

Potential of Canada's National Forest Inventory as a Monitoring Framework for the Canadian Biodiversity Index

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Abstract

Testing of a Canadian Biodiversity Index (CBI) as a tool to facilitate reporting on biodiversity in a meaningful, concise, and easy-to-understand way, and provide guidance to policy makers on the status of biodiversity is underway in several regions across the country. The draft framework for the CBI comprises four theme areas: species and genes; animal habitats and plant communities; global and landscape influences; and human influences. A series of indicators is established for each of the theme areas. Individual indicators are measured against attainment of a 'desired future state'. Qualitative responses to the indicator assessments are aggregated at the theme, ecounit and national levels.

The *Proof of Concept Testing* phase is addressing some of the unresolved technical issues associated with the CBI. Canada's National Forest Inventory (NFI) has the potential to provide a monitoring framework to support the CBI. Attributes collected under the NFI will be examined for their appropriateness as measurements of biodiversity in the CBI. Preliminary results indicate that the combination of the CBI as a reporting framework, and the NFI as a monitoring framework, may provide clear, concise and poignant messaging on the status and trends on biodiversity in Canada's forests. However, it is clear that NFI attributes alone do not provide enough information for a full assessment of status and trends in biodiversity using the CBI.

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Background

The Canadian Biodiversity Strategy (CBS), Canada's agenda to implement the United Nations Convention on Biological Diversity (CBD) has five goals:

- To conserve biodiversity and sustainably use biological resources;
- To enhance both our understanding of ecosystems and our resource management capability;
- To promote an understanding of the need to conserve biodiversity and sustainably use biological resources;
- To provide incentives and legislation that support the conservation of biodiversity and the sustainable use of biological resources; and
- To work with other countries to conserve biodiversity, use biological resources sustainably and share equitably the benefits that arise from the utilization of genetic resources

The strategy requires jurisdictions to report periodically on progress towards attaining these goals. Assessing the status of biodiversity, in a country of 9.2 million km² with 70, 000 known and probably equally as many unknown species presents a significant challenge. Since the adoption of the Canadian Biodiversity Strategy in 1996 some progress has been made on reporting specific aspects of biodiversity. For example, *Status of Wild Species 2000* examines the risk of extinction for of all vertebrates, some particularly well known plant groups (e.g. orchids) and some insects (e.g. dragonflies and damselflies).

More recently the Parties to the CBD (COP7, Feb. 2004) identified a small suite of global indicators to be reported out in the next Global Biodiversity Outlook, 2006. Parties will be encouraged to report on these indicators at the national level. Indicators chosen include measurements of particular interest to Canada such as 'the extent of key biomes such as forests, peat lands and polar ice', Red List Index, which measures the change in status of red listed species and protected areas. As well, many Canadian organizations working at a variety of scales, have begun reporting on suites of indicators covering some aspects of biodiversity, from species to habitat or ecosystems. However, even with all of these efforts, an answer to the simple policy question, "What is the state of biodiversity in Canada?" has remained elusive.

Draft Framework for the Canadian Biodiversity Index

A Canadian Biodiversity Index (CBI) is being developed to fill this gap. It is intended as a tool to facilitate communicating the state of biodiversity in Canada in a meaningful, concise, and easy-to-understand way. It will simplify the complexity of biodiversity for non-technical policy makers, provide a high level assessment of the success of biodiversity management in Canada and meet some of the reporting requirements of the Canadian Biodiversity Strategy. The CBI is being developed under the auspices of the Federal/Provincial/Territorial Biodiversity Working Group, a group which provides technical support for Canadian Ministers responsible for wildlife and biodiversity.

A draft framework, completed in May 2003 (Fig. 1) (<http://www.ec.gc.ca/soer-ree/English/documents/default.cfm>) comprises four theme areas: species and genes; animal habitats and plant communities; global and landscape influences; and human influences. A small suite of indicators is established for each theme and measured against attainment of a 'desired future state'. Qualitative assessments are aggregated at the theme, ecounit and national levels to form a national-scale picture of the status of biodiversity and how it is changing over time. It is intended to consider biodiversity more broadly than some existing indices that focus on only one aspect of biodiversity, such as species diversity (e.g. Shannon-Wiener index, Margalef index).

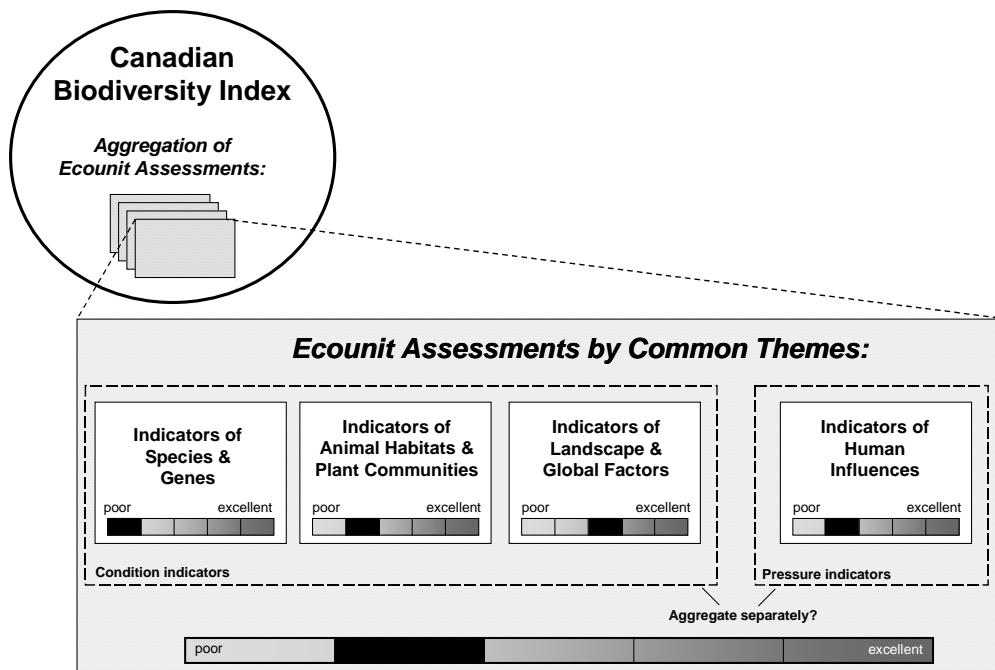


Figure 1: Draft Framework of the Canadian Biodiversity Index

The CBI is envisioned as a tool for capturing and conveying credible information on changing status and trends in biodiversity in a consistent, accessible, and regular manner (annually, for example). It will provide general “big picture” information at the national level, while allowing easy access to cascading levels of detail on particular topics, themes or geographic areas.

The development of the CBI is anticipated as a multi-stepped, iterative process, in which proof of concept testing on a wide range of available datasets, and in different types of ecosystems will result in adjustments to the framework.

Advantages of National Forest Inventory for Proof of Concept Testing

Canada’s National Forest Inventory (NFI) has considerable potential to provide a monitoring framework for the CBI. The NFI is a plot based system, (i.e. a 20km X 20km grid), covering the entire country. Although most area attributes in the CFI are collected using remote sensing sources, some ground-based sub-samples will be used to collect

information on species diversity, wood volumes, litter, soil carbon content and other relevant information. Sampling points have been stratified by terrestrial Ecozones, the same ecological unit in which many types of environmental data are collected in Canada. Change detection, using repeated measurements of all samples, is incorporated into the NFI design. The intent is to sample the entire country within the next five years, and to spread the re-measurement over a ten year period, covering 10% of the area each year in a statistically defensible manner. Finally, provinces have agreed to collect the information in support of the inventory.

Because the NFI is the only extensive network of monitored ground plots across the country, it presents tremendous opportunities for collecting information on biodiversity. It is complimentary to provincial efforts by providing a backdrop for programs such as the Alberta Biodiversity Monitoring Program or other local level forest monitoring programs such as those carried out by Model Forests or for sustainable forest management certification.

Summary

The CBI is an innovative tool for simplifying the complexity of biodiversity for policy makers. Integrating with national biodiversity monitoring programs could ensure access to information collected for programs such as the NFI is accessible beyond scientists and natural resource managers. However, care will have to be taken to ensure that national monitoring programs, such as the NFI, provide enough detail on biodiversity related measures to assess status and trends in biodiversity in a meaningful way. Testing of the NFI, as well as other national and provincial biodiversity monitoring programs, will be conducted to both ensure the CBI is a robust tool and the results of sometimes expensive monitoring programs are useable for policy development.

References

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