

The Great Lakes Silviculture Summit: An Introduction and Organizing Framework

Introduction

In recent years, institutional commitment to silviculture as a research discipline has decreased in the Great Lakes region and elsewhere. Ironically, at the same time, the various demands placed on silviculture by users of research have increased greatly and continue to do so today. There remains the need to produce more and better quality wood and fiber, a need heightened by an increasing population. In addition, silviculture is called upon to restore degraded ecosystems, to increase ecological complexity and diversity in production systems, to restore and manage ecological reserves, and to ensure that forests are managed sustainably for a wide array of ecosystem goods and services including aesthetic quality, recreational opportunities, and non-timber forest products.

There is a long history of production-oriented silviculture research in the Great Lakes region and beyond, and some methods of increasing volume yield of wood fiber are well documented. However, there is still much to learn. In particular, the synergistic effects of doing everything just right to maximize productivity in an intensive silvicultural system (e.g., fertilization, irrigation, spacing, superior genotypes, competition control, thinning) have not been well quantified for Great Lakes timber species.

Silvicultural strategies that target sustainability of a variety of ecosystem benefits and values are greatly underexplored. These approaches might be designed to optimize wood production along with other ecosystem attributes, such as native species diversity or riparian functionality. Or, the goal may be to maximize production and sustainability of ecosystem attributes other than wood fiber. More focus is also needed on

production of quality sawtimber and veneer from the variety of species that are native to the Great Lakes region.

Finally, we have come to better understand the role of natural disturbances in regulating forest ecosystems, but we also know that allowing nature to take its course is rarely possible in our human-dominated landscapes. This is true even in the context of managing ecological reserves and natural areas. In fact, such areas may have great need for silvicultural intervention, perhaps for restoring or sustaining ecosystems in the face of altered natural disturbance regimes (e.g., suppression of natural fire). While research on silvicultural strategies for ecological reserves is ongoing, often taking the form of restoration ecology or prescribed fire research, the role of silviculture in reserve management warrants further attention.

A Model For Framing Silvicultural Research Needs

One conceptual framework for organizing silvicultural research needs is a model that arrays stand management objectives along a gradient of management intensity and desired

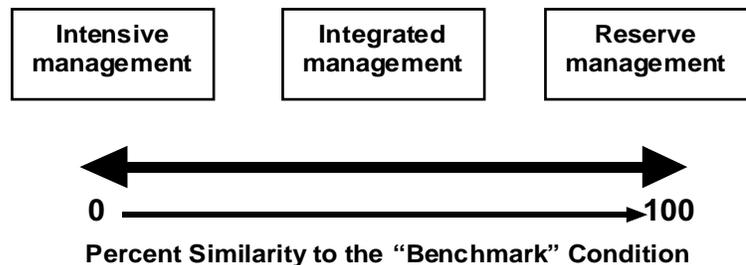


Figure 1.—Conceptual model for evaluating silvicultural needs relative to management goals and desired future conditions.

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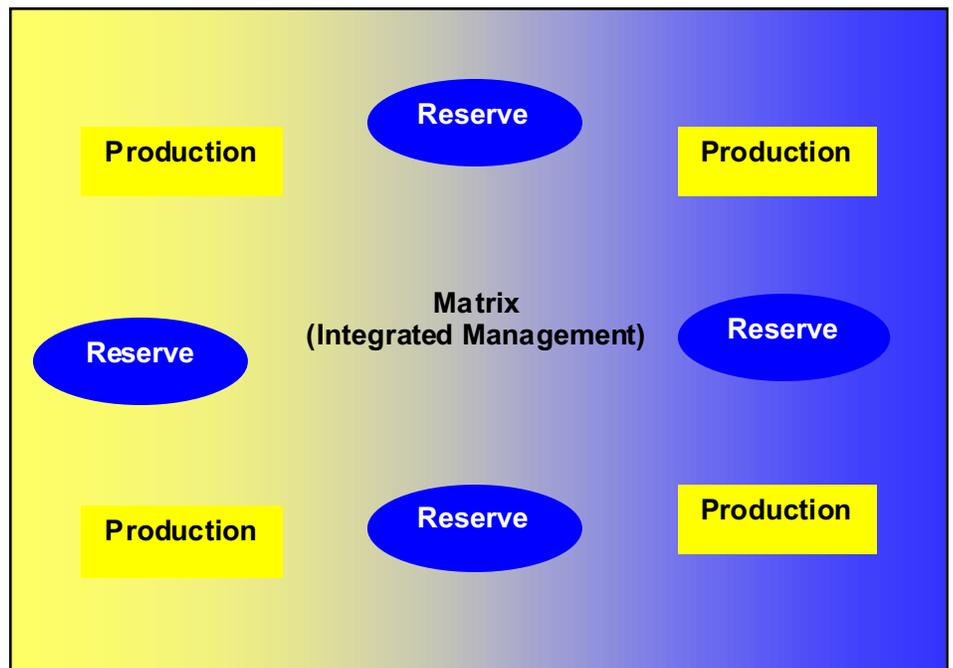
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future conditions (fig. 1). On the right end of the gradient is the unmanaged, benchmark condition. This may be the condition of choice if management of ecological reserves is the primary objective; hence we refer to this as the domain of reserve management. Research needs at this end of the gradient may include approaches for restoring historical composition and structure or eradicating and controlling exotic species. The left end of the gradient is the intensively managed condition. An extreme example is a short-rotation, single-cohort plantation of an exotic species, where maximization of fiber production is the sole objective. We refer to this extreme as the domain of intensive management. Silvicultural research needs for intensive production might include optimizing spacing, thinning, and competition control to maximize growth while minimizing costs. There is a wide array of conditions between the ends, falling within the domain of the model we call integrated management. These conditions could include, for example, extended rotation, single-cohort, single-species stands or multi-cohort, mixed-species stands. The point is that managing for extractive timber objectives is one of many goals and one that becomes less important, relative to other ecological goals, as we move to the right along the gradient, toward the domain of reserve management. Research

needs in this domain include testing approaches for adding ecological complexity (e.g., of structure or composition) to stands managed for wood production, or projecting the effects of this added complexity on production levels (Palik and Zasada 2002).

When applied to whole landscapes, the nodes of our model (intensive, integrated, and reserve management) suggest a land allocation approach similar to the “triad” model of Seymour and Hunter (1999; and see Seymour, this volume). Under the triad model, a landscape contains both production forests and ecological reserves, embedded within a forest matrix that is managed to conserve biological diversity. Some stakeholders have interpreted the matrix condition to be homogeneous with respect to management approaches and conditions, with management for diversity and complexity given priority. In application, the matrix forest will be managed in many different ways. Some approaches will focus on conservation of biological diversity and ecological complexity, with wood production being a secondary and minor objective. Other approaches will favor fiber production, but with some consideration for sustaining biological diversity (i.e., more so than with true intensive production). The examples are limitless, as suggested by the gradient in figure 1. When translated into a landscape perspective, the resultant model suggests a spectrum (fig. 2), where

Figure 2.—A spectrum model of forest land use allocation in which production and reserve forest are embedded within a matrix managed for integration of ecological and production goals. How these goals are balanced varies greatly across the matrix.



approaches and goals grade into one another. Some portions of the matrix are managed in similar ways to production forests (closer to yellow on the spectrum), and some portions are managed to favor goals and conditions similar to reserve forests (closer to blue on the spectrum), again, with a wide array of options for balancing ecological and production objectives between the ends.

The Challenge and Goals of the Great Lakes Silviculture Summit

To address the challenges and opportunities suggested by the spectrum model (fig. 2), silviculture research must become more multidisciplinary and broader in its scope and perspective. To do so, researchers need a better awareness of the range and complexity of the silvicultural needs of the stakeholders in the region. The Great Lakes Silviculture Summit, which took place in April 2003 at Michigan Technological University, was conceived with this need in mind. The primary audience of the summit included organization representatives who define needs and set policy on silvicultural approaches and practice, as well as researchers working in silviculture or related disciplines, i.e., those who can help meet the needs.

An overarching goal of the summit was to develop and strengthen a collaborative research network within the Great Lakes region that focuses on silvicultural information needs of various user groups, i.e., those that implement silviculture on the ground. A first step in developing this network was to obtain a clear message from organizational decisionmakers about their information needs. User group presenters at the summit were selected specifically to represent organizational needs from across the management spectrum (fig. 2). Representatives of regional research institutions were asked to respond to user group presentations by summarizing their current or planned research capacity to address stated needs. The specific objectives of the Great Lakes Silvicultural Summit were to:

1. Bring together silviculture and related researchers and decisionmakers from

- organizations that use this research;
2. Present the pressing issues facing the users of silviculture in the Great Lakes region and beyond;
3. Outline the capability and capacity of researchers to address these issues;
4. Chart a research agenda for the future that addresses user needs.

Our desired outcomes for the summit included clarification and articulation of the present and future status of silvicultural needs and capabilities in the Great Lakes region. We were also interested in developing stronger collaborative relationships among researchers whose work focuses on or is directly relevant to silviculture. Finally, our goal included the development of a research agenda from topics identified and endorsed by summit participants.

Some of these goals and desired outcomes are addressed in the following series of papers. In the first paper, Bob Seymour provides an articulate synthesis of the development of silviculture as a discipline. This synthesis examines where silviculture research is now, where it needs to go in the future, and by extension, what is silviculture in the 21st century? The next paper, by Dave Reed, examines the context of silviculture in the Great Lakes region. What is the current state and what are the recent historical trends in area, growing-stock volume, and utilization of Great Lakes forests? In examining these trends, we should be in a better position to consider issues and opportunities that need to be addressed by silviculture in the first decades of the 21st century. The following four papers are drawn from the user group presentations. These papers synthesize the silvicultural needs of i) *the pulp, paper, and dimensional lumber industries* (Alan Lucier); ii) *conservation organizations* (Meredith Cornett); iii) *non-industrial private landowners* (Kathryn Fernholz); and iv) *quality saw log and veneer industry* (Jack Rajala). (Note: additional presentations were made by representatives of State and Federal forest management. Although these papers are not included, their comments

are incorporated into the research agenda found in this volume.) The next paper, by Tom Crow, synthesizes what we learned from the summit presenters about information needs, capabilities, and the future direction of silviculture research in the region. Finally, we distill what we learned from presenters and participants, including comments from a panel of institutional representatives (see appendix) and respondents during small-group breakout sessions, into a research agenda for silviculture in the Great Lakes region.

Literature Cited

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