Insights

A publication of the Ontario Forest Research Institute

Ontario Forest Research Institute
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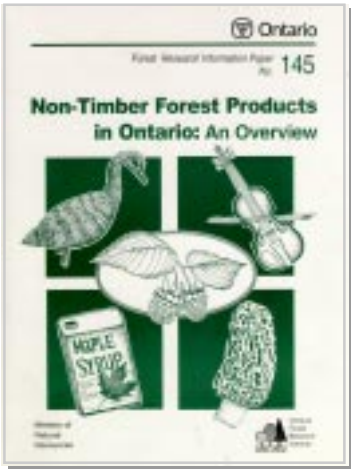
Non-timber forest products provide opportunities, challenges for forest management

By Abigail M. Obenchain

Timber production has always been a cornerstone of Ontario's economy, but now interest in non-timber forest products (NTFPs) is growing rapidly. Does this mean that one day the flower pickers and cone collectors could outnumber the loggers in Ontario's forests?

Not likely, says Gina Mohammed, an OFRI scientist and author of *Non-Timber Forest Products in Ontario: An Overview.* However, she does believe that developing the NTFP industry will benefit a broad range of stakeholders. Some examples:



• *Smaller communities, especially in the north and on First Nations reserves:* Many First Nations people are skilled at harvesting and using NTFPs, ranging from foods like berries, wild rice, and mushrooms to sphagnum moss (for lining reusable diapers), as well as producing traditional items such as baskets, jewellery, and moccasins. Other products such as biological pesticides, aromatherapy oils, ingredients for cosmetics, and nature-craft supplies are also in demand around the world. Helping struggling communities to get such products to market could greatly increase their self-sufficiency and improve their economic outlook. Mohammed points out that just 3 products – maple syrup, ginseng, and Christmas trees – contribute $66 million annually to the provincial economy.

• *Forest industry*: Fostering the development of NTFPs could help forest companies earn certification, by contributing to economic development and providing incentives to sustain a diverse range of plant species – including "weed" trees. Birch species, for example, are among the most versatile with more than 5 dozen uses. NTFP development can also help companies reduce waste. For example, a sterol from tall oil, a by-product of paper pulping, is being used in a new cholesterol-reducing margarine that is flying off store shelves in Finland and the United States despite a steep price tag.

• *The public at large:* Most drugs are directly or indirectly derived from plants: Digitalis, for example, is an important heart medicine made from foxglove; Taxol, a promising cancer drug, comes from yew bark. Other forest plants contain nutrients that promote health: Blueberries are loaded with antioxidants; ginseng is believed to aid memory. Many more drugs and nutraceuticals have yet to be discovered, Mohammed asserts.

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Winter 2000

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Non-timber forest products

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She warns, however, that producing and marketing NTFPs is not without pitfalls, such as:

• *Lack of scientific knowledge:* Is it economically and ecologically beneficial to grow marketable plant species and crop trees on the same sites? How does harvesting various plants affect ecosystem health? How do we address the fact that wild plants can produce greatly varying amounts of desirable chemicals depending on factors like climate? Do these chemicals do what their proponents claim they do? Does collecting cones and branches for craft products affect how well the forest regenerates or the nutrient levels of the site? These questions and many others need to be answered. To date, little research has been conducted on forest products other than timber.

• *Overexploitation:* In southern Ontario and elsewhere in North America, demand for wild ginseng was so great that export is now under strict control. Mohammed suggests that an alternative to disturbing forest ecosystems is using seeds or propagules from the wild to cultivate plants on farms.

• *Conflicts among users:* Land-use planners will have to determine where harvest of NTFPs fits in with crop-tree production, wilderness areas, parks, and other forest uses. Where uses overlap, harvesting, tending, and other activities will need to be coordinated. Those who provide ecological knowledge about NTFPs, e.g., First Nations people, must be assured they will reap a share of the benefits.

• *Lack of knowledge about economic development:* Many of the communities who could benefit most from NTFPs have little expertise in marketing and business development, thus they will need assistance from governments and the private sector.

Two meetings were held recently in Ontario to help address these issues. In October 1999, the Taiga Institute for Land, Culture, and Economy hosted a major conference in Kenora titled *Forest Communities in the Third Millennium: Linking Research, Business, and Policy Towards a Sustainable Non-Timber Forest Products Sector.* This workshop drew more than 150 people from across the continent; topics included traditional ecological knowledge and intellectual property rights, plant inventory techniques, production and marketing strategies, and regulation.

Mohammed, who presented recommendations for sustainable development of NTFPs at this meeting, says that discussions she participated in there led to the organization of a community-based workshop in the Algoma area in January 2000. Sponsored by Mitigaawaaki Forestry Marketing Cooperative, the North Shore Tribal Council, MNR, Natural Resources Canada, FedNor, Domtar, and St. Mary's Paper, this workshop was attended by more than 100 entrepreneurs, First Nations people, economic development experts, government representatives, forest industry staff, scientists, and others. Designed to help communities in Algoma District deal with the challenges and opportunities related to NTFPs, it covered topics such as the roles of education and research, gaining legal access to sites, product development/ marketing, and First Nations issues.

Response was very positive, and Mohammed hopes that more of these workshops will be held around the north in the future to help communities move forward in developing and marketing NTFPs. "Production and use of these products has been in full swing in a lot of other places for a long time," she notes. "It's about time Ontario begins to move forward on science, education, and economic development related to non-timber forest products."

For more information on NTFPs in Ontario, contact Gina Mohammed at ext. 214. To request a copy of Non-Timber Forest Products in Ontario: An Overview *(OFRI Forest Research Information Paper No. 145), call OFRI's publication request line at ext. 271 or e-mail information.ofri@mnr.gov.on.ca. Proceedings for the international non-timber forest products conference held in Kenora last October will be available by fall 2000 from the USDA Forest Service; call (608)231-9248. To obtain the proceedings for the community-based workshop held in January, contact Mitigaawaaki Forestry Marketing Cooperative at (705)356-1691 or e-mail coopwood@onlink.net.*

How does science support resource management policy?

By Lisa J. Buse

One of MNR's mandates is to set resource management policy for the province of Ontario. Sound policies, used to guide actions and decisions in the forest, require a solid scientific foundation.

"Good science is critical to developing and evaluating the effectiveness of forest policy," says Jim Baker, an ecologist with MNR's Forest Management Branch. "In essence, policy tells people what to do; science provides advice about why and how it should be done."

Policy instruments in Ontario take many forms, from strategic directions to technical standards and guidelines (see sidebar). So how do scientific principles get incorporated into these documents? The most common ways are:

• *Science creates new knowledge to support the development or revision of policy.* When the Crown Forest Sustainability Act was developed, OFRI and other MNR science staff helped ensure that the legislation, manuals, and guidelines reflected the best available knowledge about forests, wildlife habitat, and environmental concerns. For example, OFRI's landscape ecology researchers provided data and scientific expertise to support MNR's fire emulation guidelines. OFRI landscape ecology scientist Ajith Perera points out that "being able to understand and predict natural fire patterns provides resource managers who are developing forest management plans with benchmarks to aim for when planning harvest patterns."

• *The scientific method is used to test and refine existing policies.* The mandate of MNR's Centre for Northern Forest Ecosystem Research (CNFER) in Thunder Bay is to study the effects of

forestry practices on boreal ecosystems to determine whether moose habitat, fish habitat, and tourism guidelines are meeting their objectives and to assess their effects on other forest values. What researchers learn is delivered, in part, as recommended changes to existing timber management guidelines. For example, Baker states that "revisions are now being made to MNR's moose guidelines based on results of CNFER's landscape-scale research that demonstrates how to make forest harvesting more like natural disturbance and provide more and better habitat for moose and other wildlife."

• *Science develops tools to help resource managers implement policy in their day-to-day operations.* Ontario's Forest Management Planning (FMP) manual dictates the use of landscape indices to monitor forest changes caused by management practices. To make it easier for forest managers to calculate these indices, OFRI researchers developed LEAP, a landscape ecological analysis software package customized for Ontario's FMP process (see Page 6 for more on LEAP II).

However, what's ideal from a biological or ecological perspective must be balanced with social and economic concerns. For example, in the early 1990s, the public was very concerned about conserving red and white pine old growth. MNR policy staff recognized the concern and asked OFRI for information and data about the extent and location of red and white pine old growth stands in Ontario. Researchers provided spatial databases and background information about the flora, fauna, and successional patterns of old-growth forests. In addition, they developed tools (for example, GRASP, a GIS-based system for ranking pine stands (see *Insights* Vol.1, No. 1).

However, the tools were not adopted, "not because they weren't biologically sound or useful, but because they didn't provide socially acceptable answers," Perera says. "In this case, ecological data was not useful for solving what in essence is a socioeconomic issue. However, we now have a much better understanding of the dynamics of old growth in Ontario."

Science staff have a responsibility to identify and objectively analyze resource management issues, generate and communicate new knowledge, and provide credibility to policies that are developed. They are not forest managers, nor are they policymakers — they need to work at arm's length from both to stay objective. However, the results of their work are critical to resolving difficult forest management and policy problems.

Ontario's forest policies

Ontario's forest policies aim to ensure the long-term health of Ontario's forest ecosystems for the benefit of present and future generations by:

- Conserving forest biological diversity
- Maintaining and enhancing forest ecosystem resilience and productivity
- Conserving soil and water resources
- Contributing to global ecological cycles
- Providing for a continuous and predictable flow of forest values and resources and promoting sustainable resource development
- Accepting society's responsibility for the sustainable development of Ontario's forest lands and resources
- Maintaining a legal, institutional, and economic framework
- Meeting corporate requirements

A brief overview of Ontario resource management policies is provided here. For more information, check the MNR web site at http://www.mnr.gov.on.ca.

Policy Type	Examples
Strategic direction	Beyond 2000 Policy Framework for Sustainable Forests OMNR Business Plan
Legally binding obligations and commitments	Terms and Conditions of the Class Environmental Assessment for Timber Management Environmental Bill of Rights
Legislation and regulations	Crown Forest Sustainabillity Act Forestry Act
Administrative or operational directives and procedures	Forest Management Planning Manual Forest Resource Assessment Policy A Conservation Strategy for Old Growth Red and White Pine
Technical standards and guidelines	A Silvicultural Guide for the Great Lakes-St. Lawrence Conifer Forest Guidelines for the Provision of Martin Habitat

Ice damage research update:

What tree roots can tell us about maple syrup production

By Abigail M. Obenchain

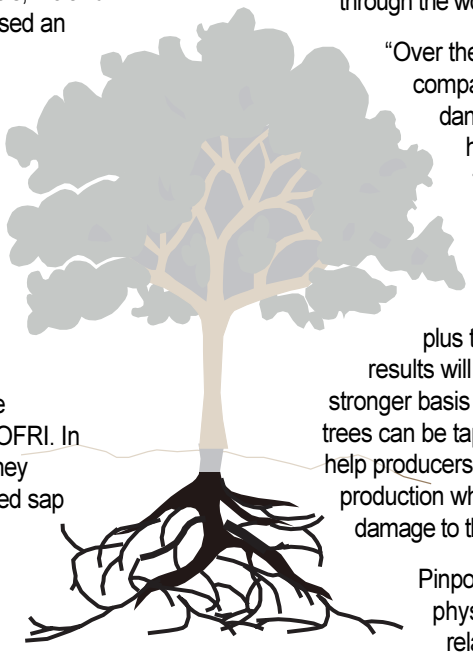
Can looking at maple roots in the fall reveal whether the next spring's syrup season will be a sweet success? *Yes*, reports OFRI scientist Tom Noland, a tree biochemist who is studying the effects of the January 1998 ice storm on maple trees in eastern Ontario.

"Before we began our research, we suspected that the more crown damage a tree sustained during the storm, the less starch it would store in its roots the following fall," Noland says. "We knew that this stored starch is the trees' food for the winter and their major energy source for sap production in the spring, so we figured that trees with less root starch in the fall would likely produce less – and less sweet – sap the following spring."

In March-April 1999, researchers collected sap from this Lanark Country tree — which lost more than two thirds of its crown due to the ice storm — and 179 other trees from across the damage area. The samples were later analyzed for sweetness at the OFRI biochemistry lab.

Photo by Tom Noland

To test this hypothesis, Noland and his assistants used an increment borer to collect 450 samples of maple roots in privately owned sugar bushes across the ice damage area in December 1998. They then analyzed the amount of starch in these samples in the biochemistry lab at OFRI. In March-April 1999, they collected and weighed sap samples from 180 trees, again with the assistance of sugar-bush operators.



According to Noland, this work confirmed that more crown damage means less root starch in the fall and less sap in the spring. Trees with severe damage (more than 50% of the branches broken off) stored *nearly a third less starch* in their roots than trees with 50% or less damage. What's more, trees with moderate or severe damage — those with more than 30% of the branches broken — produced about *10% less sap* than lightly damaged maples. The researchers are now analyzing the sweetness of the sap produced by these trees.

"By documenting the relationship between the levels of root starch in the fall and the amount and sweetness of sap," Noland says, "we will have a more complete understanding of the *physiological* effects of ice damage on syrup production. Thus we will have a more scientifically sound basis for advising syrup producers about whether and how much to tap damaged trees in the future."

Researchers are also investigating the link between the level of damage and the tree's ability to heal wounds. "Because damaged trees are less able to produce and store starch, they have fewer energy reserves to grow new cells to heal a wound," Noland explains. "The more slowly a wound heals, the more likely it is that insects or disease will invade the tree through the wound.

"Over the next 2 years, we'll compare the ability of damaged trees to heal tap holes and relate this to the amount of damage they sustained and the amount of starch they had in their roots in the fall. This plus the sap production results will give us a much stronger basis for deciding which trees can be tapped safely. It will also help producers maximize syrup production while minimizing further damage to the trees."

Pinpointing the physiological relationships among crown damage, root starch, sap production, and wound healing will be very challenging, Noland says. "A lot of factors besides damage can affect tree health during the recovery period: the weather, the fertility of the site, insects and disease, a late spring frost, and the management practices being used."

In the long term, this work could lead to practical tests for using root starch samples to predict future syrup production and tree survival after damage.

These studies of sap production and wound healing are just 2 components of the Maple Project, a larger effort to assess the effects of the 1998 ice storm on eastern Ontario's sugar bushes *(for an overview of MNR's ice-damage science program, see* Insights *Vol. 4, No. 1)*.

For more information, contact Tom Noland at OFRI (ext. 227). Other OFRI staff involved in the project: Bill Parker, Desmond Hickie, and Lesley Rich; study partner is the Eastern Ontario Model Forest. For a copy of the Forestry Chronicle *article titled* Ontario's Forest Science Efforts Following the 1998 Ice Storm*, call OFRI's publication request line at ext. 271 or e-mail information.ofri@mnr.gov.on.ca.*

Intensive forest management seen as key to increasing wood supply

By Lisa J. Buse

In 1999, MNR was one of the signatories on a landmark agreement among the province, forest industry, and environmental groups represented by the Partnership for Public Lands. Named the Ontario Forest Accord, the agreement specifically provided for intensive forest management (IFM) to ensure that the creation of additional parks and protected spaces does not reduce the quantity or quality of future fibre supplies.

What is *intensive forest management?*

IFM combines basic forest management with practices aimed primarily at increasing the value and/or volume of desired forest components. Examples of IFM practices include using a variety of stock types produced from improved seed; matching species and stock type to known soil/site conditions; varying initial plantation spacing to maximize the use of available growing space; conducting vegetation management, pre-commercial, and commercial thinning; implementing stand improvement cuts in tolerant hardwoods; and fertilizing, pruning, prescribed burning, and multi-cropping.

How is IFM science being implemented in Ontario?

In early December 1999, over 200 participants from across Ontario attended an Intensive Forest Management (IFM) Workshop in Sault Ste. Marie. Hosted by MNR, the Canadian Forest Service, and forest industry, this event was the first step in implementing the Forest Science Partnership part of the Ontario Forest Accord.

At the workshop, invited speakers from across North America and Sweden summarized their respective organizations' experiences in implementing IFM; outlined opportunities and pitfalls; presented computer tools that could assist in implementing IFM; and talked about their hopes and concerns for IFM related to Aboriginal issues, economic costs/benefits, wildlife habitat and diversity, water and site quality, and more. According to Bill Towill, senior forest practices specialist with MNR's Boreal Science Section in Thunder Bay, "it was a great opportunity to talk with colleagues about real, on-the-ground forestry issues."

He and many others found the willingness of all participants to speak openly and seriously about their hopes, concerns, and experiences with various IFM practices and strategies "incredibly energizing and motivating."

Recommendations generated through facilitated sessions focused on what practices, tools, and social, environmental, and economic issues are most relevant to IFM in Ontario and where science and information gaps exist or are likely to develop in the near future. Geoff Munro, director of MNR's Science Development and Transfer Branch, emphasizes that "these recommendations will be used to help develop the science strategies needed to implement IFM."

Workshop attendees included members of forest industry and non-governmental organizations; forest researchers; MNR planners, policymakers, science staff, and field foresters; and First Nations people. They were quick to point out that many IFM practices are already in use in the Southcentral Region of Ontario and that the groundwork has been laid in the Boreal Region.

In addition, they emphasized that some of the major hurdles are policy and planning issues rather than science or knowledge gaps. For example, participants suggested integrating and simplifying forest-management guidelines, integrating computer models used for forest planning, and developing markets for low-grade timber.

What's being done with the information collected at the workshop?

According to Wayne Bell, chair of the workshop organizing committee and an OFRI scientist, a summary of speaker presentations and facilitated session discussions will be available by spring 2000. A *Forestry Chronicle* paper synthesizing IFM science priorities is also in the works.

Tembec, one of the major sponsors of the workshop, will begin implementing IFM-related research and operational projects this spring in cooperation with MNR and CFS. Tembec's initiative emphasizes landscape indicators, growth and yield, economics, sustainability, and protection, all of which will be worked on within an adaptive management framework. Proposed projects include identifying sites for intensive silviculture; compiling an inventory of stand response to thinning, pruning, and fertilization; conducting seedling performance optimization work in nurseries; and determining stand vulnerability to insects, disease, and fire. MNR, Tembec, and CFS and are assembling framework documents to guide this work.

Where do we go from here?

"The first priority is to define where IFM can be practiced," states Munro. "Under the Ontario Forest Accord, provincial IFM areas will be recommended by the Ontario Forest Accord Advisory Board (OFAAB) and approved by the Minister of Natural Resources. Decisions about where IFM is implemented on the ground will occur through the forest management planning process."

Second, and this is where science and policy staff get involved, MNR must determine which practices provide reasonable cost-benefit in terms of environmental, economic, and social impacts. This work may lead to modifications in provincial policies and guidelines. For example, fertilization and drainage are potentially promising IFM practices but were not included in the Environmental Assessment for Timber Harvesting on Crown Forests in Ontario, and their use is not provided for in current guidelines.

Finally, as IFM is implemented, MNR will continue to work with forest industry to monitor the effectiveness of silvicultural practices. Ongoing monitoring is key to improving forestry practices. And ecologically appropriate and economically efficient silvicultural techniques and strategies are key to ensuring Ontario's forest are managed sustainably now and into the future.

Workshop sponsors: MNR, CFS, Tembec, and Bowater. To receive a copy of the workshop summary, contact OFRI's publication request line at ext. 271 or e-mail information.ofri@mnr.gov.on.ca.

LEAP II
is ready to leap to a PC near you

By Abigail M. Obenchain

OFRI has released a Windows NT version of the *Landscape Ecological Analysis Package 2.0* or *LEAP II*, developed by a team of OFRI researchers, including scientist Ajith Perera, systems analyst Frank Schnekenburger, and GIS analyst Dave Baldwin. According to Baldwin, this GIS-based software tool helps forest managers and planners to determine:

- What is the current status of patterns in Ontario's forest landscapes?
- How are Ontario's forest landscape patterns changing over time?
- How could various forest management policies and practices affect the ecological status of landscapes?

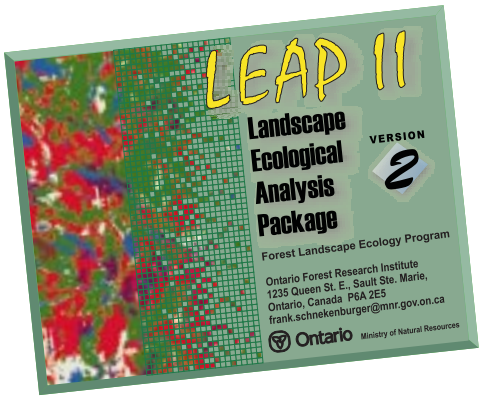
Forest managers in Ontario are required to evaluate forest landscape conditions and report on the changes every 5 years," Baldwin points out. "LEAP II helps them to meet these requirements. Now that a Windows NT version is available, a much broader range of people will be able to take advantage of the program's capabilities."

This software is a generic tool that allows the user to define analysis objectives. It analyzes landscape patterns and summarizes the information into indices that quantify the ecological status of a given landscape. "The prime users are MNR planners," Perera says, "but it can be used by anyone who wants to evaluate landscape patterns, including researchers, municipalities who want to assess woodland use, or ecology instructors."

According to Schnekenburger, LEAP II is being used by government, commercial, and educational institutions in more than 35 countries around the world. He stresses that LEAP II is very user-friendly, with a windowed interface and 3 user levels, from basic to advanced. "You don't need GIS expertise to use it; however, you do need a basic understanding of scale, data resolution, land cover classes, ecology, and the validity of the comparisons you make."

This tool is based on the landscape analysis tools LDA (an OFRI product) and FRAGSTATS (developed by the U.S. Forest Service). OFRI released a Unix version of LEAP II and a user's guide in 1997. A special forest-management planning module was released recently but is available only to MNR planners.

In the future, the team hopes to work on refining the interpretation of LEAP II analyses. "These indices are relatively new," Perera emphasizes. "We have much to learn about when to use which index, how to determine what the results mean for various management objectives, and whether the results you get at smaller scales, when combined, will be equivalent to the results you get conducting the same analysis at a larger scale."



To download this software, visit http://curie.ei.jrc.it/software/leap.htm (MNR staff, visit the MNR Intranet at http://mnrweb/ofri/flepWeb/flep.htm). To request the user's guide LEAP II: A Landscape Ecological Analysis Package for Land Use Planners and Managers, *call the OFRI publication request line at ext. 271. To get help with LEAP II or to find out about user training, call the OFRI Forest Landscape Ecology Program hotline at ext. 196. For more information on the development of LEAP II, contact Ajith Perera at ext. 217.*

OFRI STAFF *profile*

Ajith Perera

A decade ago, landscape ecology research scientist Aji Perera left a university position to join OFRI because he "wanted to work for an organization that not only conducts forest research but also helps put it into practice in the forest."

Since then, he has lead the research, development, and transfer of several important landscape ecology tools, including the Landscape Ecological Analysis Package (LEAP II), fire regime models (FLAP-X and ON-FIRE), a red and white pine decision-support system (GRASP), and the Hierarchical Eco-regional Framework (HEF).

But even more significant, Perera has helped establish landscape ecology – the broad-scale view of forest management – as an integral component of forest policy, planning, and research through OFRI's Forest Landscape Ecology Program (FLEP).

And he is lead editor of a new book titled *Ecology of a Managed Terrestrial Landscape: Patterns and Processes of Forest Landscapes in Ontario* (336 pp.; UBC Press; available in bookstores).

Current FLEP projects include spatially modelling fire and post-fire dynamics in the boreal forest, spatially simulating forest-management planning guidelines at the sub-regional scale to support the Ontario Forest Accord, developing spatial tools for forest management planning, refining methods of estimating net primary productivity at broader scales, and developing methods to estimate the spatial potential for intensive forest management. According to Perera, FLEP has adopted Nike's slogan: *Just do it!*

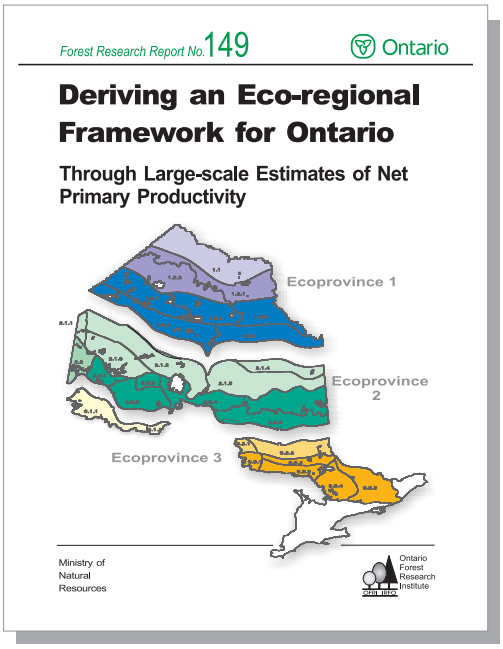
His goal for the future: "to resolve the mystery *of natural landscape benchmarks* for Ontario's forests."

Aji can be reached at OFRI at ext. 217.

New ecologically based landscape classification method shows promise for Ontario

By Abigail M. Obenchain

OFRI has released a report that describes a prototype method for organizing the landscape of Ontario into a hierarchy of ecologically distinct units, based on not just geoclimatic characteristics (climate, terrain, geology, vegetation, and soils) but also *net primary productivity*, one of the most important indicators of sustainability *(see sidebar).*



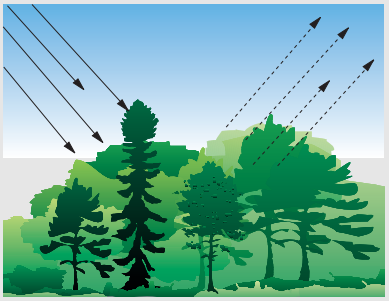
Titled *Deriving an Eco-regional Framework for Ontario Through Large-Scale Estimates of Net Primary Productivity*, this report explains how researchers used advanced statistical methods and geographic information systems (GIS) to come up with an ecologically based landscape hierarchy with nested levels, dividing the forestland of Ontario into 3 *ecoprovinces*, then each ecoprovince into e*coregions,* and each ecoregion into *ecodistricts.*

According to OFRI scientist and project leader Ajith Perera, this classification effort produced ecological boundaries that are fairly similar to those of existing schemes, for example, Angus Hills' site regions. "This is remarkable when you consider that Hills' did his work 40 years ago without GIS or sophisticated statistics software," Perera says.

Perera points out that despite these similarities, the current method has several significant advantages: It reflects variations in net primary productivity over time and space, is based on accepted ecological hierarchy theory, and is more objective and "testable" because the derivation methods are known.

Perera expects that forest policymakers, planners, and researchers will be most interested in the results of this work. Researchers in the western United States and from as far away as Germany are investigating whether these methods can be applied to their areas.

To obtain Deriving an Eco-regional Framework for Ontario Through Large-Scale Estimates of Net Primary Productivity *(OFRI Forest Research Report No. 149), contact the OFRI request line at ext. 271 or e-mail information.ofri@mnr.gov.on.ca. For more information on the methods described, contact Ajith Perera at ext. 217. Project partners included Jim Baker of MNR's Forest Management Branch and the University of Toronto.*



What is net primary productivity?

Net primary productivity (NPP) is a measure of the difference between how much carbon plants are taking in from the air through photosynthesis and how much carbon they are releasing through respiration.

Scientists view an increase in NPP as an increase in carbon stored as biomass in leaves, stems, and roots of trees and plants. Ecologically, NPP is the engine that runs all ecosystem processes. To most of us, however, increased NPP simply means *the forest is growing*.

Understanding how to measure and monitor the patterns of NPP – and using it as a basis to determine ecological boundaries – helps resource managers to develop sustainable forest-management policies and monitor their effects. It is also becoming important to government efforts to monitor and increase the carbon-storage capabilities of forests. Forest management policies that increase NPP will reduce the carbon in the atmosphere and thus help minimize the "greenhouse effect" that contributes to global warming.

UPCOMING EVENTS

May 8-12: *The Role of Boreal Forests and Forestry in the Global Carbon Budget,* Edmonton, Alberta. E-mail carbon@nofc.forestry.ca, visit www.nofc.forestry.ca/carbon, or fax (780)435-7365.

May 14-18: *Forest Sustainability Beyond 2000*, Thunder Bay, Ontario. For program information, contact Ed Iwachewski, (807)343-4016, ed.iwachewski@mnr.gov.on.ca. For registration information, contact Frances Bennett-Sutton, (807)622-8228, e-mail fsb2000@flash.lakeheadu.ca, or visit www.forconfor2000.org.

May 27-30: *Impacts of Air Pollution and Climate Change in Forests—19th International Meeting for Specialists in Air Pollution Effects on Forests.* Contact David Karnosky, (906)487-2898, karnosky@mtu.edu, or visit http://forestry.mtu.edu/iufro.

June 27-29: *MNR Forest Ecosystem Classification Workshop,* Kettle Lakes Provincial Park, Ontario. For biologists, foresters, planners, naturalists, or others working with forest ecosystems in the NE Region. Registration fee is $150. MNR staff must provide a code. Contact Gisele Berry, (705)235-1229, gisele.berry@mnr.gov.on.ca.

August 20-26: *4th International Symposium on the Tree,* Montreal, Quebec. Call Michel Labrecque at (514)872-3182, e-mail arbre2000@ville.montreal.qc.ca, or visit http://www.irbv.umontreal.ca/ARBRE2000-TREE2000.

September 2-8: *4th International Conference on Integrating Geographic Information Systems (GIS) and Environmental Modelling,* Banff, Alberta. E-mail gisem4@colorado.edu or visit http://www.colorado.edu/research/cires/banff.

September 20-21: *The Ecology and Management of White Pine in the Boreal Forest,* Chapleau, Ontario. For foresters and others involved in planning for the restoration of white pine and old growth target setting as part of the FMP process. Registration fee: $100. MNR staff must provide a code. Contact: Gisele Berry, (705)235-1229, gisele.berry@mnr.gov.on.ca.

October 19-22: *Ice Storm Forest Research Conference*, Carleton University, Ottawa, Ontario. For program information, contact R.A. Lautenschlager at OFRI (ext. 228). For information on submitting abstracts (due by September 22), contact Lisa Buse at OFRI (ext. 260) or e-mail information.ofri@mnr.gov.on.ca.

OFRI STAFF *news*

In March 2000, OFRI bid farewell to operations manager ***Dennis Gamble***, who retired after more than 30 years of service to the Ontario Ministry of Natural Resources. He spent his entire career with MNR, including more than 20 years in technical support, first as an agricultural worker and then as a plant-propagation technician for the forest genetics research program at Maple, Ontario. In 1990, when MNR moved the provincial forest research program to the new OFRI building in Sault Ste. Marie, Dennis was hired to supervise the operation and maintenance of the state-of-the-art facilities, which he did with grace and efficiency for more than a decade.

On May 1, OFRI will welcome forest research and development geneticist ***Pengxin Lu***. He recently earned a PhD in forest genetics and tree improvement from the University of Florida and has an MSc in forest genetics/tree improvement from the University of Alberta, where he studied early selection of jack pine in the greenhouse under varying nutrient and water conditions. Before that, he spent nearly a decade as a forest research scientist at the Chinese Academy of Forestry. As a scientist at OFRI, Pengxin looks forward to contributing to the sustainable management of forest resources in Ontario, especially in genetic resource conservation and tree improvement.

Vivienne Scott is acting as OFRI's resources/program operations manager during Terry Taylor's secondment to the Ministry of Northern Development and Mines. During the previous 5 years, she was the business management program leader for MNR's Flood and Fire Management Section.

Have a suggestion?

Want more information on a research project?

We want to hear from you!

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50808
(1.5k P.R., 00 03 30)
ISSN 1204-0436