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Theme: Environment & Social

Task No: F60201
Milestone Number: 2.01.09

Report No. FFR- ES009

Giving Regional Context to International Sustainable Forestry Indicators

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Date: December 2009

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EXECUTIVE SUMMARY

Background

This report is the result of a series of seven workshops undertaken across New Zealand with representatives of the forestry industry and management authorities from May to June, 2009. The overall aim of the research was to gain a better understanding of the relevance of the existing Montreal Process Criteria and Indicators within the New Zealand context, particularly at a regional level, as a step towards developing New Zealand specific criteria and indicators. The objectives of the research were to:

- Gather impressions on previous research about the values New Zealanders hold for forests;
- Assess the internationally formulated Montreal Process Criteria and Indicators of sustainable forestry for relevance to the New Zealand context;
- Assess whether there are regional differences in the interpretations of the indicators;
- Identify any gaps in the indicator sets.

Key results of the study and implications

Relevance of each Montreal Process Criteria and Indicator set at a regional level

1. The Conservation of Biological Diversity (Criterion 1) is generally seen as less relevant by workshop participants than other criteria. The primary reason participants gave for this response was that the N.Z. forestry industry is based on exotic plantations where the primary driver is economic return. Participants generally considered that this criterion is more relevant to indigenous forests, is relevant at a landscape level, or has relevance to specific regions and sites. The relevance of individual indicators varies across the country, dependent upon the management approach of local companies and local authorities (e.g. whether they account for ecosystem and species management within their regime) as well as the status of indigenous biological diversity in each region. Further work is required to define relevant regional indicators for biological diversity.
2. Indicators associated with the Productive Capacity of Forests (Criterion 2) are generally considered to be relevant throughout the country because they provide important information about the productivity and economic return of each forest. Existing indicators could be made more specific with regard to accounting for non-production zones and site productivity.
3. The Maintenance of Forest Ecosystem Health and Vitality (Criterion 3) indicators were considered relevant across all workshop locations, but may require further detail regarding specific impacts and the scale of events. Participants listed a number of different biotic and abiotic issues relevant in their regions, and noted that there are cross-boundary issues and cost implications associated with the indicators.
4. The Conservation of Soil and Water (Criterion 4) was generally considered relevant across the workshop locations. Comments suggest that soil and water conservation has been a focus of regulatory authorities and larger forestry companies for some time, and as such there are existing regulations, codes of practice and reporting requirements which guide forestry activities. The relevance of specific indicators at a regional level appear to vary based on local environmental conditions (e.g. level of soil degradation, water quality measures).
5. Comments made about the Maintenance of Global Carbon Cycles (Criterion 5) suggest that participants view these as national level issues, and some see them as 'compulsory' at a regional level. Some participants noted opportunities and implications for regional carbon accounting and the use of forestry by-products.

6. The Maintenance and Enhancement of Long-term Multiple Socio-economic Benefits (Criterion 6) elicited the most discussion and varied opinion amongst participants across the workshops. The relevance of the criterion and indicator set appears to be strongly linked to the management regime and philosophy of the individual companies and local authorities in each region and, to a lesser degree, social factors such as population density and proximity to forests. The results show that indicators relating to subsistence, forest dependent communities and distribution of revenue are largely irrelevant in the N.Z. forestry context, and that production, consumption and employment indicators are relevant. Indicators related to recreation, tourism, cultural, social and spiritual values require clarification and definition both at a national and regional level.
7. Legal, Institutional and Policy Frameworks (Criterion 7) were considered relevant to the N.Z. forestry context in all but one of the workshop locations, where participants noted that these were national rather than regional issues. A number of issues were raised in response to the indicators, including the need for certainty of property rights, measurement of forest ownership, policies and taxes that encouraged afforestation.

Overall observations

- Whilst the existing Montreal Process Criteria and Indicators were written for international forests, results show that the majority of them have relevance in the N.Z. context.
- N.Z.-specific indicators must account for regional differences (discussed within this report).
- Whilst there is recognition that communities need to view forests as important, there are barriers to actively facilitating management approaches that enhance social benefits.
- Assessment of the indicators highlights the need for cross-sectoral policy and programme coordination within the forest industry and with other industries.
- There is a significant tension between forestry and dairy farming, particularly with regard to regulations, environmental impacts and quality land resources.
- Forest managers are wary of the potential costs of implementing indicators.
- To be effective, N.Z.-specific indicators will need to be written in terminology that is consistent and meaningful for the N.Z. forestry industry.

Further Work

As part of a wider project, a concurrent workshop series was held with forest user groups in each location to generate community level indicators of sustainable forest management. It is intended that the results of both workshop series be considered collectively in any further development of criteria and indicators. In addition, these workshop series are qualitative, and as such will need to be combined with empirical analysis to develop a set of indicators that is regionally specific and relevant to the N.Z. forestry industry.



INTRODUCTION

This report is the result of a series of seven workshops undertaken across New Zealand with representatives of the forestry industry and management authorities from May to June, 2009. The overall aim of the research was to gain a better understanding of the relevance of the existing Montreal Process Criteria and Indicators within the New Zealand context, particularly at a regional level as a step towards developing New Zealand-specific criteria and indicators.

The objectives of the research were to:

- Gather impressions on previous research about the values New Zealanders hold for forests;
- Assess the internationally formulated Montreal Process Criteria and Indicators of sustainable forestry for relevance to the New Zealand context;
- Assess whether there are regional differences in the interpretations of the indicators;
- Identify any gaps in the indicator sets.

As part of a wider project, a concurrent workshop series was held with forest user groups (such as fishing, hunting and mountain biking clubs) in each location. The purpose of the workshops was to generate community level indicators of sustainable forest management. The results of the forest user groups' workshops are contained within a separate report¹. Whilst the workshop series ran a different process, it is intended that the reports be considered together in any further development of criteria and indicators for sustainable forest management within New Zealand.

The Montréal Process

The Montréal Process was formed to develop and implement internationally agreed Criteria and Indicators for the conservation and sustainable management of temperate and boreal forests.

Membership in the Working Group is voluntary and currently includes countries from both hemispheres, having a wide range of natural and social conditions. New Zealand is one of twelve member countries whose combined land area contains about ninety per cent of the world's temperate and boreal forests. This amounts to sixty per cent of all of the forests of the world².

In February 1995 in Santiago, Chile, the above countries endorsed a comprehensive set of Criteria and Indicators for forest conservation and sustainable management for use by their respective policy-makers. The Criteria and Indicators are intended to provide an international reference for policy makers to formulate national policies and to provide a basis for international cooperation to support sustainable forest management. The Criteria and Indicators are not weighted or prioritised and are intended to be considered as a 'package' rather than as individual measures of sustainability.

New Zealand Forests

Forests cover around 29 percent of New Zealand, with an estimated 6.4 million hectares in natural forest (the majority of which is non-production) and 1.76 million hectares in plantation forests (as at April 2008)³, see Table 1. Detailed information about New Zealand forests, both plantation and natural (production or protected) is found in a variety of publications and is not duplicated within this report.

¹ *New Zealand Montréal Process Review: Forest Values in New Zealand*. A Report to the Ministry of Agriculture and Forestry 2006

² Montréal process Working Group. 1998. *Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests*. http://www.mpci.org/criteria_e.html



Table 1: New Zealand land use statistics⁴

Land Use	Hectares	% of total
Pasture & arable land	11.5	43%
Natural forest	6.5	24%
Other non-forested land	6.9	26%
Plantation forest	1.8	7%

The New Zealand forest industry relies largely upon single-species plantation forests, with radiata pine making up an estimated 89 percent of planted forest area. Seventy percent of plantations are in the North Island and 30 percent in the South Island. The Central North Island wood supply region makes up 30 percent of the entire planted forest estate. Seventy-nine percent of plantation forest is owned by registered private companies, 14 percent by public companies, five percent is owned by central or local government bodies and two percent is held by state-owned enterprises. Very little of the total forest area is planted in trees over 32 years of age.

The remainder of the report is presented in four sections, methods, a nationwide overview of the results, a regional presentation of results and the authors' observations from the workshop series.

⁴ MAF.govt.nz/statistics/forestry/other-forestry-releases/facts-figures (P2)



METHODS

A qualitative research approach was used to assess how participants interpreted each indicator within their context, and to allow participants to discuss the topics with each other in their own terms. Facilitated small scale workshops (around eight to twelve participants) were chosen as a forum that would enable discussion as well as allow participants to record their own opinions.

Deliberative research approaches (such as workshops and discussion groups) are founded on the basis that participants are able to reflect on various issues and topics and make judgments through reasoned dialogue with others⁵. These approaches were considered more relevant to the aims of the research than relying on survey questionnaires, which limit people's responses to questions and do not allow discussion and consideration of similar and differing perspectives between the participants themselves.

A purposeful sampling strategy was undertaken which involved a direct approach to an 'information-rich' sample (being representatives of the forestry industry) rather than a sample size that represents the wider population.

QSR NVivo8 (a qualitative computer package) was used to manage and analyse the data.



Selected study areas

Seven study areas were chosen on the basis of their regional forestry interests and differing geographic, environmental, economic and social conditions. Each of the study areas has plantation and indigenous forests as well as public and privately owned forests of differing scales within the region.

Workshop participants

The intention of the research was to involve participants with knowledge of various aspects of the forestry industry and management framework. In each location, invitations were sent to contacts within each of the forestry companies, associated businesses (e.g. forest management companies) and organisations, the Farm Forestry Association (NZFFA), councils and relevant government agencies (e.g. Department of Conservation, Ministry of Agriculture and Forestry). Information about the workshop series was also sent out via the NZFFA, the New Zealand Institute of Forestry (NZIF) and members of the national Forest Stewardship Council (FSC) cluster group.

A mix of participants attended each workshop, which stimulated debate on the topics discussed.

Companies with large-scale forestry interests and government departments (either local or national) were represented at every workshop. Farm scale forestry and associated forestry businesses (e.g. nurseries, technology and management companies) were represented at the majority of workshops. See Table 2 for information on representation, and Appendix 1 for the full list of companies and organisations involved in the research.

Table 2: Type of organisation represented at each workshop

TYPE OF ORGANISATION REPRESENTED	WHANGAREI	AUCKLAND	ROTORUA	GISBORNE	NELSON	DUNEDIN	CHRISTCHURCH
Large Scale Forestry Company							
Farm Scale Forest Owner							
Forestry Business (e.g. nursery)							
Industry Org. (e.g. training)							
Regional/Local Council							
National Authority (Doc, MAF)							

Workshop process

Each workshop was facilitated by the same professional social science facilitator to ensure consistency within the process. After introductions, participants were shown results from previous research into the values New Zealanders hold in forests⁶ (see Figure 1). The purpose of this activity was to provide some background to the project and stimulate discussion as a lead-in to the workshop proper. Participants were then facilitated to work through the existing Montreal Process Criteria and Indicators and discuss and record their relevance at a regional level. Participants were asked in small groups whether indicators were relevant, why or why not. A group discussion was held at the end of each workshop to discuss the outcomes. Workshops were two hours long and held in the morning.

Results were recorded on paper by participants themselves, and discussion throughout each workshop was recorded by a designated independent member of the project team. All results were transcribed using intelligent verbatim, managed and analyzed within a qualitative computer package (QSR NVivo8).

Data were tabulated alongside specific indicators and/or categorised and coded with similar ideas at a regional and national scale. The following sections present the results of this analysis.

⁶ *New Zealand Montréal Process Review: Forest Values in New Zealand. A Report to the Ministry of Agriculture and Forestry 2006*



IMPRESSIONS OF THE FOREST VALUES PRESENTATION

Participants were presented with a brief description of previous research about what New Zealanders valued about forests (see Figure 1). The values presented were not ranked or prioritized in any way. The research was undertaken in 2004 and 2005⁷ to provide a social context to the initial assessment of the Montreal Process Criteria for New Zealand. The research approach was qualitative using deliberative methods, and involved community members and management authority staff.

The aim of the presentation for this process was to provide some background as a means of introducing the workshop activities. Participants were asked for their impressions of the values research and whether they thought there were any values missing or which were unclear.

Comments were made that the research elicited a much broader range of values associated with forests than participants would expect solely from the forestry industry. Across the workshops, few participants believed there were values missing, but it was noted that there was a lack of emphasis on aspects of values that they considered more important for plantation forests, particularly economic and employment factors. Several participants in different workshops noted that economics and employment were primary drivers for production forestry in N.Z., and one commented that all other values were 'side benefits'. One participant commented that to enable forest management to include a wider range of values a 'bold investment' in forestry was required. He then questioned how the industry could encourage more investment for this purpose and how many people who 'grow timber' are interested in these wider issues.

Linked to economic returns of the wider value range, other participants considered that whilst the existing research recognised the importance of forests for recreation and tourism opportunities, it did not explicitly note the potential revenue stream of these activities and others such as film production.

Other aspects of values that were commented on were the importance of forests for education, air quality, water retention, a healthy environment and cultural values. Each of these is currently reflected within the existing forest values research results.

One participant suggested that the sample size for the research was small and that a large scale written survey should be carried out for New Zealand. Few other comments were made and participants moved on to deliberate the Montreal Process Criteria and Indicators.



Figure 1. Presentation slide showing the list of values New Zealanders hold for forests⁷.

⁷ New Zealand Montréal Process Review: Forest Values in New Zealand. A Report to the Ministry of Agriculture and

MONTREAL PROCESS CRITERIA AND INDICATORS – NATIONWIDE THEMES

This section presents a nationwide overview of the research results related to the Montreal Process Criteria and Indicators. Data were analysed by systematically tabulating the regional results, reading through each regional transcript and coding the text into categories and themes discussed across the groups. The categories and themes were then assessed, and any similarities and differences between them noted. Results are set out in the order of the existing Montreal Process Criteria and Indicators. Key themes from a nationwide perspective are summarised, followed by a discussion on each individual indicator.

A quick reference chart is provided for each indicator set, see below. Blocks are shaded where participants agreed the indicator was relevant. A question mark shows where participants thought the indicator was relevant under certain circumstances or there was an unclear result. In some cases indicators are shaded both relevant and not relevant where participant’s opinion was split. Blocks are marked with a dash if participants didn’t answer the question.

	Participants stated the indicator is relevant
	Participants stated the indicator is not relevant
?	Participants either didn’t agree or thought the indicator was relevant under certain circumstances
-	Participants did not provide an answer

The existing Montreal Process Criteria encompass the:

1. Conservation of biological diversity
2. Maintenance of the productive capacity of forest systems
3. Maintenance of forest ecosystem health and vitality
4. Conservation and maintenance of soil and water resources
5. Maintenance of forest contribution to global carbon cycles
6. Maintenance and enhancement of long term multiple socio-economic benefits to meet the needs of societies
7. Legal, policy and institutional framework

Whilst the criteria are numbered sequentially, they are meant to be a ‘package’ rather than prioritized in any way. Each of the criteria has an associated set of indicators which are discussed in sequential order through this report.

For the full list of the existing Montreal Process Criteria and Indicators
<http://www.rinya.maff.go.jp/mpci/>.



Criterion 1: Conservation of biological diversity

Key theme: Clarification required for the N.Z. context

Overall, the indicators relating to the conservation of biological diversity need clarification to be relevant at either a national or regional level within New Zealand. In particular, many participants suggested that indicators need to be clarified as to whether they relate to indigenous, exotic, timber production or all forests types. Clarification and further detail is also required for indicators relating to indigenous species in plantation forests.

Many participants believe that biological diversity indicators are either irrelevant or less relevant (in comparison to other indicator sets) because the New Zealand forestry industry is largely based on mono-cultural stands of exotic species. These participants considered that the conservation of biological diversity is mostly relevant only to indigenous forests – either production or protection based. Some of these participants stated that conservation of biological diversity is not a factor of their management regime.

Key theme: May be more relevant at a landscape level

In contrast to the perspective above, some participants noted that promoting ecosystem values and recognizing native species within exotic forestry allows for better land management, particularly in relation to a wider landscape or national perspective. This was specifically noted with regard to indigenous bird species, wetland and riparian areas. Participants noted the importance of species food webs across different forests within the landscape, and that the scale of indigenous species loss within New Zealand over time means that exotic forests provide important habitat across the landscape. Participants with these perspectives considered the existing indicators are generally relevant.

Key theme: Implications of the indicators - who pays?

Participants noted that measuring species and ecosystem diversity can be difficult because it requires a level of expertise, is costly and therefore reduces their profit margins, and can hinder their day-to-day forest management – particularly if parts of the forest have logging restrictions placed on them. Some participants noted that if measuring biological diversity was deemed necessary by the wider community, then there should be some contribution to the costs involved.

Key theme: Genetic diversity – future proofing or counterproductive?

Indicators measuring genetic diversity were generally considered to be irrelevant throughout the workshop locations for two main reasons. Firstly, the industry is based on cloned species where genetic diversity may be counterproductive, and secondly because there is little genetic diversity (of indigenous species) within exotic forests.

Several participants did note that genetic diversity is relevant to 'future proof' the New Zealand forest industry because increasing genetic diversity by using a wider range of production species may reduce the risks of wide-scale damage from biosecurity or other threats.

Comments on specific Indicators

Ecosystem Diversity

CRITERION 1: CONSERVATION OF BIOLOGICAL DIVERSITY							
Indicator relevant in the locations shaded:							
Existing Montreal Indicator	WHANGAREI	AUCKLAND	ROTORUA	GISBORNE	NELSON	CHRISTCHURCH	DUNEDIN
1.1.a							
1.1.b							
1.1.c						?	
1.2.a							
1.2.b							
1.2.c							
1.3.a						?	
1.3.b							
1.3.c							

There was diverse opinion about the relevance of the indicators relating to ecosystem diversity. On one end of the scale, the indicators were seen as completely irrelevant because participants believe they apply solely to indigenous forests. On the other end of the scale, participants noted that they try to manage forests to promote ecosystem diversity and to provide important habitat for species. Christchurch participants noted that there has been significant loss of species in the past, and therefore exotic forestry provides important habitat.

1.1.a Area and percent of forest by forest ecosystem type, successional stage, age class, and forest ownership or tenure

Four of the workshop groups noted that measuring ecosystem types was not relevant to exotic plantation forests. Groups that stated that this was relevant appear to have been taking a landscape approach or wider perspective on forests in general. Rotorua participants noted that it is relevant to promote ecosystem values, irrespective of ownership and tenure.

1.1.b Area and percent of forest in protected areas by forest ecosystem type, and by age class or successional stage

Some groups considered this indicator was not relevant on the basis that it is not important for exotic plantation forests. The Nelson group noted that it is relevant because of external 'forces' to the industry (such as councils) that require this information. Rotorua participants noted that the indicator is relevant because it allows forest managers to have 'better' land management, particularly for bird life, riparian areas and wetlands.

1.1.c Fragmentation of forests

Fragmentation of forests is generally considered to be irrelevant except in Rotorua, where participants stated that accounting for forest fragmentation may provide important wildlife corridors, and in Christchurch where participants noted that it was relevant for some Crown lands. The Nelson participants noted that fragmentation could be beneficial to the protection or conservation of forests because it may reduce the risk of forest fire spread.

Species Diversity

There was mixed opinion about indicators relating to species diversity, and most of the groups made general comments about species diversity that they applied to the whole indicator set, rather than commenting on individual indicators. The Whangarei group noted that it is 'better to know what you have got' and manage for that rather than 'turning a blind eye', and stated that the indicator set as a whole was relevant. The Auckland and Gisborne groups noted that species diversity was not an indicator of sustainable forestry because it was irrelevant to the sustainability of exotic plantation forests. Dunedin participants noted that the indicators were relevant but there needed to be clarity as to whether they related to exotic or indigenous forests and the associated species.

1.2.a Number of native forest associated species

This was considered to have localized importance in some forests in Rotorua, Christchurch and Dunedin. The Nelson group noted that there is not a lot of understory in the plantation forests so it is not currently relevant.

1.2.b Number and status of native forest associated species at risk, as determined by legislation or scientific assessment

In Auckland, Nelson and Gisborne, participants stated that the indicator is not relevant because there are no risk species identified in forests. Participants in Rotorua were aware of at-risk species in the forests, but the importance of these was variable across the region.

1.2.c Status of onsite and offsite efforts focused on conservation of species diversity

Most groups either considered this irrelevant or did not specifically comment on it. The Rotorua group noted that conservation efforts were important at a national level.

Genetic Diversity

1.3.a Number and geographic distribution of forest-associated species at risk of losing genetic variation and locally adapted genotypes

1.3.b Population levels of selected representative forest-associated species to describe genetic diversity

1.3.c Status of onsite and offsite efforts focused on conservation of genetic diversity

Indicators measuring genetic diversity are generally considered to be irrelevant because of the nature of the N.Z. forest industry. Many participants noted that genetic diversity may be more relevant to indigenous forests.

Many participants did note that because the N.Z. forest industry is based on monocultural stands, there is an increased risk for wide-scale damage caused by biosecurity or other threats. Participants in Rotorua noted that genetic diversity is difficult and costly to measure, but that it may be important at a landscape or national scale.

Criterion 2: Maintenance of the productive capacity of forest ecosystems

Key theme: Indicators generally considered relevant measures of sustainable production

In general this indicator set was considered relevant because it provides a test for sustainable production from a supply and demand perspective, i.e. the forest areas available, the productivity of those areas, and the long term ability to supply the market.

Participants noted that the indicators could be more explicit about differentiating between readily available forest for wood production, areas that are unavailable because they are set aside (e.g. for erosion control or are deemed unsustainable), and areas that are not being considered for wood production. Some participants noted that differentiating areas for production or non-production is influenced by the management approach and understanding of sustainable forestry held by the forest owners and investors.

Some participants also emphasized the need for N.Z. indicators to reflect site productivity because it varies within and between forests.

Measuring non-wood forest products was generally considered to be relevant across the workshop locations because it provides an understanding of the trends in different forest uses. Participants provided specific non-wood product examples relevant to their areas, and some noted it would be useful to add a checklist of uses to the indicator. Participants who did not believe non-wood products were relevant stated that they are not related to the productive capacity of plantation forests, and as such the indicator was not a useful reflection of the Criterion.

Key theme: Expansion of forestry is constrained by land quality and land use

Across the workshop locations, participants noted that plantation forests are often on low quality lands which may affect the sustainability of the forests. Some participants noted that there are few places they can expand forestry into because of alternative land uses (which may be more economic) and lack of quality environments, particularly quality soils.

Comments on specific Indicators

2.a: Area and percent of forest land and net area of forest land available for wood production

CRITERION 2: MAINTENANCE OF ETH PRODUCTIVE CAPACITY OF FOREST ECOSYSTEMS							
Indicator relevant in the locations shaded:							
Existing Montreal Indicator	WHANGAREI	AUCKLAND	ROTORUA	GISBORNE	NELSON	CHRISTCHURCH	DUNEDIN
2.a							
2.b							
2.c							
2.d							
2.e							

This indicator was considered relevant across the country (with the exception of Auckland) because it can highlight those areas readily available for wood production and those areas



which are less viable or unavailable. Participants suggested that this indicator could be expanded or reworded to explicitly show the 'best' or readily available sites, the marginal sites and the lands that are not available because they are set aside for erosion control (or other purposes), or where forestry is considered unsustainable. Participants also noted that it would be useful to analyse this indicator in terms of whether the percentages were changing and why, as it may highlight reasons for land use changes. They also noted that this could be used as part of managing forests and land strategically by identifying the best land use for landscapes. Participants noted that whether or not some marginal lands are included within the net areas available for wood production would depend upon the investor/owner's intentions and understanding of sustainable forestry.

2.b: Total growing stock and annual increment of both merchantable and non-merchantable tree species in forests available for wood production

Participants noted that this indicator provides a measure of productivity and is a test for sustainability. The Auckland participants noted that this would be a better indicator of the productive capacity of forests than the previous indicator, but they noted that this would only relate to merchantable species because there are no non-merchantable species within plantation forestry.

2.c Area, percent, and growing stock of plantations of native and exotic species

Some participants noted that this indicator was not relevant because it related to indigenous species, and others suggested it could be merged with indicator 2.a.

2.d Annual harvest of wood products by volume and as a percentage of net growth or sustained yield

Participants in Auckland noted that the annual forest harvest is not necessarily reflective of the productive capacity of a plantation forest, and that the market and operational constraints tend to drive harvest levels. Most of the other regions considered this was relevant, some noting it indicates whether the forest is being over- or under-cut, and that it is important for the industry as a whole in relation to maintaining contracts and processing plants.

2.e Annual harvest of non-wood forest products

This indicator is generally considered to be relevant for the country (with the exception of Auckland) because it provides an understanding of the trends in different uses. Participants provided specific non-wood product examples relevant to their areas, and some noted it would be useful to add a checklist of uses to the indicator. The Auckland and Christchurch participants considered that this indicator was unrelated to the productive capacity of a plantation forest.

Non-wood products listed by participants across the country were:

- Mushrooms
- Terpenes (major component of resins and turpentine)
- Ginseng
- Honey
- Cannabis
- Pork
- Venison
- Truffles
- Berries
- Possum fibre
- Herbs
- One group also included recreation as a non-wood product

Criterion 3: Maintenance of Forest Ecosystem Health and Vitality

Key theme: Biotic and abiotic factors are nationally important and regionally specific

Indicators relating to biotic and abiotic threats or pressures on forests are relevant in each of the workshop locations, and participants acknowledged that these impacts may increase and/or change in the future.

Participants across the workshops spoke of existing and potential biosecurity threats impacting on the industry, many listing regional issues with specific pests and control measures.

Land erosion and wind and storm events were commonly mentioned as abiotic factors, but there were also factors that appear to be more regionally based, such as the peri-urban nature of Rotorua forests limiting biosecurity control options, and the high population pressure and inflated land prices in the Auckland region encouraging alternative land use from forestry (resulting in forest clearance or lack of replanting).

Key theme: Are the indicators detailed enough about the impact and scale of biotic and abiotic factors affecting forests?

An issue was raised about the scale of possible biotic and abiotic threats and whether there needed to be some trigger point as to when events became interregional or national in impact, and how these would be dealt with, e.g. climatic events such as Cyclone Bola.

Some participants also questioned whether the indicators needed to have more detail within them to reflect site-specific issues such as the type and magnitude of damage and/or infestations that local forests can withstand. One group noted that there needed to be an explanation of 'beyond reference conditions' and what this related to (e.g. an individual site, forest or region).

Key theme: Indicators to reflect cross-boundary issues

An issue was raised that there are difficulties managing biosecurity threats/issues across land boundaries. Some industry participants noted that neighbouring lands can exacerbate issues for them by harboring pests and weeds, and that neighbours can benefit from the activities that forestry companies carry out, effectively getting pest control for free. Discussion around the country highlights an opportunity to have a coordinated approach to cross-boundary issues.

Key themes: Use of pesticides, chemicals and fertilizers not reflected in indicators

Participants in some of the workshops noted that there is a pressure from within the industry and from the community to reduce the use of chemicals and fertilisers in forest management. This will likely limit the range of options available, and require investment into research for new pest control and fertiliser technologies. A measure of the use of chemicals and fertilisers in the industry is not currently accounted for within the indicator set, and some participants noted that this would be beneficial.

Key theme: Cost of control programs

Participants noted that one of the major impacts of pests and diseases is the financial cost of control which directly affects the economic sustainability of forests. This is not currently incorporated within the indicator set.



Comments on Specific Indicators

CRITERION 3: MAINTENANCE OF FOREST ECOSYSTEM HEALTH AND VITALITY							
Indicator relevant in the locations shaded:							
Existing Montreal Indicator	WHANGAREI	AUCKLAND	ROTORUA	GISBORNE	NELSON	CHRISTCHURCH	DUNEDIN
3.a							
3.b							

3.a: Area and percent of forest affected by biotic processes and agents (e.g. disease, insects, invasive species) beyond reference conditions

Participants noted that managing biosecurity threats is important primarily to protect the economic viability of the forests and maintain production levels. They noted that control is expensive and can lower return rates. One participant noted that having a certain level of pest infestation or impact is manageable until it affects profits. Participants listed a range of threats at each site, and many spoke about the constant threat of new pests and diseases. Some participants raised the issue of pressure within and outside the industry to reduce the use of chemicals and fertilizers which may limit their pest control options and/or increase the costs. Participants also noted that forests on neighbouring lands may act as a source of pests and that controlling 'un-neighbourly' land management practices may be difficult.

3.b: Area and percent of forest affected by abiotic agents (e.g. fire, storm, land clearance) beyond reference conditions

Participants noted both climatic and socially driven abiotic threats to their operations, including wind, fires, storms, snow and development. The Auckland and Rotorua participants noted that they deal with issues and impacts of population density and proximity to forests. In Rotorua the group noted that they must account for public access, and because of this their land management is limited in some areas when dealing with climatic events or trying to lower fire risk. Auckland participants noted that land subdivision is an issue because it is more economically viable than keeping lands in forestry.

Criterion 4: Conservation and Maintenance of Soil and Water Resources

Key theme: Indicators relevant because forestry considered a tool for soil and water management

Participants in general considered forestry to be a tool to promote soil and water conservation, and as such the indicators are generally relevant with some specific exceptions. Many participants noted that the soil is highly significant and that with the exception of logging operations and developing infrastructure (e.g. road cuttings and skid sites), forestry is a more sustainable land use than alternatives, particularly dairy farming.

Key theme: Reporting on best management practices encourages sustainable forestry

Indicators that measure and report on best management practices for soil and water were considered relevant across the workshop locations because they encourage sustainable forestry, can be measured and are, to a degree, accounted for within existing reporting procedures such as codes of practice, accreditation and council requirements.

Key theme: Indicators should be measured over time and across differing land uses

Indicators that measure the quality of water were seen as relevant, and participants suggested these should be measured over the long term to show change, particularly over the forest rotational cycle, as water quality tends to be affected mainly at harvest time.

Participants considered that these indicators should be measured over all land use types to highlight the impacts of other land uses, particularly dairy farming. They noted that water has a commercial value and that there are flow-on effects between land uses that should be considered (such as to and from dairy farms).

Comments on specific indicators

CRITERION 4: CONSERVATION AND MAINTENANCE OF SOIL AND WATER RESOURCES							
Indicator relevant in the locations shaded:							
Existing Montreal Indicator	WHANGAREI	AUCKLAND	ROTORUA	GISBORNE	NELSON	CHRISTCHURCH	DUNEDIN
4.1.a							
4.2.a							
4.2.b							
4.3.a							
4.3.b							

The indicators related to soil and water conservation were considered relevant to all of the workshop locations with a few exceptions based on specific regional variances. For example the area and percent of forest land with significant soil degradation is not currently relevant in the Christchurch region, although participants noted this may become an issue on the Port Hills in the future.



4.1.a: Area and percent of forest whose designation or land management focus is the protection of soil or water resources

Participants noted that their existing climatic and geological situations impacted on why and how they manage soil and water resources.

These conditions include highly erodible soils and/or high rainfalls (e.g. Gisborne) or water scarcity (e.g. Christchurch). In some regions participants noted that they are 'confined' to specific geological areas (e.g. hill country) which define their management of soil and water. Auckland participants noted that this indicator is relevant only for indigenous forests in the Auckland region. None of the other regions differentiated between indigenous and exotic forests.

4.2.a Proportion of forest management activities that meet best management practices or other relevant legislation to protect soil resources; and

4.3.a Proportion of forest management activities that meet best management practices, or other relevant legislation, to protect water-related resources.

Across the country, participants noted that the proportion of forest activities that meet best management practices to protect both soil and water resources were relevant. Reasons given were that reporting best management practices encourages sustainable forestry, is measurable and is part of existing compliance or code of practice measures (e.g. council plans, Forestry Environment Code of Practice, FSC accreditation). Participants in Dunedin noted that this type of reporting builds trust and reputation within the industry and wider community, which potentially has beneficial implications for their markets. Auckland participants noted that these indicators are 'open to interpretation' and therefore may need to be made more specific.

4.2.b Area and percent of forest land with significant soil degradation

Participants noted that measuring areas of significant soil degradation was relevant locally in certain parts of each region. Some participants noted that this should be measured across land use types.

4.3.b Area and percent of water bodies, or stream length, in forest areas with significant change in physical, chemical or biological properties from reference conditions

This indicator is considered relevant across the workshop locations (with the exception of Auckland). Some participants noted that this should be a long run (longitudinal) measure. Some participants noted that this is important because of the commercial value of water and the potential flow-on effects from one land use to another. Other participants noted that water quality needs to be maintained for drinking quality. Participants noted that forestry has a minimal effect on water quality with the exception of harvest. Auckland participants suggested that water qualities change regardless of their activities, and therefore the indicator was not relevant in the region within production forests.

Criterion 5: Maintenance of Forest Contribution to Global Carbon Cycles

Key Theme: Carbon issues relate to all land uses on a nationwide basis and require integration

Whilst results show that the indicators related to global carbon cycles are generally relevant across the country, many participants saw carbon issues as part of a wider concern linked to land use policy in general.

Participants noted that carbon policies related to forestry need to be integrated with policies outside of the industry, such as local council pollution policy to encourage fuel efficient or pellet fires, and other industry policy (particularly agriculture). Indicators should then reflect this wider integration. Some participants noted the opportunity for New Zealand to lead by example on carbon policy at a national level and also on a regional basis.

Participants noted that these indicators need to be made measurable and specific.

Key theme: Indicators to reflect regional carbon status

Whilst most participants acknowledged the wider implications and issues surrounding carbon, some also noted the significance at a regional level. Some participants noted that if carbon accounting was to be measured on a regional basis, then forestry would become a more important component of any calculation, particularly in areas that are currently being deforested for farming. Some participants suggested that carbon indicators need to account for losses and gains (because of pests, fires etc) within individual forests. They also noted that there would be a cost involved at a regional level for assessing carbon which would need to be considered.

In two workshops, participants spoke about the potential to plant indigenous forestry trees to increase the length of rotations as a means of sequestering carbon.

Key Theme: Biomass use an opportunity

In general, the use of forest biomass for alternative energy/products was seen as an opportunity for the industry (or related industries) and one that may become more important over time. Some participants noted that the existing indicator would be difficult to measure and could be better worded. Discussion suggested that the use of forest biomass may be particularly relevant where forests are in close proximity to towns and cities.

CRITERION 5: MAINTENANCE OF FOREST CONTRIBUTIONS TO GLOBAL CARBON CYCLES							
Indicator relevant in the locations shaded:							
Existing Montreal Indicator	WHANGAREI	AUCKLAND	ROTORUA	GISBORNE	NELSON	CHRISTCHURCH	DUNEDIN
5.a							
5.b							
5.c							

Comments on Specific Indicators

5.a Total forest ecosystem carbon pools and fluxes



Results show that participants considered this indicator to be relevant at a regional level and/or a national level. Rotorua participants noted that this was particularly relevant to their region because of the current land use trends to clear forestry (seen as beneficial for carbon cycles/sink purposes) for dairy farming (seen as a high carbon emission industry). Dunedin participants also noted that this indicator could provide information that would assist in land use decisions. In discussion, participants commented that the industry and New Zealand should 'lead by example' and focus on Kyoto. Wider issues were raised about the perverse outcomes from existing policy and the potential land use conflicts that will occur as a result of carbon policy.

5.b. Total forest product carbon pools and fluxes

Results from three workshops show that this indicator may be irrelevant or less relevant at the local and regional level because, for example, the majority of product is timber logs which are sent offshore. Other comments were made that it is relevant to look at the whole carbon cycle, not just one part of it (i.e. growing forests), and that this could highlight a competitive advantage for biological (wood) products.

5.c Avoided fossil fuel carbon emissions by using biomass for energy

In most workshop locations, participants viewed forest biomass being used for energy as a potential opportunity. Opportunities noted were new markets, diversity within the workforce, diversity of expertise in the industry, more or better product ranges, increased investment and alternative fuels for fires and transport. Gisborne participants noted that carbon recycling does not balance out the effects of ancient sequestered carbon being released as trees are felled or die.

Some participants noted that the existing indicator is unclear and would be difficult to measure.

Criterion 6: Maintenance and Enhancement of Long-term Multiple Socio-economic Benefits

Key Theme: Indicators need to be more clearly defined for the NZ context

In general, participants suggested that many of the Criterion 6 indicators need to be more clearly defined and/or made specific to New Zealand, particularly those related to recreation and tourism and wider social benefits.

Key theme: Indicators related to production, consumption and investment more relevant than community aspirations for forest use

There was more agreement about the relevance of the production, consumption and investment indicators than those relating to community aspirations for forest use. Participants noted that the production and consumption indicators are particularly important because they quantify the quality, quantity, profit, loss and product demands of the local industry.

Participants considered that indicators related to investment in the forest sector are highly relevant, particularly in areas where forests are close to large populations (e.g. Auckland).

Measuring the investment into research and extension is also considered highly relevant (with the exception of Auckland), and participants noted that it is important the industry is involved in research work from the outset to ensure good uptake of knowledge and outcomes.

Key theme: Employment indicators relevant but forest-dependant/subsistence not relevant

Participants across the country generally considered that indicators related to employment and employment issues (such as safety, wages etc) were relevant because they provide important information to the industry. However, the indicators related to forest-dependent communities and forests for subsistence purposes are largely considered irrelevant.

Many comments were made that there are no longer any subsistence or forest-dependent communities in New Zealand. Comments related to both Maori populations and the forestry towns such as Minginui and Kaingaroa set up during the N.Z. Forest Service days. One participant questioned whether people working in the forest (e.g. contractors) were forest-dependent communities, but others disagreed, stating that the workforce is transient and people move from forest to forest so are not regionally dependent communities.

Key theme: An indicator measuring the distribution of revenue derived from forestry is irrelevant

Most participants considered that the indicator about distribution of revenue is irrelevant because forests are privately owned, or because they did not consider it to be a measure of the sustainability of forests.

Key theme: Contrasting opinions on recreation and tourism in forests

Opinion was split about indicators related to recreation and tourism. Many participants were positive about the recreation resources that forests provide, but noted the efforts and costs involved with managing these. A strong theme was that managing recreation is important because of potential safety and access issues. Participants with this opinion noted that the indicators were relevant.

Some participants felt that recreation and tourism may be a higher priority dependent upon land tenure (i.e. privately and publicly owned forests) and traditional access, or the way forests had been originally set up, e.g. Hanger Forest which was set up to include recreational facilities

These participants suggested that indicators may need to be further specified as to which forests they relate to.

A further opinion was that production forests are managed for profit, and if there is no profit from recreation and tourism for the land owners and investors, then it is not relevant to sustainable forest management and can in fact hinder forestry activities by increasing costs and risks (e.g. fire). Participants with this opinion noted the indicators were irrelevant.

Key theme: People need to view forests as important but their values are not necessarily relevant to forest management

All of the workshop groups noted that the indicator measuring the importance of forests for people is a relevant measure of sustainable forestry. However, there was a mix of opinion about whether cultural, social and spiritual needs and values were relevant factors of sustainable forest management.

One group suggested that these values are relevant regardless of land tenure or ownership, whilst others stated that there are no socially or culturally significant sites within their forests so the indicators are irrelevant. Participants with this opinion also noted that they manage exotic forests for economic purposes, and people's values are not a measure of how sustainable those forests are.

Comments on Specific Indicators

Production and consumption

6.1.a Value and volume of wood and wood products production, including primary and secondary processing

This indicator was considered relevant to all regions except Auckland, where participants noted that most of the timber used in the region is not produced within the region. Participants in other areas noted that the indicator was important because if the value got too low, forestry becomes uneconomic, which could lead to land use change.

6.1.b Value of non-wood forest products produced or collected

The value of non-wood products is relevant in most regions because it potentially provides another revenue stream. Some participants interpreted this indicator to include the value of recreation as a non-wood product, which may have biased the results towards this indicator appearing relevant throughout the country. Recreation is accounted for in subsequent indicators. The Nelson participants noted that this was not relevant because there are few if any non-wood products produced from within their forests.

6.1.c Revenue from forest-based environmental services

Results show that this indicator is unclear and requires at least a definition of environmental services. Several participants questioned what environmental services were and why they would be relevant. Many participants agreed that carbon would be a potential revenue source in the future that would be relevant. The Dunedin participants noted that this indicator should focus on the costs, benefits and risks associated with environmental services rather than any income stream from them.



CRITERION 6: MAINTENANCE AND ENHANCEMENT OF LONG TERM MULTIPLE SOCIO-ECONOMIC BENEFITS

Indicator relevant in the locations shaded:

Existing Montreal Indicator	WHANGAREI	AUCKLAND	ROTORUA	GISBORNE	NELSON	CHRISTCHURCH	DUNEDIN	
6.1.a								
6.1.b								
6.1.c								
6.1.d								
6.1.e				?	?			
6.1.f		?						
6.1.g								
6.1.h		?						
6.1.i	Did not complete this task							
6.2.a								
6.2.b								
6.3.a								
6.3.b								
6.3.c								
6.3.d								
6.3.e								
6.4.a				?		?		?
6.4.b								
6.5.a						?		
6.5.b								

6.1.d Total and per capita consumption of wood and wood products in round wood equivalents

Participants across the workshop locations consider this indicator to be relevant with the exception of one group within the Gisborne workshop who stated that it is not relevant because it is looking at a wider market demand and competition. The Christchurch participants noted that consumption of timber was relevant, but not imported wood products. However the Whangarei participants noted that the whole measure is important because it can be compared to concrete and steel usage. The indicator may need to be made more specific.

6.1.e Total and per capita consumption of non-wood products

Most participants noted this was relevant with the exception of the Nelson group, who noted that the non-wood product and consumption is so small it is irrelevant. The Whangarei group again noted that non-wood product provides more income for the same area.

6.1.f Value and volume in round wood equivalents of exports and imports of wood products

The value of round wood equivalents is relevant throughout the workshop locations. Whangarei participants noted the benefit of importing fewer products because it adds value to the local forestry industry. Auckland participants noted that there is not a lot of export of wood from the region, but a high percentage is imported because of the population.

6.1.g Value of exports and imports of non-wood products

There was a mix of answers related to non-wood products in general – see above. In some regions, non-wood products are accounted for or are considered relevant whilst in other areas they are seen as such a small component of products that they are irrelevant.

6.1.h Exports as a share of wood and wood products production and imports as a share of wood and wood products consumption

Few comments were made about this indicator and it was considered relevant at most workshop locations.

6.1.i Recovery or recycling of forest products as a percent of total forest products consumption

Gisborne and Christchurch participants did not consider this indicator very relevant. Gisborne participants stated that this was because they were not currently logging trees. Other workshops noted that it was relevant, particularly recycling products or using by-products such as firewood. Auckland participants noted that recycling of products was particularly relevant because of the region's large population.

Investment in the forest sector

6.2.a Value of capital investment and annual expenditure in forest management, wood and non-wood product industries, forest-based environmental services, recreation and tourism

Participants gave a number of reasons as to why investment in the sector was relevant. Auckland participants noted there are potentially lots of 'Mum and Dad' investors in Auckland. Participants in other areas noted that it is a measure of the 'vitality' of the industry, and that if there was no investment or a decrease in investment, then forestry would no longer be sustainable. Participants noted that specific measures of importance are investment planning, Rate of Investment (ROI), employment levels and productivity.

6.2.b Annual investment and expenditure in forest-related research, extension and development, and education

In general, participants across the workshops considered investment and expenditure into forest related research and extension to be relevant (with the exception of Auckland). The Christchurch group noted that it is 'very important for continuing development of forestry'. Rotorua participants noted that it is important that there was a means of being involved from the start of any research and extension programs to ensure there was good application and uptake of knowledge and outcomes.

Employment and community needs

6.3.a Employment in the forest sector

Results show that the level of employment in the forest sector is relevant to most of the workshop locations with the exception of Auckland. The Auckland participants noted that forestry was a 'very small player' in the region and therefore it was irrelevant. The indicator was considered important in other regions because it provides a measure of the socio-economic effects of the industry and provides a measure of productivity and competitiveness. Participants in Rotorua noted that within this indicator, the employee/employer relations were important.

6.3.b Average wage rates, annual average income and annual injury rates in major forest employment categories

Results show this indicator is relevant in most areas (with the exception of Auckland for the reasons noted above) because it gives an indication of employer/employee relations as well as a measure of health and safety for the industry as a whole. Auckland participants did note that the sector has low wages and high injury rates.

6.3.c Resilience of forest-dependent communities

With the exception of Nelson, all workshops considered this indicator to be irrelevant because they did not consider there are any forest-dependent communities in their regions. One workshop group noted that community resilience is not a measure of sustainability. Another noted that because of the nature of the industry, there is a transient workforce, where in the past there may have been forest-dependent communities (e.g. Minginui and Kaingaroa).

6.3.d Area and percent of forests used for subsistence purposes

Similarly to 6.3.c, participants considered that there are no communities or individuals using forests for subsistence purposes, and therefore this indicator is widely considered unnecessary.

6.3.e Distribution of revenues derived from forest management

Only the Nelson participants noted that reporting on the distribution of revenues derived from forests was relevant to their experience. Other participants did not consider this indicator to be a measure of sustainable forest management. Some also stated that as many forests are privately owned, the flow of revenue to society is irrelevant. Revenue was to be returned primarily to the forest owners and managers and not to a wider public.

Recreation and tourism

6.4.a Area and percent of forests available and/or managed for public recreation and tourism

Four out of six of the workshop groups considered managed recreation to be relevant (the Whangarei group did not complete the question). Participants said that it was important particularly for safety and access issues. Participants in Nelson and Christchurch noted that the degree of relevance for the indicator depended upon land status (public, private etc) or certain locations; for example they noted that in Christchurch, Bottle Lake and Hanmer forests are very important for recreation. Gisborne participants noted that unless there was economic benefit to forestry companies from managed recreation, then it was not relevant as a factor of sustainable forestry. Auckland participants noted that recreation and tourism are not factors of sustainable forestry and they can in fact hinder the industry by having negative impacts such as soil deterioration, increased cost, increased risk and weed spread.

6.4.b Number, type, and geographic distribution of visits attributed to recreation and tourism and related to facilities available

Most of the workshop groups did not specifically say whether or not this indicator was relevant, but commented on 6.4 as a whole, therefore it is difficult to say how relevant it is. The Christchurch group did note that it was a useful measure of how useful a forest is.



Cultural, social and spiritual needs and values

6.5.a Area and percent of forests managed primarily to protect the range of cultural, social and spiritual needs and values

The Rotorua and Dunedin groups considered this to be relevant. In Rotorua the group suggested that the indicator include the ownership of an area, the area of operation and the local values associated with that area. Dunedin participants noted that there are particularly Maori cultural and spiritual values associated with forests that need to be managed, including historic sites. The Christchurch group said that there is a social value to forests but that there are no cultural values in the production forests. Auckland, Nelson and Gisborne groups stated that cultural and social values were irrelevant because they were dealing with exotic production forests which are being managed for economic purposes only, or that there are no culturally or socially important sites (specifically archeological sites) within their production forests.

6.5.b The importance of forests to people

All of the workshop groups considered that the importance of forests to people is relevant as a measure of sustainable forestry. One reason given was that people need to see forests as important so that councils and other authorities continue to allow plantings.

Criterion 7: Legal, Institutional and Policy Framework for Forest Conservation and Sustainable Management

Key Theme: Existing indicators are largely considered relevant

Participants at all the workshops, with the exception of Auckland, agreed that Criterion 7 and the associated indicators are relevant to the N.Z. context. Auckland participants considered that the legislative and policy environment is a national level issue and it is not relevant to report on these on a regional basis within a criteria and indicators system.

Participants noted that indicators related to monitoring and reporting are relevant across the country because they show whether forestry activities are sustainable. Some participants noted that there are a number of existing monitoring and reporting processes within the forestry sector, and there needs to be some clarity as to what is relevant at a regional level to report on.

Key theme: Legal and policy frameworks need to encourage forestry

Participants noted that legal and economic frameworks need to encourage afforestation and investment in forestry, as well as highlighting the impacts and benefits of different land uses. Participants noted that to be sustainable, forestry requires certainty of land use rights and long-term taxation policy. Some participants noted specific policies that discourage afforestation, and others noted that the indicators should also reflect a measure of forest ownership.

Key theme: Public participation difficult and not necessarily a factor of sustainable forest management

There is a mix of opinion about public participation in forestry management. Many participants noted this was relevant but often costly and difficult. Other participants noted that whilst working with the public is an important part of managing forests, they did not consider it was a measure of sustainable forestry.

CRITERION 7: LEGAL, INSTITUTIONAL AND POLICY FRAMEWORK FOR FOREST CONSERVATION AND SUSTAINABLE MANAGEMENT							
Indicator relevant in the locations shaded:							
Existing Montreal Indicator	WHANGAREI	AUCKLAND	ROTORUA	GISBORNE	NELSON	CHRISTCHURCH	DUNEDIN
7.1.a							
7.1.b							
7.2.a							
7.3.a							
7.3.b							
7.4.a							
7.4.b							
7.5.a							
7.5.b							
7.5.c							

Comments on Specific Indicators

Extent to which the legal framework (laws, regulations, guidelines) supports the conservation and sustainable management of forests, including the extent of:

7.1.a Legislation and policies supporting the sustainable management of forests

7.1.b Cross-sectoral policy and programme coordination

With the exception of the Auckland group, participants from across the workshop locations regard these indicators as relevant. Comments were made that 'it is too risky not to have rules' and that rules 'determine the operating framework for the industry'. Rotorua participants noted that it is important to see standards implemented industry-wide. Auckland participants noted that legislation and policies are national rather than regional issues, and as such they are not relevant to report on at a regional level. With regard to cross-sectoral policy and programme co-ordination, participants noted that in some areas this is currently dysfunctional, and there needs to be more compatibility between pastoral and forestry rules and between different authorities. Some participants noted that national standards are required.

Extent to which the institutional framework supports the conservation and sustainable management of forests, including:

7.2.a Taxation and other economic strategies that affect the sustainable management of forests

Themes of discussion and results show that this indicator is relevant over most of the workshop locations, particularly because it may show the importance of forestry alongside other land uses. They noted that tax strategies need to encourage afforestation and provide some long term certainty for the industry.

Extent to which the economic framework (economic policies and measures) supports the conservation and sustainable management of forests through:

7.3.a Clarity and security of land and resource tenure and property rights

7.3.b Enforcement of laws related to forests

Participants across the workshops noted that clarity of property rights is essential, particularly with regard to the Emissions Trading Scheme (ETS) ownership of credits, Maori land use/lease and Resource Management Act (RMA) impacts and responsibilities. Some participants noted that any law within the RMA can affect the sustainability of forestry. Rotorua participants noted that the economic framework needs to be built in a way that encourages investment in forestry. With regard to enforcement, participants noted that rules need to be able to be credible and enforced across land uses, and national rules need to be able to be enforced locally.

Capacity to measure and monitor changes in the conservation and sustainable management of forests, including:

7.4.a Programs, services and other resources supporting the sustainable management of forests

7.4.b Development and application of research and technologies for the sustainable management of forests

Participants noted that it is important to manage ongoing science, FSC extension services and education programs. They noted that development of research programs are national through Foundation for Research, Science and Technology (FRST), but they need to have regional application to be relevant (Auckland). Participants noted that these services improve sustainable forestry (Rotorua) and cited Scion, Future Forests Research (FFR) and the School of Forestry (University of Canterbury) as important service providers for this work.



Capacity to conduct and apply research and development aimed at improving forest management and delivery of forest goods and services, including:

7.5.a Partnerships to support the sustainable management of forests

7.5.b Public participation and conflict resolution in forest-related decision making

These indicators were considered relevant in most of the workshop locations, although many participants noted the difficulties involved with working with the public and allowing people into forests. Participants talked about health and safety risks, boundary management issues and increased costs. Some participants noted that there are existing processes available for public participation, including council plans. The Auckland participants did not consider public participation to be reflective of sustainable forestry, but that public consultation is an important part of forest management. The Gisborne participants noted that because they are operating private operations, public participation in management decisions is irrelevant.

7.5.c Monitoring, assessment and reporting on progress towards sustainable management of forests

Results show that this indicator is relevant across all of the workshop locations because, for example, it shows the effectiveness of forestry practices. Auckland participants noted that there is a lack of clarity around what should be monitored and reported on, and that this must be clarified and made regionally relevant. Participants named the Ministry for the Environment (MfE) Land Use and Carbon Analysis System (LUCAS) and FSC programs as relevant existing reporting processes.

RESULTS BY REGION

This section presents the results on a regional basis, providing an outline of the main themes and issues arising at each workshop, as well as discussion about the Montreal Process Criteria. A chart is provided as a quick reference as to which indicators participants considered relevant in their region.

The case studies are presented in geographical sequence from north to south.



Whangarei Case Study

Participants at the Whangarei workshop represented The Department of Conservation, the Farm Forestry Association and the North Technical Institute. Whilst several council and company staff had registered, they were unavailable on the day.

Key workshop themes

- Participants generally considered that **conservation of biological diversity** was mostly only relevant for native forest areas, particularly those that are protected.
- Both **abiotic and biotic factors** were considered relevant to Northland, with bronze beetles, needle beetles and moth plant being key biotic factors, and wind-throw and erosion key abiotic factors. Some participants noted that weeds encroaching into forests from Conservation Estates are an issue.
- Conservation and maintenance of **soil and water resources** was strongly supported by Northland participants. They also noted the importance of best management practice regardless of land use. Participants highlighted a tension between the forestry and farming communities in relation to the prescriptive nature of the forestry regulation and the less prescriptive and sometimes voluntary nature of farming (dairy) policy and enforcement systems. They suggested that forestry prevents soil erosion up until it is logged.
- Maintenance of forest contribution to **global carbon cycles** was also supported by Northland participants, who agreed New Zealand could lead by example. They also indicated strong support for the use of forest residues as a local source of energy to provide more jobs and increase product returns.
- **Non-wood products** are valued as an existing and potential revenue stream, while the value and volume of wood product imports and exports was also of interest, focusing on the need for less imported product and more value-added local manufacturing.
- The use of Copper Chromium Arsenic (CCA) **timber treatment** is of concern to some participants, who noted that it has been banned in some countries, which has implications for NZ public and international perceptions of NZ forest products. The treatment also causes recycling issues. One participant noted this issue was a 'ticking time bomb' and it may have severe implications for the NZ forest industry which is heavily reliant on radiata pine.
- A further production issue noted by some participants was that due to poor **land quality**, forestry may no longer be economically viable after more than one rotation. Participants noted that a lot of the higher quality land is in agriculture.
- Participants emphasized the importance of **training** for the industry to ensure they have an effective workforce.

WHANGAREI		
IND.	YES	NO
1.1.a		
1.1.b		
1.1.c		
1.2.a		
1.2.b		
1.2.c		
1.3.a		
1.3.b		
1.3.c		
2.a		?
2.b		
2.c		
2.d		
2.e		
3.a		
3.b		
4.1.a		
4.2.a		
4.2.b		
4.3.a		
4.3.b		
5.a		
5.b		
5.c		
6.1.a		
6.1.b		
6.1.c		
6.1.d		
6.1.e		
6.1.f		
6.1.g		
6.1.h		
6.1.i		
6.2.a		
6.2.b		
6.3.a		
6.3.b		
6.3.c		
6.3.d		
6.3.e		
6.4.a		
6.4.b		
6.5.a		
6.5.b		
7.1.a		
7.1.b		
7.2.a		
7.3.a		
7.3.b		
7.4.a		
7.4.b		
7.5.a		
7.5.b		
7.5.c		

Participants did not complete this section

Impressions of the forest values presentation

Participants commented that economics and employment were primary drivers for production forestry. One noted that all other values were 'side benefits.' Participants said that they would not choose to plant forests (production species) unless they wanted to 'make a buck' and that once they are planted they need to realize the assets by harvesting the trees. Comments suggest that the adverse impacts of harvesting on the landscape are counterbalanced by the economic benefit and the wood product resources.

The point was also made that plantation forestry helps to ensure that conservation forests and native timber are left alone, and perhaps this is a relevant value in itself.

'Plantation forests exist so that indigenous forests aren't touched'

'If not for plantation forestry [there] would be little indigenous [forests] left as they would be cut down for housing etc'

Participants also noted that forestry training is an issue because there are not enough younger people coming through into the industry. As a result there is not a lot of choice of logging contractors, which causes issues if there are problems with existing contractors undertaking work.

Regional assessment of Montreal Process Criteria and Indicators

One participant noted that the Montréal Process Criteria and Indicators were written for overseas indigenous logged forests which contrasts with the New Zealand forestry industry.

Criterion 1: Conservation of biological diversity

Overall, participants considered that the conservation of biological diversity is more relevant for native forest areas, particularly those that are protected.

Ecosystem diversity

Participants differentiated between plantation and indigenous forests in relation to ecosystem diversity, stating that measuring the areas of forest by ecosystem type (C1.a) is not relevant because their interests involve largely single species plantation forests. In addition, measuring the area of protected forest ecosystems (C1.b) is relevant only for indigenous forests, and that measurement needs to occur during different successional stages to ensure protection of biological diversity. Participants noted that fragmentation was not relevant for either natural indigenous or plantation forests, particularly production forests where the forestry cycle changes from pasture to forest to pasture.

Species diversity

Participants' written responses show that indicators related to species and genetic diversity are relevant to the region; however differing perspectives were voiced around these indicators. One participant suggested that finding species (e.g. kiwi) may restrict their ability to harvest or force them to take different management approaches. Another participant noted that 'sometimes that's just the way it is' and '[you/they] can work around it'. Other participants noted that it is better to manage species than deal with 'public backlash' if species are adversely affected, and that 'because it is better to know what's in there so you can deal with it' and its 'better than turning a blind eye'.

One participant questioned whether possums and goats were part of biodiversity and therefore relevant to this criterion.



Criterion 2: Maintenance of productive capacity of forest ecosystems

Participants considered that the net area of plantation forest and that for wood production is not likely to change in Northland, and that in general, low quality land is in forestry and high quality land is in agriculture. They noted that the sustainability of productivity on low quality land may not be economic over more than one rotation, and questioned how the energy inputs of fertilizer to maintain forest productivity were measured.

Participants suggested that the wording of C.2.a, C.2.b & C.2.d was unclear. They commented that C.2.b is not relevant because NZ forestry deals largely with plantations of single merchantable species. One participant noted that there are trees that they consider pests competing with radiata pine within forests, but these are not available for wood production.

Participants suggested that a better wording for C.2.a as well as C.2.d would be:

'The percent of readily available forest for harvesting e.g. within five years', and
'The percent of larger area not sustainable (because of e.g. labour, and catchment issues etc)'

Participants stated that the area, percent and growing stock of plantations of native and exotic species is relevant in Northland, and within this the native forest component could relate to soil conservation areas. They also noted that the annual harvest of non-wood forest products is relevant in Northland.

Criterion 3: Maintenance of forest ecosystem health and vitality

The group agreed that both biotic and abiotic agents were relevant to the Northland region, highlighting bronze beetle, moth plant and needle beetles as being key biotic factors affecting production. Participants noted that it was important to protect productive capacity from pests to protect revenue, noting that some impact was manageable as long as it wasn't impacting on returns.

The group highlighted wind-throw events and erosion as relevant abiotic factors, noting the July 07 storms which damaged large areas and resulted in subsidence of soils that had been otherwise stable for 30 years. Fire was not considered such a big issue for Northland. They noted that an aspect of forest ecosystem health and vitality is the choice of species and the types of conditions they can tolerate.

Criterion 4: Conservation and maintenance of soil and water resources

The group agreed quite strongly on the relevance and importance of Criterion 4 indicators. A range of comments was made emphasizing the importance of soil – 'our soil is our wealth', 'we shouldn't be doing anything to degrade it', and 'everything we do should be about protecting soil and water resources'. Discussion focused on the need for best management regardless of land use, noting that forestry 'always cops it, farming doesn't', and highlighting the need for all land uses to protect soil as first priority ahead of economics.

They noted there were catchment issues between the differing land uses. They suggested that landscapes/catchments should be looked at as a whole based on soil resources, and that land use decisions need to focus on sustainability before economic return. One participant commented that there should be an overriding approach of best management practices regardless of land use. Another participant agreed, commenting that if different land uses/ management practices were killing species or limiting future choices then those uses/ practices should not be allowed. Much of this discussion was focused towards dairy farming, and comments were made that forestry has more prescriptive regulations and laws than farming, for example setting aside soil conservation and set back areas. Another participant suggested clean streams was an approach to improving potential pollution to stream from dairy farming, but noted that this was voluntary. Comments were made that 'forestry prevents erosion' and that 'there is nothing like a big block being cleared out for

devastation' which highlights a potential need for soil and water indicators to be monitored over the rotational cycle of production forests.

Criterion 5: Maintenance of forest contribution to global carbon cycles

The group generally agreed that Criterion 5 indicators were all relevant to Northland. They noted that there is some argument about New Zealand being small on a global scale, but considered we could lead by example. They suggested that whilst they should be looking at the whole carbon cycle (forest growth, products, usage, recycling etc), the costs might be prohibitive. Responses indicated strong support for the use of forest residues as a local source of energy to provide more jobs and training requirements, lift forestry's profile and increase product returns.

One participant commented that 'all wood products are burned or decompose [resulting in] tonnes of carbon in 30 years, do we account for that too?' However, another considered that 'wood is better than concrete and steel, [because] less energy used.'

One participant commented that there is justification for maintaining good carbon 'reservoirs' in forests.

Criterion 6: Maintenance and enhancement of long-term multiple socio-economic benefits to meet the needs of societies

The group focused on the production and consumption aspects of Criterion 6 and did not provide feedback on the remaining indicators.

The value of non-wood products was considered relevant as another revenue stream, but the relevance of revenue from forest-based environmental services was disputed and questioned as to what it meant.

Consumption of wood and wood products was supported as relevant, given that wood involves less energy than steel and concrete. The value and volume of wood products exports and imports was of interest to the group, which discussed the need for fewer imported products and support for value-added local manufacturing. The group suggested the need for import substitution in the region, e.g. use of local eucalypt instead of kwila.

Discussion also noted that CCA in Northland is an issue, with most forest products being treated, leading to recycling issues (6.1.i). One participant considered that while most processing activities in forestry are benign, CCA is a 'ticking time bomb,' noting concerns about public and overseas perception, especially given that most of New Zealand's plantation forestry is radiata pine that needs treating. In this context, another participant questioned the sustainability of having 95% of N.Z. forestry reliant on one species. He noted the industry needs to 'get more baskets of eggs.'

Criterion 7 - Legal, policy and institutional framework

The group agreed that while New Zealand doesn't necessarily have all of the legal, policy and institutional frameworks covered by these indicators, they are all relevant.



Auckland Case Study

The Auckland workshop was held in Helensville. Participants represented the Department of Conservation, the Auckland Regional Council, Rayonier, Hancock Forestry and Arbor Forestry. Apologies were received from a number of other organisations.

Key workshop themes

- **High population** makes the Auckland region unique. There is higher pressure on resources (particularly for recreation), there is potentially a higher level of investment available, and most of the wood used is imported from other regions. Participants noted that the forestry industry is 'small player' in the region in comparison to other regions such as the Central North Island.
- **High land prices** limit commercial forestry expansion. However, there are a lot of new forest blocks coming on within private lands which are a mix of production and conservation areas.
- Participants generally considered that **conservation of biological diversity** is irrelevant for plantation forestry in the Auckland region, although it may be relevant for the Hunua ranges where there are indigenous species.
- Participants noted that there was a higher **investment potential** for the forestry sector within Auckland City (because of the population base), but that the Auckland building industry and householders are choosing to use concrete and steel over wood products, which participants suggest is adverse for the environment.
- Participants stated that measurement of the level of investment into **extension and education** was not relevant in the region because the forestry industry was relatively small in comparison to other regions.
- Participants agreed that the indicators related to **biotic and abiotic factors** were relevant (C3.a & 3.b), particularly in relation to biosecurity threats and land subdivision.
- Participants noted that in general the indicators related to **recreation and tourism, and cultural, social and spiritual needs** are unclear and do not relate to production forestry.
- Participants stated that the **legal, economic and policy frameworks** were a national level issue and were therefore irrelevant to report on at a regional level, although they did note that laws did need to be enforced regionally. The group stated that whilst public consultation is an important part of day-to-day forest management, the degree of **public participation** is not a measure of sustainable forestry.

IND.	AUCKLAND	
	YES	NO
1.1.a		
1.1.b		
1.1.c		
1.2.a		
1.2.b		
1.2.c		
1.3.a		
1.3.b		
1.3.c		
2.a		
2.b		
2.c		
2.d		
2.e		
3.a		
3.b		
4.1a		
4.2.a		
4.2.b		
4.3.a		
4.3.b		
5.a		
5.b		
5.c		
6.1.a		
6.1.b		
6.1.c		
6.1.d		
6.1.e		
6.1.f		
6.1.g		
6.1.h		
6.1.i		
6.2.a		
6.2.b		
6.3.a		
6.3.b		
6.3.c		
6.3.d		
6.3.e		
6.4.a		
6.4.b		
6.5.a		
6.5.b		
7.1.a		
7.1.b		
7.2.a		
7.3.a		
7.3.b		
7.4.a		
7.4.b		
7.5.a		
7.5.b		
7.5.c		

Impressions of the forest values presentation

Few comments were made about the past values research. Participants did note that there was very little emphasis on productive capacity, and that the research identified a much broader range of values associated with forests than they would expect solely from the forest industry.

Regional assessment of Montreal Criteria and Indicators

Criterion 1: Conservation of biological diversity

Written workshop responses show that indicators measuring conservation of biological diversity (including ecological, species and genetic diversity) are not relevant in the Auckland region. However, there were some differing perspectives expressed during workshop discussion.

Participants noted that the written responses were based on production forestry and that some of the indicators may be relevant in the Hunua ranges. Some participants suggested that there is no succession in production forests, and therefore there is no successional ecological value. Other participants disagreed, suggesting that there are trees of all ages in production forests and therefore there is successional ecological value. Some participants noted that Woodhill forest is relevant to the diversity of ecosystems in the area because it was established on the dunes for conservation purposes.

There was also some discussion about species using the forest. While one participant stated that there are no kiwi or other 'important' species in the area, another noted that if these species were present, they would use the production forests because it was the only habitat available.

Criterion 2: Maintenance of productive capacity of forest ecosystems

Responses show that, in general, participants do not consider the current indicators under Criterion 2 to be relevant for the Auckland region. This is largely because they consider the indicators do not reflect a useful measure of the productive capacity of forest ecosystems.

In discussion, participants noted that the annual harvest volume is not a reflection of productive capacity, and that non-wood forest products are unrelated to productive capacity. One participant also noted that the productive capacity of the forest ecosystem is not relevant and that:

'only economic sustainability [matters]'

They said that the total growing stock and annual increment of merchantable tree species available for wood production was relevant, but that the same measurements for non-merchantable species are irrelevant (C2.b) because they grow only merchantable species.

Criterion 3: Maintenance of forest ecosystem health and vitality

Participants agreed that the indicators related to biotic and abiotic agents were relevant (C3.a & 3.b) to the Auckland region, particularly in relation to biosecurity threats and land subdivision. Key points of discussion were the vast amount of new weeds naturalizing in the Auckland area, as well as the difficulties and cost involved with managing weed/pest issues across land uses. Participants suggested that the area of land affected by abiotic agents in the Auckland area largely relate to the high population pressure and high land prices. These factors encourage subdivision and land clearance or land use change.

Criterion 4: Conservation and maintenance of soil and water resources

In general the group agreed on the relevance of Criterion 4 and those indicators that relate to current best practice in forestry activities (4.2.a, 4.2.b & 4.3.a). The group differentiated between indigenous and production forest in relation to reporting on the area and percent of forest where the management focus is soil or water protection. They suggested that this indicator is relevant for indigenous forests (Hunua) but not for production forests. This is in contrast to all of the other workshops around New Zealand, where every group agreed this is a relevant indicator.

The written responses also show that an indicator measuring the area and percent of water bodies or stream length in forest areas where physical, chemical or biological properties have changed from reference conditions is irrelevant for the Auckland region. Comments included:



'water properties change'.

This differs from all of the other regions where workshop participants stated this was relevant.

Participants asserted during the discussion that soil degradation is not as important in the Auckland area as it is in other regions. Some participants noted that a weakness of the Criterion is that it does not account for other land uses contributing to water quality issues. They suggested that the Criterion needs to compare forestry with non-forestry land use to demonstrate the sustainability of forestry. Another participant noted that there is an issue at harvest time with soil degradation and sediment loading in streams that is specifically forestry-related.

Criterion 5: Maintenance of forest contribution to global carbon cycles

Participants' responses show that measuring the total forest ecosystem carbon pools and fluxes is relevant in the Auckland region, but only for production forest (C5.a). They noted that the largest areas in forest are indigenous. Participants did not see total forest products carbon pools and fluxes as being relevant (C5.b).

They noted that an indicator measuring avoided fossil fuel carbon emissions by using forest biomass for energy was particularly relevant in Auckland because of the high population. They see this as an opportunity for forestry, while noting that the small amount of production forestry in the region may not make it economically viable.

Criterion 6: Maintenance and enhancement of long-term multiple socio-economic benefits to meet the needs of societies

The Auckland workshop participants in general were less supportive of recreational and community needs in relation to forest resources than participants most other regions. Results show that the production and investment indicators are considered more relevant for the region and/or the forest areas. Participants considered that, in general, the indicators related to recreation, tourism, cultural, social and spiritual needs are unclear, require clarification and largely do not relate to production forestry.

Production and Consumption

Responses suggest that the production and consumption indicators are less relevant in Auckland. However, the regional industry is important for employment and there are implications for trucks and motorway usage as wood is transported around the country and to the port.

Participants stated that because of the high population and the smaller forest areas, most of the wood in the Auckland area is imported from the Central North Island. Because of this, indicators related to the value and volume of wood and wood products, as well as those related to the import and export of wood and wood products from the region are not relevant.

Responses suggest that quantifying the per capita consumption of wood, wood products and non-wood products is relevant. Discussion around these indicators related to the Auckland building industry and consumers currently using more steel and concrete and less wood product. Participants suggested this was detrimental to the environment, particularly in relation to wood being a renewable resource and the larger carbon footprint of concrete. Participants also noted that measuring the amount of forest products recovered or recycled was a valuable indicator because of the high population in Auckland City.

Participants suggested the forest estate is likely to shrink in Auckland because high land prices encourage owners to subdivide for profit.

Investment in the Forestry Sector

Indicators that measure the level of investment in the forestry sector are relevant for Auckland because the higher population potentially holds a greater number of 'Mum and Dad' investors

However, participants suggested that the level of investment into research, extension and development, and education is not relevant for the area.

Employment and Community Needs

Responses show that indicators relating to employment and community needs are not relevant in the Auckland region, specifically because in comparison to other regions Auckland has very little forestry and there are no dependent communities. Participants also noted that the distribution of revenues derived from forest management is irrelevant.

There was some discussion about the definition of the indicators related to dependent communities, questioning whether they included people who are employed in the forests.

Recreation and Tourism

Responses show that participants do not consider indicators of recreation and tourism to be relevant in the Auckland region. Comments were made including:

‘Recreation and tourism are not indicators of sustainable forestry management practice in plantation forests. They can in fact be contributors to ‘unsustainability’ e.g. costs, risk, weeds, soil deterioration.’

In discussion, participants noted that they do ‘go out of their way’ to work with recreationalists. Another participant noted that if you ask people what is important, they say recreation.

Participants commented that plantation forestry is taking the pressure off Councils for recreation purposes, but it is a ‘nuisance’ for the forest managers and is not funded by Councils.

Cultural, Social and Spiritual Needs and Values

Indicators that measure the area of forest set aside or used for cultural, social and spiritual needs and values were not considered relevant for Auckland production forests. Comments were made such as:

‘No! Not relevant to plantation forestry which is for economic purposes, not multiple socio-economic benefits.’

However, some participants did note that an indicator related to the importance of forests to people was relevant although it would need to be better defined than it is currently (C6.5b).

Criterion 7 - Legal, policy and institutional framework

Participants noted that the legislative, policy and economic frameworks for forestry are national level issues rather than regional, and therefore indicators requiring these to be measured at a regional level were irrelevant. However, they did note that any laws did need to be able to be enforced at a regional level. They also questioned what cross-sectoral policy and program coordination meant and how it would be measured.

In respect to the development and application of research and technology, participants stated that whilst research is often coordinated at a national level through the FRST, it needs to have regional application to be relevant.

The group did not consider public participation to be a measure of sustainable forestry, but consultation is an important aspect of day-to-day forest management.

They noted that monitoring, assessment and reporting is relevant as a measure of sustainable forestry, but there needs to be clarity on what should be monitored and assessed, specifically at a regional level.



Rotorua Case Study

Participants in the Rotorua workshop represented the Regional and District Councils, NZ Farm Forestry Association, two industry organisations (FITEC and Future Forests Research), PF Olsen, Hancock and Interpine.

Key workshop themes

- Participants considered that measuring **ecosystem and species diversity** was locally relevant, but that there needed to be a national overview to understand the implications of species management. They commented that species management is expensive on a per hectare basis and can render areas economically unsustainable. Some participants suggested that there needs to be wider discussion on who pays for conservation of biological diversity within plantation forest estates.
- Participants considered that whilst the indicators related to the **productive capacity of the forest systems** are relevant, the productivity of specific sites is largely influenced by the management approach and investment criteria of the investors, for example what the owners deem to be productive or marginal areas.
- Participants considered that indicators related to **non-wood products** may provide valuable information on the trends of potential markets.
- Reporting on **biotic and abiotic factors** are considered relevant and a theme of discussion was the **use of pesticides** and other chemicals in the industry. Participants noted that they are limited on control options in some areas where forests are in close proximity to urban areas.
- Indicators relating to **soil and water conservation** are relevant, and the management of soil and water has been a part of forest practice for some years. Participants considered that these indicators should be measured across all land use types, particularly dairy farming.
- Participants considered that indicators related to **global carbon cycles** are relevant, particularly because of recent land use changes from forestry to dairy farming across large tracts of land.
- With regard to **recreation, tourism and socio-cultural needs**, participants agreed that indicators are relevant, particularly for safety and access. One participant noted that a lot of regional communities are very dependent on forest use for recreation. Participants also noted that local forest values are important, which is unique to the workshop series.

Impressions of the forest values presentation

The industry group identified four values of priority within the Rotorua area that they thought were not explicit within the Forest Values list presented. These were:

- High level of employment (in comparison to other regions) in forestry and associated industries
- Shelter provided by forests, e.g. Lynmore
- High level of tourism undertaken in the forests, and the associated business revenue
- Opportunities for education

ROTORUA		
IND.	YES	NO
1.1.a		
1.1.b		
1.1.c		
1.2.a		
1.2.b		
1.2.c		
1.3.a		
1.3.b		
1.3.c		
2.a		
2.b		
2.c		
2.d		
2.e		
3.a		
3.b		
4.1a		
4.2.a		
4.2.b		
4.3.a		
4.3.b		
5.a		
5.b		
5.c		
6.1.a		
6.1.b		
6.1.c		
6.1.d		
6.1.e		
6.1.f		
6.1.g		
6.1.h		
6.1.i		
6.2.a		
6.2.b		
6.3.a		
6.3.b		
6.3.c		
6.3.d		
6.3.e	-	-
6.4.a		
6.4.b		
6.5.a		
6.5.b		
7.1.a		
7.1.b		
7.2.a		
7.3.a		
7.3.b		
7.4.a		
7.4.b		
7.5.a		
7.5.b		
7.5.c		

The group suggested that the Forest Values require 'someone' to make a bold investment in forestry. They questioned how they encourage more investment and how many forest owners/managers are interested in promoting and managing for these wider values.

Regional assessment of Montreal Criteria and Indicators

Criterion 1: Conservation of biological diversity

In general, participants suggested that indicators regarding ecosystem and species diversity are relevant locally, but that the whole picture of a species/ ecosystem is only clear at a national level. One participant questioned what measuring biodiversity 'actually indicated' and another suggested it showed change over time.

A theme of discussion was who would pay for monitoring and species conservation efforts. Some participants suggested that if this measurement was deemed important, either at the national level under the Montreal Process or regionally by the community, then the industry, authorities and wider community would need to decide how to carry it out and pay for it. Participants stated that the cost of native species management 'wipes out profit per hectare' and as a result forest production becomes unsustainable economically. Another participant noted that these indicators would create additional compliance costs and restrictions on the original land use.

Ecosystem diversity

Participants stated that measurements of ecosystem diversity are relevant because they promote better land management. They suggested that promoting ecosystem diversity is important and that the ownership or tenure of a forest is irrelevant within this context. They noted that measuring bird life and riparian wetlands are important indicators. They also stated that measuring the fragmentation of forests was important because it may assist in developing or maintaining wildlife corridors.

Species diversity

Results show that indicators of species diversity (C.1.a & C.1.b) are locally important to certain forests in the Rotorua region. However, some participants noted that New Zealand largely has native species in decline, and measuring these at a local and regional level is difficult, not necessarily meaningful, and expensive.

Participants noted that an indicator measuring the efforts focused on conservation of species (C.1.c) is only important at a national scale. One participant noted that being able to use a 'measure of effort' allows people to fabricate the results.

Participants discussed what it means to have native species in forests. One participant questioned whether these species were at risk from forest management or whether they actually existed because of the forest being there. The participant noted that the indicators and other regulations or best management practice guidelines prescribe that forest managers need to change their management if species are found in the forest, but that those species might only be there because of the forest. Another participant noted that a forest can become a 'no-go area' if significant indigenous species are found.

Genetic diversity

Participants noted that genetic diversity is not relevant at a regional level, and various comments were made about what was and wasn't important. Some participants noted that protecting the genetic diversity of radiata pine was of national importance. Another participant noted that native species (within plantations) are ecosourced and therefore that local source is important.



Criterion 2: Maintenance of productive capacity of forest ecosystems

Results show that Criterion 2 and the associated indicators are relevant for the Rotorua region but are closely tied to the management approach of the forest investors. For example, participants noted that an indicator measuring the area of forest land and the net area of that land available for wood production (C.2.a) will be influenced by the investor's perspective of sustainable forestry. They may influence management of marginal and erosion prone sites, water quality, whether they accept lesser production for higher ecological value, the costs and profits available per site etc. Participants noted that high extraction rates in certain areas may mean investors decide to retire or reduce forested areas and concentrate on those sites that are less expensive to reach. One participant noted that in some cases it will be more economically viable to retire areas than to put them into second rotation. Participants noted that indicators need to reflect site productivity, not just maximizing the area planted.

With regard to non-wood forest products, participants noted the need for indicators to help understand trends in economic values of other uses such as recreation, education, alternative uses of the forests, mushrooms, terpenes (hydrocarbons – a major component of resin and turpentine), ginseng etc.

Criterion 3: Maintenance of forest ecosystem health and vitality

Participants considered that both of the indicators under Criterion 3 are relevant to the region. They stated that it was also important to keep forest inputs for managing pests and diseases (i.e. chemicals, fertilizers) low. They noted that, because of the high public usage and peri-urban nature of some of their forests, they are limited in control techniques for both biotic and abiotic factors (e.g. aerial pesticide spraying, prohibiting access to lower forest fire risk). They noted the potential risk of the regional airport opening to international flights. They noted that 'scale' is an issue in the region with regard to managing forest ecosystem health, along with interpretation of the term 'beyond reference conditions'.

Criterion 4: Conservation and maintenance of soil and water resources

Participants considered that each of the indicators under Criterion 4 is relevant to sustainable forest management in the region. They noted that these were measurable and that they should be measured across land use types (i.e. over forestry and farming). With regard to changes in water quality (C.4.3.b), they noted that this needs to be have a longitudinal research/monitoring approach and it needs to be comparable nationally. They noted that if these measurements highlighted events/issues of national importance (e.g. damage caused by Cyclone Bola), then national funding could be made available to mitigate the impacts.

In discussion, participants commented that the current laws and regulations controlling forest management to protect soil and water resources were developed because of the adverse effects on waterways in the past. They noted that the highest impacts are during harvest, and as forests are replanted and re-grow this impact lessens and the forest protects erosion and water quality.

Criterion 5: Maintenance of forest contribution to global carbon cycles

Participants noted that measurement of the total forest ecosystem carbon pool (C.5.a) was very relevant to the region because of land use changes (from forestry to farming). In discussion one participant noted that if they were trying to be carbon neutral as a region, then forests would play a major role in maintaining the carbon balance. They noted that the carbon pool of forest products (C.5.b) was not relevant because the majority of timber is exported.

In discussion, participants talked about the importance of making sure forests were replanted for carbon sequestration, and noted that a forest has more carbon as it gets older. They raised the potential of using native species which could potentially be reverted into native bush. They suggested this would need to be subsidised to encourage growers/investors.



Participants stated that currently they don't use commercial forests as [bio]fuel, but this may be a developing industry (C.5.c).

Criterion 6: Maintenance and enhancement of long-term multiple socio-economic benefits to meet the needs of societies

Participants considered that all of the indicators relating to production and consumption under Criterion 6 were relevant; stating they were 'tools for quantifying quality, quantity, profit/loss, products demands, etc. They noted that some indicators were more useful than others to them; for example if a company is producing paper, then indicators measuring the life cycle of the product are relevant, but if a company is just selling timber the product life cycle has no relevance.

Participants also noted that the indicators related to measuring investment in the sector are important. In discussion, they pointed out the forest ownership in New Zealand is very complex now with many forests having international investors but New Zealand managers, and that the owners' values override management. One participant noted that 40% of their land is in iwi ownership, which may be a disincentive for some investors. With regard to investment in research, participants stated that they need to be involved from the start to allow for uptake of knowledge and research outcomes.

Participants stated that measuring the level of employment in the sector and the wages and injury incidence are important for employer/ employee relationships. In discussion about community needs, the group suggested that the way companies manage forests now is constrained by investors' and owners' values, which are predominantly economically driven. They noted this is in contrast to the 'Forest Service days' when Forest Service villages were built around a sustainable model, supporting economies (local and wider) over a longer term view – rather than the current 'accountant's view to rip forests out' approach.

Changes in the way the industry operates have changed the way forests are managed. They noted that subsistence living in forests is not relevant in NZ, that there are no longer any forest-dependent communities, and that the workforce is now transient. One participant noted that it is hard to measure the level of dependence people have on forests; one noted that you can measure levels of unemployment, crime and shops shutting in some areas but it is hard to ascertain why this is happening. In discussion one participant asked whether 'you give a local guy the [forestry] contract when he is 15% more expensive than a non-local?'

With regard to recreation, tourism and socio-cultural needs, participants agreed that indicators are relevant, particularly for safety and access. Participants noted that many people believe they have a 'right' of access which is not the case in privately owned forests.

Criterion 7 - Legal, policy and institutional framework

Participants noted that all of the indicators under Criterion 7 were relevant for a variety of reasons. In discussion, one participant noted that there was no national policy on forests except for conservation estate. Another participant noted that if the government/ companies were reporting on each of these indicators there would be 'severe deficiencies' in New Zealand performance. Responses show that these indicators if measured across land use types would provide the opportunity to show the importance of forestry in the landscape. They also noted that if measured, the indicators would improve and showcase/prove sustainable forestry and relationships within the industry. Whilst they agreed that public participation was relevant, they questioned how cost effective this was.



Gisborne Case Study

Participants at the Gisborne workshop represented The Department of Conservation, the Eastland Wood Council, Hikurangi Farms, Ernslaw, Juken NZ and independent farm foresters.

Key workshop themes

- The Gisborne District is a **highly erodible region** with high rainfall and frequent storms.
- Results show that indicators related to the **conservation of biological diversity** are irrelevant to Gisborne forests, but there were mixed opinions during the discussion. Whilst a number of participants considered biodiversity to be irrelevant within exotic plantation forests in general, others noted that there is biodiversity in plantation forests, particularly in the understory and waterways. One perspective was that natural areas (such as waterways and Protected Natural Areas etc) within plantation forest land blocks are separate from the forestry operation itself, and therefore outside any sustainable forestry criteria.
- A **Forest Stewardship Council (FSC)** accreditation scheme for smaller owners is being discussed throughout the district because around half of the forests in the district are small owners. FSC is too stringent and the costs are too high for small growers.
- Some participants considered that forestry should be treated like farms or cropping areas (such as corn crop) and that wider **sustainability criteria** are irrelevant.
- Participants were largely focused on the **economic and production** based aspects of sustainability
- Overall, the group didn't consider that the plantation forests they deal with had **cultural, spiritual or social value**, but commented that it is important that people see forests as important so they continue to allow forestry activities.

IND.	GISBORNE	
	YES	NO
1.1.a		
1.1.b		
1.1.c		
1.2.a		
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1.3.a		
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4.1a		
4.2.a		
4.2.b		
4.3.a		
4.3.b		
5.a		
5.b		
5.c		
6.1.a		
6.1.b		
6.1.c		
6.1.d		
6.1.e		
6.1.f		
6.1.g		
6.1.h		
6.1.i		
6.2.a		
6.2.b		
6.3.a		
6.3.b		
6.3.c		
6.3.d		
6.3.e		
6.4.a		
6.4.b		
6.5.a		
6.5.b		
7.1.a		
7.1.b		
7.2.a		
7.3.a		
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7.4.a		
7.4.b		
7.5.a		
7.5.b		
7.5.c		

Impressions of the forest values presentation

Participants questioned whether skills and labour and the potential revenue generation from tourism were incorporated or explicit enough within the existing set of values.

Regional assessment of Montreal Criteria and Indicators

Criterion 1: Conservation of biological diversity

Participants discussed whether there was any biodiversity value within plantation forests, and there were clearly differing perspectives. One opinion was that that 'biodiversity doesn't exist in plantation forestry' and has 'nothing to do with' plantation forestry. These participants noted that the biodiversity that exists is either outside of the plantation area proper so is not relevant (e.g. is in waterways and Protected Natural Areas), or is incidental to forestry operations because the operations themselves have created habitat (e.g. for bird species).

A contrasting opinion was that biodiversity does exist within plantation forests, there is 'no bare dirt' and 'you will find flora and fauna' such as kaka and species within waterways in Gisborne.

Participants who stated biodiversity is not relevant to Gisborne and plantation forests in general



noted it would be relevant to West Coast rimu forests because they are indigenous forests.

Participants also considered genetic diversity to be irrelevant in Gisborne (and plantation forestry in general) because the industry is based on 'cloned species', and any diversity would be counterproductive. Some participants noted that the industry was vulnerable to pathogens and other risk factors because of this dependence on very few species, and that genetic diversity may become more relevant. Other participants disagreed and suggested that the industry is unlikely to change use because of the level of investment into the existing forestry species.

Criterion 2: Maintenance of productive capacity of forest ecosystems

Participants considered that productive capacity was a key factor in sustainable forestry, noting that its 'all about wood production or why are we doing it?'. They considered that measuring any changes in the area available for wood production would give some insight as to the influences that promote local land use change – for example economic returns encouraging land use change from forestry to farming. Participants noted that in general these indicators provide an understanding of site productivity and whether they are over- or under-cutting areas.

Responses show some disagreement as to whether measuring non-wood products is relevant. Written responses state that non-wood products (such as mushrooms, honey, cannabis, pork and venison) are relevant because forests are 'multi-use'. However in discussion two participants commented that harvesting non-wood products was irrelevant because they weren't a measure of sustainable forestry.

During discussion a comment was made that there are some 'enthusiasts' planting native species for commercial enterprise in the area, but that there was some 'fear' that native forest blocks would have 'clearance' felling restrictions.

Criterion 3: Maintenance of forest ecosystem health and vitality

The group agreed that both biotic and abiotic factors were relevant for the Gisborne area. In comparison to other workshops, much of the conversation focused on abiotic factors such as erosion and storms rather than biotic factors. They noted that storms were a constant feature in the district but that this would only become an issue if they become permanent form of clearance, for example 'if [we have] massive storms and windfalls [we] can't replant'. Participants discussed whether the level of controlled (i.e. via felling) and natural forest destruction (i.e. via storms) was important. They also noted that in the case of forest fires, if companies don't have the services to fight fires, then there is a human influence to the level of damage sustained.

With respect to biotic factors, participants noted that pests and diseases have the potential to wipe out the forests, and the costs of control are significant.

Criterion 4: Conservation and maintenance of soil and water resources

Participants agreed strongly that the conservation of soil and water is important to the area, particularly because of the highly erodible substrate and climatic conditions. They agreed that water quality was very important and that forestry provided cover and erosion control, effectively reducing the amount of soil in waterways. They noted that one of the objectives of the East Coast Forestry project was to provide some erosion control in the area. When discussing erosion issues with logging operations, they noted that the first cycle of forestry is always more damaging to waterways than consecutive rotations because of soil run off during development of roads and access points. Some participants compared this to farming operations, stating that farmers are 'constantly turning soil over and creating impact on streams', highlighting a common tension across the workshops about farming impacts versus forestry impacts.

Criterion 5: Maintenance of forest contribution to global carbon cycles

Participants stated that indicators measuring the forest ecosystem carbon pool and forest product carbon pool were relevant for the Gisborne district (and New Zealand), particularly with respect to fulfilling obligations under the Kyoto Protocol. In discussion they noted that carbon is a 'politically relevant' topic and that it has more to do with global warming than sustainability. One participant stated that some areas could be planted just for carbon sequestration and that introducing carbon accounting into the certification process would become very complex.

Participants did not consider that measuring avoided fossil fuel use by using forest biomass was relevant because 'new age carbon recycling' can't compare with 'ancient sequestered carbon being released'.

Criterion 6: Maintenance and enhancement of long-term multiple socio-economic benefits to meet the needs of societies

Production and consumption

Opinions were mixed in relation to the production and consumption indicators. Participants agreed that measuring the value of wood and non-wood products was relevant because if values get too low forestry may become uneconomic, possibly leading to land use change. However, they noted that when values are high there is a temptation to over-cut and therefore risk the continued supply of wood to processors. Some participants believed that measuring the consumption of wood and non-wood products was relevant, but others suggested that it is not relevant at a regional scale because it focuses on wider market demand.

Participants agreed that measuring the level of investment in the sector is relevant because if there is no investment then there is no forestry, but they did not provide a response as to the measurement of investment into forest related research, extension, development and education.

Participants noted that indicators related to employment, wages and injury rates are relevant. Participants noted that forests are not used for subsistence, and that the resilience or dependence of communities on forests is not a measure of sustainability. One participant noted that they struggle to get workers in certain areas (such as Ruatoria) because people do not want to live there. The distribution of revenues is considered to be irrelevant.

Recreation, tourism and community aspirations

Participants considered indicators relating to recreation and tourism to be irrelevant in plantation forests unless they provide significant income, which currently they do not.

Participants do not consider that they have any forests or parts of forests where areas need to be managed to protect cultural, social and spiritual needs (there are archeological sites within land blocks, but these are not planted), however they do consider that people need to see forests as important because otherwise they might not be able to plant them.

Criterion 7 - Legal, policy and institutional framework

Participants considered that each of the indicators associated with Criterion 7 was relevant in the Gisborne area with the exception of C7.5.b – public participation and conflict resolution in decision making – which they stated was irrelevant because they are running private operations. They noted that, provided the forestry companies are working within the rules, then the 'public shouldn't have a say' in their management.

Participants gave the ETS as an example of cross-sectoral policy (C.7.1.b) and noted that currently the rules for forestry and farming are 'incompatible' and that there are 'tougher' rules for forestry than on 'pastoral uses'. They noted that land use changes when the economic climate favours either forestry or farming. This is a common discussion point amongst each of the workshop areas.

Participants considered that it was important that the economic framework supports the conservation and management of forests (C.7.3), giving the examples of Crown/ Maori land, RMA impacts and the ETS. They questioned the ownership of carbon credits under the ETS and on Crown land – ‘if you lease land, who owns the carbon credits, owner or leasee?’

Nelson Case Study

Participants at the Nelson workshop represented the Department of Conservation (Motueka Area Office and Nelson Office), PF Olsen, Action Forest Management Ltd, Nelson Management Ltd, NZIF, the Tree Centre, Alphametrik, MAF, Nelson Marlborough DHB, Hancock Forest Management and one private individual (a retired forester).

Key workshop themes

- Participants identified several **values missing** from the values research – tourism, film, forests as a source of food, air quality, and water retention.
- As a whole the group had concerns about the **lack of definition of terms** within the criteria and indicators. The group also highlighted the fact that international criteria and review processes are very focused on natural forests, which are not relevant to Southern Hemisphere plantations of non-native species. They considered that it will be very important for the international community to understand this difference, and were concerned that the workshop hadn't emphasized this point clearly enough.
- Participants considered it was important to differentiate between exotic and native forests to assess the relevance of **biological diversity** indicators. One participant noted that Nelson was very different from the Central North Island in that Nelson's productive forests have very limited understory, making species diversity a relative non-issue.
- While Nelson is a major area of wood production, participants were concerned that **land banks** are being used up, with extension areas only available on more limiting country.
- The group agreed that both **biotic and abiotic factors** were relevant to Nelson, highlighting invasive weeds as a significant and costly biotic issue. They identified unmanaged weeds on adjacent land as a threat that was outside foresters' control. One participant noted that foresters do not yet know what impact, if any, didymo (*Didymosphenia geminata*) may have on them.
- Snow damage, wind damage and fire were all identified as relevant **abiotic factors** in Nelson forests.
- During discussion about Criterion 6, one participant commented that if we don't have sustainable markets, we won't achieve any of the other needs and values covered under Criterion 6. Another noted that while the non-wood indicators are less relevant, changes in all the other production and consumption indicators will affect **socio-economic factors**.
- The group agreed that both indicators for **recreation and tourism** were relevant. Participants highlighted that there were issues around forest access however. The increased pressure to allow people in has an impact on security, fire, rubbish and cannabis growing.

IND.	NELSON	
	YES	NO
1.1.a		
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1.1.c		
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4.1a		
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5.a		
5.b		
5.c		
6.1.a		
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6.1.g		
6.1.h	-	-
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6.2.a		
6.2.b		
6.3.a		
6.3.b		
6.3.c		
6.3.d		
6.3.e		
6.4.a		
6.4.b		
6.5.a		
6.5.b		
7.1.a		
7.1.b		
7.2.a		
7.3.a		
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7.4.a		
7.4.b		
7.5.a		
7.5.b		
7.5.c		

Impressions of the forest values presentation

Participants commented that Maori values are important, along with wildlife values. Some people expressed concern that the sample size for this work was too small, and noted the need to survey a wider population to find out the relative significance of different values across New Zealand. One participant questioned where intrinsic values should fit, giving the example that Aucklanders want West Coast forests preserved, even though they don't visit them.

The group identified several values they felt were missing from the values work. These included tourism (forestry is an important part of our landscape, as discussed in a recent Tourism NZ conference paper), films (e.g. Lord of the Rings), forests as a source of food, air quality (forests are critical at an ecosystem level), and water retention.

Regional assessment of Montreal Criteria and Indicators

Prior to discussion about specific indicators, the group questioned how forestry was defined for the purpose of the indicators. One participant suggested it should be defined as 'timber-producing forest.' Others suggested that indigenous forest remnants within productive forest should be part of the discussion. The place of farm forestry was also raised, and one participant questioned the assumption that DOC land was not productive, citing the economic value of recreation.

Criterion 1: Conservation of biological diversity

The group considered that it was necessary to differentiate between exotic and native forests to assess the relevance of these indicators. They considered that indicator 1.1.a 'Area and percent of forest by forest ecosystem type, successional stage, age class, and forest ownership or tenure' was relevant for native forest (production or otherwise), but less relevant for exotic. Indicator 1.1.b regarding the area and type of forest protected was considered relevant but mainly "because of outside forces such as Councils." Indicator 1.1.c was not considered relevant "because fragmentation can lead to protection/conservation because [it makes forests] less vulnerable to fires."

The group didn't feel the indicators relating to species diversity were particularly relevant for the Nelson area because there was limited understory in production forests in the area and no at risk species have been identified. One participant commented that Nelson was very different from the Central North Island in this respect.

Indicators relating to genetic diversity were also not considered relevant by the group. One participant noted that foresters were not currently being asked to measure this. Another person commented there was debate about diversity within exotic tree crops but not in indigenous forest.

Criterion 2: Maintenance of productive capacity of forest ecosystems

Participants considered that all the indicators under Criterion 2 are relevant to the Nelson area. Indicator 2.a was of significance because Nelson is a major area of wood production and land banks are being used up – extension areas are only available on more limiting country. With regard to indicator 2.b, participants noted that National Exotic Forest Description (DEFD) data quantities are important for sustainability (and to support the port and industry). One participant also noted that the wilding pine potential was significant in the area. While indicator 2.e was considered relevant only at a low level because Nelson's forests have a low level of non-wood forest products, the group identified a list of non-wood products including honey dew, possum fur, manuka honey, and recreational hunting for animals.

Criterion 3: Maintenance of forest ecosystem health and vitality

The group agreed that both biotic and abiotic agents were relevant to the Nelson area. Invasive weeds were identified as a significant biotic factor in the area, imposing additional costs on forest managers. Participants noted that invasive weeds from outside forests are a threat because of the failure of Council/other landowners to manage and control them. They also identified that there are benefits from animal pest control inside the forest estate for landowners outside the forest estate. The group considered that while indicators are useful, management decisions made outside the forest estate (but affecting the estate) are outside foresters' control.

One participant suggested that adaptive forest management was needed – change management to address changes in these indicators – but noted that the increased costs would affect the economic sustainability of the forest. Another participant commented that New Zealand does not have as big a problem with insects and other pathogens as some other countries. The issue of wilding pines coming from production forests was raised and one participant noted that we don't yet know if didymo (*Didymosphenia geminata*) is relevant to forests in terms of its impact and control.

Snow damage, wind damage and fire were all identified as relevant abiotic factors in Nelson forests. One participant suggested their increased frequency could be an indicator of climate change. Another participant questioned whether acid rain was an issue. Another participant responded by noting that there is an issue with increased ammonia in the air from agricultural areas landing on forestry in the Waikato/Manawatu. He suggested it was not likely to be a problem in Nelson because it was generally the result of prevailing westerly wind travelling over a large agricultural area to the west.

Criterion 4: Conservation and maintenance of soil and water resources

The group agreed that all indicators under Criterion 4 are relevant to the Nelson area apart from 4.2.b, as Nelson has only a small relevant percentage of vulnerable soils compared with other parts of New Zealand. Indicator 4.1.a was considered relevant to specific geology and soils and water conservation land. Participants noted that indicators 4.2.a and 4.3.a are related to district plan compliance, citing the Motueka Integrated Catchment Management plan and associated best practice as relevant to 4.3.a.

Criterion 5: Maintenance of forest contribution to global carbon cycles

Participants considered that there are external pressures to maintain carbon pools e.g. pressure from the United States even though they're not a signatory to Kyoto. While the indicator relating to forest products was considered relevant, the group noted that it was less so at a local level. They commented that there wasn't much pressure to increase wood use in the region, but that it would be nice from a forest owners' perspective if it did increase. The group didn't think 5.c was currently relevant, but noted that it is likely to become an issue in the future.

Criterion 6: Maintenance and enhancement of long-term multiple socio-economic benefits to meet the needs of societies

Production and Consumption

The group considered that 6.1.a, d and i are all relevant, but the other indicators in 6.1 are not because non-wood-related items are generally not relevant in the New Zealand context. One participant commented that if we don't have sustainable markets, we won't achieve any of the other needs and values covered under Criterion 6. Another noted that while the non-wood indicators are less relevant, changes in all the other production and consumption indicators will affect socio-economic factors. The group identified firewood and use of waste for energy as relevant options for recovery or recycling of forest products (6.1.i).

Investment in the Forest Sector

Participants generally considered that indicator 6.2.a was very important, but not for non-wood products. One participant noted that his company spends 5% of its annual budget on providing recreational services.

Employment and Community Needs

Participants agreed that all the indicators under 6.3 were relevant except for 6.3.d relating to subsistence. However, one participant commented that if the recession worsens, this indicator might become relevant! Indicator 6.3.c was considered particularly relevant, with one participant commenting that 'Wakefield would be a shadow of a place without forestry.'

Recreation and Tourism

The group agreed that both indicators for recreation and tourism were relevant. However, participants highlighted that there were issues around forest access. The increased pressure to allow people into forests has an impact on security, fire, rubbish and cannabis growing.

Cultural, Social and Spiritual Needs and Values

Overall, the group considered that 6.5.a. was not very relevant to plantation forests, but applied to the conservation estate. One participant commented that there is 'lots already protected for this purpose in indigenous estate but not that important for plantation.' The group agreed that the forest estate is very important to people in general, but again considered that this value is mostly already protected in the DOC estate in the New Zealand context.

Criterion 7 - Legal, policy and institutional framework

Participants agreed that all of the indicators covered under Criterion 7 were relevant and directly affected the economics and profitability of production. They noted that any changes in any of these indicators will influence sustainable forest management (profitability, either positive or negative) e.g. changes in taxes, regulations etc.

General discussion

During general discussion at the conclusion of the workshop, participants noted their concerns about the lack of definitions associated with the criteria and indicators. They considered there would be benefit in providing interpretations for each criterion and the terms within them. One participant noted that the current lack of interpretation jeopardizes reporting, because differing definitions or changing definitions might affect responses.

The group also highlighted the fact that international criteria and review processes are very focused on natural forests, which are not relevant to Southern Hemisphere plantations of non-native species. They considered that it will be very important for the international community to understand this difference, and were concerned that the workshop hadn't emphasized this point clearly enough.

Participants were also interested to know what the next step would be at the global level in further developing and reporting on the indicators.



Christchurch Case Study

Participants at the Christchurch workshop represented Department of Conservation, Environment Canterbury, Southern Cypress, Selwyn Plantation Board, Ernslaw, Piers Maclaren and Associates, Central Canterbury Farm Forestry, Christchurch City Council, Southern Canterbury Farm Forestry, Ashburton District Council, Farm Forestry Association and Forest Trust Hanmer, and Warren Forestry.

Key workshop themes

- Participants considered **ecosystem and species diversity** to be relevant for the Canterbury context, noting that there has been significant loss of species in the region in the past. **Genetic diversity** was generally not considered relevant, but the susceptibility of clonal forest was acknowledged as a business risk.
- **Productive capacity** of exotic forest was considered a key factor in profitability, with size of stock being as important a measure as growth rate (but not relevant for indigenous forest).
- Both **biotic and abiotic factors** are relevant for Canterbury. Gorse and broom were highlighted as biotic factors making reforestation difficult after harvest. Soil erosion from wind and water, wind-throw and fire were all significant abiotic factors. Forestry has been established in some parts of Canterbury specifically for shelter from wind or to prevent water erosion.
- Management for **soil and water conservation** was considered relevant at specific sites, particularly for flood and coastal protection.
- Environment Canterbury's Natural Resources Regional Plan (NRRP) **rules** preventing afforestation in certain areas are of concern to some participants, both in relation to the Kyoto Protocol (5.a) and general loss of property rights under the RMA (7.3.a).
- Maintenance of **production capacity** was important to the group, as was the value of recreation as a non-wood product.
- **Investment** in the forest sector was seen as critical, with the value of investment and expenditure (6.2.a) viewed as a measure of the industry's vitality.
- Overall, the group did not consider that forests had **cultural or spiritual value** but agreed that **social value** was important.
- Participants commented that the current criteria should include **pesticide use**, noting that New Zealand use is low compared to Organisation for Economic Cooperation and Development (OECD) countries, and systems are already in place to track and report on this issue.

CHRISTCHURCH		
IND.	YES	NO
1.1.a		
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Impressions of the forest values presentation

Few comments were made about the past values research, and the group didn't identify any values missing from this work.

Regional assessment of Montreal Criteria and Indicators

Criterion 1: Conservation of biological diversity

The group considered that ecosystem diversity was relevant for Canterbury, particularly as there has been significant loss of species in the region in the past. However, participants were unsure about the relevance of the fragmentation indicator. Species diversity was also found to be relevant, with plantation forest providing significant habitat for some species. The group acknowledged that pure stands of radiata pine have less diversity, but noted that even indigenous areas have already lost diversity. There was mention of the use of wildlife corridors and stream setbacks on the Coromandel Peninsula as a good example of conservation measures, which may not be in place in Canterbury.

With regard to genetic diversity, responses were mixed. It was generally considered not relevant in plantation forests in New Zealand but the susceptibility of clonal forest was acknowledged as an economic risk.

Criterion 2: Maintenance of productive capacity of forest ecosystems

Participants considered that productive capacity was a key factor in profitability, highlighting that if productivity is decreasing, '[we must be] doing something wrong.' Wood is viewed as a strategic resource that can be the best use for some land, with participants noting that it is 'not natural for hills to be bare.'

In relation to indicator 2.b, it was pointed out that the size of stock was important as well as growth rate and area planted. The profitability from harvest was considered a test of the sustainability of the operation – i.e. overcutting or cutting old growth without replanting is not sustainable. However, this wasn't considered relevant to indigenous forests, as indigenous plantations are so rare.

Annual harvest indicators were considered important, with the group noting that uneven age structure in the forest leads to gaps in production. Continuity is important to keep contracts going and processors viable. Non-wood products were only considered relevant for beech trees producing honey dew.

Criterion 3: Maintenance of forest ecosystem health and vitality

The group agreed that both biotic and abiotic factors were relevant for Canterbury. In particular, they highlighted gorse and broom as key biotic factors, noting that these weeds made reforestation after harvest difficult. However, one participant noted that sometimes these weeds create an opportunity because farmers sacrifice the land to forestry to avoid ongoing control costs and effort.

Abiotic factors mentioned included soil erosion by wind and water, wind throw and fire. Participants pointed out that some forestry in Canterbury has been specifically planted as shelterbelts to protect areas from wind and in other places to prevent water erosion.

Criterion 4: Conservation and maintenance of soil and water resources

Overall the group agreed on the relevance of Criterion 4, with the exception of 4.2.b relating to areas of significant soil degradation, although they recognized an issue could develop in the future on the Port Hills. Management for soil and water conservation was considered relevant at specific sites, particularly for flood and coastal protection. Codes of practice were highlighted as important for ensuring best management practices are used and Criterion were seen as useful to help prevent bad practice.



Criterion 5: Maintenance of forest contribution to global carbon cycles

Criterion 5 indicators were all considered relevant to the Canterbury context. There was some discussion around Environment Canterbury's Natural Resources Regional Plan (NRRP) rules preventing afforestation in certain areas to protect ground water resources, with some participants unhappy about the rules and concerned this stance doesn't support Kyoto.

Participants asserted it would be a competitive advantage to produce material from bio-resources, such as wood pellets, in relation to total forest products carbon pools and fluxes. There was also significant discussion around indicator 5.c, with some participants suggesting it would make more sense for Canterbury to grow its own species for wood pellets and power generation (citing the example of an Italian village using wood burners for power generation). Use of firewood from plantation forests and wood pellets were significant topics, especially now that Environment Canterbury is allowing use of lower-emission wood pellet fires. The costs and impacts of transporting wood products were also mentioned.

Criterion 6: Maintenance and enhancement of long-term multiple socio-economic benefits to meet the needs of societies

Production and Consumption

The group considered all the indicators under 6.1 to be relevant except for 6.1.g, regarding the value of exports and imports of non-wood products, and 6.1.i regarding recovery or recycling of forest products. Maintenance of production capacity was important to the group, as was the value of recreation as a non-wood product. Participants pointed out that recreationalists purchase equipment in local towns, providing revenue for the community, but noted that track conflicts have to be managed through responsible use.

Investment in the Forest Sector

Investment in the forest sector was seen as critical, with the value of investment and expenditure (6.2.a) viewed as a measure of the industry's vitality. Investment in research and extension was described as very important for continuing the development of forestry.

Employment and Community Needs

Indicators 6.3.a and b regarding employment and wages etc. were viewed as important, while the remaining indicators relating to resilience of forest-dependent communities, subsistence use and distribution of revenue were not. Participants asserted there were no forest-dependent communities in Canterbury.

Recreation and Tourism

The group agreed that recreation and tourism were very important issues, citing Bottle Lake and Hanmer as key destinations. Indicator 6.4.b was viewed as an important measure of how useful a forest is.

Cultural, Social and Spiritual Needs and Values

Overall, the group didn't consider that forests had cultural or spiritual value, but agreed that social value was important. Participants commented that trees appeal to people on an emotional level, and that New Zealanders have a culture of bush use and wood use, with access to forests being part of that culture.

Criterion 7 - Legal, policy and institutional framework

Participants agreed that all indicators under Criterion 7 were relevant to the local context. Comments were made about deforestation laws under the [proposed] ETS, and again about Environment Canterbury's rules discouraging afforestation in some areas (7.1.a). It was noted that the Climate Change Response Act will affect all sectors.

The lack of capital gains tax was raised as an issue relating to 7.2.a, where farmers can capitalize into land, raising its value and making it unaffordable for forestry. Comments were also made

regarding forestry land having a negative value because trees on it under the current valuation models are considered part of the land, rather than a crop.

Concerns were also raised about the RMA removing property rights for foresters (7.3.a), with no assurance as to the right to harvest or build forestry roads in the future. A case in Dunedin was cited where the Dunedin City Council rezoned an area with 27-year-old trees to make forestry prohibited in that area – inability to gain a resource consent to harvest led to a ‘stranded asset’. This issue was eventually resolved, but the lack of existing use rights for forestry over time (between planting and harvest) remains a business risk. The group commented that the RMA and any planning law have the potential to greatly affect the sustainability of forests. There was some discussion about the benefits of transferring the planning functions of regional councils to a centralized EPA to improve consistency.

With regard to enforcement of laws (7.3.b), it was noted that MAF has an enforcement section for the ETS. It was also pointed out that Land Information New Zealand (LINZ) and DOC are having problems getting rid of wilding pines because of the way the relevant legislation was written.

In relation to 7.4 and 7.5, the group provided several examples of the relevant local agencies – 7.4.a is addressed by FSC extension services from MAF, and 7.4.b research and technology is provided for by Scion and the School of Forestry. The Sustainable Farming Fund work on wilding pines was given as an example of partnerships to support sustainable management of forests (7.5.a). Environment Canterbury’s NRRP process, along with district plans, were given as an example of public participation and conflict resolution (7.5.b), while Ministry for the Environment and LUCAS/FSC were cited in relation to monitoring, assessment and reporting (7.5.c).

General Discussion

At the end of the workshop, participants commented that the current criteria should include pesticide use. Use in New Zealand is low compared to OECD countries, and the 20 Forest Stewardship Council companies will track use and report back. Currently, all pesticides used in New Zealand are totaled by Ministry for the Environment and divided across all areas of NZ usage, regardless of chemicals used or the industry concerned.

One participant summed up the workshop by saying they came asking what relevance all this had [protocol and discussion], and now realize it is almost all relevant.

Dunedin Case Study

Participants at Dunedin represented the NZ Farm Forestry Association, the Otago Regional and Dunedin City Councils, City Forests Ltd, Forest Environments Ltd, WSN Ltd, Wenita Forest Products, the Department of Conservation (DoC) and the Ministry for Agriculture and Forestry (MAF).

Key workshop themes

- Participants considered that **conservation of biological diversity** was relevant for Otago, particularly on a landscape basis across different land uses and ownership. They suggested the need to further define the indicators in terms of their relevance to indigenous and exotic forest species. **Genetic diversity** was considered important, particularly in relation to the long term sustainability of monoculture forests.
- The group agreed that measuring the available forest resources for **wood production** was highly relevant, but that the indicator should also account for exclusion zones, such as set back and protection areas, within forests. They noted that forest companies should get some acknowledgements or credit for managing these zones.
- Harvest of **non-wood products** is considered to be relevant for social and personal value but of limited economic value.
- **Biotic and abiotic factors** are relevant in the area, particularly specific biosecurity threats.
- Management for **soil and water conservation** is relevant throughout the region, and participants noted that regulations/indicators should be applied across different land use types. The group noted that managing soil and water to best management practices provides confidence in the industry.
- Participants noted that the Otago region has a higher proportion of Douglas fir which may be beneficial for regional **carbon** forest and product pools. They also commented that there is potential for **forest biomass** being more effectively used in the region because of the close proximity of the forests to the city.
- Indicators related to **production and consumption, investment and employment** details are generally considered relevant to the region because they provide important information on the economic viability of the local industry.
- **Recreation and tourism** are considered relevant to the area but they are not current included within economic costings.
- Participants suggested that there should be an indicator that provides a measure of **forest ownership** e.g. private versus public, family versus corporate, national versus international. They noted this is important because the values of the owners have a significant impact on the way forests are managed.

IND.	DUNEDIN	
	YES	NO
1.1.a		
1.1.b		
1.1.c		
1.2.a		
1.2.b		
1.2.c		
1.3.a		
1.3.b		
1.3.c		
2.a		
2.b		
2.c		
2.d		
2.e		
3.a		
3.b		
4.1a		
4.2.a		
4.2.b		
4.3.a		
4.3.b		
5.a		
5.b		
5.c		
6.1.a		
6.1.b		
6.1.c		
6.1.d		
6.1.e		
6.1.f		
6.1.g		
6.1.h		
6.1.i		
6.2.a		
6.2.b		
6.3.a		
6.3.b		
6.3.c		
6.3.d	-	-
6.3.e	-	-
6.4.a		
6.4.b		
6.5.a		
6.5.b		
7.1.a		
7.1.b		
7.2.a		
7.3.a		
7.3.b		
7.4.a		
7.4.b		
7.5.a		
7.5.b		
7.5.c		

Impressions of the forest values presentation

Few comments were made about the past values research. One participant questioned whether the values related to just indigenous forests or all forests. The group agreed that there were no values missing from the list.

Regional assessment of Montreal Criteria and Indicators

Criterion 1: Conservation of biological diversity

The group considered that the indicators for conservation of biological diversity were relevant to forestry in the Otago area. Participants commented that there are indigenous species within exotic forests, and because of this biological diversity is particularly important at a landscape level (rather than particular forests). They noted that the food webs of species are important across the landscape. One participant commented that 'we don't know how important some [food web] connections are and we can't afford to lose them'. Another participant noted that the 'long-term survival of species requires diversity', and therefore indicators must be able to show trends over time.

Participants noted that the indicator relating to species diversity was unclear and a definition of native forest and associated species needed to be provided within the criteria and indicators.

Indicators related to genetic diversity were considered important for the long term survival of species, indigenous, exotic, production and non-production. They noted that increasing the genetic diversity may future proof against the threat of invasive species and/or pathogens and increase the ability of forest resources to adapt to change.

Criterion 2: Maintenance of productive capacity of forest ecosystems

The group agreed that it is important to measure the area of forest land available for wood production provided there is also some recognition for the sites within their forests that they do not log for a range of reasons, including stream protection, regulatory set back zones, landscape values, etc. Participants stated that these exclusion zones limit the productive estate, and that there should be some acknowledgement of this by the public/policy makers. One suggestion was that riparian areas be considered as part of forestry area for carbon credits. Participants also stated that these exclusion zones, such as 20-metre riparian set back areas, needed to be consistent across land use type, particularly farming. They also noted that indicator C.2.a and C. 2.c could be merged into one.

Participants noted that annual increments of wood species is less relevant to Otago because the second and third rotation are showing no or limited change.

Harvest of non-wood products is considered relevant but of limited economic value in the region. Participants noted that non-wood products were harvested more for personal use and value. Products listed were truffles, mushrooms, berries, pigs, deer, possum fibre and herbs. One participant noted that harvesting non-wood products doesn't make 'economic sense' but they are related to community values of forests. Another participant noted that the potential to harvest species (e.g. possums, deer) is limited because of pest control operations, particularly 1080 poisoning.

Criterion 3: Maintenance of forest ecosystem health and vitality

Similar to other regions in the country, the group agreed that biotic and abiotic factors were relevant for Otago. Participants noted that the lower South Island has specific disease threats. They also noted that forests on neighbouring lands can act as a 'sink' for pests and weeds which



exacerbates the issues. Regional abiotic factors mentioned were damage from snow fall and fire risk (which can be increased by the widespread gorse populations).

Criterion 4: Conservation and maintenance of soil and water resources

Criterion 4 indicators were all considered relevant to the Otago context. There was some discussion about the existing regulations that govern soil and water conservation, and the government and international drive to account for environmental impacts within the industry. Participants also raised a number of issues related to soil and water conservation, including consistency over land use and ownership (i.e. public versus private), cost viability and land use restrictions related to protection measures.

Participants stated that forestry is a management tool for soil conservation, although they qualified this by saying that whilst forestry may reduce soil erosion, it may also adversely affect soil quality (i.e. chemical, biological and physical properties). One participant stated that if there is no soil, there is no forestry.

Participants commented on the importance and commercial value of both water quantity and quality, as well as the flow-on effects to and from other industries (specifically dairy). They noted that 'provided harvesting is done properly' water quality remains high. They noted that there is a potential water scarcity issue, and wilding pines may increase the adverse nature of this issue.

Participants noted that measuring the proportion of forest management activities that meet best practice guidelines is relevant because it builds their reputation by providing confidence and trust within the industry and wider community, which leads to market benefits and practical outcomes.

Criterion 5: Maintenance of forest contribution to global carbon cycles

Participants stated that the Criterion 5 indicators were relevant, but that the existing rules and policy relating to carbon have perverse outcomes (e.g. cutting down forests early to avoid carbon taxes which lead to an oversupply of wood followed by a lack of supply for wood pulp). They asserted that rules and indicators for carbon policy must be practical, able to be implemented and encourage best land use. One participant stated that 'agriculture is the main source of carbon emissions'. Another noted that the best way to encourage forestry on farms was to allow shelterbelts to qualify for carbon credits.

In relation to measuring forest ecosystem carbon pools, participants noted that the indicators needed to be able to measure losses and gains, because of factors such as fires and pests, and that they need to align with international measurements. They commented on the existing tensions and potential conflicts that will likely arise as carbon policy is implemented across different land uses, in particular dairy farming and forestry.

The group commented that Otago has a higher proportion of Douglas fir than other parts of the country, which may be beneficial for regional carbon forest and product pools because it has longer rotations and more solid wood applications.

Participants considered that using forest biomass for energy was an opportunity in the region because of the close proximity of forests to Dunedin. They specifically mentioned using slash as firewood for residential heating, but noted that this will require more energy-efficient fires as the emissions need to be reduced. They noted that the sale of biomass for this purpose should be based on the energy content, not the volume.



Criterion 6: Maintenance and enhancement of long-term multiple socio-economic benefits to meet the needs of societies

The group generally agreed that the series of indicators associated with Criterion 6 are relevant for the Otago region. The majority of discussion focused on social factors of forest management. One participant commented that in general inclusion of socio-economic benefits was important because it was not included in current forest economic costings.

Production and consumption

Indicators related to production and consumption are relevant to the area. They noted that indicators measuring environmental services (C.6.1.c) should be able to account for the indirect costs and benefits, i.e. the positive and negative environmental services and risks, to provide a more comprehensive understanding. Participants questioned whether the production and consumption indicators accounted for the cultural values held within the local Maori forestry management e.g. South Island Landless Natives Act (SILNA) lands.

Investment

Participants noted that investment planning, particularly the Return on Investment (ROI) figures, are essential because this is the basis of the industry. They noted that employment and productivity are closely related to these indicators, and that as productivity increases, employment can decrease.

Employment and community needs

Participants noted that indicators relating to employment are relevant, particularly to highlight productivity, competitiveness within the industry, Gross Domestic Product (GDP) and health and safety of the work force. Similar to other regions, the group questioned whether there were any forest dependent communities in the area and whether the indicator was relevant to New Zealand forestry.

Recreation and tourism

Participants considered that recreation and tourism are important factors of forest management in Otago, but they are currently treated as 'side-values' or 'social by-products' and are not accounted for in economic costings. They commented that activities like mountain biking are beneficial for the local economy and provide an opportunity for people to interact with forest environments. One participant said that 'it is important for people to be in the greater outdoors even if it's not for recreation per se' because of the health and social benefits of 'green space'.

Participants discussed the connection between recreation and tourism and investment within the forest industry, although it is unclear whether they were suggesting that recreation and tourism may bring investment into the sector or whether there needed to be investment in the sector to support recreation and tourism. One participant commented that wilding pines can detract from the tourism experience.

Cultural, social and spiritual needs

The group stated that these indicators are relevant, particularly the protection of Maori cultural and spiritual values and archeological sites within forests. A comment was made that knowledge about the history of forests is important to the area. Wilding pines were also mentioned in relation to a loss of social values.

Participants suggested that there should be an indicator that provides a measure of forest ownership, e.g. private versus public, family versus corporate, national versus international. They noted this is important because the values of the owners have a significant impact on the way forests are managed.



Criterion 7 - Legal, policy and institutional framework

The group considered the Criterion 7 indicators relevant for the Otago area for a range of reasons. They stated that the legal framework 'determines the operating framework' and that 'it is too risky to not have rules'. They emphasized that cross-sectoral policy and programme coordination needs to be consistent across the country, both within and between organisations and across, particularly 'competing', land uses. They considered that national standards are required that apply across all land uses (including dairy farming), and that if regulations are not adhered to then prosecution is appropriate.

Participants noted the institutional framework needs to support the conservation and sustainable management of forests (C.7.2) by, for example, providing long term security of land use rights. They noted that rules pertaining to the Kyoto Protocol can erode their rights as land users and polarize different industries. As an example, one participant suggested that 'deforestation taxes' don't allow landowners to make the best decisions about land use. Another noted that policies allowing collection of taxes in retrospect are 'unfair'. One participant noted that the large forest owners in effect 'subsidise' the smaller owners with infrastructure (roads, port storage space, shipping routes etc) and market generation activities.

Participants noted that education on sustainable management as well as the application of research and technology is relevant for local forestry.

In relation to public involvement in forest management, the group stated that recreational use is taken for granted, and while there are some benefits for forestry, there are no financial returns. One participant commented that policies need to be flexible enough to allow for entrepreneurial use of land for recreation and tourism to generate economic return.

Participants stated that the public adjacent to forests demand input into their management and the 'big' issues largely relate to risk management with public access to forests. They noted that forest owners need to run an education process about forest use and to clarify the different interests people have in forests. One participant suggested the need to have staged processes in forestry management to allow for community use.

SUMMARY, OBSERVATIONS AND NEXT STEPS

This section provides a summary of the relevance of each of the existing Montreal Process Criteria based upon the nationwide and regional results. It also offers comment on a number of related themes that arose during the workshop series that the authors believe are important to take into account in any further development of regional criteria and indicators for sustainable forestry within New Zealand.

Relevance of each criterion

1. The Conservation of Biological Diversity (Criterion 1) is generally seen as less relevant by workshop participants than other criteria. The primary reason participants gave for this response was that the N.Z. forestry industry is based on exotic plantations where the primary driver is economic return. Participants generally consider that this criterion is more relevant to indigenous forests, is relevant at a landscape level, or has relevance to specific sites. The relevance of individual indicators varies across the country dependent upon the management approach of local companies and local authorities (e.g. whether they account for ecosystem and species management within their regime), as well as the status of indigenous biological diversity in each region. Further work is required to define relevant regional indicators for biological diversity.
2. Indicators associated with the Productive Capacity of Forests (Criterion 2) are generally considered to be relevant throughout the country because they provide important information about the productivity and economic return of each forest. Existing indicators could be made more specific with regard to mapping non-production zones and site productivity.
3. The Maintenance of Forest Ecosystem Health and Vitality (Criterion 3) indicators were considered relevant across all workshop locations, but may require further detail regarding specific impacts and the scale of events. Participants listed a number of different biotic and abiotic issues relevant in their regions, and noted that there are cross-boundary issues and cost implications associated with the indicators.
4. The Conservation of Soil and Water (Criterion 4) was generally considered relevant across the workshop locations. Comments suggest that soil and water conservation has been a focus of regulatory authorities and larger forestry companies for some time, and as such there are existing regulations, codes of practice and reporting requirements that guide forestry activities. The relevance of specific indicators at a regional level appears to vary based on local environmental conditions (e.g. level of soil degradation, water quality measures).
5. Comments made about the Maintenance of Global Carbon Cycles (Criterion 5) suggest that participants view these as national level issues, and some see them as 'compulsory' at a regional level. Some participants noted the opportunities and implications for regional carbon accounting and the increased and varied use of forestry by-products.
6. The Maintenance and Enhancement of Long-term Multiple Socio-economic Benefits (Criterion 6) elicited the most discussion and varied opinion amongst participants across the workshop. The relevance of the criteria and indicator set appears to be strongly linked to the management regime and philosophy of the individual companies and local authorities in each region and, to a lesser degree, social factors such as population density and proximity to forests. The results show that indicators relating to subsistence, forest-dependent communities and distribution of revenue are largely irrelevant in the N.Z. forestry context, and that production, consumption and employment indicators are relevant.



Indicators related to recreation, tourism, cultural, social and spiritual values require clarification and definition both at a national and regional level.

7. Legal, Institutional and Policy Frameworks (Criterion 7) were considered relevant to the N.Z. forestry context in all but one of the workshop locations, where participants noted that these were national rather than regional issues. A number of issues were raised in response to the indicators, including the needs for certainty of property rights, measurement of forest ownership, policies and taxes that encouraged afforestation.

Observation: Whilst the existing Criteria and Indicators were written for international forests, results show that the majority of them have relevance in the New Zealand context

During the workshops, many participants questioned the relevance of the Montreal Process Criteria and Indicators to the New Zealand forestry context because they were developed for international forests. A recurring theme was that the existing indicators were developed for logging natural indigenous forests and therefore were irrelevant or less relevant to N.Z.'s planted exotic forests.

However, results from the workshop series show that participants consider that the criteria in general and most of the indicators have relevance in the N.Z. context. Several indicators require clarification and specificity as noted in the text, particularly those related to indigenous biodiversity and socio-economic benefits. This is consistent with other Montreal Process member countries that have adopted the criteria and tailored the indicators to suit their forests, both natural and plantation, such as Australia.

Observation: Indicators must account for regional differences

Results show that there are regional differences between the forest environments across the country, not just because of local environmental conditions (such as weather patterns, geology, growth rates etc), but also because of forest ownership, management regimes and philosophy of the various companies and local authorities, and to a lesser degree, the influence of local communities. These factors mean that some indicators vary in relevance across the workshop locations.

The authors consider that any further development and application of the indicators for New Zealand account for regional variations.

Observation: Whilst there is recognition that communities need to view forests as important, there are barriers to actively facilitating management approaches that enhance social benefits

All workshop groups considered that it is vital that communities see the importance of forests in the landscape. Two recurring reasons for needing people to view forests as important were that companies could continue their activities, and to secure investment (from the wider community and business sector) for replanting trees. However, whilst most groups considered some level of access for recreation was relevant, few considered that indicators related to managing forests to protect cultural, social and spiritual needs were relevant. Some participants questioned why local communities should have access to forests or be involved in forest management when there was no opportunity for them to be involved with other land uses like dairy farming and horticultural cropping. Many comments were made that owners may allow access for recreation but that forests are primarily managed for productivity and investors, and providing community benefits is not a priority or a measure of sustainable forest management.

This predominantly economic focus and understanding of sustainable forest management has implications for forestry policy makers and the forestry industry in any further development of indicators related to social benefits.



Observation: Assessment of the indicators highlights the need for cross-sectoral policy and programme coordination within the forest industry and with other industries

A theme that developed through the research was that the scale of some issues is outside the control of individual companies, agencies or the industry itself. Examples are carbon policy, biosecurity control measures and water quality management. Participants noted that there needs to be better integration across land uses, between neighbouring forests, between regional policies (e.g. forestry policy and pollution policy for emission management), within the industry at a national level and across differing industries. Linked to this, participants noted that there is some overlap in reporting within the industry because of the different regulatory, code of practice and certification requirements.

The authors consider that effort should be made to make local and national indicators consistent with other policy directions and environmental reporting requirements.

Observation: There is a significant tension between forestry and dairy farming

Throughout the workshops there was frustration expressed that forestry is subject to more rigorous environmental standards and monitoring than other sectors, particularly dairy farming. Participants noted that this contributes to the overall profitability of the industry and creates a tension between farming and forestry. Participants noted that with regard to quality land resources, forestry is uncompetitive compared to farming in the current environment. Many participants are frustrated by this, not just for economic reasons, but because of environmental and landscape values they see as being adversely affected by dairy farming (such as water quality).

Observation: Forest managers are wary of the potential costs of implementing indicators

Participants noted that there are financial costs involved with implementing any indicator system at a regional level, and that these will affect the economic sustainability of each forest. Specific comments were made about the costs related to monitoring biological diversity, assessing carbon, implementing cross-sectoral policy and providing public access, involvement and conflict resolution.

The authors consider that efforts should be made to assess the financial implications of any indicator system as well as equity issues on who incurs costs.

Observation: To be effective, N.Z. specific indicators will need to be written in terminology that is consistent and meaningful for the N.Z. forestry industry

Throughout the workshop there were numerous occasions where participants questioned the terminology within the indicators. Currently many of the indicators include terminology that is not well used in New Zealand, for example the use of 'biotic' and 'abiotic' factors may be better explained by using 'biosecurity agents' and 'natural processes', and 'at-risk species' may be better interpreted if it is consistent with the DoC terminology of 'rare' or 'significant' species.

The authors consider that effort should be made to ensure the indicators are written in a way that is meaningful to the New Zealand forestry industry. It may also be useful to provide a rationale or definition with each indicator to promote consistency and understanding.



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O'Brian, L. 2003. *Public and institutional perspectives on forests and trees: a view from Vermont*. Report for the Forestry Commission and The Scottish Forestry Trust on a project undertaken in Vermont, USA

Tim Barnard, Harley Spence and Kirsten Crawford. 2006 *New Zealand Montréal Process Review: Forest Values in New Zealand: A Report to the Ministry of Agriculture and Forestry*. Currently in review process for publication.

Web based references

Ministry of Agriculture and Forestry	http://www.maf.govt.nz/forestry/
The Montreal Process	http://www.rinya.maff.go.jp/mpci/
Australian Forests	http://www.australianforests.org.au/

APPENDIX 1: LIST OF ORGANISATIONS AND COMPANIES REPRESENTED

Christchurch City Council
Ashburton District Council
North Canterbury Farm Forestry Association
Forest Trust Hanmer
Central Canterbury Farm Forestry Association
Southern Canterbury Farm Forestry Association
Selwyn Plantation Board
Ernslaw - Christchurch
Piers Maclaren and Associates
Warren Forestry
Department of Conservation – Christchurch Conservancy
Southern Cypress
Environment Canterbury
Dunedin City Council
Otago Farm Forestry Association
City Forests
Wenita Forest Products
WSM Ltd
Forest Environments Ltd
Department of Conservation – Otago Conservancy and Area Office
Ministry of Agriculture and Forestry - Dunedin
Otago Regional Council
Independent farm foresters
Juken Nissho NZ - Gisborne
Ernslaw - Gisborne
Hikurangi Farm Forests
Eastland Wood Council
Dept of Conservation - Gisborne
Rayonier - Auckland
Hancock Forestry - Auckland
Arbor Forestry
Dept of Conservation – Auckland Conservancy
Auckland Regional Council
Nelson Management Ltd
PF Olsen - Nelson
Hancock Forest Management - Nelson

Action forest Management Ltd
Alphametrik
McEwen Associates Ltd
District Health Board - Nelson
Department of Conservation – Nelson Conservancy and Motueka Area Office
Ministry of Agriculture and Forestry - Nelson
The Tree Centre
Retired Forester
Rotorua District Council
Bay of Plenty Rotorua Farm Forestry Association
Hancock Forestry - Rotorua
Interpine
PF Olsen - Rotorua
Future Forests Research
FITEC
Environment BOP
Northland Farm Forestry Association
North Tec
Department of Conservation – Northland Conservancy and Area Office



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List of Acronyms

NZFFA	New Zealand Farm Forestry Association
DoC	Department of Conservation
MAF	Ministry of Agriculture and Forestry
NZIF	New Zealand Institute of Forestry
FSC	Forest Stewardship Council
QSR	Qualitative Social Research – QSR is the company trading name
N.Z.	New Zealand
RMA	Resource Management Act (1991)
ETS	Emissions Trading Scheme
FFR	Future Forests Research
FRST	Foundation for Research, Science and Technology
NEFD	National Exotic Forest Description
OECD	Organisation for Economic Cooperation and Development
LINZ	Land Information New Zealand
SILNA	South Island Landless Natives Act
GDP	Gross Domestic Product

