



# KNOWLEDGE ACTION CHANGE

Fundy Model Forest:  
The First Fifteen Years



*United by  
a common  
commitment  
to healthy  
forests  
for future  
generations*



# VISION STATEMENT



Cover Photo taken by H. Swartzky

*To achieve, enhance, restore and sustain a healthy Acadian forest ecosystem by building capacity for sustainable forest management and conservation of natural biodiversity*

Letter from the President . . . . . page one

Who we are . . . . . page two

Knowledge: Filling in the gaps . . . . . page four

Action: Putting knowledge and tools to work . . . . . page ten

Change: Advances in sustainable forest management . . . . . page eighteen

Taking the model forward . . . . . TWENTY-FOUR



## LETTER FROM THE RESIDENT

The Fundy Model Forest came into being in 1992 as a consortium of 20 partner agencies. Now it is a "teenager", and in addition to keeping its original partners, it has grown to encompass a total of 38 partner agencies. This document is an attempt to look back at what has been accomplished.

In doing so, we have to give credit to our Chair and mentor for the first 10 years, Dr. Louis Lapierre. Louis was forever consistent to his principles and a great believer in the strength of consensus. He guided the Fundy Model Forest through its sometimes rocky formative years, and implemented working relationships that still work well today.



The Fundy Model Forest's greatest strengths are its partnerships and the commitment of its many volunteer participants and administrative staff. Natural Resources Canada provides base funding and many other contributions to this great experiment in public participation in forest management.

Another of our strengths is the diversity of Fundy's landowning partners: the New Brunswick Department of Natural Resources; the Southern New Brunswick Wood Co-operative, representing 3,500 woodlots in the Fundy Model Forest area; Fundy National Park; and J.D. Irving, Limited. Such a diverse and complex ownership pattern is unique among the 11 Canadian model forests.

Take time to read our book on achievements of the Fundy Model Forest. We believe that we have a good story to tell. Our partners are strong believers in the concept and practice of model forests, and are now actively working toward what comes after our current phase ends in 2007. While still under development, planning has begun on expanding the model forest concept to include more than just the forests – perhaps model landscapes encompassing agricultural land, rivers and streams. Time will tell.



I would like to thank and pay tribute to the tireless volunteer partner members who have invested countless hours into helping the Fundy Model Forest achieve its many successes. Our most important asset is our people.

David MacLean  
President, Fundy Model Forest





## Who we are

*An atmosphere of mutual respect and understanding.*

We are forest managers, woodlot owners, scientists, environmentalists, First Nations, teachers, hunters, anglers, government agencies, recreational and community groups, united by a common commitment to healthy forests for future generations through sustainable forest management and conservation of biodiversity.

The Fundy Model Forest provides a forum where individuals and member organizations can share their values, knowledge and resources in an atmosphere of mutual respect and understanding. We have different – and sometimes conflicting – perspectives on the social, economic and environmental dynamics of the forest. All of these views are necessary to make informed and fair decisions about how to best manage our woodlands. This dynamic partnership currently encompasses 38 organizations, up significantly from the 20 organizations we started with in 1992. And we are still growing.

Through sharing, our partners have a direct link to the cutting edge of forest knowledge and management and a strong voice in discussions on the future of our forests.

Together, we carry out research relevant to day-to-day forest operations, develop new ideas and tools, test new decision-making processes and try new forest management techniques. Our shared effort is designed to ensure our forests continue to be a strong economic resource, while conserving biological diversity, maintaining the environment and social values.

Because land owners are among the voices at the table, the Fundy Model Forest partnership has been successful in seeing emerging tools and techniques become a part of everyday work in the woods.



We are located in southeastern New Brunswick and the landbase encompasses approximately 420,000 hectares. The landscape is a mix of forests and farms, with a coastal area along the Bay of Fundy.

Since 1992, the Fundy Model Forest has conducted more than 350 projects in the areas of scientific and social research, communication, education and sustainable forest management practices. Our partners in the federal and provincial governments provide a vital corridor along which innovative practices can flow to influence public policy.

Through sharing, our partners have a direct link to the cutting edge of forest knowledge and management.

All the knowledge and processes developed within the Fundy Model Forest are shared with the forest community across Canada through the Canadian Model Forest Network and beyond through the International Model Forest Network. As a result, new broad partnerships continue to be formed, accelerating innovation.

Our partnership model was taken to neighbouring Nova Scotia in 1998 with the development of the Nova Forest Alliance as an adjunct to the Fundy Model Forest. Nova

Forest Alliance officially became one of Canada's model forests in 2002. In turn, the Prince Edward Island Model Forest Network Partnership was launched as an adjunct to the Nova Forest Alliance, carrying the model further in the Acadian forest region.

By finding solutions to local challenges, the Fundy Model Forest is helping find solutions to global challenges.



## The Canadian Model Forest Network

During the Rio Earth Summit in 1992, Canada demonstrated international leadership in environmental stewardship by launching one of the world's largest experiments in sustainable forest management, the Canadian model forests. In an era driven by environmental awareness and social change at the grass roots level, it had become clear that people, whose daily lives are affected by forest management, had to be included in decision-making. It was also clear that no one single formula would work in all situations.

The Canadian Forest Service of Natural Resources Canada envisioned a living laboratory where people who had a direct interest in the forest, supported by the latest science and technology, would become partners in sustainable forest management decisions. The new model forests would gather and apply the knowledge, perspectives and resources of all the forest stakeholders in a community.

Ten model forests were created in almost every province and forest region in Canada. Each brought together diverse partners, some of whom had been in conflict until this time. There are now 11 model forests in Canada and three special project areas.

These partnerships continue to address the challenge of balancing the extensive demands placed on forests today with the needs of future generations. As part of the Canadian Model Forest Network, our partnership is able to contribute to, and learn about, sustainable forest management within a national context. The network also brings together hundreds of partners that are involved with one or more model forests across the country.

The Canadian Forest Service has provided core funding to the individual model forests and leadership to the Canadian Model Forest Network. Except for a small administrative staff, all those involved in individual



model forests donate their time and expertise, and often bring additional financial support.

Canadian Forest Service scientists, along with researchers from the University of New Brunswick and Université de Moncton as well as the NB Department of Natural Resources, the Greater Fundy Ecosystem Research Group and Fundy National Park have contributed greatly to Fundy Model Forest research projects.

*"I am proud of our scientists' commitment and contributions to projects with the Fundy Model Forest. Together, we have achieved some remarkable results. But even more remarkable is Fundy's success in bringing together a diverse partnership – this dialogue on sustainable forest management would not have happened were it not for the Fundy Model Forest."*

*Director General Dr. John E. Richards,  
Canadian Forest Service Atlantic*



## INTERNATIONAL MODEL FOREST NETWORK

When the International Model Forest Network celebrated its 10th anniversary in 2005, there were 39 sites in existence or under development, around the world. With an aggregate landbase of more than 30 million hectares and a global reach of nearly 1,000 partner organizations, the model forest approach can easily be considered the largest sustainable forest management initiative in the world.

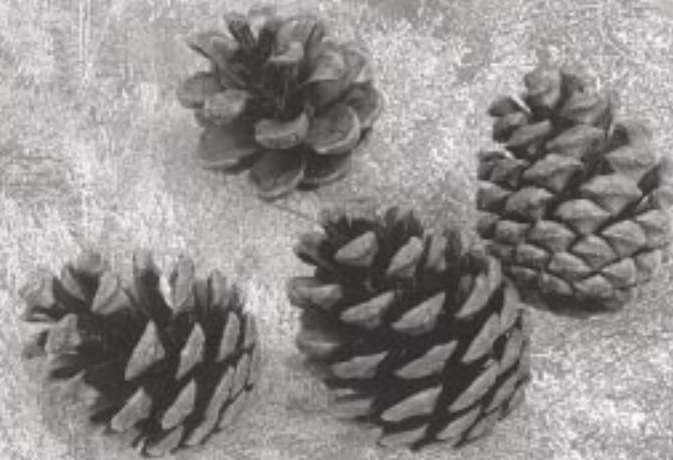


# KNOWLEDGE

filling in the gaps



*Sustainable forest management advances are rooted in knowledge and demonstration.*



*Sustainable forest management advances are rooted in knowledge and demonstration. Our partners contribute resources and knowledge, increasing the research and innovation capacity of each.*

The Fundy Model Forest provides a vital opportunity for academic researchers and forest managers to exchange ideas in the pursuit of applicable solutions to operational challenges. Social sciences, as well as the traditional sciences and economics, are included in the exchange. Universities, the Canadian Forest Service, other government agencies, and non-government agencies all have opportunities to work together. The diversity of the partnership helps make the research results more relevant to those who use the information.

While the model forest contributes funding to research projects, the science is done by individual partners.

The Fundy Model Forest carries the results to partners and beyond, serving as a clearing house for forestry information. We share our reports and publications with agencies and individuals not only here in New Brunswick, but also across Canada and internationally.

Each year, we carry out approximately 15 to 29 projects along three broad themes – ecological research, education/extension, and sustainable forest management – or under the communications and outreach umbrella. These projects are the vehicles that generate knowledge, tools and processes.



## ECOLOGICAL RESEARCH

The Fundy Model Forest strives to understand biodiversity from its building blocks (genes), through individual species, to broader scales (landscapes) – all of which are intimately linked. For example, genes determine the physical form of species, while the pattern of the landscapes (their habitat) may affect the persistence of genetic diversity in some species.

We have carried out a number of projects that investigate biodiversity, looking at the impact specific species exert on the forest and, conversely, how various forest management practices affect them. The subject matter has included:

- genetic resistance in American beech to beech bark disease
- habitat requirements for species of birds, mammals and plants
- impact of different harvesting methods on forest floor vegetation
- monitoring water and soil quality and fish habitat
- a gap analysis of ecologically significant sites
- sensitive sites
- old growth and pre-European settlement forests

Results from these studies have been used to develop and implement best management practices to guide forest workers and managers.

knowledge filling in the gaps



Through project work, the Fundy Model Forest has provided land owners with tools for stewardship, including conservation guidelines and information on new programs.

Researchers are also undertaking several long-term projects to determine the effect of forestry and the breaking apart of habitat (fragmentation) on the requirements of some forest birds, small mammals, amphibians and forest floor plants. Our understanding of the ecosystem is critical to our understanding of these processes, which take place over a long period of time. As the model forest explores effects at the stand and greater landscape levels, research results continue to add

to the knowledge forest managers use in their complex decision-making processes.

One of the strengths of the model forest is its ability to link research to those who are living and working on the ground and to give those in forest communities access to the latest innovations in sustainable forest management.

*"Based on the information we are gradually accumulating, we can suggest changes that could increase conservation in a working forest. We can try new approaches, or small changes to old approaches, and see what works."*

*Dr. Kate Frego, botanist,  
University of New Brunswick Saint John*

## Criteria and Indicators

The pursuit of sustainable forest management requires ongoing assessment of impacts and changes resulting from forest management practices and other activities. Criteria and indicators of sustainable forest management allow for the measurement of progress at different scales, from international to local.

Five years (1997–2002) of the Canadian Model Forest Program were primarily devoted to examining criteria and indicators related to sustainable forest management as put forth by the Canadian Council of Forest Ministers. Since 1997, each model forest has been involved in selecting, measuring and reporting on local level indicators developed to suit its own local and regional conditions.

The Fundy Model Forest has successfully gathered data, and set in place protocols for measurement of local indicators to determine how effectively current forest management is protecting biodiversity and to identify gaps in knowledge. By doing so, the model forest is able to direct its research strategically to the species and processes that are under the most threat and for which the least is known.



This valuable information has been compiled in a publication entitled "The Fundy Model Forest Report on the Status of Local Level Indicators of Sustainable Forest Management". It provides baseline information for measuring progress towards sustainable forest management. Coupled with ongoing research on birds, tree islands, and indicator species, this work has contributed to the knowledge regarding local level indicators and thresholds for forest management on Crown lands.

Efforts to design and implement a management strategy have resulted in many changes on the part of land managers/users in the forest. The Fundy Model Forest partnership approved guidelines for sustainable forest management several years ago. However, the model forest does not have jurisdiction over any landbase. Implementation of the guidelines is occurring through planning decisions that various land owner/managers are making and those decisions are affected by the knowledge gained through the monitoring of indicators. In effect, values and best management practices identified as a result of the planning exercises are being incorporated across the landbase where possible. Researchers continue to monitor indicators, which contributes to the update of best practices. Continued monitoring will help guide those practices into the future.

## COMMUNICATION/ EDUCATION/EXTENSION

Each year the Fundy Model Forest conducts public information sessions, tours, demonstrations, meetings, workshops and other events to take the knowledge gained through project work to as many sectors of society as possible. Many outreach events are tailored to meet the needs of specific audiences, such as forest workers interested in proper operational techniques for working in a woodlot. Others are developed for a broad public audience to increase understanding of sustainable forest management.

## DEMONSTRATION SITES

In the first few years of the model forest program, we selected several demonstration sites to provide the public and small private land owners with the opportunity to witness the practice of environmentally sound, multiple land use management.

These sites continue to serve as dynamic examples of the options and practices available to private woodlot owners, as well as demonstrate their benefits to society.

Many Fundy Model Forest partners, specific interest groups, and the public visit these sites that are managed for distinct and different objectives. Some are managed to enhance summer and winter recreation, while others highlight wildlife, rare or endangered species, timber harvesting or aesthetic and spiritual values.

Over time, more sites have been added illustrating conservation, outdoor education for students, and municipal ownership. These sites have moved beyond simply showcasing management choices and good stewardship to giving insight into complex landscape-level management challenges. They also display the many uses or values facing land owners. They provide a visible link between land owners, their options, and the consequences of their actions at local, regional and international levels.

With this diverse slate of sites, the Fundy Model Forest has been able to host visitors interested in issues ranging from private land ownership to scientific research on wildlife and the impact of forest harvesting. Many

international delegations request site visits to see the practical application of sustainable forest management concepts.

## TRADITIONAL KNOWLEDGE

An important part of the Fundy Model Forest's collective knowledge is provided by our First Nation partners. Workshops were held in 1996 and 1998 to share traditional information and knowledge and to make our partners aware of how important forests are to aboriginal culture. A project was undertaken to demonstrate why maintaining black ash is critical to traditional basket-making. It also demonstrated why these values needed to be incorporated into forest management planning to ensure that black ash continues to grow in its traditional grounds.



Other work identified medicinal plants and traced portage routes and cultural sites, showing how the First Nation people traveled and used the landscape.

Our First Nation partners help us create a more complete picture of sustainable forestry and community development for New Brunswick.

Two New Brunswick Aboriginal communities, Eel Ground and Red Bank, are partners in the Fundy Model Forest. In 2003 the Fundy Model Forest Board of Directors added a First Nations seat to the executive committee, which oversees day-to-day operations of the model forest.

**Red Bank (Metepenagiag) First Nation** is home to two national historic sites and is the oldest occupied village in New Brunswick.

**Eel Ground (Natuaganek) First Nation** actively manages 2,850 hectares of forested land and has just achieved Forest Stewardship Council certification.

*"When we have something to say or have an idea, generally the Fundy Model Forest is there to listen and to help in whatever manner possible."*

*Steve Ginnish, forest development officer of Eel Ground First Nation*





## REACHING THE NEXT GENERATION

Exposing young people to forest ecology and natural resource concepts is an important step in helping them become tomorrow's informed decision-makers. Each year, various programs are directed at schools, Boy Scouts, Girl Guides, and other youth groups. As well, students from several universities are actively involved in research projects and academic researchers often teach about the Fundy Model Forest and its approach.

## OUTDOOR EDUCATION FOR NB SCHOOL DISTRICT 6

Partners: Elmhurst Outdoors  
Fundy Model Forest  
NB Wildlife Trust Fund  
Mountain Equipment Co-op  
Shell Environmental Fund  
NB School District 6

Outdoor Education for NB School District 6 is an excellent example of involving students and teachers in a hands-on way with the forest. Classes visit a teaching woodlot, where the relationship between the school science curriculum for Grade 4 called "Healthy Habitats" and the real forest is emphasized. Concepts are explained and demonstrated through games, activities, and hikes. Students and teachers alike respond to being able to touch, smell, hear and experience the outdoors.

*"I like the opportunity the Fundy Model Forest presents for me to do more with outdoor education – to spread the word about sustainable forest management and environmental ethics."*

*Gig Keirstead, educator and woodlot owner.*

## SUSTAINABLE FOREST MANAGEMENT

Sustainable forest management is constantly evolving – or adapting – as forest managers learn more, try out new tools and technology, and adopt those that prove useful.

The Fundy Model Forest plays an important role in this process by providing a forum for different interest groups to exchange ideas as they work together to find solutions to the complex challenges of sustainable management.

The Fundy Model Forest has facilitated the development of technological tools by its partners that have become part of the regular suite of resources used by forest managers. Samples of these are featured throughout this booklet. The model forest plays an important role in distributing these products and/or providing information about them to forest managers and others in forestry.

Researchers have studied how the forests have changed since European settlement. Armed with the knowledge of what has happened, what has resulted, and what exists on the landscape today, forest planners can influence the type of forests that will grow in the future. Consequently, they can influence the biodiversity and sustainability of those forests.

Social values are a pillar of sustainable forest management. We support social scientists and economists as they try to ascertain what values different people place on the forests. Many of these values have no monetary association and are difficult to quantify. This work is particularly important to woodlot owners in demonstrating how their efforts benefit society.

## FORESTRY BEST MANAGEMENT PRACTICES AND WATER QUALITY VIDEO

Various government departments in southern New Brunswick and the Southern New Brunswick Wood Co-op have used this video. As woodlot owners and forest companies work towards certification, the video is being used in training sessions for contractors.

## PLANNING ACROSS THE LANDSCAPE

Ten years ago, woodlot owners managed their lands in isolation from neighbouring properties. Today, they are beginning to look at management on the landscape/watershed level, taking into account wildlife habitat and ecological features shared with neighbouring properties.

In recent years, several woodlot owners in the Pollett River area of southeastern New Brunswick have been participating in the Watershed-Based Woodlot Management Planning Project. This project has been described in a number of publications and presented at numerous workshops across Canada as a successful example of cooperation and implementation.

Just as individual woodlots do not exist in isolation, neither does forestry. In 2004, the Fundy Model Forest hosted a regional conference, Water Quality and Integrated Watershed Planning: Charting the Future. This event recognized that all users of water, from foresters to those dealing with municipal sewage treatment, must be included in planning to protect water quality within a watershed. After two days of presentations and field trips, delegates participated in a mock planning session, incorporating the requirements of different land users into a watershed strategy. Participants found this particularly useful and the Fundy Model Forest later hosted a one-day workshop for watershed groups around the province to provide them a similar learning opportunity.

This conference was sponsored by J.D. Irving, Limited; New Brunswick Department of Environment and Local Government; National Council for Air and Stream Improvement (NCASI); Fundy Model Forest and the Canadian Model Forest Network.

The Fundy Model Forest sees sustainable forest management as a driver for sustainable community development. Two partners are non-profit organizations determined to contribute to the growth of their communities. The Elgin Eco Association and the Washademoak Environmentalists strive to educate and demonstrate to their communities how working together with mindful use of resources – forests, farms,



local groups, natural sites, historic and cultural elements – will ensure the natural well-being, as well as the economic well-being, of these beautiful areas.

*"The ideals of the model forest are crucial to the survival of small communities and especially our community of Elgin which is surrounded by the Acadian forest. We started the Elgin Eco Association to preserve and protect these beautiful areas. We would like to see them managed properly to preserve them for generations to come. We also envision frequent hiking, biking and walking tours to teach people about our forests and to give them a better understanding, appreciation and respect for our natural areas. To accomplish these goals, we were excited to become a partner of the Fundy Model Forest and we hope this will continue in years to come."*

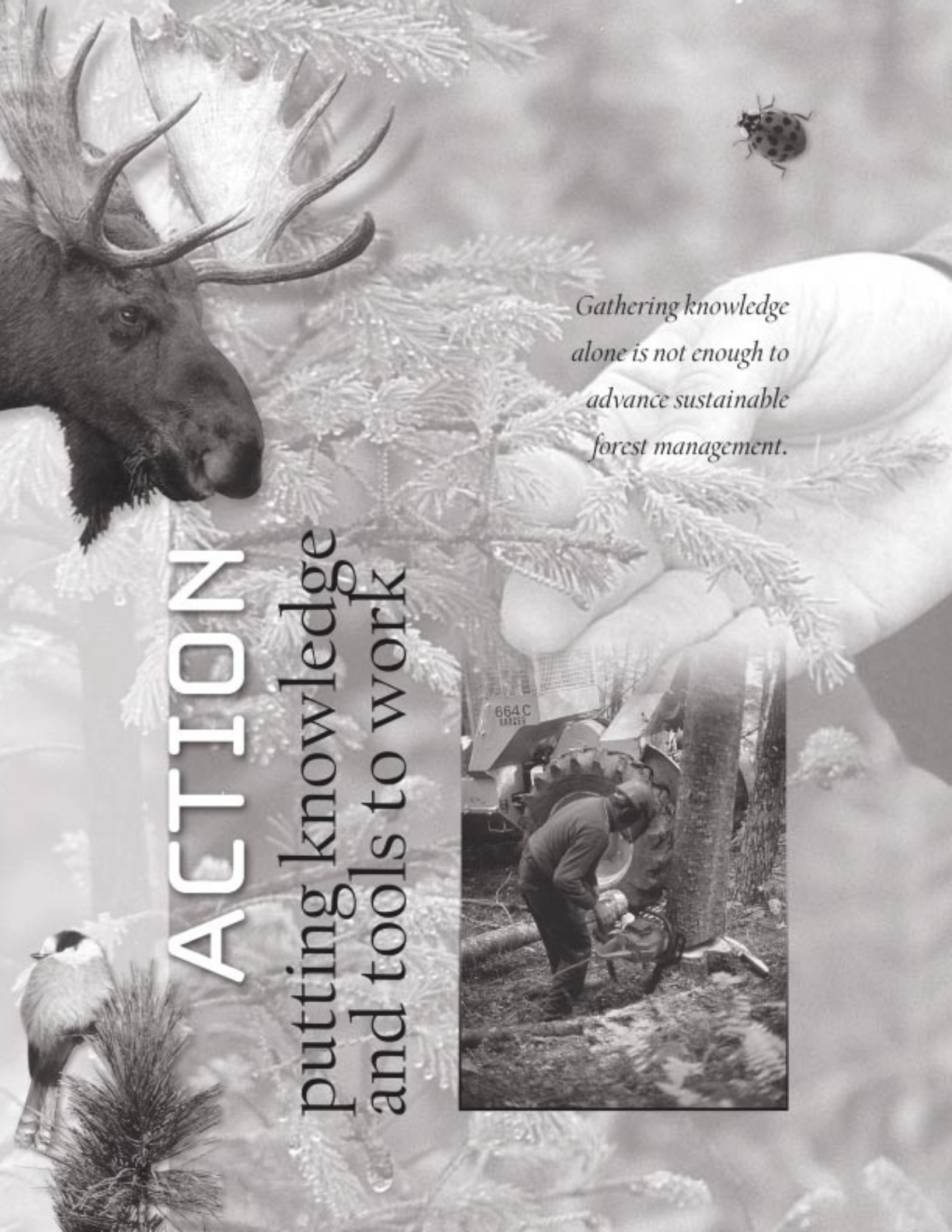
*Moranda van Geest, president of the Elgin Eco Association.*

## PROJECT: WATERSHED-BASED WOODLOT MANAGEMENT PLANNING

**Partners:** Greater Fundy Ecosystem Research Group  
Fundy Model Forest  
Southern New Brunswick Wood Co-operative

**Description:** This project provides a method for addressing both the need for landscape level biodiversity conservation and local participation in decision-making. Landscape level forest management for wildlife habitat requires a high degree of local woodlot owner participation. Currently, woodlot management in southern New Brunswick reflects the fragmented nature of land ownership. Often there is little knowledge among woodlot owners of neighbouring owners' objectives, which makes planning for deer wintering habitat, wildlife corridors and other habitat patches nearly impossible.





# ACTION

putting knowledge  
and tools to work

*Gathering knowledge  
alone is not enough to  
advance sustainable  
forest management.*



*Gathering knowledge alone is not enough  
to advance sustainable forest management.  
Research results must be shown to be of value  
through practical application.*

## J. D. IRVING, LIMITED (JDI)

J.D. Irving, Limited manages both freehold and Crown land. The freehold land accounts for 17 per cent of Fundy Model Forest's landbase while Crown Licence 7 accounts for 15 per cent. The company continues to be closely involved in the model forest at the committee and executive levels.

For JDI, one of the strengths of the Fundy Model Forest has been the continued dialogue among key partners. This has resulted in ongoing improvements to various aspects of forest management:

- The Fundy Model Forest collaborated with JDI and the Nexfor/Bowater Forest Watershed Centre at the University of New Brunswick on a pilot project to produce high resolution soil depth-to-water-table maps for the entire model forest. This initiative proved very successful. Since 2003, all of New Brunswick has been mapped using this protocol. In addition, depth-to-water table mapping of all of Nova Scotia, most of the State of Maine and 500,000 hectares in Alberta will be completed in 2006.

Bridging the gap between innovation and adoption is the key to change. One of the main objectives of the Fundy Model Forest is to implement what has been learned – "to get it on-the-ground."

Since a model forest has no jurisdiction over the land it uses as a testing ground, the partners representing land owners are vital in achieving this goal. Because they are involved in the development of new approaches and solutions for sustainable forest management, land owners/managers have an increased willingness to adopt many of the ideas. At the same time, other stakeholders are more apt to positively receive these adaptations because they, too, have been a part of the discussions.

There are four types of land ownership within the Fundy Model Forest: Crown land, industrial freehold, private woodlots and a national park. Just as each contributes to the model forest, each has found benefits.







- This tool is being used in planning, harvesting, road construction and silviculture operations in all JDI operating districts where the maps are available. Future work in the model forest will be related to linking this new high resolution water table information with the NB ecological land classification maps. (Ecological land classification and depth-to-water table mapping are detailed in the next chapter.)
- The Fundy Model Forest has helped support a number of projects related to understanding the role of managed stands in providing habitat for plant and animal species. JDI, in consultation with its Forest Research Advisory Committee, has identified this as a significant knowledge gap. Research was initiated a decade ago on vascular (ferns and shrubs) and non-vascular (mosses and liverworts) plant populations following harvesting and subsequent silviculture operations. This work has evolved to also assess the value of leaving some live and dead trees behind in harvested areas to enhance survival of certain plant species.
- In 2004, the Fundy Model Forest further partnered with JDI, the University of New Brunswick and the Université de Moncton to successfully apply to the Sustainable Forest Management Network Centre of Excellence for a more ambitious, three-year research program to better understand stand dynamics and the role of a wide range of species in both plantations and naturally regenerated managed stands.
- Fundy National Park, also a partner, started an initiative to engage other land owners and stakeholders in discussions on habitat stewardship related to endangered populations of Inner Bay of Fundy Atlantic Salmon. JDI is participating in this venture.

The Fundy Model Forest continues to provide a good forum for discussion of forest management through the eyes of its varied partners. It has recognized its role in facilitating discussion and supporting important research efforts to lead to better science-based decision making in forest management.

*"J.D. Irving, Limited is pleased to be a founding partner of the Fundy Model Forest."*

*Blake Brunsdon, chief forester, J.D. Irving, Limited*



## FUNDY NATIONAL PARK

Fundy National Park plays a unique role in the Fundy Model Forest. The only landowning partner that does not carry out any forestry operations, the park has a different perspective on the value of the Fundy Model Forest. It has provided the vehicle for the park to talk to its neighbours.

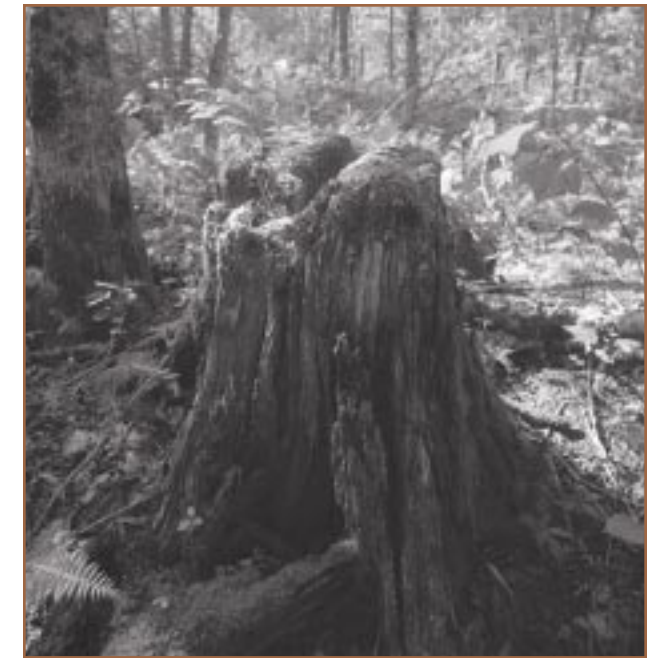
As a member of the partnership, Fundy National Park has learned and applied a number of lessons:

- Parks Canada is moving from consultation of stakeholders to effective involvement of stakeholders in shaping the vision for heritage areas and in managing these special places. Fundy Model Forest, as a multi-agency /multi-level partnership, can play a role in this. For this reason, Parks Canada invited the Fundy Model Forest to review and comment on the management plan for Fundy National Park. Comments were incorporated into the 2006 Fundy National Park

Management Plan, providing Parks Canada with clear support from a larger non-traditional stakeholder audience.

- Parks Canada and Fundy National Park have initiated a review of Fundy National Park's State of the Park Indicators. A number of indicators (northern flying squirrels, American martin and remote sensing for detection of ecosystem changes) have been selected on the basis of work initiated with the support of the Fundy Model Forest and the Canadian Model Forest Network initiatives. The park ecologist is actively working at the committee level to gain a better understanding of threshold levels and indicator suitability. As this is an ongoing process, the park plans to continue asking for advice and review by the Fundy Model Forest partners prior to completion of its final monitoring plan.
- The partnership model has led to the development of an ad-hoc committee for the development of watershed evaluation tools for the protection and recovery of Atlantic salmon and their critical habitat. The

committee has brought together land managers, research scientists, First Nation and recovery team members. The group is developing greater understanding of the challenges facing the endangered Inner Bay of Fundy Salmon and also preparing for the implementation of critical habitat protection under the Species at Risk Act.



*"Our view of how the landbase has to be managed has shifted; the landbase cannot be broken up into land ownerships, it has to be managed for the whole region. We now know that at Fundy National Park we cannot manage for ecological integrity internally, we need to have input and cooperation from our neighbours."*

*Edouard Daigle, manager of resource conservation for Fundy National Park*

## NB DEPARTMENT OF NATURAL RESOURCES (DNR) – CROWN LAND

The real strength of the model forest is in the connections, openness and inclusiveness of the partnership. It is an engine that empowers the partners to work in new ways, to coordinate and integrate their efforts, and to have more capacity and resources available to them. The connections of the partnership are crucial for sustainable forest management. For instance, connections:

- among land owners and forest managers affect decision-makers on-the-ground;
- among researchers, environmental interests, the public and land owners enable two-way communication and information sharing, and
- between the provincial and federal governments improve coordination and the capacity to address issues and commitments across jurisdictions.



These connections are valuable to the Department of Natural Resources beyond the realm of the model forest in meeting the province's commitments on biodiversity, fish and wildlife, forests and environment at the provincial, national and international levels. The model forest also fosters meaningful connections with the public on social and environmental values. The Fundy Model Forest has contributed and continues to contribute to planning and decision making of the Department:

## RESEARCH

- Results from studies from the Hayward Brook Watershed Project were used in forest management planning and setting buffer zones on Crown lands.
- Research into local level indicators contributed to the indicators and thresholds used on Crown land. The research improved the level of knowledge, provided baseline information and demonstrated a reporting framework. Integrated, long term research and monitoring relating to DNR interests were also facilitated. The role of the model forest in fostering strong research networks and sharing information is important to the department, too.

## BEST MANAGEMENT PRACTICES: A PRACTICAL GUIDE FOR NEW BRUNSWICK'S PRIVATE WOODLOTS

Partners: INFOR Inc.  
Sustainable Forestry Initiative  
Fundy Model Forest

This is a pocket-sized field guide for woodlot owners.

- The Greater Fundy Ecosystem Research Group's State of the Greater Fundy Ecosystem report and biodiversity guidelines have identified ecological concerns and been considered by DNR in its planning and conservation strategies.

## REMOTE SENSING TOOLS

Partners: University of Calgary  
University of New Brunswick Fredericton  
Canadian Forest Service  
Fundy Model Forest

Remote sensing application for change detection was developed and tested through the Fundy Model Forest. This led to the development of a Users' Guide. The New Brunswick Department of Natural Resources did additional testing in the Bathurst area.

## MAPPING

- The Ecological Land Classification (ELC) system developed by DNR was piloted in the Fundy Model Forest. The model forest and its partners have been instrumental in the system trials, and in developing and using new applications and interpretive tools (e.g. J.D. Irving, Limited harvest prescriptions and Agriculture Canada soil mapping).
- J.D. Irving, Limited led the development of the depth-to-water table model in collaboration with the University of New Brunswick and the Fundy Model Forest. DNR has implemented the water table mapping to generate more accurate soil and site maps for province-wide forest management planning on both Crown and private lands. The department considers the implementation of the ELC and water table mapping by J.D. Irving, Limited in the model forest area and the potential for use by other forest and land use managers as an extremely important outcome facilitated by the partnership.

A forum where individuals and member organizations can share their values, knowledge and resources in an atmosphere of mutual respect and understanding





## WATERSHED LEVEL PLANNING

- The departments of Natural Resources and Environment and Local Government have a strong interest in watershed based planning and have supported implementation projects. For example, the Department of Environment and Local Government was a major sponsor of the conference, Water Quality and Integrated Watershed Management Planning: Charting the Future, hosted by the model forest. The partnership's watershed planning projects have nurtured development of a cooperative framework for researchers, woodlot owners, the Southern NB Woodlot Co-operative, and other partners to work together in implementing watershed and forest planning.
- The management plans that are being completed for private woodlot owners participating in the watershed planning project in the Pollett River area and conservation projects on private land are important to the department's biodiversity strategy and especially to



the development of forest management expertise and certification for private woodlots. The model forest enables the department to be actively involved in projects that support its commitments to sustainable forest management and biodiversity on private, as well as Crown lands, across the province.

## PRIVATE FOREST LAND INITIATIVES

- Since the DNR extension program ceased in 2000, the activities of the Fundy Model Forest regarding woodlots are all the more important in supporting sustainable forest management. The department has produced insect and disease information for the public through the model forest and continues to support other partnership activities related to private woodlots. It also supports INFOR Inc., an agency providing education and training to woodlot owners, maple syrup producers and Christmas tree growers.
- The Department of Natural Resources supports certification and training for woodlot owners and contractors. The Fundy Model Forest, in partnership with the SNB Wood Co-operative, has delivered education courses for woodlot owners. It also provides support for certification, demonstration woodlots, forest management planning and public education.

*"For nearly fifteen years, the model forest has provided a true "working model" for partnership and for building the capacity for sustainable forest management. The model forest's accomplishments in delivering watershed planning, demonstrating GIS mapping applications, integrating and supporting scientific research, and, supporting forest management planning and certification of private woodlots are remarkable. My department is honoured to be a part of the partnership and its accomplishments."*

*Honourable Keith Ashfield, Minister of Natural Resources*

## SOUTHERN NEW BRUNSWICK WOOD CO-OPERATIVE (SNB)

SNB represents the private woodlot sector of the Fundy Model Forest, which accounts for 63% of the landbase. SNB represents 8,000 woodlot owners overall. Approximately 3,500 woodlots are in the model forest area. There are obvious challenges in implementing sustainable forest management practices on such a large landbase with so many land owners:

- SNB has faced challenges in educating its membership, both in providing knowledge and increasing understanding of sustainable forest management. With the assistance of the Fundy Model Forest, educational program delivery has now become the norm in the off season; more than 200 private woodlot owners/contractors have taken a best management practices course over the last two years. As well, SNB has a number of model woodlots that are used successfully as demonstration areas to help educate other woodlot owners and the public.
- The SNB Working Woodlot Program has expanded from 40 to more than 600 woodlots. Land owners in this program have committed to following sustainable forest management practices and are monitored. SNB and the model forest provide them with the information and expertise necessary to manage their woodlots sustainably for many values. SNB Wood Co-op has been actively participating in the development and implementation of the Pan Canadian Certification system and the Working Woodlot Program is the vehicle to achieving this certification. The Fundy Model Forest has been directly and indirectly involved in the evolution of this process.

- Internally, and in cooperation with programs at the Fundy Model Forest, SNB encourages harvesting practices other than unjustified clear-cut harvesting. The Fundy Model Forest provided GIS support to develop yield curves to analyze the private wood supply and determine the annual allowable cut. The limits of the resource base are now better understood and SNB is able to appreciate and address other values in addition to wood supply, such as habitat conservation.

*"Two of the Fundy Model Forest's core values are: Bringing people together, people with diverse and sometimes competing interests; and developing practical strategies for better integrating all three "legs" of the sustainable development "stool": environmental, economic and community.*

*These two values are very dear to woodlot owners' hearts.*

*Over the past two years, we have had an opportunity to work with Fundy Model Forest as partners in The Canadian Model Forest Network's Private Woodlot Strategic Initiative. This has given us very direct experience of Fundy Model Forest's capacity to push the limits of conventional wisdom in these two areas.*

*Forestry and rural communities in New Brunswick have a great need for the spirit of innovation shown by Fundy Model Forest.*

*The New Brunswick Federation of Woodlot Owners looks forward to continuing to collaborate with Fundy Model Forest on this important work."*

*Peter deMarsh, manager of the  
New Brunswick Federation of Woodlot Owners and  
president of the Canadian Federation of Woodlot Owners*





# CHANGE

## advances in sustainable forest management

*Land owners/managers have applied relevant knowledge and practices successfully in their decision-making and planning.*



*and owners/managers have applied relevant knowledge and practices successfully in their decision-making and planning within the model forest.*

In some cases, the knowledge and tools have been adopted far beyond the Fundy Model Forest's boundaries. The Fundy Model Forest provided the opportunity to test these at the operational or ground level and it has contributed to the body of scientific knowledge upon which new policy is based.

Ecological land classification, wet area mapping, and buffer zones have contributed significantly to the advancement of sustainable forest management in the Acadian forest region.

### ECOLOGICAL LAND CLASSIFICATION

Partners: NB Department of Natural Resources  
Fundy Model Forest

In 1995, an ecological land classification system developed by the New Brunswick Department of Natural Resources was piloted in the Fundy Model Forest. Ecological land classification or ELC is a process of mapping and describing ecosystems (areas of land that support homogenous forest composition). It provides a systematic framework to understand what grows where and why.

The pilot project presented – for the first time – detailed maps and information on the forested ecosystems of southeastern New Brunswick to assist with the interpretation and management of natural resources.

J.D. Irving, Limited adopted the ELC in establishing harvesting prescriptions by ecoregion. The ecological land classification system was also incorporated into the management of private lands through the SNB Wood Co-op.

### DEPTH-TO-WATER-TABLE MAPPING

Partners: J.D. Irving, Limited (NB, NS, Maine)  
Fundy Model Forest  
New Brunswick Forest Products Association  
New Brunswick Department of Natural Resources  
Nova Scotia Department of Natural Resources  
Nova Forest Alliance  
Co-operative Forestry Research Unit, University of Maine  
Albert Department of Sustainable Resource  
Millar Western (Whitecourt, Alberta)

Depth-to-water-table mapping, which digitally shows the depth of the water table below the ground surface, is important for the formulation of best forest management practices. For example, where the water table is close to the surface year round, soils generally flood during wet weather. Even in dry weather, such soils are generally too soft for forest operations.



change advances in sustainable forest management



Such places are common in wetlands and also occur frequently in areas immediately next to ponds, lakes, and streams, as well as in areas of limited soil drainage.

Until recently, forest managers and operations planners lacked tools to systematically locate wet soils across forested and non-forested landscapes with reasonable certainty. However, operating on drainage-challenged soils at the wrong time of year leads to deep and unsightly ruts, erosion and soil compaction, and discourages forest regeneration.

Researchers at the Nexfor/Bowater Forest Watershed Research Centre at the University of New Brunswick in Fredericton generated new computerized, depth-to-water-table maps and piloted them in partnership with J.D. Irving, Limited and the Fundy Model Forest.

The pilot project was so successful, the New Brunswick Department of Natural Resources and the New Brunswick Forest Products Association funded the development of maps for the entire province. This mapping tool is now being adopted in Nova Scotia, Alberta and the State of Maine. It can be applied in other jurisdictions where appropriate data exists.



The generation of the depth-to-water table maps led to the creation of new drainage maps within the Fundy Model Forest. These maps, too, were extended throughout New Brunswick where needed. The project has continued to evolve, with new species suitability maps for planting trees being developed based on the new drainage classes. This is expected to increase productivity as well, with the most suitable species being planted in the right sites.

### CONSERVATION GUIDELINES FOR ECOLOGICALLY SENSITIVE FORESTED SITES ON PRIVATE WOODLOTS WITHIN THE FUNDY MODEL FOREST

Partners: Canadian Forest Service  
Nature Conservancy of Canada  
Southern New Brunswick Wood Co-op  
Fundy Model Forest  
New Brunswick Wild Life Council Trust Fund  
New Brunswick Environmental Trust Fund  
Environment Canada: Action 21.  
New Brunswick Department of Natural Resources  
Nature Trust of New Brunswick

A manual for technicians working with the SNB Wood Co-operative, NB Department of Natural Resources staff, and woodlot owners who wish to identify and manage these sites.

The depth-to-water-table maps are being used to refine the ecological land classification system. Greater accuracy in management decision-making and growth and yield data is expected as a result.

Forest companies and natural resources staff are using depth-to-water-table maps as the base for detailed field reconnaissance of wet areas and unmapped flow channels, and for operation planning, including designing roads, access trails, and cutblocks.

They are also used in planning post-harvest operations, such as tree planting, site preparation and other silvicultural interventions. The maps are, in principle, also useful for province-wide soil erosion assessments (done in combination with the latest surface images, revealing mineral soil exposures), stream and shoreline stability mapping, and visualizing likely source-sink pathways of pollutants (sediments, nutrients, chemicals).

### BUFFER ZONES

The New Brunswick Clean Water Act was enacted in 1993, prohibiting harvesting within 30 meters of a watercourse. When the Act passed, forest managers questioned whether there was enough science behind the regulation. Their skepticism sparked a multi-disciplinary study, the Hayward Brook Project, which allowed researchers to measure the impact of different harvesting regimes. Research results reinforced, with scientific evidence, the 30-metre setback, providing industry with solid proof as to why these guidelines existed.

### DETECTION AND RECOGNITION OF FOREST PESTS CD

Partners: Canadian Forest Service  
NB Department of Natural Resources  
Fundy Model Forest

There has been constant demand for this interactive CD-Rom. Requests for copies have been received from several college and universities, including the forestry branch library of the Food and Agriculture Organization of the United Nations in Rome, Italy.

### THE HAYWARD BROOK WATERSHED PROJECT

Partners: Environment Canada  
University of New Brunswick  
Université de Moncton  
Canadian Wildlife Service  
J.D. Irving, Limited

For more than a decade, the Hayward Brook research site gave scientists the opportunity to investigate how different sized, riparian buffer zones combined with forest practices, affect water quality, wildlife and forest plants.

Participants had a rare opportunity to carry out their studies where forestry operations were taking place.



Hayward Brook enabled them to work collectively and produce scientific results that have had a significant impact on forestry today.

In 1993 scientists from the Canadian Wildlife Service, Environment Canada, Université de Moncton, and the University of New Brunswick began the project. For two years they collected data before any harvesting took place. In 1995 the site was harvested and the impacts of different harvesting regimes were measured.

The Hayward Brook Watershed Project included the following components: fish populations, macro-invertebrates, water chemistry, cavity nesting and breeding birds, bryophyte diversity and plant community regeneration after operational silviculture treatments and buffer zone management.

### CARBON ACCOUNTING MODEL

Partners: Canadian Model Forest Network  
Canadian Forest Service

This computer modeling tool was developed as part of the Canadian Model Forest Network's strategic initiative on climate change in collaboration with the Canadian Forest Service's Carbon Accounting Team. It is a user-friendly operational scale forest carbon budget model that forest managers and analysts can use to assess the impact of their activities on forest carbon stocks and stock cycles. A technical training session held at the Université de Moncton drew delegates from Russia, Japan, the United States and Canada.



Researchers were able to take what they had learned and transfer the knowledge to forest practitioners and decision makers. The Hayward Brook project determined that building roads and water crossings had one of the most significant impacts on water quality. This led to the creation of a water quality video by the Fundy Model Forest, demonstrating how to best construct roads and bridges and how to install culverts. The Forestry Best Management Practices and Water Quality video continues to be used today to train forest workers to operate in a way that maintains water quality and ecological integrity.

It also identified ground (substrate) disturbance as the greatest factor in plant decline, and provided the preliminary data that led to the testing of "tree islands" as lifeboats to preserve sensitive plant populations within a working forest.

As well, a protocol was developed for the use of macro-invertebrates as an indicator of water quality.

Both J.D. Irving, Limited and SNB Wood Co-op have implemented best management practices from the study where appropriate in their operations.

Hayward Brook provided Nova Forest Alliance, Nova Scotia's model forest, with much of the start up and design information for its Pockwock-Bowater Watershed Project.

### STAND DENSITY Management Diagrams

**Partners:** Canadian Forest Service  
USDA Forest Service  
Ontario Ministry of Natural Resources  
J.D. Irving, Limited  
Southern New Brunswick Wood Co-operative  
Fundy Model Forest

Eastern spruce-balsam fir stands form a dominant forest cover type in the Acadian forest region. Often the initial density of these stands requires intensive forest management prescriptions, such as thinning, to obtain the desired timber and non-timber products.

## FORGING NEW PARTNERSHIPS

Management Implications of Forest Dynamics, Succession, and Habitat Relationships under Differing Levels of Silviculture in New Brunswick Forests Project

**Partners:** The Sustainable Forest Management Center of Excellence  
The National Sciences and Engineering Research Council  
Fundy Model Forest  
J.D. Irving, Limited

This international project will bring together researchers from the University of New Brunswick, Fredericton; University of New Brunswick, Saint John; Université de Moncton; and the University of Maine, Orono.

The three-year, \$835,000 project will involve work in the Fundy Model Forest in southeastern New Brunswick and in the Black Brook area in northern New Brunswick.

The overall project goals are:

- To better understand the successional dynamics of this forest, its value as habitat, and the diversity and habitat implications of current management
- To use this understanding to develop and evaluate alternative stand and forest management strategies aimed at maintaining the diversity and habitat values of the forest while supplying an economic supply of industrial raw material

*"This is an important step for the Fundy Model Forest because we are addressing important questions both within and outside our boundaries, and partnering with strong researchers to use Fundy Model Forest funds to lever a large amount of additional research funding from other sources."*

*David MacLean, President of the Fundy Model Forest*

United by  
a common  
commitment to  
healthy forests for  
future generations  
through  
sustainable forest  
management and  
conservation of  
biodiversity



# TAKING THE MODEL FORWARD

*As the Fundy Model Forest moves forward, we must forge new strategic partnerships to tackle the many issues confronting our communities and those who work in our forests.*



*uch has changed  
in the practice of forestry  
since the Fundy Model Forest  
started in 1992.*

As we have demonstrated in this booklet, the model forest, through the efforts of our partners, has played a leading role in the advancement of sustainable forest management in the Acadian forest region.

During the past five years, we, like other model forests, have focused on going beyond our boundaries. The Fundy Model Forest has been reaching out to people and other organizations throughout the province. We have successfully connected with watershed organizations and land-use planning organizations locally and regionally. People from six continents have come to the Fundy Model Forest to see sustainable forest management being practised in everyday working situations and to learn about how the model forest works – what makes it successful.

The role of all model forests has been to provide an opportunity to develop and implement governance structures that incorporate "participatory decision-making" and in turn to put knowledge into practice. The heart of a model forest is its partnership – diverse stakeholders working together. This is the "model" in model forest that visitors come to see and it is a concept that is spreading around the world.

What makes the model forest concept stand out from other like-minded forest-based development initiatives is the comprehensiveness of its approach, its scale of operation, the level of policy it can affect, and the nature and range of partnerships it unites.

The Fundy Model Forest has proven vibrant and adaptable. Our partners can continue to build on what has been learned and been made to work: to put knowledge into practice, to link a wide variety of partners, and to be a proving ground for everything from consultation to computer software.

Given the changes in forest management, our focus is shifting to support the continued social and economic viability of our rural communities. Decisions within the forest sector are based on social, environmental and economic factors. Actions resulting from these decisions reach beyond those who work in the woodlands to affect everyone in the community. The Fundy Model Forest can help communities face the new global economic realities while maintaining what is held dear by those living there.

As the Fundy Model Forest moves forward, we must forge new strategic partnerships to tackle the many issues confronting our communities and those who work in our forests.

*"It has been very gratifying for the Conservation Council of New Brunswick (CCNB) to work with the Fundy Model Forest over the last 15 years. As an original member, our hope was that the various groups constituting the member base would be able to achieve a level of respect for each other, and an exchange of vital information that would help chart a course for future forest sustainability in New Brunswick. To a large extent, that has happened, and CCNB is very pleased to have been part of that opportunity. The research role of Fundy Model Forest is also crucial: the more information we have about the ecology of the forest, the better able we will be to make critical decisions. For both those purposes, we wish Fundy Model Forest many more years of fruitful activity!"*

*Stephanie Coburn, president of the  
Conservation Council of New Brunswick*





**T**he Fundy Model Forest  
appreciates the support of its partners.

# partner list

- Atlantic Society of Fish and Wildlife Biologists
- Canadian Institute of Forestry
- Canadian Forest Service
- City of Moncton
- Conservation Council of New Brunswick
- Eel Ground First Nation
- Elgin Eco Association
- Environment Canada
- Fawcett Lumber Company
- Fisheries and Oceans Canada
- Fundy Environmental Action Group
- Fundy National Park
- Greater Fundy Ecosystem Research Group
- Indian and Northern Affairs Canada
- INFOR Inc.
- J.D. Irving, Limited
- K.C. Irving Chair in Sustainable Development,  
Université de Moncton
- Maritime College of Forest Technology
- NB Department of Environment and Local Government
- NB Department of Natural Resources
- NB Federation of Naturalists
- NB Federation of Woodlot Owners
- NB Premier's Round Table on the Environment & Economy
- NB School District 2
- NB School District 6
- Nova Forest Alliance
- Petitcodiac Sportsman's Club
- Red Bank First Nation
- Remsoft
- Southern New Brunswick Wood Co-operative Limited
- Sussex & District Chamber of Commerce
- Sussex Fish and Game Association
- Town of Sussex
- Université de Moncton
- University of New Brunswick Fredericton  
(Faculty of Forestry and Environmental Management)
- University of New Brunswick Saint John
- Village of Petitcodiac
- Washademoak Environmentalists

The paper stock contains 50% recycled content including 15% post-consumer waste.



Natural Resources  
Canada  
Canadian Forest  
Service

Ressources naturelles  
Canada  
Service canadien  
des forêts

Canada