

# Fundy Model Forest Report on the Status of Local Level Indicators of Sustainable Forest Management

Phase II 1997-2002



Natural Resources  
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## ACKNOWLEDGEMENTS

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A special mention to the working groups who contributed initially through the identification of important local level indicators of sustainable forest management for Fundy, and then through the support of project proponents to address the needs and undertake the projects to assess those indicators. Without such dedication, this report would be much less complete.



## EXECUTIVE SUMMARY

Phase II of the Model Forest program was primarily devoted to examining Criteria and Indicators related to sustainable forest management as put forth by the Canadian Council of Forest Ministers. Through the Local Level Indicator development process, the Fundy Model Forest identified and modified the national set of indicators to best address the issues of sustainable forest management in the Acadian Forest Region of southern New Brunswick. Work was done to determine the functionality of the indicators and whether processes could be set in place to measure and/or monitor them.

The working groups within the FMF were structured to follow the six criteria set out by the CCFM. They have provided the bulk of the information through existing databases or, in some cases, projects undertaken to specifically address the development of a monitoring process or provide a baseline measure for a particular indicator. The status (success – functionality) of these indicators is based on how they can be or are being measured and/or monitored.

The Fundy Model Forest has been very successful in setting in place a baseline of measurements, and/or protocols for measurement, of the progress towards sustainable forest management. Fifty-three indicators are functional and have a process in place for monitoring. This provides the baseline information for future comparison of progress towards sustainable forest management within FMF.

If the partnership so decides, quantitative thresholds need to be defined for indicators if quantitative comparisons are to be made. This report gives a view of indicator status to date and how to gather data about those indicators. For that information to be relative, it needs to be put in a context of desired levels (partner-defined) for sustainable forest management. This would indicate where FMF is on the path to sustainable forest management with respect to those indicator measures.

The efforts of the FMF to design and implement a management strategy have resulted in many changes on the part of land managers/users in the forest. Although a specific plan was approved by the partnership, its implementation occurs through the decisions of the land owner/managers of the FMF rather than the plan being implemented in a particular area. In effect, values and Best Management Practices identified as a result of the planning exercises are being incorporated across the landbase where possible. The continued monitoring of indicators will help guide practices into the future.



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## ***OUTLINE OF THE REPORT – “How to Read This Report”***

The body of this report describes the Fundy Model Forest (FMF) set of criteria and indicators that were derived from the CCFM set of guidelines, and presents baseline information that was collected for each indicator.

Due to the diversity of subject matter covered in this report it does not always flow from one subject to the next. It is anticipated that this document will be used as a reference for the issues addressed herein. The design is such that this is the most appropriate approach to reading the report.

Each chapter is divided into the following subheadings that describe various aspects of the indicators (unless otherwise explained).

- \* Title - The title of the local level indicator being reported for the FMF.
- \* Management Planning Objective - These were determined after much group deliberation about each indicator and how they should fit into the objectives of the FMF. In some instances, specific targets are stated while others are broad objectives that are set out to be met through management planning on the part of the land owner/managers.
- \* Justification for Selection - A brief description of the importance of the indicator to the sustainable forest management process in the FMF.
- \* Data Sources - This is a point-form list of sources for the information provided.
- \* Monitoring Protocol - A description of how the information was gathered or reported on, whether the indicator was addressed by a specific project or by existing databases.
- \* Baseline Results - Results from the monitoring, measuring, and/or data collection about the indicator are presented.
- \* Best Management Practices (BMPs) - When BMPs apply for an indicator (most often with indicators that pertain to forest intervention activities), or have been established or recommended from the work done, they are reported in this section. In some cases (very often with Criterion 5 and Criterion 6) BMPs are difficult to state as these indicators do not have direct physical implications for the forest. Some suggested processes are given.
- \* Functionality and Application - The functionality of an indicator is the degree to which it is/or can be measured, monitored and reported on. Also, where possible in this section is a statement about the land owner/managers' attempts to achieve the management planning objective for the indicator.

Accompanying this report on CD-Rom are a digital version of the report (in separate sections) and the appendices that provide project/indicator information in further detail (e.g. graphs, tables, and maps). The appendices also include a list of acronyms.



## INTRODUCTION

### *Description of the FMF Organization*

The Fundy Model Forest (FMF), one of eleven model forests in Canada (Figure 1), is located in southeastern New Brunswick and represents the Acadian Forest Region. The administrative office is located in Sussex. The Acadian Forest Region in Nova Scotia through the Nova Forest Alliance, a previous adjunct of Fundy Model Forest and now a model forest in its own right.



Figure 1. Location of Model Forests in Canada.

A model forest is a large-scale working model of sustainable forest management where new knowledge and technology are both developed and applied (NRC 1998). “A model forest serves as a laboratory for advancing both international and national knowledge and practice (NRC 1992). It is a place that both incorporates the needs of the local area and addresses global concerns. The landowners, managers, and users within the model forest form a partnership of stakeholders and rights holders. The solutions and ideas formed are exchanged within the network, leading to new approaches of sustainable forest management.”

Since 1992, with the development of a National Forest Strategy, Canada and the Canadian Council of Forest Ministers (CCFM) committed to the development of a framework of criteria and indicators (C&I process) to monitor and report on the sustainable management of our country's forests. The C&I process resulted in six criteria and 83 indicators being established nationally.

Canada's Model Forest Program grew out of this process as a method to address forest sustainability issues and public concern for the environment at the local and regional levels. The Model Forest Program is a Natural Resources Canada - Canadian Forest Service initiative to foster the development of



innovative approaches to sustainable forest management, within both a Canadian and international context. The Model Forest Program selected 10 model forests in a highly competitive request-for-proposal process. Model forest sites were selected to represent the five major ecoregions of Canada, and the major ecosystems, social, economic, and cultural diversity inherent in various regions of the Country. The program was designed to support efforts of provincial governments and other landowners to develop new ways to manage Canadian forest resources. "The Model Forest Program represents an initiative in building partnerships locally, nationally and internationally to generate new ideas and on-the-ground solutions to sustainable forest management issues (<http://mf.ncr.forestry.ca>)."

In Phase I, the FMF proposal was developed by a diverse partnership representing most issues and concerns related to sustainable forest management. The essence of the proposal was to develop and demonstrate an integrated forest management planning process that incorporated the development of monitoring processes and recommendations for Best Management Practices. In Phase II, the partnership decided to adopt the CCFM suite of criteria and indicators of sustainability and adapt them to reflect the concepts, goals and objectives for sustainable forest management in the local region.

That process began by establishing seven working groups to address each of the criteria established at the national level, and a management planning group. The groups assessed and revised the indicators associated with these criteria, setting local management objectives, monitoring protocols, practices, and identifying knowledge gaps to be addressed through further inventory work (project establishment and implementation). Sixty-seven local level indicators were identified.

The purpose of this report is to present the processes, technologies, results and baseline information developed or collated by FMF partners and working groups, related to planning, monitoring and implementing the recommended operational practices. It describes the status of various ecological, economic and social values associated with the indicators accepted by the partnership.

### ***FMF Partnership***

FMF is a partnership of 34 diverse groups and organizations working together to ensure the environmental sustainability of our forests. They are listed in Table 1 below.

Table 1. FMF Partnership List

Atlantic Society of Fish and Wildlife Biologists	NB Federation of Naturalists
Canadian Institute of Forestry, Maritime Section	NB Premier's Round Table on the Environment & Economy
Canadian Forest Service	New Brunswick Federation of Woodlot Owners
City of Moncton	New Brunswick School District 4
Conservation Council of New Brunswick	New Brunswick School District 6
Eel Ground First Nation	Nova Forest Alliance
Environment Canada	Petitcodiac Sportsman's Club
Fawcett Lumber Company	Red Bank First Nation
Fundy Environmental Action Group	Southern New Brunswick Wood Co-operative Limited
Fundy National Park	Sussex Chamber of Commerce
Greater Fundy Ecosystem Research Group	Sussex Fish and Game Association
Indian and Northern Affairs Canada	Town of Sussex
J.D. Irving, Limited	Université de Moncton



Maritime Forest Ranger School	University of NB - Faculty of Forestry and Environmental Management
NB Department of the Environment and Local Government	University of NB - Saint John Campus
NB Department of Fisheries and Oceans	Village of Petitcodiac
NB Department of Natural Resources and Energy	Washademoak Environmentalists

Since 1992, FMF has been involved in projects spanning nine subject areas, viz.: wildlife, water quality, biodiversity, wood supply, socio-economics, recreation, soils, management planning, education and communications.

The Vision guiding the FMF Partnership is to ensure environmental sustainability and ecological integrity of the forest, while deriving sustainable social and economic benefits.

FMF brings together resource managers, 34 partners, and interested citizens to exchange information, to evaluate the impact of various resource management approaches and to choose the best alternatives in efforts to achieve sustainable forest management.

### *Historical Perspective*

Alterations of landscape patterns by humans within New Brunswick first appeared 500 to 2500 years ago, during the development of the distinctive Maritime woodland traditions of the Mi'kmaq and Maliseet peoples (Leavitt 1995). Evidence exists for pre-historic native use of fire in inland parts of New Brunswick given the prevalence of fire-adapted tree species on the landscape (Methven & Kendrick 1995).

There appears to be no evidence for intensive human use (agriculture and logging) of the Greater Fundy Ecosystem (GFE) area, immediately adjacent to and including Fundy National Park, prior to early European settlement which began around 1750 (West & Sinclair 1985; Lutz 1997). It was not until the 1830's that the area began to be intensively settled and preliminary land clearing occurred with the use of fire.

Since the period of initial European settlement, most of the GFE has been logged or converted to agriculture. Small settlements that clustered around sawmills along the Bay of Fundy coast grew rapidly once they were established (Allardyce 1994). These disappeared, however, with the developments further inland and modernization.

Examples of landscape pattern which differ from pre-European settlement conditions are industrial forestry, which has secured thousand of hectares of forest to be managed for the production of pulpwood and logs, and agriculture which dominates the landscape along watersheds in FMF.

Species composition changes have been influenced by these landscape activities as well as others. After World War II, the threat of spruce budworm infestation brought about suppression of the pest (starting in 1952) using aerielly applied insecticides. The combination of these many factors could have led to changes in the species composition of Kings County (Lutz 1996) and the ecoregions included in the FMF.



## Description of the FMF Landbase

FMF is bordered by the Bay of Fundy to the south, Washademoak Lake and the Canaan River to the north, the Kennebecasis River to the west, and the Petitcodiac River to the East. The total area within these boundaries is 420 000 hectares. Within FMF there are many different land uses including: forestry, agriculture, recreation, mining and quarries, roads, urban areas, wetlands and water features.

The FMF area is composed of five ecoregions (approximating climatic regions) comprised of eight ecodistricts (approximating areas of similar topography) (DNRE 1996), within which are nested various ecoregions showing recurring patterns of landform (Zelazny *et al.* 1999).

This system of Ecological Land Classification (ELC) was developed by the Department of Natural Resources and Energy (DNRE) (Zelazny *et al.* 1997). It was used for the first time for forest management planning in FMF. Climate, landform, geology, hydrology, and soils maps were assessed and compared to determine the controlling factors at each level of the classification. This top-down approach was used to delineate landbase areas with the same characteristics. Each hierarchical level further describes the overall system. The lower levels of the ELC have been used to define community types of vegetation known as forest community types, of which eight occur within FMF.

## Current Land Ownership/Usage within FMF

The greatest challenge to the FMF Partnership was the development of a sustainable approach to forest management across various land ownerships (Figure 2). FMF consists of the following land jurisdictions: Private Woodlots - 63%, Industrial Freehold -17%, Crown Land (Fundy License) - 15%, and Fundy National Park - 5%.

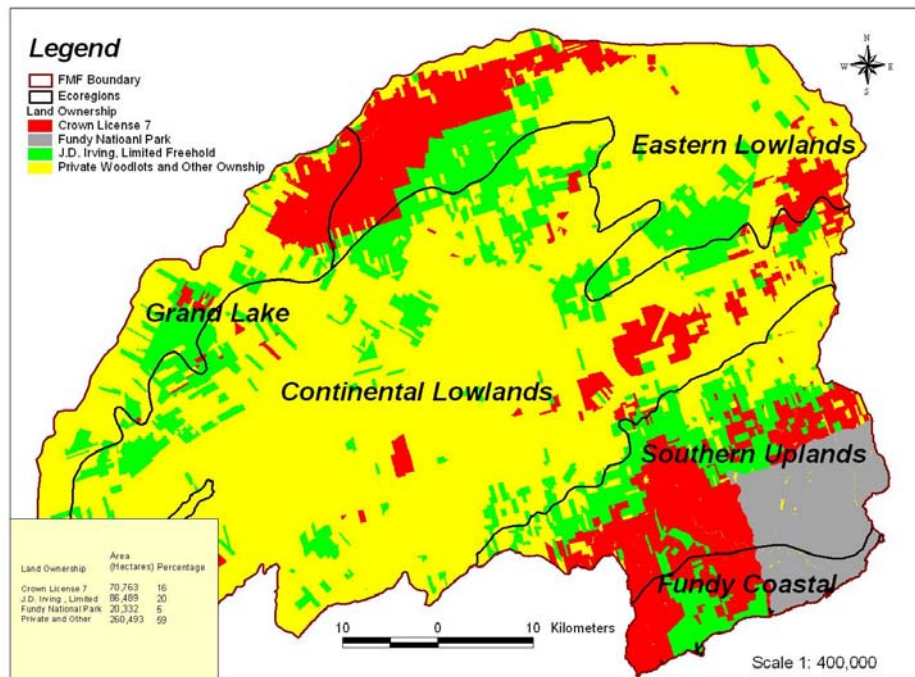


Figure 2. Land ownership within the Fundy Model Forest.



The majority of the FMF area is privately owned in small holdings varying in size from 50 to 5 000 ha, which are commonly managed in association with agricultural operations. This area is represented by the Southern New Brunswick Wood Cooperative (SNB). There are more than 3 500 wood lot owners in the FMF area with a wide variety of interests. Among these is a growing interest to develop alternative products from the forest and the pursuit of non-consumptive opportunities related to ecotourism.

J.D. Irving, Limited's (JDI) freehold land within FMF provides a portion of the wood supply for its pulp mills and sawmills. JDI carries out intensive forest management on its private land and Crown Timber License. The company has invested substantially in genetic tree improvement, nurseries, plantations, and stand improvement operations in the area over the last several decades.

The Crown Land area is part of the Fundy License under long-term forest management agreement with JDI. The License supplies wood to 27 local sawmills and pulp mills. The DNRE administers the Crown Lease agreement.

Fundy National Park is dedicated to the preservation of the Fundy area ecosystems and is a mainstay of ecotourism in the Province. Although the Park has a long history of human alteration, as a protected area it now provides the opportunity to compare the effects of current management practices or other activities on adjacent land holdings non-exploitive practices in the Park. The Park is an excellent venue for distributing information and interpretive programs about ecosystems within FMF.

FMF has provided knowledge and set the stage for a positive influence to improve forest practices in the area due to the many demonstrations and operational trials that have taken place. It has provided the forum where landowners or operators can exchange ideas, information and concerns in an open and constructive atmosphere. It is also helping to establish a sustainable forest management process that will provide demonstration for the local area. It is up to the landowners to take these ideas and use them in their forest management planning for any "on the ground" impact on our model forest to occur.