SUSTAINABLE FOREST MANAGEMENT NETWORK
RÉSEAU DE GESTION DURABLE DES FORÊTS
Networks of Centres of Excellence
Réseaux de centres d'excellence

tomorrow's forests

SPRING 2008

THE SFM NETWORK NEWSLETTER

Research excellence through training, networking, partnerships and knowledge exchange

Busting Myths: Future Forest Composition and Structure

by Dr. Han Chen, SFM Network Principal Investigator, Lakehead University

A major gap in our understanding exists concerning what future forests will look like after fire or ravaging by insects. Will these forests be exactly the same as before or will there be changes? "Prior to the research we're doing now, the assumption was that boreal forests would regenerate with the same species composition as had been the case prior to a major fire," says Dr. Han Chen, SFM Network Principal Investigator and Lakehead University researcher. This is also the primary assumption in various predictive computer modeling tools used by forest managers in government and industry.

Chen's most recent research suggests otherwise. "What we've found so far is that while the assumption may hold true for jack pine, it doesn't hold true for mid- and late-successional conifers such as black spruce, white spruce, and balsam fir." This would be of interest to forest managers attempting to predict the future annual allowable cut calculation, as fire promotes hardwood species such as aspen and birch at the expense of conifers. In other words, there could be far fewer conifers available in the future compared to what the current predictive computer models are telling us. The finding also means that significantly more effort will be required to plan for the regeneration of conifers should there be greater fire occurrences, as is predicted by various climate change models. "According to our most recent research findings, Mother Nature won't be doing the kind of conifer forest regeneration for us that we had previously thought," says Chen.

As for forest regeneration after logging, modelling typically follows the same assumption as natural regeneration after fire, but is it true? At this juncture, Chen and his research team of Dr. Norm Kenkel (University of Manitoba), Drs. Alain Leduc and Dan Kneeshaw (Université du Québec à Montréal), Dr. Yves Bergeron (Université du Québec en Abitibi-Témiscamingue), and nine graduate students are still collecting and analyzing their data. "We expect to have an answer ready for our April 2008 workshop at the Université du Québec en Abitibi-Témiscamingue," says Chen.

The research team is also providing insights into the importance of old growth forests. "We now know from our analysis that there is greater diversity of coarse woody debris in old growth forests," says Chen. "This includes more diverse tree species composition, sizes, and decay levels of coarse woody debris." The new information holds more clues to ongoing tree diversity as well as biodiversity. Traditionally, old growth forests have often been targeted for logging because of their large volume of standing timber. It may be that diversity in deadwood is yet another important element to ensuring forest regeneration as well as returning nutrients to soils and maintaining biodiversity. "Suffice to say, we should be preserving a sufficient amount of old growth forest to properly ensure future forest ecosystem functioning," says Chen.

Contact: Dr. Han Chen, Associate Professor, Faculty of Forestry and Forest Environment, Lakehead University
han.chen@lakeheadu.ca

inside

Do the Forests and the Forest Sector have a Long-Term Future? Community Consultations Planned

by SFM Network Staff

What is the long-term future of Canada's forest sector, both regionally and nationally? Dr. Peter Duinker (Dalhousie University), Manager of the Sustainable Forest Management Network's Forest Futures Project, is in the midst of conducting more than a dozen consultations in forest-based communities across Canada. Thus far, such consultations have been held in Truro, NS, Peace River, AB, Kamloops, BC, and Thunder Bay, ON. More workshop consultations are being planned for spring 2008 in Ontario, British Columbia, Québec, New Brunswick, Newfoundland, and other provinces.

The objective is to imagine what might occur 40 to 50 years from now so that policy-makers in industry and government have some advance warning on how best to adapt to ongoing and relentless change in the forest sector. "While we can't know the future, it is better to have some idea about various plausible directions we want to take in a proactive way," says Duinker.

Numerous challenges are creating major angst in the industry, such as fluctuations in commodity prices, parity in the Canadian/US dollars, increasing international competition, impending decreases in timber supply due to the mountain pine beetle and fire kill, international trade disputes, pulp and sawmill closures, corporate mergers, and consolidation of milling operations. "While this is the kind of thing we are seeing today," says Duinker, "what about tomorrow, next year, and the year 2050?" Events today do not take into account numerous other drivers of change: climate change, resource conflicts, invasive species, industry profitability, geopolitics, technology change, and global energy demands, to name a few.

There is an expression, "if you don't know where you are going, any road will do." This approach will not work for Canada's forest sector. Yet, to the best of Duinker's knowledge, there is little systematic thinking about the future across the broad spectrum. That is why, on behalf of the SFM Network, Duinker and his team are conducting consultations across the country to examine four plausible scenarios on how the future of our forests might unfold to the year 2050. "The future is unknowable, but as we track what happens day to day and compare it to what we think could happen, we have a chance to adapt in a timely way," says Duinker.

Scenario planning evolved out of World War II military planning. The technique was refined for business use in the 1960s by American futurist Herman Kahn and then refined again by Royal Dutch Shell to deal with an oil crisis. When the OPEC oil embargo of 1973 actually occurred, Shell was the only company emotionally prepared to deal with the change. The decisions it made then led to the company's fortunes rising dramatically in the years ahead.

The scenario approach has rarely been applied to Canada's forest sector, so the SFM Network decided the time had come. Duinker's team has drafted four plausible, widely differing scenarios: Goods from the Woods, Peace in the Woods, Turbulence in the Woods, and Restoration in the Woods. The scenarios are being refined based on the various consultations, and in autumn there will be opportunities for Canadians to engage in conversations about what the scenarios mean for forest policy. The scenario planning effort will culminate in the SFM Network's April 20-22, 2009 conference in Ottawa. Afterward, results will be documented and communicated through magazine articles and a possible book and television documentary. "While we can't predict the future," says Duinker, "we can use scenarios to better prepare ourselves for what society and Mother Nature might have in store."

Contact: Dr. Peter Duinker, Professor Resource and Environmental Studies, Dalhousie University
peter.duinker@dal.ca

SFM Network Forest Futures website link:
www.sfmnetwork.ca/html/forest_futures_e.html

Forest Biomass: a Low-hanging Fruit?

by Dr. Jay Malcolm, SFM Network Principal Investigator, University of Toronto

As fuel prices and atmospheric CO_2 concentrations surge, governments and forest industries are increasingly looking to forest biomass as a source of renewable biofuel. At the same time, however, the biomass that exists naturally in forests, especially standing and downed dead wood, is a key source of energy and habitat for a wide array of forest organisms, from relatively well-known wildlife species such as birds and mammals, to a microcosm of lesser known creatures such as insects, fungi, and soil micro organisms. "We're especially interested in thresholds of woody debris habitat supply," says Dr. Jay Malcolm, SFM Network Principal Investigator and University of Toronto researcher. Trade-offs exist between biomass removal and changes in biodiversity, including not only changes in species composition, but also the ecological services that species provide in contributing to site productivity.

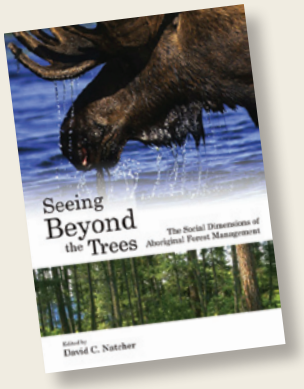
Malcolm's research team is finding that variation in both the quantity and quality of woody debris has important implications for biodiversity. "We are finding that the community of organisms that uses woody debris varies not only as a function of type of debris, such as the tree species, size, and decay stage, but also that it varies according to the volume of wood in the surrounding stand," says Malcolm. This has clear implications for the ways in which biomass is harvested, which can affect all of these variables. The team is using a diverse set of techniques to sample the biota of woody debris in Ontario's north-eastern Boreal, from removal of log sections to the lab where insects can be hatched out, to detailed study of animal movements by use of small spools of thread attached to their backs, to DNA analyses of fungal communities. "It is an exciting time in the study of the lesser known organisms that use biomass," notes Dr. Malcolm. "DNA technologies are giving us the opportunity to study some of these communities in unprecedented detail."

Because biomass is a dynamic resource, its management presents particular challenges. Using computer modelling and measurements of decay rates, the team also is trying to understand the net effect of forestry practices on long-term biomass, carbon, and habitat supply. "Woody debris originates not only at harvesting, but through stand development processes such as self-thinning," Malcolm notes, adding that it is a challenge therefore to understand the implications of harvest-based management, such as woody debris or snag retention, over the longer term.

The research team also is examining the functional roles of biodiversity. Examples include dispersal of fungi by small mammals and, most recently, nutrient and productivity implications of variation in downed wood supply. In the last phase of their SFM Network-funded research, the team completed a large-scale experiment in which they removed woody debris from a subset of their study stands. This will allow them to better understand the causal links between biomass supply and community change. It also provides an opportunity to investigate how changes in biological communities translate into changes in nutrient budgets and, ultimately, forest productivity. "Decay organisms are integral to stand productivity," says Dr. Malcolm, "but we have a poor understanding of the exact linkages between the two."

Dr. Malcolm's collaborators include Drs. Pierre Drapeau and Changhui Peng (Université du Québec à Montréal), Dr. John Klironomos (University of Guelph), Dr. Jean-Marc Moncalvo (Royal Ontario Museum), Dr. Dave Morris (Centre for Northern Forest Ecosystem Research), Dr. Sandy Smith (University of Toronto), Dr. Ian Thompson (Canadian Forest Service), and six graduate students.

Contact: Dr. Jay Malcolm, Professor, Faculty of Forestry, University of Toronto
jay.malcolm@utoronto.ca



Seeing Beyond the Trees: *The Social Dimensions of Aboriginal Forest Management* represents 10 years of collaborative research between the Little Red River Cree Nation (LRRCN) and academic researchers from across Canada. This text examines the web of interactions that influence culture, economy, and the sustainability of the natural environment.

The common theme throughout this text is the need to link research to management, policy, and the real-world needs of First Nation communities. Today's forest managers must consider the social and political context of land use, value systems and expectations, and emerging rights-based issues involving Aboriginal peoples.

This text is an ideal resource for students, educators, and forest stakeholders who engage in planning or forest management with First Nations.

Please note that this text is only available in English. For more information visit: www.captus.com.

Are Tradeable Land Use Permits a Possibility for Conservation Management?

by Dr. Marian Weber, SFM Network Principal Investigator, Alberta Research Council

The Boreal forest presents numerous challenges when it comes to designing market-based approaches for conservation management. In March 2007, the workshop "Incentives for Biodiversity Conservation on Public Forest Land" was held in Banff to explore these challenges in the context of Tradeable Disturbance Permits (TDPs). TDPs limit the amount of forest that can be disturbed in a given year and allow firms to trade permits in order to meet overall conservation objectives. Workshop participants explored options for defining conservation objectives for TDPs as well as options for implementation.

The workshop was hosted by Drs. Marian Weber, Vic Adamowicz, and Peter Boxall of the University of Alberta, under the auspices of the SFMN projects "The Challenge of Institutional Redesign: Tenure, Competitiveness, and Sustainability" and "Incentive Policies for Sustainable Forest Management". Participants included a range of internationally renowned experts on reserve design and economic instruments as well as government, ENGO, and industry stakeholders.

Workshop participants agreed on the need to prioritize and invest in conservation areas with the greatest biodiversity benefit. While it was easy to see how TDPs could help prioritize conservation areas based on costs, conservation benefits and objectives remained a great source of uncertainty and controversy. The Biodiversity Intactness Index was seen as a promising surrogate for linking information about species responses to different land uses to disturbance thresholds. But as with other surrogates, the index may perform well even while species go extinct, so close monitoring is required. One solution to this uncertainty is to design an adaptive TDP program that can be regularly checked in order to manage risks to the best of the current state of knowledge. Salinity trading in Australia's Victoria state provides an example of how complex markets can evolve.

Originally scientists wanted a trading system with a larger number of impact areas than industry was happy with, and the initial system was very simple. After gaining experience, industry recognized there was money to be made from additional complexity as it would build stronger rewards into the system.

Most participants agreed that while we can work on designing more complex management systems, the story of what is happening on Alberta's landscape is unlikely to change significantly and we are missing conservation opportunities. In Australia, the introduction of markets for ecosystem services was driven by the environmental imperative of extremely low water levels and allocations that did not reflect existing water demands and scarcities. Similar pressures in Alberta's Boreal forest make the time ripe for exploring new approaches. The Australia experience with water has led to new markets for interdependent ecosystem services, including salinity reduction, biodiversity, and native vegetation. Through these programs a number of lessons are emerging for designing complex markets.

Following up on the workshop, the research team is now developing policy experiments and simulation tools to explore alternative scenarios and test design options for TDPs in the Boreal. We hope to be able to answer some of the challenges raised at the workshop in the final SFMN Conference in Spring 2009.

Contact: Dr. Marian Weber, Resource Economist, Alberta Research Council
weber@arc.ab.ca

New 2008 Research Notes Provide Practical Forest Management Advice

by SFM Network Staff

#28: Aboriginal community-based criteria and indicators, a localised approach, explains that Aboriginal peoples typically do not compartmentalize specific environmental aspects, but tend to view the forest as a 'living system'. Their goal is to ensure that forestry and other industrial developments occurring within the forest contribute to the natural, social, cultural, and economic capitals of Aboriginal communities. Working through a bottom-up approach, a team of six community researchers conducted interviews with members of the Little Red River Cree Nation of northern Alberta. Using a series of semi-directed and open-ended questions, the team developed six matrices corresponding to one of six criteria that arose from these community consultations. Each matrix was further divided into five levels of management concern. This, in turn, provided useful direction to land-use planning and management processes, while allowing for changes over time through recognition that values are ever-evolving within the community. Aboriginal peoples do not reject commercial forestry. Rather, they are prepared to embrace it if forestry operations are properly conceived and implemented, and undertaken with the full participation of Aboriginal peoples. Results are based on research by Drs. David Natcher (University of Saskatchewan) and Cliff Hickey (U of A retired).

#29: Adaptive Management Learning from doing in the face of uncertainty is a summary of Chapter 21 of the SFM Network book Towards Sustainable Management of the Boreal Forest, published by NRC Press, Ottawa, Canada, 2003. Authors Dr. Peter Duinker and Lisa Trevisan explain that forest management, by its nature, is extremely complex and full of unknowns. Adaptive management provides a way for forest managers to proceed in the face of these challenges. The methodology is designed to produce broad, definitive, and documented knowledge that progressively moves management towards better solutions, as compared to trial and error (trying different things in the hope something will work) or field trials (small scale, site-specific, and unreplicated). Canada's Model Forest Network provides two good examples of practical adaptive management: The Fundy Model Forest in New Brunswick (an SFM Network affiliate), and Resources North Association (formerly the McGregor Model Forest) in British Columbia. Conducting proper adaptive management requires consider-ing many elements, including effective monitoring, willing-ness to adapt management practices as necessary, full corporate commit-ment, and proper regulatory approval.

#31: Conditions for economic success in First Nations forest enterprises provides an overview of the various arrangements and ventures that can occur within First Nations communities. Success of these ventures requires that they be profitable even if the reason for their existence is not economic development. A certain level of autonomy, protected from political influence and inter-ference, needs to be established. The goal is to create a stable environment through a formal institution and operating rules so that standard business planning can be used successfully. Various recommendations are provided by authors Drs. Ronald Trosper and Harry Nelson (UBC) and Dr. Peggy Smith (Lakehead University).

#32: Identifying rare species in a forest management area provides relevant information about how to more effectively conserve biodiversity. This note explains why the Canadian Species at Risk Act may not provide sufficient protection to a broad range of rare species that fall outside those listed in the Act, and why rare species are often not covered by provincial legislation. Dr. Susan Hannon and her colleagues at the University of Alberta have developed a systematic procedure for identifying rare species of concern using a step-by-step process that includes a definition of local responsibility. When it is determined that certain species have high local responsibility, forest managers need to act to give those species higher management priority.

Other recently published research notes include:

#30: Understanding public perception of forest management

#33: Maximizing ecosystem representation in managed forest landscapes

#34: Tenure and the management of non-timber forest products in British Columbia

These and other titles are available for download from the SFM Network website: www.sfmnetwork.ca

Contact: Ms. Jane Stewart, SFM Network, Knowledge Exchange Coordinator
jane.stewart@sfmnetwork.ca

SFM Network Partners

GRANTING COUNCILS

- Networks of Centres of Excellence / Government of Canada
- Natural Sciences and Engineering Research Council of Canada (NSERC)
- Social Sciences and Humanities Research Council of Canada (SSHRC)

PARTNERS

Governments

- Government of Canada (Environment Canada)
  (Natural Resources Canada, Canadian Forest Service)
  (Parks Canada, Ecological Integrity Branch)
- Government of Alberta (Advanced Education and Technology) (Sustainable Resource Development)
- Government of British Columbia (Ministry of Forests and Range)
- Government of Manitoba (Manitoba Conservation)
- Government of Newfoundland and Labrador (Department of Natural Resources)
- Government of Ontario (Ministry of Natural Resources)
- Gouvernement du Québec (Ministère des Ressources naturelles et Faune)
- Government of Yukon (Department of Energy, Mines and Resources)

Industries

- AbitibiBowater Inc.
- Ainsworth Lumber Co. Ltd.
- Alberta-Pacific Forest Industries Inc.
- Canadian Forest Products Ltd.
- Daishowa-Marubeni International Ltd.
- J.D. Irving, Limited
- Louisiana-Pacific Canada Ltd.
- Manning Diversified Forest Products Ltd.
- Tembec Inc.
- Tolko Industries Ltd.
- Weyerhaeuser Company

NGO

- Ducks Unlimited Canada

Aboriginal Groups

- Heart Lake First Nation
- Kamloops Indian Band
- Métis National Council
- Moose Cree First Nation
- Treaty 8 First Nations of Alberta

Institutions

- University of Alberta (host institution)
- British Columbia Institute of Technology
- Concordia University
- Dalhousie University
- Lakehead University
- McGill University
- Memorial University of Newfoundland
- Mount Royal College
- Royal Roads University
- Ryerson University
- Thompson Rivers University
- Trent University
- Simon Fraser University
- Université de Moncton
- Université de Montréal
- Université de Sherbrooke
- Université du Québec à Chicoutimi
- Université du Québec à Montréal
- Université du Québec à Rimouski
- Université du Québec à Trois-Rivières
- Université du Québec en Abitibi-Témiscamingue
- Université Laval
- University of British Columbia
- University of Calgary
- University of Guelph
- University of Lethbridge
- University of Manitoba
- University of New Brunswick
- University of Northern British Columbia
- University of Ottawa
- University of Regina
- University of Saskatchewan
- University of Toronto
- University of Victoria
- University of Waterloo
- University of Western Ontario
- University of Winnipeg
- Wilfrid Laurier University

Affiliated Members

- Canadian Institute of Forestry
- Forest Ecosystem Science Cooperative, Inc.
- Forest Engineering Research Institute of Canada (FERIC)
- Fundy Model Forest
- Lake Abitibi Model Forest
- Manitoba Model Forest
- National Aboriginal Forestry Association

April 2008

10% POST-CONSUMER FIBER

Vision

The forests of Canada will maintain their extent, diversity and ecological vitality and be managed in a manner that will provide for the broad social, cultural and economic needs of all Canadians.

Mission

The Sustainable Forest Management Network is a national partnership in research and training excellence. Its mission is to deliver an internationally recognized, interdisciplinary program that undertakes relevant university-based research. It will develop networks of researchers, industry, government and First Nations partners, and offer innovative approaches to knowledge transfer. The Network will train scientists and advanced practitioners to meet the challenges of modern natural resource management.

Newsletter Production

Communications Manager
Marvin Abugov

Design
www.c3design.ca

Translation
Les entreprises Verret Enterprises, Ltd.(Ltée.)

Photography
Tyler Cobb, Rochelle Owen, Dave Locky, Marlow Esau, Marvin Abugov

Contact Us
Sustainable Forest Management Network
3-03 Civil Electrical Engineering Building
University of Alberta
Edmonton, Alberta, Canada T6G 2G7

Tel: 780-492-6659
Fax: 780-492-8160
marvin.abugov@sfmnetwork.ca
www.sfmnetwork.ca

Canadian Publication
Mail Agreement No. 1571958