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PROJECT REPORTS 2003/2004

BorNet Canada: final report

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Related SFM Network Project:

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BorNet: an international network to evaluate boreal forest habitat loss



A NETWORK OF CENTRES OF EXCELLENCE
UN RÉSEAU DE CENTRES D'EXCELLENCE

BorNet Canada

Final Report

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Account of activities

Background

BorNet was established by the SFM Network to develop a network of scientists looking at boreal forests in Canada and the rest of the world. It was formed in the recognition that as large-scale forestry and urban growth continues to pace northward, Canada's boreal forests are increasingly coming under pressure. However, the biodiversity consequences of expansion and extensive forest management are complex and poorly understood. At the time the project was established, there was little collaboration between the large number of government agencies, universities and non-governmental organizations conducting research on biodiversity in Canada's boreal areas. Nor was there broad collaboration among the host of researchers, resource managers and governments involved in biodiversity management. Furthermore, as 90% of communities in the boreal are aboriginal, there was a large, unmet need to understand distinct cultural relationships to the land and resources in boreal forest across Canada. As a result of this lack of collaboration and consultation, there was no clear direction or consensus regarding current research and monitoring priorities.

To rectify some of these problems, the BorNet project was divided into three distinct phases, each of which was guided by a sixteen-member steering committee (see below for a list of steering committee members). In the first phase, funding was obtained from BorNet's key funders (FIBRE in Finland, MISTRA and WWF International in Sweden, and the Sustainable Forest Management Network in Canada) for national syntheses of information around biodiversity conservation in the boreal within Canada, Finland and Sweden.

Following this phase, the first international BorNet workshop was held in Sweden in May 2002, to begin the international comparison phase of BorNet.

In a final stage, BorNet partnered with FORREX – Forest Research Extension Partnership to develop a funding proposal that will focus on generating information syntheses and management tools for the natural resource management community. In addition, scientists involved in BorNet have applied for funding to establish research projects that are international in scope, to take advantage of the range of forest management practices existing across the boreal. Funding has been sought from the European Union 6th Framework programme and through funding agencies in Canada and elsewhere to support these initiatives. To date, these applications have been unsuccessful.

The Workshops

A key aspect of the BorNet Canada project was a series of workshops held in Sault Ste. Marie (November 23 and 24, 2001), Edmonton (November 17 and 18, 2001) and Prince

George (November 23 and 24, 2001). These were followed by an international workshop in Uppsala, Sweden, on May 27 and 28, 2002. These workshops were organized to:

- increase the exchange of information and ideas among those researching boreal biodiversity
- seek contributions to the development of a national synthesis, and
- provide direction on future research and monitoring

To guide the discussions, the workshops used as a background reference *Biodiversity Evaluation Tools for European Forests* (Tor-Björn Larsson (ed.) Swedish Environmental Protection Agency. Ecological Bulletin 50: 2001). A template of three questions, derived during a meeting between Canada and other BorNet countries, was modified by the working groups to suit key regional issues:

- How much forest needs to be devoted to biodiversity maintenance?
- How can management effectively restore/recreate/maintain important features required to conserve biodiversity?
- How can we determine the effectiveness of these biodiversity conservation efforts?

The first question addressed the task of developing targets and benchmarks for biodiversity conservation at the landscape scale. The second question was related to implementation and management tools used to achieve the objectives articulated in Question 1. Finally, the third question explored the effectiveness of management tools and systems, outlined in Question 2, in terms of meeting targets identified in Question 1.

The formal agendas for the workshops were as follows:

Sault Ste. Marie

October 13, 2001

- 8.30 Introduction to BorNet. John Innes, *University of British Columbia*
- 9.30 Wildlife habitat and climate change. *Graham Forbes and Anthony Diamond, University of New Brunswick*
- 11.00 Evidence for thresholds in forest bird response to local and landscape-scale silvicultural treatments in the Acadian Forest. *Marc-André Villard, Université de Moncton*
- 1.00 Increasing the accessibility of NTFP resources by integrating forest planning activities with wild crafter needs – a case study in the Algoma District of Ontario. *Luc C. Duchesne, Canadian Forest Service; Shanon*

Meawasige-Gow, Mitigaawaaki Forestry Marketing Co-operative Inc.; Joanne Marck, Ontario Ministry of Natural Resources; Peter Uhlig, Ontario Ministry of Natural Resources; Stacey Koumentaros, Natural Resources Renaissance Network, Sault Ste. Marie Innovation Centre.

- 2.00 Multiscale relationships between landscape pattern and biodiversity. *Rob Rempel, Centre for Northern Forest Ecosystem Research and Lakehead University.*

Edmonton

November 17, 2001

- 8.30 Introduction to BorNet. *John Innes and Carolyn Whittaker, University of British Columbia; John Spence, University of Alberta*
- 9.30 Biodiversity: Building performance indicators for the boreal forest. *Stan Boutin, University of Alberta*
- 11.00 Integrating biodiversity conservation practices into forest planning and operational practices. *Luigi Morgantini, Weyerhaeuser Company*
- 1.00 Applying conservation net theory to boreal regions. *Ross Wein, University of Alberta*
- 2.00 First Nations involvement in biodiversity management. *Clifford Hickey and David Natcher, University of Alberta*

November 18, 2001

- 8.30 Saskatchewan forest ecosystem impacts monitoring framework. *David Andison, Bandaloop Landscape-Ecosystem Services*
- 9.00 Thresholds. *Fiona Schmiegelow, University of Alberta*
- 10.00 The consequences of TRIAD and intensive timber production. *Jan Volney, Canadian Forest Service*

Prince George

November 23, 2001

- 8.30 Introduction to BorNet. John Innes, University of British Columbia
- 9.00 Using natural disturbance benchmarks to improve sustainable forest management practices. Craig DeLong, BC Ministry of Forests
- 10.30 Temporal seral stage monitoring and wildlife habitat on Tree Farm License 48. Dan Rosen, Canadian Forest Products Ltd., Peace Region
- 11.15 CanFor's implementation plan. Daryll Hebert, Encompass Strategic Resources Inc.; Carl Vandermark, Forest Planner, Canadian Forest Products, Ltd.
- 1.00 Tools for long-term monitoring of biodiversity. Mike Gillingham and Katherine Parker, University of Northern BC
- 2.00 Wildlife inventory and habitat assessment: A Gitksan approach to aboriginal participation in forest management. Russell Collier, Resource Consultant, Smithers, BC

November 24, 2001

- 8.30 Some Canadian Forest Service led research projects addressing boreal forest fire disturbance. Brad Hawkes, Canadian Forest Service
- 11.30 Bat roosting and foraging ecology in disturbed and undisturbed BC sub-boreal forests. Jennifer Psyllakis, University of Northern BC

The international conference

In addition to the three Canadian workshops, an international conference (funded mostly by the NSERC International Opportunities Fund) was held in Uppsala, Sweden on May 27-28, 2002. The meeting was followed by a field trip to the European part of Russia, traveling through Estonia to the Pskov Model Forest. The contributions to the conference were as follows:

Session I: Setting the scene

IKEA Purchasing strategy. Hans Djuberg, IKEA North America, Toronto, Canada

The High Conservation Value Forest toolkit. Steven Jennings, ProForest, UK

Keynote address. Ola Ullsten, Co-Chair of the World Commission on Forest and Sustainable Development, Canada

Canadian boreal forest biodiversity research: A synthesis and gap analysis. Carolyn Whittaker, University of British Columbia, Canada

Session II: How much and where should forests be fully protected in reserves?

Inventory of intact natural forest landscapes in northern European Russia. Alexey Yarshenko, Greenpeace, Russia

Detection of thresholds in forest bird species' response to silvicultural intensity in the Acadian forest of eastern Canada. Marc-André Villard, Université de Moncton, Canada

How much habitat is enough? Towards a scientific basis for setting boreal forest conservation targets. Per Angelstam, Swedish University of Agricultural Sciences, Sweden

Managing risk to arthropod populations with unharvested reserves. John Spence, University of Alberta, Canada

Session III: How can management effectively restore/recreate/maintain important features required to conserve biodiversity?

Integrating biodiversity conservation into forest planning and operational practices in Canada. Luigi Morgantini, Weyerhaeuser Company, Canada

Sweden's strategy for managing its national forest. Stefan Bleckert, Sveaskog, Sweden

Literature review on biodiversity research in Finland. Petri Ahlroth, Ministry of Agriculture and Forestry, Finland

Session IV: How can we determine the effectiveness of these biodiversity conservation efforts?

Biodiversity performance indicators. Stan Boutin, University of Alberta

BorNet achievements in Finland. Lauri Saaristo, University of Helsinki, Finland

Using landbirds to assess the effectiveness of ecosystem management in the boreal forest of eastern Canada. Pierre Drapeau, University of Quebec at Montreal, Canada

First Nations monitors and measures of forest biodiversity.

Sessions II-IV were followed by panel discussions, with panelists including: Rachel Holt (WWF, Canada), Jean-Paul Gladu (National Aboriginal Forestry Association, Canada), Daryll Hebert (Encompass Strategic Resources Ltd., Canada), Stig Larsson (Swedish University of Agricultural Sciences, Sweden), Suvi Raivio (Finnish Forest Industries Federation, Finland), Jan Volney (Canadian Forest Service, Canada), Russell Graham (US Forest Service, USA), Bjorn Åge Tømmerås (Norwegian Institute for Nature Research, Norway), Allan Watt (Centre for Ecology and Hydrology, UK) and Susan Leech (Forest Research Extension Partnership, Canada).

Key results

Question 1: How much and where should forests be fully protected in reserves?

Protected areas and high conservation value forests (HCVFs)

Even with an emphasis on retaining habitat elements, forest management is likely to homogenize areas and reduce complexity, particularly microhabitats within stands. To maintain biodiversity across all scales and to provide benchmarks against which to compare management, we need large, intact, natural protected areas. A pan-boreal analysis regarding how much forest is currently protected, levels of protection and what is missing is required. This gap analysis should build from a common ecological classification system across the boreal, and BorNet should partner with other organizations who are already attempting to complete this task. The specific approach for completing this type of analysis should be built from other projects as well (e.g., the BEAR project in Europe). A key industry need (for wood-users such as IKEA) is access to information about where wood is being sourced. Industry needs to have a way to assess whether wood is coming from High Conservation Value Forests (HCVFs). It is evident that some countries have more HCVFs just because of their forest management history and work needs to be done to address the need to treat countries equitably across the boreal. Europe must focus on restoring HCVFs, while Canada and Russia must work to avoid losing HCVFs. Protection efforts should be focusing on maintaining currently intact forests or restoring intact forests so that there is ecological representation and equitable distribution of protected areas across the boreal.

The role of habitat thresholds

We do not know how much is enough. This question is impossible to answer without a clear statement of goals, but even assuming goals of forest management were clearly stated, we still do not have all the information to answer this question. Eventually, a well-designed monitoring program could tell us the answer to this question, but meanwhile we need a surrogate. Thresholds are important because they provide forest managers and policy-makers with a target which can then be assessed over time and adjusted as needed. We need to put more effort into defining thresholds of habitat loss for different species, with a particular focus on species that are most sensitive to forest harvesting. Thresholds are important means to communicate and effect change on the ground.

Question 2: How can management effectively restore/recreate/maintain biodiversity?

Retaining or restoring habitat elements within managed forests

We currently have a good understanding of stand-level concerns regarding maintaining key habitat elements (e.g., snags, coarse woody debris), and we know a lot about methods for maintaining/restoring biodiversity. Scale is critical as there are gaps in our knowledge regarding the fine-scale species such as lichens, fungi, insects and processes related to this scale, as well as gaps in our understanding of landscape-level biodiversity factors. We have limited knowledge regarding some landscape-level questions (e.g., corridors and connectivity between intact forests, etc.). Natural disturbance might be used as a template, but a zoning approach may be more appropriate in areas with an extensive management history and with land tenure constraints. We also need more information about the relative effectiveness of different methods for restoring/maintaining biodiversity.

Question 3: How can we assess the effectiveness of our biodiversity conservation efforts?

Choosing appropriate indicators

An index of indicators will not be sensitive enough to warn us of rare/endangered species loss before it occurs. Several studies show that indicators do not correlate well with one another. The correlations are so weak that it would be hard to use them as an index. We need a more sensitive measure as an early warning system, but this will be very expensive. We need an indicator system that looks after all species. Current assessment programs are biased against rare species – we should try to incorporate these in a cost-effective way. On a coarse scale, indicators (e.g., amount of dead wood) are useful. In summary, by looking at a comparison of different disturbances or human footprints (e.g.,

from Europe to Russia to Canada), we can extend the x-axis and study how variation in disturbance correlates to different indicators.

Training of HQP

This project essentially was a research coordination and synthesis exercise and, as such, differed from the majority of research sponsored by the Sustainable Forest Management Network. However, it was possible to involve a number of undergraduate and graduate research assistants during the synthesis phase who all received training in literature review and analysis. One (Kelly Squires) has co-authored the main publication arising from the work. The following individuals were involved:

- Julia James
- Kevin O'Connor (undergraduate)
- Joanna Dawlings (undergraduate)
- Kym Welstead (undergraduate)
- Richard Feldman (graduate - MSc)
- Kelly Squires (graduate - MSc)
- Kenneth Er (graduate - MSc)

In addition to these individuals, several students attended the international conference, including Monika Breuss (Austria) and Jason Young (Canada) (both PhD students).

A major outcome of this international conference was the agreement to submit a joint research proposal to the European Union 6th Framework Programme that would involve scientists from Canada, the UK, Norway, Sweden, Finland and Russia. The proposal involved the following steps:

- measure the regional human footprint on landscapes with different land use history in Europe, Russia and Canada;
- stratify the forest types so that biodiversity thresholds can be analyzed with a relevant thematic resolution;
- find response variables for quantitative analyses;
- enhance communication between science and practice by establishing practical case studies representing the relative need for conservation, management and rehabilitation of ecosystem networks.

KETE

Proceedings

Each of the three BorNet Canada workshop proceedings was published as workshop reports and was widely distributed. Although 500 copies of each were printed, stocks are now exhausted, suggesting very considerable demand for the product. A proceedings report was also published for the international conference, stocks of which are also exhausted.

In fall 2002, a newsletter was published describing events to date. The proceedings and newsletter were made available on the BorNet website (www.bornet.org).

National synthesis

In addition to the materials included in the workshop proceedings, the national synthesis for Canada was written up and submitted for publication in a special edition of *Ecological Bulletins* which will describe biodiversity conservation efforts in the boreal forests of Sweden, Finland and Canada. At the time of writing, the status of this volume is unknown. The reference is:

Whittaker, C., Squires, K. and Innes, J.L. (200?) Biodiversity research in the boreal forests of Canada: Protection, management and monitoring. Submitted to special edition of *Ecological Bulletins* dealing with boreal forest biodiversity.

Many of the recommendations from Canada have been incorporated into a document by Per Angelstam and others (S. Boutin, J. Innes, L. Morgantini, F. Schmiegelow, J. Spence, M. Stephenson and M.-A. Villard) *Defining objective targets for boreal forest conservation – the need for replicated studies at the landscape scale*, which will likely be published in the special edition of *Ecological Bulletins*.

Other publications

Further publications indirectly related to the BorNet project that arose during the project period included:

Innes, J.L. and Er, B.H. 2002. Global forest regulation in the ten years after Rio. *Trends in Ecology and Evolution* 17(9), 445.

Er, B.H. and Innes, J.L. (2002) Questionable utility of the frontier forest concept. *BioScience* **52**(12), 1095-1109.

Er, B.H. and Innes, J.L. (2002) The presence of old-growth characteristics as a criterion for identifying forests of high conservation value. *International Forestry Review* **5**(1), 1-8.

Material collected for the review of habitat thresholds will also be used in a forthcoming special publication of the British Columbia Ministry of Sustainable Forest Management called *Habitat Supply Thresholds: A literature synthesis*, edited by Pamela Dykstra. The BorNet contributor for this volume is Richard Feldman, one of the graduate students employed by BorNet to work on the literature review.

SFM Network 2002 Conference session

BorNet organized a special session at the 2002 SFM Network Conference. The speakers discussed biodiversity conservation across a gradient from Scotland (John Innes), through Sweden (Per Angelstam), eastern Canada (Marc-André Villard) to western Canada (Fiona Schmiegelow). The session illustrated the benefits of comparing the condition of forest biodiversity at different stages of development.

Other outputs

As a result of the direction provided by participants in the BorNet international workshop, we developed a list of key knowledge gaps around each question in the BorNet framework. Many of these knowledge gaps may be filled by existing information, which needs to be located and synthesized into useful products. The steering committee and project coordinators met in November 2002 to prioritize the knowledge gaps in each area, identified groups that are already working on these projects, and decided which projects would be worth pursuing under the BorNet umbrella. These are summarized in the directions for future work below.

Networking

A major objective of this project was to develop networking opportunities. This was achieved, as indicated by the participant lists from the Canadian workshops and the international conference. A BorNet steering committee was formed, and this could be the

basis for future networking opportunities. The members were: Per Angelstam (Sweden), Luigi Morgantini (Canada), Marc-André Villard (Canada), Yuri Baranchikov (Russia), John Spence (Canada), Jan Volney (Canada), Stan Boutin (Canada), Jari Niemela (Finland), Allan Watt (UK), Pierre Drapeau (Canada), Suivi Raivio (Finland), Carolyn Whittaker (Canada), Andrei Gromstev (Russia), Bjorn Åge Tømmerås (Norway), Alexey Yaroshenko (Russia) and John Innes (Canada).

A particular feature of the BorNet meetings has been the mix of participants. For example, the international conference drew 26 scientists, 8 industry representatives, 7 members of non-governmental organizations and 3 individuals from government, with eight different countries represented.

Future work

Key messages from the BorNet International conference included:

- BorNet is an important mechanism for international cooperation;
- the networking is important in itself, and resources should be sought for continuing to network build through BorNet; and
- BorNet should facilitate communication among boreal countries regarding biodiversity.

These messages have since been re-iterated at several meetings, including a Canadian workshop on research priority setting for boreal forest research held in Ottawa-Gatineau in the spring of 2003.

In November 2002, a group of BorNet researchers met in Edmonton, Canada to look at possible future directions. They prepared the following vision and goals for a continuation of the BorNet program.

BorNet Vision: Conservation of Biological Diversity in the World's Boreal Forests, through international comparisons, synthesis, and dissemination to policy-makers and practitioners.

BorNet Goals

1. Viable, diverse, reproducing populations of boreal species exist throughout their natural ranges within the world's boreal forests.
2. Global, regional and local policies reflect current knowledge on biodiversity conservation.
3. Society has a broader and more international view of how forests should be managed.

4. A well established network of researchers, managers and policy-makers interested in biodiversity conservation exists across the boreal.

Goal 1: Viable, diverse, reproducing populations of boreal species exist throughout their natural ranges within the world's boreal forests

Objective 1: Clear targets for how much and where forests should be fully protected in reserves based on scientific data and ecological classifications that span the boreal, are available, adopted and used by all appropriate groups.

Objective 2: Clear targets for required presence over time of stand and landscape level elements most affected by forest management are available and adopted for use by all appropriate groups.

Objective 3: Appropriate habitat and species indicators for biodiversity conservation are available, adopted, and used by all relevant groups across the boreal

Goal 2: Global, regional and local policies reflect current knowledge on biodiversity conservation

Objective 1: Increased decision-maker knowledge of social, economic and environmental tradeoffs and risks

Objective 2: Increased researcher knowledge of the use of research results in policy making

Objective 3: Increased knowledge and consideration of other world, social and cultural views

Goal 3: Society has a broader and more international view of how forests should be managed

Objective 1: Increased trust and use of BorNet as the source of information on Biodiversity Conservation Information across the boreal

Objective 2: Increased access to biodiversity conservation Information across the boreal

Objective 3: Increased societal awareness and knowledge of BORNET members and activities

Goal 4: A well established network of researchers, managers and policy-makers interested in biodiversity conservation exists across the boreal

Objective 1: Increased profile and trust in BorNet as a global network providing information on biodiversity conservation in the boreal

Objective 2: BorNet steering committee and organization has geographically balanced representation from scientists and information users across the boreal.

Objective 3: Increased partnerships and collaboration across the boreal among all levels of natural resource managers.

Acknowledgement

This project would not have been as successful without the efforts of the two project coordinators, Carolyn Whittaker and Susan Leech. It was their efforts, often under extremely frustrating conditions, that enabled the workshops and conference to be completed and reported upon. I would like to take this opportunity to thank them both for their extraordinary efforts and enthusiasm for the project.

John Innes
Project Leader