Challenges, achievements and impacts from interdisciplinary research and training: The Sustainable Forest Management Network

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ABSTRACT

One of the big challenges of research in support of sustainable forest management (SFM) is the need for increased collaboration of researchers from different academic disciplines. The Sustainable Forest Management (SFM) Network's approach to interdisciplinary research has evolved over the past ten years. One of the most significant changes has been a shift to larger and more integrated project teams. Increased integration in research in the SFM Network has resulted in benefits, particularly in relation to Canada's capacity to address SFM-related research questions and management issues.

Key words: sustainable forest management, interdisciplinary, research network, training

RÉSUMÉ

L'un des principaux défis de la recherche appuyant l'aménagement forestier durable (AFD) est la nécessité d'obtenir une collaboration accrue de la part des chercheurs issus de différentes disciplines du secteur universitaire. L'approche du Réseau d'aménagement forestier durable (RAFD) en matière de recherche interdisciplinaire a évolué au cours des dix dernières années. L'un des changements significatifs a été une tendance à constituer des équipes de travail plus importantes et plus intégrées. L'intégration accrue en recherche au sein du RAFD a généré des bénéfices, particulièrement en relation avec la capacité du Canada de répondre aux questions portant sur la recherche et aux enjeux d'aménagement.

Mots clés : aménagement forestier durable, interdisciplinaire, réseau de recherche, formation

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Introduction

Moving toward sustainable forest management (SFM) requires fundamental changes in our approach to forest research. These changes could include new ways of thinking about forestry (Messier and Kneeshaw 1999), and new approaches to forestry education (Gauthier *et al.* 2002). An increased focus on interdisciplinary research and training is another one of the steps to

developing forest management that is more consistent with the broad set of values that people derive from forests.

The Sustainable Forest Management (SFM) Network² is a Canada-wide research network that was developed to get researchers from many academic disciplines working collaboratively on issues of interest to government, industry, aboriginal, and NGO partners. The research funded by the SFM Network is based at universities across Canada. A significant result over the Network's ten-year history has been the training of university students, post doctoral fellows, research associates, and technicians. This paper explores: 1) the rea-

sons for interdisciplinary research and training; 2) the evolution of the SFM Network's approach to research; and 3) some indicators of progress to date.

SFM Network: An Interdisciplinary Approach to Research and Training

The SFM Network's approach to research and training reflects some of the fundamental elements of sustainability. Amid the considerable debate and discussion that has gone into defining sustainability, there are a few uniting themes that justify a focus on interdisciplinary research and training. Firstly, SFM involves ensuring that forests, and the values associated with them, continue to be provided for the benefit of future generations. Secondly, SFM implies that the forest values to be sustained reflect a wide range of goods and services, including timber values, subsistence, recreation, and amenity values. These two aspects of sustainability suggest that one of the great SFM challenges is making sure that future generations continue to have the ability to derive benefits from forests in a broad sense (Adamowicz and Burton 2003).

SFM provides us with many challenges, not the least of which is an increased ecological understanding of forests, as the primary provider of the varied sources of benefits, whether in the form of lumber, clean water, aesthetics, recreation, aboriginal uses or carbon storage. Sustainability also requires a better understanding of social and economic values, including how the diverse set of social and economic values derived from forests are developed and how they change

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²<http://sfm-1.biology.ualberta.ca/english/home/index.htm>

through time. The challenge of sustaining multiple values from forests across generations has often been summarized by relating to "three pillars" of sustainability, with each pillar representing a general category of forest values. But the challenge is far greater than simply devoting some effort to understanding and describing the ecological, social and economic pillars. In many respects, the integration of different values is the great challenge of sustainable forest management. For example, the need for integration between the "pillars" is particularly relevant in the development of criteria and indicators to measure our progress toward SFM (Yamasaki *et al.* 2002, Adamowicz 2003).

Ensuring that we have people with the right knowledge and skill to carry out this new style of research is another key element of SFM. As with all research, today's results generate new and different questions for tomorrow. This emphasizes the need for researchers and practitioners with both a broad knowledge base, and the ability to work with partners, to ask the right questions. The SFM Network has recognized that students trained, "in an environment where all concerned parties were "at the table," would be the best ambassadors of sustainable forestry for future generations" (Burton *et al.* 2003).

Evolution: SFM Network Experience over Time

There are some very strong arguments for taking on the challenge of SFM through an interdisciplinary approach. Trying to meet the challenge of interdisciplinarity has been an evolutionary process within the SFM Network. While acknowledging that moving toward sustainability should involve many disciplines, much of the early SFM Network research tended to be single-discipline research (Veeman *et al.* 1999). Examples of this early work include trying to assess what natural disturbance could tell us about managing forests, and more specifically, testing the assertion that the emulation of natural disturbances was an effective means of moving toward SFM (Hunter 1993). Subsequent work has put more focus on how the results of science could be transferred into changes in forest practices and policies (Veeman *et al.* 2002). The SFM Network's research focus has also expanded beyond natural disturbance to assess zoning strategies, such as "TRIAD," that partitions the landscape into areas with intensive forestry, extensive forestry and protected areas. Throughout this early SFM Network research, significant resources were devoted to the economic and social aspects of sustainability; however, the integration between ecological, economic and social research has increased as the research program has developed.

In 2002, the SFM Network entered its second seven years under the banner of the Network of Centres of Excellence (NCE) program.³ Through the first three years of the second stage of NCE funding, two significant changes have contributed to increased interdisciplinarity in the SFM Network. First, there has been a conscious effort to increase the effectiveness of the dialogue between researchers and partners in the identification of research priorities. Second, there has been a shift towards larger and more integrated project teams being seen as the most effective way to deal with the integration of the ecological, economic and social aspects of sustain-

ability. One of the primary outcomes of these two forces has been an increase in the number of multidisciplinary projects. There has also been an increase in research projects that span more than one province and often involve partners from more than one sector (Abugov 2004).

Increased Integration in SFM Network Research

There are many examples within the SFM Network of university researchers that have gone beyond their traditional area of expertise in order to more effectively address a question. Further, there are examples of graduate students that have both met the requirements of scientific rigour and made significant achievements in interdisciplinary research (e.g., McEachern 2003). The examples of students graduating and taking with them a broad knowledge base to draw from as they address future SFM questions will likely increase along with the increase in interdisciplinary research projects in the SFM Network.

When considering the projects themselves, there have been some excellent examples of integrated research efforts. The, largely Alberta-based, Boreal Ecology and Economics Synthesis Team (BEEST), started relatively early in the SFM Network and continues to encourage collaboration that has resulted in important insights on tenure (Cumming and Armstrong 2001) and suggested novel approaches to help forest managers balance timber and wildlife values (Armstrong *et al.* 2001). The success of integrated research projects, such as BEEST and the "Quebec Integration Project" (Yamasaki *et al.* 2002) have, in part, led to increased emphasis within the SFM Network on Integrated Resource Management research.

Another indication of the level of integration between disciplines can be seen by examining the portfolio of projects within one of the SFM Network's nine research areas. An interesting example is provided by research done in collaboration with our aboriginal partners. Current research projects in the SFM Network's, "Sustainable Aboriginal Communities" (SAC) research area, includes lead researchers and collaborators with expertise in anthropology, ecology, economics, forest management, political science, and sociology. Further, the current portfolio of projects involving our aboriginal partners and affiliates has expanded beyond the SAC, and now includes projects in several other research areas.

Impacts on Canada's Capacity to Achieve SFM

This paper argues that an interdisciplinary approach to research and training is an important part of moving toward SFM in Canada. Perhaps the most significant impact of the SFM Network has been the improved capacity to meet the challenges of SFM. Many established researchers have broadened and enriched their areas of expertise and in so doing, effectively increased our capacity for SFM. For example, economists or ecologists may increase their professional literacy with respect to aboriginal people in Canada by leading, or collaborating, on projects involving aboriginal partners.

The students, research associates, technicians and others working in an environment that promotes interdisciplinary research by responding to partner needs directly contributes to our capacity for SFM. On this front, there can be little doubt that the SFM Network is beginning to have a major impact on Canada's capacity for forest research. For example, in 2003–2004, there was a total of 98 Masters Students, 58

³see <http://www.nce.gc.ca/>

Ph.D. Candidates, 66 Undergraduate Students, 69 Research Associates and Technicians, and 18 Post Doctoral Fellows funded by the SFM Network. As these students graduate, many will be employed in government, industry, consulting, aboriginal organizations and non-governmental organizations. A large number of graduates have already become established researchers at various Canadian universities, or with organizations like Natural Resources Canada and the Canadian Forest Service.

Conclusion

SFM is an interdisciplinary concept. Research that is designed to provide options for moving toward SFM, or to measure progress toward SFM has to involve researchers from many disciplines. Recent evolution in the SFM Network's research program toward increased collaboration and integration between disciplines, and more active engagement of government, industry, Aboriginal partners and stakeholders in research promises to contribute further to our capacity to address the challenges ahead. The students, research associates and technicians currently working on SFM Network-funded projects are working in a far more collaborative environment than their predecessors. As future forest managers and researchers, they will bring with them a broader view of SFM issues and help to define new questions and further enrich the next round of research partnerships.

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