# WORKSHOP PROCEEDINGS
# 2002-6

sustainable forest management network

réseau sur la gestion durable des forêts

## BEYOND THE DATA:
## Integrating research findings into forest management planning and operations

## AU-DELÀ DES DONNÉES:
## intégration de la recherche dans la gestion de la forêt et son exploitation

May 3-4 , 2002
Moncton, NB

Marc-André Villard

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# BEYOND THE DATA: integrating research findings into forest management planning and operations

# AU-DELÀ DES DONNÉES: intégration de la recherche dans la gestion de la forêt et son exploitation

**3-4 May 2002 - 3 et 4 mai 2002**
**Université de Moncton, Moncton, Nouveau-Brunswick**
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## INTRODUCTION

In spite of the efforts that have recently been invested into research on forest biodiversity and natural disturbance dynamics, the evolution of forestry planning and operations often seems to be more sensitive to public perception than to the emerging body of science. Although public involvement in forest management is highly desirable, decisions must ultimately reflect the most current understanding of ecological processes if forest management is to be sustainable.

Several reasons may account for the relatively slow integration of research findings into forest management in many systems: (1) researchers often are unaware of the specific constraints faced by managers in their work; (2) some managers expect to be given rules-of-thumb rather than to receive detailed information upon which to base their decisions; (3) the training of researchers makes them very reluctant to develop rules-of-thumb; (4) differences in their respective reward systems are such that forest managers and researchers have no strong incentives to form "adaptive management teams".

Organizations like the Sustainable Forest Management Network and Model Forest Network have actively promoted the creation of adaptive management teams composed of forest managers, researchers, and various stakeholders. How have these teams performed so far? Can they claim that their management of forest resources and values is sustainable?

Workshop objectives:

1. To review the current applications of biodiversity (BD) and natural disturbance (ND) research into forest management planning and operations

2. To examine the performance of existing "teams" composed of managers and researchers.

3. To discuss principles and procedures allowing to more efficiently integrate research results into management as research proceeds

# INTRODUCTION

En dépit des nombreux travaux de recherche qui sont effectués sur la biodiversité forestière et les perturbation naturelles, les changements dans la planification de l'exploitation forestière semblent refléter davantage l'opinion du grand public que les résultats de ces travaux. Bien que l'implication du public dans la gestion des forêts soit hautement désirable, les décisions prises doivent ultimement refléter notre compréhension des processus écologiques afin que la gestion forestière soit écologiquement durable.

Objectifs de cet atelier:

1. Réviser les applications actuelles de la recherche sur la biodiversité et les perturbations naturelles en gestion et exploitation des forêts

2. Évaluer la performance des équipes existantes d'aménagement adaptatif composées de gestionnaires et de chercheur(e)s.

3. Discuter des principes et procédures permettant d'intégrer efficacement les résultats de recherche dans la gestion des forêts à mesure que ces résultats sont obtenus

# AGENDA

1ST AND 2ND OBJECTIVES

**DAY 1: Friday 3 May 2002**

**0815-0845** Registration

**0850** INTRODUCTION - Marc-André VILLARD, Canada Research Chair in Landscape Conservation/CRC en conservation des paysages, Université de Moncton, Campus de Moncton

**0900** KEYNOTE SPEAKER: Per ANGELSTAM, Swedish University of Agricultural Sciences - Fennoscandian perspective on the integration of research into forest management and biodiversity conservation

**0940** Stan BOUTIN, Integrated Landscape Management Chair, Alberta-Pacific Forest Industries and University of Alberta

Principles of adaptive management and overview of current applications of biodiversity research to forest management in Canada

**1000** Thuy NGUYEN, Chaire industrielle CRSNG-UQAM-UQAT en aménagement forestier durable, Université du Québec en Abitibi-Témiscamingue

Implementation of forest management based on natural disturbance and biodiversity research for the Claybelt region, Québec and Ontario

**1020** Break

**1040** Martin BÉLAND and Kalifa GOÏTA, Université de Moncton, Campus d'Edmundston

Setting the stage: long-term changes in forest composition in nw New Brunwick and implications for forestry and biodiversity

**1100** Scott MAKEPEACE, NB-Dept. of Natural Resources and Energy

Application of Wildlife Habitat Objectives in the Management of New Brunswick's Public Forests

**1120** Gordon BASKERVILLE, Forest Research Advisory Committee, J.D. Irving Ltd
David MacLEAN, Dean, Faculty of Forestry and Environmental Management, University of New Brunswick

Case study: Application of biodiversity and natural disturbance research to forest management on JDI private lands

**1140** Laird Van DAMME, KBM, Thunder Bay.

Case study: Application of biodiversity and natural disturbance research to the management of Millar Western FMA

**1200** Lunch

**1330** Jeff HEPINSTALL, Cooperative Forest Research Unit - University of Maine

Case study: Application of biodiversity and natural disturbance research to forest management on Maine private lands

**1350** Louis BÉLANGER, Département des sciences du bois et de la forêt, Université Laval

Integrating research to develop new forest practices in Québec: starting with two strikes

**1410** Margaret DONNELLY

Research Implementation and the SFMN Knowledge Exchange Program – from theoretical to practical sustainable forest management

**1430** Break

3RD OBJECTIVE

**1500-1615** Open discussion. Moderator: Marc-André Villard

Some key questions to be addressed:

1. Is there evidence that research on biodiversity and natural disturbance has significantly improved forest management ("metric" or "currency" to be discussed)?

2. If the answer to (1) is no, how can we explain this? If the answer is yes, is there room for improvement?

3. Is there a concensus on some general principles derived from natural disturbance and biodiversity research that should be used to plan forest management?

Questions clés:

1. La recherche sur la biodiversité et les perturbations naturelles a-t-elle significativement amélioré la gestion de nos forêts?

2. Sinon, comment peut-on expliquer cet état de choses? Dans l'affirmative, y-a-t-il place à de l'amélioration?
3. Y-a-t-il un concensus sur des grands principes dérivés de la recherche sur la biodiversité et les perturbations naturelles sur lesquels devrait se fonder la gestion de nos forêts?

**DAY 2 - 4 May 2002 - FIELD TRIP, FUNDY MODEL FOREST (organized by Fundy Model Forest)**

0815 Departure from Université de Moncton Campus (main entrance – Adrien-Cormier building)
0830 Departure from Chateau Moncton

# ABSTRACTS

**Marc-André VILLARD**, Associate Professor, Chaire de recherche du Canada en conservation des paysages and Département de biologie, Université de Moncton, Moncton, NB E1A 3E9. villarm@umoncton.ca.

### Introduction to the workshop

Woodland managers and forest researchers have similar goals, but different reward systems. Both managers and researchers are (or should be!) driven by intellectual challenges, with the ultimate goal of improving the world in which we live. Forest managers face a tremendous intellectual challenge, having to plan for long-term timber supply while maintaining biodiversity and recreational values. Researchers in forest ecology and management also face tough challenges, having to answer questions about highly-dynamic and structurally complex ecosystems. While researchers are rewarded for their production of peer-reviewed publications, the training of highly-qualified personnel, and the presentation of conferences in scientific congresses, the implementation of research findings in the real world is not particularly valued by their peers. The performance of forest managers, on the other hand, is mainly determined based on their contribution to their company's financial performance. To achieve ecologically-sustainable forest management, we need to develop a better synergy between the efforts of researchers and managers. This will only be possible (1) if both parties involved agree on the biodiversity goals to be achieved and (2) if the efforts of both managers and researchers to implement research findings are valued by their peers. Otherwise, this work will only be achieved by a minority of proactive individuals on very small portions of the land base.

**Per ANGELSTAM**, Swedish University of Agricultural Sciences, Grimsö Wildlife Research Station, Department of Conservation Biology, Forest Faculty SE-730 91 Riddarhyttan, Sweden per.angelstam@svb.slu.se

### Fennoscandian perspective on the integration of research into forest management and biodiversity conservation

(Abstract unavailable)

**Stan BOUTIN**, NSERC Industrial Chair in Integrated Landscape Management, Department of Biological Sciences, University of Alberta, Edmonton, Alberta, Canada, T6G 2E9. stan.boutin@ualberta.ca

### Principles of adaptive management and overview of current applications of biodiversity research to forest management in Canada

Adaptive management makes intuitive sense. It is "learning by doing". Then why is it so hard to put the information obtained by science into practice? I will offer some experiences from the Sustainable Forest Management Network to highlight the

challenges and opportunities involving adaptive management and biodiversity. The challenges involve development of operational measures of biodiversity and designing experiments that reduce key uncertainties in a timely fashion. The opportunities involve progressive companies and researchers willing to enter into a shared game plan to solve problems.

**Thuy NGUYEN**, Research agent, NSERC-UQAT-UQAM Industrial Chair in Sustainable Forest Management, 445 boul. de l'Université, Rouyn-Noranda, Qc, J9X 5E4, (819) 762-0971 ext. 2362, thuy.nguyen@uqat.uquebec.ca

**Implementing a forest management strategy based on natural disturbance and biodiversity research in the Claybelt region of Québec and Ontario**

During the past three years, we have been assessing the implementation of a forest management strategy based on natural disturbance dynamics for the black spruce forests of Northern Abitibi. This strategy stems from the findings obtained in research on natural disturbance and biodiversity in the Québec and Ontario Claybelt which suggest that a mixed-management approach (even-age and uneven-age silvicultural systems) would be better suited to maintain the forest's ecological integrity. The implementation of the strategy has been assessed in a 4,500 $km^2$ pilot study-area. In collaboration with Tembec Forest Products, Norbord Industries, and the QMNR, the strategy has been integrated in different activities associated with forest management planning. These include setting management objectives at a landscape level, performing a wood supply analysis, proposing patterns for the spatial and temporal distribution of harvesting activities, and establishing a silvicultural diagnostic at the stand level. The results of the assessment indicate that the implementation of the strategy seems possible but is conditional to the improvement of present planning tools, the development of complementary tools, and to the documentation and evaluation of several management hypotheses. The immediate implementation of the strategy is not only dependent on the acquisition of further knowledge and the development of new tools. The case of Tembec Forest Products, which operates in the Claybelt of both Québec and Ontario, illustrates the importance of the economical, social, and political contexts. For example, the implementation of the strategy may be facilitated by Tembec's effort to achieve certification of its forests in both provinces. However, differences in regards to provincial forest management policies may result in its earlier implementation in Ontario. Tembec also seems to be interested in eventually implementing a natural disturbance based management strategy in forest management units elsewhere in Québec. As such, they recognize that natural disturbance dynamics vary regionally and that the proposed management strategy can be adapted accordingly.

**Martin BÉLAND** et **Kalifa GOÏTA**, Professors, Faculté de foresterie, Université de Moncton, 165 boul. Hébert, Edmundston, NB, E3V 2S8, mbeland@umce.ca

## Setting the stage : long-term changes in forest composition in northwestern New Brunswick and implications for forestry and biodiversity

Changes in forest composition in northwestern New Brunswick between 1985 and 1999 were studied with Landsat images. In 1985, forests already comprised large proportions of tolerant hardwoods and clearcuts assumed to be very different from the precolonial forests. Between 1985 and 1999, 47% of the study area did not change whereas 30% were subject to some disturbance and 17% have progressed in the succession. The main change is the reduction of the area of softwood merchentable forests towards more clearcuts and more conifer saplings stage. These results indicate a high intensity of harvesting of wood although possibly sustainable considering the allowable cut effect of plantations and precommercial thinnings. Some mixed stands were probably subject to conversions into softwoods. Using the coarse filter approach to conservation of biodiversity, the reduction of the area of conifer forests and the reduction in age constitutes a potential habitat loss. The area has seen a long history of intensive harvesting and high pressure on the resource. A reduction of clearcuts and increase of partial cuts could slow the trend. A reduction of herbicide use and increased use of natural regeneration would reduce the risk of converting mixed stands to conifers and a better respect of site preferences of some species.

## Un premier pas: changements à long terme de la composition forestière au nord-ouest du Nouveau-Brunswick et implications pour la foresterie et la biodiversité

Les changements de composition forestières du nord-ouest du Nouveau-Brunswick entre 1985 et 1999 ont été étudiés à l'aide d'images Landsat. En 1985, les forêts comportaient déjà de fortes proportions de forêts de feuillus intolérants ainsi que de coupes à blanc qu'on suppose fort différentes de la forêt précoloniale. Entre 1985 et 1999, 47% de la zone d'étude n'a pas changé tandis que 30% était occupée par des superficies forestières qui ont subi des perturbations et 17% se sont régénérées ou développées. Le principal changement est la réduction de la superficie couverte par les forêts (principalement de conifères) dont les arbres sont de taille marchande au profit de celle couverte par les coupes à blanc et les jeunes gaulis de conifères. Ces résultats indiquent une forte intensité de récolte de matière ligneuse bien que possiblement compatible avec un rendement soutenu compte tenu de l'effet d'accroissement de possibilité dû aux plantations et aux éclaircies pré-commerciales. Certaines forêts mixtes ont probablement subies des conversions en conifères. Selon l'approche du filtre brut de la conservation de la biodiversité, la diminution des forêts de conifères et la réduction de l'âge des forêts constituent une perte potentielle d'habitat. La région a connue une longue histoire de récolte intensive et une grande pression sur la ressource. Une diminution des coupes à blanc au profit des coupes partielles permettraient de ralentir la tendance. L'utilisation réduite d'herbicides et l'utilisation accrue de la régénération naturelle, permettrait d'éviter les conversions des peuplements mixtes et un meilleur respect des préférences des espèces pour certaines stations.

**Scott MAKEPEACE**, Forest Habitat Biologist, New Brunswick Department of Natural resources and Energy, Fish and Wildlife Branch, PO BOX 6000, Fredericton, NB E3B 5H1 Scott.makepeace@gnb.ca

**Forest Habitat Management on Public Lands in New Brunswick**

Goals and objectives for wildlife habitat have been incorporated into the management of Crown lands in New Brunswick since 1992. Most recently, objectives and strategies for eight habitat types were included in the 2002 forest management plans. Habitats are described at the stand and forest scale. The amount of habitat needed to maintain viable populations of associated vertebrates across the area of Crown land to which they are indigenous was determined. Wildlife species that represent ecological processes within the habitat types were selected. In implementation, Old Spruce-Fir and Deer Wintering habitat were spatially identified, at objective levels, for at least 35 years in to the future. The other six habitat types were maintained at objective levels, non-spatially. The future direction includes creating habitat objectives for all development stages of habitat, evaluating management strategy assumptions and developing and implementing population monitoring programs for indicator species.

**Gordon L. BASKERVILLE**, Faculty of Forestry, University of British Columbia (retired). 420 Harlech Rd., Qualicum Beach, BC, V9K 1J3 gordonbaskerville@shaw.ca
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**David A. MACLEAN**, Dean, Faculty of Forestry and Environmental Management, University of New Brunswick, P.O. Box 44555, Fredericton, NB, E3B 5A3 Email macleand@unb.ca

**Case study: Application of biodiversity and natural disturbance research to forest management on J.D. Irving Ltd. private lands**

A 1997 evaluation of the J.D. Irving Ltd. (JDI) Black Brook Forest District (189,000 ha in northern New Brunswick) resulted in Forest Stewardship Council certification, subject to conditions of development of policies for identification of reserve trees and plantation design, a pre-harvest biological survey of planting sites, and establishment of benchmark reserves. The evaluation team also urged the company to establish a Forest Research Advisory Committee (FRAC) to address uncertainty with respect to management of timber and non-timber values for large forest areas over a long time horizon. The company formed the JDI FRAC and charged the group with identifying/ advocating research that would address significant knowledge gaps defined by the certification team, and empower the manager to manage for a broad range of values. Only objective measures of non-timber values will permit the company to manage the temporally/ spatially dynamic pattern of stand types and conditions to ensure that all values would be available somewhere in the forest at all times. Although the particular certification that began the process has ceased to be an issue, JDI has continued the FRAC. The group has developed and recommended research projects involving funding from traditional research agencies as well as from JDI.

Major research projects at present are: 1) establishing the history of the target forest with reference to natural disturbance as the historical cause of temporal/ spatial patterns of stand types and stages of development; 2) developing approaches to assess the state of the forest quantitatively with respect to non-timber values, especially biodiversity; 3) to analyze TRIAD management scenarios, including projecting indicators of timber production, habitat, and forest composition under alternative landbase allocations; 4) to develop and implement new harvesting methods inspired by natural disturbance regimes on 2600 ha of adaptive management areas; and 5) to assess a suite of indicators of biotic integrity of stands in reserves, adaptive management areas, and the working forest.

**Laird VAN DAMME**, Adjunct Professor, Lakehead University
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**The Development and Application of Decision Support Systems for Sustainable Forest Management in Alberta; A Case Study of Integrating Research, Planning and Operations**

Millar Western Forest Products Ltd. manages a forest in west-central Alberta under a Forest Management Agreement (FMA) with the Government of Alberta. Part of Millar Western's planning process brought researchers together to develop a Decision Support System (DSS) for its forest management planning and monitoring programs. Four modules, Timber Supply, Biodiversity, FIRE, and WATER were built to evaluate indicators of Sustainable Forest Management (SFM) for current and future forest conditions predicted from computer simulations of alternative management scenarios. In the first round of assessment, the current forest management scenario improved moose habitat at the expense of timber supply. All scenarios had similar fire risk and generated increases in peak flow and water yield of selected watersheds, and slightly decreased forest biodiversity. This led to landscape design scenarios to reduce fire risk and balance biodiversity indicators with timber supply objectives, one of which was eventually selected for implementation. All scenarios were examined in light of a computer simulated natural disturbance benchmark. The Company's monitoring and research program is also highly focused on improving DSS modules and the underlying data, thus its association with the Forest Watershed and Riparian Disturbance (FORWARD) project, which considers the effects of forest management on aquatic ecosystem indicators. Several characteristics of the project led to the successful integration of planning and research that include a permissive regulatory environment, top level corporate commitment, recruitment of talented people and a project management environment that stimulated fun and creativity. The next challenge facing Millar Western is to implement the approved plan.

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**Daniel J. HARRISON**, Department of Wildlife Ecology, University of Maine, Orono, ME 04469-5755 USA, harrison@umenfa.maine.edu
**David C. PAYER**, USDI Fish and Wildlife Service, Arctic National Wildlife Refuge, Federal Building & Courthouse, 101 12th Ave, Box 20, Fairbanks, AK 99701-6267, ridgelurker@gci.net, and **Angela K. FULLER**, Department of Wildlife Ecology, University of Maine, Orono, ME 04469-5755 USA, afuller@umenfa.maine.edu

## Applications of field research to forest landscape planning: a case study using the American marten in Maine

American marten (*Martes americana*) are the most area-sensitive, forest specialized mammal inhabiting forest landscapes in northern Maine. We developed models to predict marten habitat supply in northern Maine using 124 adult marten home ranges and 98 simulated unoccupied home ranges from north-central Maine. Year-specific habitat maps were generated separately from Landsat Thematic Mapper satellite imagery. Six landscape metrics were calculated. The information-theoretic approach was used to rank 30 *a priori* logistic regression models. Model predictions were tested against additional field data (n = 127 occupied and 41 unoccupied home ranges) to assess each model's predictive capability. The top ranked model, containing four variables (the proportion of suitable habitat, patch density, patch size variability, and the interaction of patch variability and density) correctly predicted 70% of our model build data and 72% and 100% of our independent data sets. The proportion of the home range in suitable habitat was the most important single variable in predicting marten presence or absence. However, our highest-ranking models included at least three variables measuring landscape configuration, indicating that landscape shape and configuration are important determinants of habitat supply for marten. Marten density and abundance were estimated for Maine's Wildlife Management Districts within marten's range in Maine. Our results indicate that natural resource managers should consider both the amount and spatial configuration of suitable habitat when managing forest landscapes. Additionally, we are exploring the utility of marten habitat supply as a coarse filter for terrestrial vertebrate conservation. Using habitat predictions for 269 terrestrial vertebrate species developed by the Maine Gap Analysis Project and various cutoffs from our logistic model, we estimated the number of species that would be retained on the landscape by conserving marten habitat. Preliminary results indicate that marten habitat supply may be useful as a coarse filter for conservation of selected groups of species for regional forest management and long-term forest planning. Future applications of this research include using our top-ranked model and habitat maps based on 1993 and 2000 satellite imagery to predict habitat supply across the marten's range in Maine and to estimate changes in habitat supply and marten density over time. Potential future applications of this research include a semi-automated decision support system that would allow land managers to visualize the affects of forest management actions on available habitat for marten.

**Louis BÉLANGER**, Professor, Centre de recherche en biologie forestière, Université Laval, Sainte-Foy, QC G1K 7P4; email: louis.belanger@sbf.ulaval.ca

**Integrating research to develop new forest practices in Québec: starting with two strikes**

(Abstract unavailable)

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**Research implementation & the SFMN Knowledge Exchange Program – From theoretical to practical sustainable forest management**

The Sustainable Forest Management Network (SFMN), one of Canada's 22 Networks of Centres of Excellence (NCE), provides interdisciplinary research on the management of the forests of Canada. The SFMN provides integrated and directed research to assist in developing new planning and management tools for industry, as well as policy insights and improved institutions for government, to assist in ensuring that Canada's forests are managed sustainably.

The SFM Network began in 1995 as a research organization and is centered at the University of Alberta. Currently the Network operates with a $7M annual budget that is judiciously allocated to research that meets the SFM Network mission. The network has a number of funding partners beyond the NCE program including provincial governments, forest industries and First Nations. Thirty Canadian universities are represented in total in the Network. Over 100 researchers and 200 graduate students are involved in SFM Network research and more than 200 graduate students have already completed their studies within the SFM Network.

The Knowledge Exchange and Technology Exploitation (KETE) program of the SFMN was initiated in 2001 to provide tools and support to enhance research implementation and knowledge exchange among Network Partners, based on the first seven years of research completed by the network. The research completed to date has focused on understanding natural disturbance processes and the boreal forest ecosystem, and relating it to current forest management approaches. An outline of the KETE program will be provided and initiatives for 2002-2003 outlined. Strategies for enhancing the integration of research results into forest management planning and operational practices, and an overview of past SFMN research will also be presented.

# DISCUSSION
## Current status and future outlook of research integration into forest management

This workshop aimed to assess the current status of research integration in forest management, based on perspectives from several Canadian participants, as well as participants from Maine (USA) and Sweden. Research integration implies that forest management plans or specific field operations (silvicultural treatments, road building, etc.) are modified to reflect findings from scientific studies. In this workshop, the focus was on the integration of findings obtained from ecological research.

During the workshop, one of the speakers challenged the audience by stating that he did not know any case of active adaptive management beyond the stand level in Canada. This statement was not refuted in the discussion, suggesting that participants felt that, indeed, landscape-scale forest management in Canada cannot claim to be "adaptive", at least not yet. Active adaptive management implies that (1) the ecological effects of forest management are measured using appropriate indicators and that key uncertainties (e.g. poorly known ecological process) are identified, (2) these uncertainties are reduced through research, (3) indicators/processes are monitored and changes to management are implemented to address problems. Currently, most companies tend to apply "best management practices" on their entire land base, they rarely measure the ecological response to these practices, and when measures are taken, the experimental design rarely includes a proper control. Management plans and operations are being modified to include new values, but few companies can claim that they truly operate within an adaptive management framework.

It was suggested that for truly adaptive management to take place, a key ingredient would be to facilitate managerial learning rather than to "transfer" knowledge/technology. Research findings should empower the manager to integrate biodiversity into forest planning, rather than to create a new set of rules. We discussed approaches and procedures that could facilitate the exchange between researchers and forest managers. The "liaison officers" considered by SFMN's KETE program ("Knowledge exchange and technology exploitation") might help in this respect. However, an industrial representative pointed out that for this approach to work, officers should be individuals who are highly regarded by both parties involved (researchers and practitioners) and have a lot of experience applying the concepts and working with the industry and research organizations. Interestingly, Sweden's national forestry company (*Sveaskog*) recently hired a person whose job consists in implementing conservation measures by integrating them into the company's harvest planning. So far, the experience seems highly positive.

Researchers' contribution can be communicated to and implemented by the industry more readily via specific projects rather than through broader research "programs". However, as one researcher pointed out, research programs are still needed to address "bigger issues". Companies that have a research advisory committee can actually ensure that each project goes through a "big picture template". Other companies make sure to invite researchers and graduate students when discussing their forest management plans. In the latter case, little will be achieved unless researchers are involved at various steps throughout the process rather than being presented with a nearly final plan.

Researchers must also consider the way they communicate to managers: knowledge is not always synonymous with insight! An industry representative also pointed out that sending tools or reports to the practitioners does not achieve the goal. Researchers must present ideas to the managers and convince them of their value. In this respect, frequent meetings in person between researchers and managers are extremely important. Spending the time to discuss issues is critical to achieve goals as a team. A researcher argued that this should be a two-way street. Forest managers rarely contact researchers to communicate their ideas or needs.

It is pointed out that certification has indeed favoured a greater level of interaction among various stakeholders, but some participants expressed doubts about the actual value of current certification schemes for integrating biodiversity conservation into forest management. Current certification processes do not really account for ecosystem dynamics. They mainly tend to deal with non-timber values by measuring what the forest is, and measuring what the managers are doing, and hardly, if at all, by measuring/assessing what the forest is functionally becoming in context of the measurable availability of non-timber values.

It was suggested in one of the talks that the political arena is a key area if we want research findings to be integrated into forest management and relevant policy. This is especially true in Québec, but it bears some truth elsewhere. One participant explained his role when he became Assistant Deputy Minister of Natural Resources and Energy in New Brunswick. His experience suggested that politics are so critical to the management of our forests that this called into question the importance that he used to attribute to peer-reviewed scientific research. The interactions between annual allowable cut (AAC), tenure arrangements, and the jurisdiction’s forest management guidelines largely determine the degree to which forest practices change or do not change. Indeed, a flexible policy is critical if we are to favour adaptive management on public lands.

The invited speaker, Dr Per Angelstam, drew a comparison between Canadian and Swedish forests which was very instructive. After the initial loss of old growth forest in Sweden through steel mining and charcoal production, intensive silviculture resulted in highly productive forests essentially devoid of dead wood. In contrast, Canadian forests still have fairly high amount of dead wood except in heavily thinned plantations. Dr Angelstam's recent research indicates that some species, including a holarctic woodpecker, show very clear thresholds in their requirements for snags below which they are absent from the landscape. Swedish forestry has recently taken a sharp turn to integrate biodiversity conservation objectives. For this purpose, Sveaskog has purchased forest lands in northern Sweden where it can implement a broader array of conservation measures. A great challenge will be to coordinate efforts with other land owners in southern Sweden to achieve conservation/restoration objectives. We should make use of this insight to ensure that we do not go down the same path and have to implement remedial measures.

In summary, a variety of approaches are proposed to efficiently integrate findings from ecological research and, more specifically, biodiversity research into large-scale forest management. Promising avenues include (1) a proper mixture of short-term projects providing quick answers and broader-based research programs addressing larger-scale, longer-term issues; (2) more efficient communication between researchers and managers through regular meetings with specific and realistic objectives; (3) the development of a broad perspective by researchers and managers to ensure that we benefit from the experience and expertise acquired in other provinces and other countries; (4) certification systems reflecting the most recent developments in ecological research and focusing on measuring "biodiversity performance" rather than on measuring what the managers are doing. This will not happen on its own. Instead, it will require that the various stakeholders take part in active adaptive management, which is probably the best way to learn and to correct our mistakes as we continue to intensify the management of our forest landscapes. Future generations deserve that we succeed in this effort.

Marc-André Villard

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