants on private land was also identified as a disincentive. In this context the concern is that:

- Section DO7 of the Income Tax Act 1994 (ITA) places a \$7,500 limit on the tax deduction on expenditure by a farmer, or agricultural business, for tree planting or tree maintenance that is not for the purpose of forestry or horticulture
- The successful establishment of native trees

often requires the prior establishment of a nurse crop (e.g. mānuka), but it is uncertain whether the ITA treats such expenditure as a land improvement (these costs can only be deducted over a number of years) or as a planting cost, which can be deducted against other income in the year it was incurred.

5.9 Landowners' rights and responsibilities

In recent times, conflicts arising from the different views about rights and duties of landowners with respect to native plants on private land have largely occurred under the umbrella of the RMA, but these tensions existed prior to this legislation. People's concerns are often expressed in terms of the need for fairness and respect for individual freedoms when these have to be balanced against the interests of wider society.

Property and regulation

Property is often referred to as a 'bundle of rights' including the right to possess, enjoy, use and dispose of a particular piece of land, object, or intangibles. These rights are capable of being used or exchanged separately or as a whole. Fundamentally, property defines relationships between people, things and places.

Many questions arising in the current debates about property rights are about the appropriate extent of the regulation of private property. Laws are built on fundamental social norms, setting out the boundaries of what society determines to be acceptable. However, society's values are not homogeneous and there will always be a range of different views about what levels of individual choice and regulation are appropriate. In addition, societal values and laws are not constant and will change over time.

Many New Zealanders believe that an individual's ability or right to choose what to do with his or her own land is sacrosanct. The expectation is that such rights cannot be unfairly compromised. Consequently, there is the view that if landowners are required to give up certain land use choices for

the public benefit then they should be compensated.

There are different views as to what compensation might entail. Some believe that compensation should be paid for the lost opportunity cost caused by relegating land to a particular use or by prohibiting some land use choices. Others believe that payment should only be made for the additional costs of land management that arise from the imposition of the regulation. This view stems from the idea that landowners are often willing to forgo land use choices for the good of wider environmental values, but feel that they simply cannot afford to provide a free land and pest management service. It was also suggested that compensation laws should be stringent enough so as to reduce any incentive for official agencies to overuse the regulatory approach.

However, other parties in these debates consider that it is an appropriate role for the State to purchase or negotiate agreements for all areas of significant natural habitat and vegetation. Where this is not possible, then it is argued that the State should regulate to prevent further loss from the adverse impacts of human activities.

It has also been argued by some members of environmental groups that landowners have a responsibility to protect any remaining native vegetation on their properties on the grounds that they or their predecessors have derived a benefit, either directly or indirectly, from any removal of native plants that has occurred in the past. It is suggested that these benefits should be weighed against any costs imposed on the landowner by the regulation of natural areas, and there is therefore no need for compensation.

However, it has been pointed out that most of New Zealand's infrastructure was built on revenues raised from land use, often not ecologically sustainable, but considered within the value frameworks of earlier times to be appropriate and necessary for achieving progress and improved social welfare. Within this context many consider

that expecting that the descendants of these individuals should accept such concepts of 'debt' is neither just, nor an effective way of improving current management practices.

The legal context ⁷⁷

Private ownership of land does not give the landowner a right to unrestrained use of the land. The common law doctrine, that ownership of property carries with it absolute rights to use and enjoyment, has always been subject to limitations; most notably the equally revered maxim that an individual cannot use his or her land in a way that injures or harms another.⁷⁸ The latter maxim is considered to be the beginnings of the law of nuisance from which modern environmental law is said to have stemmed.⁷⁹

The Crown has always had the power to take private citizens' property for public purposes (this is a prerogative power of the Crown called eminent domain). However, in New Zealand the right to acquire land for public purposes has usually been regarded as deriving from statute (for example the Public Works Act 1981) and not the exercise of prerogative power. In the planning area, arguments about property rights have largely centred not on what has been termed 'compulsory acquisition', but on the extent to which regulation constitutes a 'taking' of private property (termed a regulatory taking) and the extent to which compensation is available.

In New Zealand the right to compensation for these takings is not given any explicit constitutional recognition; therefore Parliament has the ability to legislate to take private land for public use without compensation. However, there is a well-established legal principle that if the State exercises this power then it ought to fairly compensate the landowner.⁸⁰

At common law, landowners have no right to compensation when the Government imposes planning restrictions on their land. The RMA, by virtue of section 85(1), expressly recognises the concept of a regulatory taking but excludes the

possibility of it occurring as a result of the operation of the Act.

While the short answer to the question "can Parliament take away my property rights without compensation?" is yes, there are a number of possible qualifications to this power. First, while Parliament is supreme, there are arguments that the principles of equity, fairness and liberty dictate that Parliament ought to provide compensation for takings. Secondly, if Parliament can acquire land or regulate without cost then there are strong concerns that there will be a tendency for Parliament (and local authorities) to regulate excessively. Finally, there is the argument that some constitutional common law rights, such as the right to fair compensation for takings, lie so deep that even Parliament cannot override them.

5.10 Central Government

Background to the government institutions

To understand the roles of central government agencies with respect to native plants on private land it is helpful to go back to the circumstances surrounding their establishment during the government reforms of the late 1980s. Before 1987 government functions affecting native plants on private land were spread across a number of large government agencies that had also had responsibilities for resource development. The main agencies were:

- Department of Lands and Survey (National Parks and Crown Pastoral Leases)
- Department of Internal Affairs (Wildlife Service, Wildlife Reserves and Acclimatisation Societies)
- Ministry of Agriculture and Fisheries
- Ministry of Transport (Coastal reclamations)
- New Zealand Forest Service (Forest Parks, plantations, and the Forest Research Institute)
- Department of Works and Development (lands managed under Water and Soil conservation legislation).⁸¹

The government reforms of the late 1980s were

based on a desire to make government processes more effective, promote economic growth and reduce the role of government in economic activities. Those agencies undertaking environmental management were not the primary focus for the reforms, but the general principles of the reforms also applied to them. These principles can be summarised as:

- separation between policy and operational functions
- separation between funding, purchasing and provision of service
- reallocation of responsibilities across departments so as to:
 - ensure that similar functions were collected within the same agency
 - avoid conflicts of interest within an agency
 - disassemble conglomerate organisations seen as being difficult to manage, lacking focus and given to concealing information internally.⁸²

Prior to the reforms, the environmental NGOs and other groups saw the government agencies with environmental responsibilities as having conflicting objectives and unclear decision-making processes.⁸³

The agencies that were of most concern were the Department of Lands and Survey and New Zealand Forest Service. These agencies were very involved in land development, for pastoralism and plantation forestry respectively, while also having responsibility for the management of large areas containing native species. Both agencies were perceived by environmental groups as being primarily development oriented organisations with only a limited commitment to conservation.

The reforms resulted in the creation of a number of new agencies. The restructuring reflected and affirmed the polarisation of thinking between a protection ethic and the sustainable use of lands. A single new agency, the Department of Conservation, became the manager of lands that were considered to have primarily conservation values. These lands were transferred from the

Department of Lands and Survey, the Department of Internal Affairs, and the New Zealand Forest Service.

Those lands that were considered to have primarily productive values were transferred to two new State Owned Enterprises (SOEs). Landcorp received the Crown's pastoral lands, and Forest Corp (subsequently renamed Timberlands) received the Crown's production forests, both exotic and indigenous.

However, this reallocation of land was not straightforward where the land had either no predominant conservation or production function. In some cases this conflict was resolved only because the new SOEs had no purpose for marginal lands that had limited financial viability.⁸⁴

Consistent with the principle that policy making should be separated from the operational functions of Government departments, two new policy agencies were created: the Ministry of Forestry (now part of the Ministry of Agriculture and Forestry) and the Ministry for the Environment.

The Ministry for the Environment

The Ministry for the Environment was established by the Environment Act 1986. The long title states that the objective of the Act is to:

Ensure that, in the management of natural and physical resources, full and balanced account is taken of:

- (i) *The intrinsic values of ecosystems*
- (ii) *All values which are placed by individuals and groups on the quality of the environment*
- (iii) *The principles of the Treaty of Waitangi*
- (iv) *The sustainability of natural and physical resources*
- (v) *The needs of future generations*

The Ministry for the Environment has a range of functions that directly or indirectly impact on native plants on private land, such as to:⁸⁵

- advise the Minister on matters concerning environmental administration
- obtain information, conduct and supervise research, so as advise the Government on environmental policies
- provide the Government, its agencies, and other public authorities with advice on the application, operation and effectiveness of those Acts that impact on the environment in relation to the achievement of the objectives of the Environment Act 1986 (the list of Acts includes the RMA 1991, Forests Act 1949, and Conservation Act 1987)
- facilitate and encourage the resolution of conflict in relation to the environment
- provide information and services to promote environmental policies, environmental education and mechanisms for promoting effective public participation in environmental planning.

The Department of Conservation

The Department of Conservation was established by the Conservation Act 1987 (CA). The primary functions of the department which are most relevant in relation to native plants on private land are: ⁸⁶

- to manage for conservation purposes, all land, and all other natural and historic resources held by the department and any other land managed on behalf of the owner
- to advocate the conservation of natural and historic resources
- to advise the Minister of Conservation on matters relating to DOC's functions and to conservation generally.

It should be noted that conservation is defined in the Act to be: ⁸⁷

the preservation and protection of natural and historic resources for the purpose of maintaining their intrinsic values, ⁸⁸ providing for their appreciation and recreational enjoyment by the public, and safeguarding the options of future generations.

Early versions of the Conservation Bill included the term utilisation, but this was considered confusing because it merged protection with

utilisation, and thus it was removed from the final version. ⁸⁹ Utilisation functions in the CA are, therefore, limited to appreciation and recreation. ⁹⁰

It is within this statutory context that the department undertakes its advocacy, education and policy functions with respect to native plants on private land. The legislation requires that DOC advocates for conservation in the sense of the above definition.

Native Plants Protection Act 1934

This Act makes it an offence to take protected native plants from Crown land, state forest land, public reserve land, or from private land without the consent of the owner or occupier. ⁹¹ All native plants are protected under this Act with the exception of a list of plants including piripiri, kānuka, mānuka and all mosses, fungi and lichen. ⁹²

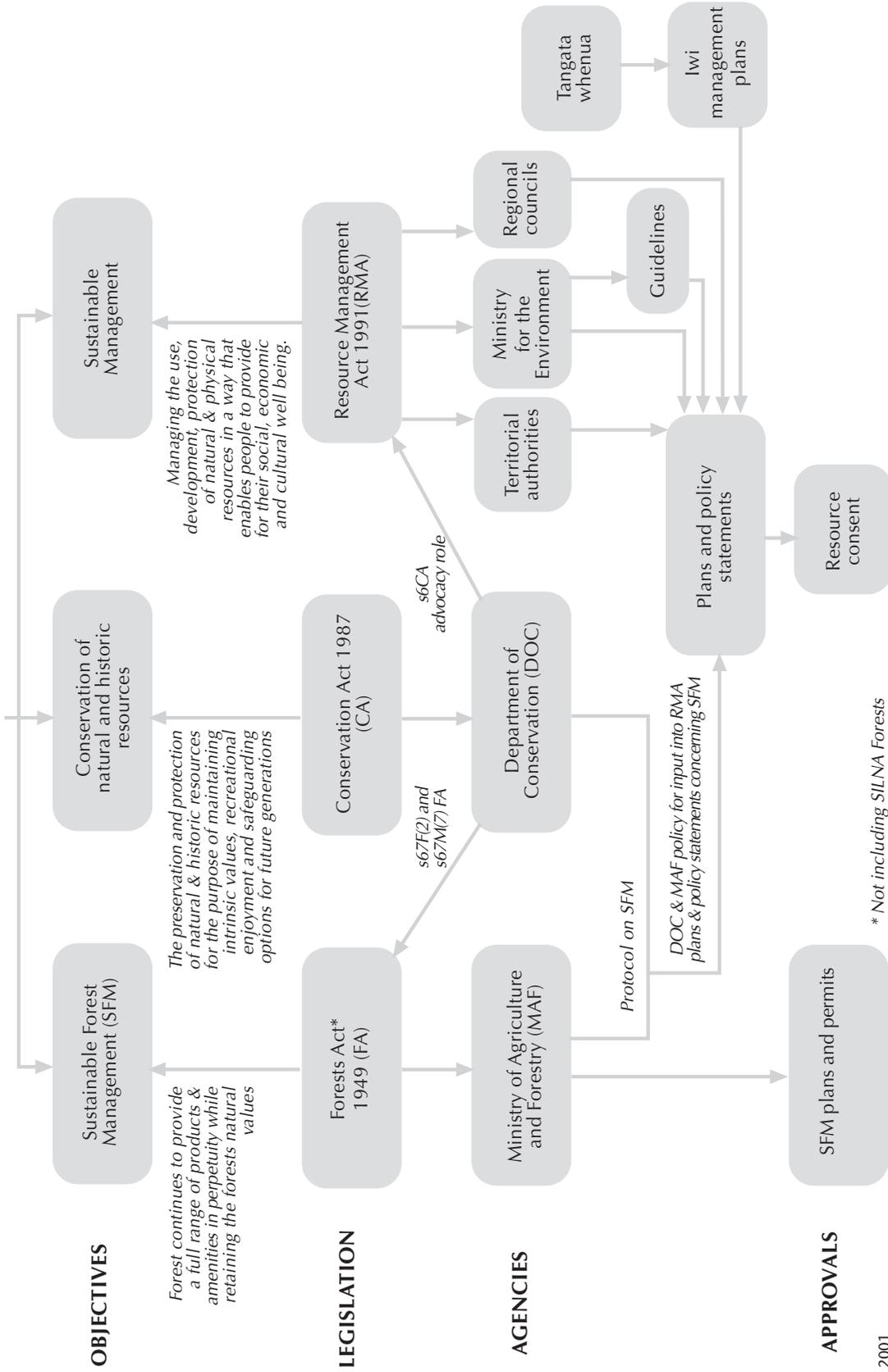
The Act is considered largely inadequate as a protection mechanism because it does not specify fruit, seeds or trees and it does not prevent a landowner from taking native plants from their own land. Enforcement is extremely difficult and if caught the penalties under the Act are limited to a fine of not more than \$40. ⁹³

5.11 Operation of Part IIIA of the Forests Act 1949

Figure 4 sets out the legislative framework for the management of non-plantation indigenous forestry.

The Indigenous Forestry Unit of the Ministry of Agriculture and Forestry is responsible for the administration of Part IIIA of the Forests Act 1949 (FA). Part IIIA allows for a number of management options so as to achieve the objective of sustainable timber production from private forests.

Figure 4 Framework for the management of non-plantation indigenous forestry on private land



Source: PCE 2001



Option 1: Salvaged Timber, Windthrown and Dead Standing Timber and Landowner's Personal Use (Up to a total of 50 cubic metres in any 10 year period)⁹⁴

A written statement is required from the Chief Executive of MAF, confirming that the timber falls into one of these categories, before the timber can be milled.

Option 2: Sustainable Management Permits

A permit requires less information than a plan for approval and is suitable for smaller forest areas. It allows the landowner to harvest, within a ten-year period, up to 250 cubic metres of podocarp or kauri or shade tolerant, exposure sensitive, broadleaved species and up to 500 cubic metres of beech or other light demanding hardwood species, as long as the amount harvested is less than 10 percent of the timber standing on the landholding.⁹⁵ A subsequent permit for podocarp or kauri or shade tolerant exposure-sensitive broadleaved hardwood species may be issued after 10 years provided forest growth in that time has replaced the timber harvested during that time.⁹⁶

Option 3: Sustainable Management Plans

Sustainable Management Plans have comprehensive information requirements and require an understanding of the forest's growth and regeneration characteristics. Plans place more emphasis than permits on factors other than the management of sustainable timber yield. The information provided must include:

- land ownership
- land description
- forest description
- forest inventory and proposed harvest volume
- forest management system(s)
- protection measures
- any measures to protect soil, water, flora and fauna and to retain and enhance these values
- relevant requirements under the RMA, e.g. relevant details of applicable district and regional plans

- the plan's term.

MAF may require landowners to set up representative areas that protect flora and fauna and other conservation values in an unmodified part of a forest. This will occur where flora and fauna or other conservation values in the forest are considered to be of regional or national importance. The representative area must be of an adequate size and location to protect the identified values, and those values must be adequately protected.⁹⁷

Monitoring of compliance with the conditions in the plan is achieved by the requirement that landowners maintain comprehensive forest inventories and records of forest operations, so as to determine the ongoing stand characteristics and current management practices (e.g. standing volumes, regeneration, silviculture activities). It has been proposed that sustainable management plans under the Forests Act should be more closely aligned with Forest Stewardship Council (FSC) certification standards to allow for mutual recognition and reduce compliance costs.

MAF must also consult with the Director General of the Department of Conservation and Chief Executive of the Ministry of Māori Development if the area includes any Māori land.⁹⁸

In addition, before undertaking any forestry activities the owner must obtain the necessary consents under the RMA.⁹⁹

There are around 1.3 million hectares of privately owned indigenous forest that fall under the ambit of Part IIIA of the FA. As of 30 June 2000 there were:

	Number	Area (ha)	Volume of timber approved (m ³)
Plans	19	23 309	51 234 (annual)
Permits	232	29 592	65 732 (over 10 yrs)
Total	251	52901 (4% of all private forest)	

(MAF, 2000¹⁰⁰.)

Select Committee inquiry into indigenous forest management

The Primary Production Committee of the House of Representatives is currently undertaking a review of the indigenous forest management regime under the FA. The select committee expects to complete its enquiries in 2002.

While there are some areas of common interest between this discussion paper and the select committee's review, that review is focused only on assessing the efficacy of the sustainable forest management regime. In contrast this discussion paper has a much broader objective with respect to the future role of native plants on private land. Nevertheless, this study is interested in how the FA and its implementation affects attitudes and perceptions about the role of native plants on private land and the credibility of sustainable land management. The terms of reference for the select committee's inquiry are:

1. To examine the sustainable management of privately owned indigenous forests and within this examination to consider:
 - a) The scope and range of sustainable management plans.
 - b) The processes and procedures for developing sustainable management plans.
 - c) The relationship between sustainable management plans and sustainable management permits.
 - d) The inter-relationship between sustainable management plans, the RMA and local government.
 - e) The international credibility of sustainable management plans for privately owned indigenous forests in New Zealand.
 - f) The conditions or requirements placed on those wishing to harvest or market timber from native forests.
2. To examine what restrictions, if any, should be placed on those wishing to completely remove native forests in favour of other land uses.
3. To examine whether indigenous forest

managers regardless of whether they are producing timber, should be required to demonstrate that they are managing their forests in a sustainable manner.

4. To examine what the future role of the State should be in relation to indigenous forest management and research, given the potentially wide role of native forest management (including planting) in relation to such objectives as landscape protection, erosion prevention, biodiversity conservation and timber production.
5. To consider what policy or legislative mechanisms should be used to give effect to any findings of the inquiry.¹⁰¹

5.12 The South Island Landless Natives Act 1906

The term SILNA is an acronym of the South Island Landless Natives Act 1906. In 1906, 57,498 ha of land in Marlborough, Northwest Nelson, South Westland, Southland and Rakiura (Stewart Island) was awarded to various South Island Māori who had been made landless by the land acquisition processes of the Crown. The Crown intended at that time that the new owners would clear the land for farming purposes, but this did not happen, as the land was economically marginal and very inaccessible.¹⁰²

As with many of the uneconomic and inaccessible parts of New Zealand, the SILNA lands remained in the original indigenous plant cover. Over time access improved and the owners of the SILNA land in Southland began to harvest the timber. This was primarily beech, but also included rimu forests.

One of the key debates surrounding the SILNA lands is that they are excluded from the scope of the sustainable management regime of the FA and may therefore be clear felled, subject to the rules in the relevant district plan and regional plan under the RMA. When the new Forests Act regime was introduced in 1993 the SILNA owners resisted it as they saw it as compromising tino rangatiratanga. The owners also strongly believe

that the original grant of land was in compensation for land unlawfully taken in the late 1800s. Therefore, the owners feel that any law passed that results in a foregone economic benefit, because of the move from clear felling to sustainable harvesting, should be compensated. At the time of the introduction of the Forests Amendment Act 1993 Hon Denis Marshall, then Minister of Conservation, stated:

*Of course, those people have rights under the Treaty, but they also have rights under a specific Act of Parliament (SILNA). It would not be at all appropriate to override those rights in this measure, it would be proper to identify first the areas affected by the legislation... It would also be appropriate to negotiate with them in a proper manner on the future of their forests.*¹⁰³

In 1996 Waitutu Incorporation reached a settlement with the Crown and surrendered its cutting rights over areas of virgin rimu forest in return for cutting rights over regrowth beech forest, plus a cash payment.

The SILNA owners, based on the same arguments, have also argued that their lands are exempt from any regulations under the RMA that adversely impact on their activities. A recent decision by the Environment Court determined that under the Southland District Plan, the Council had the authority to regulate the clearance of indigenous vegetation under the RMA on SILNA lands.¹⁰⁴

5.13 International agreements

This section provides information on two international agreements that have a close relationship with the Convention on Biological Diversity (see section 2.12).

The Montreal Process

The Montreal Process is the name commonly used to refer to the Working Group on Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests. It was formed in Geneva, Switzerland, in June 1994 to develop and implement internationally agreed

criteria and indicators for the conservation and sustainable management of temperate and boreal forests.

Membership of the working group is voluntary and currently includes 12 countries including New Zealand, Australia, Chile, Japan and the United States of America. The member countries represent about 90 per cent of the world's temperate and boreal forests in the northern and southern hemispheres. This amounts to 60 per cent of all of the forests of the world and 45% of world trade in wood and wood products.¹⁰⁵

Santiago declaration

The Santiago Declaration was issued in February 1995 at the sixth meeting of the Montreal Process countries in Santiago, Chile. The Declaration contains a set of seven criteria and 67 indicators to guide policymakers, forest managers and the general public in the conservation and sustainable management of temperate and boreal forests. The Montreal Process countries agreed to use these criteria and indicators as assessment and monitoring tools at the national level.¹⁰⁶

The criteria:

1. Conservation of biological diversity
2. Maintenance of productive capacity of forest ecosystems
3. Maintenance of forest ecosystem health and vitality
4. Conservation and maintenance of soil and water resources
5. Maintenance of forest contribution to global carbon cycles
6. Maintenance and enhancement of long-term multiple socio-economic benefits
7. Legal, institutional and economic framework for forest conservation and sustainable management.

The Montreal Process criteria and indicators are not static and will be continually reviewed and refined to reflect new research findings, advances in technology and an increased capability to measure indicators.

5.14 The RMA and sustainable management

Sustainable management

The overarching purpose of the RMA is set out in section 5 and is to promote the sustainable management of natural and physical resources.¹⁰⁷ Section 6 sets out matters of national importance, section 7 sets out other matters to be given particular regard, and section 8 directs persons with functions and powers under the Act to take into account the principles of the Treaty of Waitangi. These sections provide additional guidance on how to achieve the purpose in section 5, and use words and expressions that are meant to be broad and are intended to enable the application of policy in a general way.¹⁰⁸ Essentially, they are principles to guide sustainable management. Section 6(c) states that the protection of areas of significant vegetation and significant habitats of indigenous fauna is a matter of national importance.

Case law

The considerable uncertainty that surrounds the terms ‘significance’ and ‘protection’ used in section 6(c) has resulted in some decisions of councils being referred to the Courts. The Courts have not extensively considered what ‘significance’ means in the context of section 6(c) and how it should be assessed. However, the Courts have heard and taken into consideration evidence pertaining to criteria such as rarity, representativeness, diversity, connectivity, buffering and variability.¹⁰⁹ The issue of what is significant in terms of section 6(c) is still a contentious one with different local authorities and sectors of the community proposing many different views.

The Court of Appeal has considered the meaning of the word ‘protection’ and held that it did not have as strong a meaning as the words ‘prevention or prohibition’ and that it meant ‘keeping safe from injury’.¹¹⁰ The Courts have also consistently held that ‘protection’ in the context of section 6

does not mean ‘absolute protection’, but is tempered by the purpose of sustainable management.¹¹¹ This means that when deciding what methods to use to ‘protect’ areas of significant indigenous vegetation, local authorities must take into account factors such as whether the method or rule enables individual people and whole communities to provide for their social, economic and cultural well being. The question remains as to how to design such methods.

Much of the tension surrounding section 6(c) arises in rural areas where some local authorities have run into opposition from landowners when proposed plans were notified with schedules containing a list of specific sites identified on private land as Significant Natural Areas (SNAs). However, some local authorities have contended that they are legally required to identify and delineate areas that require protection in terms of section 6(c), and to provide for a different management regime within these areas. This may have some legal foundation. In *Wakatipu Environmental Society Inc v Queenstown-Lakes District Council*, a case concerning landscape and primarily section 6(b), the Environment Court stated:¹¹²

In respect of a district council's functions, including integrated management of land, the starting point for the first stage must be to identify the facts and the appropriate matters to be considered. In particular it is fundamental to consider Part II of the Act. That means it is mandatory to identify the matters of national importance. We do not see how this can be achieved without identifying (necessarily with a broad pencil, but with as much accuracy as possible) the boundaries of the areas concerned. Once the coastal environment...significant vegetation, significant habitats of indigenous fauna...have been identified the general issues tend to be self generating: how can these resources be protected from inappropriate use or development or have access to them maintained and enhanced, or be recognised and provided for, as the case may be? Only then should the Council turn to

the next stages in the process: considering the appropriate objectives, policies and methods of implementation. [PCE's emphasis.]

From this decision it can be argued that local authorities are required to identify significant areas of indigenous vegetation in their district or region first, and then consider what methods they can use to protect them. However, the Environment Court has also stated that the fact that the area has been identified as 'significant indigenous vegetation' in a proposed district plan does not mean that the Court should necessarily conclude that it was 'significant indigenous vegetation' for the purposes of s6(c) RMA.¹¹³

Section 32 of the RMA requires local authorities to consider the extent to which a particular method is necessary and likely to be effective in achieving the objective of the Act including in relation to section 6(c).¹¹⁴ Local authorities must also consider other means of achieving objectives, including the provision of information services and incentives.¹¹⁵ There is a range of opportunities for protection under the RMA and other legislation. These include the reservation or covenanting of parts or all of an area, if it is desirable and agreement of all parties is reached; or allowing for the use and management of the area, provided any potential adverse effects on the environment are avoided, remedied or mitigated.¹¹⁶

It has been stated that section 6(c) is not about obtaining more reserves, and protection of SNAs identified under the RMA does not preclude use of natural resources within an SNA, as long as that use does not impact adversely upon the values for which the area is considered significant.¹¹⁷

However, there is a perception that section 6(c) is being used as a default reserve-making power and that a landowner's land use options are unreasonably restricted within those areas listed as SNAs. There is also the view that having to apply for resource consent to carry out work in these areas is costly and time-consuming with no guarantee of success, especially if the application is

publicly notified. As a result, many landowners have called for voluntary initiatives as a replacement for, rather than in addition to, regulation (see sections 2.10 and 5.9).

The Ministry for the Environment (MFE), in recognition that councils require some guidance, began developing guidelines, for councils on implementing section 6(c) of the RMA in 1997; however, work is now focusing on the development of a draft National Policy Statement for Biodiversity under the RMA.

Councils' approaches to 'significance'

Environment Waikato has released a regional policy guide for applying significance criteria with regards to section 6(c) (1999). The Waikato process addresses a range of questions, including:

- whether the site provides habitat for indigenous species that are uncommon, threatened or endemic to the Waikato region
- whether the site forms an ecological buffer, linkage or corridor that protects other areas from external adverse effects
- the site's significance at international, national, regional or district levels.

Local authorities and native plants outside significant natural areas

Both regional councils and territorial authorities can include in their policies and plans rules about the management of native plants on all areas of private land, even where the area has not been identified and provided for as an SNA.

Local authorities vary in their approaches for protecting areas of native vegetation not specifically identified as SNAs.

Regional councils

Regional councils (and unitary authorities) have a responsibility under the RMA for the integrated management of the natural and physical resources of the region, and more specific responsibilities for soil conservation and water quality.¹¹⁹ Consequently, many of the objectives, policies and methods in regional plans that impact on

CASE STUDY: WEST COAST SIGNIFICANT NATURAL AREAS PROGRAMME

The Buller, Grey and Westland District Councils and the West Coast Regional Council are currently implementing a joint process to identify and to provide for the protection of significant areas of indigenous vegetation under section 6(c) of the RMA.

Concerned about the experiences of other councils when undertaking this process the West Coast councils decided to combine their resources and implement a different approach. With funding assistance from the Sustainable Management Fund the councils have established a core group of council staff to oversee a two-stage process. The first stage is the identification of areas of significance and the second stage will be the development of mechanisms to provide for the protection of these areas.

A reference group was established with representation from DOC, environmental NGOs, landowner groups and local iwi. However, the control of the project remains clearly with the councils. It was considered essential that the process be seen to be inclusive but independent of any particular interest group.

Early on it was decided not to undertake an 'identification' process to define areas of significance, based on DOC's Protected Natural Area Programme methodology. The PNAP system was considered by the core group to have been developed for conservation purposes under the Conservation and Reserves Acts, whereas implementing section 6(c) of the RMA was seen to have a different objective of sustainable management as defined by section 5. Furthermore the PNAP approach requires detailed field based surveys that are expensive. The councils were keen to develop a new approach using material that could be manipulated by information technology systems such as Geographical Information Systems (GIS).

Information was collected from a range of sources, including new national databases that had recently become available, such as MAF's land cover database and Landcare's environmental domains database.

Some DOC data on species distributions and status were also used. Applying information technology this data became a first order 'desktop' survey that identified the 'possible' sites.

Approaching landowners of 'possible' sites was undertaken carefully with councillors and council staff often making the first approach. These meetings would involve outlining the process and talking to the landowners about their needs, concerns, and expectations. It was made clear that the process was not about 'locking up' significant areas and that there would be a range of mechanisms developed within the scope of the RMA.

Once approval for access was gained an ecologist undertook actual surveys on the land. The councils have found that engaging an ecologist who can work well with landowners is critically important to the success of the whole process.

The identification process has been underway for nine months and given the area to be covered, is expected to take another two years. This gradual approach, and taking the time to consult, has managed to reduce (but not totally eliminate) concerns or resistance. The development of mechanisms to provide for the protection of confirmed sites is still proceeding, but it is already apparent that a 'suite' of mechanisms will be required. The timeframe for the completion of this next stage of the project has not been finalised, but in the interim there are some indigenous vegetation rules in place in the district plans to prevent pre-emptive clearances before the completion of the process.

Recently, landowners and some local politicians have raised concerns about the longer-term consequences of the SNA process. This increase in concern was influenced by the Government's recent decision to transfer the Timberland's beech forests into DOC management, and the perception that similar management philosophies might be applied to the West Coast SNAs in the future.¹¹⁸

native plants are targeted at managing the impact of vegetation clearance on soil and water values. These are usually defined in terms of factors such as the plants location with respect to watercourses, the severity of the slopes and the propensity for erosion of the land on which the plants are located. In this regard some regional councils make no distinction between the clearance and disturbance of exotic or indigenous vegetation.

Regional councils also undertake a range of programmes to promote soil and water conservation through the fencing off and planting of riparian areas, unstable slopes, sand dunes and other marginal lands. Recently regional councils have started to emphasise the use of native plant species in such projects in recognition of the additional benefits to indigenous biodiversity.

CASE STUDY: ENVIRONMENTAL FUND

The Northland Regional Council has set up an Environmental Fund to help people improve and protect Northland's natural environment. The Environmental Fund provides up to 50% of the total costs of projects that meet the funding criteria.

Every year \$100,000 is available to fund environmental work. Funding for past projects has ranged from \$200 to \$28,000; a maximum of \$30,000 is available for any one project.

The types of projects that are suitable for funding by the Fund include:

- fencing of native or regenerating forest, streamside areas, edges of lakes, wetlands and coastal areas, where
 - native plants are predominant
 - erosion will be prevented or reduced
 - stock will be excluded from water bodies; and/or
 - water quality is likely to be improved.
- restoration, retirement, and revegetation of land, including areas of the following significant indigenous habitat:
 - freshwater wetlands
 - remnant forest
 - scrubland
 - coastal wetland, including mangroves and salt marsh
 - eel grass
 - sand dune vegetation
 - other significant habitats of native animals.

Regional councils also have responsibilities for the management of pests (including weeds) under the Biosecurity Act 1993,¹²⁰ and this responsibility often acts as the impetus for regional councils to consider measures that address indigenous biodiversity and native plants.

The Wellington Regional Council has the Key Native Ecosystem programme (KNE). This determines priorities for the council's possum control. KNE is designed to control introduced pest species so as to reduce pressure on remnant native habitats, and allow natural ecosystem processes to thrive.

Under the latest version of the RMA Amendment Bill 1999, reported back to Parliament by the Local Government and Environment Committee on 8

May 2001, both regional councils and territorial authorities will have responsibilities for the maintenance of biological diversity.¹²¹

Territorial authorities

Section 31(a) of the RMA gives territorial authorities responsibility for the:

establishment, implementation, and review of objectives, policies, and methods to achieve integrated management of the effects of the use, development, or protection of land and associated natural and physical resources of the district.

Therefore, the RMA requires territorial authorities in executing their powers and functions under the Act, to take account of land use changes and the potential impact on native plants.

As with regional plans, district plans can specify the rules to apply to particular activities. For example, how land uses of areas of indigenous vegetation are managed in district plans depends on whether the particular activity is determined to be a:

- permitted activity (does not require resource consent) or
- controlled activity (resource consent is required but must be granted by the consent authority which can impose conditions in respect of those matters over which it has retained control in the plan) or
- discretionary or restricted discretionary activity (resource consent is required and can be issued with conditions, in the case of a restricted discretionary activity conditions can only be imposed in respect of matters to which the consent authority has restricted its discretion) or
- non-complying activity (the activity contravenes a rule in the plan, therefore resource consent is required and can be issued with conditions) or
- prohibited activity (no resource consent will be granted).

Distinguishing what approval is required for an activity on land with native plants is dependent on how native vegetation is defined, and the scope of activities defined in the relevant provisions in district plans. These can vary but the important factors are the plants included in the definitions of 'indigenous vegetation', 'native bush', 'indigenous forest' or 'indigenous tree'. Plans usually define 'indigenous vegetation' in terms of areas where there is a predominance of naturally occurring native vegetation, although it is uncertain how 'predominance' is determined. In addition, there are often exclusions to these definitions. For example, in some instances native vegetation that occurs under the canopy of a plantation forest can be excluded from the definition of indigenous vegetation. Other exclusions included in plans are often those species that are considered to be of limited ecological value, such as mānuka and kānuka, unless areas of these plants are considered to have additional ecological values.

These definitions are then used in conjunction with vegetation clearance rules to determine the type of approval, if any, required. Clearance rules can be used in plans to prevent the removal or disturbance of an area before it can be assessed under section 6(c), as part of the controls for SNAs, or to control vegetation clearance in areas outside SNAs.

The criteria used in vegetation clearance rules vary but they are often based around the following parameters:

- the area of clearance that is to occur
- the period of time that the area of clearance can occur (e.g. 500 m² in any 12 month period)
- whether the area contains native vegetation that has, or has the potential to form, a closed canopy above a certain height (height criteria vary but are usually between 3 and 6 metres)
- additional significance criteria, such as the presence of rare or threatened species.

There have been some concerns expressed about

the development of rules based on area, time period and height criteria and these types of rules result in unintended outcomes such as:

- vegetation clearance still occurring but in small increments
- a focus of protection efforts on areas that contain stands of tall trees irrespective of the actual environmental value of these areas; and
- landowners who want to retain control of those areas considering native regeneration as a liability and ensuring that it does not reach the height limits.

5.15 Research agencies

This section describes some of the current research activities concerning the management of native plants. It is not a full survey of all research underway in these areas, but gives an indication of the range of topics being studied.

Forest Research (FRI)

In 1992 the Forest Research Institute (FRI), previously the research facility of the New Zealand Forest Service, became a Crown Research Institute (CRI). Despite the change in structure the strong focus on production-forestry research continued. However, there had long been an active research effort within FRI into indigenous plant species, with respect both to their ecology and management. Although the forest ecologists in FRI were transferred to the Landcare Research CRI, research continued into silviculture of native species.

FRI has also responded to the growing interest in developing sustainable management systems for planted indigenous tree species for both market and non-market benefits. The limited amount of management-oriented research in this area had been seen as an impediment to employing plantation-grown indigenous timber for high quality end uses, rather than trees from naturally occurring forests. Current management-focused research on native species includes: establishment, pruning and thinning trials; genetic variation; growth database and growth models; natural

regeneration on new sites; market and non-market values. FRI has also evaluated the growth rates of many native tree species that were planted on over 50 disturbed sites during the 1960s, and followed up with silviculture trials and ecological studies of several species.

In 1989 Forest Research started a duneland research programme aimed at evaluating the role that indigenous species play in stabilising and protecting coastal sand dunes. Research trials on spinifex,¹²² sand tussock and pīngao have developed practical methods for the successful rehabilitation of dunes. In 1997, the Coastal Dune Vegetation Network was established as an independent forum to help in the technology transfer of research results to managers, iwi, nurseries and user groups. 'How To' guidelines have been published and the outcome is not only active management by a number of communities to rehabilitate eroded dunes, but also projects for the sustainable harvesting of pīngao fibre for weaving and other cultural purposes.

2000/01 year PGSF total funding for Forest Research was \$23.8 million. Funding to develop management techniques for species other than *Pinus radiata* (including both native and other exotic species) is \$1.35 million.¹²³

Landcare Research - Manaaki Whenua

Landcare Research is the CRI most closely involved in research on terrestrial native plants and animals as well as invasive species. It has a number of research programmes aimed at research of pests and weeds of native species and ecosystems, ranging from the weed *Hieracium* that threatens South Island high country plant communities to research for control of possums. It also has programmes looking at much broader levels of biodiversity and ecosystem processes. Such work recognises the importance of understanding how healthy ecosystems function and their roles in maintaining clean air, water and soils as well as mitigating the effects of pollution.

Research on harakeke (New Zealand flax) is looking at over 70 different cultivars to examine the genetic and environmental components of cultivar variation. The objective is to make the best selections for particular uses in different locations. Other research with a Waikato region focus is assessing forest fragments - what remains, how the species respond to the effects of isolation and small size, and what influences their survival (e.g. management practices, or the impacts of surrounding land uses). This is relevant to issues such as the importance of corridors for wildlife species in fragmented landscapes. It is also contributing to the development of ecological assessment methodologies appropriate for fragments of indigenous vegetation. The results should be useful to assist in local planning decisions and inform landowners about how different farming practices can help or hinder forest fragments to survive.

The survival of forests in the dairy farm landscapes of the Waikato has been examined by comparing stands of kahikatea identified in 1977 with 1997 measurements. Results show a small decline in the number of stands, but the stands where cattle browsing was allowed had become threatened, and the environmental benefits of these stands (e.g. conservation, surface and ground water purification, reducing impacts of floods) were poorly recognised.

2000/01 year PGSF total funding for Landcare Research was \$25.7 million. There was \$9.4 million for indigenous species most of which was for protecting biodiversity and pest management. However, \$2.34 million is for study into indigenous plant species and ecosystems for carbon sequestration.¹²⁴

National Institute of Water & Atmospheric Research (NIWA)

NIWA has a research programme on the management of aquatic plants that covers four linked objectives: aquatic plant biodiversity and ecology; identifying and predicting threats from

invasive weed species; restoration of freshwater ecosystems; and development of protection, mitigation and restoration strategies. Several parts of this programme involve native plants:

- identifying the characteristics of plant communities in freshwater ecosystems
- determining the barriers to restoring native plants in water bodies
- evaluating the risks to water bodies of invasive species and ways to control them
- identifying the conditions for restoring submerged native vegetation and using the results of the research in protection
- mitigation and restoration strategies developed by agencies such as regional councils and DOC.

Useful freshwater native plants that are good 'indicators' of lake health and of increases in sediment or nutrient levels will be identified. The results of this and similar research will be helpful for restoring degraded habitats and in better managing riparian areas. As the vital roles that native plants play - regulating runoff, helping with soil and water conservation and improving freshwater habitat for many native animal species - become better appreciated, interest in using them more widely for conservation and utilitarian reasons will increase.

AgResearch

One of the three key areas for research promotes a healthy, safe environment. A project within that area is to develop cost effective technologies for using native plants to restore native biodiversity in degraded habitats. Also included is research on the ecology of native grasslands and their management to maintain biodiversity and integrate them with sustainable farm management systems.

2000/01 year PGSF total funding for Agresearch was \$57.5 million. Of this amount \$2.6 million is for pest management. The description of the work being undertaken recognises that there would be some benefits for indigenous flora and fauna species.¹²⁵

Institute for Crop & Food Research

There is a strong commercial focus to the work of this CRI. Its research extracts and identifies natural plant products such as bioactive compounds, pigments and essential oils from native and introduced plants. Another area of research is based on the expansion of New Zealand's live plant and floriculture exports using, in part, native plants that fetch high prices on international markets. Research is focused on the development of flowering, propagation and post-harvest treatment for exported native plants.

Hort Research

Other CRIs, such as HortResearch, have research programmes that focus on the use and improvement of imported species, such as poplars and willows, rather than native plants in connection with erosion control and other land use management.

Department of Conservation (DOC)

DOC has management responsibilities for extensive public conservation lands, including the management of pests and weeds that threaten native species and ecosystems. To assist regional field managers and staff the department has an in-house research capacity to investigate a wide range of management-related issues. This includes research into the ecology of a range of native plants and ecosystems, the effects on them of weed and animal pests, and measures that can be taken to reduce the impacts of pests and restore degraded habitats. This research effort extends from coastal situations, freshwater and forests to South Island high country environments. DOC also contracts CRIs to undertake research as required.

As a rule DOC does not distinguish between research and management expenditures.

There is an extensive range of publications available to the public from its research and advocacy programmes that deal with practical aspects of managing weeds and pests as well as the promotion and management of native plants.

Some of these assist private landowners interested in managing native plants on their land.

Regional councils

Some councils contract for research to be undertaken relating to the conservation and management of native plants. This tends to have a strong management focus to meet the management responsibilities councils have under the RMA.

University research

The School of Forestry is located within the University of Canterbury and its courses and research are weighted to the use and management of introduced species. Some faculty pursue research interests into native plants and ecosystems. Research topics covered include: fragmentation and restoration ecology; conservation management; design of reserves; effectiveness of restoration plantings; indigenous forest ecology; and silviculture of indigenous species.

In the 2000/01 year PGSF provided \$179,000 for research at the Forestry School to assess the sustainability of Māori-owned Indigenous Forests, so as to increase self-sufficiency and prosperity of Māori. It is recognised that much of research also relates to forest owners in general through the improved performance of sustainable forest management in social, economic, and ecological terms.¹²⁶

In October 1999, a forum was held at the University of Waikato on "Native Trees for the Future".¹²⁷ It brought together researchers, managers and landowners concerned about the future of indigenous forest species and the tendencies to fund less and less research focused on indigenous tree species. The proceedings include papers on propagation, management of different species, ecology and management options and legal issues. The focus was not on utilising old-growth forests, but on the potential

of plantation native trees in agricultural landscapes.

The PGSF has provided \$197,000 to a University of Waikato project that is researching Māori sustainable development. While not specifically targeted at native plants it is intended to enhance Māori social and economic development by assisting tribal authorities and their memberships to define their own resources and taonga, and plan for the sustainable use and development of those resources.¹²⁸

The University of Lincoln is also active in the area of the ecologically sustainable use of native plants. It hosted a symposium in conjunction with the Ministry of Agriculture and Forestry and Landcare Research in January 2000 on Sustainable Management of Indigenous Forest.¹²⁹ The International Centre for Nature Conservation at Lincoln University is also active in this area organising workshops to facilitate debate on issues surrounding ecologically sustainable use of native plants.

In addition, Lincoln University has incorporated indigenous biodiversity into its demonstration organic farm project.

All Universities in New Zealand are actively involved in research on aspects of indigenous plant ecology. One of the most active in this area, however, is Otago University as it has specifically identified as an emerging area the need to undertake research on ecological, conservation and biodiversity issues. Over the last three years the university has won research funding of \$3.5 million. The scope of the work is broad, but does include research that assesses the patterns and processes in New Zealand plant communities; plant community and physiological ecology; and human impacts on soil and vegetation processes and patterns.

5.16 Publicly funded conservation and sustainable land management organisations

In New Zealand a number of organisations either entirely or mainly funded by the taxpayer are active in supporting the place of native plants on private land enhancing the conservation of indigenous species and habitats, and encouraging more sustainable land management.

These organisations can be described as either having a protection conservation focus, or working for conservation goals as part of broader sustainable management objectives over a range of land uses.

Conservation organisations

Nature Heritage Fund

The Nature Heritage Fund (NHF) is a contestable fund administered by an independent committee and serviced by the Department of Conservation. Originally called the Forest Heritage Fund, its focus was on indigenous forests, but in 1998 this scope was widened to include non-forest ecosystems. At present there are approximately 100,000 hectares under conservation management through the provisions of the fund. Landowners who wish to set aside areas for conservation can be supported through direct purchase, covenanting of land where the owner wishes to retain title, or by assisting with management costs.

Criteria developed by the fund as a basis for allocations are representativeness, sustainability, landscape integrity, and amenity and utility.¹³⁰

Nga Whenua Rahui

Nga Whenua Rahui is also a contestable fund with a similar structure to the Nature Heritage Fund. The Nga Whenua Rahui committee is appointed by the Minister of Conservation and administers the fund, which is also serviced by the Department of Conservation. However, the kaupapa takes a different approach to the NHF with mechanisms that focus on Māori landowners

retaining tino rangatiratanga. Agreements are subject to review, usually over a 25-year period.

At present there are about 112,000 hectares under Nga Whenua Rahui protection. There is a range of protection methods, including covenanting under a Nga Whenua Rahui kawenata. This allows for consideration of Māori values in terms of spiritually and tikanga. Cultural use of these natural areas is blended with the acceptance of public access within the agreements.

Māori reservations are another mechanism that can be used to protect places of cultural, historic or scenic interest in accordance with Part XVII of the Te Ture Whenua Act 1993. This involves the setting aside of areas as Māori reservations.¹³¹

Queen Elizabeth II National Trust

The National Trust is an independent trust established by the Queen Elizabeth the Second National Trust Act 1977, and administered by a board of directors. The objective of the Trust is to encourage and promote the provision, protection and enhancement of open space for the benefit and enjoyment of the people of New Zealand.¹³² The objective is to be pursued without jeopardising the rights of ownership.

A Queen Elizabeth II National Trust Open Space Covenant is a legal agreement between the National Trust and a landowner to protect a special open space feature in perpetuity (or, occasionally, for a specified time). Landowners often initiate contact with the National Trust, as it is seen to be independent. The Trust's approach relies on landowners' goodwill and commitment for the ongoing care and management of the covenanted area over the longer term.

To date, over 1,400 Open Space Covenants covering in excess of 50,000 hectares have been registered. These covenants protect a variety of open space, including forest and forest remnants, wetlands, lakes, peat lakes, coastline, tussock grasslands, tracts of rural landscape, archaeological sites, and geological formations.¹³³

Sustainable land management organisations

New Zealand Landcare Trust

The New Zealand Landcare Trust was established in 1996 to promote sustainable land management practices and help communities become more involved in land management issues. It is largely funded by central Government and is a component of its Sustainable Land Management Strategy. The funding level from Government is \$450,000 per year, and this commitment was confirmed in the 2001 Budget.

Landcare Trust also receives funding from private sources, including support announced in May 2001 by the Transpower - Landcare Trust Grants Programme.

The first priority of the trust is to inform the public about sustainable land management issues and practices and to promote, monitor and achieve improved land management performance in the community. The trust has no regulatory powers but operates as a facilitator for the initiatives of various landcare groups by providing help, information and technical advice. Landcare groups have been established in all regions, but their roles vary depending on local needs, which can include native plants on private land under more general concerns such as 'nature conservation', 'waterways protection', and 're-vegetation and replanting'.

5.17 Private organisations

This section gives a brief account of some of the private, often volunteer organisations that are actively involved at a national level in promoting the cause of native plants on private land. This can occur through:

- proactive liaison with key decision-makers in central and local government
- contributing to agencies' consultation rounds and to RMA consent processes
- providing information about the group's particular perspectives both on specific issues

and at broader policy levels.

In addition there are numerous community-based groups that are active at local levels with a wide range of initiatives for the propagation, planting and maintenance of native plants in habitats ranging from sand dunes and stream margins to hillsides and urban landscapes.

Royal Forest and Bird Protection Society

New Zealand's largest conservation society, Forest and Bird was formed in 1923 as the New Zealand Native Bird Protection Society (see section 5.3). From its beginnings the society has been involved in issues well beyond its core interests in the protection of native birds. The society's current objectives are to preserve and protect the indigenous flora and fauna and natural features and landscapes of New Zealand for their intrinsic worth and for the benefit of all people. The society and its many branch members have long taken an interest in the protection of native plants, advocating for their protection through the creation of national parks or other categories of protected areas. The society owns a number of forest reserves throughout the country where members actively control animal pests and weeds. Members are involved in restoration schemes and plant nurseries, such as the restoration and interpretation work, underway since 1985, at the Pauatahanui Reserve, a tidal marshland north of Wellington.¹³⁴

Fish and Game New Zealand

Fish and Game New Zealand is mandated under the CA to manage freshwater sports fishing and game bird hunting on behalf of anglers and hunters. One of its primary roles is conservation of habitat, specifically the places where sports fish (trout) and game birds (e.g. ducks, pheasant) live. The major interest is in protection of natural waterways and protection of wetlands. Fish and Game New Zealand operates through making submissions during planning processes under the RMA and through political and community advocacy. It gets directly involved with the

purchase and management of wetlands and with assisting landowners to create, enhance and manage wetlands. Planting advice stresses the importance of using native plants if a natural wetland is the goal, although introduced plants also feature on 'suitable species' lists for purposes such as amenity and food.¹³⁵

Ducks Unlimited New Zealand Inc.

Ducks Unlimited New Zealand has similar interests to Fish and Game in ensuring there is quality habitat for New Zealand game birds. A membership-based society, it is dedicated to the conservation of New Zealand wetlands through: wetland restoration and development, conservation programmes for threatened waterfowl, and advocacy and education of wetland values. Ducks Unlimited has purchased a number of significant wetlands throughout the country and run campaigns aimed at increasing the numbers of the threatened native brown teal (pateke) and blue duck (whio). Tips are given on which native species to plant to encourage native birdlife in general as well as game birds. Both Ducks Unlimited and Fish and Game New Zealand have a national structure and regional field staff.¹³⁶

New Zealand Native Forest Restoration Trust

The trust was founded in 1980 as an outcome of the 'tree top protests' that ended the logging of podocarps in Pureora Forest. The objects of the trust are to encourage and undertake the restoration of degraded or destroyed New Zealand indigenous habitats and plant communities. The trustees have raised money and purchased for restoration over 4,000 ha, all of which is now under covenant. The trust has been particularly active in Northland where purchases adjacent to the Waipoua Forest and extensive replanting aim to improve the integrity of the forest ecosystem and provide links between separate areas of forest. Purchase, followed by active restoration work, has also occurred in the King Country, around the Waitomo Caves, the Wairarapa and in a number

of other areas. The Trust works with the Royal Forest and Bird Protection Society, DOC, the Queen Elizabeth the Second National Trust and other conservation organisations.¹³⁷

NZ Farm Forestry Association

Formed in 1957, the NZFFA has over 4,000 members throughout New Zealand in over 30 branches. Their focus is strongly oriented towards the planting and management of exotic timber species, but the association does have an indigenous forest section. This section of NZFFA promotes indigenous forestry (including timber production), and the "ecologically sustainable management of indigenous forests so that they retain their unique characteristics for the benefit of future generations". Members share information and experience on the management of native plants and many are actively involved in planting programmes with native species for conservation, amenity or long-term use objectives.¹³⁸

New Zealand Institute of Forestry¹³⁹

Founded in 1927, the New Zealand Institute of Forestry has as members people who are currently studying, working in, or have an interest in forestry. There were around 800 members (in five categories) in 2000, representing disciplines such as economics, law, engineering and resource management as well as forestry. From 1996 full members of NZIF wishing to provide forestry consulting services to the public could become registered forestry consultants and obtain an annual practising certificate. The institute enables members to exchange ideas and information on forest management, utilisation, research and consulting. While its focus is largely on exotic timber species, the growth in farm forestry is increasing landowner interest in the use and management of native species.

The institute has developed an indigenous forest policy which states that it believes that New Zealand's indigenous forests have important ecological, cultural, production and scientific

values that contribute to the economic and social well-being of the nation. The policy also states that the institute advocates and supports a range of goals. The first of these is:

*a forest ecosystem management approach to manage New Zealand's indigenous forests sustainably and, in particular, to sustain forest productivity, health, biodiversity, soil quality, water quality, natural landscapes, and the full range of natural forest ecological processes*¹⁴⁰

New Zealand Ecological Society

The New Zealand Ecological Society was formed in 1951 to promote the study of ecology and the application of ecological knowledge in all its aspects. The society attempts to encourage ecological research, increase awareness and understanding of ecological principles, promote sound ecological planning and management of the natural and human environment and promote high standards both within the profession of ecology by those practising it, and by those bodies employing ecologists.

Activities include an annual conference, a biannual publication of a scientific journal, *New Zealand Journal of Ecology*, a regular newsletter, with one objective of fostering debate on current ecological issues in New Zealand and also the provision of special purpose publications.¹⁴¹

5.18 Corporate involvement with native plants on private land

Corporate landowners

Forestry corporations own a significant proportion of land in pine plantations that also include remnants of indigenous vegetation. In 1999 corporations owned 47% (805,000 ha) of planted production forests. A further 44% (770,000 ha) were privately owned (including privately owned companies, partnerships, trusts and Māori trusts).¹⁴² There is also a corporate presence in farming activities and this seems to be especially true for larger sized properties.

There is a perception that there is an increasing corporate ownership of farms. The concern expressed in discussions for this project was that corporate landowners are less likely to have a commitment to the protection of native plant remnants on the lands they manage. This view is based on the perception that corporate farms, being answerable to shareholders, are managed principally to maximise profit. Therefore, the managers of these farms will have only a limited ability to make decisions that trade-off those activities that provide an economic return for those that provide other sorts of benefits, such as conservation and amenity values. There was also a perception that the corporate farming model is not conducive to the development of a stewardship ethic, unlike the intergenerational family farm model.

Corporate conservation efforts

Some corporations have initiated and sponsored projects for the benefits of native plants in the landscape.

Project Crimson, established by NZ Forest Products (now Carter Holt Harvey) in 1989, is one such scheme that has been taken up by the broader community. Initially focusing its efforts on pohutukawa restoration in the North, the Project Crimson Trust extended its work in 1996 to include the three species of New Zealand tree rātā. The trust is involved with a range of community-based projects, including conserving existing stands, research, advocacy, plant nurseries, and restoration plantings. Over the last ten years the trust has established 200,000 pohutukawa trees.

Another organisation is the recently founded New Zealand National Parks and Conservation Foundation, an independent charitable trust. It was established to promote and support the conservation and protection of New Zealand's unique natural heritage.

The foundation's current aim is to build an endowment to fund \$2 million over the next three years using corporate and private support. From

this fund, grants will be made to a range of conservation projects, particularly those supporting projects in and around national parks.¹⁴³

New Zealand Forest Accord

In 1991, the New Zealand Forest Owners' Association (representing a number of the major forestry companies), the New Zealand Timber Industry Federation, the New Zealand Farm Forestry Association and the New Zealand Wood Panels Manufacturers' Association signed an agreement with a number of environmental organisations.¹⁴⁴

This agreement was the 'New Zealand Forest Accord' and it had a range of objectives intended to protect naturally occurring areas of native plants within land owned or managed by the companies.

The accord defines naturally occurring indigenous vegetation to include:

- any emerging area of tree species of 5 hectares or greater
- any area between 1 and 5 hectares where the native vegetation has an average canopy height of at least six metres
- any area recommended for protection under the Protected Natural Area Programme, or classified as a Site of Special Wildlife Interest or would qualify as a Recommended Area for Protection.

The accord does recognise that production management and the harvesting of naturally occurring indigenous forest can occur, but this can only happen where such an activity is conducted on a sustainable basis taking account of the rate and method of extraction. The forest ecosystem in the area must be maintained in perpetuity.

The accord did not apply to those forests referred to under the West Coast Accord and the transitional arrangements in Southland.¹⁴⁵

The Principles of Commercial Plantation Forest Management in New Zealand

The Principles of Commercial Plantation Forest Management in New Zealand are an attempt to build on the Forest Accord. The principles are an agreement made in 1995 between the New Zealand Forest Owners Association and New Zealand Farm Forestry Association and the Royal Forest and Bird Protection Society, World Wide Fund for Nature - New Zealand, Federated Mountain Clubs and the Maruia Society (now the Ecologic Foundation).

The agreement attempts to address some of the environmental concerns with respect to issues relating to the management of plantation forestry. The objective of the agreement is:

To promote understanding between the signatory parties with a view to New Zealand achieving environmental excellence in plantation forest management and participating as an effective advocate internationally for the sustainable management of plantation forests and the protection, preservation, and sustainable management of natural forests. These principles are complementary to the New Zealand Forest Accord. (August 1991)

In the agreement consideration is made of the impact of plantation management on:

- threatened wildlife habitat within plantation forests
- indigenous biodiversity in plantation forests
- prevention of the spread of exotic wildings species
- water, soil and ecosystem values
- risks associated with the use of agrichemicals, biological controls and pests
- social factors such as public access, tenure and rights use, landscape values and community consultation.

During discussions for this paper some concerns have been raised about the Forest Accord and the Principles of Commercial Plantation Management In New Zealand. These concerns include:



- the number of major forestry companies that have entered New Zealand and that are not bound by the accord
- that while the companies are required under the principles agreement to undertake restoration of natural areas many of these are often not well maintained
- that the companies have sold lands including natural areas in them to non-signatory third parties
- that there is inadequate recognition of the provision in the accord that allows for the sustainable management of natural areas for production by some of the environmental group signatories.¹⁴⁶

¹ DEST 1993

² MAC 2000, p 21.

³ MFE and DOC 2000.

⁴ MFE 2000.

⁵ Stephens 1999.

⁶ MAC 2000, p 31.

⁷ MAC 2000, p 21.

⁸ MAC 2000, p 31.

⁹ Norton and Roper-Lindsay 1999.

¹⁰ *ibid.*

¹¹ Shepard 1969 & Park 1995.

¹² MFE 1997, p 9.30.

¹³ Dunlap 1999.

¹⁴ Thom 1987.

¹⁵ Roche 1987.

¹⁶ MFE 1997, p 8.31.

¹⁷ MFE 1997, p 8.6.

¹⁸ NZCA 1997, p 113.

¹⁹ Roche 1987.

²⁰ Thom 1997, p 120.

²¹ Thom 1987, p 126.

²² Roche 1987, p 17.

²³ NZCA 1997, p 115.

²⁴ This is consistent with the definition of 'conservation' in the Conservation Act 1987. The Act defines conservation as meaning "the preservation and protection of natural and historic resources for the purpose of maintaining their intrinsic values, providing for their appreciation and recreational enjoyment by the public, and safeguarding the options of future generations".

²⁵ Leist and Holland 2000.

²⁶ WCED 1987, p 8.

²⁷ *ibid* p 8.

²⁸ Leist and Holland 2000.

²⁹ AtKisson 1999, p 145.

³⁰ Hamilton et al. 1998, p 96.

³¹ AtKisson 1999, p 9.

³² United Nations International Covenant on Economic, Social and Cultural Rights and United Nations International Covenant on Civil and Political Rights.

³³ Holling 1995, p 9.

³⁴ Holling 1995, p 6.

³⁵ Allen 1999.

³⁶ Begon et al. 1996.

³⁷ Reducing complex issues or scientific problems to their basic component parts; the expectation that a system can be understood in terms of its isolated parts (Concise Oxford Dictionary).

³⁸ Holling 1995, p 13.

³⁹ Holling 1995, p 9.

⁴⁰ O'Connor 1998, p 17.

⁴¹ Orbell 1985, p 167.

⁴² Barlow 1991, p 148.

⁴³ Manatu Māori 1991, pp 2-3.

⁴⁴ NZCA 1997, p 92.

⁴⁵ Waitangi Tribunal 1993, p 18 (quoting the NZ Māori Council 1983, from Kaupapa: Te Wahanga Tuatahi).

⁴⁶ NZCA 1997, p 88 (quoting Margaret Mutu 1994, from The use and meaning of Māori words borrowed into English for discussing Resource Management and Conservation in Aotearoa/New Zealand).

⁴⁷ Waitangi Tribunal 1983.

⁴⁸ Swidden garden - a gardening method that uses slash and burn techniques to clear the land.

⁴⁹ Park 1995, p 47.

⁵⁰ NZCA 1997, p 94.

⁵¹ Jacob Haronga FOMA, pers comm.

⁵² McGowan 1999.

⁵³ Interview with Te Taru White, Māori Forestry Association, NZ Forest Industries 29(4), April 1998, p 11.

⁵⁴ *ibid* p 11.

⁵⁵ *ibid* p 12.

⁵⁶ PCE 1998, pp 16-26.

⁵⁷ *Pahia and District Citizens Assn Inc v Northland Regional Council* (unreported, Environment Court A77/95, 10 August 1995, Judge Sheppard), 10/8/95.

⁵⁸ Contemporary press item quoted in Murray Parsons' Introduction to the Biodiversity Ethics Symposium, Lincoln University, July 1996.

⁵⁹ McGowan 1999.

⁶⁰ Kel Sanderson, Director, Business and Economic Research Limited, Wellington, 2001, pers comm.

⁶¹ See section 5.16 for a description of the functions these organisations.

⁶² MAF 2000.

⁶³ Tim Thorpe, Forestry Consultant, 2001, pers comm.

⁶⁴ FSC 2001.

⁶⁵ Landcare Research - Manaaki Whenua 2001.

⁶⁶ Livesey 1999 and Merrifield 1996.

⁶⁷ Ricker kauri - young kauri.

⁶⁸ Roger MacGibbon, Environmental Consultant, Managing Director, Natural Logic Limited, Taupo, 2001 pers comm.

⁶⁹ Bergin 1999.

⁷⁰ Barton 1999.

⁷¹ Stephenson 1999.

⁷² Horgan 1999.

⁷³ Wallingford 2001.

⁷⁴ Don Bell, Vice President of the New Zealand Beekeepers Association (Inc), Sheffield, New Zealand, 2001, pers comm.

⁷⁵ David Given, Manager, International Centre for Nature Conservation, Lincoln University, New Zealand, 2001, pers comm.

⁷⁶ MAC 2000, p 56.

⁷⁷ This section is indebted to a report by Philip A Joseph, commissioned by the Ministry for the Environment; Property Rights and Environmental Regulation under the Resource Management Act 1991, December 1999.

⁷⁸ Williams 1997, p 9.

- ⁷⁹ *ibid* p 10.
- ⁸⁰ This principle can be traced back to statutes of the English Parliament dating from the early 15th century and is believed to have its origins in the Magna Carta 1215, although the Magna Carta does not explicitly mention compensation. See Joseph 1999, p 10-11.
- ⁸¹ Memon 1993.
- ⁸² Scott 1996.
- ⁸³ Memon 1993.
- ⁸⁴ *ibid*.
- ⁸⁵ Environment Act 1986 s31(a) - (e).
- ⁸⁶ Conservation Act s6(a), (b) and (f).
- ⁸⁷ *ibid* s2.
- ⁸⁸ Intrinsic values are not defined in the Conservation Act; however the Resource Management Act defines them as:
in relation to ecosystems, means those aspects of ecosystems and their constituent parts which have value in their own right, including:
- (a) *Their biological and genetic diversity*
- (b) *The essential characteristics that determine an ecosystem's integrity, form, functioning, and resilience.*
- ⁸⁹ Memon 1993.
- ⁹⁰ There is also provision for Māori customary use and the New Zealand Conservation Authority is currently working on this issue, NZCA 1997.
- ⁹¹ Native Plants Protection Act 1934 (NPPA) s4(1) with certain exceptions e.g. reasonable quantities taken for scientific research.
- ⁹² Specified by Warrant of the Governor General, 17 April 1935.
- ⁹³ Native Plants Protection Act 1934 s8.
- ⁹⁴ FA s67D(i)(b)(iii) and (vi) and s67D(3).
- ⁹⁵ FA s67M (2)(a).
- ⁹⁶ Ministry of Forestry 1997, FA s67M(3).
- ⁹⁷ *ibid*, FA s67N and 2nd Schedule clause 10(2)(a).
- ⁹⁸ FA 67F(2).
- ⁹⁹ FA s67V.
- ¹⁰⁰ Information in the document brought up to date by personal communication with MAF officials.
- ¹⁰¹ Primary Production Committee 2000.
- ¹⁰² The South Island Landless Natives Act 1906 was repealed by the Native Lands Act 1909, before all of the grants were implemented, and further implementation was barred. Ngai Tahu Deed of Settlement s15D 1997.
- ¹⁰³ Hansard, 11 March 1993.
- ¹⁰⁴ *Minister of Conservation v Southland District Council* (Unreported, Environment Court A039/01, 19 April 2001, Sheppard J).
- ¹⁰⁵ See < http://www.mpci.org/meetings/future/broch_e.html#2>
- ¹⁰⁶ See < http://www.mpci.org/meetings/future/broch_e.html#4>
- ¹⁰⁷ Section 5. Purpose-
- (1) The purpose of this Act is to promote the sustainable management of natural and physical resources.
- (2) In this Act "sustainable management" means managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables peoples and communities to provide for their social and economic and cultural well being and for their health and safety while-
- (a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations
- (b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystems
- (c) Avoiding, remedying or mitigating any adverse effects of activities on the environment.
- ¹⁰⁸ *NZ Rail Ltd v Marlborough District Council* [1994] NZRMA 70, 85.
- ¹⁰⁹ See for example *Waitakere Ranges Protection Society Inc v Waitakere City Council* (Unreported, Environment Court A89/00, 19 July 2000, Whiting J), paragraphs [54] to [72].
- ¹¹⁰ *Environmental Defence Society v Mangonui County Council* [1989] 3 NZLR 257, 262 [EDS]. This case considered section 3(1)(c) of the Town and Country Planning Act 1977 (TCPA) which, slightly modified, became RMA s6(a).
- ¹¹¹ See for example Waitakere (endnote 109).
- ¹¹² *Wakatipu Environmental Society Inc v Queenstown Lakes District Council* [2000] NZRMA 59,82.
- ¹¹³ *Waitakere Ranges Protection Society Inc v Waitakere City Council* (Unreported, Environment Court A89/00, 19 July 2000, Whiting J) paragraph [53].
- ¹¹⁴ See *Nugent Consultants Ltd v Auckland City Council* [1996] NZRMA 481.
- ¹¹⁵ RMA s32(1)(a)(ii).
- ¹¹⁶ DOC 1999.
- ¹¹⁷ *ibid*.
- ¹¹⁸ Article by David Norton entitled *Coast fears private land grab*, The Press, 11 June 2001.
- ¹¹⁹ RMA s30(1)(a) and (c).
- ¹²⁰ Regional Pest Management Strategies s71 Biosecurity Act 1993.
- ¹²¹ RMA Amendment Bill 1999 clauses 10A and 10B.
- ¹²² Spinifex - coastal dune plant, *Spinifex sericeus*
- ¹²³ Foundation for Research, Science and Technology, 2001.
- ¹²⁴ *ibid*.
- ¹²⁵ *ibid*.
- ¹²⁶ *ibid*.
- ¹²⁷ Silvester and McGowan 1999.
- ¹²⁸ Foundation for Research, Science and Technology 2001.
- ¹²⁹ Stewart et al. 2000.
- ¹³⁰ www.doc.govt.nz/commu/priv/fhf.htm
- ¹³¹ www.doc.govt.nz/commu/priv/ngawhen.htm
- ¹³² Queen Elizabeth the Second National Trust Act 1977.
- ¹³³ www.nationaltrust.org.nz/about/index.html
- ¹³⁴ www.forest-bird.org.nz/index.asp
- ¹³⁵ www.fishandgame.org.nz/
- ¹³⁶ www.ducks.org/conservation/newzealand.asp
- ¹³⁷ www.geocities.com/RainForest/6581/
- ¹³⁸ www.nzffa.org.nz/main.html
- ¹³⁹ www.fore.canterbury.ac.nz/nzif/home.html
- ¹⁴⁰ www.fore.canterbury.ac.nz/nzif/indigens.htm, 9 June 2001.
- ¹⁴¹ www.nzes.org.nz/
- ¹⁴² www.maf.govt.nz/MAFnet/publications/nefd99/nefd9915.htm
- ¹⁴³ www.nationalparks.org.nz/
- ¹⁴⁴ The Royal Forest and Bird Protection Society of New Zealand (Inc.) together with the following environmental or recreational organisations which collectively comprise the New Zealand Rainforest Coalition:
- Environment & Conservation Organisations of N.Z. Inc.
 - Federated Mountain Clubs
 - Friends of the Earth
 - Beech Action Committee
 - Pacific Institute of Resource Management
 - World Wide Fund for Nature (N.Z.)
 - Japan Tropical Forest Action Network
 - Tropical Rainforests Action Group and
 - Maruia Society.
- ¹⁴⁵ <http://homepages.caverock.net.nz/~bj/beechnzaccord.htm>
- ¹⁴⁶ http://nzfoa.nzforestry.co.nz/pfm_principles.asp

Glossary - Nga Kupu Māori

Aotearoa	New Zealand	mana whenua	traditional status, rights and responsibilities of hapū as residents in their rohe
atua	gods	marae	local community and its meeting places and buildings
hapū	family or district groups, communities	matauranga	traditional knowledge
harakeke	flax, used in weaving, <i>Phormium tenax</i>	mauri	essential life force or distinctiveness that enables each thing to exist as itself
Hawaiki	original Pacific homeland of Māori	pīngao	coastal dune plant valued for weaving, <i>Desmoschoenus spiralis</i>
hui	gatherings, discussions, meetings, usually on marae	rāhui	protection of a place or resources by forbidding access or harvest
iwi	tribal groups	rangatahi	younger generations
kaitiaki	iwi, hapū or whanau group with the responsibilities of kaitiakitanga	rangatiratanga	the right of iwi, hapū and whanau to make their own decisions about things that concern them
kaitiakitanga	the ongoing necessity for tangata whenua to look after the taonga, both physical and intangible, that are their heritage	raranga	weaving
karakia	prayer, incantation, expression of respect	rohe	geographical territory of an iwi or hapū
kaumātua	elder, decision-maker for the iwi or hapū	rongoā	plants traditionally used for medicinal purposes
kaupapa	plan, strategy, tactics, methods, fundamental principles	runanga	committee of senior decision-makers of an iwi or hapū
kawanatanga	government, the right of the Crown under the Treaty of Waitangi to govern and make laws	tangata whenua	people of the land, Māori people
kawenata	covenant, mechanism established under the Nga Whenua Rāhui programme	taonga	valued resources, assets, prized possessions both material and non-material
kereru	wood pigeon	tapu	the particular sacredness of people, things and places for particular reasons
kōwhaiwhai	painted scroll ornamentation	te ao marama	the world of light
kukupā	wood pigeon	te reo	the Māori language
mahinga kai	places where food and other resources are traditionally gathered, and the gathering and management of those resources	Te waonui a Tāne	the great forests of Tāne
mana	the status and authority of tangata whenua	tikanga	customary correct ways of doing things

Acronyms

tuku iho	passed down from the ancestors	CA	Conservation Act 1987
wāhi tapu	special and sacred places	CBD	Convention on Biological Diversity
waka	canoe	CRI	Crown Research Institute
wānanga	place of education, university	DOC	Department of Conservation
whakapapa	genealogy, ancestry, identity with place, hapū and iwi	DEST	Commonwealth of Australia Department of the Environment, Sport and Territories
whanau	family groups	EA	Environment Act 1986
whanaungatanga	relationship, kinship, bonds	EC	Environment Court
whareniui	meeting house on the marae	FA	Forests Act 1949
		FAA	Forests Amendment Act 1993
		FOMA	Federation of Māori Authorities
		FSC	Forest Stewardship Council
		FRI	Forest Research Institute
		IFU	Indigenous Forestry Unit
		ITA	Income Tax Act 1994
		KNE	Key Native Ecosystem programme of Wellington Regional Council
		MAC	Ministerial Advisory Committee on Biodiversity and Private Land
		MFE	Ministry for the Environment
		NGO	Non Governmental Organisation
		NHF	Nature Heritage Fund
		NZCA	New Zealand Conservation Authority
		PCE	Parliamentary Commissioner for the Environment
		PNAP	Protected Natural Area Programme
		RMA	Resource Management Act 1991
		SILNA	South Island Landless Natives Act 1906 (repealed)
		SNA	Significant Natural Area
		SOE	State Owned Enterprise
		TLA	Territorial Local Authority

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