Weaving Resilience into our Working Lands

Summary of Submissions

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

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This report provides a summary of submissions made to the Parliamentary Commissioner for the Environment in response to the discussion paper *Weaving Resilience into our Working Lands: future roles for native plants on private land* (2001).

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1 The discussion paper: *Weaving Resilience into our Working Lands*

In June 2001 the Parliamentary Commissioner for the Environment released a discussion paper *Weaving Resilience into our Working Lands: future roles for native plants on private land*. The purpose of the discussion paper was to stimulate debate on the place of native plants outside the conservation estate.

The paper raised a number of issues concerning the sustainability of land use and management that required further critical thinking and debate, specifically:

- If New Zealand is to achieve the goals in its national Biodiversity Strategy, do opportunities to increase the occurrence of native plants outside of conservation areas exist and can they be realised?
- Is it possible, or desirable, to develop new land management practices using native plants that provide for a greater range of combined economic and conservation outcomes?

At present New Zealand's land management systems could be characterised as being predominantly based on exotic plant species that are managed using monocultural practices. Such practices raise questions about the:

- resilience to unforeseen changes in environmental conditions
- sustainability – monocultural systems are often heavily reliant on non-renewable energy, and can have adverse impacts on soil and water
- unforeseen consequences that arise from seeking economic opportunities through the introduction of new exotic plant species (including those from genetic modification)
- possible inconsistency between actual practice and New Zealand's current export marketing strategy, which is based on a clean green image.

The discussion paper asked readers to consider:

What are the future roles of indigenous vegetation on private land?

In addressing this question respondents were asked to assess:

- the implications of the divergent views about the values and uses of native plants
- the language we use to discuss the topic and its impact on communication processes
- the effects of current laws, policies and central and local government organisations
- economic constraints, risks and opportunities
- appropriate market structures and roles
- the scope and focus of current research and knowledge accumulation
- overcoming soured relationships between landowners, public agencies and special interest groups
- the implications for New Zealand's biodiversity
- traditional and practical values and taonga for tangata whenua
- recognition of the value and potential of ecosystem services
- our sense of place.

This document summaries the submissions received in response to the discussion paper. Its purpose is to represent the range of views and common themes present in submissions received. The opinions expressed in this summary and the quotes taken from submissions are not necessarily representative of the views of the Commissioner or his staff, nor are they endorsed or disputed by the Commissioner at this point in time.

This summary of submissions will contribute to the final stage of the process, a report that will be tabled in Parliament mid-year. The report will contain the findings and recommendations of the Commissioner's investigation into the role of native plants on private land.

2 Analysis of submitter information

The Commissioner received 58 submissions in response to the discussion document *Weaving Resilience Into Our Working Lands: future roles for native plants on private land.* Submissions were received from:

Maori (M)	2
City council (C)	1
District council (D)	3
Regional council (R)	3
Central government department/quasi-government agency (G)	6
Non-governmental organisation/community group (N)	5
Professional association (P)	4
Research institute/university lecturer/student (RES)	16
Individual (I)	18

Individual submitters included landowners, farm foresters, indigenous forest managers, consultants, owners of businesses making use of native plants and people in general who are passionate about the future of native plants.

Non-governmental groups included Rural Women New Zealand, Tāne's Tree Trust, Greenpeace New Zealand, one local branch of the Forest and Bird Protection Society and a community group from Manawhae.

The professional associations represented included farm forestry, beekeepers and Federated Farmers of New Zealand.

Submissions classified as 'Maori' included one South Island Landless Natives Act 1906 (SILNA) landowner and another from the Hauraki Maori Trust Board.

The Department of Conservation (DoC) and the Indigenous Forestry Unit of the Ministry of Agriculture and Forestry (MAF) made substantial submissions on the discussion document. The Treasury submitted a brief letter of support. Two Conservation Boards and the Queen Elizabeth the Second (QEII) National Trust also made submissions.

Researchers from Crown Research Institutes (CRIs) and universities who provided submissions came from various interests in forestry, nature conservation, landscape ecology, sustainable land management, potentials for native plants, indigenous ecology and resource management.

A full list of submitters is located in Appendix 1. Direct quotes are referenced to submitters throughout the document.

3 General feedback

All submitters commented on the usefulness of the Commissioner's initiative in producing a discussion document on the future of native plants on private land.

There were also comments on the:

- use of terminology
- definition of some concepts
- scope and emphasis of the discussion paper
- methodology, accuracy and structure of the paper.

3.1 Usefulness of the discussion paper

Fifty-seven submitters supported the need for this discussion paper and the Commissioner's concern about the future of native plants on private land. One submitter questioned the need for the Commissioner to be involved in the area of biodiversity.

The following quotes represent a cross-section of submitters supporting the discussion paper:

> *The report provides an excellent summary of the issues, perceptions, roles and responsibilities in relation to native plants on private land. [20]*

> *It is a significant issue and one with many component parts, it is also an issue that carries much emotion and with it strong views and positions. [4]*

Submitters also commented on the Commissioner's view that there is a need to integrate the concepts of sustainable use and biodiversity into the management of private land:

> *... 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. [25]*

> *The report 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. [26]*

> *The Board agrees that ecological sustainability must be the fundamental requirement for all New Zealand's land use and recognises the important role that native plants can play in New Zealand's society. This role will not diminish in future years. [18]*

> *If nothing else the paper has provided a useful stock take of where we are presently with promoting the productive use of native plants material. In this respect it will remain a useful resource for some time to come. But it does more than that; it makes a strong case for policy makers to think more deeply about native plants as productive resources. [39]*
>
> *We believe that the paper takes a much welcomed pragmatic and reasoned approach that attempts to broker a positive new path towards actually increasing biodiversity on working lands by advocating 'use' as opposed to 'preservation' and 'regulation'. [42]*
>
> *In the current political environment it is difficult for government officials to comment, much less become advocates, for the use of New Zealand native flora for commercial purposes. Many commercial forestry interests have purposely shunned involvement with 'natives' thus avoiding being off side with government or vocal interest groups. It is a very welcome change, therefore, to have the Parliamentary Commissioner's report squarely addressing the issue. [40]*

The Indigenous Forestry Unit of MAF agreed that the report is a timely reminder of New Zealand's need to work actively with its heritage of native plants, particularly with forest ecosystems. However, the submitter pointed out that the report needed a greater focus on forest ecosystems and less on native plants, and continued by stating:

> *The report is not proactive enough. Too much on soured relationships and inappropriate mindsets. Greater focus on what can constitute sustainable management to achieve resilient indigenous plant ecosystems especially forest would be helpful. [10]*

The Department of Conservation felt that the discussion paper had limited value:

> *No compelling evidence is produced to show that they [current institutions and instruments of the Resource Management Act 1991] are preventing new opportunities from emerging or that new markets are being stifled. There are some issues which could be beneficially resolved but they do not appear critical. There are some interesting case studies presented, but all of them have emerged under the current framework.*

The submitter concluded its comments by stating:

> *At this stage further work by the PCE [Parliamentary Commissioner for the Environment] 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 on Biodiversity] process being run by the Ministry for the Environment is inclusive of a range of stakeholders. [15]*

3.2 Use of terminology

Three submitters commented specifically on the way in which some terminology was applied within the discussion paper.

One submitter questioned the term 'ecosystems' in the document, considering it to be of limited use because it refers to a concept rather than something with a geographical or spatial boundary.

The same submitter considered that the reference to diversity of native plants in the document was also of limited usefulness and preferred the use of terms such as biological communities or ecological assemblages. The submitter considered that these terms would be more useful within the context of having an objective of introducing native plants into new areas.

Finally, the same submitter considered the term 'ecosystem health' to be of limited use because there is no analogy between human health and that of biological diversity, and that a more accurate term would be ecological state or condition.

Another submitter suggested that, rather than use the term 'uses and services', a less loaded term would be 'values'.

A number of submitters stated that the term forestry in New Zealand conjures up those practices associated with *Pinus radiata* forestry, and that the public is largely ignorant of the techniques of sustainable indigenous forestry as practised in Europe (see also section 6.2).

3.3 Definitions of concepts

Ten submitters commented on the concepts of ecological resilience and biodiversity and discussed the role of indigenous plants in the context of these issues.

Seven of these submitters questioned the Commissioner's assertion in the discussion paper that increasing indigenous biodiversity will improve the resilience of New Zealand's working lands. They pointed out that, while some research supports the thesis that diversity is linked to resilience, there is no evidence that indigenous biodiversity provides any more resilience than working lands dominated by exotic or mixtures of exotic and native species. These submitters concluded that this assertion required further, more careful justification as to why there might be a preference for native diversity over that provided by exotic species.

A joint submission from the New Zealand Forest Owners Association and New Zealand Farm Forestry Association stated:

> *There is no data that substantiates that planting native species will accomplish this task [addressing erosion and nutrient loss problems]. The opposite can easily be argued as we know that native insects harboured in native plants can be extremely detrimental to many crops, e.g. citrus borer in tree crops and puriri moth in many exotic timber species. [40]*

Another submitter 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 similar as possible to the ecosystem that would be present without man's intervention. [22]*

This submitter expressed the view that, in terms of human-managed productive lands, forestry is the easiest in which to utilise near-natural management systems. In addition, the resilience and sustainability of exotic forests can also benefit from being managed in a near-natural manner. However, managing farmlands and orchards using a near-natural approach is more difficult.

The submitter then stated:

> *'Near naturalness' describes a process rather than an outcome. In contrast, biodiversity and indigenous-ness describe outcomes. Thinking about them causes confusion, because they do not convey how they are to be achieved. [22]*

3.4 Emphasis and scope of the report

Nine submitters expressed concern about the emphasis given to various issues in the discussion paper. A number stated that the paper failed to highlight sufficiently that assemblages of plants containing mixtures of exotic and indigenous species would also provide biodiversity and other benefits (in addition to those containing just indigenous species) (see also section 6.2).

One submitter pointed out that the focus on indigenous biodiversity in the paper does not reflect the emphasis of New Zealand's biodiversity strategy, which also includes the value of genetic diversity provided by introduced species.

The emphasis on growing indigenous plants at the expense of exotic plants was again raised, but in the context of the important role that exotic plant species currently play in soil conservation, amenity/landscape management and economic well-being.

One submitter expressed the view that the paper had largely overlooked the importance of spatial considerations when assessing ecological sustainability. They stated that the effective reintroduction of native species onto private land will be dependent on whether efficient patterns of vegetation at a broader landscape level can be achieved. This issue is also raised in the context of a landscape approach to biodiversity and land management (see also section 6.1 Managing for conservation and biodiversity).

Three submitters felt that the discussion paper placed an over-emphasis on terrestrial biodiversity to the detriment of aquatic ecosystems. These submitters highlighted the importance of improving riparian management objectives and restoring wetlands.

One submitter stated:

> *The PCE does focus a great deal on indigenous forests and their sustainable use. This is understandable, forest was once and still is New Zealand's most extensive indigenous vegetation cover. However, forests are by no means the worst affected of New Zealand's native ecosystems. Only 15% of New Zealand's original wetlands remain, many of which are affected by grazing and pollution, compare this to the 30% of the original forests that remain. [16C]*

Another submitter expressed the view that the paper seemed to downplay the importance of indigenous 'ecosystems' in favour of focusing on indigenous plants 'species'.

One submitter considered that the paper was advocating the reversal of past damage, and commented:

> *Sustainable development does not entail restoring ancient landscapes to the detriment of human persistence rather it is the development of beneficial long-term relations between the biosphere and humans. [16D]*

This submitter concluded that, rather than restoring pre-human ecosystems, a more realistic image of successful ecosystem functioning within our modified lands needs to be promoted.

Two submitters expressed concern that the discussion paper over-emphasised the economic value of biodiversity rather than altruistic, heritage and identity values.

The Department of Conservation commented that this over-emphasis on economic use:

> *... marginalises the very real and ongoing contribution that farmers do make towards strengthening biodiversity on private land through their protection of forests and tussocks and their creation of new wetlands. [15]*

Three submitters felt the scope of the discussion paper was limited. One pointed out that resilience is about more than just plants:

> *As this report arose out of concerns over the way that sustainable forest management was being debated its focus is primarily on plants. However, it seems important to me that the scope is broadened to focus on all indigenous biodiversity. This is necessary because plants are dependent on animals and vice versa, because it is impossible to manage indigenous plants without affecting indigenous animals, and because indigenous species across all taxonomic groups are facing a range of problems on private land. [35]*

The Indigenous Forestry Unit questioned the view that 'old growth' native forests can only be managed using conventional 'protection' techniques as this:

> *… is only supportable from a 'conservation' perspective if the requisite funds are available to compensate landowners and fully protect all elements of these ecosystems on both private and public land. Clearly this is not the situation nor is it likely to be in the foreseeable future. [10]*

In the same submission, the following view was expressed over the decision to exclude the conservation estate from the discussion paper:

> *However, it seems unrealistic to assume we will ever 'get past the polarised debates' while New Zealand's preservation estate of 30% remains excluded by policy from integrated land management that can and must include sustainable productive use within wise ecological constraints. Without including both State and Private lands, the PCE's well-intended efforts are unbalanced and unlikely to initiate the best long-term environmental response. [10]*

Five submitters also expressed concern at the exclusion of the role of native plants in urban areas from the discussion paper. They considered that there is considerable potential to increase the occurrence of native plants in urban areas.

One submitter saw a greater role for native plants in the development of new subdivisions around the largest cities. The submitter noted that some of the best examples of native forest planting are in city gardens where the plants receive good maintenance. They noted that riparian urban areas also provided potential for planting native plants.

However, one submitter, while supporting the increased use of native plants in urban gardens, did not consider that this alone would be sufficient to promote indigenous biodiversity to the required level.

3.5 Accuracy, methodology and structure of the paper

Three submitters commented on the accuracy of the paper. One submitter had general concerns about lapses in accuracy. Another expressed concern about the accuracy of Figure 2 that illustrates the historical coverage of indigenous forest in New Zealand.

One submitter expressed concern about the lack of a systematic methodology for analysing the viewpoints raised in the discussion paper, such as the use of a formal survey. The submitter concluded that:

> *It appears to represent a data free approach to policy analysis which is of concern. [15]*

There were also comments on the presentation of the material in the discussion paper, including the lack of a glossary of terms and a list of key words, phrases and definitions. One submitter stated a preference for footnotes at the bottom of the page rather than endnotes at the conclusion of each chapter, and commented that chapter summaries would have been useful, given the complexity and extent of the material in the discussion paper.

4 Visions and scenarios for native plants on private land

This section summarises visions from submitters for native plants on private land and includes two alternative future scenarios for native plants as suggested by one landowner. Visions are ideally what we would like the future to be, scenarios, however, provide predictions on what the future will be like, depending on different influencing factors (although they may contain a visionary component).

4.1 Visions

The visionary ideas expressed by submitters for native plants on private land (and beyond) had common themes. These are summarised below, followed by a selection of quotes illustrating the nature of submitter's visions. There is an emphasis on ecosystems of indigenous flora, rather than on single species, and a common call to increase the cover and presence of native plants, particularly in lowland areas. Many submitters had visions of native plants providing linked corridors along riparian margins, from the mountains to the sea, reflecting a whole landscape approach. It was noted that:

> *Landscape restoration within productive agricultural systems and urban systems is a growing focus of such collective visioning internationally ... [21b; 51a]*

Although many submitters outlined specific visions for private working lands, as far as the place of native plants is concerned, only a small number specifically referred to and outlined an overall vision. In order to ensure neutrality and integrity in representing the views of submitters, no visions have been summarised or inferred from other information gleaned from the submissions.

Vision: The planting of indigenous flora will have occurred and continue to occur on, in and/or around a range of areas. These areas include:

- road reserves/roadsides
- paddock boundaries
- stream edges/riparian margins
- shelterbelts
- woodlots
- gardens
- exotic plantation boundaries and understories
- farm dams to create mini wetland habitats
- marae
- lifestyle subdivisions with conditions for some native plantings
- the 'quarter-acre section'
- areas considered 'uneconomic' for 'production purposes'
- pastureland, as trees for shelter eg, totara.

Vision: The harvesting of native plants will occur where 'appropriate' for timber, fibre, oils, resins, medicinal products, genetic resources, honey, mahinga kai, rongoa resources. There will be continuous-cover management of indigenous forests. There will be native tree plantations for harvesting and the inter-planting of regenerating areas with native timber trees.

Vision: Extensive networks of native plants across the New Zealand landscape. This vision was seen as achieving a landscape mosaic of different land uses and ecosystem types, providing a variety of habitat for wildlife. Networks and corridors of native plants for bird, insect and seed migration exist between conservation lands and native bush remnants, in wetlands and along riparian margins. Many forest, wetland, tussock and coastal dune lands have been restored. There is more lowland podocarp forest. Remnants of native bush, such as QEII National Trust areas are actively managed and kept free of pests. Native plants are present from the 'mountains to the sea'. (See also section 6.1 Managing for conservation and biodiversity.)

Vision: That there are 'transitional landscapes', which provide a bridge between the present and the future. These landscape types will be represented by the reverting of steeper and eroding land from exotic to native plants, for which exotic plantings will provide nursery cover. The landscape will be a mosaic of exotic and native plants. In the rural environment indigenous species will gradually replace the functions of non-essential exotic species. This change might begin incrementally with road margins being used for planting native species. This "would transform a landscape without any loss of productive function" and allow for transitional landscape change.

Vision: That native plants will be used as a sustainable tribal resource, where the native seed stock is protected and sustained for future generations. The intellectual property rights of Maori associated with native plants will be protected.

Vision: The near-natural use of productive lands.

Vision: Native plants will be integrated into the urban environment, creating enhanced human well-being. Planting of native species will exist on, in or around:

- roadsides and streets
- car parks
- land surrounding businesses
- apartment roof tops
- urban waterways
- gardens
- sewerage and waste treatment areas.

The following selection of quotes articulate some of the visions presented by submitters:

> *It is 2050. Hauraki people are able to enter the great forests of Tāne and witness a place alive with life. Kūkūpa again make their migration from the mountains to the lowland forests to feast upon the berries of the mātai, the miro and the karaka … These places of the land and sea have once again become abundant food baskets. [14]*

My Vision for the Waikato:

- *The Waikato, Waipa, Piako, Waitoa and Waihou rivers with a thick riparian margin from upper to lower catchments; presence of galaxiids in lowland streams as indicators of stream health*
- *Large areas of mineralised wetland retained and extensive areas of estuarine wetlands restored ... breeding populations of rare and endangered wetland birds expanded (as indicators of native vegetation restoration)*
- *Breeding populations of tui and native pigeon throughout the Waikato, particularly in Hamilton, which currently is devoid of native plant communities that neither of these birds are resident in the City*
- *Farmers throughout the Waikato proud of their treed farms, with drainage ditches that are lined by bushes and shrubs (not necessarily all natives), and hillside sidelings that are treed by various mixes of commercial pine, commercial natives, and amenity forest*
- *Farmers throughout the Waikato knowledgeable about native plants, their history and their ecology*
- *Urban volunteers and rural landowners working together to restore and replant areas of pure and mixed native bush and wetland. [31]*

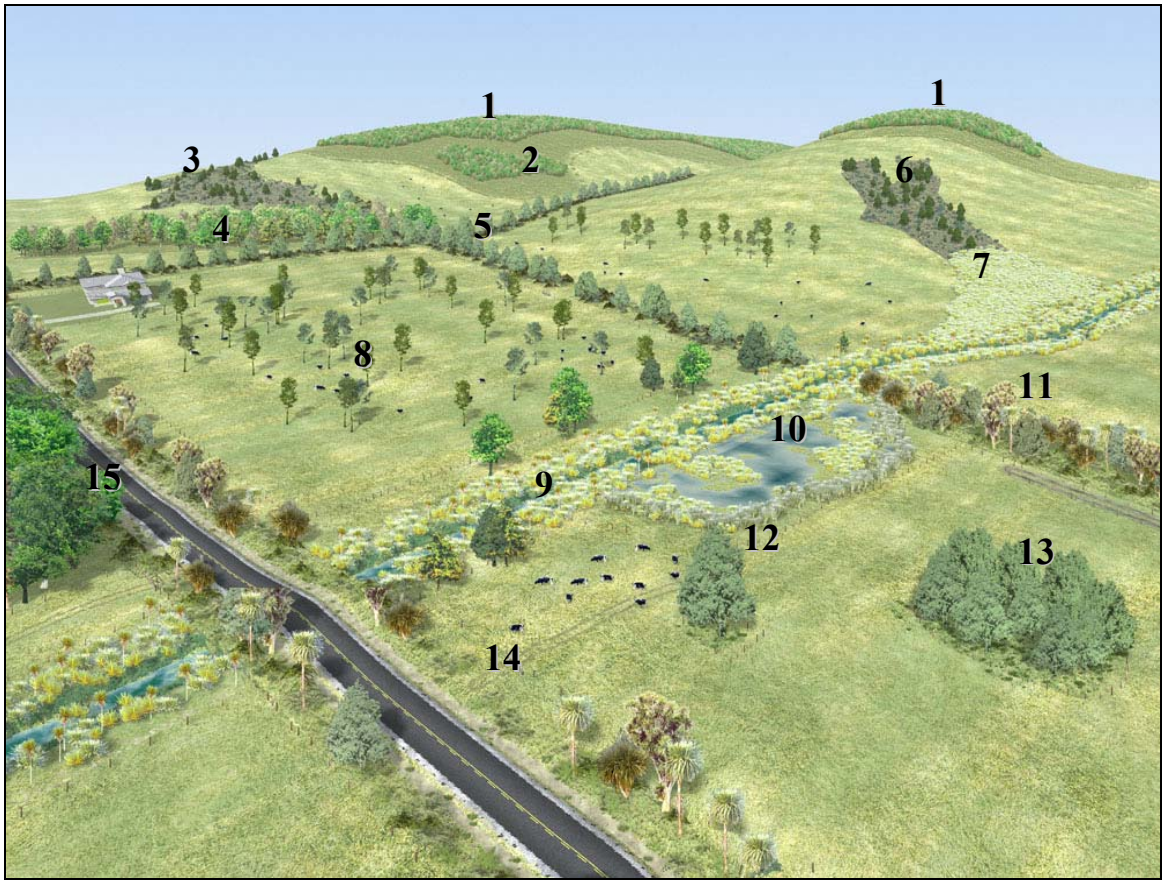
... working more strongly with nature, not against it as in monocultures be they exotic or native, by encouraging through adaptive management of ecological processes the continuous growth of forest plant assemblages that are dominated by our rich indigenous flora and fauna. [10]

Shelter belts planted for animals and trees by horticulturists, viticulturists and farmers could as well be natives as they are Pinus, cypress species ... the trees could be harvested for their timber and have a dual benefit. [23]

One submitter questioned the broad vision they saw implied in the title of the discussion document, *Weaving Resilience into our Working Land: future roles for native plants on private land:*

How to make sufficient connection between individual actions and the broad vision implied in the title. Weaving implies working to achieve a landscape mosaic which transcends individual property titles. [21]

The vision of Environment Waikato staff is depicted in this graphic:



1 Forest fragments supply a source of seed and birdlife to regenerating areas.
2 Naturally regenerating vegetation to extend and connect forest fragments, can be interplanted with native timber trees.
3 Reverting steeper and eroding land.
4 Planted block of native timber trees.
5 Shelter belts of native plants that can also be used as forest corridors and for timber.
6 Revegetated gully for erosion control.
7 Wetland seepage area to filter nutrients and sediment from runoff water, and to regulate water flow.
8 Native trees for shade and timber.
9 Riparian planting to prevent erosion and help cool water.
10 Wetland recreated from boggy unproductive pasture.
11 Forest corridor connecting to wetlands and forest fragments.
12 Fenced individual remnant tree. Individual trees can live for hundreds of years and are worth fencing.
13 Fenced and underplanted remnant group of trees.
14 Planted road verges to create ‘Bird Roads’.
15 Recreated forest block to extend the distribution of forest fragments.

4.2 Scenarios

Some submitters discussed future scenarios. As mentioned, scenarios differ from visions: visions are what we ideally want the future to be like whilst scenarios provide predictions on what the future will be like, depending on different influencing factors.

One forest farm landowner proposed the following scenarios:

> *The 'this is as good as its gets' scenario:*
>
> *This scenario assumes ... a continuation of present trends towards stricter controls on the use of land with a cover of indigenous vegetation ...*
>
> *Landowners will see no value in indigenous vegetation and will prevent revegetation with indigenous species, to limit the areas of their land subject to land use restrictions. Indigenous plants on productive land and in exotic forests will be viewed as weeds, and as plants with a net economic liability. New plantings on private land (including riparian areas) will be restricted to exotic species. Small areas of new indigenous plantings will be made for cultural or environmental reasons, mainly on lifestyle blocks and around ecotourism ventures. [27]*
>
> *The 'expanding indigenous influence' scenario:*
>
> *This scenario assumes that the regulatory approach towards private land is modified to use less direct regulation and more education, research and consultation ... [a number of other assumptions were made, for example, compensation for full protection of indigenous vegetation]*
>
> *Native vegetation gradually becomes a part of most New Zealand landscapes after an initial decline due to clearance of some regenerating areas. The productive uses of native plants expand as the result of increased research and interest in products derived from native plants for the 'cultural' appeal. This results in a steady increase in land managed primarily to promote indigenous vegetation cover. [27]*

Another individual stated:

> *I am confident ... that there will be an ever accelerating willingness to consider a greater – and more diverse – role for native plants in the lived-in environment. [41]*

5 Human–nature relationships

Sixteen submissions commented specifically on the relationship between humans and nature, focusing on emotional, or non-monetary, dimensions.

5.1 Valuing native plants for anything other than monetary reasons

Personal relationships to native plants were variously expressed as love, a special affection, an affinity, a feeling for and respect of, an emotional or personal attachment, a spiritual connection, and a sense of responsibility as 'stewards' of the land. These relational values are seen as important motivators with respect to how we interact with, value and manage New Zealand's native flora and fauna – for some people these are more important than specific ecological values or monetary motivations. For the majority of submitters commenting on this topic, an emotional attachment was cast in a positive light – that is to say it created a desire to establish and care for native plants and ecosystems. Some submitters pointed out the limitations in human–nature relationships and the impacts on environmental management outcomes as outlined below.

> *Tiakina nga manu, ka ora te ngahere. Kia ora te ngahere, ka ora naga manu. Look after the birds and the forest flourishes. If the forest flourishes, the birds flourish. [cited in 44]*

> *My interest in this topic is as a New Zealander with a lifetime love of trees, and with a special affection for those species that are unique to our homeland. [1]*

Two submitters raised a point concerning the relationships with nature of Maori and non-Maori. One submitter sought recognition of the fact that many people have feeling and respect for the land. The other submitter stated:

> *Some groups believe that only those with a proven indigenous (i.e. tangata whenua) ancestry are spiritually connected to the land and nature, while others understand that any New Zealander may have a spiritual connection to the land and its resources. [16A]*

Seven submitters explored the less tangible values of native plants and ecosystems. They commented on the aesthetic values and pleasure derived from native flora and fauna, the link between nature and cultural identity, biodiversity and heritage, and the contribution of native plant ecosystems to a sense of place. One submitter related the importance of natural surroundings to our well-being as a nation:

> *In order for public philosophy to change, people need to realise that the beauty of our natural surroundings is important to our general well-being and quality of life. [16B]*

Another submitter stated:

> *The lack of a subheading to acknowledge the potential benefits of native planting for heritage and identity in the opportunities section is surprising ... you should place greater emphasis upon the interconnections between biodiversity and heritage ... [21]*

The relationship between these 'intangible' values and ecological or economic values was also commented on:

> *It is hard to define in economic terms but my view is that aesthetic value is no less powerful than economic value. [16B]*
>
> *... native bush is valued [by farmers] as much for aesthetic, symbolic and spiritual reasons as ecological reasons. [31]*
>
> *The rate of New Zealand's biodiversity loss is ... a sad reflection of the lack of understanding and respect for the indigenous biota of the country and the value it has in intrinsic and economic terms. [46]*

The doctoral research from one submitter highlighted the difference between people's views on native plants in the landscape, when given two quite different pictures of farmland to look at. The first picture was described from a farmer's viewpoint as beautiful pasture, but seen from an ecological viewpoint as being a biological desert, whilst the second picture was described from a farmer's viewpoint as an untidy mess, but seen from an ecological viewpoint as being rich in species diversity.

This researcher also found that:

> *Farmers use their bush for a variety of reasons, including stock shade and shelter ... However, other important reasons included aesthetic reasons (a very important reason), symbolic or heritage reasons (personal and family histories); the pleasure derived from the wildlife; and spiritual reasons (a number of people mentioned that a family member had had their ashes scattered in the bush) ... [31]*

One Canterbury landowner, with over three kilometres of native shelterbelts on his property, gave the following personal reasons for favouring the use of native plants in shelterbelts:

- *Proximity to an area of native bush – landscape considerations*
- *Affinity with 'New Zealand' flora and fauna, and to encourage and preserve biodiversity*
- *Challenge of doing something different from the mainstream of exotic planting, and the subsequent rewards of achieving something quite unique. [5]*

Another example of the non-monetary value of native plants was highlighted by one submitter who pointed out that:

> *... a farmer pumped water for several weeks to a small fragment of indigenous forest during a recent drought in order to save it. [42]*

Two submitters highlighted a sense of responsibility amongst farmers in protecting native bush for future generations. This quote from Federated Farmers of New Zealand notes:

> *Holding onto our biological treasures, maintaining and restoring them and long term sustainable management and monitoring are principles and aims that fit well with rural landowners and are an integral component of their well being. [42]*

Recent research found that:

> *... ecological principles and 'biodiversity' ideals do not fit within mindsets [of dairy farmers] that have developed over decades through interaction with a science and technology-based industry that treats land as a commodity, and ecological systems as infinitely manageable. [31]*

5.2 Sense of place

One submitter stated that both native and exotic species are important to New Zealanders' sense of place. Other submitters had these points to make:

> *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. [21b, 51a]*

> *To possess sense of place one needs to feel an affinity with the place where you live; your turangawaewae. To put it another way humans need to be a functioning part of the ecology of their community. ... In order for Homo sapiens to find a sense of place in New Zealand we need to weave the naturalness of the environment into our life systems. Within a few hundred years of their arrival its seems that the ancestors of the Maori people had achieved this, although they began to grow away from the concept once they began to compete for resources. [38]*

> *Indigenous ... forestry ... provides an opportunity for New Zealanders to express their national and cultural identity by providing something that is purely New Zealand, sourced from sustainably managed native forests. [Devoe and Olson, 2001,[1] cited in submission 38]*

5.3 Impact of human–nature relationships on policy development, management approaches and landscape changes

The following quotes highlight a range of issues concerning the uncertainty and complacency in New Zealanders' relationships with nature, the divisive split made between nature and culture, and the impacts of cultural preferences on land and native ecosystem management to date.

One submitter noted that:

> *... all inhabited landscapes are crafted according to the 'culture' of those occupying the land. [27]*

Another submitter pointed out that the efforts of the Commissioner in furthering the place of native plants on private land would need to be cautious of letting the issue:

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[1] Devoe, N. and Olsen, S. 2001: Why a strong indigenous forestry sector is in the national interest. *New Zealand Journal of Forestry*. 46(1) 22–26.

> *... become buried in the ephemeral controversies that are symptoms of New Zealander's underlying confusion about our relationship to nature. [22]*

In terms of cultural influences on land management, the Indigenous Forestry Unit of MAF is of the opinion that:

> *... we have for too long been encouraged to take positions about what is right for NZ based on emotive argument and biased information ... It's no use feeling good about the size of our 'protected' natural areas if we can't adequately maintain their requisite parts. [10]*

Two other submitters, by way of their published research paper, stated that land-management policy and practice in the twentieth century was:

> *... largely based upon a conceptual and practical dichotomy between nature and culture, and between the public conservation estate, and privately owned productive landscapes. [21b, 51a]*

The authors stated that, if this dichotomy continues:

> *... 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 personal and political level. [21b, 51a]*

5.4 Relationship between conservation and preservation – the place of 'use'

It is possible, with thorough analysis, to deduce from the nature of submissions, the views of submitters on the relationship between conservation and preservation. However, this analysis has the potential to over-simplify or incorrectly interpret these personal philosophies. Therefore, this section refers only to submissions that specifically discussed the relationship between conservation, preservation and the place of consumptive use.

One submitter referred to conclusions from their recent postgraduate research project into the sustainable use of indigenous flora and fauna that found 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 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. [53]*

Another submission, based on a recent discussion between conservation stakeholders in Southland and Otago, stated:

> *Two poles have been identified: groups and individuals who advocate for, or are sympathetic towards, the consumptive use of indigenous biodiversity, and those who are against its consumptive use. The two poles have a number of characteristic differences in their attitudes towards conservation ... Some role players view conservation and preservation as synonymous, and assume that any form of utilization of wild resources works against their conservation. On the other side of the spectrum, there are people who believe that nature is there to be used and exploited by humans, and who do not accept the need for conserving landscapes where no extractive use takes place. Certain groups and individuals view conservation as the preservation of individual large charismatic species and their habitats, while others see conservation as the holistic management of ecosystems, water catchments and landscapes. [16A]*

Further to this point, a submitter stated, in relation to land-use management in New Zealand, that:

> *At one end of the scale are those areas retained inviolate for the maintenance of biodiversity, the protection of soil, water and landscape values, the conservation of gene pools and many other uses which do not involve the removal of any part of that ecosystem. The other end of the scale used to imply the complete removal of the forest or wetland ecosystem and its replacement with a completely different one – usually exotic grassland or forest. In New Zealand today there is probably no place for such complete change of ecosystem, mainly because the process is often extremely detrimental to the greater area. Rather we should be making explicit provision for the management of ecosystems which are native to this place and for the provision of a wide range of social and economic benefits from these ecosystems. [38]*

The National Beekeepers Association believes conservation includes preservation and was of the opinion that:

- conservation is a continuum that includes non-extractive preservation
- it is appropriate to designate some special areas for protection of indigenous biodiversity
- extractive utilisation is a valid option provided it is sustainable
- there should be encouragement of planting for a wide range of values.

The following quotes highlight other views on the relationship of preservation and conservation:

> *[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. [21]*

> *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. [38]*

> *... the knowledge that [tangata whenua] already hold by dint of centuries of forest use and, perhaps because of this, Maori have a more consistent and sensible view of the useful value of biodiversity/taonga than Pakeha do. [38]*

6 Managing native plants

Thirty-two submitters provided views on how to manage native plants so as to achieve the visions discussed in chapter 4.1. Comments were made on a variety of ecologically sustainable management regimes. These include management for:

- conservation and biodiversity outcomes
- forestry (timber production) outcomes
- carbon sequestration
- shelter benefits
- ecotourism benefits
- grassland/pastoral benefits.

These six points are discussed in turn.

6.1 Managing for conservation and biodiversity

Twenty-four submitters discussed options for managing native plants so as to achieve conservation and biodiversity outcomes.

One submitter expressed the view that extractive uses should be limited to new plantings of native plants, because extractive use of existing forest remnants could threaten their ongoing existence. The submitter felt that, in general, non-extractive uses should be promoted over extractive uses.

Another submitter called for caution and stated that the range of sustainable management options for indigenous plants was limited because of the extreme vulnerability of New Zealand flora and fauna, and that specialised plant and animal relationships can be readily destroyed by habitat modification, such as the removal of large timber-producing trees.

The submitter went on to say:

> *... when 'using' what remains of our indigenous forests it must be recognised that in many instances we are looking at somewhat 'battered' remnants, having had much of the larger, timber and upper canopy producing trees removed, ravaged by seedling and regrowth destruction from introduced rats, deer, wallabies and even farm stock; and with dead, dying or struggling-to-survive trees as a result of possum browsing. We need to ask is our proposed 'use' likely to inflict some further 'extraction' upon an already greatly weakened forest ecology? [36]*

This submitter did not oppose use prospects and proposals per se, but strongly supported activities and practices that further native plant propagation within the context of their special nature, uniqueness and sensitivity.

Another submitter expressed concern about the size of our ecological footprint and the ability of New Zealand's ecosystems to absorb human-related impacts.

However, a number of submitters felt that there is a role for different management approaches to achieve a range of outcomes that would assist in the conservation of New Zealand's indigenous plants.

One submitter concluded that there is a need to shed the view that the preservation approach to conservation is the only way to conserve indigenous species.

> *Indeed we need to develop a new ethic for land management in New Zealand that focuses on sustainable land management whose goal is to ensure that indigenous biodiversity flourishes while enabling an economic return to be taken from the land.*

The submitter continued by stating:

> *I am not arguing that we should open up the public conservation land for multiple-use activities, but rather I am suggesting that we need to accept that private land is different and take an approach that recognises its important ecological, social and economic values. [35]*

6.1.1 Pest control

Four submitters viewed pest and weed control as the most important issue when managing for conservation and biodiversity. Two discussed this concern in the context of the Far North region where they consider it to be a more pressing issue than the need to establish new areas of native plants.

Another submitter stated:

> *In addition to funding [of] DoC etc, more funds should be made available to Councils, communities, [and] landowners that are achieving things on the ground, that may not involve formal covenants, but still result in the landowner continuing to protect and enhance our natural areas. Ongoing pest control on a catchment basis is vital. Any landowner will tell you this. Creating covenants doesn't protect or enhance it, active management does. And Government needs to provide incentive/resources to recognise the public benefit of the work and ensure it is carried out effectively. [28]*

6.1.2 Coordination of effort and community involvement

Four submitters commented on the need for coordination across ownership boundaries in order to achieve the effective reintroduction of native ecosystems onto private land. It was stated that this coordination would require institutions and frameworks to provide advice and advocacy across the areas of both conservation and sustainable management.

Another submitter considered that achieving conservation and biodiversity goals would require the help of skilled mediators and the establishment of non-confrontational biodiversity planning processes. In the submitter's view, these processes would incorporate informal, traditional and formal scientific knowledge, and would be validated through research and critical evaluation. The submitter proposed the establishment of pilot programmes in the southern South Island to raise awareness of the value of natural landscapes and ecosystems services, and that the New Zealand Biodiversity Strategy could be an ideal basis for this type of initiative.

Another submitter pointed out that one of the most successful ways to achieve biodiversity conservation on private land is by getting the local community to run the entire process, from goal-setting through to management. They stated that without buy-in from the local community there would never be resilient landscapes within which indigenous biodiversity could flourish.

6.1.3 Integrated conservation management and taking a landscape approach

Eight submitters discussed the need to address biodiversity and conservation in New Zealand in an integrated manner.

A regional council submitted the view that much of the indigenous forest remaining on private land exists in small fragments of less than 10 hectares, with little connectivity between them. To address this problem the council encourages and supports landowners, groups and communities in native planting. However, further efforts are required.

Another submitter stated that it is unrealistic to suppose that leaving remnants of native forests unmanaged is sufficient, and stated that most types of native vegetation need some form of active management, be it for pest or weed control or retaining water levels (eg, for wetlands).

One submitter stated:

> *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 to improve responsiveness*
> - *Research that integrates a broad range of disciplines*
> - *Active citizen involvement. [13]*

(See also chapter 8 Knowledge and research; chapter 10 Government agencies and legal frameworks.)

Another submitter pointed out that biodiversity goals would be different for different parts of rural New Zealand, reflecting the nature of the local environment and the wishes of the local community.

The same submitter also expressed the view that forest remnant management is only a part of the management issue. There is also a requirement for management of remnants such as roadside cabbage trees, copses of kahikatea in paddocks, or even scruffy gullies, because all are important. They commented on the need to move beyond forest management to landscape management, because indigenous fauna, especially birds, utilise the whole landscape.

Three other submitters also advocated the landscape approach, one stating:

> *... 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. [21]*

6.1.4 Importance of landowners

One submitter stated that the QEII National Trust programme is clear evidence of the importance of the participation of landowners as a key component to the success of any strategy to enhance biodiversity on private lands.

Another submitter discussed the role of landowners within the legislative framework and policy context:

> *The pressures [on landowners] have been both legislative and in the form of numerous Resource Management Plans, discussion papers, campaigns and strategies. Almost all these have unfortunately been critical and condemning of farmers' achievements. Only one (Bio-What[2]) has actually recognised that rural people are in fact the keenest and most active environmental stewards and are key to achieving the visions of a clean, green and sustainably managed environment. [42]*

6.1.5 Eco-sourcing

The quality and type of genetic material from reintroduced plants was raised in seven submissions. Five submitters expressed the view that the sourcing of local plant material and the role of plant nurseries were important issues. The Southland Community Nursery was given as an example. A number of potential consequences of not sourcing local plants were identified including:

- the risk of hybridisation with rare local provenances
- that plants might be too vigorous and become pest species
- that plants might not survive the local conditions and thereby discourage investment.

One submitter, however, did not consider the ecological source of the plant as a crucial issue. This position was based on the view that New Zealand is a living and evolving landscape and the movement of plant material has already occurred in the past, for example by Maori. The important issue is that of increasing the area covered by native plants.

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[2] *Bio-What?* is the preliminary report of the Ministerial Advisory Committee on biodiversity to the Minister for the Environment (2000). The report addresses the effects of private land management on biodiversity.

One submitter raised the related issue of genetic modification and the possibility that native plants could be genetically modified along similar lines as *Pinus radiata*, so as to improve productive aspects of the species. This management approach was seen as not contributing to New Zealand's biodiversity strategy, because there could be risks to unmodified specimens from unmanaged cross-pollination.

One submitter provided an excellent summary of many of the issues/views raised on the topic of managing native plants on private land for conservation and biodiversity outcomes:

- *Most New Zealanders agree that no species useful to humans should become extinct and ecosystems must be managed to produce clean air and water on a sustainable basis*
- *Government agencies must cooperate to manage environmental resources more sustainably and eradicate aggressive alien organisms*
- *That there is a need to develop cross-landscape management strategies (mountains to the sea) and conserve a spectrum of areas from pristine ecosystems through to heavily managed landscapes*
- *There is a need to integrate a range of conservation approaches from European orthodox to rahui, taiapure and mataitai [reserves]*
- *There is a necessity to share information and inform the public of the importance of integrated landscape management*
- *There is a need to conserve whole ecosystems rather than single species*
- *Active adaptive management and pest control are required to maintain and restore natural systems*
- *The need to benchmark sites representing pre-human, pest free landscapes. [16A]*

6.2 Managing for forestry

Ten submitters discussed the management of native plants for forestry (timber production) outcomes.

6.2.1 Definition of sustainable forestry

Six submitters commented on the definition of sustainable forestry and what this implies. One stated that the term 'forestry' in New Zealand conjures up those practices associated with *Pinus radiata*, and that the public is largely ignorant of the techniques of sustainable forestry, such as those practised in Europe. Three submitters specifically promoted the European *Plenterwald*, or continuous-cover forestry model, as a means of achieving ecologically sustainable forestry practices.

The Indigenous Forestry Unit provided the most comprehensive discussion on these types of management practice:

> *In the long term we need to aim for vegetation systems close to natural if we are to achieve resilient sustainability. Thus the length of the rotation has no place and should not be used to 'compare' native species with radiata pine. Rotation becomes irrelevant in near-natural forest management systems. Ultimately we will need to consider working with natural systems, not against them as in risky monocultural cropping of trees, especially if our aim is for diverse and resilient landscapes that incorporate Gondwana communities. [10]*

The sustainability of current radiata pine forest management techniques was also brought into question by two other submitters. One expressed the view that current even-aged, high rotation forestry practices have adverse impacts on indigenous fauna, water and soil quality, and are a source of invasive weed threat.

The other submitter emphasised the major reliance of plantation forestry on fossil fuels, due to the intensive land-use practices associated with plantation forestry. The submitter stated that this reliance on fossil fuels is further exacerbated by New Zealand's reliance on one exotic species (95 per cent of forestry is *Pinus radiata*), which requires huge amounts of energy at the processing stage to produce a useful timber product.

There were, however, two submitters who favoured the application of more conventional silviculture techniques to indigenous tree species, encompassing thinning and pruning regimes with the clear objective of maximising timber production. These submissions were primarily focused on trees that had been specifically planted or allowed to regenerate for forestry purposes.

6.2.2 Newly planted areas versus existing areas

Five submitters did not support forestry or other practices that extract biomass from remnant areas of forest. However, one of these submitters saw the planting of new areas of native trees for the purpose of future timber extraction as a way of moving beyond the current polarised debate over the harvesting of native trees.

However, the Indigenous Forestry Unit submission expressed the view that a more useful long-term approach would be to put further effort into the management of existing indigenous forests and the creation of new ones from land currently in scrub, exotic forests and grass cover. The submission concluded that this approach would lead to the establishment and management of near-natural ecosystems over a much greater area of land than currently carries indigenous forest, and would be more economically viable than forests based on conventional even-aged silviculture (see also chapter 9 about the economic value of native plants).

6.2.3 Silviculture

Fourteen submitters commented on specific issues relating to the establishment and ongoing management of native plants for forestry.

Three of these submitters discussed the use of exotic species as a nurse crop. One submitter proposed that exotic species could provide a suitable microclimate for native plants in harsher climates (especially shade tolerant rimu and matai), that exotic species could also provide a source of timber for the first 50 years, and that excessive damage to native trees could be minimised by careful harvesting.

However, another submitter stated:

> *My planting of kauri [in Northland] has led me to place them in full light. A 'nurse' crop of ti tree proved a hindrance. Growth is maximised in full light. It is important in establishment to get kauri above the shrubby growth of hangehange and mahoe. While kauri may grow on poor soil it is necessary to have the fertility of a humus layer. [54]*

Three submitters discussed the growth rates of native trees and the means to increase these rates.

One of these submitters argued that:

> *A common perception is that native trees are too slow growing. Many plantings of native species have been on sites left over after the best land has been converted to pasture or pines. This perception can and should be turned around with the planting of native species on better sites. [34]*

Another submitter was more cautious:

> *While under good soil conditions and with progressive silvicultural practice and fertilizer growth rate[s] may be faster than generally expected, in purely commercial terms exotic species will [still] considerably outperform natives. [1]*

The submitter concluded that there must be other supplementary non-commercial values such as biodiversity, landscape aesthetic and Maori values and uses in order to encourage landowners to plant native trees.

Two submitters were concerned that planting native trees with the expectation of producing timber in a relatively short term is unrealistic, because short timeframes result in lower quality timber. One of these submitters gave as an example 80-year-old kauri that, at this age, is mainly sapwood. It was felt that the discussion paper failed to highlight price differences between sapwood and older heartwood kauri (see chapter 9 on the economic value of native plants).

6.2.4 Certification

Forest Stewardship Council (FSC) Certification was seen as being central to achieving sustainable forest management by three submitters, and they felt that the discussion paper gave insufficient emphasis to this. The submission from Greenpeace New Zealand stated:

> *The role of the FSC is underplayed [in the discussion paper]: the FSC is the most successful initiative to conserve forests in the plethora of international ones, particularly intergovernmental. It is voluntary and has some key criteria that relate to biodiversity protection and restoration. [45]*

6.3 Managing for carbon sequestration

Two submitters expressed concern that the discussion paper implied that new native forests, planted for the purpose of carbon sinks, would produce very little or no timber because:

- there would be few tall (timber) trees growing in these forests
- timber could not be extracted from these forests without undermining their carbon sequestration capacity.

The first point was disputed by the submitters because significant amounts of timber trees would develop over time, the second point was disputed because timber could be produced using continuous-cover low-impact forestry techniques.

Another submitter interpreted the discussion paper to mean that the primary purpose of new native forests would be for carbon sequestration, that this would result in all, or most, of the timber left standing, and that any extraction of timber from these forests would be secondary to this primary objective.

6.4. Managing for shelter

Three submitters discussed the specifics of using native plant species for shelter. One submitter stated that using native plants for shelter on the Canterbury plains involved a number of difficulties, including:

- *Establishment problems with frost-tender juveniles and the need to create your own bank of knowledge through trial and error*
- *Slower growing species and the need to establish hardy species first and the less hardy ones a number of years later means that the shelter belt takes at least five extra years, compared with most exotics, before it becomes effective shelter and shade*
- *Much more labour, and therefore cost, is needed as the shelter belt is not finished its establishment stages for eight to ten years compared with exotics after two years. [5]*

However, these three submitters expressed the view that, despite the slower growing period, native plants still presented an opportunity as shelterbelt species.

6.5 Managing for ecotourism

Two submitters discussed the role of native plant species in ecotourism. One submitter expressed concern that, although ecotourism is considered to be a non-extractive use of native plants, there are actually a number of negative environmental effects from ecotourism.

6.6 Managing for grasslands

One submitter questioned the viability of using native tussock grasslands as pasture. The submitter expressed the view that tussock grasses have not evolved in the presence of mammalian herbivores and, if these tussock grasslands were to be grazed, there would have to be rigorous guidelines and research to ensure that there were no detrimental effects on these ecological communities.

7 Education and information

Forty submitters commented on the role of education and made specific suggestions on approaches and topics through to more generic comments.

The concepts of guidance, encouragement and support were recurring themes. All 40 submitters saw education and/or its associated practices of advice, advocacy, liaison, promotion and information sharing as necessary and fundamental to an ecologically sustainable management approach with regard to indigenous plants on our working lands.

The concept of education, as covered in the submissions, was broad and ranged from a tool for imparting, sharing and disseminating information, through to a method of advocacy and moral persuasion. The following quotes highlight both the belief in education as an effective method for furthering the place and roles of native plants on private land, and ways in which education may be used to do this.

> *... information, education and encouragement are needed so that [landowners] can find out what the costs and benefits of having native species on their properties might be, and thus be in a position to make informed decisions. [23]*
>
> *The Council agrees that the survival and diversity of New Zealand's indigenous vegetation species on private land could be enhanced through the promotion and encouragement of sustainable uses/practices. [12]*
>
> *... we strongly recommend that any [proposals for the use of indigenous plants] should be accompanied by an intensive educational programme to ensure a full understanding of the special nature of our indigenous ecology, of its uniqueness and sensitivity to change. [36]*
>
> *There is a need to show New Zealanders that greater care of our indigenous resources, however insignificant and degraded, is important because they have the potential to confer major benefits. [38]*
>
> *... education, in the provision of information to landowners on the benefits of native plants, is the key to getting 'buy in' from landowners. [13]*

One submitter noted the potential of the presence of native plants on private land to aid education initiatives:

> *The Board agrees that extending the native plants and plant associations on private land offers a unique opportunity to develop public understanding and awareness of the value of ecosystems. [18]*

7.1 Emphasising education rather than regulation

Education is seen by some submitters as an alternative, or complementary approach to regulation in ensuring the sustainable management or protection of native plants outside of conservation areas. Five submitters suggested that education be linked to additional incentives aimed at changing landowner behaviours:

> *Methods for communicating good practice and changing actions/behaviours outside of rules and regulation (i.e. voluntary means, incentives, education, awareness raising) also need to be developed ...* [12]

> *It is vital to keep rules to the minimum, and encouragement to the maximum.* [37]

> *... vision, education and incentive driven, not regulatory or compulsive.* [16E]

> *This scenario [the expansion of native plants] assumes that the regulatory approach towards private land is modified to use less direct regulation and more education, research and consultation.* [27]

7.2 Current inadequacies in education and information sharing

One submitter commented on the positive aspects of information having been made more accessible:

> *The greater interest shown by the community [in native plants] has in part been brought about by the increased amount of information that is being presented in more accessible ways. [8]*

The majority of submitters called for improvements in education and more dissemination of information. In relation to this, the following issues were raised:

- there is a lack of available knowledge (see also chapter 8 Knowledge and research)
- the information that is available is not easily sourced or disseminated sufficiently
- information needs to be adapted and related to local conditions
- information needs to be better packaged.

The inadequacies of current education and information collection and dissemination are seen to:

- "… [do] no service to native plants on private land nor the historical beliefs held regarding them" [6]

- result in private landowners, whether urban residents, lifestylers or farmers, having a lack of knowledge and experience in relation to native plants and ecosystems
- devalue indigenous ecosystem resources
- result in the loss of cultural heritage including heritage landscapes.

The following quote from a forest owner and manager highlights concerns regarding current provisions for education in relation to indigenous forestry:

> *Despite the recognition that indigenous forestry is different ... education opportunities in the industry are virtually non-existent. At present, most 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 ... Education for those working in the industry or those wishing to enter the industry is considered to be vital for sustainable indigenous forestry to develop. [47]*

7.3 What to educate about?

Information, education and the promotion and encouragement of the uses/services and values (typically non-monetary) of native plants was sought by submitters in relation to:

- what and why native plants are invaluable/valuable
- biodiversity
- landscape harmonisation/natural landscape
- art
- recreation
- amenity and aesthetic values
- conservation
- non-timber products
- ecosystems services and values
- wildlife values
- sustainable indigenous forest management.

Education was suggested on the following topics:

- the establishment of native plants
- the cultivation of native plants for a wide range of uses, eg, harvest, extractive uses, timber, 'supplementary' values
- the practicalities of indigenous forest management (silvicultural, ecosystem and near-natural approaches)
- near-natural approaches to the use of productive lands
- identification of sites with potential for productive use
- native plant species that can be alternatives/substitutes to exotic species used currently
- eco-sourcing and plants suited to the locality, eg, what indigenous flora is appropriate for a region, that would be beneficial to bees in providing sources of pollen and nectar
- weed and pest control
- biosecurity risk management/threats

- sustainable land uses and resource management practices involving native plants
- the goals for native plants and ecosystems in New Zealand
- the concept of land stewardship
- integrated landscape ecology and management
- whole ecosystem rather than single species approaches
- uniqueness of indigenous ecology and susceptibility to change
- native plant ecology and history
- threats to native ecosystems from introduced species (for example, native tussock grasslands and the threat of wilding *Pinus* species, Douglas fir, larch, sycamore, and hawthorn)
- conservation/protection options for native plants/ecosystems, such as covenants
- the costs and benefits of having native plants on private land
- a sense of place for New Zealanders that is related to New Zealand ecology.

The following comments from submitters relate to the points above:

> *Information needs to include lists of native plants, their potential uses and services, as well as how to manage them in an ecologically sustainable manner. It also needs to be pointed out how the use of these plants will contribute to improving current land use practices. [13]*
>
> *The Council considers that the points raised in the document regarding sense of place are pertinent and could be used to make people more aware of these features and their own relationships and feelings with them. [6]*
>
> *We need to make a much greater effort to inform the public about the good and bad aspects of current resource management on all land tenures. [10]*
>
> *We need to build a network of knowledge sharing amongst stakeholders by concentrating on a number of activities:*
> - *Education of New Zealanders, especially landowners and land managers, as to the virtues of native trees.*
> - *Also education of the wider community so that the place of sustainable indigenous forestry is better understood.*
> - *Dissemination of current knowledge and future findings to landowners so that they can be encouraged to plant native trees and can do so with a sound and proved knowledge base. [46]*
>
> *Native forest management education must be refocused onto ecological models rather than solely on empirical ones. Such education needs to be particularly directed at forest managers and those actually carrying out the work in the forest. [47]*
>
> *Areas that need to be covered in a native forest management programme include:*
> - *Indigenous forestry philosophy*
> - *Indigenous forest ecology*

- *Silviculture characteristics and tending of different species*
- *Low impact harvesting techniques*
- *Forest engineering*
- *Forest inventory*
- *Wood properties*
- *Value adding and processing*
- *Seasoning methods*
- *'Minor' uses and multiple use of indigenous forest resources*
- *Information dissemination and marketing. [47]*

Differences in attitudes towards conservation and use of native plants were seen by one submitter to*:*

> *... relate mainly to differences in knowledge and understanding, and different perceptions and values. [16A]*

It was suggested that education might assist in addressing these divergent views:

> *The depth of feelings that New Zealanders have for their forests is constantly demonstrated in many different ways. However this fervour does not necessarily reflect the level of people's knowledge of the forest ecosystems. Much of the controversy in recent times results from people advancing their views without ensuring that they really know what they are talking about. [26]*

7.4 Whose responsibility?

A range of institutions and people are seen to have a role to play in education, the sharing of information and the provision of advisory services with regard to native plants on working lands. Submitters suggested that education regarding the different topics outlined above, could be the responsibility of the following organisations:

- Relevant government agencies including regional, city and district councils and the Department of Conservation:

  > *The paradigm shift required for native trees to become a more dominant feature in New Zealand's landscape will most effectively be achieved via education and advocacy. This must begin with central and local government to ensure that policies and programmes are consistent nationwide. [20]*

  > *Definitely, YES, support of environmental education has to come from all levels in government and not only from the Department of Conservation ... Local bodies also need to address this issue by supporting schemes in their own area. Rotorua District Council for instance is not funding a single person to help Environment Bay of Plenty environmental education initiatives. If we want to preserve biodiversity we need to start with educating the next generation, and the younger the better.* [34]

- Trusts, community organisations and non-governmental organisations:

The best way to ensure conformity of approach to the issue is to effectively communicate the potentials, results and successes of those working in indigenous forest management. This will be one of the major roles of Tāne's Tree Trust. [38]

… government departments would win more support from farmers … if departments focussed on giving advice and support to trusts, funds and community organisations. [16B]

- Maori:
  The values, knowledge and environmental practices about the heritage of Hauraki are being progressively lost as each generation passes. It is incumbent upon the present generations of Hauraki people to re-establish wananga to transfer what remains to the next generation in order that they may learn from, build on and transfer that knowledge on to their children. [14]

- Schools, both primary and secondary.

- A new national entity to take on the role of coordinating a nation-wide approach to promotion, advocacy, advice and education:

  [There] needs to be an agency with technical expertise and knowledge … able to assist both landowners/land users and local government. [12]

  Whilst there are a number of organisations and agencies involved in the broad area of conservation and sustainable management, there is a notable lack in New Zealand of a country wide system of advice and advocacy for landscape ecological development and management … This contrasts with the situation in many other developed countries … [21]

7.5 Who needs to be provided with information, knowledge, advice and encouragement?

Submitters suggested that the following people need to provide advice, information, guidance, encouragement and education, to some extent, on the various topics relating to the role of native plants on private land:

- landowners/farmers/land managers (provided primarily from regional/local government and liaison networks)
- forest managers and workers
- public of all ages, land users
- Maori community/Maori youth
- regional council and local government staff (provided by research institutions and central government).

The majority of respondents focused their submissions on the requirement for provision of information and advice to landowners, as the quotes throughout this section highlight. Interesting points were made about the way in which information is both presented to, and accepted by, landowners. The quotes below illustrate aspects of the relationship between knowledge and values, and some of the challenges in educating for goals, such as ecologically sustainable land use (see also chapter 5 Human–nature relationships).

Challenging aspects in educating for sustainable land use include:

> *... '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. [21a]*

> *In the literature aimed at dairy farmers, 'the good' tends to equate with growth, production, profit, efficiency, and technical mastery of the natural environment ... The weather and the land are often viewed as adversaries; environment is often seen as 'a problem', land is a medium of production, not a place where people, families and communities live and gain a livelihood. [31]*

> *Farmers are very much influenced by peer pressure and information flows – their values are reinforced by the predominant messages from the dairy industry ... Conservation farmers tend to be individualist and more resistant to peer pressure; they have strong supportive ties to one or more individual (e.g. spouse, father, son). [31]*

One submitter discussed opportunities:

> *Farmers today are enthusiastic about protecting any bush they have on their property for future generations. Previous generations of farmers viewed the bush as a hindrance, to be replaced with pasture ... These altruistic values then are forever looming larger in the considerations of landowners. It is a natural progression from struggling pioneer farmers able to focus on little other than utility considerations to today's situation where great resources, enlightenment and knowledge are available. ... [Women] at farm forestry field days ... are more likely to be interested in the emotional aspects of forestry, while the men concentrate [on] woodlot silviculture. The influence of women then is a force to be recognised and utilised in the objective of establishing biodiversity on private land. [1]*

7.6 Suggested methods, forms and approaches for education

Submitters suggested the following tools, methods and approaches for promoting education. They highlight various ways of packaging and disseminating information, the need to consider which approach is most appropriate for the different target audiences, and the type of outcomes sought.

- National guidelines/ecological guidelines (see also section 10.2 Role of Government).

- Website development:

  The motivated individual [aspiring planter] should be aided through the extension of knowledge, primarily through a dynamic and properly resourced web site ... up-to-date, simple yet comprehensive, and imaginatively presented. This vital information would then be available free ... [1]

  A web site with an easy use directory would perhaps be a good starting point so different agencies could post and access information. [6]

  It is critical that we share information (digital if possible) on the sites that are currently being managed for restoration and/or protection ... collation and dissemination of what material is available would be beneficial as a starting point. [7]

- Networking and sharing of knowledge between agencies and individuals. Submitters suggested that those involved in sustainable land management and biodiversity use undertake networking and knowledge sharing. This would be accompanied by interactive learning. One of the main objectives of Tāne's Tree Trust, a submitter, is "building a network of knowledge sharing amongst stakeholders" [46].

  ... because of their philosophies and unique approaches to flora and fauna management, the people involved in [use of indigenous flora and fauna from cropping, grazing, habitat provision, regeneration, timber, education and tourism] are isolated and would benefit from networking with each other to share knowledge. [53]

- Leadership by example. This would be coupled with acknowledgement and encouragement of those landowners who are seen to be working towards sustainable ecosystem management:

  Work with those landowners who understand the economic, aesthetic and cultural values of using native species. Their success will attract the sceptical. In turn ideas will gradually permeate society. [9]

  The Lincoln Organic Farm's incorporation of indigenous vegetation into their farming system and the monitoring and recording of the values that are derived from this are important contributions to the success of the concept [of 'use']. Advice and knowledge from such research and practices will inspire others. [42]

  However, one submitter pointed out that leading by example would not be sufficient to achieve success by itself:

The planting of native plantings on private lands is increasing. This paper rightly argues that the pace of this progress is insufficient and needs supercharging. Merely for those committed to the ethic of more native plantings to uphold such to others will have little or no effect. [1]

On this note, encouragement and recognition may be helpful, as suggested in the following quotes:

The strengths of day-to-day management, knowledge and practical ability coupled with an inherent willingness to conserve natural resources to the best of their ability must be recognised and encouraged. [42]

Recent initiatives such as the Farm Environment Awards are starting to promote environmental performance within the farming sector. The possibilities afforded by increased emphasis on triple bottom line reporting would be particularly relevant to corporate ownership of productive lands. [25]

- Advisory service offering liaison and assistance.

- Education, to be accompanied by incentives, as a means of encouragement to restore and protect indigenous biodiversity for a range of purposes (see also section 9.4.2 Role of incentives):

  Native plants on working lands must be promoted as a comprehensive package, based on encouragement, cooperation, information, education and incentives. [6]

  One submitter suggested introducing 'adopt a tree' programmes to raise the profile of specific species within an area, whilst another suggested including a section on native biodiversity in garden competitions.

7.7 Funding for education and advisory services

Funding for education and associated programmes was an issue not widely canvassed by submitters. However, Federated Farmers of New Zealand endorsed the allocation of funding for raising awareness and establishing an advisory service for farmers. A submission from an individual stated that:

Central government needs to put more resources into improving the condition of biodiversity on private land ... more funds should be made available to Councils, communities, [and] landowners that are achieving things on the ground ... We will be applying to the various new government funds to help us appoint a biodiversity advisory officer, and to assist with enhancing areas, but the resources available are chicken feed compared to what's required. [28]

7.8 Some good news – what is happening today or planned for the future

7.8.1 Guidelines, assistance and advice at a regional level

The discussion document highlighted initiatives being undertaken by the Taranaki Regional Council. Further examples from submitters of work being done by other regional councils are listed below:

> *Environment Waikato currently provides assistance on mixed planting and appropriate plant identification by providing a web based planting guide for wetlands, and fact sheets that provide planting tips within the region. This provides property owners with a planting plan, which is based on linking the property location to its ecological habitat, size of plot and the boundary type. [19]*

The Auckland Regional Council has developed Riparian Zone Management Strategy and Guidelines for the Auckland region.

> *[Tasman District Council has] started ... a riparian enhancement programme with the vision of connecting the mountains to the sea ... These projects are in Golden Bay and are principally driven by groups of enthusiastic individuals with assistance from council and a range of other organisations ... A 'Trees on Farms' project organised by local farmers is encouraging landowners to plant and look after native plants. Through field days we are demonstrating the benefits of planting natives and effective pest management control methods ... [28]*

The Isaac Centre for Nature Conservation at Lincoln University and Landcare Research, in conjunction with Environment Canterbury, have prepared a guide to the establishment and use of native plants in Canterbury shelterbelts and hedgerows.

7.8.2 Indigenous forestry

The following initiatives will be taking place in the future:

> *The Ministry through grants under its 'Sustainable Farming Fund' has approved some $100,000 to the Indigenous Forest Certification Steering Committee (IFCSG) for an education and consultation process for indigenous forestry best management practices and standards. There are to be a series of 10 workshops/field days throughout New Zealand to present options for forest management. [10]*

> *... 2003 will see the commencement of NZs first course [specifically for indigenous production forestry] at Tai Poutini Polytechnic (Greymouth). [47]*

> *The Indigenous Forest Section of the NZFFA ... [plays an] important role ... promoting sustainable forest management on private land. [It has produced] a highly relevant publication 'Strategy for New Zealand Indigenous Production Forests and Timber Industries' (O'Loughlin & May 1999). [10]*

8 Knowledge and research

This section focuses on the potential for loss of research knowledge, its retention, suggested research areas, and the funding and administration of research on native plants (see also chapter 7 Education and information).

8.1 Potential loss of knowledge, skills and experience

Many submitters feared that valuable knowledge, skills and experience would be lost because this is unpublished, held in archives or in the minds of retired researchers and foresters. The point was made that knowledge and skills are diminishing because there is a reduced focus on native plant and forestry related research, particularly in the following areas:

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

Reasons for this were seen to relate to:

- implementation of government policies over the last 15 years, including the lack of extensive practice of forest ecosystem management and the lack of policy on the sustainable use of indigenous species across agency mandates
- skills and experience being confined largely to research organisations
- the demise of the Forest Service and inadequate archiving of records
- research (especially long term) never being published, instead it is in storage and inaccessible to researchers, or it has been dumped
- research on opportunities and current uses coming "virtually … to a halt" [42]
- the people with the knowledge (eg, scientists) have retired.

The following quotes support these concerns:

> *The knowledge of [retired researchers] can never be replaced. Nor can the research they have been involved with ever be repeated because much of it was carried our before the forests were severely impacted by possums and other pests. [26]*

> *[There is a] breadth of existing information regarding sustainable use of indigenous flora and fauna held by individuals from different disciplines and perspectives within management agencies. However this information is not drawn upon by the existing mandates of some agencies. [53]*

In relation to cultural heritage and the associated values and environmental practices, the main cause of concern, as noted by two submitters, is the progressive loss of knowledge with the passing of each generation:

> *Kaumatua who are pūkenga in matters relating to the ngahere are passing away rapidly and much of the depth and breadth of the knowledge that [the discussion document] refers to is in danger of being lost for ever. [26]*

8.2 How can we address the loss of knowledge?

Three submitters stressed that major efforts need to be made to secure the knowledge of former researchers and foresters. The following ways of securing this knowledge were suggested:

- sponsoring researchers to work for senior foresters and to record their knowledge
- sponsoring researchers to retrieve, catalogue, and if need be, store archival material relating to indigenous forestry species
- relocating and reassessing Forest Research Institute records
- increasing funding to retain existing, but unpublished, databases and other information that is in danger of being lost from our research systems
- securing knowledge of pūkenga and tangata whenua. Nga Whenua Rahui is administering biodiversity funding to do this, however, one submitter believes that a more substantial resource needs to be made available to secure this knowledge before it is too late
- securing the knowledge of local people who have relevant experience in indigenous plant management.

One of the objectives of Tāne's Tree Trust is:

> *Consolidating and advancing the state of knowledge of an increasing range of indigenous tree species – their establishment, growth and productive use. [46]*

8.3 Respect for and integration of different types of knowledge

Two submitters commented on the scope for a complementary relationship between 'informal', traditional or local knowledge and 'formal' scientific knowledge, and sought the validation of and acknowledgement of this. One submitter cautioned against giving 'privilege' to local knowledge without first applying critical thought.

Other submitters stated:

> *Many Maori have shown great reticence to participate in science-based research in the natural world largely because of the attitude of scientists to what Maori call "Our Science" i.e. the understanding of the relationship between man and his environment developed by centuries of observation tied closely to survival of the people. Also the oft times total lack of acknowledgement of Maori input into research projects. As a general rule in Murihiku, university based research is held in high regard as opposed to that emanating from Crown Research Institutes and the like. This may be due to universities being seen as non-governmental agencies. [52]*

> *... it is important not to assign unquestioned privileged to local knowledge. While the full participation of individual managers and communities is fundamental to sustainability, one of the other great lessons of history is that local knowledge is neither infallible, nor free from the influence of narrow self interest, expedience, or even plain prejudice. [21a]*

8.4 Research into indigenous forestry, cultivation of native plants and indigenous ecosystems

The suggestions for research from a number of submitters are listed in this section. One submitter stated that the "knowledge for sustainable management, especially forests, is already well advanced in New Zealand" [10], whilst another stated that "… there is a wealth of knowledge concerning New Zealand's indigenous biota, however it is by no means complete" [16C].

Research in relation to indigenous forestry:

- practical demonstration of continuous-cover management of production forests
- the functioning of growth rates and form, productive capabilities
- harvesting methods of indigenous ecosystems and species
- the role of trace elements and symbiotic planting possibilities
- the use of native podocarps for forestry
- all aspects of indigenous forestry management and ecology
- indigenous tree planting for possible future harvesting
- intensive silviculture of indigenous stands
- hardwood species for timber – genetic variation, nursery stock quality, site quality, tending and so on
- multi-use models.

Research in relation to indigenous ecology:

- threats to indigenous ecosystems and species
- indigenous ecosystems and their suitability for use
- measuring the resilience of New Zealand's indigenous species and ecosystems
- genetic importance of native species
- the relationship between introduced and indigenous flora in landscape ecology and their relative contributions to ecological health.

Research in relation to land use alternatives:

- the sustainable uses of native vegetation – including the definition of both sustainable use and how landowners can implement and incorporate this alongside current land use practices
- potential and ongoing environmental impacts of commercial development of indigenous flora
- alternative indigenous plant species suitable for purposes /functions currently carried out by exotic species (eg, for riverbank stabilisation) and the benefits of these
- the most effective way to restore native biodiversity on 'productive lands'
- successes where native plants have been used
- identification and development of demonstration sites to display the functionality of indigenous species in working landscapes
- spatial analysis that extends beyond the individual property – an analysis of the amount of landscape cover needed. It was noted that, "weaving implies working to achieve a landscape mosaic, which transcends individual property titles [21]
- field research into appropriate species mixes, and detailed spatial configurations (eg, how much extra benefit would result from expanding a 10 metre riparian corridor into a 20 metre corridor, in a range of conditions?). It was noted that, "in Europe, hedgerows fulfil major ecological functions" and the question was asked whether "riparian strips and shelter belts offer similar benefits in New Zealand, or … would alternative structures be more relevant? [21a].

Research in relation to the establishment of native plant species including:

- how to deal with frost tender juveniles
- cost-effective methods to improve survival
- reduction of establishment costs
- the importance of soil fertility, slope and aspect.

8.5 Research into social science and institutions

Submitters suggested that research/critical attention is needed in the following areas:

- public opinion regarding the use of natural resources
- landowner motivations
- how landowners make choices between different land use options
- the values landowners place on native plants
- understanding our cultural responses to the relationships between introduced and indigenous species
- the extent of our sense of belonging/place related to native vegetation in New Zealand
- the role of landowner organisations in framing landowner attitudes
- identification of possible institutional structures and processes that can undertake landscape-scale analyses and promote opportunities for coordinated action without provoking negative reactions from highly sensitive landowners.

8.6 Research into benefits and values

Submitters suggested that research be undertaken to address the current gaps in knowledge regarding the benefits that can be experienced through planting native plants on private land, specifically:

- benefits for everyday farming practices
- benefits for production crops
- ecosystems service benefits and their economic value
- economic uses and values
- monetary and non-monetary benefits to landowners from such things as ecosystem enhancement, carbon sinks, social amenities and enjoyment, air quality, soil stability, water purity, flood prevention, aquatic organisms and sustainability
- identification through landscape modelling of potential opportunity costs and benefits of native plants.

Submitters commented that:

> *CSIRO [Commonwealth Scientific and Industrial Research Organisation] in Australia have recently embarked on a cooperative research project to assess the nature and value of ecosystem services provided by a selection of important Australian ecosystems, together with an assessment of the consumption of these services and their economic value. Research on ecosystem services in New Zealand, and particularly in relation to indigenous biodiversity, is scattered and not currently unified under one banner. Developing a similar research programme in New Zealand would be one means of clarifying the functional benefits and values of indigenous vegetation and other biodiversity in production systems. Funding for such a programme should be sought from central government and primary industry organisations. [25]*
>
> *We need to quantify the non-timber benefits to the nation and the value of planting natives in landscapes that are devoid of biodiversity and yet will be essential in the near future to improve/enhance environmental sustainability to ensure ongoing access to overseas markets. [34]*

8.7 Research into markets and services

Research was suggested in relation to:

- existing markets for by-products from sustainable uses
- seeking new products and services from native plants
- the properties and economic potentials of native plants
- the establishment and development of new domestic and international markets for products/by-products from sustainable use.

8.8 Monitoring

Monitoring was sought by submitters in order to increase knowledge and responsiveness in relation to trends in ecosystem health and the environmental impacts from the commercial development of indigenous flora.

Two submitters commented on the usefulness of developing environmental measures of performance (which included indigenous biodiversity indices) for utilisation within farming systems. This idea was promoted as enabling farmers to monitor management practices and identify the point of 'sustainability' as best they could, with the potential of contributing to achieving New Zealand's biodiversity goals.

One submitter noted that the establishment of benchmark areas is needed, against which the degree of sustainability of indigenous ecosystems or native plant use can be measured.

8.9 Current research initiatives

Submitters commented on the research activities being undertaken by the following agencies:

Landcare Research:

- *… indigenous forest processes, forest classification and silvicultural systems for sustainable management of different forest types in the South Island and podocarp/tawa forest in the North Island. [This is supported by the] … Foundation's sustainable indigenous forestry programme … and Landcare's operational research contracts with MAF … [10]*
- *… a research programme entitled 'Changing Landscapes and Restoration of Biodiversity' … The main goal of this programme is 'to improve biodiversity in rural and urban environments' … [This work has highlighted that] clarifying and quantifying existing benefits (uses and services) … and developing new alternative benefits would be major incentives for landowners to adopt improved biodiversity management approaches [25]*
- *… the potential of using natives for bank stability riparian plantings instead of using just willows [28]*
- *… the structure and composition of indigenous forests, considering such things as the impact of disturbance and environmental factors at various scales [46]*
- *Management, restoration and integration of indigenous biodiversity in human dominated landscapes [46]*
- *Environmentally and economically sustainable land uses [46]*
- *Consideration of the health of ecosystems across a variety of landscapes and including the conservation of rare species of birds and plants [46]*
- *Growth modelling of indigenous species and extrapolation of their biomass to carbon sequestration for carbon accounting. [46]*

The Forest Research Institute (FRI) – indigenous species research projects as part of its New Plantation Species programme (Foundation for Research, Science and Technology (FRST) funded):

> *The programme seeks to determine the potential and to provide practical techniques for establishing indigenous species for cultural needs, enhancing aesthetic and amenity values, increasing biodiversity in a range of landscapes as well as developing a sustainable resource of high-value wood on appropriate sites. Areas of research include:*
> - *Establishment trials*
> - *Growth database and development of growth models*
> - *Tree architecture and wood quality*
> - *Genetic variation*
> - *Market and non-market values*
> - *Pruning and thinning trials*
> - *Natural regeneration on new sites*
> - *Networking and technology transfer. [34]*

Doctoral research at the University of Waikato has been conducted based on the following questions:

> - *Why is there any native bush left on dairy farms in the Waikato?*
> - *Why do some farmers retain native bush in the face of high land prices and significant opportunity costs?*
> - *What are the differences (if any) between farmers with bush on their farms, and those without? [31]*

Rau Murihiku Whenua Maori[3] and the University of Canterbury University School of Forestry are preparing funding applications for research to investigate "the possibilities of selecting faster growing Beech trees with desirable characteristics for development of plantation trials on cut-over SILNA lands" [52].

8.10 The administration and funding of research

The main issues raised by submitters concerning the administration and funding of research into indigenous plants and ecosystems in New Zealand, are summarised in the following quote from Tāne's Tree Trust:

> *The current position of indigenous forest research is weak for many reasons:*
> - *It is fragmented amongst different Crown Research Institutes, Universities etc*
> - *Organisations involved in research have to compete for funding*
> - *Consequently, at an institutional level, there is lack of co-operation although at staff level this does occur.*
> - *The total amount of funding available is too low. [38]*

This last point on the availability of funding was also commented on in three other submissions, particularly when compared with the funding allocated for research on exotic species. Another common concern was the lack of foresight and long-term planning for research under current government research funding policies.

[3] An umbrella group of SILNA landowners.

The Indigenous Forestry Unit of MAF noted that:

> *While FRI has conducted valuable dune land research with native pingao, FRI currently has decidedly modest capability and funding … for research on indigenous forests, and the limited focus is mainly on growth of several native tree species and their potential for plantation management. FRIs 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 forests as sustainable ecosystems. [10]*

Two submitters pointed out that, of the $1.35 million Public Good Science Fund (PGSF) funding to the Forest Research Institute for research into alternative plantation species to radiata pine, only $120,000 is spent on native species production forestry research.

On this note, recent postgraduate research concluded that:

> *… 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. [53]*

In relation to the funding for research into indigenous species, two scientists from the Forest Research Institute commented on the level of investment in research:

> *We totally agree [with bullet points on page 31 and 32 of the discussion document] re minimal investment in economic, social and staffing issues related to research on the productive aspects of native plants. We have funding for less than one full time scientist in this field … [34]*

They also commented on the impacts of government funding policies, the competitive nature of funding and the relationships and sharing of information between researchers:

> *[While] limited research funding is a serious impediment to employing plantation-grown indigenous timber, it is the funding policies of recent years that has created huge disruption and uncertainty in the research field. There has to be continuity of funding in this area and there has to be an understanding at government level that investment in research in indigenous species cannot provide results within a framework of short term funding where every two years researchers have to rebid to the Foundation for Research, Science and Technology (FRST). Short term funding time frames and constant changes in central government policies undermine what needs to be long term research programmes for indigenous species research.*

> *There are few options for increasing funding for research for indigenous species other than through the PGSF. Funding is available from several highly competitive sources for technology transfer such as the Sustainable Management Fund of MfE [Ministry for the Environment] and various Environmental Enhancement Funds of Regional Councils. These have the effect of 'mining' the capital of information that research institutions have with proportionally less money going into fundamental research. Quality of information inevitably decreases.*
>
> *The competitive nature of Crown Research Institutes is restricting free exchange of information and a disincentive to collaboration between colleagues in the area of environmental research where there is limited research finding. New Zealand is a relatively small country so more efficient uses of resources would be achieved if there was less emphasis on commercial imperatives in the area of indigenous species research. [34]*

One submitter noted that achieving outcomes from research was hindered by a lack of coordinated focus on indigenous research, except at the individual institutional level and, even then, it is often mixed up with other research – as is the case at the FRI. On this the submitter stated:

> *If the effort to research and communicate results about all aspects of the commercial management of indigenous forests is concentrated in one body it will be possible to achieve good results. [38]*

A regional council noted that there is a strong case for policy makers and researchers to consider more carefully the role of native plants as productive resources, finding that the information on current research presented in the Commissioner's discussion document:

> *... casts a very unflattering spotlight on the present allocation of Public Good Science Funding. Whether this is due to a lack of quality funding applications or because of FRST priorities, it clearly warrants some attention.* [39]

8.11 Whose responsibility?

Submitters had this to say on who should be responsible for ensuring appropriate levels of research:

> *Government must play a role in research for it is only the State, with its long tenure and corporate memory, which can sustain the long term research effort, which is required. Unfortunately the State has hitherto not performed well in this area and its efforts can best be described as 'stop-go'. [38]*
>
> *Government assistance is required to help research, monitor and promote various management prescriptions for a wide range of landscape types. [44]*

> *I am confident ... that there will be an ever accelerating willingness to consider a greater – and more diverse – role for native plants in the lived-in environment. Particularly so if there is leadership and encouragement from Government in terms of research funding. [41]*

Two submitters felt that current funding, and the level of research on indigenous plant ecology in universities and other research organisations, should be increased, or at least maintained at current levels. One also stated that research findings need to be more effectively transferred to practitioners, at times in simplified form, to enable practical interpretation and adoption.

8.12 The WAI 262 claim

Three submitters commented on the impact of the indigenous flora and fauna claim, WAI 262 claim on research. It was stated that the WAI 262 claim:

> *... introduces considerable uncertainly into research and investment decisions. [29]*

> *... is a major impediment to the research and planting of indigenous species. [43]*

One company that is conducting research stated:

> *Our research into the medicinal and productive properties of other indigenous plants is being politically hampered on two fronts. One of these is the WAI 262 claim – which presents a threat to our right to use the science we have developed in these plants. The Horopito has been in New Zealand for 65 million years so a claim to special rights over the plant and its uses by people who arrived a few hundred years before my ancestors is prima facie absurd, but the fact it is being given serious consideration at a political level is a disincentive for us to fund, or partially fund, research.*
>
> *We have also run into political resistance to our research in a SOE [State Owned Enterprise]. The Plant Extract Research Unit of Crop and Food Research have effectively stymied a successful research program we were conducting into an indigenous plant. We initiated the project and it does not involve a traditional usage of the plant, but we have been informed by the above Unit that Crop and Food will only continue to conduct the research (at our and Tech NZ expense) when we have a Maori partner in the project. In fact they want part of the research funding for the project to be finding a Maori partner for us. [24]*

9 The economic value of native plants within the productive landscape

Thirty submitters discussed the economic and financial implications that landowners are faced with when considering the future role of native plants on their land. These concerns fell into a number of clearly identifiable topics:

- the economic opportunities afforded by native plants when compared with those of exotic plant species

- the economic value and risk currently presented by native plants already existing on private land
- the non-monetary values/benefits that arise from having native plants on private land (see also section 5.1)
- current market barriers
- potential market opportunities for native plant products and services.

9.1 The economics of native plants versus exotic plants

Ten submitters discussed this issue. Most stated that exotic plant species would continue to be of importance to the economic output of the working landscape. Differences in opinion were evident over the economic role that native plants could play within this exotic-dominated context.

In general, respondents were concerned about the limited economic opportunities arising from the establishment of new areas of native plants. One submission from a landowner stated:

> *... exotic species are overwhelmingly the first choice. This is because of significantly greater growth rate, amongst the highest in the world, and provides [a] wider range of species options. [1]*

The submitter went on to point out that, in planting exotic tree species, there is a greater ability for pasture maintenance, including the ability to graze pasture where willows and poplars are being established.

This view was endorsed in a submission from a landowner organisation, which stated that landowners have to live in the real world and the demands of the wider community are unrealistic. The submitter continued by stating that considerable funding and expertise would be necessary to make progress.

A submission from the Department of Conservation questioned the direct economic benefits that might be derived from the sustainable use of native plants:

> *Where is this economic lodestar of biodiversity on private land that is not being tapped into at present and where are all the missed opportunities hiding out? [15]*

The submitter continued by referring to the discussion paper, where it had been stated that the slower growth rate of native plants is often used to justify not planting these species. The submitter commented on this:

> *The way this statement is written seems to imply that somehow farmers are making the wrong or uninformed decisions. But perhaps their view is correct and the PCE's office is trying to defy economic gravity. [15]*

A submission from the Indigenous Forestry Unit expressed the view that the establishment of new areas of native forest for the purpose of producing timber would never be viable on purely economic grounds without rate relief and tax incentives.

The submitter's view was formed on the conclusion that the establishment of native forests, based on conventional short-term even-age forestry, would only result in rapidly grown beech and ricker kauri timber. Because these timbers are high in sap content they will be of relatively low economic value. Therefore, to be financially successful, the manager will have to move away from this approach by allowing some trees to grow on. This approach would result in a range of age classes in any particular area and require the application of continuous-cover forestry techniques. These techniques would also provide biodiversity benefits and would be more economically successful for any native forestry operation.

Another submitter stated that the sustainable management of indigenous timber for a variety of purposes should have a significant place in the overall aim of sustainable land management, including prevention of erosion and protection of soil structure. The submitter expressed the view that well-managed native species have good growth rates and qualities that place them in the first rank of world timbers for aesthetic appearance, stability and workability.

9.2 The economic value of native plants already existing on private land

Five submitters discussed the importance of landowners realising that there is an economic benefit from having native plants on their land. Two submitters expressed the view that, due to changing landowners' values, the presence of native plants, usually within QEII National Trust covenants, are no longer seen as a liability, but as an asset resulting in increased land value.

Another two submitters discussed a case where native plants were undervalued by a landowner and were removed. One submitter stated:

> *The ecologist undertaking a review of the damage on behalf of the Council considered that the matagouri remaining on the land was more valuable in terms of the farming enterprise than its removal, or any benefits its removal would bring about. [6]*

A scientist at Landcare Research stated that:

> *... one of the most difficult questions to answer is how improved indigenous biodiversity management of forest remnants, wetlands etc. will lead to direct and tangible benefits to the landowner over and above those benefits to biodiversity conservation improvement at the district, regional and national level. [25]*

Another submitter disagreed strongly with the discussion paper's conclusion that values, such as sense of place, have no direct economic value. The submitter pointed out that:

> *Landscape identity and imagery are increasingly used as marketing and promotional resources ... Geographical literature suggests that sense of place is now a commodity in the global market place. [21]*

9.3 The non-monetary values/benefits of having native plants on private land

Three submitters expressed concern about the focus of the discussion paper on the monetary benefits of having native plants on private land (see also section 5.1 for discussion of non-monetary benefits).

9.4 Current market barriers

Nineteen submitters identified a range of economic or market barriers as reasons preventing landowners from integrating the sustainable use of native plants into their overall land management practices. These included:

- economic uncertainty
- the role of incentives
- cost sharing
- non-financial incentives
- carbon charges.

These five issues are discussed in turn.

9.4.1 Economic uncertainty

One submitter commented that the decision over whether or not to plant native species was influenced by the long period between investment (plant establishment) and when an income is derived, and this factor is largely seen to be the cause of this economic uncertainty.

A scientist at Landcare Research suggested:

> *... at this landholding scale, clarifying and quantifying existing benefits (uses and services), reducing uncertainties surrounding future benefits and developing new alternative benefits will be major incentives for landowners to adopt improved biodiversity management approaches. [25]*

Another submitter stated that native plants could replace the use of exotic tree species for shelterbelts. However, they believed that this would be more likely to happen if landowners could expect the same range of benefits that are derived from exotic tree species, specifically that landowners could expect to harvest some timber from the shelterbelt.

One submitter proposed converting existing pine plantations to native tree plantations. The submitter suggested that the revenue derived from harvesting the pine trees could be used to fund the conversion.

The issue of certainty of future revenue was also often raised within the context of the future regulatory environment. This issue is discussed in section 10.5 The role and effectiveness of regulation.

9.4.2 Role of incentives

Most submitters who discussed the economic aspects of growing native plants also addressed the role and value of economic incentives.

Submitters considered that incentives had to address the problem of encouraging and enabling landowners to shift from land management systems based solely on exotic plants to those that incorporate a greater range of native plants species. One submitter referred to this shift as a diversification and stated that this process:

> *... is likely to require a great deal of effort, money, and knowledge, none of which are available to a busy landowner. There is therefore a need for certain structures to be put in place to provide education, monetary aid or loans and perhaps voluntary assistance, at least during the early stages of this diversification. [16C]*

Another submitter stated that there is a need for economic or financial incentives to protect existing indigenous remnants from pests and weeds.

A member of the Farm Forestry Association made a case for not using rates relief as an economic incentive:

> *They [farmers] don't want rates relief or formal protection – they want to continue to look after their bush. [They] need recognition for those 'saved' areas from development in the first place. [They] also need some assistance with weed and pest control and possibly identifying areas with potential for productive use. [37]*

A submission from a district council reported that rates relief is not a very popular incentive mechanism for ecological restoration in their area. The council has found that landowners prefer practical assistance or information on how to manage an area better.

Another submitter expressed concerns about the use of incentives and the potential for them to result in perverse behaviour by landowners. The submitter outlined, as an example, some of the behaviour demonstrated by British farmers during the foot and mouth outbreak to ensure that they obtained compensation. The submitter stated:

> *... subsidies always seem to lead to some sort of distortion of the markets if not of the mind. [23]*

9.4.3 Cost sharing

Nine submitters raised the issue that landowners can end up bearing the full economic cost of planting native plant species, and of providing flow-on benefits that are received by the public. Five submitters commented that, when a landowner establishes an area of native plants for their own benefit, there are also benefits to society (such as soil quality, amenity, biodiversity, water quality and so on).

One submitter stated:

> *If society wishes to control the use of the land for supposed public good then the public must pay. Whoever receives the benefits must pay the cost. [43]*

These submitters proposed that, because the benefits are shared, so then should be the costs, and that this could be achieved through the use of subsidies, tax deductions, rebates and other measures. Some submitters pointed out that these types of measures could provide interim support in helping offset costs during the long period before any income is received from harvesting (see section 10.5 The role and effectiveness of regulation).

Three submitters commented specifically on providing incentives to landowners solely for conservation-related purposes. One submitter proposed that:

> *There should be no limits placed on tax deductions, which can be claimed for native revegetation works.*

They also stated:

> *... that Territorial Councils [should] provide for full rates relief for land covenanted to conserve existing native vegetation or to provide for native revegetation. [16E]*

9.4.4 Non-financial incentives

A number of submitters were concerned about the use of, or total reliance on, financial incentives to encourage the planting of native plants on private land.

Auckland Regional Council gave examples of the type of non-financial incentives it uses to promote planting native plants on private land, including:

- transferable title rights
- bush lot subdivision, with protection of wetland and forest in exchange for subdivision rights
- enhancement planting in exchange for subdivision rights.

The submitter continued by stating:

> *However, the use of subdivision-related incentives needs to be balanced against the cumulative impacts of growth into rural parts of the region, and particularly in coastal areas. [20]*

Other forms of assistance suggested by the submitter included planting advice and the supply of low-cost eco-sourced plants and other related materials.

9.4.5 Carbon charge

Two submitters referred to the economic role that carbon sequestration could play in overcoming the long lead-in period before harvest and economic return. One submitter suggested introducing a regime to address this problem:

> *This [the cost of the long time period] could be overcome if invisible benefits like carbon sequestration and erosion control were paid for as they accrued. Carbon sequestration would come from a fund paid into by carbon producers and erosion control from a fund created from a tax on those land users that create erosion (any form of land use apart from permanent forest cover or scrub cover). Payments to the owner of the new native forest could be made on an annual basis, increasing as the trees grow larger or, alternatively, a lump payment could be made following establishment. [38]*

9.5 Potential markets for native plant products and services

Nine submitters discussed the development and role of markets for the products and services derived from the sustainable use of native plants.

One submitter raised the issue about the negative effect of unfair competition (from imported timber and timber products derived from unsustainably harvested forests) on these emergent markets. This submitter proposed that the Government should address this issue by considering the use of tariffs or regulations to prevent the import of unsustainably derived timber and timber products.

Federated Farmers of New Zealand expressed the view that there were many opportunities in the future, stating:

> *The time is right, the public is generally seeking similar outcomes, the markets are sending the same signals and the rural economy is currently in a good position to respond. This is an essential first step in generating innovation, a greater level of respect and management and ultimately more indigenous plants in our environment. [42]*

The role of certification, primarily forest certification, was mostly discussed in the context of developing new markets and in forest management (see also section 6.2 Managing for forestry).

One submitter pointed out that a certification process would reduce the occurrence of people passing off unsustainably produced products and services as sustainable, and help develop consumer appreciation for 'green' services and goods.

Another submitter raised the concern for accountability:

> *Market structures for timber sales are more or less in place. They require monitoring for several reasons, most importantly of which is to ensure that forests are being managed sustainably. There is also the fear of some that growing native timber and other useful native plants will cause the creation of a 'black market' for stolen timber from the conservation estate. [38]*

The submitter, however, balanced this concern by expressing the view that timber prices would drop if a market was established for certified sustainable timber.

Federated Farmers of New Zealand expressed the view that creating new markets for native plants is important because:

> *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. [42]*

10 Government agencies and legal frameworks

Forty-three submitters commented about the impact of government organisations, legislative frameworks and the use of regulation on the maintenance and promotion of native plants on private land.

Submitters made specific comments on the activities of the:

- Parliamentary Commissioner for the Environment
- Ministry for the Environment
- Department of Conservation
- Local authorities.

Submitters also made specific references to the:

- Resource Management Act 1991 (RMA)
- Forests Act 1949.

10.1 Role for the Parliamentary Commissioner for the Environment

Three submitters thought that the Parliamentary Commissioner for the Environment should take an active role in promoting the use of native plants on private land.

One of these submitters expressed the view that the major problem with the RMA is the variable interpretation of it by local government. The submitter asked:

> *Could the PCE arbitrate the setting in place of National Guidelines relative to the interpretation of the Act re indigenous vegetation on private land? [38]*

Another submitter, concerned that the National Policy Statement on Biodiversity (NPS) process was undermining the good work of the Bio-What process, stated that the Commissioner should use his independent position to try to convince government to reassess the speed and scope of its current NPS process (see also section 10.4.3).

10.2 Role of Government

Fourteen submitters discussed the role of central government organisations that are involved with native plants on private land.

Two submitters expressed the view that central government agencies need to be better resourced to deal with expanding the range of roles for native plants on private land (see also chapters 7 and 8).

Another submitter added to this:

> *... relevant Government agencies (national, regional and local) should:*
> - *Encourage a trend of raising the status of the native vegetation (as compared to exotic plants) in every possible way*
> - *Promote the use of covenants (e.g. conservation covenants, open space covenants) to protect remaining viable stands of native vegetation on private land*
> - *Promote planting of native timber trees on private land for sustainable commercial forestry*
> - *Promote the use of native plants for amenity planting (e.g. kowhai, rata, cabbage trees). [17]*

One submitter believed that greater integration across government and non-government agencies is required. The submitter was specifically concerned that information on the management practices for restoration and/or protection of native bush sites should be shared.

Another submitter commented that the short time horizons associated with politics have an adverse impact on the development of policies that will promote the role of native plants on private land, stating:

> *Because it is politicians who make the law and because their tenure of office is short compared with the growth rate of trees, the potential for positive action to become bogged down in the inertia of short term expediency is high. [38]*

Another submitter expressed concern about the impact of current political agendas:

> *... that the fundamental concepts developed for discussion in this paper will gain little political traction because it is not being driven by recognised environmental strongholds of officialdom such as MfE and DoC. [42]*

10.2.1 Ministry for the Environment

Another issue raised in three submissions related to the need for MfE to provide guidance with respect to the significant natural areas provisions of the Resource Management Act 1991 (see also section 10.4.1).

One submitter expressed the view that central government, through MfE, had failed to provide sufficient support and guidance to councils in this regard and stated:

> *... it is time the Ministry [for the Environment] to put a line in the sand and publicly make firm statements about overriding legislation and property rights, provide a national definition of what 'indigenous vegetation' is, support case law and provide a best practice for territorial authorities and landowners alike. [6]*

10.2.2 Department of Conservation

The framework for the Department of Conservation for advocating conservation on private land was specifically addressed by seven submitters.

The Indigenous Forestry Unit questioned the effectiveness of the fundamental approach of the Conservation Act 1987:

> *While the Conservation Act appears to be based on a concept of 'strong sustainability' we are not in fact achieving sustainability of ecosystem health at the present time. The problem here is not about conflicting interests but funding/performance. Is this the price we pay for separating land use functions? [10]*

One landowner expressed doubt over the effectiveness of the conservation approach being used currently by DoC pointing to declining kūkūpa, kaka, kiwi and kokako populations within the conservation estate. The submitter stated that:

> *For this reason there is little respect for the department, when they advocate for conservation on private land. [43]*

Another landowner concluded that because of its funding constraints, DoC should concentrate on better management of its own estate and not on conservation advocacy. The submitter continued by suggesting that the funds currently directed towards advocacy would be more effective, in terms of conservation outcomes, if they were directed towards working with adjoining private landowners so as to achieve integrated pest and weed control.

Two submitters expressed the view that, in general, DoC does not have a good relationship with landowners and they doubt any process that has DoC as a major player.

Federated Farmers of New Zealand suggested that:

> *The role of DoC in terms of advocacy for natural values on private land under the guiding principles of the Conservation Act are more adversarial than constructive. A neutral Crown agency needs to undertake this role, if the need is required. [42]*

A district council, noting new initiative of DoC to work more with landowners, communities and associate agencies to protect important ecosystems, habitats and indigenous flora and fauna, stated that:

> *We would encourage the Department in achieving this goal. [7]*

The Department of Conservation expressed concern that the discussion paper appeared to criticise the single focus mandates of the current institutional structures and went on to say:

> *This seems to be a reiteration of the old 'balanced use' philosophy and it misrepresents the role of the Department of Conservation in relation to the protection of biodiversity on private land. We 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. [15]*

The Department of Conservation also disagreed with the view expressed in the discussion paper, that it undertakes its advocacy based solely on the definition of conservation found in the Conservation Act 1987, by saying:

> *This statement fails to acknowledge that 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. [15]*

The Department of Conservation also questioned the emphasis in the Commissioner's discussion paper given to the adversarial atmosphere surrounding its involvement with planning processes around native plants on private land.

> *While there has undoubtedly been an adversarial atmosphere surrounding many of these processes, there is scant mention in the report of the considerable progress that has been made (apart from a vague genuflection to 'historical context') and the issues that have been resolved. The PCE report tends to concentrate on the negative side, as in the segment on 'soured relationships' and while this is undoubtedly true in some cases, it ignores the many positive relationships that have been developed and the fact that most of the adversarial planning processes are complete. [15]*

The Department of Conservation continued by stating:

> *We strongly endorse the enhancement of biodiversity on private land where it can be shown to be ecologically sustainable, be it the planting of riparian margins, the creation of wetlands, the protection of old forests and the creation of new ones. We accept that if a farmer wishes to sustainably harvest biodiversity, as provided for under current legislation then this can proceed, so long as it meets all requirements. We have a whole series of partnerships with community and private interests and are well aware that we cannot restore indigenous biodiversity alone. We are surprised that the PCE has bought in to question the department's mandate, albeit at the margins. [15]*

10.3 Local government

Eight submitters provided comments on the role of local government, additional or complementary to their statutory requirements under the RMA, with respect to the role of native plants on private land.

One submitter saw a role for councils to:

> *... promote and provide for property management plans whereby development and conservation goals are agreed between the landowner and the Council over a set period, negating the need for resource consents for specified projects. [16E]*

Another submitter proposed that councils should be encouraged to use native plants for their beautification projects, and that funding for restoration projects should be directed at those using native plants.

One submitter proposed that local government promote ecologically sustainable land management practices beyond significant natural areas, stating that:

> *... the benefit of using native plants seems to be understated and undervalued in many regional and district planning documents. [18]*

A number of submitters provided examples of initiatives currently being undertaken or developed by local government. These included:

- Christchurch City Council's Waterways and Wetlands Project
- Auckland Regional Council's development of:
  - Riparian Zone Management Strategy and Guidelines
  - structure and catchment management plans for existing indigenous vegetation and riparian corridors
  - transferable title rights
  - bush lot subdivision
  - enhancement planting in exchange for subdivision rights
- Tasman District Council's riparian enhancement programme has a vision of connecting the mountains to the sea, and is principally driven by groups of enthusiastic individuals, in conjunction with other organisations, replanting native plants in riparian strips
- Environment Canterbury's work on wetland enhancement, protection and creation with a focus on the use of native plants, through the use of advocacy, promotion and cooperation with local authorities in the region, government agencies, landowners and other interested parties
- Environment Canterbury has also been focusing on capacity building and has just launched an Environment Enhancement Fund that provides grants up to $5,000 for approved protection enhancement projects.

10.4 Statutes

Thirty-six submitters commented on the effect of current legislation and its implementation on native plants on private land.

Two submitters expressed concern that current legislative frameworks discourage integrated resource management policies and sustainable use of resources across conservation and production areas. One stated:

> *It is agreed that at the present, the legislation may not adequately recognise or provide for the sustainable use of native vegetation as is contemplated by the discussion paper. The current legislative framework (which includes many and varied Acts) will need to be rigorously examined and amended as is appropriate. [12]*

10.4.1 Resource Management Act 1991

Of the thirty-six submitters that commented on legislative frameworks, 30 of these discussed the impact of the RMA.

The Department of Conservation criticised the discussion paper for its lack of formal analysis on the effectiveness of the RMA and on other institutional arrangements, stating:

> *Perhaps even more important, is the crucial issue as to whether any critical analysis has been done to show that the current institutions and instruments of resource management are preventing their [new opportunities for native plants on private land] emergence?*

The submitter concluded:

> *There are some interesting case studies presented, but all of them have emerged under the current framework. [15]*

Other submitters, who discussed the RMA, expressed concern over whether the legislation and its processes were fully supportive of sustainable management of native plants on private land.

A district council made a number of points on the impact of section 6(c) of the RMA as it is currently drafted:

- The wording of section 6(c) requires all persons exercising functions and powers in relation to … managing the use, development and protection of natural and physical resources to recognise and provide for … the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna. This has resulted in two streams of sustainability effort that has tended to be in parallel rather than integrated, i.e. sustainable management and conservation/ preservation.
- A reductionist approach to ecosystem management (dealing with specific aspects of an issue or ecosystem) will not be enough to deliver ecologically sustainable management. Yet section 6(c) of the Act has resulted in such a reductionist focus by those agencies operating under the RMA, due to a separation of activities and a lack of national guidelines in respect to restoration.
- Because of a lack of resources Territorial Local Authorities often include sites in their register, which are Recommended Areas for protection identified during the Protected Natural Area Surveys by the Department of Conservation. The criteria used for these surveys may be different from that used to determine 'significance' under the RMA. In addition, these surveys often do not include equally important sites such as coastal dune lands, upper stream catchments and small seasonal wetlands.

Another point raised by the same submitter, based on their experience, stated:

> *Landowners who have heritage features on their property want to be involved in the policy process at the start of the process. [7]*

Federated Farmers of New Zealand stated that:

> *The existing legislative framework and in particular s6 RMA renders indigenous vegetation on private land a liability rather than an asset. Clearly this needs to be changed. Greater 'use' of native plants will help reduce this frustration but it must be supported by legislation. [42]*

A regional council stated that, although identifying ecologically significant areas is important, it is not sufficient in itself. A holistic approach to the management of the environment is needed, which takes into account the dynamic nature of ecosystems and the ecological context of natural areas through linkages, corridors and connections.

One submitter questioned whether the RMA is effective in adequately protecting rare ecosystems. The submitter's concern was based on the recent experience of the loss of a number of valuable ecosystems in the Canterbury region (one area of matagouri and three areas of lowland remnant kanuka). This perceived inability of the RMA to protect remnant areas adequately was believed, by the submitter, to result from a lack of ecologically based bottom lines. The submitter proposed that a landscape ecological framework could form the basis for developing such thresholds (see also section 6.1).

While these submitters expressed concern over the ability of the RMA to protect native vegetation adequately, other submitters thought the Act, and its processes, focused overly on protection. One submitter discussed current regional and district policies and plans:

> *The primary focus to date of these documents has been on protecting indigenous vegetation for its values (e.g. wildlife, species, amenity, landscape, biodiversity, s6(c) RMA). These documents therefore contain policies and rules restricting the removal, damage, destruction of native vegetation to achieve the protection of these values. The sustainable use of native vegetation is not really contemplated under these Plans. Councils will be concerned at how they can ensure the protection of important areas of native vegetation on private land, but still provide for sustainable uses. Therefore, guidance needs to be provided on how best sustainable use of native vegetation could be incorporated into these planning documents. [12]*

A number of submitters pointed out the lack of national guidelines for local government when interpreting and implementing the RMA. They considered that this lack has led to differing interpretations by local government on the management and protection of native plants and ecological systems (see also section 10.1).

One submitter expressed the view that district plans currently contain restrictions hampering forestry activity and do not recognise that sustainable timber production from indigenous forest is possible. The same submitter expressed the view that:

> *District and Regional Plans often contain restrictions on felling of native trees over a certain size. While these may be appropriate or even essential in urban areas they are not so in rural areas. At the very least they [rules in plans] should be linked to the Forests Act. [38]*

10.4.2 Future changes to plans and rules

Fourteen submitters were concerned that landowners could be subject to *ex post facto*[4] legal protection if they planted or set aside regenerating native trees with the intention of commercial harvest.

One submitter stated:

> *This fear may or may not be justified – only time will tell. This fear could be allayed with a legal mechanism. [1]*

The submitter then described a possible mechanism to alleviate their concern: the landowner could register the objective of the planting on the land title. This is a similar mechanism to that used by the QEII National Trust, and would allow for:

- a degree of official recognition
- identification of planted areas and gaps (thereby helping to define a network)
- determination of the degree of progress or lack of progress occurring
- participants in the project to be assessed in terms of silvicultural practice, biodiversity and harmony with landscape.

Another submitter proposed attaching a legal document to the land title that stipulated the area involved and its intended use. However, the submitter pointed out that such an instrument would need to be recognised in district plans. Alternatively, it was suggested that a reputable organisation could be charged with certifying newly established indigenous forests at the time of planting.

Another submitter expressed a different view on the legal uncertainty arising from changes to laws or regulations:

> *All companies and individuals have to factor in the manifold uncertainties of doing business. In this case there can be no guarantees which can bind future generations (either for or against conservation/preservation) so it is a risk farmers have to manage, as they successfully do for a whole range of other issues. Once again the term 'regulatory' has a pejorative aspect whereas in fact it may simply be the elected response to ongoing social trends. [15]*

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4 After the fact.

10.4.3 National Policy Statement on Biodiversity

Four submitters discussed the role of the proposed National Policy Statement on Biodiversity with respect to native plants on private land.

One submitter held the view that the NPS should guide local authorities by standardising the criteria used to assess significant natural areas.

Two submitters expressed concern that the NPS may be too bureaucratic, suggesting instead that there should be a focus on redirecting the money to be spent on the NPS to working on the ground with landowners.

Another submitter discussed the relationship between the discussion paper and the NPS process, noting:

> *The intersection of these two processes, the recent completion of the Ministerial Advisory Committee report and the considerable ongoing public interest and concern suggests that there is an urgent need for the government to take a step back from the NPS process in order to pull these threads together… At present I have the feeling that much of the good work of the Ministerial Advisory Committee review is being ignored while the NPS seems to be being rushed through without the necessary evaluation of what the best options are. [35]*

The submitter then stated:

> *We should recognise that indigenous biodiversity occurs along a continuum, from sites with an almost full complement of indigenous species (some offshore islands) to those that have been totally modified (e.g. urban parking lots) and that the goals of biodiversity conservation will differ depending where you are along this continuum. [35]*

10.4.4 Forests Act 1949

Six submitters specifically discussed the Forests Act 1949.

One submitter expressed the view that there needs to be more consistency in the relationship between the RMA and the Forests Amendment Act.[5] They commented that, currently, although a landowner might have an approved Sustainable Management Plan (SMP), they might not be allowed to harvest under the rules of their district plan.

Five submitters raised concerns over the ability of the Forests Act 1949, in its current form, to deliver ecologically sustainable indigenous forestry.

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[5] Forests Amendment Act 1993 (The Forests Act 1949 was amended by the Forests Amendment Act 1993 which 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).

One submitter stated:

> *The present Forests Act covers natural forests only and suffers from the inadequacy in that, with the processes of time, it will become more difficult to tell the difference from planted indigenous forest. To function effectively it [the Forests Act] needs to cover immature forests including new plantings and the management of regeneration. This does not mean just adding these categories to the Act. Rather the Act requires a major overhaul to clearly define the major constraints, requirements and benefits to be gained from the different classes of indigenous forest. [38]*

Another submitter stated:

> *If forests are managed under a sustainable permit or plan this should include pest control and in the long term be beneficial to the forest. [43]*

Another submitter questioned the focus of the indigenous forest regime under the Forests Act 1949:

> *At present the main reason that forest owners (or more usually their consultants) prepare SMPs is to satisfy the requirements of the Forests Act and enable them to harvest timber. SMPs are often being prepared for no other good reason than to legally permit timber to be removed from indigenous forests. We are not against Management Plans however we feel that the driving force behind their production is not leading to the sound management of native forests. [47]*

The submitter concluded that SMPs should be a living, working document that evolves over time to take into account new knowledge. They believe that sustainable forest management in New Zealand would be better served by a national code of practice and a national certification scheme.

Another submitter focused on the impact of the Forests Act 1949 on the development and implementation of indigenous forest silvicultural practices. The submitter considered that Ministry of Forestry Officers (now Ministry of Agriculture and Forestry) are the most closely involved government agents in indigenous forestry, but are taking no active part in the quality of the silviculture. In addition, the submitter criticised ministry officers for not providing guidelines to landowners on how to optimise the productivity of their forests.

The submitter also discussed the issue of preventing the unsustainable practice of high grading timber, where some or all of the biggest and best trees are harvested:[6]

> *To improve silvicultural practice [MAF] officers should be stationed locally and take a more active part in the execution of harvest plans. Ideally they would oversee all harvest selection. [54]*

(See also section 6.2 Managing for forestry.)

[6] Repeated high-grade harvesting will, over time, greatly reduce forest genetic quality and diversity.

10.4.5 Income Tax Act 1994

One landowner specifically discussed the impact of the Income Tax Act 1994 on an initiative to restore an area in native plants for both financial and conservation reasons.

The submitter explained that they have been unable to claim any costs for the expenditure arising from preparing planting, fencing and providing pest and weed control. The submitter stated that this was because the Inland Revenue Department saw the activities as not being undertaken primarily for income earning reasons, because the activities included restoration for biodiversity purposes.

The submitter pointed out that the forest is already generating income from a number of non-timber products, including that received from providing an educational resource for local schools, and providing the Crown with a pest-free site for kiwi.

The submitter expressed the view that the Income Tax Act 1994, or its interpretation, needs to change so as to accommodate a broader view of business within the context of native plants. The submitter pointed out that there is a proposed Private Members Bill, by John Luxton, entitled the 'Income Tax (Native Trees) Amendment'. The Amendment proposes to extend the range of farming activities, on which expenditure can be claimed, to include such things as pest-proof fencing, and the planting and maintenance of indigenous trees for improving a range of conservation values. It will also explicitly provide for the claiming of expenses associated with establishing a nurse crop for indigenous forestry purposes.

10.5 The role and effectiveness of regulation

Eight submitters expressed varying degrees of reluctance for public controls (ie, regulations) on private land as a means to protect native plants. One submitter felt that there was a need to keep rules to a minimum and encouragement to a maximum.

Another submitter stated that:

> *... all the rules and beautifully worded statements won't make any difference to the trees – what is needed is people prepared to work on the ground to make a difference. [37]*

Three other submitters were concerned about the impact that regulations could have on property rights, and highlighted the need for compensation for this by councils.

Regulatory measures were also seen to fail to recognise the:

- good work being undertaken currently by landowners to protect and enhance indigenous biodiversity on their land
- realities that landowners face in earning a livelihood.

Federated Farmers of New Zealand questioned the effectiveness of the regulatory approach:

> *The environment and consequent interpretation that this legal framework creates is highly inflammatory and has completely the opposite end result to the purpose of the Act to 'promote sustainable management'. In effect farmers have regressed from actively assisting the amount of indigenous plants on their land to putting all their energies into fighting against Council Plan decisions and making endless submissions on government led strategies. [42]*

A district council expressed concern over private property rights and stated:

> *Concepts of property rights create a barrier to the involvement [of the community] in formulation of policy, developing land care groups and trust of outside agencies. The concept that all New Zealanders are stewards of the land, whether landowners or not, needs to be emphasised and its meaning clarified… [6]*

One landowner discussed the economic impact of regulations:

> *The most obvious [influence] is the cost of complying with regulations and hence the effect on the economics of development and future wealth creation. The second influence is on the removal of future economic uses of land that is reserved from production or becomes uneconomical to use because of regulatory costs. [27]*

The submitter went on to comment that any naturally occurring regeneration of indigenous vegetation is merely increasing the economic risk faced by the landowner, who therefore has an incentive to ensure that this regeneration does not happen. The submitter suggested that reducing the amount of regulation might result in some loss of indigenous vegetation in the short term, but because other disincentives will have been removed, it should, in the long-term, result in increased areas of native vegetation.

Another landowner questioned the basis for rules that deal with indigenous vegetation. The submitter stated that the reasonable use of land is expressly allowed for in section 85(2) of the RMA. This implies a general assumption that any activities on private land can be undertaken, albeit with possible conditions to minimise or avoid adverse environmental effects. However, the submitter believes that the current regulatory treatment of indigenous vegetation on private land has the effect of a total prohibition on use, and is therefore different from the treatment of other activities.

Another submitter, however, stated:

> *Regional and local authorities need legislation to ensure wise management, preference for planting indigenous rather than exotic, and control of significant areas to ensure continuing indigenous biodiversity and habitat protection, and other such values. [32]*

10.6 Other legal mechanisms to promote native plants on private land

Seven submitters discussed various non-regulatory legal mechanisms to promote native plants on private land.

10.6.1 Use of trusts

Five of these submitters raised the issue of use of trusts as a legal mechanism to promote and protect native plants on private land.

Two submitters discussed the role of the QEII National Trust.

One of these submitters queried the possibility of a wider role for the QEII National Trust. The submitter pointed out that there are examples of QEII National Trust covenants producing economic, social and environmental outcomes while core ecological values remain protected. The submitter believes that there is potential for any economic benefits derived from the covenanted area to be used to fund the ongoing protection of that area.

The submitter proposed that other types of covenants could provide for appropriate management of productive areas that surround more highly valued covenanted protected areas to ensure buffering.

Another submitter also stated that the QEII National Trust has been a great success, demonstrating the enormous will among landowners to protect native bush if they can receive some help towards the ongoing costs of protection, such as fencing.

These last two submitters also raised the possibility of using other forms of trusts. One submitter promoted the UK Countrywide Stewardship scheme as an effective model worthy of attention in New Zealand. The submitter explained that the UK scheme provides for a menu of land management options that have differing productive and conservation outcomes. The landowner chooses options from this menu and receives payment from the scheme in return.

One submitter suggested that a new trust could be established that would provide funds to landowners for use in offsetting the expenses involved from the requirement to protect native plants on their land.

Another submitter raised the example of the British National Forest Project. This was described this as a government backed, but community based, scheme to plant 30 million trees to transform 500 square kilometres of the least-wooded part of the United Kingdom scarred by past industrial development.

One submitter, however, stated that there is already a sufficient number of organisations and institutions in existence and creating more would simply dilute the funding available.

10.6.2 Other legal instruments

A submitter, discussing the economic impact of rules on landowners, proposed that the costs of protecting native vegetation should be borne by the public. This could be achieved by a system of land-leasing through a central government agency. The submitter concluded that these leases would be linked to the system of significant areas in the district plan.

Another submitter suggested that the NPS could direct local authorities to prepare a Natural Lands Plan.

> *The purpose of this plan would be to solely give shape to the vision for ecological conservation and enhancement for each district. Varying levels of priority for existing vegetation and re-vegetation could be identified on planning maps. More generally, the plan should clearly outline objectives, policies and methods to achieve progress on establishing a coherent system of native vegetation focused on the waterways in the landscape. [16E]*

The submitter continued by pointing out that any such plan should not be regulatory, but would outline the non-regulatory incentives and programmes that its objectives intended to achieve.

Glossary

hangehange — bushy shrub, *Geniostoma rupestre*, found mainly in lowland and coastal forest.

heartwood — the wood at the centre of a tree trunk or branch. It consists of dead xylem cells heavily thickened with lignin and provides structural support. Many heartwood cells contain oils, gums and resins, which darken the wood. Heartwood of kauri is very structurally stable. Compare with sapwood.

iwi — tribal groups.

kahikatea — podocarp tree, *Dacrycarpus dacrydioides*.

karaka — tree, *Corynocarpus laevigatus*.

kaumātua — elder, decision-maker for the iwi or hapu.

kauri — tree, *Agathis australis*.

kūkūpa — wood pigeon, *Hemiphaga novaeseelandiae*.

mahinga kai — places where food and other resources are traditionally gathered.

mahoe — tree, *Melicytis ramiflorus*, also known as whiteywood.

marae — local community and its meeting-places and buildings.

matai — podocarp tree, *Podocarpus spicatus*.

mataitai reserves — areas which are of such customary importance that they are reserved exclusively for Maori customary use. Generally they are small discrete areas used by a local Maori community for the harvest of a particular fish or shellfish.

matauranga — traditional knowledge.

miro — podocarp tree, *Prumnopitys ferruginea*.

ngahere — forest.

pingao — coastal dune plant valued for weaving, *Desmoschoenus spiralis*.

pūkenga — wise person.

rahui — protection of a place or resources by forbidding access or harvest.

ricker — the pole form of kauri that occurs over the first 50 or so years before the tree breaks through the forest canopy and develops into its mature form.

rongoa — plants traditionally used for medicinal purposes.

sapwood — the outer wood of a tree trunk or branch. It consists of living xylem cells, which conduct water and provide structural support. Compare with heartwood.

taiapure — areas of the coast where Maori have a special interest in fisheries. Where such an interest is recognised, the Minister of Fisheries can appoint a Management Committee on the recommendation of the local iwi to advise on the management of that fishery. Within a taiapure commercial, recreational and customary fishing can all co-exist but there is an enhanced opportunity for Maori to ensure there is better recognition of their special interest in the way the fishery is managed.

taonga — valued resources, assets, prized possessions both material and non-material.

ti — tree, *Cordyline australis*.

wananga — place of education, university.

Acronyms

CRI	Crown Research Institute
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DoC	Department of Conservation
FAA	Forests Amendment Act 1993 (The Forests Act 1949 was amended by the Forests Amendment Act 1993 which 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)
FRST	Foundation for Research, Science and Technology
FSC	Forest Stewardship Council
FRI	Forest Research Institute
IFU	Indigenous Forestry Unit
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
PCE	Parliamentary Commissioner for the Environment
PGSF	Public Good Science Fund
RMA	Resource Management Act 1991
SILNA	South Island Landless Natives Act 1906 (repealed)
SMP	Sustainable Management Plan
SOE	State Owned Enterprise
TLA	Territorial Local Authority

List of submitters

Submission	Name/Organisation	Classification
1	Ewan McGregor	Individual
2	Professor Ian Spellerberg	Research
3	Ashley Cunningham	Individual
4	Queen Elizabeth the Second National Trust	Government
5	Alan Totty	Individual
6	Hurunui District Council	District Council
7	Kapiti Coast District Council	District Council
8	Wellington City Council	City Council
9	Herb Madgwick	Individual
10	Ministry of Agriculture and Forestry	Government
11	Treasury	Government
12	Rodney District Council	District Council
13	National Beekeepers Association	Professional Association
14	Hauraki Maori Trust Board	Maori
15	Department of Conservation	Government
16A	Dr Katharine Dickinson	Research
16B	Natasha Fijn	Research
16C	Garreth Kyle	Research
16D	Selai Letica	Research
16E	Mike Moore	Research
17	Otago Conservation Board	Government
18	Taranaki /Wanganui Conservation Board	Government
19	Environment Waikato	Regional Council
20	Auckland Regional Council	Regional Council
21*	Dr Simon Swaffield	Research
22	Dr Mark Bloomberg	Research
23	Elizabeth Lee	Individual
24	Peter Butler	Individual
25	Dr Bruce Burns	Research
26	Robert McGowan	Research
27	Murray Redpath	Individual
28	Martin Workman	Individual
29	Rural Women New Zealand	Non-governmental organisation
30	Rick Stolwerk	Individual
31	Mariri Jay	Research
32	Isobel Thompson	Individual
33	North Canterbury Federated Farmers	Professional Association
34	Dr Luis Gea and Dr David Bergin	Research
35	Dr David Norton	Research
36	Tauranga Branch Forest and Bird Protection Society	Non-governmental organisation
37	Geoff Wightman	Individual
38	Tāne's Tree Trust	Non-governmental organisation
39	Environment Canterbury	Regional Council
40	NZ Forest Owners Assn and NZ Farm Forestry Assn	Professional Association
41	Chris Peterson	Individual
42	Federated Farmers of New Zealand	Professional Association
43	John Crawford	Individual
44	Michael Hayes	Individual
45	Greenpeace New Zealand	Non-governmental organisation
46	Dr Maggie Lawton	Research
47	Dean Walker	Individual
48	Colin and Irene Wilcocks	Individual
50	Manawahe District Committee	Non-governmental organisation
51*	Colin Meurk	Research

52	R Kenneth McAnergney	Maori
53	Kirsten Crawford	Research
54	Owen Lewis	Individual
55	David Wallace	Individual

Submissions 21 and 51 included two papers, which have been referenced as 21a and 21b/51a within the text.

21a

Swaffield, S., 1998. Structuring sustainability. In: *Today's actions, tomorrow's landscapes*. Proceedings from NZILA/LIANZ 25th Anniversary Conference, Te Papa, Wellington, 29 March-1 April 1998. 31-40.

21b/51a

Meurk, C.D. and Swaffield , S.R., 2000. A landscape ecological framework for indigenous regeneration in rural New Zealand-Aotearoa. *Landscape and Urban Planning,* 50, 129-144.