



PROJECT REPORT

**A Common Ground for  
Criteria and Indicators of  
Sustainable Forests for  
British Columbia**

**Criteria and Indicator  
Initiatives in British  
Columbia: A Dialogue  
on Science, Experience,  
and Innovation**

**Forum Summary**

**February 21, 2006  
Victoria, British Columbia**



# **Criteria and Indicator Initiatives in British Columbia: A Dialogue on Science, Experience and Innovation**

## **Forum Summary**

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Susan Leech (Compiler)



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# EXECUTIVE SUMMARY

In April 2004, FORREX Forest Research Extension Partnership was asked to co-ordinate an initiative exploring common ground for criteria and indicators of sustainable forest management initiatives in British Columbia. In response, FORREX convened a group of government, industry, academic and First Nations partners to summarize ongoing criteria and indicator initiatives internationally, nationally, and locally, and to create a community of practice related to criteria and indicator development in British Columbia. Work completed in the first year was presented at a forum in February 2005.

This report summarizes the results from the 2006 Forum, *Criteria and Indicator Initiatives in British Columbia: A Dialogue on Science, Experience, and Innovation*, held February 21<sup>st</sup> 2006 in Victoria, British Columbia. This event brought experts together to share their knowledge of the science, experiences, and innovative adaptations relating to criteria and indicators of sustainable forest management being implemented in, or relevant to, British Columbia. Over 70 participants and speakers from government, industry, First Nations, academia, and non-governmental organizations attended the workshop and helped shape the future direction for the Common Ground Initiative. Participants raised a number of key issues through the Forum, which were grouped into five main theme areas. At the end of the day, focussed discussions on these five theme areas yielded the following recommendations for the Common Ground Initiative:

1. ***There are still many C&I initiatives. Is there more to do to make them more informative?***
  - Communicating information about ongoing C&I initiatives should continue. The Common Ground Initiative should continue to facilitate communicating information about C&I initiatives. We should revisit initiatives that have multiple-use indicators (such as watersheds). There is a need for information about how sustainability “targets” are set, and an ongoing need for information related to socio-economics, non-timber forest products, and trade-off analyses.
2. ***Canadian Council of Forest Ministers (CCFM), Certification and Forest and Range Practices Act Resource Evaluation Program (FREP): Is there an opportunity to address the perceived disconnect? Is there a difference between sustainable forest management and sustainable development?***
  - Most participants were happy with the current level of communication between these groups and agreed that it was appropriate for these initiatives to use different indicators in many cases; however, there continue to be overlaps between the various systems. Participants pointed out some gaps in communication and issues could arise if objectives from land and resource management plans conflict with objectives defined by public advisory groups (e.g., indicators being used by strategic land use plans).

## ***Citation—***

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- While FREP is focused on land base objectives, it is missing the social and economic aspects where trade offs and balance must be achieved.
  - There needs to be a link between C&I, continual improvement, and back to Allowable Annual Cut (AAC).
  - Continue to communicate at the executive level to help with collaboration.
- 3. *First Nations and C&I: what do we need to do?***
- First Nations communities are building their own land use plans and sets of objectives and measures. We need to work with these communities. An approach for integrating measures of First Nations accommodation into C&I was suggested. We need to focus on existing case law, and ensure that participation is not equated with consultation.
- 4. *Thresholds of sustainability: Are the bars at the right level? Where do we find adequate reference areas?***
- Concerns were expressed about how the province will be revisiting the sustainability thresholds associated with FRPA values, and about the qualifier associated with most FRPA values (without unduly impacting the timber supply). Exploring the possibility of setting aside reference areas for benchmarking was mentioned.
- 5. *How do we address issues of scale (spatial and temporal), and make trade-offs or balance indicators?***
- FREP, 200-indicator set, and results from case studies comment on and indicate scale issues and the need to compile social, economic and biophysical indicators at various scales. The discussions encouraged a C&I culture at as many scales as possible and with various communities.

Other key issues that were raised in the Forum included:

- Clarifying the roles of government and industry to reduce the complexity and ensure that we know where responsibility lies, particularly with respect to socio-economic indicators. Government needs to commit to improving data access and data quality. From a policy perspective, some participants felt volume-based tenures were inherently incompatible with sustainable forest management.
- The importance of professional judgment for defining appropriate practices in ecologically distinct areas was highlighted repeatedly.
- Education is needed about the holistic nature of SFM, particularly for industry foresters in British Columbia.
- In general, we may need to re-examine SFM to see if criteria and indicators are appropriate (given the apparent disjunct with the sustainable development community) and to ensure that our C&I include all values that are applicable to SFM.

In general, participants encouraged the Common Ground Initiative to continue facilitating communication on criteria and indicators of sustainable forest management, and to encourage participation from a wide variety of organizations interested in sustainable development in and outside British Columbia.

# 1 INTRODUCTION

The sustainability of British Columbia's forests is vital to the economic, social, and environmental well being of our province. Over the years, there has been much investment in developing criteria and indicators (C&I) of sustainability through research, certification, performance audits, and sustainable forest management planning. However, there is a great need for efficiency through development of common indicator sets that can be measured and reported at appropriate levels and for a common purpose.

Sets of values (called criteria) outline the elements of the forest ecosystems and related social and economic systems that British Columbians believe should be maintained or enhanced when it comes to sustainable forest management (SFM). Indicators measure an aspect of a criterion and are used to assess the state of the forest, measure progress over time and inform future decision-making. Together, criteria and indicators characterize the essential components of sustainable forest management. When added to a monitoring and information system, they provide a decision framework to assess progress and adapt to achieve desired goals.

Over the past 10 years, much work has been done to develop criteria and indicators of sustainable forest management. However, efforts continue to be somewhat isolated and disparate, resulting in a lack of common ground and the need for collaboration.

Research institutes, universities, and government research groups are investigating social, economic, and biophysical criteria and indicators of sustainable forest management at the international, national, and regional level. In response to, and in support of, international commitments, the Canadian Council of Forest Ministers (CCFM) also recently revised a set of national criteria and indicators for Canada's forests. Under the new *Forest and Range Practices Act* (FRPA), the Province of British Columbia is currently setting objectives for 11 values outlined by the CCFM and is looking for appropriate and meaningful science-based criteria and indicators for their effectiveness evaluation framework.

Under FRPA legislation, licensees are defining results and strategies to achieve provincial objectives and seek meaningful local-level indicators. At the same time, the forest industry is also seeking third party certification that requires performance indicators and monitoring frameworks. Finally, the Forest Practices Board retains its role of performing independent audits and reporting on forest practices throughout the province. All parties seek an effective, efficient and meaningful mechanism to assess and report on sustainable forest management performance as well as inform future decisions.

The BC Government, forest industry, academia and other key constituents are committed to collaborating on developing common criteria and indicators for measuring and reporting on sustainable forest management performance in British Columbia. These key constituents agree that a collaborative approach will improve communication, reduce duplication and redundancy, increase efficiency, and make more effective use of investment funds.

In April 2004, the Province of British Columbia, through the Forest Practices Board, engaged FORREX Forest Research Extension Partnership to collaborate with interested key parties to identify work that needs to be done to complete sets of criteria and indicators for British Columbia's forests. This initiative, called the Common Ground for Sustainable Forest Management Criteria and Indicators Initiative, brings together key parties to facilitate collaborative development of scientifically sound, commonly accepted criteria and indicators and to increase awareness of the need for working models with generally acceptable methods of measurement and practical application. Participation in this initiative has largely been by government and industry to date; however, the results from this project should be useful more broadly to First Nations and non-government organizations. Summaries of ongoing projects and associated reports may be accessed at [www.forrex.org/bcci](http://www.forrex.org/bcci).

Since 2004, considerable work has been done under the auspices of the Common Ground Initiative to summarize criteria and indicators development, both locally within British Columbia and more broadly in the national and international forest management communities. In 2005, and again in 2006, FORREX convened a Common Ground for C&I Forum to bring together a community of practice which is working on common issues related to criteria and indicator development, and which has expressed a desire for better communication and integration between these ongoing initiatives.

This document summarizes the results from the 2006 Common Ground for C&I Forum: *Criteria and Indicator Initiatives in British Columbia: A Dialogue on Science, Experience, and Innovation*. Held on February 21, 2006 in Victoria, the Forum brought together experts in this field to share their knowledge of the science, experiences, and innovative adaptations relating to criteria and indicators of sustainable forest management being implemented in, or relevant to, British Columbia. The event included a summary of local and national activities, including progress on the Forest Resources Evaluation Program (FREP). Results from case studies on current use and usefulness of a common set of criteria and indicators were also presented. Participants heard provocative summaries on the use and relevance of criteria and indicators to information forest policy, planning, and management regimes, and had an opportunity for dialogue with leaders in this community of practice. Over 70 people from government, industry, academia, First Nations, and non-governmental organizations attended the Forum and provided their input into the future direction of the Common Ground for C&I Initiative.

The 2006 Common Ground for C&I Forum was sponsored in part by Forestry Innovation Investment Ltd., the BC Ministry of Forests and Range – Forest Investment Account, and the Forest Practices Board.

## 2 FORUM DESIGN

The 2006 Common Ground for C&I Forum was designed to share information with participants about ongoing criteria and indicators initiatives in British Columbia, including those funded through the Common Ground Initiative, and to solicit input from participants and speakers about potential future directions for the Common Ground Initiative. The full agenda for the Forum can be found in Appendix 1 of this document.

The morning session focussed primarily on sharing information about ongoing C&I initiatives with participants. The session included three overview presentations on current criteria and indicator initiatives in Canada and British Columbia, the C&I approach being used by the *Forest and Range Practices Act* (FRPA) Resource Evaluation Program (FREP), and the provincial government's role in managing information through the Integrated Land Management Bureau (ILMB). Two case studies of C&I development were also presented. The first of these discussed the results from the Common Ground Initiative's most recent project, which examined 200 indicators through literature searches and case studies in British Columbia. The second presentation outlined the biodiversity conservation auditing approach developed and piloted by the Forest Practices Board on Tree Farm License (TFL) 37. Following these presentations, participants were invited to direct questions of a general nature to any of the speakers from the morning session.

Extended abstracts for each of the morning presentations are provided on pages 7–20 with links to on-line PDFs of the full presentations. Comments and questions specific to each presentation are noted following the extended abstracts; comments of a general nature related to the morning session are summarized on pages 21–23.

The afternoon session of the Forum was intended to be more of a dialogue session, involving both speakers and participants in discussions about key challenges being faced with respect to C&I development in British Columbia. Four speakers were asked to give their opinions on some of these key challenges, including using information from C&I to inform policy, measuring accommodation of First Nations rights and entitlements, discussing how C&I can adapt to institutional and policy changes, and the potential use of C&I in mountain pine beetle (MPB) outbreak areas. After these presentations, the floor was opened to all participants to ask specific questions to presenters on the challenges and potential solutions to these challenges. Extended abstracts for each afternoon presentation can be found on pages 24–31, and the results from the afternoon discussion period are summarized on pages 32–33.

At the end of the Forum, a ninety-minute facilitated session focussed participants on five of the key themes that were brought up throughout the day. These discussions are summarized by theme on pages 34–38. Finally, Bruce Fraser, co-chair of the Common Ground Initiative, summarized the key messages he heard to wrap-up the 2006 C&I Forum.

## **3 KEY MESSAGES**

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### ***3.1 Extended abstracts and recorded comments from the morning session***

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# Overview: What's happening with Criteria and Indicators in BC and Canada?

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## Tom Niemann, Manager, State of Forests Reporting

Forest Practices Branch, BC Ministry of Forests and Range

Presentation available at: <http://www.forrex.org/bcci/reports.asp>

The purpose and dimensions of criteria and indicators (C&I) of sustainable forest management were briefly reviewed. Starting with the basics, Niemann described C&I as a framework of *values* and *measures* for holistic assessment of sustainable forest management (SFM) whose purpose is to define, monitor, and communicate SFM. The *values* are essentially goals based on subjective perspectives of what SFM should entail, while the *measures* are objective and science-based, requiring targets to be most useful.

Niemann described three dimensions related to defining SFM: topics, spatial issues, and temporal issues. He illustrated the subjective nature of SFM through describing three diagrammatic representations of the topics of SFM: society nested within the environment, the three-legged stool showing environmental, economic, and social aspects equally supporting SFM; and a venn diagram showing the intersection or balance between environmental, economic, and social aspects, with good governance as the foundation. As an example of topics, the Canadian Council of Forest Ministers C&I Framework uses six criteria for describing SFM, four of which are ecological and two of which relate to socio-economics. Related to spatial issues, environmental aspects of SFM may be described at many different spatial scales, including Global, Ecoregional (British Columbia has 6 of 30 global Ecoregions), Biogeoclimatic (BC has approximately 180 different zones), Watershed (BC has approximately 18,000) and stands (BC has approximately 4 million). Economic and social aspects may be also be described at different spatial scales, usually based on administrative boundaries such as groups of nations, individual nations, provinces, and forest management units. Time scales are also variable depending on what aspect of SFM is being measured. Niemann illustrated several issues regarding temporal scales by showing a graph of a potential indicator of SFM (volume of timber harvested in BC). Looking back from 2000, for about 15, 30, and 90 years, this indicator's trend is falling, stable, or rising, respectively, illustrating that choice of temporal scale can change the conclusions drawn. Past trends do not necessarily indicate future trends. Looking into the future, conclusions can change dramatically in just five years, as illustrated by timber supply forecasts having been stable in 2000 and unstable by 2005, due to the mountain pine beetle.

Niemann also reviewed the many C&I processes underway in Canada and British Columbia. Canada-wide, these initiatives include the Montreal Process, the Canadian Council of Forest Ministers (CCFM) C&I Framework, the Canadian Standards Association (CSA) certification, and the Model Forests. Specific to British Columbia, initiatives include the CCFM framework, certification through CSA, the Sustainable Forestry Initiative (SFI) and the Forest Stewardship Council (FSC), indicators being developed by FREP (the FRPA Resource Evaluation Program) and the Forest Practices

Board, State of the Forest reporting, and strategic land use planning initiatives (e.g. Land and Resource Management Plans [LRMPs]).

Implementing C&I includes the following activities: developing and selecting indicators for C&I frameworks; monitoring indicators; analyzing and reporting individual indicators; assessing and reporting frameworks of indicators; and using the C&I data and assessments in forest management. Work conducted by Drs. Gordon Hickey and John Innes from the University of British Columbia, funded by the Common Ground Initiative, is an example of developing and selecting indicators (Hickey and Innes 2005). Monitoring indicators requires protocols, tools, field measurement, and data storage. Analyzing and reporting individual indicators can be challenging. Assessing and reporting frameworks of indicators entails additional challenges. C&I are useful only if they are used to improve field operations, policies, and public acceptance of forest management.

Niemann concluded that many groups in British Columbia are working on C&I and there are clearly a lot of opportunities to share, learn, improve and save money. He encouraged collaboration on C&I to get to sustainable forest management.

#### **Questions and Comments:**

*How has British Columbia been involved in the development and revision of the CCFM C&I?*

Niemann explained that BC has been engaged in both the development and the revisions to the list (which was produced in 2003). A National Report is due out some time this spring, and BC has also contributed to that. He anticipates that BC will continue to be involved in successive reports and reviews of the framework.

*Was the CCFM 2003 revised list of C&I reflected to individual certification schemes (e.g. CSA)?*

Niemann explained that there is a connection between CCFM and CSA, but the two were never meant to be too closely tied, except to agree on the general themes (i.e., they have the six criteria in common). The latest CSA C&I list was produced in 2002, so it does not reflect changes made to the CCFM C&I list. Niemann noted that everyone has their own list of indicators, and often of criteria. This presents some advantages (greater ownership of the list) but also some challenges (harder to communicate).

*What is the status of Criteria and Indicators in British Columbia today? How much is being reported out and how many companies are using C&I frameworks?*

Niemann stated that two-thirds of the timber harvested in British Columbia comes from certified operations. In terms of government efforts, there are both field-based evaluations related to government objectives through the FREP program, and the broader scale State of the Forest report, which Niemann authored.

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# The *Forest and Range Practices Act* and links to Criteria and Indicators

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## Peter Bradford, Stewardship Evaluation Officer

Integrated Resources Section, BC Ministry of Forests and Range

Presentation available at: [www.forrex.org/bcci/bradford.pdf](http://www.forrex.org/bcci/bradford.pdf).

British Columbia is 95 million hectares in size, two-thirds of which is forested, and 95% of which is owned by the public. Given the amount of forest activity that occurs, there is a huge potential for impacts. The people who live in or visit our province and those who buy forest products from British Columbia are interested in how we manage the forests. British Columbia's economic health depends, over the long term, on our environmental health. One of Premier Campbell's five key goals for the decade ahead includes leading the world in sustainable forest management. All of these factors have led to the development of FREP.

When the *Forest and Range Practices Act* (FRPA) was introduced, the founding principle was "results-based" forestry. Effectiveness evaluation was seen as a key component of implementing FRPA, to ensure that desired results were being met. The FRPA Resource Evaluation Program (FREP) is a long-term commitment designed to:

- assess the effectiveness of FRPA and its regulations in achieving stewardship objectives;
- determine if forest and range policies and practices are achieving government's objectives, with a priority on environmental parameters and consideration for social and economic parameters, where appropriate;
- identify issues related to the implementation of forest policies, practices and legislation in achieving stewardship objectives; and
- implement continuous improvement of forest management in British Columbia.

To accomplish these objectives, FREP has developed what they have termed the FREP continuous improvement cycle. This cycle includes:

- *Developing specific monitoring and evaluation questions.* Bradford explained the comprehensive process used to ensure that the right questions were asked. For each of the 11 values in FRPA, a series of questions was developed in collaboration with teams of experts on each value, who then whittled the list down to 37. After a more extensive external review, the list now includes 41 questions.
- *Selecting indicators:* Indicators for each value are being developed, tested and continuously improved by the resource values teams, working in co-operation with other experts, field staff, and other stakeholders.
- *Data collection:* FREP is using field-based data collection to determine how well the "health" of each value is being maintained through measuring the various indicators selected.
- *Analysis and recommendations:* These are carried out by the resource values team leads. Recommendations are provided to government decision makers.

- *Decision-making based on recommendations:* FREP has a very formal structure for using all data collect to make decisions; a talk later in the day will focus on this process.
- *Implement decisions:* May include changes to forest and range policies and legislation, where required.

Thus far, FREP has developed the program framework and structure (see FREP Web site <http://www.for.gov.bc.ca/hfp/frep/> for overview documents), and implemented monitoring for stand-level biodiversity and riparian across 19 of 29 regions in British Columbia. Full implementation (all forest districts) for biodiversity and riparian is anticipated in 2006. Development of indicators for soil, water, and karst are continuing and will be completed in 2006 for implementation in 2007. With 11 key values and multiple indicators across 29 regions, FREP has anticipated the data management challenge. To this end, they have conducted a business case analysis for developing a data management system. In the meantime, they continue to focus on training, communication, and extension to ensure that the results of monitoring and the program progress are publicly available.

## Questions and Comments

*How do you establish your baseline for what you are comparing against?*

Bradford explained that they have collected data on blocks harvested under the Forest Practices Code (FPC) and will be using these data as a baseline for comparison to ensure that they are maintaining at least FPC levels of protection. In terms of natural condition baselines, FREP has struggled with this issue. Bradford used the example of wildlife tree monitoring: it is challenging to do before-and-after sampling of cutblocks, and sampling adjacent stands is only of limited use. They are exploring the use of modelling some of these attributes from cruise data. On behalf of FREP, Dave Huggard collected baseline data in different ecosystems across the province to look at the attributes of interest to FREP. For riparian baselines, FREP is generally using upstream condition.

*How do you know if you are asking the right questions?*

Bradford reiterated that FREP worked with the team leads for each value to select 37 key questions based on what the key concerns were for each value. In 2006, the list was revised based on input from a much broader spectrum of people, and as a result they now have 41 key questions, which are available on the FREP Web site.

*How well does what FREP is doing tie back to the Common Ground Initiative? It seems like there's a disconnect. FREP is doing a lot of work: how can we tie into that?*

After noting that it is unlikely that we'll ever have one set of questions or one set of indicators, Bradford explained that FREP began this process about two years ago with a sense of urgency; however, they have been very collaborative with the Common Ground Initiative. The Common Ground Initiative indicator report will be a huge asset for them in terms of selecting potential indicators.

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# Integrated Land Management Bureau: Role in Land Information Management and Access

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## Elaine Dawson, Manager

Integrated Land Management Bureau  
Chief Resource Information Office

Presentation available at: <http://www.forrex.org/bcci/reports.asp>

The Integrated Land Management Bureau (ILMB) is a client-focused organization providing services, on behalf of other government ministries and agencies, to clients within and outside of the provincial government. Key functions include:

- Providing Natural Resource Sector Corporate Resource Information Management Governance;
- Co-ordinating access to tenures, licenses and permits on Crown land;
- Developing, implementing and revising land use plans; and
- **Managing and delivering resource information;** and
- Co-ordinating recovery planning for species at risk.

The ILMB is responsible for many significant data management and access initiatives including Base Mapping, Digital Image Management, Integrated Land and Resource Registry, Land and Resource Data Warehouse, and Front Counter BC. The Bureau also provides data management and decision support services for land use planning and monitoring, resource management to meet partner client Ministry service plan priorities as well as supporting treaty negotiations, and emergency response.

Two major initiatives are improving access to land and resource data: the **Integrated Land and Resource Registry** and the **Land and Resource Data Warehouse**. The Integrated Land and Resource Registry (ILRR), provides a Web-based single legal register of rights and interests on Crown Land plus information on private land, and related status and land use information. The Land and Resource Data Warehouse provides Web-based access to planning data, resource data (e.g. species at risk), and business views of operational data sets which can be accessed and downloaded without impacting the regulatory systems.

British Columbia has a huge landbase: over 95 million hectares of land and water need to be managed effectively on behalf of all British Columbians. ILMB is working to provide co-ordinated access and a single authoritative source for many land and water datasets in British Columbia. ILMB also provides analysis and decision support for processes such as strategic land use planning, Species at Risk planning, and emergency response.

## Questions and Comments

*Will ILMB be delivering services on a cost-recovery basis or will information be provided free of charge? This is particularly important for First Nations who have limited resources for accessing information. If they have to pay for services, how does that policy fit into meaningful consultation and collaboration with First Nations?*

Some data are free and some are priced. There are data sharing guidelines in place for Treaty negotiations. [Stephen.Connolly@gov.bc.ca](mailto:Stephen.Connolly@gov.bc.ca) from the Integrated Land Management Bureau can be contacted with specific questions related to First Nations access to data.

*What do other clients pay for these data and services? Are data publicly available free of charge to everyone?*

Dawson explained that while many of the provincial datasets are free, others have cost recovery associated with them. For the priced datasets, unless there is a data-sharing agreement in place, other clients must pay.

*It is very difficult to access forest cover data on Crown Land. From a First Nations perspective, one of the biggest hurdles to the “New Relationship” between government and First Nations is accessing information on land use planning. This problem needs to be addressed with some urgency.*

The facilitator suggested following up on these questions with Dawson following the forum.

*Can we explore creating a direct link between the information base that FREP is creating and the data warehouse that ILMB manages?*

Dawson responded that this possibility could be explored.

*Existing inventory in British Columbia is often lacking in accuracy. Is ILMB doing anything about data quality issues?*

Dawson stated that primarily they are only dealing with data quality for information they collect internally, not information that they steward on behalf of other organizations. There is a large data quality initiative related to the Integrated Land and Resource Registry Project.

*Does ILMB provide standards for data quality?*

Dawson explained that they do collect metadata and data quality information should be captured there. Metadata are publicly available, and much of the information they house is publicly available. Provincial Baseline Atlas (TRIM) is also ISO 9000 certified and has data quality standards.

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# Indicators of sustainable forest management in BC: What are we monitoring and what is the cost?

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**John Innes, Angeline Gough, and Alyson McHugh**

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Presentation available at: <http://www.forrex.org/bcci/reports.asp>

For the past two years, a consortium consisting of industry, government, and universities has been working on the “Common Ground” project. This project, initiated by a group of licensees, was intended to identify a small but credible set of indicators of sustainable forest management that could be used to demonstrate in a convincing fashion that the licensees were selling wood products from sustainably managed forests. This was considered important because British Columbia needs to demonstrate to people who are buying forest products from this province that we are managing our forests sustainably. Once the project began, it became rapidly apparent that this project was of considerable interest to government and to many other forest stakeholders.

The first step in the project was to identify indicators being used, not only in BC, but also throughout the world. A basic assumption here was that there might well be potential indicators in use in other parts of the world. Over 3000 indicators were identified – these were all in use or had been strongly recommended for use. This list was assessed for relevancy to sustainable forest management in British Columbia, and gradually winnowed down to 200, which were presented at the Common Ground forum in February 2005. The list is summarized in Hickey and Innes 2005.

Since then, a detailed examination of each of these indicators has been undertaken. For each indicator, we have examined the rationale for using the indicator, provided a basic description, described the methods used for measuring it, provided examples of its use and reporting, described uncertainties and research needs associated with the indicator, and provided a selection of references associated with the indicator. This reference document is currently 700+ pages in length and has been structured according to the CCFM C&I framework, at the request of the Common Ground Initiative steering committee. Existing indicators used within the CCFM framework are distinguished from other potential indicators. This was not intended to be an exhaustive or comprehensive analysis; rather we wish to provide sufficient information about the indicator and its use to enable informed judgment about its use in a particular situation. This work has already attracted considerable interest outside of Canada, with similar processes in Europe, Australia and New Zealand drawing on the material that has been prepared.

As part of this exercise, we have also interviewed a range of stakeholders with direct connections to forest management. These include: the Coast Forest Conservation Initiative (CFCI), the Land-use Planning Department of the Wet’suwet’en First Nation (specifically the Gitumden Trust), the Tsilhqot’in First Nation (the interview was conducted with

Stonefield Consulting, who do not and cannot represent the Nation), the Land-use Planning Department of the West Moberly First Nation, Lillooet TSA (Ainsworth Lumber Co. and the TSA Public Advisory Group), TFL 37 (interview conducted with Canadian Forest Products Ltd.), TFL 54 (International Forest Products Ltd.) and the Kamloops Indian Band (MPB volume-based salvage tenure).

The interviews assessed the extent to which each of the indicators listed under the six criteria of the Canadian Council of Forest Ministers were being used in each of the study areas. As expected, the results revealed major differences between the criteria. Biodiversity and forest productivity are generally being assessed quite widely. Social and economic indicators are not generally being assessed by forest licensees, but most knew where they could access the relevant information, since much of the data is being collected. The maintenance of soil and water resources, and the contribution of forestry to global cycles, are generally not being assessed.

The interviews revealed some fascinating trends. Although the criteria of sustainable forest management are well-defined internationally, and both the province and Canada have signed on to these criteria, there is a feeling amongst many land managers that assessment of these criteria is not a part of their role or duty. This is partly a function of legal responsibilities – the tenure system in BC precludes the achievement of sustainable forest management by licensees. Genuine partnerships between licensees, other stakeholders, and government could, however, lead to sustainable forest management. The closest that any land managers come to the generally accepted principles of sustainable forest management is the approach taken by some First Nations. This is because their management philosophy embraces the complex connections between the forest ecosystems and the people that depend upon them.

The next stage of this project will be to determine how land managers are setting targets for each of the indicators that they use, how they adjust the targets to ensure a balance between the different criteria, and how they adjust their management practices when a particular target is not achieved. Strictly depending on funding availability, this work will be undertaken using a transect of sites stretching from British Columbia to Newfoundland and Labrador, and involving a range of different tenure types and situations. Potential study sites include: Western Newfoundland, the Eastern Ontario Model Forest, the Moose Cree First Nation (northern Ontario), the Clear Hills Upland area of Alberta, and British Columbia (Tree Farm License 54, Moberly Lake, the Lillooet Timber Supply Area, Burns Lake, and a salvage timber license held by the Kamloops Indian Band).

Some conclusions from these projects thus far include:

1. There is a great need to educate the forest sector about sustainable forest management. At the moment, the focus of most industry foresters they interviewed was avoiding biological impacts of forest harvesting. There was little emphasis on the other, equally critical aspects of SFM. Forest companies need a holistic approach that incorporates the ecological, economic, and social aspects of SFM.
2. We need more focus on the social and economic indicators of SFM. Who is responsible for compiling this information?

3. We need to move away from compiling lists and studies of new indicators (collecting pet rocks) towards meaningful targets and trade-off analyses. These need to be included in forest management plans.
4. We need improve how we link the conditions of forests to the condition of communities that depend on the forest. First Nations do a better job of this and we can learn from their approaches.
5. We need to learn from other jurisdictions which have strived to slash complexity. By having some clarity about who is responsible for SFM, what companies are expected to do vs. the government, and who collects and maintains comprehensive data sets, we will increase our ability to manage forests sustainably and to report on SFM to clients who purchase forest products from British Columbia.
6. Finally, we need to start managing the land base for the benefit of all current and future British Columbians.

### Questions and Comments

*Are some of the indicators you list in your report linked to thresholds of ecosystem resiliency?*

Innes responded that, in theory, yes they are; however, in practice, it is hard to identify that threshold. Measuring ecosystem resilience is most certainly variable and depends on the indicator chosen. Innes suggested referring to a report by the former BC Ministry of Water, Land and Air Protection on how much habitat is enough (Dykstra 2004), which illustrates that for most species, we do not really know where these thresholds exist.

*What indicator is appropriate for each criterion and/or element often depends on scale. Do you have any suggestions or ideas related to how to bring the scale of indicators down to people who are managing a portion of a single Timber Supply Area (TSA)?*

Innes explained that, through the process of winnowing down the indicator list from 3000 to 200, they eliminated a lot of the national level indicators that are of no value at the local level. They tried to focus their report on indicators that are local in scale and useful at the forest management unit level. He also mentioned that the State of the Forest report needs to meet national standards, so the BC government does want each forest company to provide information that will allow them to report up to the country-wide level.

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# Application of Criteria and Indicators: Experience of using C&I in Forest Practices Board audit process – CANFOR Biodiversity Audit Case Study

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**Kevin Edquist, Forest Practices Audit Manager**

Forest Practices Board

Presentation available at: <http://www.forrex.org/bcci/reports.asp>

Of the forest values identified in FRPA, biodiversity is considered by many to be the most complex to manage and conserve. Biodiversity encompasses a variety of ecological conditions that change naturally over time. To be effective at conserving biodiversity it is important that companies and government understand, manage and conserve the important elements of biodiversity over time.

In 2004, the Forest Practices Board (FPB) set out to develop and test criteria and indicators to assess the effectiveness of forest practices in conserving biodiversity. The Board's purpose for developing the C&I was to facilitate an approach to auditing forest practices in relation to governments objectives for biodiversity conservation established under FRPA. In developing the C&I, a number of questions had to be considered. What is biodiversity? What can we say to the public about the conservation of biodiversity? How do we design an audit to ensure that what we say is meaningful and credible? Can, and should, an audit define what biodiversity conservation actually is and looks like on the ground? If we can't say what biodiversity looks like on the ground, then how do we draw conclusions by examining the results of forestry practices?

To answer these questions, the Forest Practices Board approached Canfor to conduct a pilot audit of TFL 37 (note: TFL 37 is now held by Western Forest Products). The pilot audit developed in a full blown case study which helped the Board refine their auditing approach.

Initially, the Board settled on three criteria for biodiversity:

*Criterion 1:* forest planning and practices are carried out within the framework of a forest management system designed to conserve biodiversity and foster continuous improvement in relation to the conservation of biological diversity.

*Criterion 2:* forest planning and practices maintain ecosystem diversity across the landscape.

*Criterion 3:* forest planning and practices maintain habitat for species at risk and locally important species across the landscape.

From here, the Board began reviewing documents that guide the management and conservation of biological diversity on TFL 37. Most of these documents were not FRPA-related: approved Forest Stewardship Plans (FSP) do not generally contain the level of detail needed to make an assessment of biodiversity conservation. Documents developed

to meet certification requirements (SFM plans) tend to be much more specific and therefore more useful for conducting the audits.

After reviewing relevant documents, the Board chose 10 elements or surrogates of biodiversity that they deemed to be important on TFL 37. These elements included:

- Ecosystem representation
- Old growth representation
- Native tree species diversity
- Landscape and site level structure
- Protection of rare ecosystems and sites of biological significance
- Queen Charlotte goshawk habitat
- Marbled murrelet habitat
- Keen's long-eared myotis habitat
- Black bear habitat
- Ungulate winter range

Following a review of the system for tracking these elements, the auditors did an overview flight of the defined forest area to visually assess the highest risk areas, which were then prioritized for field testing. The field work included looking at over 30 cutblocks as well as numerous reserves to examine how well each of these elements was being met. After analyzing the data, an exit workshop was held with all of the stakeholders to talk about how the process worked and what the criteria and indicators actually mean. The final report for this audit will be available shortly.

Through the process of conducting the audit of TFL 37, the Board changed its initial framework from three criteria to five criteria and 11 indicators related to biodiversity. The revised criteria are:

*Criterion 1:* ecologically distinct ecosystem types are **sufficiently represented** in unmanaged state across the landscape. Edquist noted that this criterion provides an indication of the state of the forest: it does not necessarily relate to the individual licensee and their practices at the moment, but it is important to know this information.

*Criterion 2:* sufficient habitat exists across the landscape for species at risk and locally important species. Edquist noted that this criterion worked well for TFL 37, because species at risk habitat needs aligned well with old growth representation in this case.

*Criterion 3:* forest planning adequately supports the conservation of biological diversity and fosters continuous improvement in biodiversity conservation. Edquist noted that this criterion ensures that things are going in the right direction. There are eight sub-criteria associated with Criterion 3:

- 3.1 pre-industrial condition and natural disturbance regimes across the landscape have been identified
- 3.2 responsibility for biodiversity conservation across the landscape has been established in relation to the scale and scope of forestry practices

- 3.3 objectives for biodiversity conservation have been developed that take into consideration natural disturbance regimes, ecosystem diversity, maintenance of habitat and licensee responsibility
- 3.4 strategies have been developed at an appropriate scale in relation to objectives, and include measurable and verifiable targets for ecosystem representation and wildlife habitat retention
- 3.5 landscape and site level plans are developed that describe the operational implementation of strategies
- 3.6 inventory data is sufficient to support objectives, strategies and plans, and includes forest cover, ecosystems, wildlife habitat and riparian areas.
- 3.7 the achievement of objectives is evaluated using appropriate spatial and temporal scales, including ecosystem function and species populations
- 3.8 strategies and plans are adapted in relation to effectiveness monitoring results, including recruitment and/or restoration of ecosystems, structures and habitats.

*Criterion 4:* the results of forest practices reflect intended results established in strategies and plans.

*Criterion 5:* Stand level forest practices conserve biological diversity. There are five sub-criteria associated with this criterion:

- 5.1 sensitive plant communities, ecosystems, sites and structures of biological significance are conserved
- 5.2 wildlife habitat is conserved
- 5.3 native tree species diversity is maintained
- 5.4 aquatic habitat is conserved
- 5.5 botanical species are conserved

A few things are important to note about the auditing process. First, Edquist explained that the Board looked at trends in biodiversity management, rather than a snapshot in time. Future trends were also examined, and these are of course subject to change, especially considering the recent change in management of TFL 37. Second, the Board did not restrict itself to legislative plans (because they contained little information compared to SFM plans). Third, the Board did not look at implementation, it looked at how the results were being met. In other words, the monitoring was truly effectiveness monitoring. Finally, there are issues with baselines: we have no baselines for a lot of this type of information. In going forward with C&I, we are going to find ourselves in a world with no baselines, and we can only conclude on what we see as the important aspects of biodiversity and the relative risks and/or gaps associated with them.

## Questions and Comments

*From a First Nations perspective, we are people who have lived in the forest over the past many thousands of years and see ourselves as part of the species who depend on the forest. It doesn't sound like this is something you've incorporated into your framework. Is this something you would be interested in incorporating?*

Edquist replied that the Forest Practices Board would be interested in discussing this opportunity.

*You outlined five criteria related to biodiversity. The first two depend on the word "sufficiency." Assessors would need to know what is sufficient. Who defines sufficiency?*

Edquist explained that this is what makes these criteria. To assess it, you need to look for any scientific baselines (but often these data are woefully inadequate). For the audits, they rely on the criterion dealing with the system (knowing where you are, where you were, and where you are going) and professional judgment. If there seems to be a knowledge gap, is there a monitoring program in place?

*To what extent do the scientific baselines exist?*

Edquist replied that it varies and often all you will be able to talk about is gaps and risks. It is unlikely that we will ever get to the point of saying 15% old growth is enough, for example. Again, the FPB audits rely on the systems analysis. Is the information available that tells you if you have a gap? Are you doing the monitoring that is necessary to determine if you are meeting your objective, and changing practices if required?

*How do you go back in the past to assess what should be done in a particular area?*

Edquist explained that in some cases, this analysis could be very general. In the case of TFL 37, Canfor had reports about where fires had occurred from about 1500 onward. But it will depend on the information each licensee has.

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### **3.2 Discussion following morning session: Summary of key points**

Chris Hollstedt invited all speakers to return to the front of the room for general questions aimed at any of the participants. An overview of these questions and the responses follows.

*A lot of companies will opt for certification to ensure they can sell their products (not necessarily to meet SFM). The motivation for choosing particular criteria and indicators might have more to do with what is useful for buyers. Are there studies that look at the utility of these C&I for product buyers?*

John Innes responded that C&I from the CCFM are closely bound to certification but are still independent. Buyers seem to be moving away from certification. They are asking forest companies to demonstrate that they are managing their forests sustainably, but leaving it up to the company to demonstrate how they are doing that. For example, Time Warner has recently said that they are not sure SFI certification is sufficient to say that a forest is being managed sustainably. Certification may not be considered sufficient largely because of battles between certification strategies. SFI and CSA standards have achieved recognition under international standards, but FSC has not, and will not be until auditing procedures are changed. Buyers are not sure how to navigate in the world of certification, but are discussing what their position should be.

*The Forest Practices Board looks at companies' indicators and uses that as a basis for determining their auditing procedures. What if their indicators were not appropriate? We need to ensure there is a link back to science to determine how useful an indicator is.*

Edquist responded that whenever the FPB sees a strategy for conserving biodiversity, they turn it back to the company to ask them: how does this strategy work to meet your objective? They can then assess whether the company has a good rationale. It is not necessary from Edquist's perspective to force companies to use a standardized set of indicators; it is just important for the FPB to understand the scientific rationale for why a company has used a particular indicator.

*According to John Innes' presentation, the group that is working on the land collects the information they are interested in collecting; this leads to gaps in the types of information that are collected in different areas. Are there opportunities for changing the terms of tenure to give companies an interest in collecting all of the information?*

Innes responded that it might be worth exploring changing tenure or changing the way we look at property. It would be useful to see how C&I are being used on private property. In their interviews, they tried to get as many different types of tenure represented as possible. Unfortunately, although they approach TimberWest for an interview to see how they were using C&I on their private land, TimberWest was unable to give one. Community forests were also a gap that could be filled.

Bradford added that opting for changing tenures is a political decision. One of the goals of FREP is to look at the current model to see if there is a need to tweak legislation. However, it is unlikely that the monitoring they are doing will contribute to the much larger question about whether tenure reform is needed.

Niemann interjected that, in the late 1980s, the Minister of Forests wanted to increase the number of Timber Forest Licenses (TFLs) in the province to increase security for the forest industry and increase their incentives for investing in the landbase (i.e. working more towards SFM). That proposal did not get much support. Changing the set up necessitates that there will be winners and losers.

Fraser, who was involved in gathering feedback on the report Niemann referred to, added that one of the big concerns from the public was that, if more area was converted to TFLs, it would all end up in the hands of a few large corporations – which, of course, is what happened anyway.

Innes made a further contribution that, in general, their case studies found that industry working on TFLs had a greater appreciation for the principles of SFM than industry working on volume-based licenses, except where the group with the volume-based license also had an interest in the land (e.g., the Kamloops Indian Band). In his opinion, volume-based tenures and SFM are not compatible.

*It will be challenging for the Forest Practices Board to conduct audits in TSAs, to audit something like biodiversity as it relates to multiple tenure holders. Any comments on this?*

Edquist stated that they started with something simple: a single operator on a large landbase. They have given some consideration to how these audits would be conducted on TSAs, but they are not sure how to approach it yet.

*In his talk, John Innes suggested that the FRPA Resource Evaluation Program was constrained by sustained yield, because all objectives have the qualifier “without unduly impacting the timber supply.” Any comments from the panel on this issue?*

Bradford stepped up to answer this question. In general, FREP staff had trouble with the FRPA objective statements. If they used the underlying context of “without unduly impacting the timber supply,” it would be hard to conduct a meaningful evaluation of how well values were being maintained under FRPA. Their approach instead is to assume that there is a line of sustainability, and focus on ways to get above the line. FREP will have to look at the economic aspect, but their focus is currently the ecological aspects of sustainability. In general, they do not feel constrained by the qualifying statement, “without unduly impacting the timber supply.”

*The public needs assurances about sustainability in forest management. Criteria and Indicators are an important part of providing public assurance, but there are other ways. John Innes has stated that forest companies do not understand all aspects of SFM. Neither the CCFM nor FRPA does a very good job of describing SFM. Is the Common Ground Initiative trying to define a set of C&I that would reflect a better vision of SFM for British Columbia?*

Innes responded that this question should really be addressed by the Common Ground steering committee, but he would advocate looking very carefully at the CCFM criteria, which are now about 10 years old or so. The Montreal Process is re-evaluating its Criteria, of which there are seven. The concept of social capital has emerged over the last 10 years, and this is not captured in either the Montreal Process or the CCFM framework. There is a bias towards ecological values, largely because of who contributed to defining the frameworks. Internationally, concerns related to sustainability are increasingly aimed towards social issues.

Niemann also provided a response to this question. He noted that the divergence between the Montreal Process and the CCFM is peculiar, but also pointed out an inconsistency between the way we talk about sustainability in forestry versus more generally in the sustainable development world. Sustainable development does not talk about criteria as a major grouping of values. He suggested that it might be better to go back to the basics about the environmental, social, and economic aspects of sustainability and wipe out the concept of C&I.

*At the operational level, cruise data are collected on each area to be harvested: is there any appetite for amending cruising standards to incorporate values associated with FRPA and the types of indicators that FREP is interested in?*

Bradford stated that they have not had any discussions with the people who lead the cruising programs. FREP is trying to work with existing data to see if they can model what they need to know from data that are currently collected. They are working with BC Timber Sales to see if this is possible; if not, they need to decide if using cruising data is a model they would like to pursue and if there is value for others in collecting additional data through cruises.

*Can you clarify what SARCO (the Species at Risk Coordinating Office run through ILMB) does?*

Dawson explained that SARCO co-ordinates recovery plans for the so-called “major species” (mountain caribou, marbled murrelet, spotted owl, and northern goshawk). Most of the activities they undertake are at the policy level. Elaine offered to provide additional information on SARCO to Chris Hollstedt, to make it more widely available.

Related to the issue of scale, one participant suggested that we should be looking at an LRMP scale because it is at this level that management decisions and social choices are made. This scale has a lot of direct relevance to local people as well.

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### **3.3 *Extended abstracts and recorded comments from the afternoon session***

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## ***Where do C&I inform government policy?***

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### **Ralph Archibald, Director**

Forest Practices Branch, BC Ministry of Forests and Range

Presentation available at: <http://www.forrex.org/bcci/reports.asp>

One of the planned uses of data collected through FREP is to inform changes to government policy, if necessary. Picking up from Bradford's talk in the morning, Archibald explained how information from FREP supports continuous improvement from a policy perspective. Archibald began by asserting that the Ministry of Forests and Range is very supportive of FREP: this program will have great longevity and yield very useful results to ensure that forest policy supports sustainable forest management.

Step-by-step, Archibald then walked the audience through a complex conceptual diagram showing how information from FREP could lead to policy changes at the highest levels. Each of the eleven values in FRPA has a Resource Value Team behind it which makes recommendations about how each value should be monitored and brings them forth to a Working Group, which can either accept or reject the recommendations. The Working Group reports to the Joint Management Committee, a government committee at the director's level that draws its membership from all of the partner agencies. Once resourcing decisions are made by this committee, projects are implemented and data are collected as per the continuous improvement cycle outlined in Bradford's talk earlier in the day. The data are analyzed by the Resource Value Team and brought forth to the Working Group, which is responsible for shaping the recommendations. These go forward to the Chief Forester, who, if he supports the recommendations, brings them forth to the Ministry of Forests and Range Public Advisory Council, a group of public representatives who are heavily engaged in forest policy discussions, for their approval. From here, the decision may go to the Minister (if the PAC does not support the recommendations) or proceed forth into two possible decision-making streams: the non-legal framework (extension and guidance documents) and the legal framework (changes in policy). In either case, once recommendations are brought into force, they become part of how practices are delivered on the ground.

To ensure that the system as designed will work properly, a review of this framework has been requested. One portion of this cycle that has not been clearly defined is exactly when information generated through monitoring by FREP moves into the public arena. It is critical to FRPA that the results from this monitoring are reported publicly, to be transparent and build confidence. Currently the plan is to communicate the results publicly before a decision is made at the highest level. This will likely be changed once the review is completed.

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# Measuring Accommodation? It's easy!

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**Russell Collier**

Athyrium Services and Consulting

Presentation available at: <http://www.forrex.org/bcci/reports.asp>

First Nations, like any other group of people who want to see their interests accounted for in forestry operations, want to see measurable accommodation of those interests. Consultation, at least as it has been defined in provincial policy, usually means nothing more than going through a process. If the process has been followed, then everything is okay.

The problem with these kinds of process-based systems, however, is that they have nothing to do with actually accommodating our interests, and everything to do with having the appearance of accommodating us.

To illustrate the incongruity inherent in the process-based approach for accommodation, let me tell you about the concrete life jacket. It's certainly possible to design a life jacket out of concrete; it may even be possible to get it certified, so long as we just stick to the process established for building the item. The only problem with the concrete life jacket is it doesn't float, because it was never designed with that end result in mind. And yet the recipient of that jacket might have grounds for objecting to it, and might conceivably feel a sense of dissatisfaction at being offered it.

Similarly, First Nations communities have long objected to the provincial interpretation of aboriginal case law, which is what policy is, correctly pointing out that a process that is designed solely to satisfy provincial lawyers provides no satisfaction to us at all. Indeed, it's actually a fairly bad double bind. If we do not participate in the process, they get to tell the judge, "Your Honour, we tried to involve them and here is the evidence." And yet if we do participate in the process, we end up leaving the room angry and dissatisfied—again, the provincial lawyers get to tell the judge that a consultation process equates with accommodation of our interests.

This has to change.

Collier recommended three sources of information that would allow accommodation of First Nations interests to be measured. First, on-the-ground monitoring to ensure that First Nations' concerns are being addressed. If, for example, First Nations are concerned about the amount of wildlife being killed on a road, a company might implement some management approaches to reduce the amount of roadkill. In the future, it would then be possible to measure whether First Nations now think fewer animals are being killed on the road. Collier suggested a number of possible methods for breaking down concerns expressed into component parts and then designing indicators to measure ways those concerns might be accommodated.

Second, Collier suggested measuring processes themselves to ensure these are being developed collaboratively with First Nations. Possible indicators might include: the number of strategic planning processes whose terms of reference have been designed by or with First Nations; the number of consultation processes that incorporate First Nations concerns into planning, etc. The essence of his point was that, in a true government-to-government relationship, the ability to set terms of reference, and design processes to mutual satisfaction, is itself a test or measure.

Finally, Collier recommended measuring adherence to case law. The courts have recommended that consultation should be done on three levels: mere consultation (occurs only rarely), deeper consultation (which should be the norm) and consent required (occurs only rarely). The pattern of consultation should follow a bell curve, with most consultation fall into the “deeper consultation” category. At the moment, most of the consultation that occurs falls into the “mere” category. Moving this curve towards the ideal distribution would be a good measure of how well First Nations’ interests are being accommodated. Case law, far from being too ambiguous to use (as has frequently been claimed by provincial lawyers) actually lends itself well to being measured. Collier suggests that all aboriginal case law should be reviewed with a new eye for measurability and accountability.

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# Can diligence and rigor survive institutional and policy changes? Stories from Western Forest Products TFL 6

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## David Mogensen, Regional Forester

Western Forest Products

Presentation available at: <http://www.forrex.org/bcci/reports.asp>

Western Forest Products TFL 6 on Northern Vancouver Island is certified to ISO 14001 and the Canadian Standards Association (CSA) Z809 forest management standard. Western has been working with a public advisory group on a Sustainable Forest Management Plan and a local indicator set addressing the CSA/CCFM criteria.

Mogensen's presentation focused on three themes:

- How a science based due diligence framework developed for CSA Certification supported transition from Code Rules to FRPA Results.
- Designing locally appropriate indicators and monitoring.
- Connection between licensee innovative efforts, and government under FRPA.

Beginning with the first theme, Mogensen described Western Forest Products' pre-FRPA project for CSA certification on TFL 6, a 198,000 ha area with high rainfall (2-3,000 mm/year), encompassing 40 watersheds. The area has high fish values, and various stream and riparian enhancement projects have been funded through Forest Renewal BC (FRBC) and Western, including three Western Forest Products-funded fish hatcheries. Western Forest Products (WFP) has focussed their monitoring program at the watershed level, and used a combination of existing inventories and reports, new inventories, and expert/scientific input to develop alternative management strategies and locally relevant indicators. By keeping these focussed on the issues appropriate to the terrain and ecology of TFL 6, the most cost-effective approach was possible. By including use of latest science, the approach was consistent with FSP guidelines for developing results and strategies.

Mogensen showed how indicators related to road and terrain (sediment delivery potential to streams), riparian (large woody debris, channel bank stability, etc.), and channel type sensitivity (non-alluvial vs. low-gradient alluvial streams) were amalgamated into a risk rating for each watershed related to stream sensitivity and hydrological hazard. Hydrological hazard was mapped against watershed sensitivity for each watershed to yield a risk assessment matrix. Depending on the rating of the watershed or stream, various potential strategies are being considered, including:

- WFP *Terrain Due Diligence Strategy*.
- WFP *Windthrow Management System*.
- Road maintenance or deactivation prioritization.
- Stream buffers tailored to stream sensitivity.
- Monitoring: Pre and post code performance

Monitoring data then feed back into the adaptive management cycle to ensure that management strategies are achieving desired results.

One question raised was: is there a potential for disconnect between innovative approaches by industry and government actions? How does licensee adaptive management tie into government actions, and will the licensee experience be used? Government, for example, may be developing criteria for the designation of fisheries-sensitive watersheds, and their watershed-specific objectives. In the case where a licensee has an advanced indicator set, and an advanced adaptive management system, the information will be highly applicable to watershed-specific objectives.

Mogensen compared the approach WFP is considering for riparian effectiveness evaluation vs. the FREP approach. For the TFL 6 SFM plan, there are 60 indicators, of which 8 or 9 relate to watersheds. These tend to be for implementation or compliance monitoring. The FRPA model, with more emphasis on results rather than prescriptive rules, will require increasing emphasis on effectiveness monitoring. FREP pilot evaluations are based on routine effectiveness evaluations to red-flag concerns. These use low-cost overviews, visual estimates, yes/no checklists, and random sampling. The FREP indicators are aimed at determining “properly functioning stream condition.” As an example, Mogensen described one of the FREP riparian effectiveness evaluation indicators **that are in pilot implementation** for properly functioning condition:

*Has the RMA been sufficiently protected from windthrow?*

Indicator: less than 5% post logging windthrow (yes or no).

The indicator was reviewed in comparison to the “characteristics of a good indicator” (e.g., 5% windthrow): Is the threshold correlated to what we want to measure (stream impact or biodiversity issues)? Is it based on literature review or research? Five percent seems a low threshold in TFL 6 which is subjected to storm-force to hurricane-force winds annually – is it peer reviewed and understood/supported by stakeholders? Is the threshold in fact a red-flag?

Mogensen concluded with a few key points. First, a report card process or numerical evaluation, in the absence of professional interpretation, may lead to problems. Adequate cause and effect in relation to the value at risk, requires professional judgment. Red-flagged issues could mislead the public that streams are impacted when potentially they are not. Second, regionally derived criteria and indicators may not be locally appropriate. One size does not fit all. There needs to be room for professional judgment and locally developed indicators. From Mogensen’s perspective, CSA certification can align with FRPA to support adaptive management and innovation. Government and industry will need to ensure that there is not a disconnect between industry efforts and government actions.

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# **A lesson from the mountain pine beetle on sustainable forestry: Do Criteria and Indicators (C&I) help?**

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**Mike Fenger, President**  
Friends of Ecological Reserves

Presentation available at: <http://www.forrex.org/bcci/reports.asp>

Environmental organizations, like the members of Friends of Ecological Reserves, are deeply concerned both intellectually and spiritually about society's collective responsibility to steward our natural environment; so are many resource professionals. We depend on science-based C&I to inform the public (the owner of the forest) on whether our use of forest resources is sustainable. We look to historic trends and forecasting of C&I to hold government, the forest industry and ourselves to account. C&I are central to answering the question, "Are we living on the interest from our ecosystems or are we consuming our natural capital?"

As good and compelling as C&I are for informing us on the sustainability of forestry, they require a firm "science-based" understanding of how C&I track in dynamic natural systems that have naturally evolved through disease, insects, and wildfire disturbance. Our harvesting and road building are cumulative to these. To understand how much incremental disturbance a system can take is the Holy Grail to understanding forest sustainability. Too much development and we cross thresholds, degrade terrain, lose productivity, decrease diversity, and receive less goods and services from our ecosystem. Forestry is a long-term landscape/watershed-level experiment. Fundamental to any experiment is the need for controls, a place to calibrate C&I and compare the results to the control. A sustainable forestry benchmark needs to be of sufficient size that after a stand-replacing disturbance, the elements of variability persist within the benchmark. Undeveloped watersheds are ideal benchmarks since diversity of both aquatic and terrestrial ecosystems and variability can be monitored. Gap replacing forest disturbances operate over a smaller area in wet coastal and interior ecosystems so smaller watershed (5,000 hectares) are suitable to serve as benchmarks. Forests developed through frequent major disturbances such as wildfires and insects require larger undeveloped watersheds as smaller areas are reduced to a single seral stage in a single event. Undeveloped watersheds of 20,000 hectares are a practical minimum in the pine forests of BC's interior. Undeveloped benchmark watersheds need to contain ecosystems representative of those managed (roaded and harvested areas) so that C&I and natural areas research can be extrapolated between them.

Do we have a system of sustainable forestry benchmarks (controls) to guide forestry? Yes we do, in many of the forested watersheds within Ecological Reserves, Parks and Protected Areas; there is, however, a significant lack of benchmarks in our pine forests. Currently there is more dead pine than can be harvested. This is the moment in our forest history at which we face unprecedented opportunity and can establish long-term research benchmarks from the remaining undeveloped pine-dominated watersheds, forested watersheds where students, research scientists from UNBC, from Thompson Rivers University, UBC, and SFU can focus on C&I and natural areas research. To be a leader on sustainability, we must seize this day.

Who will stand with FER to make sustainable forestry benchmarks a reality? When we invite the world in 2010, who will stand to celebrate, rising to the challenge and opportunity given us by the mountain pine beetle to create tomorrow's laboratories?

### **Questions and Comments**

*One participant expressed 100% support for Fenger's key point: that we need benchmarks so we can have something with which to compare our management approaches. Concern was also expressed about current reference sites for monitoring benthic macroinvertebrates, sites that are slated for logging in the future.*

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### **3.4 Discussion following afternoon session: Summary of key points**

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Chris Hollstedt invited all speakers to return to the front of the room to take questions from participants. An overview of these questions and the responses follows.

*In the morning session, John Innes talked about the constraint on FRPA values related to “without unduly impacting the timber supply.” Is FREP asking the right questions? For example, with stand-level biodiversity, it sounds like FREP is mostly focussed on evaluating the quality of what is left on a site, not looking at whether leaving 9% is sufficient. A larger percentage might be required but would likely have an impact on timber supply. When do these types of issues get addressed? Should the questions being asked by FREP be designed to see if the legislation is sufficient?*

Archibald responded that although he wasn't familiar with the specific questions being asked for each value, he was confident of the approach they used to develop these questions. Resource Value Teams were asked to identify the right questions to ensure that the answers will inform policy. We had to set a “sustainability bar.” The intent was to ask questions and develop indicators that will inform us about whether that threshold of sustainability is in the right place or not. The teams of experts will be able to tell us if the bar is set too low.

From the Ministry of Environment's perspective, Greg Jones added that they were satisfied that the questions being developed were of interest from MOE's perspective. Are we getting the results we expect on the ground? If not, then we may need to revisit FRPA legislation.

*The Risk Matrix developed by Western Forest Products directs management decisions based on risk. There were no indicators looking at the effectiveness of those management strategies down the road. Is this a gap?*

Mogensen responded that WFP is considering this issue. If they use default management strategies through FRPA, they probably will not need their own monitoring program, but if they do something different, they will.

*Russell Collier mentioned a satisfaction test for First Nations accommodation. Satisfaction tests are notoriously hard to conduct. Are there parameters?*

Collier agreed that an open-ended satisfaction test is meaningless. He explained that any satisfaction test would need to be guided by an assessment of the risk, distance in time or space from the area under discussion (First Nations communities who are further away from their claim area generally express a decreased level of satisfaction), and finally severity: how substantial is the impact, are there a lot of impacts around a particular feature of interest?

*Researchers, both from government and non-government, often want to get involved with collaborations with First Nations but not necessarily confront the issue of consultation. Is this*

*possible, particularly in the case of government researchers, when other parts of government are actively involved in consultation?*

Collier explained that there just needs to be a clear line between the two and an understanding of how one will impact the other. He emphasized that building a strong relationship with First Nations is key, which takes time, a personal investment, and personal connections.

Ken Barth commented that sometimes processes involving First Nations assume an outcome right from the beginning; for example, BC Oil and Gas referrals are often called an “approval process”, which implies the outcome from the beginning. He also discussed the issue of infringement. Government asks First Nations to tell them when their rights are being infringed, but if First Nations make a claim that they are being infringed, they usually need to bring it to the courts to get government to accommodate. On the positive side, he also stated that some processes are starting to address these issues; for example, Ecosystem-based Management on the central coast: First Nations had the opportunity to bring forth indicators for human well-being.

*Are volume-based tenures realistic? Can forest companies do SFM on volume-based tenures, given the amount of collaboration required?*

Mogensen responded that SFM is probably easier to do if you have an area-based tenure, but SFM is still probably possible on volume-based tenures.

*Issues of scale are critical for indicator development. What scale has FREP considered when it started to develop indicators?*

Archibald responded that FREP has started on the stand level, mostly because it’s easier to understand relationships at this level. His understanding is that teams are working on landscape-level indicators, which Greg Jones confirmed was the case for Biodiversity indicators.

Mike Fenger shared his vision with the group. In British Columbia, we study AAC intensively. It would be nice if we did this type of intensive analysis for other indicators as well. We are doing State of the Forest and Environment reporting on a provincial level; why not bring this down to the forest estate level? Section 80 of the Forestry Act states that the Chief Forester needs to look at short- and long-term implications of the cut, but nothing in this statement restricts the Chief Forester to only assessing the economics.

## 4 RECOMMENDED NEXT STEPS FOR THE COMMON GROUND FOR CRITERIA AND INDICATORS PROJECT

At the end of the Forum, ninety minutes were set aside for a facilitated discussion with participants and speakers on key themes brought forth throughout the presentations and discussions earlier in the day. The purpose of this facilitated session was to focus discussions around these key themes and develop potential next steps for the Common Ground Initiative to address as it moves forward. Chris Hollstedt, the facilitator for the Forum, introduced five themes and asked participants to modify these as needed. In the end, focussed discussions were conducted related to the following five theme areas:

1. There are still many C&I initiatives. Is there more to do to make them more informative?
2. CCFM, Certification, and FREP: Is there an opportunity to address the perceived disconnect?
3. First Nations and C&I: What do we need to do?
4. Thresholds of sustainability: Are the bars at the right level?
5. How do we address issues of scale (spatial and temporal), and make trade-offs or balance indicators?

### ***Theme 1: There are still many C&I initiatives. Is there more to do to make them more informative?***

Angeline Gough, one of the authors of the report, explained that their report includes 200 indicators and 138 sub-indicators, summarized without any attempt to remove repetition. It is a scientific review of the indicators to reflect what is currently going on, not to provide recommendations on where we should head in the future. A next step could be to boil these down into a list of 100 or so and remove some of the repetition. Participants need to review this report and provide input, to know where to go next to make it useful for people. Many of the indicators listed in this report are different from those that BC currently uses, and most are focussed on the local-level, management-unit scale.

One of the participants who was interviewed for the case studies noted that the questioning was extremely thorough and rigorous. Likely there are more indicators that could be examined, but overall the approach and the document should be useful to people involved in C&I initiatives. One participant noted that the approach seems to have ignored the multiple land use question, because the focus is on the forestry sector. Indicators may need to be revised based on the confounding relationship between forestry and other land uses.

### ***In Summary:***

- ***Communicating information about ongoing C&I initiatives should continue. The Common Ground Initiative should continue to facilitate communicating information about C&I Initiatives. We should revisit initiatives that have multiple use indicators (such as watersheds). There is a need for information about how sustainability “targets” are set, and an ongoing need for information related to socio-economics, non-timber forest products, and trade-off analyses.***

## ***Theme 2: CCFM, Certification, FREP, Forest Practices Board audits, and LRMPs: Can we address the perceived disconnect?***

The Canadian Council of Forest Ministers, Certification Schemes, the Forest and Range Practices Act Resource Evaluation Program, Forest Practices Board audits, and Land and Resource Management Plans are all using Criteria and Indicator approaches to address and evaluate sustainability. Although there are issues of scale and different objectives for each of these initiatives, there also seems to be some overlap. Can we address the perceived disconnect and bring these initiatives closer together? Should these groups be using similar indicators? Sustainability will be looked at differently on different scales, so perhaps some dissimilarities should be expected. However, the scale of certification, FREP, FPB audits, and LRMPs is similar: should they be communicating more and aligning their indicators to make this process easier from a data collection perspective? If so, this communication needs to happen at the highest level.

There was much discussion about the issue of these initiatives using different criteria and indicators to examine the key values of sustainability. One participant asked if there was a reason that the perceived “disconnect” should continue. Kevin Edquist with the Forest Practices Board responded that there *is* a reason: these different initiatives have distinct objectives. The FPB does communicate with FREP and with licensees. Perhaps what is needed is to clearly articulate the distinct objectives of the different initiatives.

It was noted that licensees are trying to fit in under all of these initiatives, and the need to collect and incorporate all of the different approaches for data collection is challenging. FREP is focused on the eleven values with no initiatives related to social indicators, which leads to a perceived disconnect from certification initiatives. (It was later noted that FREP will be incorporating social and economic values at some point in the future.) From an industry perspective, it would be easier if common indicators were used whenever possible.

With respect to using similar strategies to meet the requirements of all of these initiatives, the response was that Certification strategies are often higher than the bare minimum that a company would put in an FSP, but it did not seem to be a huge challenge for industry to write a strategy that could meet both the requirements of FRPA and certification. However, it was noted that, if industry aims for a certification standard under, for example, FSC, they may not meet the timber supply objectives under FRPA. So it is not always straightforward to align certification strategies with strategies that would be acceptable under FRPA.

In terms of integrating different strategies, a sustainable forest management plan that is developed for certification can be viewed as an umbrella document that can encompass many different initiatives, including certification, FRPA, and the *Forest Act* (which is focused on timber supply and socio-economics). It seemed feasible to industry representatives to use this vehicle to meet the requirements of all legislation and voluntary initiatives. Both certification and FRPA rely on continual improvement and professional judgment; however, FREP’s evaluation process tends to rely on identifying “red flags”, which could lead to public misinterpretation. It is important from an industry perspective to ensure that the evaluation program developed by FREP incorporates local-level conditions and makes room for professional judgments.

Does a disconnect really exist between FREP, FPB, LRMPs, and certification? One participant suggested that, while it may not be feasible for certification schemes to do this, the first three of these (FREP, FPB, and LRMPs) could align their indicators better. There was fairly strong opposition to this suggestion from FPB and FREP representatives, who maintained that they did not want to be restricted to a common set of indicators. Since the beginning, these groups have worked very closely together. Although they do have slightly different objectives and approaches, they do use similar indicators where possible. It was noted that, for example, stand-level audit plots of the FPB could provide information to inform FREP stand-level biodiversity monitoring. In their auditing process, the FPB collects information from all of the initiatives, so it does provide an umbrella for integrating information. Perhaps the word “disconnect” is too critical: there are probably more connections than disconnections between FREP and FPB.

Regarding socio-economic indicators, one participant asked if forest companies should really be expected to create sustainable communities. Do they have that responsibility? It was also noted that FREP does deal primarily with ecological issues, although the charter does include social and economic values. These will be dealt with over time.

Overall, it seemed that, while the Common Ground Initiative should continue to support dialogue and communication between all of the different C&I initiatives; most participants were fairly positive with maintaining the focus on communication and not forcing these initiatives to adopt similar indicators.

***In Summary:***

- ***Most participants were happy with the current level of communication between these groups and agreed that it was appropriate for these initiatives to use different indicators in many cases; however, there continue to be overlaps between the various systems. Participants pointed out some gaps in communication and issues could arise if objectives from land and resource management plans conflict with objectives defined by public advisory groups (e.g., indicators being used by strategic land use plans).***
- ***While FREP is focussed on land base objectives, it is missing the social and economic aspects where trade offs and balance must be achieved.***
- ***There need to be links between C&I, continual improvement, and back to Allowable Annual Cut (AAC).***
- ***Continue to communicate at the executive level to help with collaboration.***

***Theme 3: First Nations and C&I: What do we need to do?***

The Common Ground for Criteria and Indicators program followed the CCFM framework, which does not include a First Nations criterion. It was noted that the National Aboriginal Forestry Association has proposed a different set of C&I. Should we be looking more closely at integrating more issues specific to First Nations?

Many First Nations in British Columbia are undertaking land use planning in their territories, and C&I will hopefully be part of these plans (not just ecological, but social and economic

indicators as well). In general, most people have noted problems with getting First Nations input into C&I development because of treaty negotiation issues. This is because some branches of the government have linked participation to consultation, so participating can be used against First Nations in a court of law. This unfortunate stance has forced First Nations to abstain from active participation in many cases. There is a great need to make a distinction between participation and consultation.

During research into case studies of C&I in British Columbia, the authors noted that, at the community level, there was often a lot of interaction with First Nations groups. If government was involved, First Nations were less likely to be involved. Often the community-level participation was founded on previous relationships; that kind of trust does not generally exist with government.

Overall, on-the-ground monitoring approaches using First Nations participation are going well. However, the two areas that are not covered are: the processes themselves and whether First Nations are participating willingly in these processes; and case law. Government needs to draw a hard line regarding case law. First Nations have won multiple times in the courts, but government does not adhere to these decisions. There is a desperate need for more social scientists in government. Overall, it was felt that new legislation and new approaches were not needed to deal with First Nations issues: we just need to find the will to comply with existing case law.

***In Summary:***

- ***First Nations' communities are building their own land use plans and sets of objectives and measures. We need to work with these communities. An approach for integrating measures of First Nations accommodation into C&I was suggested. We need to focus on existing case law, and ensure that participation is not equated with consultation.***

***Theme 4: Thresholds of sustainability: Are the bars at the right level?***

Are the thresholds for sustainability set at the right level? Do we have any mechanism for changing these bars? Under FREP, are we able to ask the question, “is 10% wildlife tree patches enough?” It was explained that eventually FREP will be addressing these issues (which are truly related to effectiveness evaluation), and that the bar will change as they gather more information. Meanwhile, sometimes the implementation of a strategy is actually higher than the current bar.

There was interest expressed in establishing reference areas (i.e., studied areas that are not under forest management).

***In Summary:***

- ***Concerns were expressed about how the province will be revisiting the sustainability thresholds associated with FRPA values, and about the qualifier associated with most FRPA values (“without unduly impacting the timber supply”). Exploring the possibility of setting aside reference areas for benchmarking was mentioned.***

***Theme 5: How do we address issues of scale, and make trade-offs or balance indicators?***

A key issue that was brought up throughout the Forum was the issue of scale: different indicators are appropriate at different spatial scales. Participants noted that FREP is moving in scale from the stand to the landscape level. Like many of the other issues raised, it is a development process. Regarding the report produced by the Common Ground Initiative, issues of scale were noted for all of the indicators reported (see McHugh *et al.* in prep).

Related to trade-off analysis, it was noted that a culture of people who are dealing with this issue, particularly as it relates to First Nations, is growing. Participants encouraged the culture of discussion, openness, and coming together as something that the Common Ground Initiative could continue to support. The Criteria and Indicator culture should be encouraged at as many scales as is appropriate, and should engage as many parties as possible.

***In Summary:***

- ***FREP, the 200-indicator set, and results from case studies comment on and indicate scale issues and the need to compile social, economic, and biophysical indicators at various scales. The discussions encouraged a “C&I culture” at as many scales as possible and with various communities.***

## 5 CLOSING REMARKS

Bruce Fraser found three unifying principles interwoven in the discussions at this forum, which could serve as a basis for moving forward with the Common Ground Initiative. These three unifying principles were:

1. Market oriented issues: The province of British Columbia is attempting to achieve an internationally competitive industry with good market access, providing money to the Crown, which necessitates a high cut. Attached to this is a set of legal obligations to allow market access to occur and permit the social license.
2. Quality of place issues: This theme is embedded in First Nations issues but also Land and Resource Management Plans (LRMPs) and other strategic land use plans. Personal relationships, equity of distribution, stewardship: these are all important on a local, community level.
3. Properly functioning and condition: As framed in the UN Millenium's Assessment, the earth has a certain finite capacity to sustain the ecosystem services upon which our communities are based. Properly functioning and condition of ecosystems is vital: we must live within a sustainable level.

Our criteria and indicator schemes tend to be centred on one or the other of these three themes, and there is the potential for these schemes to be at cross purposes. Overall, this illustrates the point that, if you are not sure where you are going, you will have a lot of different routes chosen to get there.

## 6 LIST OF REFERENCES

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McHugh, A., A. Gough, and J.L. Innes. [2006]. Indicators of sustainable forest management: Review of potential indicators. In prep. Draft chapters for review available at: [http://www.forrex.org/bcci/constituent\\_input.asp](http://www.forrex.org/bcci/constituent_input.asp)

## APPENDIX 1: FORUM AGENDA

08:30 - 08:50	Welcome by the hosts: Outline of meeting objectives; introductory presentation <i>John Dunford and Bruce Fraser</i>
<b>PLENARY SESSION</b>	
08:50 - 09:10	<b>Overview:</b> What's happening with Criteria and Indicators in BC and Canada? <i>Tom Niemann</i>
09:10 - 09:30	The <i>Forest and Range Practices Act</i> and links to Criteria and Indicators <i>Peter Bradford</i>
09:30 - 09:50	Integrated Land Management Bureau: Role in Land Information Management and Access <i>Elaine Dawson</i>
10:00 - 10:30	<b>Break</b>
<b>CASE STUDIES</b>	
10:30 - 11:00	Indicators of sustainable forest management in BC: What are we monitoring and what is the cost? <i>John Innes</i>
11:00 - 11:30	Application of Criteria and Indicators: Experience of using C&I in Forest Practices Board audit process – CANFOR Biodiversity Audit Case Study <i>Kevin Edquist</i>
11:30 - 12:00	Discussion with the Audience
12:00 - 01:00	<b>Lunch (provided)</b>
<b>PANEL DISCUSSION AND PUBLIC FORUM</b>	
01:00 - 02:30	<ul style="list-style-type: none"> <li>• Canfor's experience using C&amp;I and current needs <i>TBA</i></li> <li>• Where do C&amp;I inform government policy? <i>Ralph Archibald</i></li> <li>• Measuring accommodation? It's easy! <i>Russell Collier</i></li> <li>• Can diligence and rigor survive institutional and policy changes? Stories from Western Forest Products TFL 6 <i>David Mogensen</i></li> <li>• A lesson from the mountain pine beetle on sustainable forestry: Do Criteria and Indicators (C&amp;I) help? <i>Mike Fenger</i></li> </ul>
02:30 - 04:00	A Vision for the Future - Open Microphone Questions, Answers, Commentaries
04:00	Take-home Messages <i>Bruce Fraser</i>
04:30	Adjourn

Presentation PDFs are available at: <http://www.forrex.org/bcci/reports.asp>