

WEAVING RESILIENCE  
INTO OUR  
WORKING LANDS:  
recommendations for the  
future roles of native plants



Office of the  
PARLIAMENTARY COMMISSIONER FOR THE  
ENVIRONMENT  
Te Kaitiaki Taiao a Te Whare Pāremata  
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## Preface

What is this report all about? At its simplest it is about a deep clash of values (or mindsets) over what we should do with the native plants growing, or planted, on privately owned lands. Should these plants all be protected for their conservation values, or should some be developed in ways that will also contribute directly to wealth creation?

This clash is born out of widespread recognition that New Zealand has lost most of its former indigenous forest cover, particularly on lowland areas. This loss has led, rightly, to a major focus on protecting what is left – largely by purchase but also by covenanting. All this is well known, and the role of protection and preservation has been widely debated during the development of the New Zealand Biodiversity Strategy. The conservation ethic is well developed in New Zealand. So, what else should we be thinking about regarding the future of our native plants?

I initiated the exploration of the roles of native plants on private lands because I believed there were many barriers to their expansion; constraints on their potential to contribute to the sustainability of land uses, wealth creation and indigenous biodiversity. The study proved to be one of the most challenging, and yet rewarding, I have undertaken. Challenging because of the deep passions that flow around the topic of ‘uses’ of native plants in New Zealand, and rewarding to discover the great things some Kiwis are doing with our Gondwanan vegetation.

The aim of the discussion paper, *Weaving Resilience into our Working Lands: future roles for native plants on private land*, produced in 2001, and this report, following consideration of 58 submissions, is to release the creativity that is being applied to native plants and their uses on farms and lifestyle blocks throughout New Zealand. However, to do that, we have to be very realistic about the nature of the barriers to releasing creativity.

The first barrier is in the current mindsets and understandings present in New Zealand. At the core of the debates swirling around the protection and management of native plants is a fundamental difference of view about our ability, as a society, to interact with native forest, grasslands and wetlands. Some people in New Zealand believe passionately that we should manage native plant systems sustainably (particularly re-growth or planted) both for production and conservation purposes. Others, equally passionately, believe this is not possible and that there is not even a debate to be had. As long as the current ‘stand off’ between these two positions continues we will continue to forgo opportunities to maintain our amazing biodiversity and make innovative use of the species of native plants on the lands we choose not to protect formally. A change in mindsets is urgently needed.

The second barrier to releasing creativity is more obvious, being the lack of knowledge of the potential applications and sustainable management of many of our native plants and trees.

The third barrier is in the current legislative and policy frameworks that give limited scope for native plants to provide both conservation and wealth creation benefits on private land.

Does the feedback on the discussion paper *Weaving Resilience* indicate any consensus on the need to rethink the roles and opportunities for native plants on private land? The answer is a resounding yes! Almost all of the submissions believed that a new approach and concerted action are needed. It was widely acknowledged in the submissions that the current political and policy ‘climate’ continues to favour the sharp separation of conservation and commercial production, with little role for native plants in the latter category.

To stimulate action I have targeted my recommendations on three areas: research, regulatory frameworks and taxation. Realising the potential of native plants first depends on knowing what their attributes are (ecologically and economically) via research. Secondly, it depends on realising the benefits on private land by facilitating opportunities through policy, regulation and taxation. At present, there are clear gaps and barriers in all these areas.

I urge all readers to reflect on the risks that biodiversity in New Zealand faces by our not addressing the barriers in mindsets, the limitations of our research and the legislative hurdles. Having reflected, please consider what you can do to contribute to the actions needed and, most of all, to keep open a robust debate about the roles of native plants on private land.

A handwritten signature in black ink, reading "J Morgan Williams". The signature is written in a cursive style with a large initial 'J'.

Dr J Morgan Williams  
Parliamentary Commissioner for the Environment



# Introduction

## 1.1 Background

In June 2001 the Parliamentary Commissioner for the Environment (PCE) released a discussion paper *Weaving Resilience into our Working Lands: future roles for native plants on private land* (referred to throughout this paper as *Weaving Resilience*).<sup>1</sup> The discussion paper arose in response to the ongoing decline of New Zealand's indigenous biodiversity, and out of a concern for the ecological sustainability of land uses that support our primary industries.

Various agencies within New Zealand are putting great emphasis on how to halt the disturbing trend of decline in our native plant species. The management of native plants, and plant communities, currently focuses on preserving and protecting indigenous biodiversity. Preservation efforts have concentrated on securing areas of significant biodiversity value either through covenants, or purchase with public funds. In *Weaving Resilience*, the Commissioner expressed strong support for these preservation initiatives and endorsed the efforts by individuals and groups to restore threatened ecosystems. This effort is much needed, as the *New Zealand Biodiversity Strategy* states: "Without increased and more targeted management efforts, driven by clear biodiversity goals, the decline in biodiversity will continue, with irreversible consequences".<sup>2</sup>

However, there has not been adequate exploration of the potential beneficial roles that native plants can play on our working lands. The limiting of efforts to a focus on preserving and restoring remnant plant communities may not suffice in ensuring New Zealand's indigenous biodiversity is maintained. Additionally, this narrow focus may fail to harness the potential contribution that native plants can make in improving the ecological sustainability of current production

systems, or the range of possibilities for native plants to be the basis of future systems.

*[The discussion document] addresses a major gap in recent conservation thinking and strategy, and appropriately emphasises the opportunities for re-establishing native plants as an integral component of working landscapes, rather than solely protecting remnants.*<sup>3</sup>

There is a large body of opinion that argues that sustainable use of native plants should not be a part of New Zealand's economic future and wealth creation. This, in the Commissioner's view, is generating major barriers to the management of native plants on private lands in ways that could provide multiple benefits to New Zealand and, by so doing, expand the total area of indigenous species. These barriers must be acknowledged, discussed and addressed. The *Weaving Resilience* discussion paper and this follow-up report aim to do that by emphasising that native plants can be managed to support both utilitarian and biodiversity conservation goals.

Native plants have roles on our working lands in addition, and complementary, to that of contributing to our indigenous biodiversity. The Commissioner previously highlighted these roles in the context of:

- New Zealand's reliance on biotic resources for much of its wealth creation
- ensuring that ecosystems are kept resilient and healthy
- a world market that is demanding higher environmental standards
- a growing realisation by New Zealanders that our native flora and fauna contribute to our sense of identity.

The Commissioner's vision is that, in time, native plants will be a vital, and much more widespread, component of New Zealand's working lands. As such, and in addition to biodiversity objectives,

they will be widely valued and managed for their essential contribution to the wellbeing of society, our cultural identity, the sustainability of our land management and the creation of wealth. This is a long-term vision, but efforts to realise it must start now.

## 1.2 Scope of the project

New Zealand's working lands are a major source of economic wealth to New Zealand. At present, this wealth creation relies heavily on exotic plant and animal species.

Some submissions to the *Weaving Resilience* discussion paper queried the Commissioner's sole focus on working lands and asked for a broader focus to be considered, such as on urban areas, aquatic ecosystems, and even parts of the conservation estate. The importance of these places is acknowledged and recognised by the Commissioner. However, our working lands make up approximately 70 percent of the total land area in New Zealand and, as such, have the potential to make an enormous contribution to the following goals:

- protecting indigenous biodiversity
- fulfilling cultural values
- realising new economic opportunities
- developing greater ecological resilience of the biotic resources that are the basis of the nation's wealth creation.

There is a broad range of management opportunities for native plants on working lands that will further these goals. The adoption of these management opportunities will extend the presence of native plants on working lands, from permanent reserves through to a diversity of ecologically sustainable production areas. Native plants will then be present in many forms, from near natural communities to mixtures of native and exotic plant species that are intensively managed.

It is necessary to consider seriously the opportunities that will help weave native plants back into the mainstream of New Zealand's working lands, and thereby reverse the trend of the last 200 years that has resulted in native plants becoming increasingly marginalised.

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<sup>1</sup> Parliamentary Commissioner for the Environment (PCE) (2001) *Weaving Resilience into our Working Lands: future roles for native plants on private land*. PCE, Wellington.

<sup>2</sup> Department of Conservation and Ministry for the Environment (DoC and MfE) (2000) *The New Zealand Biodiversity Strategy: Our chance to turn the tide. Whakakōhukihukitia Te Tai Roroku Ki Te Tai Oranga*. DoC and MfE, Wellington.

<sup>3</sup> Submission from Simon Swaffield, Professor of Landscape Architecture, Lincoln University, Canterbury.



# Section 2

## Summary of the *Weaving Resilience* discussion paper

This section provides a brief summary of the key concepts and ideas discussed in the *Weaving Resilience* discussion paper. Those readers who are already familiar with this document may wish to proceed directly to section 3 of this report.

### 2.1 Introduction

The *Weaving Resilience* discussion paper asked two questions:

- Is the vision of a broader set of roles for native plants on working lands a valid concept?
- If so, what are the current barriers and future opportunities of such a concept?

To gain a better understanding of the issues, readers can access the full discussion paper on the website of the Parliamentary Commissioner for the Environment.<sup>4</sup>

### 2.2 Uses and services provided by native plants

The values, services and uses provided by indigenous ecosystems are extensive. These can be categorised as those that have no apparent economic (commercial) value and those that do have an economic (commercial) value.

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#### *Uses and services with no direct or indirect economic value<sup>5</sup>*

- Intrinsic values – qualities and existence values.
- Identity and sense of place:
  - national (icon species, for example, cabbage tree, pohutukawa, silver fern)
  - regional and district (characteristic landscapes and vegetation patterns, for example, Northland's kauri forests, Otago's tussock grasslands)

- local and personal (identification of communities, families and individuals with the special plants of their home environments).
- Habitat for both indigenous and exotic wildlife.
- Aesthetic, amenity and landscape values.
- Traditional and cultural values of taonga for tangata whenua.

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### ***Uses and services with direct or indirect economic value***

#### *Non-extractive*

- Ecosystem services – which include maintenance of biodiversity, water catchment and purification, waste decomposition, carbon sequestration, nitrogen fixation, weed suppression, soil generation and protection, riparian protection, pollination, and nutrient cycling.
- Ecotourism and recreation services.
- Real estate values.

#### *Extractive*

- Timber harvested sustainably from existing or newly established forests.
- Other products including honey, oils, resins, biological compounds, medicinal products, flax fibres, genetic resources.
- Mahinga kai and rongoā resources.
- Freshwater fisheries improved by riparian or wetland vegetation.
- Grazing of indigenous grasslands.

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## **2.3 Indigenous biodiversity**

Biological diversity, or biodiversity, describes the richness, diversity and variability among all living organisms and ecosystems.

The Ministerial Advisory Committee on Biodiversity and Private Land (MAC) pointed out that integrating private land into New Zealand's efforts to enhance biodiversity would require collaborative approaches and new ways of

encouragement to involve landowners, tangata whenua, councils and other interested parties. The Committee concluded that exploration is required into the extent to which this integration will include ecologically sustainable use of indigenous plants.<sup>6</sup>

## **2.4 Ecological significance**

The term 'ecologically significant' is used to identify areas for protection under the Resource Management Act 1991 (RMA).

People have a range of different views as to what is ecologically significant and, by implication, what management approaches are appropriate for these areas.

## **2.5 Preservation and conservation**

There are two identifiable perspectives on the preservation and conservation of New Zealand's indigenous biodiversity:<sup>7</sup>

- conservation equals preservation, and the best way to prevent further losses of indigenous species and ecosystems is to set aside areas free from normal human enterprises and exploitation; protection is best achieved through the purchase, acquisition or covenanting of areas containing native plants, or through regulation or other planning mechanisms
- conservation includes preservation, but exists within a broader continuum that includes non-extractive uses, such as, enjoyment of wilderness, through to the ecologically sustainable use of natural resources.

## **2.6 Ecological sustainability**

Ecological sustainability is of fundamental importance to New Zealand's social, cultural, political and economic future. The concept of ecological sustainability has been defined by the Commissioner as one that:

- encompasses biodiversity, as a core component of ecological services



- works within ecological limits and the carrying capacities of the biosphere
- recognises the importance of complex biophysical systems and processes
- ensures ecological services and natural processes are maintained into the future
- maintains natural capital
- enhances the resilience and robustness of the environment.

## 2.7 Managing for change and resilience

There is an increasing awareness that natural systems are complex non-linear systems with different capacities to cope with natural and human impacts. Environmental management needs to evolve to incorporate:

- integrated policies that are flexible and adaptive
- close monitoring to increase knowledge of trends in ecosystem health and improve responsiveness
- research that integrates a broad range of disciplines and perspectives
- active citizen involvement.

## 2.8 Tangata whenua

There are important traditional, spiritual and practical relationships between tangata whenua and native plants. These include the concepts of tikanga, mauri, tāpu, mana, rangatiratanga, and kaitiakitanga (see Glossary – Nga Kupu Māori).

Māori, as owners of the majority of the remaining indigenous forest on private land (approximately 80 percent), must be engaged in any process involving the future roles of native plants.<sup>8</sup>

It is important to recognise Te Tiriti o Waitangi (the Treaty of Waitangi) and the implications it has for the management of native trees and plants under the RMA. The RMA requires councils to take into account the principles of the Treaty of Waitangi and to recognise and provide for the

relationship of Māori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu and other taonga.

## 2.9 Markets

Market mechanisms could provide a financial incentive to landowners to plant and nurture native plants on their properties. The discussion paper canvassed the:

- Appropriate role of markets in encouraging the protection and ecologically sustainable use of indigenous plants.
- Limitations of markets.
- Role of forest certification as a quality assurance (and enforcement) mechanism.
- Ability of markets to give a monetary value to those ecosystem services provided by native plants, such as markets that:
  - promote carbon sequestration through the protection and establishment of indigenous ecosystems
  - place a value on the presence of indigenous biodiversity on private property.
- Economic opportunities and barriers faced by those considering establishing new areas of native plants (primarily for timber production).
- Treatment of native plants under the Income Tax Act 1994.

## 2.10 Rights and responsibilities of landowners

Differing views on the property rights of individuals, and what those rights are, have an impact on:

- the extent to which society, through the actions of government, can determine appropriate roles for native plants on privately owned property
- the role and effectiveness of regulation as a means of protecting indigenous biodiversity
- who should pay for protecting native plants on private land.

Concepts of property rights are often based on strongly felt beliefs about the need for fairness and respect for individual freedom. These beliefs must, in turn, be balanced against the interests of society, and the expectation that landowners will fulfil certain social responsibilities.

Landowners are wary of the possibility of regulatory change to existing rights in relation to native plants on their properties. There is a belief held amongst some landowners that the establishment of new areas of native plants, by planting or facilitating regeneration, with the objective of undertaking extractive use, may be prevented because of the significant ecological values that would develop. This tension between the public good and private property rights may incline some landowners to view such a preventative outcome as a potential liability.

## 2.11 Central government: roles and approaches

The government reforms of the 1980s appear to reflect and affirm the separation of land use between protected reserves and the commercially focused (that is, largely extractive) use of working lands.

### The Ministry for the Environment

The Ministry for the Environment (MfE) has a major role in the development of environmental policy and an ongoing oversight role for the Resource Management Act 1991. The Ministry is the lead agency in the government's commitment to sustainable management.

The Ministry has a mediating role, working to manage the tensions arising from conflicts between protection and production, and the environmental, developmental and social interests. As a consequence, during its establishment phase, it was referred to as the "Ministry in the middle".

### The Department of Conservation

The primary functions of the Department of Conservation (DoC) in relation to native plants are to:

- manage land and other natural and historic resources for conservation purposes
- advocate the conservation of natural and historic resources
- advise the Minister of Conservation on conservation matters.

In the Conservation Act 1987, conservation is defined as:

*The preservation and protection of natural and historic resources for the purpose of maintaining their intrinsic values,<sup>[9]</sup> providing for their appreciation and recreational enjoyment by the public, and safeguarding the options of future generations.*

### The Ministry of Agriculture and Forestry

The Ministry of Agriculture and Forestry (MAF) has responsibility for the Forests Act 1949 and administers, via the Indigenous Forestry Unit (IFU), the indigenous forest provisions as provided for under Part IIIA of the Act. Under this legislation, indigenous timber can only be produced from forests administered by that Act and managed in a way that maintains the ability of the forest growing on the land to continue to provide a full range of products and amenities in perpetuity while retaining the forest's natural values.<sup>10</sup>

## 2.12 Biodiversity policies and strategies

The Convention on Biological Diversity (CBD) is an international agreement adopted at the 1992 Earth Summit in Rio de Janeiro and ratified by the New Zealand government. The objectives of the CBD are the:

- conservation of biological diversity
- sustainable use of its components<sup>11</sup>



- fair and equitable sharing of the benefits from the use of genetic resources.

The New Zealand Biodiversity Strategy was announced in 2000 with the goals of:

- increasing community and individual awareness of biodiversity
- protecting iwi and hapū interests in indigenous biodiversity
- maintaining and restoring the health of natural habitats and ecosystems
- maintaining the genetic resources of those introduced species that are important to New Zealand for economic, biological and cultural reasons.

The strategy acknowledges that the sustainable use of indigenous biodiversity could contribute to these goals. The implementation plan of the biodiversity strategy, however, makes no reference to the various ecologically sustainable uses and services that might be derived from native trees and plants in the landscape.

### 2.13 The Resource Management Act 1991 and sustainable management

The RMA provides for the management of native plants on private land through plans and policy statements produced and implemented by local authorities. Management is achieved through section 6(c) of the RMA, which requires the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna as a matter of national importance.

The Department of Conservation has stated that:

*Protection of SNAs [significant natural areas] 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. The issue is sustainable management, not reservation.<sup>12</sup>*

However, there is a perception among some landowners that section 6(c) areas in the district

plans of local authorities are being used as a default mechanism to make reserves, restricting land use options and increasing compliance costs. In some regions this has led to conflict and controversy, which has had an ongoing influence on the levels of trust and cooperation between landowners and local authorities.

### 2.14 Research and the provision of information

The focus of current research is towards the commercial utilisation of exotic plant species. Integrated research that addresses the needs of those landowners who are trying to realise the full contributions that native plants can make on working lands is comparatively limited.

However, some research agencies are trying to investigate the ecologically sustainable management of native plant species on private land.

It is important to provide landowners with accessible information on native plants, their potential uses and services, and approaches for managing them in an ecologically sustainable manner. Personnel from Forest Research, Landcare Research and universities do undertake this work, but it is often in their own time.

### 2.15 Attitudes and relationships

During the discussions undertaken for this project, concerns and dissatisfactions were raised about the role of official agencies and the policies and performance of the Ministry for the Environment, Department of Conservation and the Ministry of Agriculture and Forestry. This raised the need for better communication to achieve:

- good practical working relationships between agencies, landowners, tangata whenua and other groups
- improved management of New Zealand's native trees and plants on private land.

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- <sup>4</sup> Parliamentary Commissioner for the Environment, [www.pce.govt.nz/reports/allreports/0\\_908804\\_99\\_7.shtml](http://www.pce.govt.nz/reports/allreports/0_908804_99_7.shtml).
- <sup>5</sup> One submission on the discussion paper pointed out that many of these cultural values have been turned into commodities through marketing and advertising initiatives.
- <sup>6</sup> Ministry for the Environment (MfE) (2000) *Biodiversity and Private Land: Final report of the Ministerial Advisory Committee on Biodiversity and Private Land*. MfE. Wellington, p 31.
- <sup>7</sup> Feedback on the discussion paper pointed out that there is a third perspective, where:  
All forms of conservation are subsumed under the umbrella of sustainable harvest and there is no role for protection practices that 'lock-up' resources.
- <sup>8</sup> Jacob Haronga, Federation of Māori Authorities, personal communication, March 2001.
- <sup>9</sup> Intrinsic values are not defined in the Conservation Act 1987; however, the Resource Management Act 1991 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; and  
(b) The essential characteristics that determine an ecosystem's integrity, form, functioning, and resilience.
- <sup>10</sup> Part IIIA of the Act does not apply to:
- Any indigenous timber from or on any land permanently reserved under the South Island Landless Natives Act 1906 and having the status of Māori land or any land owned by Māori under Te Ture Whenua Maori Act 1993.
  - Any indigenous timber from, or on, any land held, managed, or administered by the Crown under the Conservation Act 1987 or any of the Acts specified in the First Schedule to that Act.
  - Any indigenous timber from any planted indigenous forest.
- <sup>11</sup> 'Sustainable use', as defined in the Convention on Biological Diversity, means the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.
- <sup>12</sup> Department of Conservation (DoC) (1999) *Significant Natural Areas and Timberlands West Coast Production Forests*. Conservation Advisory Science Notes: 241. DoC, Wellington.



## Section 3

### Response to *Weaving Resilience*

The Commissioner received 58 submissions on the *Weaving Resilience* discussion paper. A summary of these submissions has been published on the website of the Parliamentary Commissioner for the Environment.<sup>13</sup>

Submissions were received from:

Māori	2
City councils	1
District councils	3
Regional councils	3
Central government/ quasi government agency	6
Non-governmental organisation/ community group	5
Professional association	4
Research institute/university lecturer/ student	16
Individual	18

The submissions included a broad representation of interests, with the majority coming from research agencies (Crown Research Institutes and universities) and individuals (many of them landowners). Only two of the major conservation organisations responded to the discussion paper. These were Greenpeace New Zealand and a branch office of the New Zealand Royal Forest and Bird Society (Tauranga). No response was received from any landowner conservation groups.

Although many of the submissions to the discussion paper were extremely comprehensive and helpful, it was disappointing that some of the major environmental groups and landowner conservation groups, that have considerable experience in conservation on private land, did not make submissions.

### 3.1 The need for the discussion paper

Fifty-five submissions were supportive of the need for the discussion paper and the Commissioner's contention that native plants can have a greater range of roles on working lands. The overwhelming consensus was that the use of native plants (and their ecosystems) should be managed in an ecologically sustainable manner.

Dr Bruce Burns of Landcare Research stated:

*... congratulations to you and your office on identifying the neglected links between the goals of sustainable land management and reducing biodiversity loss in New Zealand and for seeking the potential powerful synergies of a combined approach.*<sup>14</sup>

The New Zealand Forest Owners and New Zealand Farm Forestry Association noted that proposing that native plants have a commercial role is difficult in the current political climate, which separates conservation and commercial production.

Another submission expressed delight that the Commissioner had produced a report that:

*... brings the discussion back to the middle ground. It provides a vehicle that encourages and enables people to make a personal contribution to the maintenance and restoration of New Zealand's biodiversity, particularly on their own land.*<sup>15</sup>

The Tauranga Forest and Bird Society and the Otago Conservation Board expressed concern that initiatives that open up this 'middle ground' and promote the sustainable use of native plants could increase the occurrence of extractive uses of existing remnants of native vegetation on private land. This view was supported by three other submissions, although one of these did state explicitly that they supported extractive use of native plants in new areas if they were established for that purpose. The majority of submissions were generally supportive of greater attention being given to the potentially valuable roles for native

plants in situations that are neither solely for conservation nor commercial purposes.

The Department of Conservation stated:

*At this stage further work by the PCE on developing policy for indigenous biodiversity on private land related to the Resource Management Act would be of limited use. The Department does not see a need for the PCE to focus on processes for dialogue between various stakeholders as this continues. At the regional and local level various approaches have been adopted by councils to promote discussion and reach agreement on outcomes for policies and plans. At the national level the current NPS [National Policy Statement] process being run by the Ministry for the Environment is inclusive of a range of stakeholders.*<sup>16</sup>

The Department did not see compelling evidence in the discussion paper to suggest that current institutions and the instruments of the Resource Management Act 1991 are preventing new opportunities for native plants on private land.

### 3.2 Use of terminology in this report

The discussion paper highlighted that some of the terms used in relation to native plants carry associated (often negative) meanings. This was brought to our attention again during the submission process where concerns were expressed about the Commissioner's use of certain words. To remove some of the potential ambiguity in this report the following meanings are used for the following terms.

**Conservation** – is a process for maintaining and protecting certain values including indigenous biodiversity. This can be achieved through a range of means, depending on the circumstances, from the almost total elimination of human activity through to various forms of ecologically sustainable use.

**Ecosystems services** – services that directly or indirectly benefit society. Includes the maintenance of biodiversity, water catchment and

purification, waste decomposition, carbon sequestration, regulation of climate, nitrogen fixation, weed suppression, soil generation and protection, pollination and nutrient cycling.

**Forests** – an ecosystem dominated by the presence of trees. Forests can be self-regenerating or established by humans.

**Forestry** – the practice of managing forests for some human benefit or benefits. In recent times, forestry has been characterised by a focus on timber production, but other benefits are also managed for, such as recreation, protecting biodiversity, and water and soil conservation.

**Native plants** – refers to all possible occurrences of native plants including individual trees, native monocultures, mixtures of native and exotic species, and plant assemblages that are ‘near natural’ or unmodified indigenous ecosystems.

**Sustainable use** – means ecologically sustainable use that:

- encompasses biodiversity, as a core component of ecological services
- works within ecological limits and the carrying capacities of the biosphere
- recognises the importance of complex biophysical systems and processes

- ensures ecological services and natural processes are maintained into the future
- maintains natural capital.

**Plantation** – any planted area (including the supplementary planting of a regenerating area) that will evolve into a forest. These forests range from monocultures through to those that will evolve to become near natural ecosystems.

**Working lands** – those lands managed primarily to produce wealth through the use of their biotic resources, for example, pastoral farming, cropping, forestry, horticulture and viticulture.

### 3.3 Main areas of concern

Figure 1 outlines the main topic areas on which submissions provided comment. Concerns about the need for more research, loss of knowledge and the role of education applied to all the topic areas, with the need for education on native plants being the issue most frequently commented on.

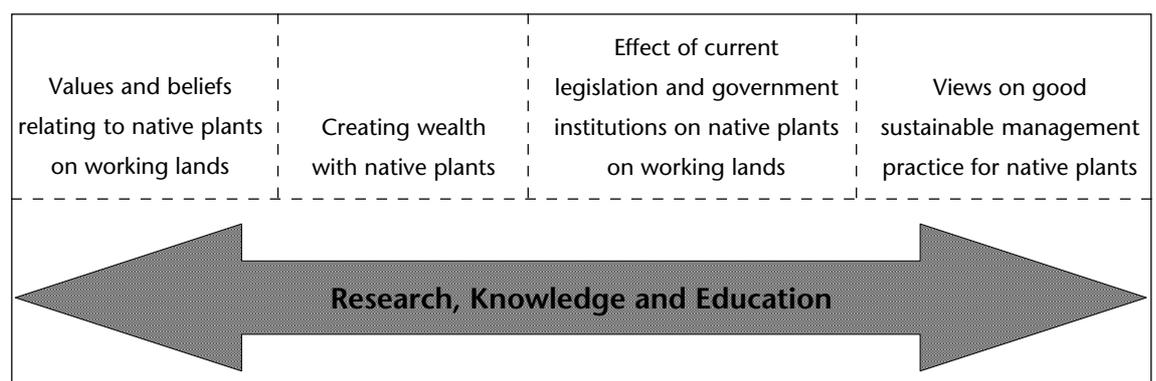
<sup>13</sup> *Weaving Resilience into our Working Lands: Summary of Submissions*, PCE (2002), [http://www.pce.govt.nz/reports/allreports/1\\_877274\\_02\\_X.shtml](http://www.pce.govt.nz/reports/allreports/1_877274_02_X.shtml).

<sup>14</sup> Submission from Dr Bruce Burns, Landcare Research.

<sup>15</sup> Submission from Robert McGowan, Centre for Continuing Education, University of Waikato.

<sup>16</sup> Submission from the Department of Conservation.

Figure 1: Main areas of concern over the roles of native plants





# Main themes

## 4.1 Values and mindsets

Open dialogue and debate about how to address the continuing loss of native vegetation in agricultural landscapes is crucial, especially so since this is internationally recognised as a major threat to biological diversity and sustainable land use. The significantly diminished and degraded state of indigenous biodiversity on working lands in New Zealand gives added urgency to considerations of how to achieve the objectives of the Convention on Biological Diversity in providing for both the sustainable use of native plant ecosystems *and* their conservation. As outlined in the introduction, these objectives also need to be integrated with sustainable land use management practices.

### **The conservation–production divide**

While there are many common and collectively held values in relation to native plants, beliefs about what is possible, or how progress can be made possible, are very different. The discussion document provided an opportunity for dialogue around these value-based issues. Yet, of all the groups involved in securing private land for protection purposes, only three submitted feedback on the discussion paper.

At the core of the debate regarding the future roles of native plants on private land is a fundamental difference of view concerning the ability of New Zealanders to interact with indigenous ecosystems in ecologically sustainable ways. There is an inherent tension in human efforts to manage natural resources. This tension is most immediately evident in the conflicts between values of utilisation and protection, between monetary returns and ecological constraints. The inability of New Zealanders to reconcile these conflicts has created a significant split in the purposes for which we manage land.

As a result, land use for production is seen as distinct from land use for conservation/protection outcomes. On working lands, utilisation dominates over protection, economic returns are maximised, often to the detriment of ecosystems, and the landscape of predominately introduced species is intensively managed. Separated from this are the lands managed primarily for conservation purposes. Here, protection dominates over utilisation, and ecosystem maintenance and restoration are the primary considerations, enabled largely through government funding. These areas are primarily public lands and overwhelmingly indigenous in character. However, there are also innumerable smaller remnants of native plants scattered across the landscape, as well as those on private land that have been purchased or covenanted for conservation purposes.

As illustrated, land management in New Zealand can be characterised by a dichotomy between:

- nature and culture (society)
- public and private
- indigenous and exotic
- conservation and production
- protection and exploitation.

This split in the purpose and orientation of land management reflects both the historical consequences of land settlement and current beliefs about the management options that will facilitate the achievement of ecologically sustainable outcomes in New Zealand. What will be the impact of this approach into the future?

As Meurk and Swaffield state:

*New Zealand is at a crossroads ... We can collectively decide to integrate indigenous nature into our productive landscapes, or we can allow reinforcement of the historical dichotomy of nature and culture and continue the ambivalence and uneasy sense of displaced identity it brings. ...*

*Indigenous nature in New Zealand will remain or become ever more enigmatic – conserved in National Parks and reserves, yet isolated as frequently degrading remnants in the productive landscape, valued by some, but regarded as untidy threats to conventional management by others. Furthermore, there will be no deepening basis for a popular understanding of the way nature works, its constraints, and potentials – and the choices people then make about resource use and management at a personal and political level.<sup>17</sup>*

At present, in New Zealand, there is a fair amount of knowledge about how to manage established native ecosystems for conservation purposes, and a lot of information on how to manage our exotic plant dominated working lands for primary production and profit. What New Zealand is not doing well is developing an understanding of how to manage our productive land for conservation outcomes, or indigenous ecosystems on private land for sustainable wealth generation.

By continuing to uphold the current dichotomy between ‘protected indigenous’ and ‘utilised exotic’, we constrain our knowledge and understanding, our ability to generate wealth from the natural resources that sustain us, and we perpetuate the fracturing of human interaction with the environment that is unique to this island nation. Thus, we reinforce and reinstate our inability to use indigenous resources sustainably.

The dualistic separation of culture and nature is so widespread throughout the Western world that it is not perceived as a chosen approach, but simply accepted as the way things are done. If we are to move beyond serving interests that are at odds with natural systems, we must change the fallacy of thinking that we are removed from nature. This debate is not about changing one value, or one group of people’s values, but an entire value system. A paradigm shift in the thinking of New Zealanders about native plants on private land is required.

*The time has come to begin exploration of the middle ground. ... We cannot live apart from our environment but we have to learn, and fast, how to use it in a sustainable manner.*<sup>18</sup>

There are a few innovators and enthusiasts working to achieve utilisation and conservation goals, through practices that combine commercial viability and ecosystem integrity. Some of these businesses are featured in the case studies in the discussion paper. These people are giving life to the possibilities that balance their personal values and attachments to native plants, with the need to make a livelihood. Their management practices are the exception, and many still doubt their sustainability. Commercially orientated land users question the profitability of such efforts. Those people with a protection orientation doubt the ability of these innovators to sustain conservation values in their use of native plants.

### **Valuing native plants**

Landowner motivations for retaining native plants on their properties are, in general, not directly concerned with either economic or ecological values. It is the social and cultural values that landowners associate with native plants that are most often cited as the reason for retaining or increasing their presence. Submitters to the discussion paper variously expressed their personal relationships to native plants in terms of love, special affection, an affinity, a feeling for, a spiritual connection and a sense of responsibility. Recent research in the Waikato found that farmers use their native bush for aesthetic, symbolic, heritage, and spiritual reasons and for the pleasure derived from the presence of wildlife.<sup>19</sup>

However, so long as there are no commercial returns on nature, the number of landowners who want to be, or can afford to be, altruistic or are able to protect symbolic values on their properties will continue to be a minority. A recent study into the social values and the appeal of native

vegetation in agricultural landscapes in Australia found that, in the current economic climate, benefits to the environment and benefits to the individual (that is, to the landowner) are considered to be almost mutually exclusive.<sup>20</sup> If ecological sustainability is to be achieved, the value system that gives rise to this incompatibility of motivators (measures of success, such as economic viability, the drive for maximum annual profits and productivity records) and outcomes (biologically diverse ecosystems) must change.<sup>21</sup> This change should involve a greater understanding and recognition of the influence of social value orientations on decisions regarding native plants.<sup>22</sup> Currently, the forums in which we typically debate the roles of native plants are dominated by sustainability concerns from an economic and scientific perspective. These forums need to be expanded to be more inclusive of human-centred values.

As Swaffield points out:

*... 'sustainability' could be seen as a form of innovation. The concept of interrelatedness in the theory of innovation means that individuals and communities will only adopt new innovations (such as sustainable practices) if they can be fitted into their overall pattern of life – their economic situation, skills, social practices and cultural values.*<sup>23</sup>

Recent postgraduate research concluded that:

*Sustainable use and conservation can be one in the same; that sustainable use can apply to exotic and indigenous biodiversity; and that furthering sustainable use in Aotearoa/New Zealand will likely strengthen and diversify economic and social relationships ... Sustainable use of indigenous flora and fauna is contentious, largely relating to the different value sets of individuals and community groups. Many of the barriers encountered along the path of this research related directly to these value systems and the lack of open discussion associated with them.*<sup>24</sup>

## 4.2 Sustainable management of native plants

Thirty-two submissions provided comments on aspects of managing native plants for a range of uses and services. The main concerns were about management for biodiversity and forestry.

### Biodiversity

Twenty-four submissions commented on the management of native plants with the objective of maximising the presence of indigenous biodiversity on private lands.

Four submissions expressed the view that the only management approach that will ensure indigenous biodiversity is maintained is one that excludes any extractive use of forest remnants. This position is based on the view that the current condition and extent of indigenous plants on working lands is very poor. Hence, any management approach that risks further reduction of these areas is inconsistent with the goals of the New Zealand Biodiversity Strategy.

Other submissions noted that a number of different plant management approaches exist, and that some of these approaches may encompass different types of extractive use. The submissions considered that such diverse approaches could maintain indigenous biodiversity.

The submissions identified a number of key principles for achieving successful biodiversity management on private land as follows:

- recognition that indigenous ecosystems have different abilities to absorb human-related impacts
- need for ongoing and effective control of pests and weeds
- need for coordination of conservation efforts across land ownership boundaries, with institutions and legal and policy frameworks that provide advice and advocacy (with the involvement of the community) in the areas of both conservation and sustainable management

- involvement of landowners in the conservation of biodiversity
- correct sourcing of plant genetic material
- integration of conservation management between native plant remnants, based on a landscape ecology approach (see Meurk and Swaffield, 2000).<sup>25</sup>

*... ecological sustainability has a fundamental spatial dimension. The effectiveness of reintroducing native species onto private productive lands will depend in large part upon whether we can create efficient patterns of vegetation at a broad landscape scale.*<sup>26</sup>

### Forestry

Ten submissions discussed forest management and emphasised the need for practices based on continuous cover or 'near natural' forestry. These management practices are seen as a means of achieving both biodiversity and timber production goals. The submissions also called for the need to improve knowledge on how to establish trees in new areas and develop better silvicultural techniques to maximise growth rates.

Submitters also expressed the view that development of similar management techniques is required to address the problems associated with using native plants for shelter, riparian management and slope stabilisation.

### Managing native plants on working lands

Native plants have the potential to contribute across a broad range of situations, extending from reserves through to productive systems with a commercial focus. The nature and purpose of these native plants is dependent upon a variety of factors, such as land type and the existing predominant land use. Native forest ecosystems on working lands can occur in situations, such as forests, riparian zones and steep gullies. Native plants can even be introduced to intensively managed production areas, such as dairy and arable cropping farms through the planting of field margins.

For native plants to be successful in supporting the range of roles identified in *Weaving Resilience*, and not be used solely for either conservation or production, there are a number of fundamental principles that need to be applied:

- management of whole ecosystems not single species (management for multi-species, multi-aged diversity)
- recognition of the limitations of affected ecosystems
- recognition of the limitations of current management knowledge and management of risk accordingly
- integration of the management of biodiversity across land ownership boundaries and land uses based on landscape ecology principles
- involvement of landowners and communities in native plant management
- development of new approaches and skills (adaptive management).

In discussing the management of ecosystems to promote indigenous biodiversity and ecological resilience, it is important to understand that indigenous biodiversity is a global concept. The adding of plants to a landscape, whether they are exotic or native species, may initially increase species richness, but does not necessarily prevent the decline of overall global biodiversity. In fact, these new plants may crowd out the already established indigenous species and further reduce overall biodiversity.

Additionally, biodiversity does not, in itself, provide ecological resilience. As one submission stated:

*Similarly, biodiversity per se does not equate to resilience in an ecosystem. The most likely measure of an ecosystem's resilience is "near naturalness". [A] near natural ecosystem ... is one that is managed to be as similar as possible to the ecosystem that would be present without man's [sic] intervention.<sup>27</sup>*

The IFU also advocates in its submission that the focus of indigenous forestry management should

move to one that encompasses the application of continuous cover (near natural) forestry principles. The IFU believes this approach will provide greater economic returns to the landowner, improve ecological resilience and enhance indigenous biodiversity.

Therefore, the encouragement of ecological resilience in working landscapes, which are often intensively managed, will require approaches that introduce some degree of 'near naturalness' to these areas.

Not all land management systems will meet the principles above. Table 1 sets out the five land management paradigms that are practised in New Zealand. In the nineteenth century, management of the working land in New Zealand was, for the most part, based on the mining/liquidation approach (especially evident in the land clearing practices of the period). This approach is no longer considered acceptable or sustainable by many people in society, although it does still occur in some situations.

Working lands in New Zealand are now dominated by the Sustainable Yield Cropping management approach, which uses exotic plant and animal species. This method has resulted in the landscape of today, one dominated by exotic plants and a low degree of near naturalness and biodiversity (represented by Figure 2).

Management of other areas off working lands is largely based on the ecological preservation approach.

To fulfil the vision of *Weaving Resilience* both Ecosystem and Sustainable Yield/Multiple Use management approaches will need to have a significant role. These methods will provide the bridge between areas dominated by exotic plants, managed on a Sustainable Yield basis, and areas managed using an Ecological Preservation approach.

Landscapes managed under Ecological Preservation, Ecosystem Management, Sustainable

Table 1: Land management paradigms

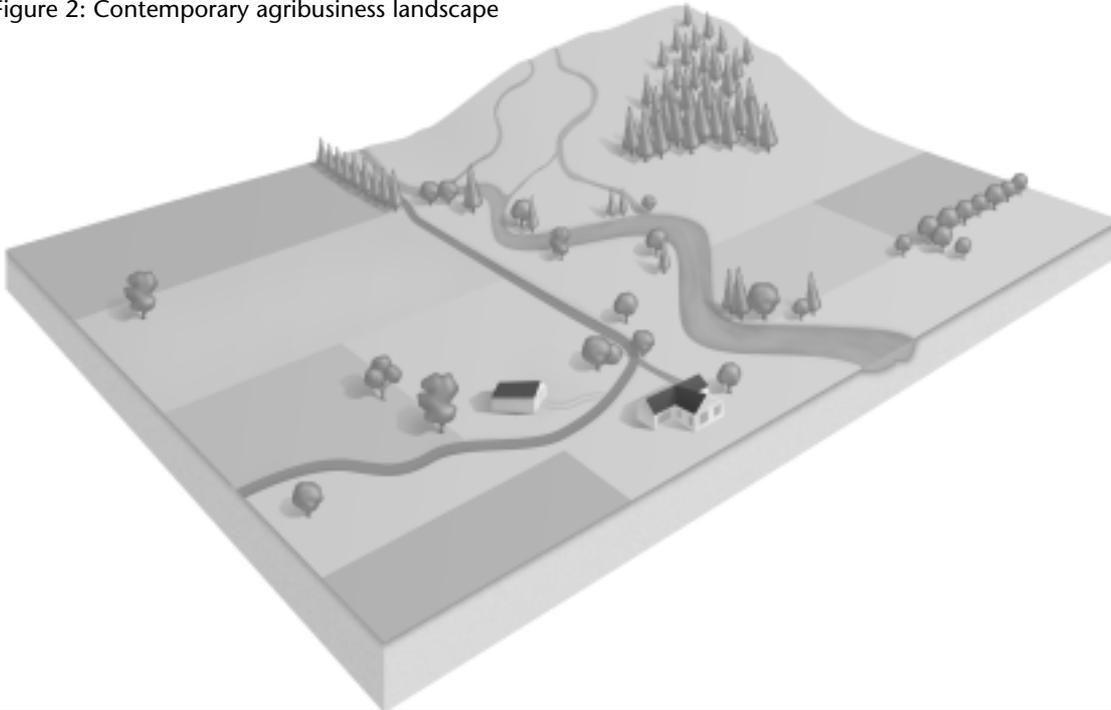
Paradigm	Description	Objective	Scope sociological/ environmental use	Extractive use	Perspective on health	Sustainability criteria
<b>Ecological Preservation</b> Eocentric. (Eg, Reserves, Native Heritage Fund, QEII National Trust.)	Single objective of protecting ecosystem health/integrity. Management for: 1. intrinsic ecosystem values – ecological diversity and function, and 2. non-extractive utilitarian values – soil and water, aesthetics, recreation, etc. No extractive use. Seen by many as presenting the lowest risk approach to protecting sensitive ecosystems  Requires external financing to maintain ecological health (especially pest control).	Single objective – protecting ecosystem health/integrity.	Intrinsic ecological values and non-extractive utilitarian values.	None.	Relates to ecosystem functions.	Sustaining ecosystem functions, biodiversity and complexity across space and time.
<b>Ecosystem Management (sustainable management)</b> Primarily ecocentric: long term and broad perspective. (Eg, Some indigenous forestry. Some QEII National Trust covenants on grasslands.)	Primary objective of protecting ecosystem health/integrity. Management for: 1. intrinsic ecosystem values – ecological diversity and function, and 2. wider range of utilitarian values, including extractive products such as timber. Extractive management is within ecological disturbance patterns to protect intrinsic values. Extraction is set at below sustainable yield levels, because constrained by intrinsic values.  Requires considerable knowledge, skill, and management expertise.  Large proportion of funds invested back into the ecosystem, including ecological health.	Primary objective – protecting ecosystem health. Commercial use allowed within that constraint.	Broadest perspective – intrinsic, utilitarian, community considerations.	Below 'sustainable yield' of extractive products (eg, timber) alone.	Relates to ecosystem functions.	Sustaining ecosystem functions, biodiversity and complexity across space and time.

Table 1: *continued*

Paradigm	Description	Objective	Scope sociological/ environmental use	Extractive use	Perspective on health	Sustainability criteria
<b>Sustainable Yield and Multiple Use</b> Primarily anthropocentric, but encompassing issues of ecology and intergenerational time periods. (Eg. Some New Zealand industry and farm forestry.)	Mixed environmental, social and economic objectives – respective priorities depending upon particular circumstances. Management for usually utilitarian values – extraction of products as well as soil and water, aesthetics, recreation. Products are extracted at or below sustainable yield levels to cater for other utilitarian values. Intrinsic environmental benefits are usually incidental, though not inconsiderable. ‘Health’ is measured in utilitarian terms – eg, aesthetics, productivity or individual plant health.	Mixed objectives – commercial and non-commercial utilitarian – extraction dominant use.	Considers only utilitarian values to owner and wider community.	At or below sustainable yield of extractive product (eg, timber, oils).	Relates to utilitarian forest values – extractive products, aesthetics, water quality, and recreation.	Sustaining production of uses and services to owner and community.
<b>Sustainable Yield Cropping</b> Anthropocentric: longer-term perspective than below. (Eg. Much New Zealand industrial forestry and farming.)	Single objective on (usually) sustainable crop yield. Social and environmental constraints, other than sustainable yield, are imposed by regulation/legislation. Crops harvested at assumed sustainable yield levels. Any intrinsic benefits to environment are incidental to management objective. ‘Health’ is related to crop production.	Single objective – sustaining crop yield.	Considers only utilitarian values to owners.	At sustainable crop yield, possibly artificially augmented.	Relates to crop quality and quantity. as artificial augmentation is sustained.	Sustaining production – at least as long as artificial augmentation is sustained.
<b>Mining/liquidation</b> Anthropocentric: very short-term perspective.	Single objective of either maximising profit or land use change. Extraction rates at above sustainable yield levels. Funds not invested back into the land system – invested in next mining operation. Ecological health not an issue.	Single objective – maximise discounted cash flow profit.	Narrowest considerations – utilitarian monetary values of owners.	Above sustainable yield for all ecosystem values.	Relates to cashflow and capital.	Sustaining capital and profit – at least over the short term, over long term, ecosystem damage will occur.

Source: Adapted from a table provided by Chris Perley.<sup>28</sup>

Figure 2: Contemporary agribusiness landscape



Source: adapted from Meurk and Swaffield, 2000.<sup>29</sup>

#### Yield/Multiple Use and Sustainable Yield

Cropping approaches need to be integrated both within and across property boundaries and landscapes. Landowners should not consider these management regimes as being discrete, but as mutually supportive parts of a continuum. This integration across the landscape will make native plants, and their use and importance, a part of everyday life.

Figure 3 provides a vision of what working lands might look like with native plant species occurring along side exotic species, in a range of sites and functions.

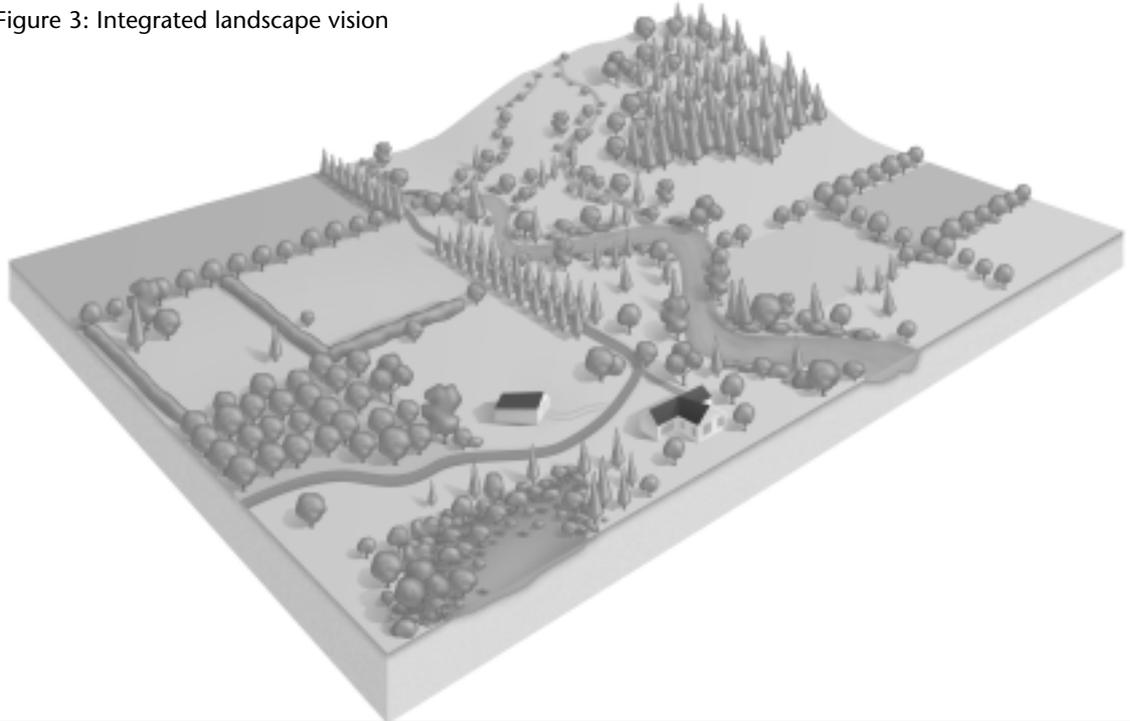
An example of the integrated approach is the Man and the Biosphere Programme (MAB) run by the United Nations Educational, Scientific and Cultural Organisation (UNESCO). This programme includes the establishment of a worldwide network of Biosphere Reserves. These reserves are areas of terrestrial and coastal ecosystems that promote solutions to reconcile the conservation of biodiversity with its sustainable use. Each biosphere reserve is intended to fulfil three basic functions that are complementary and mutually reinforcing, as follows:

- conservation function – to contribute to the conservation of landscapes, ecosystems, species and genetic variation
- development function – to foster economic and human development, which is socio-culturally and ecologically sustainable
- logistic function – to provide support for research, monitoring, education and information exchange related to local, national and global issues of conservation and development.<sup>30</sup>

### 4.3 Creating wealth with native plants

Many landowners will, for personal reasons, protect or restore indigenous biodiversity on their property. In some cases, landowners receive financial and other forms of support from public or private organisations, the most well known being the Nature Heritage Fund, Nga Whenua Rahui and the Queen Elizabeth the Second (QEII) National Trust. However, these organisations face funding constraints, and it is likely that they will continue to focus their efforts on those areas that they consider to have high ecological values. Therefore, in many cases, landowners will have to carry much of the financial burden of the ongoing

Figure 3: Integrated landscape vision



Source: adapted from Meurk and Swaffield, 2000.<sup>31</sup>

conservation management costs. These costs are in addition to the foregone opportunity of using that land for some other purpose.

This approach to protecting indigenous biodiversity treats native plants on private land as a charity and not as an integral part of the landowner's overall business operation. There are questions about the long-term financial viability of this approach, given competing demands on the public and private purse. Measures are needed to extend native plants into other areas, such as modified indigenous areas with low ecological value or completely new areas that are devoid of indigenous biodiversity.

A range of uses and services of native plants have commercial potential. With careful management and innovation a contribution to indigenous biodiversity can occur in conjunction with the creation of wealth. Commercial uses of native plants occur already in New Zealand with tourism, sphagnum moss, honey, oils, herbs and timber. Additionally, there are other services and uses that can be provided by native plants that are either not currently valued or remain unidentified.

The submission from Federated Farmers New Zealand highlighted the need for innovation and new commercial opportunities for native plants on working lands:

*Not everyone is attracted to the possibilities of tourism or has mature forest that timber can be extracted for milling so it is important that a range of uses [and therefore markets] be found so that conservation can be encouraged from a broader base.*

### Valuing ecosystem services

Ecosystem services are an example of a benefit provided by indigenous biodiversity that is used by society, but largely unvalued. In 1997, the annual global value of ecosystem services was estimated at US\$33 trillion per year. This figure can be compared with the Gross Global Product<sup>32</sup> of approximately US\$18 trillion.<sup>33</sup>

In 1994, the annual value of New Zealand ecosystem services derived from native species was estimated to be approximately \$30 billion.<sup>34</sup> In that year, New Zealand's Gross Domestic Product was \$80 billion.<sup>35</sup>

If these services are so valuable why are they not appreciated and promoted? There are two reasons:

- those who receive these benefits are largely unaware of their existence
- these benefits are mostly provided at no direct cost to any sector of society.

### **Raising awareness of ecosystem services from indigenous biodiversity**

Preliminary and anecdotal evidence indicates that the presence of native ecosystems within working lands provides ecosystem services that contribute to the profitability of adjacent biotically based businesses.<sup>36</sup> The dynamics of these relationships have yet to be fully assessed, but work is currently being undertaken at both Lincoln and Massey Universities to identify these services and assess the benefits that they provide.

There is a clear requirement for more research into ecosystem services to maximise the benefits to both landowners and all New Zealanders.

However, research in itself is not sufficient; the concept of ecosystem service, as an integral part of the productive capacity of any successful biotic-based business, needs to be widely disseminated. Managers of these businesses should incorporate this knowledge into their management plans.

### **Development of ecosystem service markets**

The *Weaving Resilience* discussion paper highlighted two proposals for trading in ecosystem services. These are a market for carbon sequestration (the 'Emissions/Biodiversity Exchange (EBEX) 21 Project'), and a possible system of tradable biodiversity credits.

The establishment of such markets can be instigated by private organisations, as with EBEX21, which is a commercial venture of Landcare Research. However, many of these markets require government to play a role in setting up frameworks and rules for management. This ensures that desired objectives are achieved,

there are no perverse outcomes, and the markets reflect accurately the value of the ecosystem services. Through the creation of ecosystem service markets there are opportunities for government to integrate a number of its policy objectives. For example, the government can link both biodiversity and biosecurity objectives with its climate change objectives.

### **Establishing new areas of native plants**

Some of the feedback on the *Weaving Resilience* paper expressed the view that native plants have limited economic potential on working lands. Submissions on the discussion paper indicate that there are a number of factors restricting investment in establishing areas of native plants for commercial reasons, certainly when compared with alternative exotic plant species.<sup>37</sup> These include:

- higher costs of establishment and native plants take longer to become self-sufficient
- difficult to source relevant expertise
- require more pest and weed control effort
- current tax treatment of native forestry (see section 4.5)
- high cost, and difficulty faced in sourcing good-quality seedlings<sup>38</sup>
- takes longer for a financial return to be derived (especially in relation to timber production).

The submission from the Department of Conservation was perhaps the most emphatic about the perceived lack of economic potential and cited this as the reason for few commercial ventures based on native plants. The Department's submission questioned the basic assumption of the discussion paper, that there are unexplored economic opportunities for native plants, and stated that:

*... perhaps their [the landowners] view is correct and the PCE's office is trying to defy economic gravity.*

The basis for this comment appears to be that native plants are much more slower growing than comparative exotic species. This view is best summarised by a comment from a landowner and farm forester:

*... exotic species are overwhelmingly the first choice [for commercial purposes]. This is because of significantly greater growth rates, amongst the highest in the world, and they provide a wider range of species options.*<sup>39</sup>

A number of submissions pointed out that the range of perceived limitations are transitional problems. In the long run, indigenous species have the potential to be as commercially productive as exotic plant species. However, investment in native plants may result in a longer pay-back period than that for a similar investment involving exotic plant species.

Submissions identified a number of management approaches that can help reduce the costs of this transition phase. These measures include:

- improving silvicultural and horticultural techniques, such as undertaking good site selection, species selection and practising better ongoing management
- using mixtures of exotic and native plant species, with the exotic species producing revenue while the native plants grow<sup>40</sup>
- diversification of revenue flows (multiple use) through the development of a compatible range of uses and services (for example, tourism, education, honey, oils, herbs).

Further research and dissemination of knowledge to landowners is required on the management options available. The research should incorporate a wide range of specialities: ecology, silviculture, pest and weed control, multiple use management and economics. Guidelines need to be available to land managers on the management techniques that can be used for a range of settings. These include, for example, riparian areas, shelterbelts, soil protection, and pollination and

pest control services. Research is also required into the derivation of new uses and services from native plants (see section 4.4).

Often, the establishment of new areas of native plants by a landowner will provide not only private benefits but also public benefits through ecosystem services. In such cases there may be a justification for the sharing of the establishment and initial maintenance costs between the landowner and the community. Central and regional government do this already in the case of some biodiversity and water and soil protection projects.

The Ministry for the Environment, as part of its work on developing markets for ecosystem services, could also further the establishment of native plants by assessing the potential for cost sharing where native plants on working lands provide public benefits such as biodiversity protection, and soil and water enhancement.

### **Commercial use of existing areas of native plants**

Existing areas of native plants have the most immediate commercial potential, because there are no establishment costs and there is little time delay before the intended use can begin. These are, however, the most controversial areas for commercialisation and consequently often have high regulatory costs.

Submissions raised the issue of the impact of regulatory uncertainty from the RMA. This uncertainty affects investment decisions for both new and existing areas of native plants. One submission pointed out that it is impossible to provide absolute regulatory certainty because the attitudes in societies change, especially over the timeframes involved with native forest management.

To address this uncertainty the government needs to provide clear direction on what uses of remnant areas of native plants it considers to be sustainable

and, therefore, appropriate. When providing direction on these matters the government should take account of the concepts of sustainable development and sustainable management that are incorporated in both legislation and government policy. Government will also need to assist landowners and land managers to achieve the standards implicit in its sustainable management and sustainable development policies by ensuring that landowners develop good management practice.

Regulatory regimes impose compliance costs on landowners in an attempt to ensure high levels of accountability. Central and local government should develop measures that will reduce compliance costs while providing an appropriate level of quality assurance. Key factors for any such regime will involve education on good practice and the development of close working relationships between landowners and authorities that foster mutual respect.

Management of native plants on working lands in New Zealand must be based on the principles of ecologically sustainable management. New Zealand businesses, therefore, should not be exposed to unfair competition from producers from other countries that do not meet ecologically sustainable management standards. The *Weaving Resilience* discussion paper pointed out that, with the decline in the availability of high value domestic native timber products, there has been a corresponding increase in the value of imports of wooden furniture. It is likely that a significant proportion of this furniture is derived from unsustainably managed overseas forests.<sup>41</sup>

The government should assess measures to reduce the adverse effects of unfair competition from unsustainably sourced products. These initiatives, however, will need to take account of New Zealand's broader trade commitments. One possible approach could be the promotion of a domestic sustainable brand/quality assurance

scheme, and associated education of the public. For timber products, such branding could be linked to, or incorporate features of, the Forest Stewardship Council certification process.<sup>42</sup>

#### 4.4 Knowledge and research

The *Weaving Resilience* discussion paper noted that the extent of knowledge regarding indigenous plants on private land in New Zealand is characterised by:

- minimal investment in exploring the economic potentials and capabilities of native plants in New Zealand
- little social and economic research into the full range of values associated with native plants and the acceptability of various uses and management approaches
- concern that much of the existing knowledge of the ecologically sustainable use of native plants is being lost as the personnel with expertise move on to other positions or retire.

#### Potential loss of knowledge, skills and experience

Many submissions feared the loss of valuable experience, skills and knowledge that remains unpublished. Knowledge is seen at risk of being lost, or already progressively diminishing, in the following areas:

- skills and experience in indigenous species management and forest ecology
- collection and preparation of medicinal and edible native plants
- traditional Māori knowledge in general
- local knowledge in relation to forest management.

#### The need for more research

The discussion paper suggested that:

*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 and in new associations within the contexts of forestry, farming, nurseries, and other productive sectors.*

Research to support biodiversity and conservation on working lands appears to be receiving greater priority as a consequence of the New Zealand Biodiversity Strategy. However, there is limited research being undertaken on the sustainable use of native plants, the productive capacity of native plant ecosystems and the role that they can play in increasing the sustainability and diversity of land use choices on our working lands.

The summary of submissions on the discussion paper lists a number of requests for information dissemination and research regarding native plants on private land.<sup>43</sup> Research was requested into various aspects of indigenous forestry, the establishment and cultivation of native plants, alternative land use options that involve native plants and the monitoring of the consequences of different management approaches.

*At present, most [indigenous] forest management is confined to harvesting and ... much of the harvesting that is taking place is devaluing the resource ... This is considered to be due to a lack of skills and experience combined with a lack of knowledge about low impact harvesting and the management of indigenous forest ecosystems ...*<sup>44</sup>

Submissions also requested more social science research into the values, behaviour and cultural responses related to native plants, the range of benefits and values derived from having native plants on private land and the potential markets for native plants and their services.

Some research in these areas is taking place, but many of the submitters consider the amount and scope of research to be inadequate. In particular, more research is required into the human dimension – the values and benefits associated with native plants (both monetary and non-monetary), and the behavioural motivations

behind different landowner choices (see section 3.3). To gain a greater understanding of how to progress sustainable development initiatives, research into ecological systems should be integrated with the research into human dimensions. In summary, native plant research needs to be combined across the areas of:

- conservation and biodiversity
- sustainable land management
- understanding the social values associated with native plants and their uses
- the range of benefits derivable from native plants, both monetary and non-monetary
- development of economic opportunities and markets
- approaches and mechanisms for implementing a landscape-scale approach to land management that transcends individual property boundaries.

### **The administration and funding of research**

Submissions to the discussion paper expressed the view that the current research into indigenous forestry and the sustainable development of indigenous plant ecosystems is inadequate, particularly when compared with the amount of research undertaken on exotic plant species.

Submissions suggested a number of reasons for this, including:

- research being fragmented amongst different CRIs, universities and other providers
- organisations involved in research have to compete for funding
- a lack of coordination of research effort at an institutional level, although at a staff level this coordination can occur
- funding for native plant research is too low
- the lack of foresight and long-term planning for research under current government research funding policies.

Research into sustainable indigenous forestry was seen as the most inadequately funded area. Some of the reasons given for this were provided in the

submission from the IFU of the Ministry of Agriculture and Forestry:

*... FRI [Forest Research Institute] has decidedly modest capability and funding ... for research on indigenous forests, and the limited focus is mainly on growth of several native timber tree species and the potential for plantation management. FRI's interests are overwhelmingly commercial and since its thinking is locked into the imperative of short cropping rotations, then unsurprisingly our relatively slow growing native trees are given little serious research commitment. FRI looks most expertly at wood properties and sustainable yield in radiata pine, but barely considers natural forest as sustainable ecosystems.*<sup>45</sup>

Of the \$1.35 million Public Good Science Fund (PGSF) funding received by the Forest Research Institute (FRI) in 2000/01 for research into alternative plantation species to radiata pine, only about \$120,000 was spent on the research of native species production forestry research.<sup>46</sup>

This lack of investment in indigenous forestry reflects the limited funding available for research on advancing the sustainable use of indigenous ecosystems. Creative thinking about the place of native plants as productive resources is lacking – for example, use in floristry and as medicinal herbs. There is little effort being put into research on how to contribute to biodiversity goals through the diversification of land use in ways that will also create wealth for the landowner.

*... the lack of support for investigation into alternative species and uses than those currently dominating New Zealand industries and land based practices ... will [in part] inhibit further investigation and action into potential sustainable use projects.*<sup>47</sup>

Indigenous plant research, because of the very nature (for example, long lifecycle) of the plants and ecosystems being observed, requires committed long-term funding. There is currently much uncertainty in the native plant research field. Some submissions believed that the impact of government funding policies (seen to be in

constant change), the competitive nature of acquiring funding, and a lack of sharing of information between researchers are having a detrimental impact on the progress of native plant research.

Government must put more resources into ensuring long-term funding so that coordinated research can be achieved. This does not supersede the requirement for shorter-term research but, rather, emphasises the need for better coordination and greater consistency of focus and effort at a national level. New Zealand is a small country – the application of information and knowledge gained from research in progressing sustainable wealth creation, biodiversity objectives and ecologically sustainable resource use must be more effectively and efficiently organised and disseminated in a manner where this can be applied practically.

### **Education and information**

Education was the most widely raised issue in submissions on the discussion paper. Education was seen as imperative to ensuring a future for native plants on private land. The main theme of submissions was the call for greater guidance, encouragement and support for landowners in relation to the establishment, regeneration, enhancement, use and overall management of native plant areas. It was obvious from the submissions that many of the current education efforts are not reaching the people who want the information and assistance. Organisations that are involved in education in relation to the environment and practical sustainable management are encouraged to read the summary of submissions.<sup>48</sup>

## **4.5 Legislation and institutions**

### **Separation of conservation and production**

The legislation, and the various government agencies responsible for it, treat native plants as a resource managed primarily for either protection or utilisation/exploitation. The primary

government agencies that deal with native plants are the Department of Conservation, which has a conservation focus, and the Ministry of Agriculture and Forestry, which has a commercial production focus.

The Department of Conservation provides for some limited use of conservation lands and resources. Tourism and recreational activities are accommodated on conservation land, as are a range of extractive uses (for example, sphagnum moss, mining, cultural harvesting for specific purposes). These activities can, in some cases, have adverse effects on conservation values.

The IFU of the Ministry of Agriculture and Forestry not only has to consider timber production but must also take into account other values when approving Sustainable Management Plans and Permits. These values include measures to protect soil, water, flora and fauna.

The predominant paradigm provides little accommodation within the current frameworks for a broad-based integrated approach to the management of native plants on working lands. Conflicts that subsequently arise between those advocating conservation or production objectives are often dealt with through the processes of the Resource Management Act 1991.

The Department of Conservation, in its submission, provided a description of how it sees its role in these processes:

*We [the Department] are one among many advocates in the whole regional and district planning hearing forums and we are not the final arbiters, except in very restricted cases. Ultimately it is local authorities who make decisions on the sustainable management of resources on private land in their region and they are elected by the people in their districts and regions.*

Further:

*... the Department recognises that conservation is not the purpose of other legislation, in particular the*

*Resource Management Act. The Department advocating under the RMA is aware that the purpose of that Act is the promotion of sustainable management. Conservation under the RMA can only be achieved to the extent that it promotes sustainable management.*

However, in the context of the RMA, conservation and production often appear to occupy adversarial positions. Typically, DoC represents conservation interests, and other groups, such as landowners, represent utilisation interests. Local authorities, and the courts, have the task of reconciling these polarised positions and coming to a decision on what best promotes *sustainable management*.

Some submissions expressed the view that these positional debates over native plants on private land can, in some cases, undermine conservation efforts. A concern was raised that the advocacy role of DoC has alienated it from the very people it needs to be engaging with.

### **Ministry for the Environment and the Resource Management Act 1991**

At present, the Ministry for the Environment is leading the development of a National Policy Statement (NPS) on Biodiversity under the provisions of the Resource Management Act 1991. The development of the NPS is a consequence of the New Zealand Biodiversity Strategy and will provide guidance to local authorities on the protection of indigenous biodiversity through the mechanisms of the RMA and other initiatives by local government. It is expected the NPS will be notified before the end of 2002.

Feedback from submissions on the role of the Ministry for the Environment focused on the lack of guidance with respect to the identification of Significant Natural Areas (SNAs) under section 6(c) of the RMA. It is hoped that the NPS will provide the required guidance.

There is also a role for MfE in developing and promoting the broader concepts of ecologically sustainable management of native plants.

More immediately, MfE should address the concerns of those landowners who want to invest in establishing new areas of native plants with the intention of undertaking commercial use, but who have not done so because of the fear that they will be prevented from carrying out these activities due to the imposition of new regulatory measures.

*This fear may or may not be justified – only time will tell. This fear could be allayed with a legal mechanism.*<sup>49</sup>

The Ministry for the Environment could take the lead in developing mechanisms that could provide as much certainty as possible for these landowners.

### **Forests Act 1949 and the Indigenous Forestry Unit**

The Primary Production Select Committee's inquiry into indigenous forestry is expected to present its findings to Parliament in the near future. The Committee's focus is on the indigenous forestry sections of the Forests Act 1949.

The Forests Act 1949 is the major piece of legislation that deals with the use of native plants, specifically those species that are capable of producing timber. Feedback on the discussion paper highlighted a number of concerns about the performance of the Act as follows:

- the Act needs to be broadened in its scope to be able to accommodate all types of native forests: 'natural', planted and naturally regenerating
- the Act should focus on achieving sustainable forest management (consistent with approaches such as continuous cover and near natural forestry) with timber production being part of the overall management strategy
- the management approaches currently contained in Sustainable Management Plans and Permits are too inflexible and need to be able to evolve as knowledge develops with respect to biodiversity and commercial production

- district plans need to be linked to the requirements of the Forests Act 1949 so as to reduce regulatory uncertainty and compliance costs.

Most of the submissions had an expectation that the standards for managing forest remnants should be more stringent than those for newly established areas. However, over time, this distinction may become redundant, because the biodiversity values of new forests will tend to increase, making them indistinguishable from 'natural' forests.

Two submissions envisaged a much greater role for the IFU under an amended Forests Act that focuses on ecologically sustainable forestry. Under a revised Act, the IFU would provide more assistance to landowners to achieve good forest practice, realise commercial opportunities and undertake monitoring and quality assurance. To achieve this, the IFU would require more personnel in order to be able to increase its presence on the ground working with landowners.

It should be noted, however, that the IFU has expressed a concern about the potential conflict between its support and advisory role and a monitoring and quality assurance function.

### **Income Tax Act 1994**

The Income Tax Act 1994 currently treats the planting and maintaining of native plants as either a forestry investment (a production activity and a business) or as a conservation or public service (non-business) (section DO7 of the Income Tax Act 1994). The Act does not appear to recognise that an investment in native plants can have both a business and a conservation function.

A farmer<sup>50</sup> who actively increases indigenous biodiversity on their land by protecting remnant areas, enhancing plant regeneration or establishing new areas may be doing this for conservation reasons, but they are also supporting and increasing the productive capacity (and profitability) of their land. While some

landowners are unaware of this relationship, there is evidence that the presence of biodiversity provided by natural ecosystems on agricultural land adds to the long-term profitability and sustainability of the farming business.<sup>51</sup> By increasing biodiversity through the protection or introduction of indigenous species, the farmer is achieving two goals: support of New Zealand's valuable biodiversity and supporting farm productivity. Therefore, these activities can be compared with any farm activity that is intended to promote farm production and the health of the farm system (see section 4.3). As such, these costs should be deductible against farming income.

The forestry provisions of the Income Tax Act 1994 do not fully take into account the differences between native forestry and conventional forestry practice. Two areas of concern were identified by submitters. The first concern is that it is necessary to include the establishment and maintenance of nurse crops as a normal native forestry cost. The second concern is that the forestry provisions in the Act are based on current exotic forestry practices and do not envisage a forestry business producing revenue from anything other than timber. Indigenous forestry, however, will often produce revenue from a number of products that are in addition to timber. The forestry provisions of the Income Tax Act 1994 should be reviewed to ensure that the Act can accommodate the requirements of an indigenous forestry business.

The Income Tax Act 1994 needs to be fully reviewed to determine if there are any other anomalies that require attention.

<sup>17</sup> Meurk, CD and Swaffield, SR (2000) A landscape ecological framework for indigenous landscape regeneration in rural New Zealand-Aotearoa. *Landscape and Urban Planning*. 50(103):129-144.

<sup>18</sup> Submission from Tānes Tree Trust.

<sup>19</sup> Submission from Mairi Jay, Senior Lecturer, Department of Geography, University of Waikato.

<sup>20</sup> Sandall, Jean, Kaine, Geoff and Cooksey, Ray (2001) *More than a matter of taste: social values and the appeal of native vegetation in agricultural landscapes*. Presentation at 2nd International Symposium on Landscape Futures, Armidale, Australia, December.

<sup>21</sup> It is assumed that the Australian value system is similar to that in New Zealand.

<sup>22</sup> For example, the study by Sandall *et al*, *op cit*, found that primary producers in Australia favour:

- individual goods over social and environmental goods
- freedom over equality
- individual and practical approaches to conservation
- production associated landscapes, where productive is viewed as developed and improved, versus alternative interpretations such as damaged, exploited or overgrazed.

<sup>23</sup> Swaffield, Simon (1998) *Structuring sustainability, today's actions, tomorrow's landscapes*. Conference papers from the New Zealand Institute of Landscape Architects (NZLIA) 25th Anniversary Conference, Te Papa, Wellington, March.

<sup>24</sup> Submission from Kirsten Crawford, Postgraduate Student, Lincoln University, Canterbury.

<sup>25</sup> Meurk and Swaffield (2000) *op cit*.

<sup>26</sup> Submission from Simon Swaffield, Professor of Landscape Architecture, Lincoln University, Canterbury.

<sup>27</sup> Submission from Mark Bloomberg, Lecturer in Forestry, Lincoln University, Canterbury.

<sup>28</sup> Chris Perley and Associates, PO Box 7116, Dunedin, New Zealand.

<sup>29</sup> Meurk and Swaffield (2000) *op cit*.

<sup>30</sup> [www.unesco.org/mab/](http://www.unesco.org/mab/).

<sup>31</sup> Meurk and Swaffield (2000) *op cit*.

<sup>32</sup> The annual total value of goods produced and services provided for the planet.

<sup>33</sup> Costanza, R, *et al* (1997) The Value of the World's Ecosystem Services and Natural Capital. *Nature*, 387:253, Table 2. Sourced from the World Resource Institute, [www.wri.org/wr-98-99/ecoserv.htm](http://www.wri.org/wr-98-99/ecoserv.htm).

<sup>34</sup> Patterson, M and Cole, A (1999) *Assessing the Value of New Zealand's Biodiversity*. Occasional Paper Number 1. School of Resource and Environmental Planning. Massey University, Palmerston North.

<sup>35</sup> Statistics New Zealand (1999) *New Zealand Official Yearbook 1998*. Statistics New Zealand, Wellington.

<sup>36</sup> Steve Wratten, Professor of Ecology, Lincoln University, Canterbury, personal communication.

<sup>37</sup> These apparent difficulties apply to the establishment of native tree species for timber production, shelter, soil stabilisation and riparian management.

<sup>38</sup> Work by organisations such as the New Zealand Ecological Restoration Network on eco-sourcing is helping to address some of these concerns. For further information see: <http://www.bush.org.nz/home/index.html>.

<sup>39</sup> Submission from Ewan McGregor, Environmental Consultant and Facilitator.

<sup>40</sup> The method of having a mixture of exotic and native plant species can be used either as a transitional measure while moving towards all native species ecosystems, or an ongoing management approach. Both situations will contribute to the maintenance of indigenous biodiversity.

<sup>41</sup> Imports increased from \$30 million to \$80 million in 1999. Tim Thorpe, Forestry Consultant, March 2001, personal communication.

- <sup>42</sup> See <http://www.fscoax.org/principal.htm> for more information on the Forest Stewardship Council.
- <sup>43</sup> *Weaving Resilience into our Working Lands: Summary of Submissions*, PCE (2002), sections 7 and 8, [www.pce.govt.nz/reports/allreports/1\\_877274\\_02\\_X.shtml](http://www.pce.govt.nz/reports/allreports/1_877274_02_X.shtml).
- <sup>44</sup> Walker, Dean and Topping, Peter, Submission to the Primary Production Committee Inquiry into Sustainable Forestry Management.
- <sup>45</sup> Submission from the Indigenous Forestry Unit, Ministry of Agriculture and Forestry.
- <sup>46</sup> The current emphasis of research into alternative species is dominated by a focus on exotics. Those alternative species that will be most commercially viable (in the current short-term focus) will be those with the greatest growth rates and reproductive potentials. It follows that these species will be the most aggressive invaders, posing significant threats to New Zealand's indigenous ecosystems. This in turn will generate biosecurity costs that will likely be an insurmountable burden.
- <sup>47</sup> Submission from Kirsten Crawford, Postgraduate Student, Lincoln University, Canterbury.
- <sup>48</sup> *Weaving Resilience into our Working Lands: Summary of Submissions, op cit.*
- <sup>49</sup> Submission from Ewan McGregor, Environmental Consultant and Facilitator.
- <sup>50</sup> In this context, 'farmer' includes all landowners who derive an income by growing something from the land.
- <sup>51</sup> Daily, Gretchen, *et al* (1997) Ecosystem Services: Benefits Supplied to Human Societies by Natural Ecosystems. *Issues in Ecology*, No 2. A publication of the Ecological Society of America, <http://www.esa.org/daily.html>.



## Section 5

## Recommendations

The following recommendations address three areas where the Parliamentary Commissioner for the Environment considers that action is clearly needed. These recommendations concern:

- research
- regulatory frameworks
- taxation.

### 5.1 Research

#### To the Minister of Research Science and Technology

Expand the sustainability portfolios to increase research focused on achieving the objectives of conservation, protection *and* economic innovation, through the ecologically sustainable use of native plants on working lands.

Consider supporting:

- greater investment in exploring the economic potentials and capabilities of native plants in New Zealand
- more social and economic research into the full range of values associated with native plants and the acceptability of various uses and management approaches
- undertaking to record, retain, and make available existing knowledge concerning the ecologically sustainable use of native plants.

*Explanatory note:*

*While there is research being undertaken on native plants, both from biodiversity and production perspectives, this research effort is minimal when compared with that being undertaken on exotic plant species.*

*There is a need for research on native plants to be better integrated across the innovation based enterprise, and environment and biodiversity groups.*

*The current sustainability review being undertaken by the Foundation of Research Science and Technology presents an opportunity to balance long-term ecological studies with shorter-term applied research, and to give greater priority to research on native plants that focuses on:*

- *integrating ecological restoration efforts across ownership boundaries and land use types*
- *describing the range of social, cultural, economic and ecological values, and their influence on behavioural choices (the human dimension)*
- *ecosystem services and the benefits of these on working lands for both landowners and others*
- *implementing ecologically sustainable management*
- *identifying new ecologically sustainable uses and services, and the means to reduce establishment and management costs*
- *increasing cooperative approaches across research organisations that are multidisciplinary and systems focused.*

## 5.2 Regulatory frameworks

### To the Minister for the Environment

Initiate, in partnership with local government, the development of mechanisms under the Resource Management Act 1991, that will provide greater certainty to landowners who invest in the establishment of new areas of native plants with the intention of undertaking commercial use.

*Explanatory note:*

*The development of these mechanisms will address the widely held perception amongst landowners that a financial investment in native plants carries a high risk. This perception is currently limiting the establishment of native plants on private land. Landowners fear that new regulatory protection measures will be imposed that restrict or prevent the realisation of any return on their investment, particularly when this involves extractive use.*

### To the Minister for the Environment and the Minister of Finance

Where native plants on working lands provide both private and public benefits, assess the role and potential of cost sharing between public agencies and landowners.

*Explanatory note:*

*The protection, establishment and ecologically sustainable use of native plants by a landowner often provides benefits to others, such as improved water and soil quality and enhanced indigenous biodiversity. Local and central government can and, in some cases, already do assist in maintaining and enhancing these benefits. There is the potential to do more in this area with targeted assistance that may be permanent or transitional.*

### To the Minister of Forestry

1. Review the Forests Act 1949 to:
  - include regenerating forests within the scope of Part IIIA
  - permit the inclusion of planted indigenous forests, if desired by the landowner
  - change the objective of Part IIIA to that of achieving ecologically sustainable forest management
  - assess how other commercial forest-based activities should be included within the scope of the Act to ensure that ecologically sustainable management is achieved
  - allow more flexibility in management practices to achieve ecologically sustainable forestry, by having recognition for different forest types and taking account of developing knowledge.

*Explanatory note:*

*Part IIIA of the Forests Act 1949 needs to ensure that the indigenous forestry of existing and regenerating areas is ecologically sustainable. Some landowners who plant new indigenous forests may also wish to operate within the regime and should be able to do so.*

*To be ecologically sustainable the objective of Part IIIA of the Forests Act 1949 must change from that of sustainable timber production to the sustainable management of forest ecosystems. These ecosystems may produce a range of commercial and non-commercial benefits and services in addition to timber (that is, multiple use). The provisions of the Act must be flexible enough to encompass all types of sustainable indigenous forestry. Often the type of management practices used for sustainable forestry develop and improve over time; the standards set out within the regime must also be able to evolve based on the development of new knowledge and experience.*

2. Increase the capability of the Indigenous Forestry Unit, so that it can actively monitor performance on the ground and assist forest owners to achieve good, ecologically sustainable, forestry practice.

*Explanatory note:*

*The achievement of good forestry practice, within a regime based on ecological sustainability, will require support and education for forest owners. Currently, the Indigenous Forestry Unit does not have sufficient personnel to undertake these critical activities.*

### **5.3 Taxation**

#### **To the Minister of Revenue**

1. Review the Income Tax Act 1994 to:
  - make the expenditure incurred by landowners in conserving indigenous biodiversity tax deductible, in recognition that these native ecosystems enhance the commercial productivity of working lands through the provision of increased ecosystem services
  - include the establishment and maintenance of nurse crops for native forestry as a tax-deductible expense.

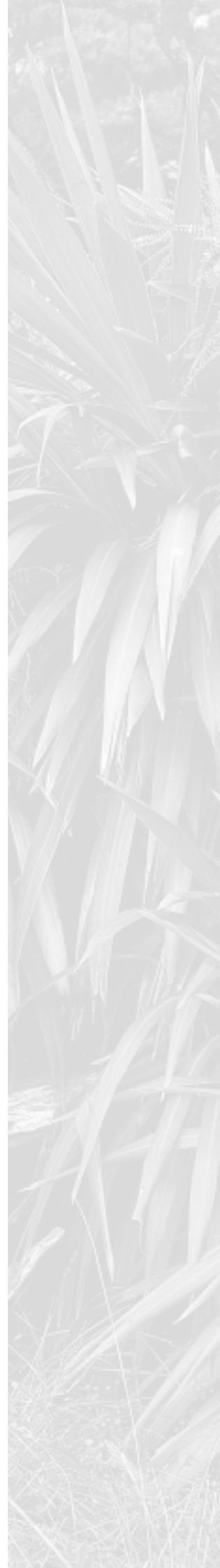
2. Review the operational policy of the Inland Revenue Department to ensure that, where an indigenous forest is established or maintained for the stated objectives of providing benefits, in addition to timber production, that business will still be treated as a forestry business.

*Explanatory note:*

*The current forestry provisions of the Income Tax Act 1994 were designed to deal with the common forestry practice based on even-aged monocultural forests. These forests have the sole function of producing timber. Sustainable indigenous forestry, however, will often be managed for benefits or services in addition to the production of timber. In some cases, these services will directly result in the production of revenue and others will not. Even so, these operations are still authentic forestry businesses and should be able to use the forestry provisions in the Income Tax Act 1994.*

## Glossary – Nga Kupu Māori

hapū	family or district groups, communities
iwi	tribal groups
kaitiakitanga	the ongoing necessity for tangata whenua to look after the taonga, both physical and intangible, that are their heritage
mahinga kai	places where food and other resources are traditionally gathered, and the gathering and management of those resources
mana	the status and authority of tangata whenua
mauri	the essential life force or distinctiveness that enables each thing to exist as itself
rangatiratanga	the right of iwi, hapū and whanau to make their own decisions about things that concern them
rongoā	plant traditionally used for medicinal purposes
taonga	valued resources, assets, prized possessions both material and non-material
tangata whenua	people of the land, Māori people
tāpu	the particular sacredness of people, things and places for particular reasons
tikanga	the correct way of doing things, and is based in some of the essential principles that shape the Māori world
Te Tiriti o Waitangi	the Treaty of Waitangi
wāhi tapu	special and sacred places
whanau	family groups



## Acronyms

CRI	Crown Research Institute	PGSF	Public Good Science Fund
CBD	Convention on Biological Diversity	RMA	Resource Management Act 1991
DoC	Department of Conservation	SILNA	South Island Landless Natives Act 1906 (repealed)
EBEX21	Emissions/Biodiversity Exchange 21 Project	SNA	Significant Natural Area
FAA	Forests Amendment Act 1993 (The Forests Act 1949 was amended by the Forests Amendment Act 1993 that introduced a new Part (Part IIIA) that deals with the sustainable harvesting of native trees on private land. The correct term for the legislation is the Forests Act 1949, but those involved with the industry usually refer it to as the Forests Amendment Act)	SOE	State Owned Enterprise
		TLA	Territorial Local Authority
		UNESCO	United Nations Educational, Scientific and Cultural Organisation
FRST	Foundation for Research, Science and Technology		
FSC	Forest Stewardship Council		
FRI	Forest Research Institute		
IFU	Indigenous Forestry Unit, Ministry of Agriculture and Forestry		
MAB	Man and the Biosphere Programme, UNESCO		
MAC	Ministerial Advisory Committee on Biodiversity and Private Land		
MAF	Ministry of Agriculture and Forestry		
MfE	Ministry for the Environment		
NGO	Non-governmental Organisation		
NPS	National Policy Statement on Biodiversity, Ministry for the Environment		
NZILA	New Zealand Institute of Landscape Architects		
PCE	Parliamentary Commissioner for the Environment		

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### Check these out

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