SUSTAINABLE FOREST MANAGEMENT NETWORK

RÉSEAU DE GESTION DURABLE DES FORÊTS

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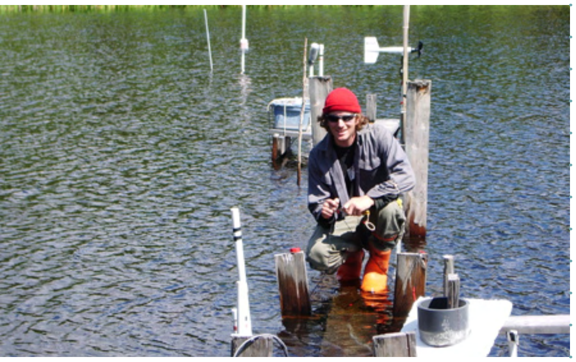

PROJECTS AND PUBLICATIONS GUIDE

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06|07

THE SUSTAINABLE FOREST MANAGEMENT NETWORK

The Sustainable Forest Management Network (SFM Network) is one of Canada's Networks of Centres of Excellence (NCE). Established in 1995, the Network starts from a foundation of researchers from a range of disciplines working with partners from industry, universities, government, Aboriginal peoples and non-governmental organizations to explore the very foundations of sustainable forest management. Through rigorous scientific peer-reviewed research, Network partners and researchers are discovering new solutions to some of the most perplexing challenges facing Canada's forests today.

Five criteria common to all Networks of Centres of Excellence drive the SFM Network:

- Research Excellence
- Networking and Partnerships
- Highly Qualified Personnel
- Knowledge Exchange and Technology Extension
- Network Management

We'd like to dedicate this year's publication guide to the memory of Jake Kejick, an important partner from Whitefeather Forest Initiative.

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PROJECTS AND PUBLICATIONS GUIDE

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RESEARCH PROGRAM 2006 | 2007

PROJECTS

All 28 new and continuing projects
arranged alphabetically by principal investigator

1

Participating SFM Network Partners and Affiliates

Natural Resources Canada - Canadian Forest Service

Canadian Forest Products Ltd.

Daishowa-Marubeni International Ltd.

Tembec Inc.

Little Red River Cree Nation/Tallcree First Nation

Moose Cree First Nation

Locations of the Research

Alberta

Ontario

Carbon credit trading: the law, firm behaviour, economics, and landscape impacts

armstronggcarb10 Initiated 2004-06-02

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Description

This project provides insights into effective policy options relating to forest-based carbon, through a combination of legal analysis, experimental economics, and landscape-level modeling.

Legal analysis is required to understand how international agreements, the Constitution, and existing laws and treaties will influence carbon ownership and trading regulation. Specifically, we propose to analyze:

1. Ownership rights in forest-based carbon, and constitutional authority to regulate carbon trading, including an examination of First Nations' rights and authorities;
2. The Kyoto Protocol and the Land Use, Land-Use Change and Forestry sub-agreement, to assess the parameters they set for "forest management" and carbon; and
3. Legal dimensions of options for carbon-trading regimes and implications for forest management.

The research team will investigate the incentives given by various institutional arrangements for the offset trading system, using economic experiments to explore the behavior of agents. Some examples of the institutional rules that we may investigate are:

- the determination of the baseline in credit allocation;
- monitoring and verification;
- liability;
- the definition of permanence; and
- market concentration. The experiments will use representatives from forest companies, First Nations, and agricultural landowners. Other issues concerning transactions costs and their impact on a carbon trading system can also be examined with this framework.

We will project the impacts of alternative incentive systems on forest landscapes, using models integrating forest growth, management, and disturbance. Unintended impacts of carbon-related incentives on other forest values, such as recreation and biodiversity, will be taken into account. The modeling component will be linked with Natural Resources Canada - Canadian Forest Service (CFS) carbon modeling efforts. The results of this linkage will enter into national policy discussions regarding carbon management through CFS, and will inform our Aboriginal, industrial, and government partners about the implications of carbon management schemes.

This project is funded under the Sustainable Forest Management Network/BIOCAP Canada Foundation Joint Venture Agreement.

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Description

This project will seek to:

1. Demonstrate the applicability of the mapping of hydrologically sensitive areas (HSAs) for the forest management and forest operations context, at partner-selected locations across Canada, with a geo-spatial resolution of 10 m or better;
2. Advance our understanding about processes controlling formation of HSAs; and
3. Develop HSA-interpretation and planning tools for a priory recognition and determination of soil disturbance susceptibilities, at two data-intensive sites on the boreal plain (Alberta) and the Hudson plain (Ontario).

Our research objectives are to develop HSA mapping tools for forest operations planning:

1. By defining HSAs and identifying related values and/or uses;
2. Through focusing on select landscapes to determine if, where and when currently used wet-area HSA delineation tools are sufficient for forest operations planning using static ("time-integrated") analyses;
3. Through focusing on 2 boreal landscapes (Alberta, Ontario), to ascertain the dynamics of HSA boundaries, according to weather and climate regions for specific regions; dynamic terms also refer to "probabilities" or "return periods" regarding certain HSA conditions, such as flooding and flood stage; this is to be done by way of dynamic ("time-variable") analyses which further involves:
   - developing empirically- and physically-based models to map time-variable HSAs
   - identifying processes that regulate HSA occurrence and stability
4. Through delineating HSA susceptibilities to forest operations, summer through winter.

Through working with related SFMN research projects (RIPNET, SID) towards establishing acceptable HSA criteria and indicators for sustainable management and conservation.

Participating SFM Network Partners and Affiliates

Government of Alberta
Government of British Columbia
Government of Newfoundland and Labrador
Government of Ontario
Moose Cree First Nation
Abitibi-Consolidated Inc.
Alberta-Pacific Forest Industries Inc.
Bowater Incorporated
Daishowa-Marubeni International Ltd.
J.D. Irving, Limited
Tembec Inc.
Ducks Unlimited Canada

Locations of the Research

Alberta
British Columbia
Manitoba
New Brunswick
Newfoundland and Labrador
Nova Scotia
Ontario

Tools for generating maps of hydrologically sensitive areas for use in forest operations planning

arpptool12 Initiated 2006-06-07

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Social sustainability: strategies for definition, measurement, and management

beckleytsoci10 Initiated 2004-06-02

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Canada-wide

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Description

Guided by 3 workshops with designated themes and planned outputs, this project will focus on:

1. Defining social sustainability in the context of natural resource management;
2. Developing innovative measures for social sustainability; and
3. Interpreting the implications of these definitions and measures for resource managers.

The workshops will involve researchers and resource managers from partner and other agencies, to help ensure that our research is relevant, and that we convey our results in ways that resource managers find useful and understandable.

The research team plans to examine 3 aspects of social sustainability, mainly (but not exclusively) at the community level:

1. Governance (rights, responsibilities, decision-making, tenure, equity, and management authority);
2. Social structure and values (public perceptions, opinions of resource management (satisfaction, dissatisfaction, levels of knowledge, interest, etc.), and the ways in which forest values are distributed, communicated, and formulated); and
3. Adaptation and resilience (the ability to adapt positively to change).

Results from the research will be made available through:

1. Synthesis reports that summarize and translate findings from the social science literature into usable information for resource managers;
2. Conceptual pieces that deal with the fundamental definition of social sustainability, and that may suggest new ways to approach the concept; and
3. Empirically-based work that tries to demonstrate new tools and approaches to measure social sustainability.

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Description

This project will assess the response of focal wildlife species and assemblages across a broad range of landscape conditions, through a combination of field studies and spatio-temporal modelling. The results will provide empirical data to evaluate some of the fundamental principles of landscape ecology that are being applied in sustainable forest management (SFM) strategies, and to improve objective setting and monitoring of landscape targets within SFM plans.

The research team is uniquely positioned to conduct this research because:

1. Epidemic insect attack and associated timber harvesting is creating a gradient of habitat composition and pattern within our study area, effectively providing a natural landscape experiment;
2. There is extensive baseline inventory and research information available that will serve as a foundation for this research (including a sample of 150 Northern Goshawk (Accipiter gentilis) territories, and a developed spatio-temporal model); and
3. We are using strategic and operational SFM plans being developed by industry, government, and the public, to direct the research questions being asked (to ensure the research is operationally relevant), and to structure the delivery mechanisms of the research outcomes (to ensure our results are operationally applicable).

Participating SFM Network Partners and Affiliates

Natural Resources Canada - Canadian Forest Service

Government of British Columbia

Canadian Forest Products Ltd.

Tembec Inc.

Locations of the Research

British Columbia

Effects of landscape composition and pattern on the abundance and fitness of wildlife indicator species at multiple scales: do thresholds exist?

boutinseffe10 Initiated 2004-06-02

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Locations of the Research

Canada-wide

Hydroecological landscapes of Canada's forests

buttlejhydr12 Initiated 2006-06-07

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Description

We are proposing to combine previous and ongoing project data on terrestrial-aquatic linkages across Canada's forest landscapes in order to produce a framework for quantifying hydrologic, geomorphic and ecologic processes of forest landscapes at the national level. Based on this framework, we will define quantitative criteria and indicators for detecting hydroecologic responses to forest management activities. We will also test the ability of various modeling strategies to scale study results obtained at the local level to entire drainage basins in order to assess the cumulative effects of management activities in different forest landscapes across Canada.

The specific objectives of the project are to:

1. Classify stream-riparian-basin systems (SRBSs) using hydroclimatic (HC), hydrogeomorphic (HG) and hydroecological criteria (HE);
2. Identify specific quantitative process indicators (e.g. peak flows, nutrient export) potentially affected by forest management in a given SRBS as a function of HC/HG/HE characterisitics;
3. Create a database of measurements and models at stream, riparian and/or basin scales from previous and current studies of HC/HG/HE processes, with representation from all of Canada's ecoclimatic regions;
4. Integrate and synthesize these data to develop conceptual/statistical/numerical models of natural variability of hydrologic, geomorphic and ecological processes in forest landscapes;
5. Develop conceptual frameworks and indicators of the consequences of forest management activities for various SRBSs (identified in (1)); and
6. Test the ability of various conceptual/statistical/numerical modeling strategies to scale site/stand level results up to the basin to assess cumulative effects of management activities in different forest landscapes.

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Description

The research team's purpose is to further our understanding of forest compositional and structural dynamics with and without disturbances, and to improve our ability to project future forest conditions.

For ageing succession, the objectives are to:

1. Quantify successional pathways of forest cover types;
2. Determine rates of change in species composition so that forest composition can be projected from individual stands within spatially explicit forest management models; and
3. Define and classify stand structure types using both live tree and coarse woody debris characteristics, and quantify successional pathways of stand structure.

For post-disturbance succession, the objectives are to:

1. Quantify postfire and postlogging stand composition for the purpose of forest management planning; and
2. Examine the similarity of stand structural attributes including live tree structure and coarse woody debris in relation to logging and fire.

For integration, the objectives are to:

1. Conduct a comprehensive literature review on forest succession models for the purpose of forest management planning; and
2. Improve understanding of inter-regional similarities and differences of forest succession through integration.

Participating SFM Network Partners and Affiliates

Natural Resources Canada - Canadian Forest Service
Parks Canada
Government of Alberta
Government of British Columbia
Government of Newfoundland and Labrador
Government of Ontario
Moose Cree First Nation
Abitibi-Consolidated Inc.
Louisiana-Pacific Canada
Tembec Inc
Ducks Unlimited Canada

Locations of the Research

Manitoba
Ontario
Québec

Forest successional dynamics in the eastern-central Canadian boreal forests: modeling compositional and structural pathways and their diversity characteristics

chenhfore12 Initiated 2006-06-09

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National Aboriginal Forestry Association

Locations of the Research

Ontario

Cooperative learning for integrated forest management: building a C&I framework for the Whitefeather forest initiative, northwestern Ontario

davidsonhunticoop10 Initiated 2004-06-02

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Description

The research team will use a combined field studies-modeling approach with Pikangikum First Nation elders, to learn about the signs and signals of forest ecosystem change, and to build a harmonized criteria and indicators (C&I) framework, in support of community-based land-use planning and management in northern boreal forests.

The research will be guided by four key questions:

1. How do indigenous people draw upon signs and signals to create an understanding that a forest ecosystem is moving toward a desirable or an undesirable state?;
2. Can informal signs and signals of ecosystem change provide the basis for a dialogue to develop a harmonized C&I framework, for cross-scale and pluralistic systems of natural resource governance?;
3. Can the development of a harmonized C&I framework lead to the shared perception and meaning of ecosystem change, and the basis of an information system for adaptive community-based resource management?; and
4. What is the First Nation experience in deriving C&I frameworks based upon their knowledge, values, and institutions, as opposed to adopting frameworks developed by others?

Specific objectives are to:

1. Identify and document signs and signals that can be utilized to monitor changes in boreal forest ecosystems, using the cooperative research framework developed by Davidson-Hunt, in his work with Ojibway non-timber forest product (NTFP) users;
2. Document signs and signals in the field with Ojibway elders and trappers, to build a harmonized C&I framework for integrated management of the Whitefeather Forest Planning Area (WFPA); and
3. Assess the state of knowledge, and integrate lessons learned from First Nation experiences with C&I processes.

Researchers and Collaborators

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Description

This project aims to:

1. Develop a hydrogeologic framework to define landscape units that control the storage and movement of water in the Western Boreal Forest (WBF);
2. Determine the best model structure to predict hydrologic response to land disturbance, given the variability of the region's climate and landforms; and
3. Provide a tool to evaluate the effectiveness of riparian areas in ameliorating water quantity and quality impacts of forest activities, at varying scales over a Forest Management Agreement (FMA) area.

The research team will use a combined field studies-modelling approach. This will allow us to assess the spatial and temporal scales at which hydrological responses (wetland and groundwater levels, stream peak, base flows, etc.) to disturbance (fire, harvesting, etc.) will occur. The models developed through this research can be coupled with our partners' Geographic Information System (GIS)-based forest management practices (FMPs), and used to define appropriate criteria and indicators (C&I) of change. The models can also be used to evaluate cumulative watershed effects (CWE) of land management scenarios, on water quantity and quality.

Participating SFM Network Partners and Affiliates

Government of Alberta
Alberta-Pacific Forest Industries Inc.
Ducks Unlimited Canada

Locations of the Research

Alberta
British Columbia
Manitoba
Saskatchewan
Yukon

Landform-based hydrologic indicators of disturbance in heterogeneous landscapes: water cycling in relation to disturbance in the Western Boreal Forest

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Old-growth forests in eastern Canada: exploring tradeoffs among timber, biodiversity, carbon, and public preferences

duinkerpoldg10 Initiated 2004-06-02

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Description

The goal of our project is to develop knowledge that will assist forest managers to conserve old-growth forest (OGF) and its associated values, through set-asides and active silvicultural intervention.

The research team's specific objectives are to:

1. Develop comprehensive ecological characterizations of OGF at both the stand and forest scales, in 2 study forests in Nova Scotia and Ontario, and assess the degree to which the OGF is now fulfilling (and might fulfill in the future) ecological functions associated with biodiversity and carbon cycling;
2. Determine how various citizen constituencies (e.g., rural people, urban people, and environmental advocates) perceive and value OGF and its management, in the 2 study forests;
3. Assess, in the 2 study forests, implications of alternative OGF management approaches for forest values associated with timber production, biodiversity, and carbon uptake and storage, and explore tradeoffs among the values, across the assessed management approaches;
4. Determine what management objectives and associated actions forest managers should apply to conserve OGF in their respective forests; and
5. Develop comprehensive, detailed, well-grounded, and implementable OGF management strategies that will satisfy both the forest managers' wood-supply needs, and their desire to conserve biodiversity.

This project is partially funded under the Sustainable Forest Management Network/BIOCAP Canada Foundation Joint Venture Agreement.

Researchers and Collaborators

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John Stadt
Alberta Sustainable Resource Development

Description

This project will identify a set of avian indicator species that represent important ecological functions in the boreal forest, and are sensitive to changes in forest structure and function. These indicators may be used to:

1. Determine the ecological benefit of best practices by industry;
2. Assess the value of protected areas; and
3. Enhance monitoring efforts, at several spatial scales.

We will attempt to identify important functional indicators or keystone species in the cavity-using community, and characterize nest webs in 2 forest seral stages that are most likely to be affected by logging: old forest and young post-fire stands. One outcome of this research will be the development of methods to survey primary cavity producers, in a cost-effective and repeatable way.

To ensure our research is relevant both now and in the future, we plan to conduct our analyses of impacts of harvesting using 2 new types of harvesting: aggregated harvest, and partial harvesting in riparian buffer strips. Our work on the aggregated cuts and partial harvest areas will allow us to suggest what types of trees to leave, and how big patches should be on harvested blocks.

Participating SFM Network Partners and Affiliates

Environment Canada
Government of Alberta
Alberta-Pacific Forest Industries Inc.
Weyerhaeuser Company
Ducks Unlimited Canada

Locations of the Research

Alberta
Saskatchewan

Keystones and functional indicators for sustainable forest management, with special emphasis on the cavity nesting community

hannonskeys10 Initiated 2004-06-02

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Government of Alberta

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Locations of the Research

Alberta

Developing biodiversity patterns for predicting the effect of management on the boreal mixedwood forests of Alberta

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Description

This research aims to describe and quantify biodiversity patterns in boreal mixedwood forests and relate them to basic theory in order to understand the distribution, function and maintenance of biodiversity in these ecosystems. This entails documenting species-abundance relationships, species-area curves, species turnover across landscapes, food web structures and tree size variation, for plants and insects, two numerically most diverse and biologically most important taxa in boreal forests. These biodiversity patterns are trusted measures of ecosystem integrity, are relevant for integrated models and thus are useful for assessing and predicting the effect and success of sustainable management on mixedwood forests.

The specific objectives of the proposal are to:

1. Document biodiversity patterns in the boreal mixedwood forests of Alberta, as characterized by species-abundance relationships, species-area curves, species turnover across landscapes, food web structures and tree size variation;
2. Develop biodiversity-based methods to calculate edge effects and to determine the sizes and arrangement of retention patches that best maintain biodiversity so as to provide scientific support for coarse-filter approaches to sustainable forest management; and
3. Develop statistically representative, scientifically reliable and practical operational models and methods for assessing and predicting the impact of disturbances and management practices on mixedwood biodiversity.

Researchers and Collaborators

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Description

The goal of this project is to determine how the cumulative impacts of development on Treaty 8 First Nations' communities can best be managed given the diverse nature of resource developments and policy environments that exist in the different provincial/territorial jurisdictions throughout the Treaty 8 settlement area. It will develop modules for the implementation of a cumulative effects tool, including both social and ecological impacts, and will examine the policy environments that are leading to differing interpretations of the Treaty.

This research will address two related issues:

1. The way in which the Treaty promises relating to natural resources uses/access and the preservation of traditional livelihoods have been interpreted and implemented by the provincial, territorial and federal governments that have jurisdiction over Treaty 8, and the way in which they are viewed by Treaty 8 Nations; and
2. The development of a decision support tool to assess the cumulative impacts of resource development at both the regional and local levels.

The first part will be achieved through an examination of the legislative and policy backgrounds giving rise to the differing interpretations of Treaty 8. The second part will build on a framework model developed during a pilot project on cumulative impacts, and will focus on adding specific modules (agricultural conversion, hydroelectric schemes) to a spatially explicit model that already includes forestry and oil and gas development impacts.

Participating SFM Network Partners and Affiliates

Government of British Columbia

Government of Alberta

Little Red River Cree Nation/Tallcree First Nation

Tembec Inc.

Locations of the Research

Alberta

British Columbia

Barriers to the management of cumulative effects of development in the Treaty 8 region of Canada

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Locations of the Research

Canada-wide

Market and institutional structures, economic welfare and global competitiveness of the Canadian forest industry

kantsmark12 Initiated 2006-06-09

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Description

The main purpose of the project is to develop and employ appropriate economic models and techniques to:

1. Examine the impact on the economic wellbeing of Canadians and on the forest industry (in aggregate and in selected provinces) of market conditions and government policies (such as trade actions, forest tenures, including Aboriginal tenures, protected area policies, and policies relating to mountain pine beetle infestation); and
2. Evaluate the global competitiveness vis-à-vis other countries of different sectors of the forest industry and selected provinces.

The research is organized in 3 parts:

1. We develop a comparative understanding of (1) markets for lumber, pulp and OSB; (2) forest management institutions, such as forest tenure, Aboriginal tenure and protected area policies; and (3) forest sector institutions (e.g. stumpage systems, corporate tax regimes, economic incentives for investment and R&D);
2. We evaluate the impact of different market and institutional structures on the competitiveness of the forest industry and economic well being of Canadians using (1) firm-level cost model, (2) a spatial price equilibrium, regional trade model (similar to a stand-level model), and (3) a computable general equilibrium model (similar to a forest-level model); and
3. We develop and use a framework to examine the Global competitiveness of the forest sector, particularly of lumber, pulp and OSB sectors in different countries and selected Canadian provinces.

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Description

This project will address the potential for insect management (primarily the use of insecticides) to contribute to measurable carbon stock changes in forests, during the 2008-12 Kyoto Commitment Period.

The specific objectives are to:

1. Evaluate the impact of insect outbreaks on forest carbon dynamics from 2008-12, and determine the influence of pest management on forest carbon dynamics. We will use the Spruce Budworm Decision Support System (SBW DSS), integrated with the Carbon Budget Model for the Canadian Forest Sector (CBM-CFS3), to: (1) project carbon (C); (2) determine the marginal benefit of insecticide spray programs on timber volume, biomass, and carbon; and (3) evaluate current outbreak status and population forecasts of various pests in a number of Canadian provinces, from 2008-12;
2. Assess the cost-effectiveness of investing in pest management activities for forest carbon sequestration. We will use regression analysis to determine the factors that affect the marginal cost of a forest pest aerial spray program, and compare the cost estimate to other program options; and
3. Explore long-term costs and benefits of an institutional arrangement, whereby carbon credits are purchased by companies, and the revenues used for pest management activities. This will involve a combined sensitivity analysis of the SBW DSS, and a full cost-benefit analysis of protecting the susceptible forest from an outbreak.

This project is funded under the Sustainable Forest Management Network/ BIOCAP Canada Foundation Joint Venture Agreement.

Participating SFM Network Partners and Affiliates

Natural Resources Canada - Canadian Forest Service
Government of Alberta
Government of Newfoundland and Labrador
Gouvernement du Québec
J.D. Irving, Limited

Locations of the Research

New Brunswick
Ontario
Saskatchewan
Québec

Role of pest management in sequestering carbon in the 2008-12 Kyoto Commitment Period: integration with CBM-CFS3 and economic analyses

lantzvrole10 Initiated 2003-06-04

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Natural regeneration of white spruce following logging in mixedwoods

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Participating SFM Network Partners and Affiliates

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Locations of the Research

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Description

This project will devise and test a model of natural white spruce recruitment that can be used to develop recommendations for silvicultural practices aimed at facilitating natural regeneration of white spruce, in logged boreal mixedwood stands.

To build this model, the research team needs to determine the conditions (competing vegetation, seedbed, seed source, silvicultural treatment, and time since disturbance) under which natural regeneration of white spruce will be successful. This will involve documenting competing vegetation, densities, size, and survival of naturally-regenerated white spruce, on sites that were exposed to different types of silvicultural treatment (site preparation versus no site preparation, and winter versus summer logging) at various times (up to 30 years post-harvest).

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Description

This project will achieve a better understanding of the successional dynamics of the Acadian forest, its value as habitat, and the diversity and habitat implications of current management. Using this understanding, we plan to devise and evaluate alternative stand and forest management strategies; such as TRIAD zoning (allocating reserve, intensive, and extensive zones) that are aimed at maintaining the diversity and habitat values of the forest, while ensuring an economic supply of industrial raw material.

The research team will:

1. Develop an ecologically-relevant definition of mixedwood stands, based on stand dynamics and habitat relationships;
2. Describe the successional dynamics and habitat value of 3 key stand types (natural mixedwoods, plantations, and precommercially thinned stands);
3. Evaluate biodiversity indicators and habitat suitability (bryophytes, ground vegetation, American marten (Martes americana), birds, northern flying squirrel (Glaucomys sabrinus), and salamanders) in these stand types; and
4. Conduct manipulative experiments to test hypotheses on the relationships between stand structure and diversity and habitat indicators.

Participating SFM Network Partners and Affiliates

Government of Alberta

Parks Canada

J.D. Irving, Limited

Locations of the Research

New Brunswick

Management implications of forest dynamics, succession, and habitat relationships under differing levels of silviculture in New Brunswick forests

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Dynamics of woody debris in eastern boreal forests: implications for carbon and wildlife management

malcolmjdyna11 Initiated 2005-04-01

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Lake Abitibi Model Forest

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Description

This project will determine:

1. The relationships among the dynamics of woody debris (WD), such as downed logs and standing dead trees, and associated biological communities and carbon supplies; and
2. Use the process-based TRIPLEX ecosystem model to examine tradeoffs, by investigating the implications of different scenarios of WD retention and biomass harvesting, for biological diversity, carbon supply and fluxes, and ecosystem productivity.

We will:

1. Determine thresholds of WD supply for WD-associated organisms (cavity-nesting birds, fungi, insects, and small mammals), in study plots that represent a range of WD quantities and management types, and that are sampled before and after manipulation of WD supply;
2. Examine key ecological interrelationships between: (1) small mammal productivity and WD-associated production of insects and fungi; (2) the richness of fungal communities, and the richness of certain insect groups and their parasitoids; and (3) primary cavity excavators and secondary cavity users;
3. Measure the temporal progression of WD decay and WD carbon stocks; and
4. Sample above- and below-ground carbon stocks at the study sites, and at additional sites that represent differing times post-harvest.

This project is partially funded under the Sustainable Forest Management Network/BIOCAP Canada Foundation Joint Venture Agreement.

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Description

The main goal of this study is to work directly with practitioners and local stakeholders in order to learn more about how the public would make trade-offs on critical SFM planning issues, as part of a reciprocal learning and decision-support process.

A second goal of the study is to assess the effectiveness of novel methods of information presentation designed to make the communication of complex spatial and temporal dynamics more useful to resource managers and more understandable and meaningful to local stakeholders and community representatives, by using interactive visualization-based interfaces tied to SFM planning models; this would also enable us to assess public confidence in forest planning models and strategies in order to further elicit stakeholder preferences and assist in making resource management decisions.

Specific objectives include:

1. Examining people's trade-offs over time and space in the context of increased uncertainty;
2. Examining opportunity costs among ecological, social and economic values which people are typically willing to accept;
3. Identifying how people's preferences change with improved information on SFM plans; and
4. Developing tools and extension materials that resource managers and local stakeholders, public advisory groups and community representatives can use in the development of local forest resource management strategies.

Objectives 1 through 3 will be achieved through the deployment of a user-friendly forest value trade-off model in a kiosk to be set up at a number of public locations in Alberta and British Columbia. The fourth objective will be achieved trough dialogue among team members with input from project advisors and partners.

Participating SFM Network Partners and Affiliates

Environment Canada

Natural Resources Canada - Canadian Forest Service

Canadian Forest Products Ltd.

Locations of the Research

British Columbia

Using interactive forest planning models and visualization to assess public preferences for trade-offs among possible SFM futures

manesstusin12 Initiated 2006-06-09

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Spatial forest management planning under uncertainty due to natural disturbance

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Tembec Inc.

Locations of the Research

Alberta
British Columbia
New Brunswick
Nova Scotia
Ontario

Researchers and Collaborators

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Description

In this project, the research team will:

1. Develop a framework that both researchers and managers can use to evaluate existing spatial forest management planning models and forest management plans. This will involve: (1) establishing a protocol for benchmarking spatial forest management models and decision support systems; and (2) launching a public web site to communicate this protocol, distribute benchmarking problems, and disseminate benchmarking results;
2. Formulate and test new stochastic spatial forest management planning models that address the planning needs identified by our government and industrial partners, while accounting for sources of uncertainty - natural or anthropogenic disturbance processes – that they feel have the most significant impact on their spatial planning practices; and
3. Devise improved methods for solving spatial forest management planning optimization problems.

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Description

In this project, the research team will assemble a “Sustainable Forest Management (SFM) Toolkit,” composed of different modeling tools that are available now, are nearing completion, or can be developed rapidly. In conjunction with this modeling Toolkit, we will develop a generalized framework designed to:

1. Identify the key drivers of change and their associated scale, in different ecological and socio-economic settings;
2. Assign the appropriate tool(s) from the Toolkit, to model the drivers and their interactions;
3. Take advantage of local “domain experts,” to rapidly parameterize and calibrate the tools to the new location; and
4. Design scenarios that will simulate the relevant range of management options, and evaluate their effect on forest landscapes, relative to desired future conditions.

To evaluate the generality of this approach, the research team will apply our framework to seven landscapes that represent diverse ecological, socio-economic, and management histories, in Canada, Finland, and the United States. These applications will provide validation of our SFM Toolkit and modelling frame-work, and allow us to address some key research questions that will advance sustainable forest management in each region.

Participating SFM Network Partners and Affiliates

Natural Resources Canada - Canadian Forest Service
Government of British Columbia
Government of Newfoundland and Labrador
Gouvernement du Québec
Abitibi-Consolidated Inc.
Tembec Inc.
Lake Abitibi Model Forest

Locations of the Research

British Columbia
Newfoundland and Labrador
Ontario
Québec
Finland
United States

Implementing and testing decision-support tools to evaluate forest management scenarios for SFM: a multiple scale and perspective approach

messiercimpl10 Initiated 2004-06-02

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Government of British Columbia

Government of Ontario

Tembec Inc.

Weyerhaeuser Company

National Aboriginal Forestry Association

Locations of the Research

Canada-wide

Researchers and Collaborators

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Description

This project will develop and apply a framework for:

1. Determining a community's criteria for successful commercial development of non-timber forest products (NTFPs);
2. Identifying key factors that influence the likelihood of success; and
3. Identifying key factors that influence the impact of NTFP commercialization on forest environments.

The team will undertake a comprehensive analysis of the policy and legislative framework for NTFPs and bio-products in Canada, and build a searchable database of NTFP and bio-product development cases in North America.

The research team will use the results of our analysis to develop approaches to:

1. Assist Aboriginal and rural communities in determining when and how to proceed with commercial development of NTFPs and/or bio-products; and
2. Assist decision-makers in determining appropriate policy initiatives for the management, production, and marketing of NTFPs.

Commercial development of non-timber forest products and forest bio-products: critical factors for success

mitchelldcomm10 Initiated 2004-06-02

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Description

This project will assess the opportunities and obstacles associated with the design and implementation of a variety of forest tenures held and negotiated by Aboriginal groups. The team will conduct 3 case studies to develop a framework that:

1. Encompasses the relationships between Aboriginal communities, governments, industry, and other stakeholders;
2. Serves as a vision for the types of institutional relationships required for successful forest tenures; and provides a yardstick by which to measure progress.

Our results and methodology will inform future forest policy, and will be of particular value to First Nations in Canada who are seeking tenure reforms within their traditional territories.

Participating SFM Network Partners and Affiliates

Government of British Columbia
Government of Newfoundland and Labrador
Government of Yukon
Canadian Forest Products Ltd.
Kaska Tribal Council
National Aboriginal Forestry Association

Locations of the Research

British Columbia
Newfoundland and Labrador
Yukon

A participatory approach to aboriginal tenure reform in Canada

natcherdpart11 Initiated 2005-04-01

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A systems approach to integrating ecological, economic, and social values within the SFM framework developed for Riverside's TFL 49

nelsonjsyst10 Initiated 2004-06-02

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Participating SFM Network Partners and Affiliates

Government of British Columbia

Government of Ontario

Riverside Forest Products Limited

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Description

This project will establish a set of criteria and indicators (C&I) and a decision support system (DSS), to evaluate the TRIAD approach (i.e., zoning the land base for intensive forestry, extensive forestry, and protected areas) that Riverside Forest Products Limited has proposed for Tree Farm Licence (TFL) 49, near Kelowna, British Columbia. The C&I will be developed based on strategic planning at the coarse-filter level, supported by tactical (medium-filter) considerations, and implemented operationally, through a series of stand-level management options.

The specific objectives are to:

1. Identify and test ecological indicator species, focussing on birds and the stand and ecosystem characteristics that they favour;
2. Develop social indicators based on visible measures of stewardship, by using visualization techniques with local and non-local publics to test perception of zoning and management scenarios;
3. Identify and incorporate economic indicators for timber production, and estimate the economics of non-timber outputs; and
4. Develop and apply a DSS that can forecast impacts of stand-level management practices and landscape-level zonation strategies on the indicators, and help assess tradeoffs.

A series of models used to project forest conditions and to track indicators will be integrated into the DSS. These include:

- a stand-level ecosystem management model;
- a forest-level model;
- a zonation model;
- a natural disturbance model [mountain pine beetle (Dendroctonus ponderosae)];
- a road network model;
- a habitat model; and
- a suite of visual communication tools.

Researchers and Collaborators

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Description

The purpose of the project is to allow policy makers to design and implement an integrated approach to resource management on the basis of evidence about designs that work and designs that have run into problems. An integrated approach at the landscape level is indicated where multiple stakeholders are operating on the same forested landscape and policy makers are pursuing multiple objectives with respect to them.

The specific objectives are:

1. To further our understanding of policy change, especially understanding how the legacies of previous resource policies constrain present policy options;
2. To be achieved by comparing three integrated landscape management initiatives in three Canadian provinces in varying stages of development. We aim to isolate the factors that promote optimal policy change and those that lead to less than optimal outcomes;
3. To deliver our assessments of their progress in a timely manner to those involved in ILM policy formulation and implementation by working directly with the governments and stakeholders engaged in these ILM initiatives; and
4. To help develop the policy networks that will be needed to implement ILM by working with our partner organizations.

Participating SFM Network Partners and Affiliates

Environment Canada
Natural Resources Canada - Canadian Forest Service
Government of Alberta
Government of British Columbia
Government of Manitoba
Alberta-Pacific Forest Industries Inc.
Daishowa-Marubeni International Ltd.
Weyerhaeuser Company

Locations of the Research

Alberta
British Columbia
Manitoba

Designing and implementing integrated strategies: risks and opportunities of an integrated landscape management strategy in western Canada

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Government of Ontario

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Locations of the Research

Ontario

Developing a science-based decision support framework for shoreline forest management

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Description

This project will develop a science-based decision support framework that:

1. Helps balance competing values for riparian use;
2. Can be used by the forest industry and government in Ontario and across Canada, as part of an effective strategy for sustainable shoreline forest management; and
3. Devise spatially-explicit hydrologic and ecological models to supply key lines of evidence to support decision points within the framework.

These models – derived from biogeochemical, ecological, and hydrologic studies – will relate indicators of response (biotic communities, water chemistry) to selected indicators of disturbance (percent watershed harvested, size of watershed), at different spatial scales (stream reach, stream site, watershed); and bring together researchers under an integrated network, to conduct coordinated projects that address questions related to the response of forest riparian zones to forest harvesting, in the boreal region of Ontario.

The first remeasurement of the EMEND experiment and associated work

spencejfirs11 Initiated 2005-04-01

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Weyerhaeuser Company

Locations of the Research

Alberta

Description

This project will remeasure aspects of biodiversity, silviculture, and soil productivity 5 years after harvest and 2 years after slash burns, as part of the ongoing, large-scale (1,000 hectare) Ecosystem Management Emulating Natural Disturbance (EMEND) experiment. EMEND was established in the boreal mixedwood forest of northwestern Alberta in 1999, to investigate the short- and long-term effects of partial cutting and variable retention forestry.

The remeasurements will help us determine the:

1. Degree of similarity between recovery from harvesting designed to emulate natural disturbance and wildfire; and
2. Speed of recovery toward the characteristics of uncut forest.

The research team will:

1. Examine drivers of composition, diversity, and spatial distribution of bryophyte and other understory communities;
2. Assess the short-term effects of the EMEND treatments on beetle and moth biodiversity; and
3. Describe the mechanisms behind apparent (local abundance) and actual (reproductive success) response of songbirds, and develop empirical and theoretical relationships between local and landscape implications of harvesting strategies; evaluate the growth of white spruce seedlings established on the mechanical site preparation (MSP) treatments in 1999; and measure microbial communities, organic matter quality, and soil nutrient availability after fire (controlled burning); analyze the linkages among them; and compare the post-fire and post-harvest results.

Participating SFM Network Partners and Affiliates

Natural Resources Canada - Canadian Forest Service
Government of Manitoba
Government of Ontario
Gouvernement du Québec
Government of Yukon
Alberta-Pacific Forest Industries Inc.
Louisiana-Pacific Canada Ltd.
Tembec Inc.
Lake Abitibi Model Forest

Locations of the Research

Alberta
Manitoba
Ontario
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Tree mortality following partial stand harvests: a cross-canada study

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Description

As the first broad-scale study of post-harvest mortality in representative partial-harvest riparian and upland forest ecosystems across interior Canada, this project will:

1. Quantify the temporal pattern and mechanisms of post-harvest tree mortality;
2. Assess the causes of post-harvest mortality;
3. Obtain robust estimates of average rates of post-harvest mortality, at an operational scale;
4. Modify the SORTIE and SORTIE-boreal stand models to incorporate post-harvest mortality functions; and
5. Use these modified models to: (1) examine the impacts of post-harvest mortality on forest growth and yield and coarse woody debris (CWD) recruitment; and (2) provide assessments of management options.

The challenge of institutional redesign: tenure, competitiveness, and sustainability

vertinskyichal10 Initiated 2004-06-02

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Description

This project will develop proposals and implementation strategies for new tenure arrangements under which companies assume management responsibilities and other commitments, in exchange for access to timber on Crown land (land owned by the Canadian provincial governments).

The research will be done in 3 phases:

1. The research team will review relevant literature and existing experiments with new types of tenure arrangements, to articulate a framework for the tenure systems. This framework will help identify key features of tenure systems and criteria for their evaluation, and provide the means for generating proposals for new tenure arrangements;
2. The team will conduct a national survey and 9 comprehensive case studies that highlight critical issues associated with tenure systems, guided by the framework developed in Phase 1. The data from the national survey and the case studies will allow us to construct statistical models that can be used to evaluate and assess existing and proposed tenure systems (particularly with respect to their impacts on both the cost and availability of timber, and the provision of non-timber values), and to assist in the development of implementation strategies; and
3. The team will use the evaluation and design tools devised in Phase 2 to develop proposals for institutional change and strategies for implementation, in regional workshops involving community, industry, and government decision-makers. One outcome of these workshops may be the implementation of experimental pilots in various provinces.

Participating SFM Network Partners and Affiliates

Government of Alberta

Government of British Columbia

Government of Newfoundland and Labrador

Gouvernement du Québec

Riverside Forest Products Limited

Tembec Inc.

Tolko

Weyerhaeuser Company

Locations of the Research

Canada-wide

Participating SFM Network Partners and Affiliates

Environment Canada

Government of Alberta

Alberta-Pacific Forest Industries Inc.

Little Red River Cree Nation/Tallcree First Nation

Ducks Unlimited Canada

Locations of the Research

Alberta

Incentive policies for sustainable forest management

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Description

Using the Alberta boreal forest as a case study, this project will determine how to move from theory to application of incentive-based instruments for achieving environmental objectives in the boreal forest.

The project team will:

1. Identify market-based incentive programs applicable to Alberta's boreal forest;
2. Quantitatively explore outcomes of incentive programs, such as conservation easements and tradable landuse rights (TLRs); and
3. Evaluate incentive programs in terms of various criteria, such as:
    - consistency with the existing legal framework for land management;
    - compliance, monitoring, and enforcement costs;
    - economic efficiency;
    - distribution and equity;
    - environmental effectiveness; and
    - ability to integrate multiple resource management objectives;

The project team will also consider:

1. Institutional feasibility of incentive programs, including legal constraints, and requirements for implementation and integration of Aboriginal rights and obligations;
2. Identify opportunities for Aboriginal communities to use incentive programs to develop new markets and/or livelihoods from environmental services;
3. Determine the public preferences for tradeoffs between outcomes from different incentive programs; and
4. Develop recommendations on integrating natural capital indicators into policy objectives and instruments.

SELECTED COMPLETED PROJECTS

PROJECT SUMMARIES

2

This project developed criteria and assessed whether wetland lakes are likely to be affected by forest harvesting. Wetland ponds and lakes in Alberta and Saskatchewan were studied.

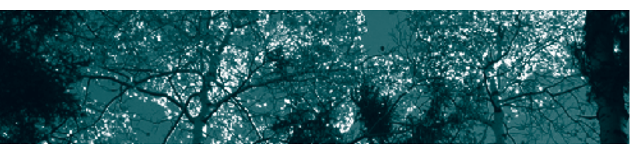
Reference

Suzanne E. Bayley, Agnes S. Wong, A. Lee Foote, V. St.Louis **Natural variation in nutrients, mercury, water clarity and waterfowl across western boreal wetland ponds in Alberta and Saskatchewan: implications for forest harvesting.** Edmonton, Alberta: SFM Network.

Locations of the Research

Alberta

Saskatchewan



Natural variation in nutrients, methyl mercury and waterfowl in western boreal wetland ponds: implications for forest harvesting

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Results

- Wetland ponds in Grande Prairie and Prince Albert had much lower nutrient concentrations than did ponds from Utikuma, Alberta, although there was extremely high variability in water chemistry among the 3 sites.
- Abundance of waterfowl broods was similar between Grande Prairie and Prince Albert. From west to east, there appeared to be a gradient of decreasing submersed aquatic vegetation (SAV) and concentrations of dissolved total nitrogen and iron, and increasing concentrations of dissolved organic carbon and potassium.
- Grande Prairie and Prince Albert wetland ponds had higher water quality than Utikuma, and as a result, may be more susceptible to eutrophication.
- Grande Prairie and Prince Albert wetlands exhibited high water clarity. This may be due to lower nutrient concentrations and SAV abundance in Grande Prairie and Prince Albert than in Utikuma.
- Total mercury was slightly lower in ponds with active beaver lodges than in ponds with inactive beaver lodges or ponds with no beaver activity at all.
- There were significantly higher nutrient values found in ponds with inactive beaver lodges than in ponds with no beaver activity.
- Grande Prairie wetland lakes were impacted more by beaver influences than wetland lakes in Prince Albert.

Implications

- There was no clear or consistent relationship between water quality and wetland type found across the three study areas indicating that it is difficult to predict water quality of waterbodies based on surrounding vegetation. Water quality surveys must be done prior to harvesting to know if harvesting has affected water quality.
- Background nutrients were relatively low in Grande Prairie and Prince Albert ponds so they may be susceptible to declines in water quality when the landscape is altered by harvesting.
- Presence of beaver activity may have the potential to mitigate the effects of catchment disturbance on water quality.
- Both Grande Prairie and Prince Albert may provide high quality waterfowl foraging habitats. According to current drying trends in the prairie region, wetland ponds of the western boreal forest may represent future waterfowl 'refugia' as southern prairie wetlands disappear. Disturbance may adversely affect both water quality and waterfowl.
- Increased runoff output of mercury due to clear-cut harvesting may have detrimental effects on Grande Prairie's wetland ponds.

Results

- The study of the boreal forest use of the Anishnaabe of Shoal Lake (Iskatewizaagegan No. 39 Independent First Nation), a small community in northwestern Ontario, shows how these forests can be managed in ways that permit ecosystem renewal
- The Anishnaabe believe it is important to maintain the full suite of biodiversity and they have a duty not to influence abundance and distribution of habitats at the landscape and site level.
- The Anishnaabe protect biodiversity through the maintenance of all successional stages of the forest, creation of patches, gaps and mosaics, creation of edges (eco-tones that are characterized by high diversity), and the conservation of vertical diversity.
- The study found the community used fire as a management tool, to leave a supply of standing dead trees for firewood, cultivate gardens, maintain blueberry patches, control vegetation, help increase visibility for hunting and to keep campsites free of brush.

Implications

- Recent approaches to sustainable forest management promote the integration of ecosystem management with human well-being.
- Human activities do not have to result in the degradations of ecosystems and loss of biodiversity.
- Local peoples have incentive to conserve biodiversity when their livelihood depends on it.
- Learning from traditional management systems can broaden management objectives and approaches.
- The use of local knowledge is one way to build more inclusive and robust systems for sustainable forest management.

This project illustrated how traditional systems of forest use facilitate the continued renewal of ecosystems through various Aboriginal understandings.

Reference

Fikret Berkes, Iain J. Davidson-Hunt, Will Roberts, Christa Foley **Aboriginal cultural landscapes: sustainable boreal forest management, biodiversity, and traditional systems.** Edmonton, Alberta: SFM Network.

Selected Publications from this Project

L. Carlsson, F. Berkes **Co-management: concepts and methodological implications.** *Environmental Management* 2004. 75; 65-76.

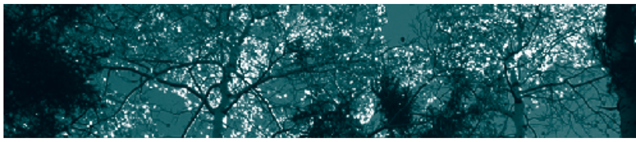
T. Elmqvist, F. Berkes, C. Folke, P. Angelstam, A.S. Crépin and J. Niemelä **The dynamics of ecosystems, biodiversity management and social institutions at high northern latitudes.** *Ambio* 2004. 33; 350-355.

Iain J. Davidson-Hunt **Iskatewizaagegan (Shoal Lake) plant knowledge: an Anishinaabe (Ojibway) ethnobotany of Northwestern Ontario.** *Journal of Ethnobiology* 2004.

Locations of the Research

Alberta

Saskatchewan



Restoring Aboriginal cultural landscapes: social-ecological health indicators for sustainability

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This project defined social and ecological indicators of community and ecosystem health and assesses how those indicators can be linked to community-based forest management.

Reference

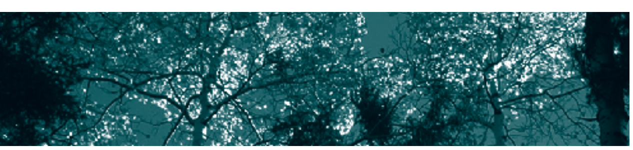
Fikret Berkes and Brenda Parlee **Social-ecological indicators for community-based monitoring and forest resource management.** Edmonton, Alberta: SFM Network.

Selected Publications from this Project

Brenda Parlee, Fikret Berkes, Teetl'it Gwich'in Renewable Resources Council **Health of the land, health of the people: a case study on Gwich'in berry harvesting.** *EcoHealth* 2005. 2,2; 165-182.

Locations of the Research

British Columbia



Social-ecological indicators for community-based monitoring and forest resource management

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Results

- The research aimed to address the gap in ecosystem health by developing social-ecological health indicators based on local and traditional ecological knowledge of Gwich'in women, with particular attention to forest ecosystems and non-timber forest products, specifically berries.
- The study documented local informal institutions, or rules-in-use, developed by Gwich'in women for dealing with variability in the abundance and distribution of valued NTFPs (berries). Gwich'in women are able to cope with variability by adapting their harvest practices through i) the use of microclimates, ii) selection of species-specific harvesting areas, iii) selection of harvesting areas with diverse resources and iv) selection of harvesting areas with redundant resources.
- Nine dimensions of social-ecological health were revealed including: individual and family well-being, social connectivity, cultural continuity, land and resource use, stewardship, self-government and spirituality.
- The research documented a set of ecological indicators or "signs and signals" used by women to understand and communicate about change in the abundance and distribution of berries in their region. These indicators focus on ecological variability at a regional, local and site-specific scale.

Implications

- The Gwich'in developed institutions that help integrate local perceptions and values regarding the interrelationships between local communities and their land into management decision-making.
- This project illustrated the interrelationships between ecosystem dynamics and local institutions, a neglected area of commons research, and thus contributed to commons theory.
- In a forest management context, the kinds of indicators developed from this research can reveal details about change at the local scale (individual, household, community) that could be convergent with regional or national scale criteria and indicator frameworks.
- This study revealed the important role that forest ecosystems play in individual and family well-being, social connectivity, cultural continuity, land and resource use, stewardship, self-government and spirituality. The identification of such values in forest management planning and policy is a critical step towards recognizing the relationships that Aboriginal peoples have to Canada's forests for more inclusive forest management and decision-making.

Results

- Barring large-scale stand-replacing disturbances, seismic lines and other cutlines in the boreal forest are persistent features. The results of this study can help improve the accuracy of landbase reductions in timber supply calculations.
- In the undisturbed condition, the recovery rates of seismic lines to woody vegetation were low (~8.2% after 35 years).
- Both wildfire and timber harvest significantly increased the percentage of lines recovering in aspen and white spruce forests (44.4 to 63.1% after 10 years).
- There was no recovery of lowland black spruce in undisturbed forests and only 12.0% recovery after wildfire.
- Seismic lines were commonly converted to other anthropogenic features such as tracked access. The conversion to these features is greater than the recovery rate to woody vegetation in undisturbed forests.

Implications

- After a period of non-use, seismic lines should be actively closed to further use. If seismic lines become active as transportation routes then those segments may be further developed into a road network. There needs to be active tracking and reclamation goals for seismic lines.
- Application of silvicultural treatments – Given the significant area of open linear features, ground preparation and planting of trees is likely to be prohibitively expensive and may only be feasible in areas of critical wildlife habitat or other areas where the control of access is critical.
- The coordinated application of timber harvest for the reduction of footprint should be explored as a component of reclamation over the landscape after energy exploration.
- The development of a road network may be a better approach if the road network at lower linear density than the existing seismic lines has less ecological impact than the ad hoc use of seismic lines.
- The re-use of seismic lines prevents the cutting of new lines and should be encouraged. The switch to minimal or very narrow seismic will mean that even re-used wide seismic will eventually have to be closed.
- Given that the study found no recovery in undisturbed lowland black spruce and relatively low rates of recovery in burned black spruce, it may not be appropriate to continue a practice of using seismic lines that leave any footprint in lowland black spruce and perhaps all peatlands.

This project determined to what extent a forest recovers from the incursion of seismic lines used in oil and gas exploration. This serves to improve the accuracy of land base reductions in timber supply calculations.

Reference

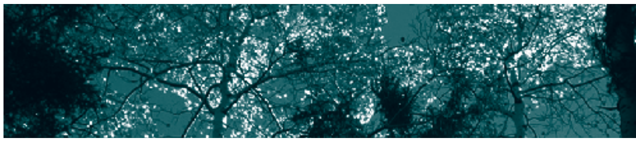
Philip Lee and Stan Boutin **Transition of seismic lines to anthropogenic features in undisturbed, wildfire, and timber harvest disturbed boreal landscapes.** Edmonton, Alberta; SFM Network.

Selected Publications from this Project

Philip Lee and Stan Boutin **Persistence and developmental transition of wide seismic lines in the Western Boreal Plains of Canada.** *Journal of Environmental Management* March 21, 2005.

Locations of the Research

Northeast Alberta



Vegetation succession on linear features undergoing cumulative disturbances in the boreal forest

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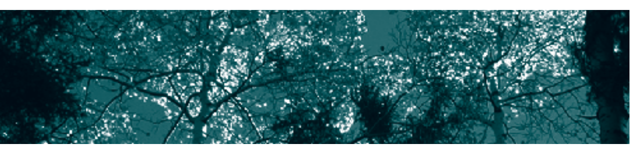
This project examined the role of competition, mortality, physical interaction and the spatial relationships and distribution of aspen and spruce in mixedwood stand development over time. This was done using detailed measurements of research stands that have a 50 year history of data collection.

Reference

Phil Comeau, Dan MacIsaac, Ellen Macdonald
Final SFM project report on spatial aspects of boreal mixedwood succession and stand dynamics.
Edmonton, Alberta; SFM Network.

Locations of the Research

Alberta



Spatial aspects of boreal mixedwood succession and stand dynamics

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Results

- Over time, spruce and aspen became more spatially segregated. In terms of stand dynamics there was a period of secondary recruitment of white spruce as the aspen canopies started to break up.
- Physical abrasion from growing in close proximity to aspen has a significant effect on spruce growth and mortality.
- Density of aspen suckers in gaps is mostly related to slash levels and grass (Calamagrostis canadensis) cover. Grass cover and browsing by ungulates play important roles in maintaining gaps.
- Spatial analysis showed that for all white spruce and for white spruce greater than 6m tall, there are two scales of pattern: 5m (representing small clumps of trees) and 20-40 m (representing dense spruce patches).
- The study increased knowledge of long-term stand dynamics (recruitment, survival, mortality) and growth trajectories in mixed stands. It also identified 50 year understory vegetation successional trajectories in stands with aspen removal and aspen retention.
- Results provided insight into the dynamics of early-successional post-harvest aspen gaps. By knowing that gaps persist through early stand development, foresters can target harvest operations to reduce gaps (i.e., winter logging, remove slash) to ensure full restocking of these sites, and if desired, enhance gaps for wildlife habitat.

Implications

- Results provide guidance regarding the best spatial arrangements and species mixes to maximize productivity at the stand level, and provide alternatives to current practices used in tree spacing and retention of uncut patches.
- To create a fully re-stocked deciduous stand avoid summer logging on sites with fine-textured soils and disperse logging debris following harvest. This will minimize gap formation after harvesting deciduous stands and will help ensure vigorous deciduous regeneration.
- The study provided an increased understanding of the importance of spatial aspects of light competition and physical leader abrasion in stand development. These results are important to consider when designing mixedwood silviculture systems.
- Results have indicated that white spruce growing in close proximity to aspen are negatively influenced by physical abrasion. This means that stand tending operations may be required to remove close competitors. In mixedwood stands, however, there are a range of ecological benefits in having both species growing on the same site, and so in some situations it may be beneficial to retain some deciduous stems.

Results

- Throughout the history of public participation in resource management there has been a clear link between popular concern for environmental issues and public desire to participate in decision-making.
- A professionalization of public participation was also observed and represents a reduction in scale of deliberative activity and a refinement in process efficiencies and outcomes that has made such processes more affordable and more manageable, but also less populist and more expert driven.
- There was evidence of a gradual decentralization and privatization of environmental governance in Canada from first-generation participatory mechanisms, where public funds and government regulators were center stage, to more private and market-based initiatives. This transition was marked by the extensive deployment of local-level public advisory committees that are now a major feature within the structure of environmental governance in Canada.
- There appear to be two underlying reasons why public participation activities are becoming less centralized and more focused on local, contextualized, sources of knowledge: 1) cultural pluralism - survey research shows that environmental values (and forest values specifically) are quite diverse among the general public, and 2) complexity and uncertainty - considerable uncertainty exists regarding the state of the forest resource and the ability of the system to sustain human and non-human needs over the long term.
- The study found that the quality of advisory committee processes was enhanced when there was greater autonomy of advisory committees from their sponsoring agency.

Implications

- De-centered nature of public participation in the form of local-level advisory committees has its advantages.
- The company-sponsored advisory committee is sometimes stubbornly deficient at meeting the standards for healthy public discussion and debate. Areas of weakness include a lack of inclusiveness, limited autonomy, and asymmetries of power and control.
- Advisory committees can be characterized in at least three ways: (1) Optimistically, as a diverse representation of local citizens, deliberating about matters of public concern, these committees are a useful format for engaging diverse interests at the local level and incorporating this knowledge into the decision-making process. (2) Less optimistically, as a group of local stakeholders governed by somewhat truncated representation and a limited mandate to deliberate on matters of public concern, these committees may be governed by a more uniform collection of ideas that represent one among many perspectives on the status of forest management. In this way, ideas that emerge from these advisory committees are no more or less distorted than other sources of information. (3) Pessimistically, as an industry-sponsored advisory process, these advisory committees may represent a compley co-opted collection of mostly handpicked local stakeholders who are used by industry in instrumental ways to assist in legitimating forest management and in amplifying an industry-oriented discourse into the public sphere.
- Advisory committees can be 'deliberative spaces' that serve to foster the kinds of interpersonal trust, social cohesion, and 'civicness' that are considered to be crucial factors in successful public processes.

This project provided an overview of the underlying historical, social and structural relationships associated with the emergence of advisory committees in Alberta. The researchers explored the extent to which individual advisory committees promote or limit the quality of public debate and meaningful exchange of ideas and how existing practices within advisory committees might be improved.

Reference

Debra Davidson and John Parkins **Public participation in forest management: a case study of advisory committees in Alberta.** Edmonton, Alberta; SFM Network.

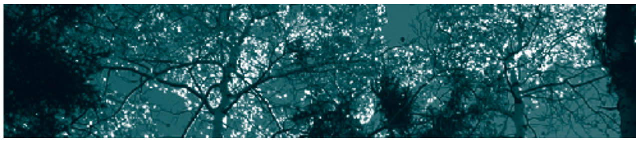
Selected Publications from this Project

J.R. Parkins **De-centering environmental governance: A short history and analysis of democratic processes in the forest sector of Alberta, Canada.** *Policy Sciences* January 24, 2006.

J.R. Parkins and D.J. Davidson **Constructing the public sphere in compromised settings.** *Environmental Politics* October 12, 2005.

Locations of the Research

Alberta



Alberta forest management in the public sphere: a province-wide case study of public advisory groups

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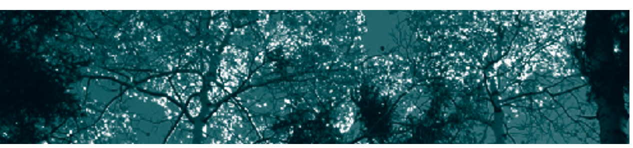
This project analyzed the impacts of risk to a company regarding harvesting decisions and the economics of Intensive Forest Management (IFM). A real options model of price uncertainty was developed and used to analyze IFM on representative, uniform stands in Ontario's boreal forest.

Reference

Glenn Fox, Margaret Insley, Shirra Freeman **Modeling risks in timber management at the stand and landscape level.** Edmonton, Alberta; SFM Network.

Locations of the Research

Ontario



Risk management for sustainable forestry

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Results

- Generally, investment in intensive forest management (IFM) practices are not justified by its economic returns, although when the decision-maker has flexibility over the size and timing of harvests, returns to the harvest are increased.
- The integration of non-market risks requires a landscape level model that will more accurately represent the physical unit of management and the natural and socio-economic interactions that determine the risk profiles.
- Integration of forest- and mill-level economics was explored to examine whether a forest level economic analysis produced different results on the economics of intensive silviculture than those obtained with more traditional forest level economic analyses. The findings of the integrated forest and mill economic model, however, confirmed the earlier forest level analysis that IFM is not justified by its economic returns.
- The economic analysis of timber management at the spatial landscape level is relatively underdeveloped.
- For uniform stands in the Canadian boreal forest, IFM techniques are insufficient to compensate forestry companies for reductions in license areas. In fact, the net returns to more intensive silviculture are often lower than the net returns to lower intensities.
- The stochastic price process is a key determinant of the model's results.
- These results imply that in the evaluation of forest investments, a mean reverting price model with a power diffusion term should be considered.
- It was found that the incorporation of fire risk reduces stand value as well as optimal harvesting prices.
- Product differentiation may lead to longer optimal rotations because more valuable products such as veneer tend to come from older trees.
- There is preliminary analytic evidence that integration of harvest and mill decision will lead to very different harvesting regimes than those prescribed by optimal rotation models.

Implications

- The research provides the basis for timber managers and regulators to include economic variables in their management planning and practice; in particular, the management of market risk through more flexibility in harvesting decisions.
- The empirical analyses have demonstrated that IFM practices may not be sufficient to compensate timber firms for decreases in the size of their license and consideration of other options may be necessary.
- The importance of economic analyses at the landscape level has been clearly demonstrated as important to more fully understanding optimal behavior by forest firms, especially in the face of environmental risks. The landscape level is also more consistent with the directions of current forest policies that focus on the sustainable, multiple-use forest resource.

Results

- On coarse textured soils severely bladed sites that were subsequently thinned had significantly lower basal area and very nutrient–poor soils compared to less intensely bladed, unthinned sites.
- Studies of jack pine and black spruce suggest that total C and N storage increase with stand age and is higher in wildfire burned sites compared to harvested and salvage logged sites. This is thought to be due to large coarse woody debris, particularly dead standing wood.
- Research found poor tree productivity and nutrient status on sites subjected to high levels of organic matter removal during site preparation.
- Winter harvesting in peaty black spruce stands may contribute to nutrient losses.
- There is little cause for concern over nutrient depletion effects on seedlings with clear-cutting or variable retention harvesting - availability to planted seedlings is much more limiting.
- Tree-length harvesting should be recommended on sites with cation imbalances.

Implications

- Although the influence of harvesting disturbance dissipates over time, management practices strongly influence understory communities, which, in turn influence ecosystem diversity, habitat niches and nutrient cycling.
- Site preparation intensity is important in determining future site productivity and that the impact of harvesting method is moderated by soil and forest type.
- Retaining one-third of the total basal area of boreal aspen mixedwoods could reduce some of the potential environmental impacts of clearcutting.
- Clearcut sites and those with retention and slash inputs emulate wildfire to some extent but not with respect to soil nutrient status – this is a consideration for forest managers that seek to emulate natural disturbance.
- The conversion of natural forests to intensively managed, single-species plantations may affect C sequestration rates, which would have implications for Canada's fulfillment of the Kyoto protocol.

This project developed nutritional indicators for forest productivity and assessed the impacts of operational harvesting on productivity.

Reference

Jim Fyles, Robert Bradley, Suzanne Brais, Benôit Côté, Andrew Gordon, Dave Morris, Alison Munson, David Paré, and Cindy Prescott **Developing practical nutritional indicators for boreal forests.** Edmonton, Alberta; SFM Network.

Locations of the Research

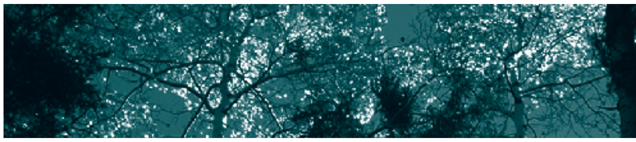
Québec

Ontario

Manitoba

Saskatchewan

Alberta



Nutritional indicators for the maintenance of boreal forest productivity

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This project improved the understanding of regeneration ecology of white spruce and the dynamics of mixedwood stands. It also made improvements to the spatially dynamic FEENIX model (a boreal forest landscape simulator).

Reference

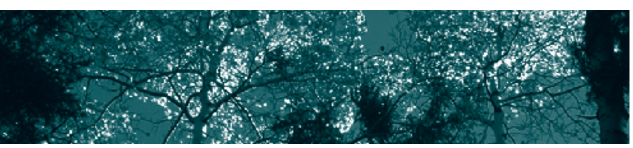
D.F. Greene and S.G. Cumming **Modelling the spatial dynamics of white spruce and aspen in the boreal mixed-wood.** Edmonton, Alberta; SFM Network.

Locations of the Research

Alberta

Northwest Territories

Québec



Modelling the spatial dynamics of white spruce and aspen in the boreal mixedwood

greenedmode7

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Results

- It is now possible to establish the temporal variance around the mean seed production for a white spruce tree of a given size.
- The project helped prove that the standard technique of inverse modeling is greatly underestimating the real dispersal capacity of tree seeds.
- Results showed that the far tail of the seed dispersal curve can be adequately modeled by the (1989) Okubo-Levin model.
- The maximum rate of increase in white spruce canopy cover occurs at approximately 100 years following fire as aspen height growth ceases and the fastest post-fire white spruce catch up with, and begin to overtop, the aspen.
- Large emergent spruce are present in 20% of young pure aspen stands in the Alberta mixedwood. Where present, their densities are sometimes high enough to influence stand-level dynamics and such trees may need to be accounted for in landscape models.

Implications

- These findings permit us for the first time to include realistic temporal variation in seed availability in models of mixedwood regeneration and stand dynamics.
- Simulation models that use incorrect dispersal models or that implicitly rely on natural regeneration to ensure that harvested or burned stands regenerate to their pre-disturbance composition, even on average, will lead to misleading management prescriptions. This is important because forest managers are increasingly using simulation models to demonstrate the sustainability of their forest management plans. If the models are structurally flawed, the demonstrations are invalid.
- Inventories underestimate the capacity of white spruce to maintain itself in those stands where white spruce numbers are so small that the polygon is deemed to be pure aspen. These “veterans” are strong seed producers, creating a dense cohort of recruits on the rotted wood that builds up decades after the fire, and probably have been crucial in the persistence of white spruce in the landscape.
- Forest management plans that include old growth management areas in boreal mixedwood forests will need to explicitly account for stand dynamics and changes in the species composition of the old-forest reserves.

Results

- The study found that the most significant parameters affecting forest age distribution were the management strategy, the harvest rate and the fire return interval. Without such a consideration some long-term forest management goals may not be achieved.
- The research highlighted the importance of considering different soil types in planning silvicultural interventions.
- The project advanced understanding of the historical levels of old-growth across the Canadian boreal forest. Despite the occurrence of fire these levels of old-growth are much higher than traditionally thought.
- Work on habitat suitability indexes under different forest management strategies has shown that areas can be identified which meet habitat needs of a number of species at the same time. At a coarse scale these may be used by forest managers to identify priority areas for wildlife use.
- The project explored the interaction of fire and different forest management strategies and suggested that the additive effects of management strategies (even those that include reduced AAC) do not ensure the maintenance of old-growth habitat unless this is specifically managed for.
- Results showed important variations between forest management and natural disturbances.
- Studies of the links between forest management laws and current understanding of different indicators of sustainability show some large gaps between knowledge and regulation in the different jurisdictions explored.
- Landscape level decisions can have important impacts on longterm soil fertility and temporal effects may not show up immediately but can leave a long-term legacy.

Implications

- Forest managers need to consider effects of forest management practices at a variety of scales – spatial and temporal.
- Old growth forests are important. Historic levels should be studied and considered when modifying forest management practices.
- The effects of fire must be incorporated in forest management calculations.

This project focused on developing and improving the VLM (Visual Landscape Management) model in SELES (a landscape simulator). As well the project improved links with industrial partners, evaluated interactions between natural disturbances and forest management, explored the effect of different management scenarios on a number of ecological indicators and developed comparative work between regions.

Reference

Dan Kneeshaw, Jarie-Josée Fortin, Andrew Fall, Christian Messier, Pierre Drapeau, Luc Bouthillier, Alain Leduc **Modelling the spatial dynamics of white spruce and aspen in the boreal mixedwood.** Edmonton, Alberta; SFM Network.

Selected Publications from this Project

D.D. Kneeshaw and M. Prévost **Can natural disturbances guide us to better management of mixedwood forests?** *Forest Ecology Mangement* February 2005.

M. Bouchard, D.D. Kneeshaw, Y. Bergeron **Mortality and stand renewal patterns in mixed forest stands following the lasts pruce budworm outbreak in western Québec.** *Forest Ecology and Management* 2005. 204; 297-313.

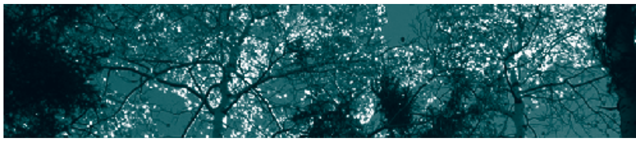
S. Brais,Y. Bergeron, C. Messier, D.F. Greene, A. Belleau, D. Paré **Testing forest ecosystem management in boreal mixedwoods of Northwestern Québec: Initial response of Aspen stands to different levels of harvesting.** *Canadian Journal of Forest Research* 2004. 204, 34; 431-446.

Locations of the Research

Québec

Ontario

British Columbia



Integration of public participation and bio-physical and socio-economic modelling for sustainable forest management

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This project developed a means of qualitatively gauging market awareness and acceptance of environmental certification of commonly purchased value-added wood products. The project also assessed the potential for certified wood products within the Canadian value-added sector.

Reference

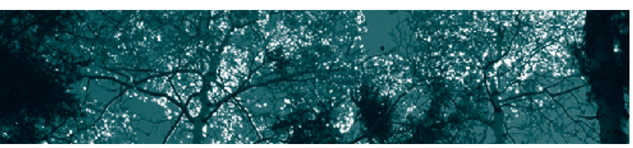
Robert Kozak **Forest certification in the Canadian value-added wood products manufacturing sector.** Edmonton, Alberta; SFM Network.

Selected Publications from this Project

R.A. Kozak, D.H. Cohen, J. Lerner and G.Q. Bull **Western Canadian consumer attitudes towards certified value-added wood products: an exploratory assessment.** *Forest Products Journal* 2004. 54, 9; 21-24.

Locations of the Research

Canada-wide



Assessing the impacts of forest certification on Canadian value-added wood products businesses

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Results

- Most consumers had little knowledge of environmental labeling of wood products.
- All consumers that participated indicated they would be willing to purchase certified value-added wood products in the future.
- Most consumers polled were willing to pay a small premium for these products.
- 64.8% of the value-added manufacturers surveyed were not interested in forest certification and only 17.6% of the respondents were currently involved in forest certification processes.
- There seems to be a general perception among value-added manufacturers that there is a lack of consumer demand for certified value-added wood products.
- Value-added producers appear to have low general knowledge levels of forest certification issues, even though there seems to be a widespread interest in sustaining forests.
- Value-added producers that are aware of forest certification tend to be doubtful about its ability to provide marketing and production-related benefits.
- There is a sizable proportion of the value-added wood products sector that is taking a "wait and see" approach to adopting forest certification strategies.

Implications

- The study clearly indicated that forest certification is in its infancy in the Canadian value-added wood products manufacturing sector.
- Not all value-added manufacturers surveyed were positive about the benefits of certification. In fact, the majority doubted whether price premiums could be obtained for certified goods.
- Widespread adoption of certified wood materials by Canadian value-added producers would serve to enhance objectives related to managing our forest resources more sustainably.

Results

- Approaches were developed for: (1) predicting time-since-fire from inventory age and other inventory information; (2) assigning ages to areas that did not have ages in the forest inventory; and (3) grouping adjacent stands with similar predicted time-since-fire into probable single-fire events.
- While there was not a strong correlation between the inventory age information and time-since-fire on the landscape studied, the approaches developed can be used to provide time-since-fire information that is much more useful than simply using the unadjusted ages from the forest inventory.
- A linear relationship was expected and found between the forest inventory age of a polygon and the observed time-since-fire.
- Not surprisingly, simply using the unadjusted ages from the forest inventory dataset poorly represented the time-since-fire values. The forest inventory age distribution was shifted to the right of the observed time-since-fire values, since it included younger ages from harvesting.
- The regression relationships that were derived were not strong. In general, the models explained about 30 percent of the variation present in the time-since-fire for the landscape.

Implications

- The drive to pattern forest management (and harvesting) after historic disturbance patterns has changed forest management policies over the last decade.
- This research sought to decrease the effort needed to collect the data required for quantifying natural disturbance patterns due to fire.
- Unfortunately, an acceptable shortcut to producing an accurate time-since-fire dataset using forest inventory data was not found. The search continues.

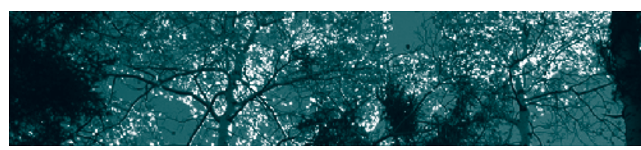
This project explored alternative approaches to acquiring time-since-fire data for a particular landscape. Traditional methods are time consuming and expensive. This study used tree ages and other information collected for forest inventories to predict time-since-fire for a boreal mixedwood landscape in northwest Saskatchewan.

Reference

Peter Marshall, Rueben Schulz, David Andison, Valerie LeMay **Relationships between inventory age and time-since-fire in Northwest Saskatchewan.** Edmonton, Alberta; SFM Network.

Locations of the Research

Saskatchewan



Comparing stand origin ages with forest inventory ages on a boreal mixedwood landscape

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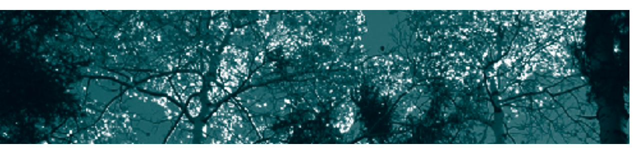
This project determined whether or not there was higher zooplankton biomass in cut lakes post-harvest in the boreal shield as compared to the pre-harvest conditions or to reference lakes.

Reference

Bernadette Pinel-Alloul, Lyne Duhaime, Mathieu Bondallaz
Experimental study of the effects of forest harvesting on zooplankton communities in Boreal Shield lakes.
Edmonton, Alberta; SFM Network.

Locations of the Research

Québec



Experimental study of the effects of forest harvesting on zooplankton communities in Boreal Shield lakes

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Results

- There was no pre-harvest spatial variation in the morphometry, water quality and zooplankton biomass between the six reference lakes and the six lakes with to be logged watershed. However, we found significant variations in zooplankton variables among sampling months and years.
- During the first post-harvest year there was no detection of any changes in zooplankton biomass in the cut lakes. This lack of effect during the first post-harvest year may be explained by the low intensity of harvesting (lower than 15% of watershed area).
- There were significant changes in zooplankton variables 2 years after harvesting. The spring of the second year post-harvest had greater precipitation and run-off which may have produced higher inputs of nutrients and DOC in the cut lakes. Climatic changes, especially higher precipitation and runoff at spring or during summer can intensify the effects of harvesting on Boreal Shield lakes on nutrients exports, water quality and plankton.
- The study found more significant effects of forest harvesting on zooplankton size fractionated biomass than previous studies. This better performance may be explained by differences between studies in harvesting intensity, study design, and zooplankton sampling.
- The effects of harvesting on the biomass of zooplankton size classes differed. The more significant changes were in the biomass of the small (53-100 µm) and the median size classes (53-100, 100-200, 200-500 µm) than of the largest (> 500 µm) size class.
- Despites significant changes (Delta values) after harvesting in zooplankton biomass in the cut lakes, these changes could not be related to the indices of harvesting intensity.

Implications

- The results supported the hypothesis of higher zooplankton biomass in the cut lakes post-harvest, compared to the pre-harvest conditions (BACI design) or to reference lakes (comparative design).
- It is difficult to dissociate the relative influence of climate events such as high precipitation from direct effects of harvesting.
- This study demonstrated that harvesting has enhanced effects during year of higher runoff, and that logging impact may still occur still several years after perturbation after precipitation events.
- From a forest management perspective, lakes affected by watershed logging should be monitored several years after harvest to fully assess the long-term effects of watershed disturbances.

Results

- There was, in the short term, a decrease of the biomass and an increase in methylmercury concentration (2 to 10 times) in the littoral biofilms of lakes where the watershed was logged. This increase was associated with the percent of the slope and the percent area of the watershed that was logged.
- There was a negative effect of logging on the accumulation of methylmercury in lakes is higher when the slopes of watersheds are lower than 7%. Methylmercury is the most toxic form of this metal and it is the most likely to accumulate and to be bio-amplified along the aquatic food web to the fish and eventually to humans who eat it.

Implications

- During the planning step for areas to be logged, it is important to consider the morphological characteristics of watersheds in order to limit the negative effects of logging on lakes.
- The watersheds with gentle slopes (< 7%) should be considered for particular protection measures when logging plans are made, because their lakes have the lowest concentration of MeHg in their natural state, but they are also those that accumulate the most MeHg following logging.
- This project observed that the effect of logging when watershed slopes are weak can be supplanted by the presence of beaver activity around the lake. This observation is based on results from only one lake and would require further investigation.

This project documented changes in the concentration of mercury and methylmercury (the toxic and bio-accumulating form) in the littoral biofilms of lakes before and after logging in the boreal shield lakes in Québec.

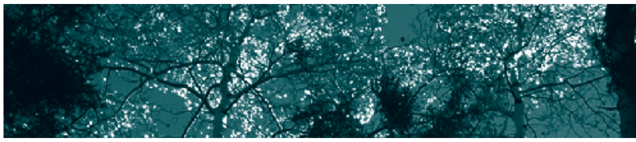
Boreal soils retain mercury originating from atmospheric deposition. Logging produces an increase in the export of mercury from the forest soils towards lakes through runoff and seepage. The biofilm in the littoral zone of lakes, located at the interface between terrestrial and aquatic environments, is the first receptor and accumulator of these exports, and its consumers are a source of food for fish.

Reference

Dolors Planas, Mélanie Desrosiers **Short-term response to watershed logging on littoral biomass and mercury accumulation.** Edmonton, Alberta; SFM Network.

Locations of the Research

Québec



The importance of the littoral biofilm on methylmercury accumulation in relation to DOC fluxes

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This project developed new tools for windthrow risk assessment and improved existing tools in order to enhance the planning and sustainable management of landscapes.

Reference

Jean-Claude Ruel and Steve Mitchell **Development of tools to predict windthrow occurrence.** Edmonton, Alberta; SFM Network.

Selected Publications from this Project

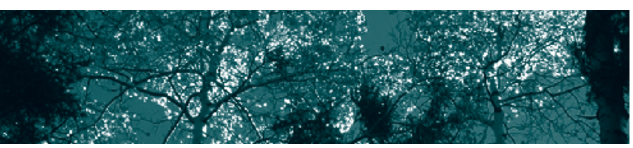
J.G. Élie and J.C. Ruel **Windthrow hazard modelling in boreal forest for black spruce and jack pine.** *Canadian Journal of Forest Research* 2005. 35; 2655-2663.

Lanquaye-Opoku and Stephen J. Mitchell **Portability of stand-level empirical windthrow risk models.** *Forest Ecology and Management* 2005. 216; 134-148.

Locations of the Research

Québec

British Columbia



Windthrow risk modelling

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Results

- The project developed two approaches for windthrow risk assessment. Given the relatively poor performance of mechanistic models at the present time, empirical models appear to provide an effective way to incorporate windthrow hazard concerns into forest management while continuing to improve mechanistic models
- Overturning resistance was strongly related to stem mass for all species tested. Overturning resistance equations were incorporated into the ForestGales model.
- Species relative resistance in the best rooting conditions was: jack pine>black spruce=lodgepole pine>balsam fir=white spruce>hybrid spruce>western redcedar=western hemlock.
- The study measured the effect of wind speed on streamlining and drag coefficient. As a result of branch and foliage streamlining, there is a decrease in the drag coefficient with increasing wind speeds if the frontal area in still air is used as the reference for calculation. The rate of decrease is not constant for all species.
- Models predicting the occurrence and amount of damage around clearcuts were built for balsam fir and black spruce in Québec.
- A model to predict incidence of windthrow around clearcut edges was fit for the McGregor Model Forest (Canadian Forest Products TFL 30) northeast of Prince George, British Columbia.

Implications

- The project has provided an adaptation of a mechanistic model and developed empirical models to incorporate windthrow concerns into forest management. The models provide a means to refine current cutting strategies and minimize losses to windthrow.
- The empirical model developed for balsam fir showed an increased risk of damage with smaller clearcuts. Managers could either move to larger clearcuts, plan for salvaging the windthrown volume or consider a loss when calculating their allowable cut.
- In some cases, regular inventory plots systematically avoided edge conditions. This project has made some managers aware that they were systematically overestimating standing volumes and allowable cut by doing so.
- The empirical model developed for British Columbia indicates how different cutblock design factors affect windthrow risk. Managers can use this knowledge in designing future cutblocks in order to reduce the amount of timber lost to windthrow.

Results

- Consideration of the three SACs (stakeholder advisory committee) operating in Manitoba, revealed that they represent increments toward meaningful public participation in forest management in Manitoba.
- Early and ongoing participation involving meaningful dialogue among participants is central to successful involvement.
- Participants need clear and unambiguous notice of participatory events, easy access to non-technical information, support and strong facilitation at events.
- Evaluation of issues and practices can be informed by posing questions and providing information that elicit values orientations.
- It is important that participants and facilitators are understand prior to participatory events that learning is to be an outcome of engagement requiring individuals to share their knowledge and experience.
- Utilizing web tools can improve the level of committee member preparation before SAC meetings thereby advancing the level of dialogue. Visual tools and field tours are preferred methods of communication among committee members.

Implications

- The research has revealed a number of strengths and weaknesses in consultative processes being initiated by both forest products companies and governments in regards to forest planning and management.
- There is opportunity for regulators and committee members to address these issues.
- Regulators could modify the environmental licencing that requires forest companies establish SAC process and require that the committees actually get to comment on normative level decisions rather then limited stand level operational decisions.
- Stakeholder advisory committee members could require changes in procedure such as the development of dispute resolution approaches or the requirement of more information sources for specific topics.
- The research help to raise awareness among committee members about what the potential could be in terms of dialogue and reflection. Such reflection could lead to a number of SAC process modifications and company policy changes.

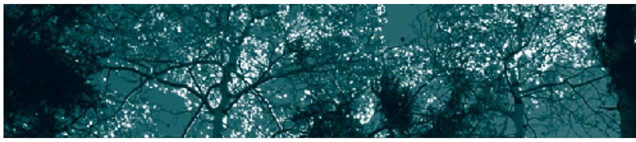
This project examined what people learn through consultation and participation in forest management planning initiatives and the role of such learning in ensuring sustainable forest management.

Reference

A. John Sinclair **Public involvement in forest management and planning in Manitoba.** Edmonton, Alberta; SFM Network.

Locations of the Research

Manitoba



Public involvement in forest management and land use planning on Manitoba's east side

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SELECTED PUBLICATIONS

PUBLISHED BETWEEN APRIL 2005 AND MARCH 2006

SFM NETWORK PUBLICATIONS

REFEREED AND NON-REFEREED JOURNAL ARTICLES

GRADUATE THESES

3

Synthesis Reports

Thomas Beckley, John Parkins, Stephen Sheppard **Public participation in sustainable forest management: a reference guide.** *(SFM Network March 2006)*.

Ève Lauzon, Yves Bergeron, Sylvie Gauthier, Daniel Kneeshaw **Fire cycles and forest management: an alternative approach for management of the Canadian boreal forest.** *(SFM Network October 2006).*

ToolKit

Michael Splinter, Kirby Wright **Effective knowledge exchange: Linking research and extension. A guide to developing a knowledge exchange plan.** *(SFM Network September 2006).*

Research Notes

No. 16 Forest floor: mix, move or manage it?

No. 17 Compaction of boreal forest soils.

No. 18 Criteria and indicators and a decision support system for an alternative zoning approach to sustainable forest management.

No. 19 Considering climate change in sustainable forest management.

No. 20 Modeling stand-level indicators of sustainable forest management in TFL 49.

No. 21 Assessing SFM values: a tool for describing attachment to place.

No. 22 Wood-ethanol in Canada: production technologies, wood sources and policy incentives.

No. 23 Wood-ethanol plantations: implications for sustainable forest management.

SFM Network publications

Refereed Contributions

Natural Disturbance Management

Brian Brassard, Han Chen **Stand structural dynamics of North American boreal forests.** *Critical Reviews in Plant Science* 2006; 25: 37-59.

J.G. Élie, Jean-Claude Ruel **Windthrow hazard modelling in boreal forest for black spruce and jack pine.** *Canadian Journal of Forest Research* 2005; 35: 2655-2663.

Nicole Fenton, Yves Bergeron **Facilitative succession in a boreal bryophyte community driven by changes in available moisture and light.** *Journal of Vegetation Science* 2005; 17: 65-76.

David Greene, Ellen Macdonald, Lynn Swift, Steve Cumming **Seedbed variation from the interior through the edge of a large wildfire in Alberta.** *Canadian Journal of Forest Research* 2005; 35: 1640-1647.

David Greene, Josée Noël, M Rousseau, Sylvie Gauthier, Yves Bergeron **A field experiment determining the effect of post-fire salvage on seedbeds and tree regeneration.** *Frontiers in Ecology and the Environment* 2005; 4, 2: 69-74.

D. Grenier, Daniel Kneeshaw, Sylvie Gauthier, Yves Bergeron **Fire frequency for the transitional mixedwood forest of Timiskaming, Québec, Canada.** *Canadian Journal of Forest Research* 2005; 35: 656-666.

Art Groot **Biases in LI-COR Plant Canopy Analyzer estimates of seasonal light interception by black spruce and trembling aspen canopies.** *Canadian Journal of Forest Research* 2005; 35,11: 2664-2670.

Daniel Kneeshaw, Mathieu Bouchard, Yves Bergeron **Mortality and stand renewal patterns in mixed forest stands following the last spruce budworm outbreak in western Québec.** *Forest Ecology Management* 2005; 204: 297-313.

Nicolas Lecomte, Yves Bergeron **Successional pathways on different surficial deposits in the coniferous boreal forest of the Québec Clay Belt.** *Canadian Journal of Forest Research* 2005; 35: 1984-1995.

A. Leduc, A. Park, Daniel Kneeshaw **Role of time since fire and secondary disturbance in explaining compositional and spatial diversity of the mixed boreal forest.** *Canadian Journal of Forest Research* 2005; 35: 750-761.

Ellen Macdonald, M.R.T. Dale, V.S. Peters **The masting phenomenon in relation to fire is key to white spruce regeneration.** *Ecology* 2005; 86:1744-1750.

Christian Messier, K.J. Stadt, R. Hall, Vic Lieffers **Spatially explicit modeling of PAR transmission and growth of Picea glauca and Abies balsamea in the boreal forests of Alberta and Québec.** *Canadian Journal of Forest Research* 2005; 35: 1-12.

A Nappi, M Saint-Germain, Pierre Drapeau, V.A. Angers **Les régimes naturels de perturbations, l'aménagement forestier et le bois mort dans la forêt boréale québécoise.** *Bois mort et à cavités, une clé pour des forêts vivantes* 2005; Chapitre 4. 45-55.

Craig Nitschke **Does forest harvesting emulate wildfire? A comparison of effects on selected attributes in coniferous-dominated headwater systems.** *Forest Ecology and Management* 2005; 214: 305-319.

Lanquaye Opoku, S.J. Mitchell **Portability of stand-level empirical windthrow risk models.** *Forest Ecology and Management* 2005; 216: 134-148.

K.J. Stadt, Vic Lieffers **Comparing PAR transmission models for forest understorey vegetation.** *Applied Vegetation Science* 2005; 8: 65-76.

Alanna Sutton, Jacques Tardif **Distribution and anatomical characteristics of white rings in Populus tremuloides.** *IAWA Journal* 2005; 26: 221-238.

Natural Disturbance Management | Ecological Criteria and Indicators

Darwyn Coxson, S.K. Stevenson **Retention of canopy lichens after partial-cut harvesting in wet-belt interior cedar-hemlock forests, British Columbia, Canada.** *Forest Ecology Management* 2005; 204: 99-114.

André de Romer, Daniel Kneeshaw, J. Messier, Mathieu Bouchard **A comparison of gap characteristics in mixedwood old-growth forests in eastern and western Québec.** *Canadian Journal of Forest Research* 2005; 35: 510-2515.

Caroline Drapeau, K.A. Harper, Louis de Grandpré, Sylvie Gauthier, Yves Bergeron **Structural development following fire in black spruce boreal forest.** *Forest Ecology Management* 2005; 206: 293-306.

A. Larouche, Dominic Cyr, Sylvie Gauthier, Yves Bergeron **Are the old-growth forests of the Clay Belt part of a fire regulated mosaic?** *Canadian Journal of Forest Research* 2005; 35: 35-73.

A. Larouche, Andrée-Anne Simard, H. Asnong, Nicolas Lecomte, P. Richard, Yves Bergeron **Effects of fire severity and initial tree composition on understory vegetation dynamics in a boreal landscape inferred from chronosequence and paleoecological data.** *Journal of Vegetation Science* 2005; 16: 665-674.

D. Ostaff, Dan Quiring, Rob Johns **Sample units and sampling plan for evaluating yellowheaded spruce sawfly density and defoliation in juvenile black spruce stands.** *Journal of the Acadian Entomological Society* 2005; 2: 1-13.

Selected refereed and non-refereed journal articles from SFM Network-funded research

Innovative Zoning | Integrated Resource Management

Dave MacLean, Michael Montigny **Using heterogeneity and representation of ecosite criteria to select forest reserves in an intensively managed industrial forest.** *Biological Conservation* 2005; 125: 237-248.

Craig Nitschke **Triad zoning and management on a dynamic landscape: conserving biodiversity and timber supply through holistic analysis and risk spreading.** *The International Forestry Review* 2005; 7,5: 361.

Craig Nitschke, John Innes **The application of forest zoning as an alternative to multiple use forestry.** *Forestry and Environmental Change: Socioeconomic and Political Dimensions* 2005: 97-124.

Innovative Zoning | Ecological Criteria and Indicators

A.W. Diamond, B. Matson, Graham Forbes, J.A. Loo, Kate Frego, L. Wuest, M.G. Betts, Marc-André Villard, Mark Roberts **Plantations and biodiversity: a comment on the debate in New Brunswick.** *Forestry Chronicle* 2005; 81: 265-26.

Integrated Resource Management

Luc Bouthillier **La gestion intégrée des ressources forestières.** *Préface* 2005; XV-XVI.

Dave MacLean, Michael Montigny **Using heterogeneity and representation of ecosite criteria to select forest reserves in an intensively managed industrial forest**. *Biological Conservation* 2005; 125.

Integrated Resource Management | Innovative Zoning

Andrew Fall, B. Rayfield, G. Farley, Marie-Josée Fortin, Patrick James **Reserve network design combining spatial graph theory and species' spatial requirements.** *GEOMATICA* 2005; 59: 121-129.

Selected refereed and non-refereed journal articles from SFM Network-funded research

Integrated Resource Management | Value Added/ Alternative Products

Charles Bourque, Dave MacLean, Eric Neilson, Fan-Rui Meng, Jag Bhatti, Paul Arp **Modelling carbon sequestration with CO2Fix and a timber supply model for use in forest management planning.** *Canadian Journal of Soil Science* 2006; 86: 219-233.

Policy and Institutional Analysis

D. Cavens, D. Harrison, Howie Harshaw, Mike Meitner, P. Picard, Ryan Gandy, Stephen Sheppard **The multiple roles of environmental data visualization in evaluating alternative forest management strategies.** *Computers and Electronics in Agriculture* 2005; 49,1: 192-205.

Colette Fluet, Naomi Krogman **Stakeholder Involvement in environmental policy networks: A case study of the northern east slopes strategy, Alberta, Canada.** *Environmental Conflicts and Democracy in Canada* 2006.

A.H. Mathey, Craig Nitschke, G.M. Hickey, S.D. Allen **Forestry Chronicle special IUFRO World Congress issue: Crossing borders: international perspectives onilnterdisciplinary research.** *The Forestry Chronicle, Guest Editorial* 2005; 81, 3: 95-296.

Mike Meitner, Ryan Gandy, Stephen Sheppard **Reviewing the role of visualization in communicating and understanding forest complexity.** *IEEE Proceedings, International Conference on Information Visualisation* 2005; IV05:121-128.

Mike Meitner, Stephen Sheppard **Using multi-criteria analysis and visualisation for sustainable forest management planning with stakeholder groups.** *Forest Ecology and Management* 2005; 207,1-2: 171-187.

Craig Nitschke, G.M. Hickey **Crossing disciplinary boundaries in forest research: An international challenge.** *Forestry Chronicle* 2005; 81, 3: 321-323.

John Parkins, R.E. Mitchell **Public participation as public debate: a deliberative turn in natural resource management.** *Society and Natural Resources* 2005; 18,6: 529-540.

B. Seely, Clive Welham, J.P. Kimmins, Mike Meitner, R. Remple, T. Sullivan **Science in forestry: why does it sometimes disappoint or even fail us?** *Forestry Chronicle* 2005; 81,5: 739-742.

Stephen Sheppard **Participatory decision support for sustainable forest management: A framework for planning with local communities at the landscape level.** *Canadian Journal of Forest Research* 2005; 35, 7: 1515-1526.

Ecological Criteria and Indicators

Anne-Sophie Bertrand **Ground beetles (Coleoptera: Carabidae) from northwestern New Brunswick, Canada: notes on uncommonly reported species and new provincial records.** *Northeastern Naturalist* 2005; 12, 3: 287-294.

Charles Bourque, D.E. Swift, Fan-Rui Meng, M. Krasowski, W.C. Clowater, Z. Xing **Carbon and biomass partitioning in balsam fir (Abies balsamea (L.) Mill).** *Tree Physiology* 2005; 25, 9: 1207-1217.

Kevin Devito, Kirsten D. Hannam, Sylvie Quideau, Todd Redding **Particle density of aspen, spruce and pine forests floors on the boreal plain or northern Alberta, Canada.** *Society of Soil Science of America Journal* 2005; 69, 1503-1506.

A.W. Diamond, Graham Forbes, J.S. Gunn, M.G. Betts, Marc-André Villard **The importance of spatial autocorrelation, extent and resolution in predicting forest bird occurrence.** *Ecological Modelling* 2006; 191: 197-224.

Frank Doyle, Todd Mahon **Effect of timber harvesting near nest sites on the reproductive success of northern goshawks.** *Journal of Raptor Research* 2005; 39, 3: 335-341.

Andrew Gordon, Jim Buttle, Paul Hazlett, Paul Sibley **Carbon and nitrogen pools of riparian and upland boreal forest and soils in northeastern Ontario.** *Forest Ecology and Management* 2005; 219: 56-68.

J.S. Guénette, Marc-André Villard **Les oiseaux forestiers montrent-ils la même sensibilité à l'exploitation forestière aux échelles du peuplement et du paysage?** *Vertigo* 2005; 6, 2.

J.S. Guénette, Marc-André Villard **Thresholds in forest bird response to habitat alteration as quantitative targets for conservation.** *Conservation Biology* 2005; 19: 1168-1180.

Barbara Kishchuk, Kirsten D. Hannam, R.E. Wasylishen, S.W. Oh, Sylvie Quideau **Forest floor chemical properties are altered by clearcutting in trembling aspen- and white spruce-dominated stands of the boreal mixedwood forest.** *Canadian Journal of Forest Research* 2005; 35: 2457-2468.

J. Lemaître, Marc-André Villard **Foraging patterns of pileated woodpeckers in a managed Acadian forest: a resource selection function.** *Canadian Journal of Forest Research* 2005; 35: 2387-2393.

Dave MacLean, J.M. Hagan, J.M. Reed, J.W. Higdon **Evaluating vertebrate species risk on an industrial forest landscape.** *Forest Ecology Management* 2005; 204: 279-296.

Ecological Criteria and Indicators | Water and Wetlands

Irena Creed, Kevin Devito, M.L. Macrae, Todd Redding, Wayne Bell **Soil, surface water and groundwater phosphorus relationships in a partially harvested Boreal Plain aspen catchment.** *Forest Ecology and Management* 2005; 206: 315-329.

Dave Kreutzweiser, K.P. Good, T.M. Sutton **Large woody debris characteristics and contributions to pool formation in forest streams of the Boreal Shield.** *Canadian Journal of Forest Research* 2005; 35: 1213-1223.

Dave Kreutzweiser, K.P. Good, S.S. Capell **Effects of fine sediment inputs from a logging road on stream insect communities: a large-scale experimental approach in a Canadian headwater stream.** *Aquatic Ecology* 2005; 39: 55-66.

Dave Kreutzweiser, K.P. Good, S.S. Capell **Macroinvertebrate community responses to selection logging in riparian and upland areas of headwatercatchments in a northern hardwood forest.** *Journal of the North American Benthological Society* 2005; 24: 208-222.

Water and Wetlands

C.J. Oswald, David Woods, Jim Buttle **Hydrologic recovery of snow accumulation and melt following harvesting in northeastern Ontario.** *Proceedings of the Eastern Snow Conference* 2005; 62: 83-91.

Brian Smerdon, Carl Mendoza, Irena Creed, Kevin Devito, Rich Petrone, Thian Gan, Uldis Silins **A framework for broad scale classification of hydrologic response units on the Boreal Plain: Is topography the last thing to consider?** Invited Commentaries. *HP Today, Hydrology Process* 2005; 19: 1705-1714.

Brian Smerdon, Carl Mendoza, Kevin Devito **Interaction of ground-water and shallow lakes on outwash sediments in the sub-humid Boreal Plains region.** *Journal of Hydrology* 2005; 314: 246-262.

J.M. Waddington, Kevin Devito, M.L. Macrae, Rich Petrone, Steven Kauffman **Potential carbon losses from boreal pond and riparian areas: influence of temperature and drought.** *Dynamics and Biogeochemistry of River Corridors and Wetlands* 2005; 294.

Sustainable Aboriginal Communities

Peggy Smith **Natural resource co-management with Aboriginal peoples in Canada: coexistence or assimilation.** *First Nations and Forest Lands,* in press.

Leslie Treseder, Naomi Krogman **Aboriginal forestry: linking social and ecological research for sustainability.** *Forest Co-Management in Northern Alberta: Does it Challenge the Industrial Model?* 2006.

Social/Economic Criteria and Indicators

Luc Bouthillier, N. Gélinas **La forêt habitée comme mécanisme de gestion partenariale: Une analyse de la perception des participant à cinq projets au Québec.** *Cahiers de géographie du Québec* juin 2005.

Mike Meitner, Robert d'Eon, Ryan Gandy **Human perceptions of forest fragmentation: Implications for natural disturbance management.** *Forestry Chronicle* 2005; 81, 2: 1-9.

Dave Tindall, Howie Harshaw **Social structure, identities, and values: a network approach to understanding people's relationships to forests.** *Journal of Leisure Research* 2005; 37, 4: 426-449.

Social/Economic Criteria and Indicators | Natural Disturbance Management

B. Amiro, R. Rittmaster, R. Pelletier, Vic Adamowicz **Economic analysis of health effects from forest fires.** *Canadian Journal of Forest Research* 2006; 36: 868-877.

Selected refereed and non-refereed journal articles from SFM Network-funded research

Non-refereed Contributions

Natural Disturbance Management

Carl Bergeron, J.G. Élie, Jean-Claude Ruel **Résistance au renversement de l'épinette noire.** Chaire de recherche industrielle CRSNG-Université Laval en sylviculture et faune. *Bulletin d'information no 2* 2005; 2.

D. Dubeau, D. Imbeau, L. Lebel, Luc Bouthillier **Le dégagement de la régénération, l'effet réel… sur les travailleurs.** *L'Aubelle, journal de l'Ordre des Ingénieurs Forestiers du Québec* Été-automne 2005; 149: 33-35.

Chris Hennigar, Dave MacLean, K. Porter **Integration of the spruce budworm DSS into Woodstock: case study on the Black Brook District, New Brunswick Canada.** *Proceedings of the Spray Efficacy Research Group International and USDA Forest Service Workshop Feb. 13-16th, Banff, Alberta* 2006; 179.

Daniel Kneeshaw, Sylvie Gauthier, Yves Claveau **Nos pratiques s'inspirent-elles vraiment des feux?** *L'Aubelle* in press.

Natural Disturbance Management | Ecological Criteria and Indicators

Dave MacLean **Insect outbreaks as determinants of the structure and function of Canada's forests.** *Health and the Planet* 2005; 53-79.

Innovative Zoning

J. Gonzalez, Mike Meitner, S. Pacheco **Land use planning in the Yungas biosphere reserve in Argentina.** *In Proceedings, ESRI International Users Conference, San Diego, California* August 2005.

Chris Hennigar, Greg Slaney **Role of pest management in sequestering carbon during the 2008-2012 Kyoto commitment period.** *Proceedings of the SERG International and Canadian Forest Service Workshop* 2005.

Innovative Zoning | Integrated Resource Management

Daniel Kneeshaw, Josianne Bonneau **Le choix des forêts représentative pour les aires de conservation.** *L'Aubelle* 2005; 149: 9-30.

Alberta Pacific Industries Inc., Ducks Unlimited Canada **A hydrology-based conservation program.** *Information Bulletin* 2005.

Selected refereed and non-refereed journal articles from SFM Network-funded research

Integrated Resource Management

Brent Chamberlain, Mike Meitner, Ryan Gandy **Visualizing international deforestation trajectories using ArcGIS.** *In Proceedings, ESRI International Users Conference, San Diego, California* August 2005.

B.C. Larson, Rasmus Astrup **A Bayesian framework for model parameterization: an approach for inclusion of different sources of knowledge in model parameterization.** *The International Forestry Review* 2005; 7, 5: 256-257.

Mike Meitner, Ryan Gandy **Using image mapping techniques to model and visualize our changing forests.** *In Proceedings, Italy-Canada Workshop 2005, 3D digital imaging and modeling: Applications of heritage, industry, medicine and land, Padua, Italy* May 2005.

Mike Meitner, Ryan Gandy, Stephen Sheppard **Reviewing the role of visualization in communicating and understanding forest complexity.** *IEEE Proceedings, International Conference on Information Visualisation – ACM Press,* 2005; *IV05*, 121-128.

Craig Nitschke **Considering climate change in sustainable forest management.** *TFL 49 Technical Note #3* 2005.

Integrated Resource Management | Ecological Criteria and Indicators

Robert d'Eon **The TFL 49 project: criteria and indicators and a decision-support system for an alternative zoning approach to sustainable forest management.** *TFL 49 Technical Note #2* September 2005; 3.

Clive Welham **Modeling stand-level indicators of sustainable forest management in TFL 49.** *TFL 49 Technical Note #1* September 2005; 3.

Policy and Institutional Analysis

Larianne Brown, Lisa Marie Ambus **Tenure Reform in British Columbia: A journey of a thousand miles begins with a single step.** *Forum magazine, published by the Association of BC Professional Foresters* 2005.

D. Cavens, J.D. Salter, Mike Meitner, Stephen Sheppard **Planning, communicating, designing, and decision-making for large scale landscapes.** *Visualization in Landscape and Environmental Planning: Technology and Applications* 2005.

Policy and Institutional Analysis | Integrated Resource Management

Luc Bouthillier **Les enjeux de la foresterie durable.** L*e monde forestier* décembre 2005; 19,10: 35.

Luc Bouthillier **Tendances européennes.** L*e monde forestier* décembre 2005; 19,10: 29.

Héloïse Le Goff, Yves Bergeron **Doit-on remettre en question notre façon d'aménager la forêt boréale canadienne?** *Vertigo* 2005; 6, 2.

Value Added/Alternative Products

Brent Mainprize, Darcy Mitchell, Tom Hobby **Non-timber forest products and indigenous enterprise: prospects for income, conservation and community wellbeing.** *IUFRO World Congress, "Forests in the Balance: Linking Tradition and Technology", Brisbane, Queensland, Australia* August 8-11, 2005.

Ecological Criteria and Indicators

Todd Mahon **Foraging habitat selection and home range size of northern goshawks in the sub-boreal spruce BEC zone.** *Morice & Lakes Innovative Forest Practices Agreement* 2005.

Craig Nitschke, G.M. Hickey, John Innes **Effectiveness monitoring of biodiversity in dynamic environments: Is it possible?** *Monitoring the Effectiveness of Biological Conservation* in press.

D.G. Reid, Frank Doyle **Does spatial scale of forest disturbance affect snowshoe hare and lynx population dynamics?** 2005; 20.

Isabelle Robichaud, Marc-André Villard **Tolerance thresholds: a tool for conservation.** *Living Landscapes No.1. Canada Research Chair in Landscape Conservation, (also published in French in À Grande Échelle)* 2005.

Isabelle Robichaud, Marc-André Villard **The Pileated Woodpecker: inspector of large trees.** *Living Landscapes No.2. Canada Research Chair in Landscape Conservation, (also published in French in À Grande Échelle)* 2005.

J.D. Steventon **Analysis of presence/absence data when absence is uncertain (false zeroes): an example for the northern flying squirrel using SAS.** *Extension Note 74* 2005; 6.

Kari Stuart-Smith, Karl Larsen, William Harrower **Movements of the Northern Goshawk (Accipiter gentiles atricapillus).** *In A Fragmented Forest Landscape: Preliminary Results from the East Kootenay Northern Goshawk Research Program* 2005.

Water and Wetlands

A. Curry, Carl Mendoza, D. Schindler, J. Culp, Kevin Devito, Sylvie Quideau, Uldis Silins, V. St. Louis **Southern Rockies Watershed Project Annual Report 2004**. *1st year study results* 2005; 32 pages.

Kevin Devito, Todd Redding **Snowmelt infiltration and runoff from forested hillslopes, Boreal Plain, Alberta.** *62nd EASTERN SNOW CONFERENCE Proceedings Waterloo, Ontario,* in press 2005.

C. Fraser, Irena Creed, Kevin Devito **Climate and runoff characteristics of a boreal plain headwater catchment, Lac La Biche, Alberta, Canada: implication for forest management.** *National Centre of Excellence, Sustainable Forest Management Technical Report* 2005; 92.

Carl Mendoza, Kevin Devito **A Framework for classifying and assessing potential water resources: comparison with Fort McMurray** *Manual prepared for CEMA* 2005.

Carl Mendoza, Kevin Devito **Wetland hydrology.** *Workshop Notes* 2005.

Brian Smerdon, Carl Mendoza, Kevin Devito **Can lakes and ponds be represented in a hydrologic model without excessive numerical intervention?** *Canadian Geophysical Union Elements* 2005; 23, 2: 22-26.

Brian Smerdon, Carl Mendoza, Kevin Devito **Sub-humid Climate, glacial outwash, and groundwater recharge: the case of a shifting water source to a Boreal lake in northern Alberta.** *IAH-CNC/CGS Groundwater Specialty Conference Saskatoon, Saskatachewan. Specialty Conference, Paper #598* 2005; 8.

Sustainable Aboriginal Communities

Naomi Krogman, Trena Allen **Aboriginal forestry: a national perspective.** *Unheard Voices: Aboriginal Content in Professional Forestry Curriculum,* planned for 2006.

Jennifer Shuter, Peggy Smith, Shashi Kant **A multi-level typology for the classification and comparative evaluation of Aboriginal co-management agreements in the forest sector.** *Sustainable Forest Management Network, Edmonton, Working Paper,* in press.

Monique Passelac-Ross, Peggy Smith **Forest management tenures and the accommodation of Aboriginal rights: the need for an aboriginal forest tenure.** *First Nations and Forest Lands,* in press.

Peggy Smith **Community-based framework for measuring the success of indigenous peoples' forest-based economic development in Canada.** *Managing the Commons: Indigenous Rights, Economic Development and Identity,* in press.

Peggy Smith **Resources to learn about Aboriginal issues in forest management in Canada, with an emphasis on Ontario.** *The Professional Forester* 2005; 18,19: 177.

Dave Tindall, Pamela Perreault **First Nations and forest lands: Social and Cultural Perspectives** *University of British Columbia Press,* in press 2006.

Social/Economic Criteria and Indicators

D. Martz, I. Brueckner, Maureen Reed, S. Mills **Hidden actors, muted voices: the employment of rural women in Saskatchewan forestry and Agri-food industries.** *Final report to the Status of Women Canada, Policy Research Fund On Restructuring in Rural Canada: Policy Implications for Rural Women* December 12, 2005; 173.

Other

Luc Bouthillier **Premier contact avec la Suède.** *Le monde forestier* novembre 2005; 19,9: 14.

J. Gonzalez, Mike Meitner **Working together for environmental management: A collaborative learning approach.** *In Proceedings, ESRI International Users Conference, San Diego, California* August 2005.

Brian Smerdon, Todd Redding **Multidisciplinary emphasis to environmental physics: Skip the calculus?** *Book Review: "An Introduction to the Environmental Physics of Soil, Water and Water-sheds" by Calvin W. Rose. Hydrological Processes* 2005; 19: 2091-2092.

Selected refereed and non-refereed journal articles from SFM Network-funded research

PhD Theses

Girardin, Martin **Dendrochronological reconstruction of the variability in atmospheric circulation and fire weather conditions for the past three centuries in the Canadian boreal forest.** University of Winnipeg; gauthiersuseo9.

Hannam, Kirsten **The organic matter and microbial community composition of forest floors in the boreal mixedwood forest**. University of Alberta; quideausfore8.

Master's Theses

Sutton, Alanna **Anatomy of white rings in trembling aspen and reconstruction of forest tent caterpillar outbreaks in the Duck Mountain region, Manitoba.** University of Manitoba; gauthiersuseo9.

Byrne, Ken **Critical turning moments and drag equations for British Columbia conifers**. University of British Columbia; rueljcwind8.

Fish, Heather **Crown Shyness and leaf area index in lodgepole pine stands of varying stand height, relative density and site index.** University of Alberta; lieffersvnatu11.

Périgon, Sophie **Dynamique de trouées dans de vieux peuplements résineux de la Côte-Nord, Québec**. Université du Québec à Montréal; gauthiersuseo9.

Uto, Kinga **Economic feasibility of recreational enterprises with First Nations cultural attributes.** Université du Québec à Montréal; gauthiersuseo9.

Simons, Brock **Habitat suitability modeling from empirical data: application to mule deer in the interior of British Columbia.** University of British Columbia; nelsonjsyst10.

Javier, Esmyra **Incorporating Aboriginal peoples' values into measures of economic sustainability: The case of the Heart Lake First Nation.** University of Alberta; adamowiczvasse8.

Martin, Adam **Post-harvest tree mortality following single tree selection silviculture.** University of Toronto; thomasstree11.

Sanford, Seneca **Scale-dependence of natural variability of stream flow parameters in a forested drainage basin on the boreal shield.** University of Western Ontario; buttlejscal9.

Keefer, Michael **The ecology and economy of morels in British Columbia's East Kootenay.** Royal Rhodes University; mitchelldcomm10.

Robertson, Susan **The economic potential of taxus canadensis plantations in Northern Ontario.** University of Alberta; mitchelldcomm10.

Montigny, Michael **TRIAD forest management: scenario planning analysis on an industrial forest in New Brunswick.** University of New Brunswick; macleandnewb8.

Selected graduate theses from SFM Network-funded research

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Manitoba

New Brunswick

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Nova Scotia

Ontario

Québec

Saskatchewan

Yukon Territory

Outside Canada

Finland

United States

Government Partners

Environment Canada

Natural Resources Canada - Canadian Forest Service

Parks Canada

Government of Alberta

Government of British Columbia

Government of Manitoba

Government of Newfoundland and Labrador

Government of Ontario

Gouvernement du Québec

Government of Yukon

Industry Partners

Abitibi-Consolidated Inc.

Ainsworth Lumber Co. Ltd.

Participating SFM Network partners and affiliates

Participating SFM Network partners and affiliates

Non-Governmental Organizations (NGO) Partners

Aboriginal Partners

Affiliates

Forest Engineering Research Institute of Canada (FERIC)

Lake Abitibi Model Forest

National Aboriginal Forestry Association

Special Funding Agreements

Sustainable Forest Management Network/BIOCAP Canada Foundation Joint Venture Agreement

Participating SFM Network partners and affiliates

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- Social Sciences and Humanities Research Council of Canada (SSHRC)

Partners

Governments

- Government of Canada
  (Environment Canada)
  (Natural Resources 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

- Abitibi-Consolidated Inc.
- Ainsworth Lumber Co. Ltd.
- Alberta-Pacific Forest Industries Inc.
- Bowater Incorporated
- 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
- Kaska Tribal Council
- Little Red River Cree /Tallcree First Nation
- Métis National Council
- Moose Cree First Nation
- Treaty 8 First Nations of Alberta

Institutions

- University of Alberta (host institution)
- 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
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Affiliated Members

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

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