

MEASURING FOREST SUSTAINABILITY

AN INTRODUCTION



Eastern Ontario
Model Forest

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Measuring Forest Sustainability: An Introduction

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To the Future

The EOMF State of the Forest reporting process is an ongoing effort. More indicators will be developed over the next few years. Measurement of new and existing indicators will be undertaken in order to maintain up-to-date knowledge on the state of Eastern Ontario's forests. This will allow constant monitoring of the state of the forest, and a means to develop research programs and management strategies to maintain sustainable forests.

Landowners and residents of eastern Ontario can make a difference in the management of the regions' forests. Landowners can contribute to sound forest management by developing forest management plans and being aware of sound forestry practices for the forest types on their property. Landowners, residents, and those that conduct forest related business within eastern Ontario are eligible for membership within the EOMF. Members become part of a large network of forest scientists, landowners, and naturalists, and can provide input on the activities of the organization.

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Forest management based on information in the State of the Forest Reports will help protect many forest values, including recreation and aesthetics.

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On Assessing the Forest

Canada is the caretaker of 10% of the world's forests. This rich legacy requires a commitment by Canadians to carefully manage this precious resource. One of the ways to ensure our forests are managed wisely is to develop a means to evaluate changes in the condition of our forests – whether these changes are a result of harvesting, disease, fires or urban development.

The 1992 United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro focused world attention on the importance of the world's forest resources and on the need to formulate a system for measuring and monitoring them. Six values have been accepted as essential components of forest systems. These components include vital attributes such as biodiversity, ecosystem condition and productivity, conservation of soil and water resources, and global ecological cycles. These values also include socio-economic concerns, namely multiple benefits to society and society's responsibility for ensuring sustainable management.

Evaluation of changes to Canada's forest resources is no easy task. The vastness of the forest base, its location far from urban centres, and the difficulty of measuring a complex and dynamic forest make this task a challenge. The challenge is even greater in areas of privately owned forest lands, where management objectives may vary from one property to the next.



The Eastern Ontario Model Forest has recently produced a "State of the Forest Report" which presents information on 18 topics that cover a wide range of ecological, social and economic issues. Subsequent reports will determine whether or not the forests of eastern Ontario are being managed sustainably.

Eastern Ontario's Legacy

The forests of eastern Ontario have changed dramatically over the last two centuries. What was once unbroken pine forests has given way to towns, cities, farms, and rural residences. The original forest cover was dramatically reduced during this time down to approximately 34% of its former state.

Eastern Ontario's forests contain a diverse range of plant and animal species, typical of the Great Lakes-St. Lawrence forest region, but like the forests in southern Ontario, they are highly fragmented. There are very few large areas of contiguous forest, and none of it can be called truly undisturbed wilderness.

With the clearing of the forest came changes to the health, structure, diversity, and composition of the forests of eastern Ontario. Disturbances such as fire, insect infestation, harvesting, and the ice storm of 1998 have all had an impact.

Much of the land in eastern Ontario is privately owned, and most of these landholdings are very small. This makes managing this large forest resource that much more challenging. The diversity of landowners and the highly disturbed nature of the forest have made the State of the Forest reporting process even more of a necessity.

Why be concerned?

Although eastern Ontario's forests are currently increasing in area, there are some ongoing concerns:

- *Butternut canker, Dutch elm disease, spruce budworm, gypsy moth and forest tent caterpillar continue have a major impact on forest health and diversity.*
- *Soils research suggests that acid deposition in the area is currently exceeding the maximum recommended levels.*
- *Several animal species are at risk including the red shouldered hawk, the eastern cougar, the black rat snake, the spotted turtle, and the cerulean warbler.*

Eastern Ontario's Commitment

At the present time, the amount of forest cover in Eastern Ontario is increasing, particularly as abandoned farm land in the north-west region of the EOMF reverts back to its original forested state. However, issues such as forest health, disturbances, wood supply for economic opportunities, and rare and endangered animals and plants are still of concern.

The Eastern Ontario Model Forest is a key player in a National Model Forest program to assess forest sustainability. The selection of 18 indicators that are specific to Eastern Ontario conditions, and the production of two summary companion documents to the first State of the Forest Report are initial accomplishments in the Eastern Ontario strategy. This work builds upon previous forest history research which uncovered and compiled information on the condition of the EOMF area in earlier times.

Copies of both the technical and summary versions of the State of the Forest Reports and the Forest History of Eastern Ontario Report are available from the EOMF office.



The ice storm of 1998 had a devastating effect on eastern Ontario's small trees, as well as on aspen, poplar, birch, white cedar and red pine.

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The Model Forests

In 1992 Canada embarked upon an ambitious project of creating a network of "Model Forests" across the nation. These sites were established as partnerships between local landowners, industries, First Nations, federal, provincial and municipal governments, and interested citizens. Eleven such sites are located across the country. With funding from the Canadian Forest Service, research, demonstration and education projects, including a nation-wide Criteria and Indicators project, are underway in each Model Forest. The results of the projects, and the partnerships that are developed in the undertaking of project work all go a long way towards a sustainable future for our forests.

Eastern Ontario is home to one of these Model Forests. The Eastern Ontario Model Forest (EOMF) is located in the extreme south-eastern portion of the province (figure 1).

The EOMF is...

- 1.5 million hectares of private and public lands
- 570,000 hectares of productive forest
- Home to approximately 1 million people, living in cities, towns, villages, farms and rural areas
- Part of the Great-Lakes St-Lawrence Forest Region
- Composed of tree species such as sugar maple, beech, hemlock, white pine, white cedar, red and white oak

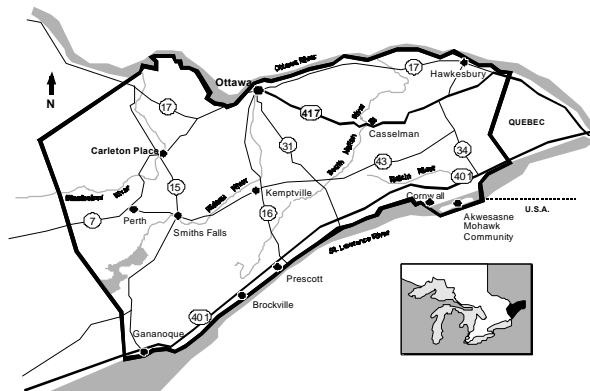


Figure 1 Eastern Ontario Model Forest Location and Boundaries

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Forest Values

The forest values introduced previously have generally been referred to as *Criteria and Indicators*. *Criteria* reflect the range of values that need to be considered when asking the question, "Is the way we use and manage the forests sustainable"? *Indicators* are more specific and provide ways and means to assess or describe a criterion.

Many indicators are quantitative, while others are qualitative or descriptive. All indicators provide information about the present condition of forests, their use and, over time, will establish the direction of change in the forests.

The indicators can be used as guidelines for developing plans and policies for forest management that can help protect the forest for future generations. They can also be used to ensure that multiple forest values are protected and monitored during forestry operations.



Ginseng, (*Panax quinquefolius*)
a threatened species in Ontario.

Describing Forest Values

The six values that form the basis of the eastern Ontario *State of the Forest* reporting process are:

1. Conserving Biological Diversity – *ensuring the continued survival of a diverse range of plants and animals in the forest.*
2. Ecosystem Condition and Productivity – *ensuring forest ecosystems remain healthy and productive.*
3. Conserving Soil and Water Resources – *maintaining the quality of the resources that support the forest.*
4. Global Ecological Cycles – *concern for global scale environmental pressures that may have an effect on Canadian forests.*
5. Multiple Benefits of Forests to Society – *ensuring that multiple uses, values and products continue in our forests.*
6. Society's Responsibility – *a commitment to ensure that all Canadians are involved in decision making around the use of Canada's forest resources.*

These values form six key distinguishing characteristics of sound, sustainable forest management. Using these as a guideline, indicators of sustainable management, such as those on the following page, can be identified for any forest region in Canada.

"The six sustainable forest management criteria that have been identified include traditional concepts, such as timber values, but go beyond economics to encompass – among others – environmental, social, and Aboriginal values."

- Canadian Council of Forest Ministers, 1997

Eastern Ontario Indicators

The first State of the Forest Report includes information on 18 indicators:

Conserving biological diversity

- Percentage and amount of area forested
- Percentage and amount of interior forest space
- Protection of sites of biological significance
- Number of known species at risk
- Population levels and changes over time of selected species

Ecosystem Condition and Productivity

- Natural disturbance and stress by type and severity
- Forest stand health

Conserving Soil and Water Resources

- Percentage of riparian (shoreline) areas with natural vegetation cover
- Buffering capacity and soil acidification

Global Ecological Cycles

- Ground level ozone and pollution deposition
- Climate trends

Multiple Benefits of Forests to Society

- Production of timber forest products
- Regional wood prices
- Employment in forest related sectors

Society's Responsibility

- Community involvement in sustainable forest management
- Implementation of integrated resource management plans
- Private land management and conservation programs
- Mutual learning mechanisms

These indicators were selected on the basis of data availability and reliability, significance, and importance in monitoring trends over time. Additional indicators will be incorporated into the program as the project progresses.