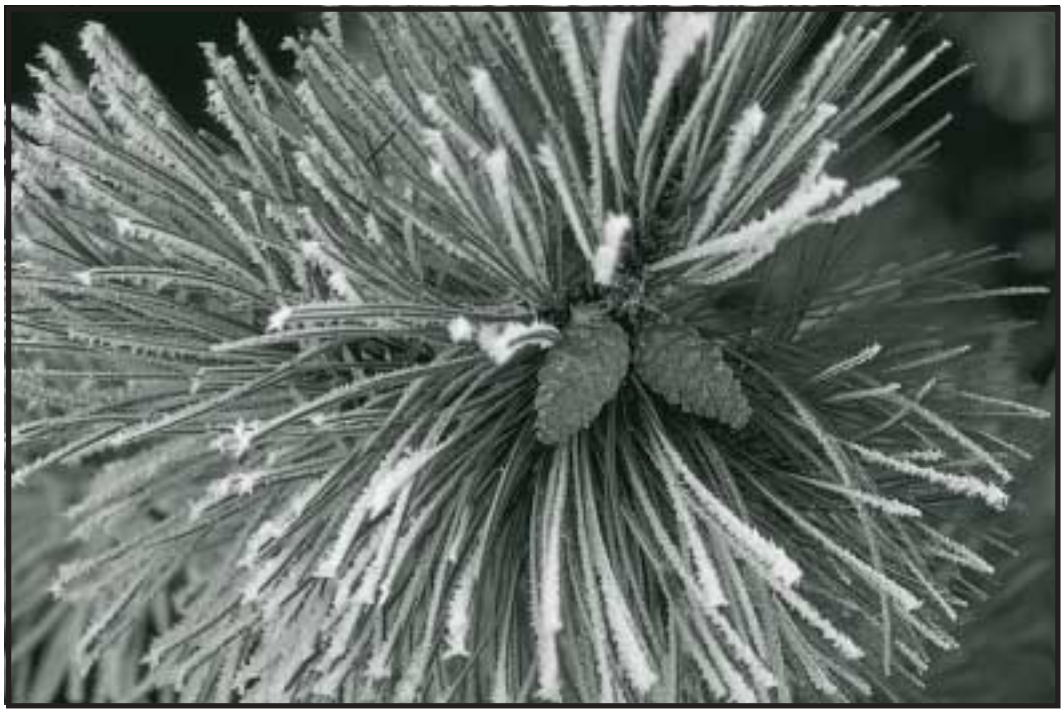
Minnesota Forest Resources Council



2003 Annual Report to the Governor and Legislature

on the Implementation of the Sustainable Forest Resources Act

Thank You

Thank you to all the organizations that continue to help, organize, support, and participate in the programs of the Sustainable Forest Resources Act (SFRA) and the Minnesota Forest Resources Council (MFRC):

Associated Contract Loggers
Audubon Minnesota
Blandin Foundation
Cloquet Forestry Center
Institute for Agriculture and Trade Policy – Community Forestry Resource Center
Minnesota Association of County Land Commissioners
Minnesota Center for Environmental Advocacy
Minnesota Department of Natural Resources
Minnesota Forest Industries
Minnesota Forest Resources Partnership
Minnesota Forestry Association
Minnesota Indian Affairs Council
Minnesota Logger Education Program
Minnesota Resort Association
Minnesota Ruffed Grouse Society
Minnesota Timber Producers Association
Sierra Club
The Nature Conservancy
The Trust for Public Land
USDA Forest Service
- Chippewa National Forest
- Superior National Forest
- North Central Research Station
- State and Private Forestry

University of Minnesota-Duluth
- Natural Resources Research Institute
- School of Business and Economics

University of Minnesota-Twin Cities
- College of Natural Resources
  - Center for Continuing Education
  - Dean's Office
  - Department of Forest Resources
- Extension Service
- Southeast Regional Sustainable Development Partnership

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Cover photo provided courtesy of University of Minnesota Agricultural Experiment Station

Minnesota Forest Resources Council

2003 Annual Report to the Governor and Legislature

on the Implementation of the Sustainable Forest Resources Act

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Photo courtesy of University of Minnesota College of Natural Resources

The Vision of the Minnesota Forest Resources Council

➤ Minnesota's forests are managed with primary consideration given to long-term ecosystem integrity and sustaining healthy economies and human communities.

➤ Forest resource policy and management decisions are based on credible science, community values, and broad-based citizen involvement.

➤ The public understands and appreciates Minnesota's forest resources and is involved in and supports decisions regarding their use, management, and protection.

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Message from the Chair

An Overview of MFRC Accomplishments in 2003

The Minnesota Forest Resources Council (MFRC) had a successful year in 2003, as shown by the eleven major areas of accomplishment highlighted below:

1. MFRC staff played a major role in helping to develop the *Governor's Task Force Report on the Competitiveness of Minnesota's Primary Forest Products Industry.*[1]
The report recommended ways to improve the competitive position of Minnesota's primary forest industry in the global marketplace.

As a result, a variety of legislative initiatives will be proposed during the 2004 legislative session, and several administrative initiatives are already being implemented or will be implemented in 2004. (See page 5.)

Alfred Sullivan, Chair of the Minnesota Forest Resources Council
Photo by Tom Foley/University of Minnesota College of Natural Resources

2. MFRC staff and members played an important support role in helping the Blandin Foundation convene two major forest policy conferences promoting sustainable forest management in Minnesota.
These conferences were part of the Blandin Foundation's *Vital Forests/ Vital Communities* initiative. This three- to five-year effort seeks to increase the economic, social, and ecological well-being of Minnesota's forest-based communities, and to increase the sustainability of the forest-based industries on which those communities depend. (See page 6.)

3. We completed final plans for three of the six major forested landscape regions in Minnesota: the Northeast, North Central, and Southeast landscapes.[2] These plans were the result of two or more years of work by diverse forest interests in each landscape. Each plan outlines landscape-level goals and suggests multiple strategies for public and private land managers to consider. Follow-up groups in each landscape will enable plan implementation by land managers and ensure that landscape-level coordination activities are actively pursued. (See page 9.)

4. We are nearing completion of final plans for two more major forested landscape regions, and we are initiating plan development in a sixth region.

Plans for the Northern and West Central landscape regions are likely to be approved by the MFRC in early 2004, and a plan for the East Central landscape region will be developed by mid-2005. (See page 11.)

[1] "Primary industry" refers to producers of lumber, engineered wood products, and paper, whose products are typically inputs to other industries.

[2] See page 9, Figure 1, for a map of the eight MFRC landscape regions.

5. The MFRC completed a spatial analysis project to improve understanding of past, present, and possible future forest spatial patterns that are important for wildlife, forest productivity, outdoor recreation, and other forest values. A final overview of this project was presented to the MFRC in September 2003. (See page 13.)

6. We conducted a peer and practitioner review of revisions to Minnesota's voluntary timber harvesting and forest management guidelines.

We have initiated a public review of the guidelines, which we anticipate will be revised and published by the statutory deadline of June 2005.[3] (See page 18.)

7. We completed an MFRC-sponsored empirical research study evaluating who pays for implementing the timber harvesting and forest management guidelines. This study will serve as an important part of the economic analysis of the guidelines required by the Sustainable Forest Resources Act (SFRA).[4] In 2004, we plan to cosponsor research on how much it costs to implement the guidelines, as well as potential policy and legislative implications. (See page 20.)

Minnesota Forest Resources Council photo

This stand contains a majority of Norway pine (also called red pine), Minnesota's state tree.

8. With the MFRC providing oversight and program direction, the Minnesota Department of Natural Resources conducted a comprehensive analysis of the first three years of compliance monitoring data (2000–2002). This analysis established a statewide baseline for timber harvesting and forest management guideline use, and for pre-comprehensive guideline and post-comprehensive guideline comparisons. (See page 22.)

9. MFRC supported and monitored progress on an ongoing research study funded by the Legislative Commission on Minnesota Resources and the MFRC to evaluate how well the timber harvesting and forest management guidelines protect forest resources, especially in forested riparian areas. (See page 23.)

[3] This deadline is specified in the Sustainable Forest Resources Act (SFRA), as revised by the 2002 Legislature.

[4] Minnesota Statutes 89.05, Subd. 2

10. Two educational workshops were held in the spring of 2003. The first provided participants with an overview of MFRC's site-level guidelines, focusing on cultural resources, forest soils, riparian areas, and wildlife habitat.

The second emphasized increasing the application of those water and soil quality protection practices identified through guideline monitoring as having the lowest rates of implementation.

The Minnesota Logger Education Program and the University of Minnesota Center for Continuing Education, College of Natural Resources, cosponsored these workshops. (See page 28.)

By maintaining support for the MFRC in 2003 despite a significant state budget shortfall, the Governor and the Legislature demonstrated continuing support for sustainable forest management.

11. Implementation of the Sustainable Forest Incentive Act continued this year.[5] The MFRC played a major role in helping design the reduced property tax incentive program created by this act.

More than 350 forest landowners have made a long-term commitment to good stewardship and management of their land by enrolling over 700,000 acres of forestland in this program during its first year.

By maintaining support for the MFRC in 2003 despite a significant state budget shortfall, the Governor and the Legislature demonstrated continuing support for sustainable forest management.

In 2004, the Minnesota Forest Resources Council will continue to play a leadership role in statewide forest policy initiatives and in promoting voluntary, incentive-based sustainable forest management policies and practices on all forest ownerships in Minnesota.

Alfred D. Sullivan
Chair

Photo by Don Breneman/University of Minnesota Agricultural Experiment Station

Many private owners manage their forestland for wildlife, recreation, and aesthetic reasons.

[5] Minnesota Statutes, Chapter 290C

The Minnesota Forest Resources Council

What is the Minnesota Forest Resources Council?

The Minnesota Forest Resources Council (MFRC) is a 17-member organization working to promote long-term sustainable management of Minnesota's forests in two ways:

➤ By coordinating implementation of the Sustainable Forest Resources Act (SFRA).

➤ By advising the Governor and federal, state, county, and local governments on sustainable forest resource policies and practices.

The MFRC works to promote long-term sustainable management of Minnesota's forests within the policy framework set forth in the Sustainable Forest Resources Act.

What is its purpose?

Created in 1995, the MFRC operates within the policy framework for sustainable forestry set forth in the SFRA, which is to:

➤ **Pursue the sustainable management, use, and protection** of the state's forest resources to achieve the state's economic, environmental, and social goals.

➤ **Encourage cooperation and collaboration** between the public and private sectors in the management of the state's forest resources.

➤ **Recognize and consider forest resource issues,** concerns, and impacts at site and landscape levels.

➤ **Recognize the broad array of perspectives** regarding the management, use, and protection of the state's forest resources, and establish processes and mechanisms that seek these perspectives and incorporate them into planning and management.

Who is on the MFRC?

The Governor appoints a chair and 15 other members to the MFRC. The Minnesota Indian Affairs Council appoints one additional member. MFRC membership includes a chair plus individuals representing the following categories:

➤ Commercial logging contractors

➤ Conservation organizations

➤ County land departments

➤ Environmental organizations (two representatives)

➤ Forest products industry

➤ Game species management organizations

➤ Labor organizations

➤ Minnesota Department of Natural Resources

➤ Minnesota Indian Affairs Council

➤ Nonindustrial private forest landowners (two representatives)

➤ Research and higher education

➤ Resort and tourism industry

➤ Secondary wood products manufacturers

➤ USDA Forest Service

MFRC Forest Policy Initiatives and Collaborations

What forest policy initiatives have occurred this year?

The MFRC continues to collaborate with other organizations to guide policies that promote sustainable forestry.

In 2003, the MFRC assisted a task force appointed by the Governor in developing a report assessing the long-term competitiveness of Minnesota's primary forest products industry (Policy Initiative #1).

In addition, the MFRC collaborated with the Blandin Foundation (Policy Initiative #2) and the Minnesota Forest Resources Partnership (Policy Initiative #3). Finally, the Minnesota Department of Natural Resources (DNR) implemented MFRC's white pine management recommendations (Policy Initiative #4).

These four forest policy initiatives that occurred as a result of collaboration with other sustainable forestry efforts are described in this section.

Policy Initiative #1: Assessing the Competitiveness of Minnesota's Primary Forest Products Industry

In March 2003, in response to recent employment losses in the state's primary forest products industry, Governor Tim Pawlenty established an Advisory Task Force on the Competitiveness of Minnesota's Primary Forest Products Industry[6] to assess the long-term competitiveness of this manufacturing sector.

The nine-member task force included representatives from the Minnesota Department of Employment and Economic Development, the DNR, primary forest products and logging industries, the St. Louis County Land Department, and the University of Minnesota.

MFRC staff assisted the Task Force by participating in the working group that conducted the analysis and wrote the 34-page summary report. Through this initiative, the MFRC contributed staff time and resources to affect policies related to the role of the forest products industry in sustainable management of Minnesota's forests.

The Task Force concluded that the State has substantial influence over several areas that affect competitiveness.

What the Task Force recommended

The Task Force examined global trends and issues, classifying them into 10 factors perceived to be major impediments to competitiveness. The Task Force concluded that the State has substantial influence over several areas affecting competitiveness, especially wood and fiber availability and price, permitting and environmental review, and transportation.

The Task Force report included seven major recommendations[7] to increase Minnesota's primary forest products industry's global competitiveness while maintaining sustainable forest management practices and environmental quality.

[6] "Primary industry" refers to producers of lumber, engineered wood products, and paper, whose products are typically inputs to other industries.

[7] MFRC members did not endorse these recommendations; the report represents the combined views of Advisory Task Force members only.

Follow-up activities

As a follow-up to the Task Force's report, an implementation team was chosen by the Governor, which includes representatives of the MFRC,[8] to work on specific topics. The implementation team developed specific policy recommendations for enhancing the competitive position of Minnesota's primary forest products industries.

These recommendations include a variety of legislative initiatives to be proposed during the 2004 legislative session, as well as several administrative initiatives that are being implemented or will be implemented in 2004.

Policy Initiative #2: Assisting the Blandin Foundation with Its Vital Forest/Vital Communities Initiative

In 2003, the MFRC continued its collaboration with the Blandin Foundation to assist in the development and implementation of the Blandin Foundation's three- to five-year public policy initiative entitled *Vital Forests/Vital Communities*.

This initiative is based on the premise that growing and managing healthy forest ecosystems makes both environmental *and* economic sense.

This initiative is based on the premise that growing and managing healthy forest ecosystems makes both environmental *and* economic sense. The initiative set goals to:

➤ Help create a more diversified forest-based economy.

➤ Promote ecologically based approaches to forest management to ensure the sustained health of the state's forest ecosystems.

➤ Build public support for long-term investments in forests and in natural resource management agencies and programs.

➤ Improve the effectiveness of public engagement in natural resource management processes.

The MFRC's assistance included staff participation in the steering group that helped shape two "call-to-action conferences" in the fall of 2003.

These conferences, and the work of action teams resulting from them, have focused attention on the challenges and opportunities facing Minnesota's forests, forest-based communities, and forest industries.

The conferences also fostered a collaborative approach to addressing these challenges and opportunities. For more information on the Vital Forests/ Vital Communities Initiative, visit www.blandinfoundation.org/strategy/strat_public_vitalfor.html.

Policy Initiative #3: A Collaborative Approach to Landscape Plan Implementation and Coordination

The Minnesota Forest Resources Partnership (MFRP) plays a role in implementing MFRC programs.[9] The MFRP has been in place since 1995 as a voluntary partnership of forest landowners, forest resource mangers, and loggers. In 2003, the MFRC and MFRP began to define a collaborative approach to landscape plan implementation and coordination. The MFRC recognizes the important role the MFRP plays in sustainable forestry management.

[8] Wayne Brandt, Mike Carroll, and Dave Zumeta, Executive Director of the MFRC

[9] As described in Minnesota Statutes, Chapter 89A.04, Subd. 4

Minnesota Department of Natural Resources photo

White pine significantly decreased during the period from the late 1800s to the 1990s. Beginning in the 1990s, significant investments by the State in seedlings and planting have resulted in a reversal of this trend. We are now seeing an increase in the acres of white pine in Minnesota.

Policy Initiative #4: Implementing the White Pine Initiative

In 2001, the MFRC provided a set of white pine management recommendations to the DNR. The DNR continued to make progress in 2003 to implement those recommendations, although funding for this initiative was available only through June 30, 2003.

Areas of significant progress include the following:

➤ The DNR completed the white pine old growth designation process on state lands. Approximately 6,000 acres of white pine have been designated as old growth. In addition, there are approximately 520 acres of white pine and 2,270 acres of mixed red pine/white pine old growth protected in Itasca State Park.

➤ During 2003, plantation surveys evaluated the quantity and quality of white pine seedlings planted in 1998 and the success of protection efforts. These data are currently being evaluated.

➤ Research and education activities continue. A workshop was conducted in September 2003 to review recent research on white pine silviculture and ecology.

➤ Many agencies are continuing to comply with the 1996 recommendations to the extent possible given their available resources.

Significant findings include the following:

➤ From 1990 to 2003, white pine timberland acres increased from 63,700 to 97,167 in Minnesota—an increase of more than 50%.[10]

➤ Where stand age class is greater than 100 years old, white pine timberland acres increased from 14,300 acres in 1990 to 26,400 acres in 2003—an increase of 85%.

➤ White pine regeneration practices have been applied on state, county, and private lands. White pine regeneration efforts also increased on national forestlands, such as the Chippewa and Superior National Forests. An estimated 9,400 acres have been planted with white pine since 1994 in the Superior National Forest, with the largest plantings occurring in recent years (3,430 acres in the last two years). In the Chippewa National Forest, 3,335 acres have been planted with white pine seedlings since 1994.

[10] These data, which do not include the Boundary Waters Canoe Area, are based on a partial inventory of Forest Inventory and Analysis plots (as of October 31, 2003).

Strategic Forest Resource Issues and Opportunities

The goal of long-term sustainability is important to Minnesota citizens. Achieving this goal will require strategic examination of issues and opportunities facing Minnesota's forests and forest-based communities. In 2003, the MFRC explored forest certification programs and possible policy approaches for Minnesota.

What is forest certification?

Forest certification emerged as part of a grassroots movement to devise market mechanisms that provide incentives for forest managers to integrate sustainability objectives into their forest operations.

Forest management certification offers a process by which forest products companies and forest landowners allow third-party auditors to evaluate their forest management practices against standards established by independent programs. These audits assess compliance with standards, so that customers and the public know that individual companies are managing forests in an environmentally friendly, responsible, and sustainable manner.

What forest certification programs exist?

There are several major forest certification programs in North America. There are two leading third-party forest certification systems currently in use in the United States: the Forest Stewardship Council© and the Sustainable Forestry Initiative.®

Each of these programs is a comprehensive system of standards and principles that integrates the goals of sustainable growth and harvest of trees with protection of wildlife, plants, and soil and water quality. In addition, the International Organization for Standardization has standards for environmental management system registration for forestry and mill operations.

The DNR is pursuing a goal to certify all state-owned and state-managed forestland by 2005.

What aspects of forest certification are being analyzed?

Because sustainability is difficult to define, certification of sustainability is an uncertain practice. Changes and challenges are ongoing in the forest certification arena.

The MFRC is analyzing the evolution of certification, trends in certification, and its effects on Minnesota. The MFRC plans to further explore how third-party certification can benefit Minnesota, and how certification relates to forest management guideline monitoring requirements.

The Governor's Task Force Report included a recommendation to promote voluntary third-party certification of forestland in Minnesota. As part of implementing these recommendations, the DNR is pursuing a goal to certify all state-owned and state-managed forestland by 2005.

In addition, the Blandin Foundation's Vital Forests/Vital Communities initiative is exploring several strategies to promote voluntary certification of private forestland, and to improve market supply and demand for certified wood products. The MFRC will be determining what role to play as Minnesota embraces forest certification.

Landscape-Level Forest Resource Planning and Coordination

How does the MFRC's landscape program address geographically unique resource issues?

The MFRC is a statewide forum where landowners and other forest stakeholders work together to sustain Minnesota's diverse forest resources. The landscape program provides a process that allows landowners and stakeholders to work together over broad regions to address resource issues that generate geographically unique solutions to sustainability challenges.

In six forested and two non-forested regions (Figure 1), residents and stakeholder representatives currently are or will be working cooperatively to:

➤ **Gather and assess information** on each region's economic, social, and ecological characteristics.

➤ **Identify key issues and plan ways to address those issues** to promote sustainable forest management.

➤ **Agree on desired future forest conditions** that promote sustainable forests, and agree on goals and strategies to achieve those conditions.

➤ **Coordinate agreed-upon strategies, activities, and plans** among forest landowners and managers to achieve desired future forest conditions.

Figure 1. Landscape regions. Solid lines represent administrative boundaries; shaded areas represent ecological boundaries. Although the regional borders follow county boundaries to facilitate coordination among units of government, they also correspond closely with the borders of ecological regions.

What plans were completed in 2003?

During 2003, regional committees completed plans for the Northeast, North Central, and Southeast regions. Each plan outlines desired future conditions of the region's forests and landscape-level goals, and then suggests multiple strategies for consideration by public and private land managers.

Figure 2. Northeast Landscape Region.

The Northeast Plan[11]

In the Northeast Plan (Figure 2), the regional committee envisions a forested landscape that includes the entire range of plant communities and conditions that naturally occurs in northeastern Minnesota.

To achieve this desired future vision, the plan urges managers to:

➤ Maintain habitats diverse enough to sustain viable populations of both plants and animals native to the area.

➤ Increase the abundance of white, red, and jack pine.

➤ Favor older stages of aspen-birch communities containing pine, spruce, and tamarack.

➤ Increase the age diversity within northern hardwood communities.

➤ Increase the proportion of older trees (100 years old and older).

The North Central Plan[12]

The North Central Regional Committee (Figure 3) recommends that the species composition, age class structures, and patch sizes of future forests more closely resemble the natural patterns and functions in the landscape.

The desired future forest will:

➤ Contain more red, white, and jack pine, cedar, tamarack, spruce, and fir than are currently present.

➤ Include large blocks of uninterrupted forest canopy and a minimum of other land uses.

➤ Maintain current amounts of forestland and timberland.

To work toward those desired future forest conditions, the regional committee recommends:

➤ Restoring historical amounts of white pine, tamarack, and cedar.

➤ Increasing the amount of red pine.

➤ Maintaining a substantial amount of aspen.

➤ Increasing the number of younger jack pine.

[11] The title of the plan is *Recommended Desired Outcomes, Goals, and Strategies: Northeast Landscape Region, March 2003.*

[12] The title of the plan is *Recommended Desired Outcomes, Goals, and Strategies: North Central Landscape Region, March 2003.*

[13] The title of the plan is *Recommended Vision, Goals, and Strategies: Southeast Landscape Region, June 2003.*

Figure 3. North Central Landscape Region.

Figure 4. Southeast Landscape Region.

The Southeast Plan[13]

The Southeast Plan (Figure 4) outlines two major goals:

➤ Over the next 5-10 years, restore 3% more forest than currently exists.

➤ Decrease fragmentation of forestlands.

The Southeast Regional Committee's desired future conditions include the following:

➤ A greater amount of forest will be in large blocks, connected via corridors to provide a variety of habitats for plants and animals.

➤ Riparian vegetation dominated by native species will surround lakes and streams.

➤ Development patterns that sustain forest resources and decrease fragmentation will be supported.

➤ Residents of the region will participate in forest management, environmental education, and natural areas-based recreation.

What additional plans are being finalized?

Plans for the Northern and West Central regions likely will be finalized in early 2004.

Figure 5. Northern Landscape Region.

The Northern Plan

The Northern Regional Committee (Figure 5) has developed several economic, social, and environmental goals to create the following vision for the Northern Landscape Region in the future.

The region will exhibit the following characteristics:

➤ A vibrant economy, based in large part on natural resources, will sustain communities that share a strong sense of place.

➤ Employment opportunities and rising incomes will promote a stable resident population.

➤ Greater forest productivity and harvest will allow economic development.

➤ Improved recreational access to public lands and waters will attract visitors and help diversify the local economy.

Due to difficult economic conditions in the Northern Region, the regional landscape committee is putting considerable emphasis on social and economic issues.

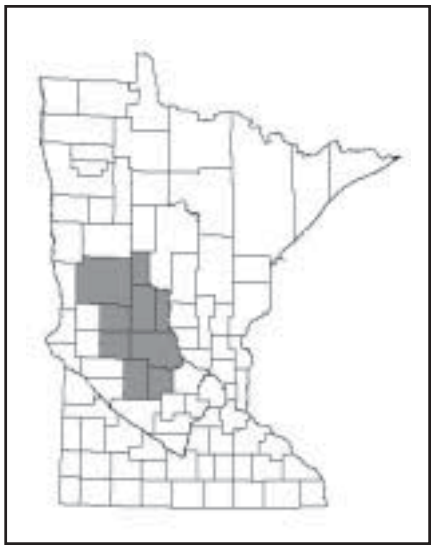


Figure 6. West Central Landscape Region.

The West Central Plan

The West Central Regional Committee (Figure 6) describes the future landscape as containing more large tracts of native forest and more habitat dominated by native grassland species.

In order to achieve this future vision:

➤ Riparian buffers and other management practices will reduce nonpoint source pollution, reduce flooding, and provide habitat.

➤ Businesses, education, and public policy will promote long-term stewardship of natural resources.

Because forestland in the West Central Region has decreased from 36% of the land base to 11%, this regional committee is recommending forest restoration on 75,000 acres.

How did the landscape program focus shift in 2003?

During the second half of 2003, the MFRC landscape program shifted its focus toward working with the MFRP and regional coordination committees to facilitate landscape coordination between existing regional landscape planning efforts of land managers, both public and private.[14] In the Northeast and Southeast regions, groups have been meeting and working on coordination and monitoring. The North Central, West Central, and Northern regions are developing coordination work plans (Figure 7).

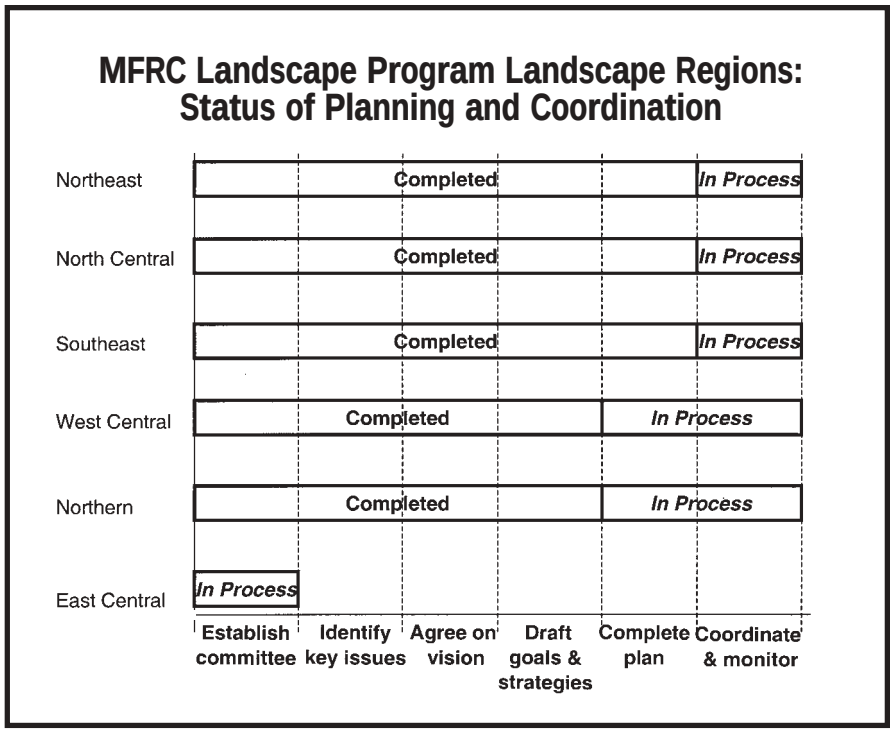


Figure 7. Status of planning and coordination in MFRC forested landscape regions.

How have outreach efforts improved the effectiveness of the landscape program?

Over the last year, increased public awareness of the landscape program contributed significantly to its effectiveness:

➤ A new brochure for private landowners was distributed widely at conferences and workshops. The brochure provides general information about the MFRC's landscape planning program.

➤ Fact sheets were developed to complement the brochure. The fact sheets provide summaries of activities specific to each geographic region. These fact sheets and the brochure are available on the MFRC website: www.frc.state.mn.us/Landscp/Landscape.html.

➤ In addition, the MFRC regularly shared assessment information, as well as other information and expertise, with the USDA Forest Service, the DNR, and county planning boards across the state.

➤ Public responses to our efforts indicate that regional planning has:

- **Made science-based information and tools more readily available** for assessing landscapes.
- **Fostered working relationships and improved communications** among people representing very diverse interests.
- **Provided viable strategies for use by organizations and individuals** willing to help attain region-wide goals.

➤ Perhaps most importantly, many land managers now understand the broader context within which they operate. They also understand that their individual decisions collectively determine the diversity and ecological health of Minnesota's forested landscapes.

What are the next steps for the landscape program?

In 2004, the landscape program will:

- **Focus on developing a landscape plan** for the East Central Region.
- **Increase public awareness of landscape goals and strategies,** especially among private forest landowners.
- **Facilitate the efforts of landowners and managers** to coordinate their activities.
- **Improve our ability to document progress** toward landscape goals via monitoring.

[14] Minnesota Statutes 89A.06, Subd. 5

Forest Spatial Analysis and Modeling Project

What are forest spatial patterns?

Spatial patterns refer to the size, shape, and arrangement of landscape patches. Patches may be any feature that can be mapped, such as:

➤ Forest types, habitats, and vegetation communities

➤ Landforms, soils, and aquatic systems

➤ Disturbances (natural or human-caused)

Why are forest spatial patterns important?

Forest spatial patterns are important for numerous forest values, including wildlife, forest productivity, and recreation. For example:

➤ Some species require large patches of forest, while others require smaller patches of several forest types in close proximity.

➤ Forest productivity depends on spatial patterns of soils and landforms, and costs associated with logging vary according to harvest size and arrangement on the landscape.

➤ Spatial patterns affect a whole range of recreational opportunities, such as hunting, bird watching, hiking, and off-road vehicle use.

What is spatial analysis?

Spatial analysis is simply mapping and measuring spatial patterns. Figure 8 depicts two habitats (320 acres each) arranged in five different ways. The number of patches, average patch size, and amount of edge vary dramatically from left to right, while habitat acreage of each type is constant.

Habitat A (light shading) Habitat B (dark shading)					
Number of patches (Habitat A)	1	4	6	6	12
Average patch size (Habitat A, in acres)	320	80	53	53	27
Total edge (in miles)	3.6	6.4	8.0	9.6	11.6

Figure 8. Example of potential variation in spatial patterns for two habitats, with values for several spatial measurements.

Why was a forest spatial analysis project needed?

Despite the importance of spatial patterns, they have not been assessed comprehensively in Minnesota, and a lack of information on spatial patterns has contributed to controversy.

The 1994 Generic Environmental Impact Statement on Timber Harvesting recommended that the State conduct a spatial assessment.

The MFRC's forest spatial analysis project was initiated in 2000 to improve understanding of past, present, and possible future forest spatial patterns. This project focused on spatial patterns of vegetation types and age-classes, land uses, and natural and human-caused disturbances.

What did the Spatial Analysis and Modeling Project focus on in 2003?

This project focused on three areas of study:

➤ How forest spatial patterns have changed over time

➤ How different management scenarios can affect spatial patterns

➤ How plants and animals are affected by spatial patterns

Now completed, this project developed tools, conducted analyses, and assessed the value and limitations of using spatial pattern data in forest management.

Each of these project components is described in this section. For additional information about this project, visit www.frc.state.mn.us/Spatial/SpatialIntro.html.

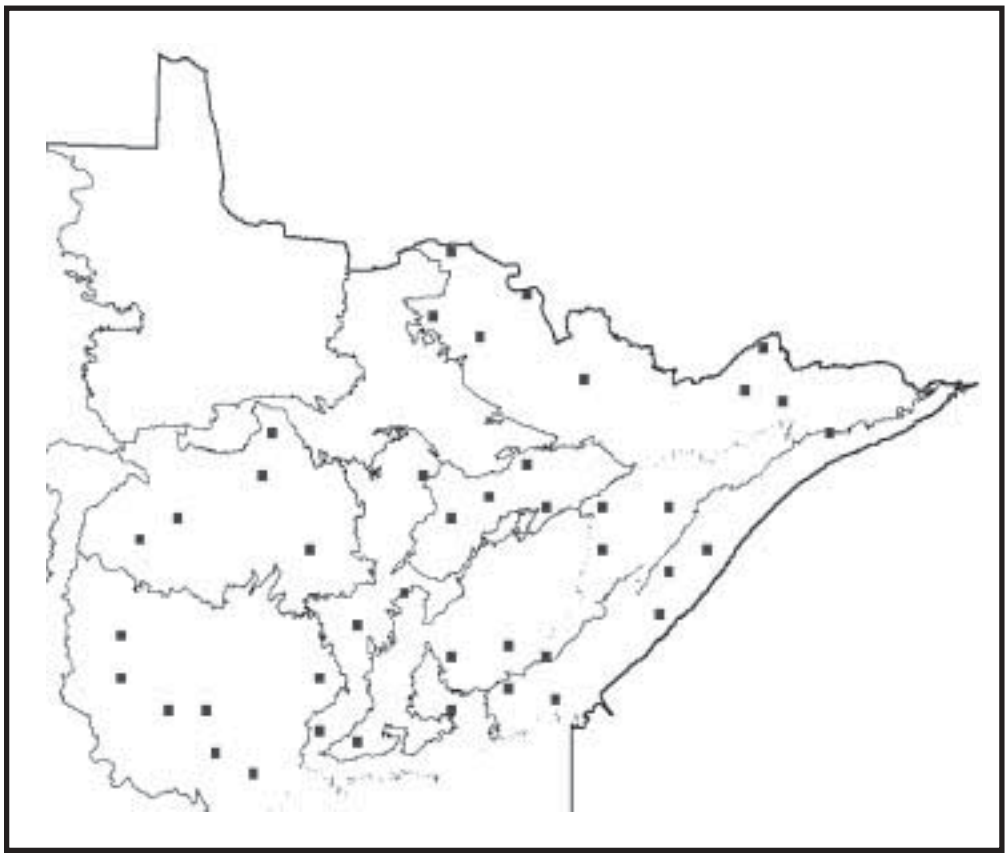
1. How spatial patterns have changed over time

What we did

The first component of this project assessed pre-settlement disturbance[15] characteristics on 42 sample blocks[16] (each 144 square miles) throughout the study area.[17]

More recent change (since 1910) was assessed using aerial photos of the sample blocks from three time periods: the 1930s, the 1970s, and the 1990s (Figure 9).

Figure 9. The study area included 42 sample blocks where disturbance was assessed.



[15] "Disturbance" refers to natural and human-caused events that bring changes in ecosystem and natural resources (such as wildfires or timber harvest).

[16] Pre-settlement information was compiled from surveyor line-notes from the 1847-1910 General Land Office survey.

[17] The study area included the Drift and Lake Plains and Northern Superior Uplands ecological sections in Minnesota.

What we learned

➤ **Rate of disturbance for fire and timber harvest over time:** In the study area, an increase in fire frequency until the 1930s was followed by a dramatic decrease by the 1990s. Timber harvest increased over the same time period, and is now the dominant disturbance type (Figure 10).

➤ **Disturbance patch size:** Prior to the 1930s, average natural disturbance patch sizes were considerably larger than those created by timber harvests from the 1930s to the 1990s (Figure 11). Since the 1930s, timber harvest patch size has decreased.

➤ **Vegetation/land use patch size:** The average overall patch size declined significantly from the 1930s to the 1990s (Figure 12).

In summary, these findings suggest that, over time, Minnesota's forests have been fragmented, resulting in smaller patch sizes and more "edge" habitat.

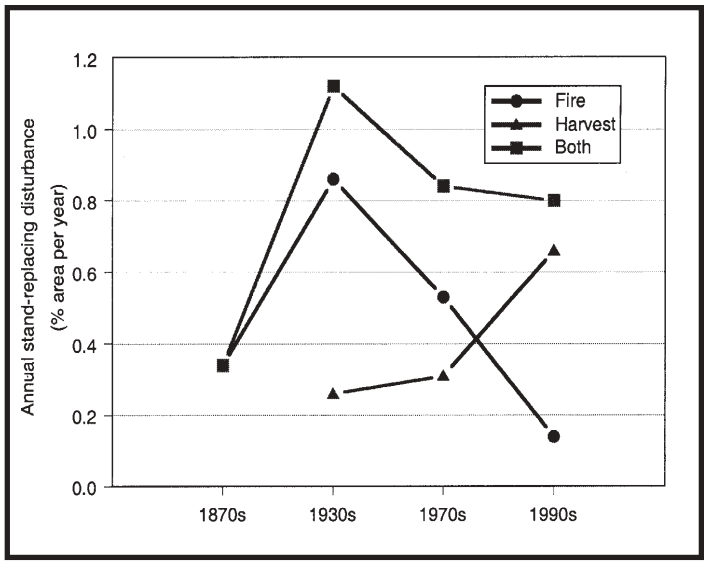


Figure 10. Estimated annual stand-replacing disturbance rate (percent of forest area) over four time periods. For reference, a 1% disturbance rate is equivalent to a 100-year timber harvest rotation.

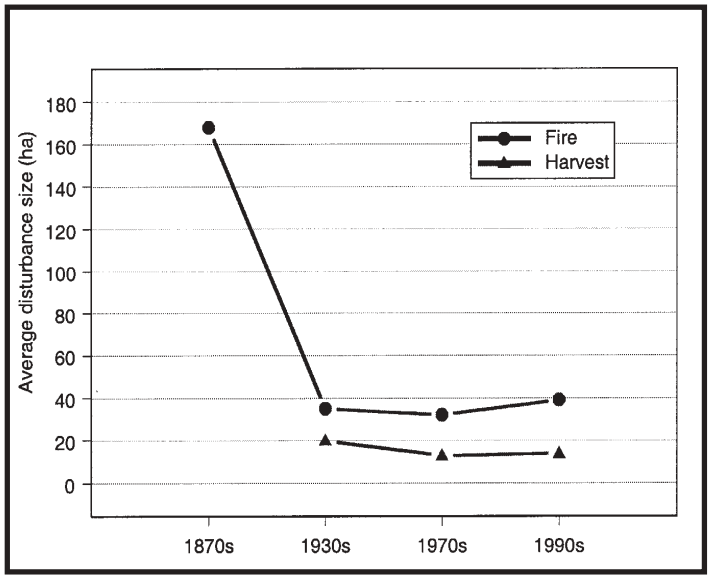


Figure 11. Estimated average disturbance patch sizes in hectares over four time periods.

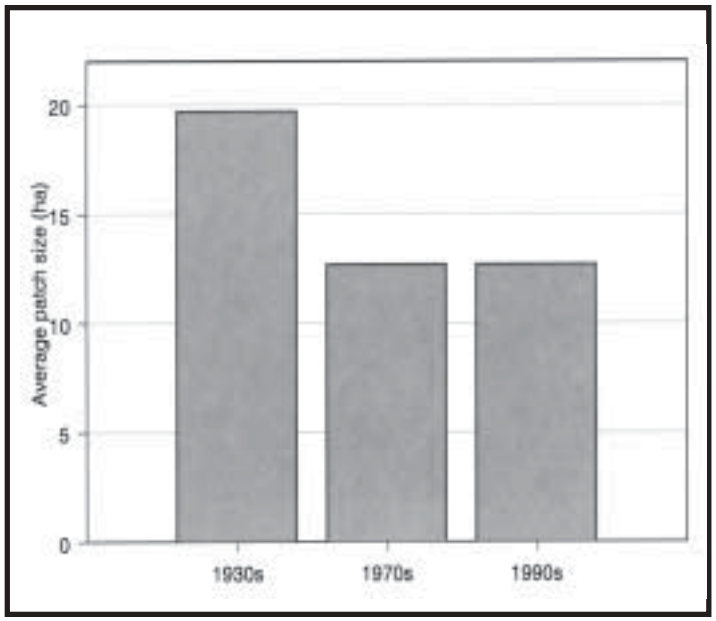


Figure 12. Change in average vegetation/land use patch size from the 1930s to the 1990s in the study area.

2. How different management scenarios can affect spatial patterns

What we did

The second project component used two models to examine potential changes in forest spatial patterns given different management scenarios. The study addressed such questions as:

➤ What are the effects of changing the size and type of harvest?

➤ What are the best strategies for maintaining large patches of forest?

➤ What are the economic costs of different spatial management strategies?

One model (LANDIS) examined ecological and management interactions at a large scale, and another model (DP-Space) examined the economic effects of different spatial and economic objectives, along with ecological concerns.

What we learned

➤ **Several strategies may be useful for restoring larger patch sizes.** These strategies include increasing harvest sizes, coordinating management across land ownerships, and clustering harvests in some areas more than in others.

➤ **In some landscapes, increasing patch size will be difficult,** because many small wetlands within the forest limit the opportunity to create large forest patches.

➤ **The timing of any strategy to increase patch size is critical.** For example, simply increasing harvest size may be detrimental to maintaining larger patches of older forest in the short term. Simple rules such as "harvest in large blocks" or "reserve large blocks" may preclude future options or lead to inefficiencies.

➤ **Combinations of different harvest sizes and management approaches over time** will likely be involved in effective and efficient strategies for meeting patch space and timber objectives. Models such as DP-Space can simultaneously evaluate short-term and long-term implications of different strategies.

Photo courtesy of U.S. Fish and Wildlife Service

The gray wolf is sensitive to the spatial pattern of roads. Wolves are generally most abundant in areas of low road density.

3. How plants and animals are affected by spatial patterns

What we did

For this third project component, a "primer" was created to describe the effects of spatial patterns on plant and animal species.[18]

The primer summarizes literature on 49 species of birds, mammals, amphibians, insects, vascular plants, and lichens. The primer illustrates concepts with examples, describes critical uncertainties, and develops a framework for further investigation.

What we learned

➤ **Spatial patterns are clearly important** for numerous species.

➤ **Some species prefer large patches,** while others prefer smaller patches of different types in close proximity.

➤ **Little is known about how most species respond to spatial patterns,** though research is growing rapidly.

➤ **In general, permanent habitat loss is a greater concern for species than spatial arrangement.** It appears that spatial patterns are most important when habitat is reduced to less than 20-30% of the pre-settlement amount.

➤ **Better tools and approaches are needed** for categorizing species for analysis, and for modeling approaches that link species to forest models.

[18] Formal title of the primer is *Background paper: Relationships between forest spatial patterns and plant and animal species in northern Minnesota, December 2003.*

What implications do these findings have for spatial pattern management?

The findings of the MFRC's Forest Spatial Analysis and Modeling Project show a substantial decline in forest patch size over the past 70 years.

This finding is significant because, once a smaller patch structure is in place, it is difficult—and it takes time—to restore large patches.

Management implications include the following:

➤ Important wildlife, recreational, and timber values (cost savings from larger harvests, for example) depend on larger patches.

➤ Larger patches of both young and older forest are under-represented today compared to past conditions.

➤ If a larger patch structure is desired, using simple rules such as "harvest in large patches" or "reserve large patches" can result in unintended consequences, such as loss of older large patches when they are in shortest supply or, conversely, unnecessary reduction in timber harvest levels.

➤ Maintaining adequate representation of large patches over time requires careful, long-term planning and depends on models that help determine the most efficient ways to meet a variety of management objectives.

➤ There are no "one-size-fits-all" solutions to spatial pattern management.

➤ It is important to tailor forest management plans to existing conditions. For example, utilize small patch management where the landscape is already finely divided, and utilize large patch management where large patches already exist or where there is the best potential for restoration.

There are no "one-size-fits-all" solutions to spatial pattern management. It is important to tailor forest management plans to existing conditions.

How will this important work continue?

A number of spatial analysis research projects will continue in Minnesota. These projects will build on and complement the work completed for the MFRC project.[19] These projects include:

➤ A two-year spatial modeling project that focuses on the Manitou Forest Landscape near Finland, Minnesota.

➤ The exploration of opportunities for increasing forest productivity by utilizing spatial analysis.

➤ Continued development and use of models to explore spatial management options in Minnesota landscapes.

➤ More detailed analysis of historical line-note and aerial photo data.

[19] These projects will be funded by The Nature Conservancy.

Guideline Review and Revision

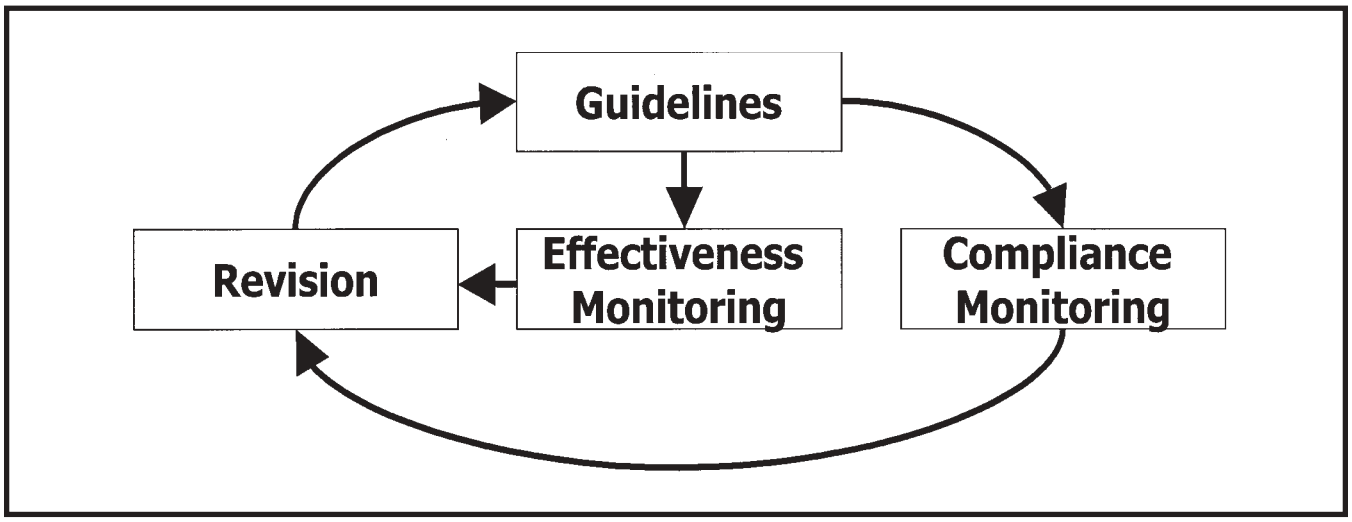


Figure 13. The MFRC's process of monitoring voluntary guidelines, which in turn prompts the need for revisions.

Why are the forest management guidelines being reviewed and revised?

The development of comprehensive timber harvesting and forest management guidelines in March 1999, titled *Sustaining Minnesota Forest Resources: Voluntary Site-Level Forest Management Guidelines*, was a core mandate in the Sustainable Forest Resources Act (SFRA) and a major MFRC accomplishment.

At that time, the Minnesota Legislature anticipated the need to periodically review and revise the voluntary guidelines,[20] based on learnings from compliance and effectiveness monitoring (Figure 13).

Photo by Chad Skally/Minnesota Forest Resources Council

MFRC members tour an area where site-level guidelines have been applied.

[20] Specifically, Minnesota Statutes, Chapter 89A.05, Subd. 1, states that "…By June 30, 2003, the council shall review the guidelines and identify potential revisions. If deemed necessary, the council shall update the guidelines by June 30, 2005…"

What is the timeline for the review and revision process?

The review and revision process began in September 2001 and is projected to be completed by June 2005. (See timeline at right.)

Steps in the guideline revision process	Completion date
Step 1: Approved proposed guideline revision language.	June 2003
Step 2: Conducted economic study that assesses which entities bear the cost of guideline application.	June 2003
Step 3: Conducted peer review of proposed guideline revisions.	December 2003
Step 4: Conduct public review of proposed guideline revisions.	June 2004 (projected)
Step 5: Modify guideline revision language based on all reviews.	Nov 2004 (projected)
Step 6: Publish revised guidebook.	June 2005 (projected)

What steps have occurred, and what happens next?

The first three steps were completed in 2003, within the time frames specified by the Legislature.

Step 1: The MFRC approved the set of proposed changes to the timber harvesting and forest management guidelines based on recommendations by the MFRC's Ad-hoc Committee on Guideline Revision.

Step 2: An economic study and follow-up survey of loggers were completed and the results published. (See Research section, page 20.)

Step 3: For peer review of proposed guideline revisions, the MFRC convened a group of 16 reviewers, including eight scientists with expertise in forest soils, wildlife biology, silviculture, aquatic ecology, and cultural resources; four economists; and four practitioners.

The proposed guideline revisions were modified based on the comments of peer reviewers, and the final package of guideline revisions was approved by the MFRC for public review.

Steps 4, 5, and 6: Public review of the guidelines is expected to occur in the first half of 2004, and publication of revised guidelines is expected to be completed on or before the statutory deadline of June 2005.

One area of the current guidelines will not be addressed in this revision process. Due to difficulty in gaining agreement on specific aspects of guidelines related to riparian management zones, a riparian scientific team will be convened in 2004 to review the state of current research in this area and identify potential changes in riparian management zone width and basal area guideline recommendations.

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MFRC-Sponsored Forest Resources Research

What are the goals of MFRC-sponsored research?

Research projects funded by the MFRC meet the research goals listed in the SFRA. In selecting projects for funding, the MFRC strives to:

➤ Support collaboration among organizations that conduct forest resources research.

➤ Link forest resources researchers of various disciplines.

➤ Maintain interaction and communication between researchers and practitioners in developing and using forest resources research.

What studies were completed or continued in 2003?

During 2003, two MFRC-funded studies were completed, and work continued on a third project, a multi-year study, that is partially funded by the MFRC.

Results from these studies are being used in combination with previous studies to review and revise the voluntary site-level timber harvesting and forest management guidelines.

Analyzing the Financial Impacts of Timber Harvesting and Forest Management Guidelines

During 2003, two MFRC-sponsored studies conducted by University of Minnesota researchers were completed.

➤ **The first study** determined the extent to which forest landowners incur costs and receive benefits from applying Minnesota's timber harvesting and forest management guidelines.[21]

The DNR, the St. Louis County Land Department, and various logging businesses were cooperators on this project. This is the first empirical study of this type ever done in Minnesota.[22]

➤ **The second study** involved surveying loggers who participated in the first study. The goal was to obtain greater insight into each firm's business characteristics, perceptions, and timber sale bidding behavior. [23]

The DNR and the St. Louis County Land Department offered 27 tracts of timber for sale through a sealed bidding process during fall 2002. Each tract was offered for sale both with and without the requirement to apply a specific set of guidelines.

A total of 80 paired bids were received from 36 logging businesses, resulting in the sale of timber on 23 study tracts. When guidelines were required as part of the timber sale specifications, the bids averaged 10 percent ($2.66/cord[24]) lower than bids on the same tracts when guidelines were not specified.[25]

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[21] The report is titled *An Assessment of the Extent to Which Forest Landowners Bear Additional Cost Resulting from Implementation of Minnesota Timber Harvesting Guidelines, May 2003.*

[22] "Empirical" refers to research that originates in or is based on observation or experience.

[23] The report is titled *Willingness To Pay for Stumpage Requiring Timber Harvesting Guidelines: An Evaluation of Bidder Characteristics, Strategies, and Perceptions, June 2003.*

[24] A cord of wood is approximately four feet high, four feet long, and eight feet wide.

[25] It is important to realize that these results may or may not be representative of guideline implementation practices throughout Minnesota.

Observations

➤ Guideline benefits produced on public forests may easily justify their cost, as these lands are managed for the production of both market and nonmarket goods and services.

On private lands, however, financial support in the form of incentives and/or compensation and education may be needed if landowners are to be expected to routinely apply the guidelines on a voluntary basis.

➤ Because of time and budget constraints, the actual costs borne by a timber harvester to apply Minnesota's timber harvesting guidelines were not assessed as part of this study. Previous research suggests, however, that these costs could be substantial.

Looking ahead

➤ New metering and sampling technology is now available that would allow researchers to collect data on per-unit productivity over a broad range of factors, such as site conditions, operators, and season of harvest.

Employing this technology would enable an assessment of the impact Minnesota's guidelines have on timber harvesting productivity and associated operating costs.

➤ In 2004, the MFRC hopes to cosponsor such a study in order to identify potential policy and legislative initiatives to address guideline implementation costs for landowners and/or loggers.

Evaluating the Sustainability of Timber Harvesting and Forest Management Practices in Riparian Areas

Because this research supports the goal of understanding the effectiveness of applying voluntary forest management and timber harvesting guidelines, this study is described in the Effectiveness Monitoring section of this report (see page 23).

Guideline benefits produced on public forests may easily justify their cost, as these lands are managed for the production of both market and nonmarket goods and services.

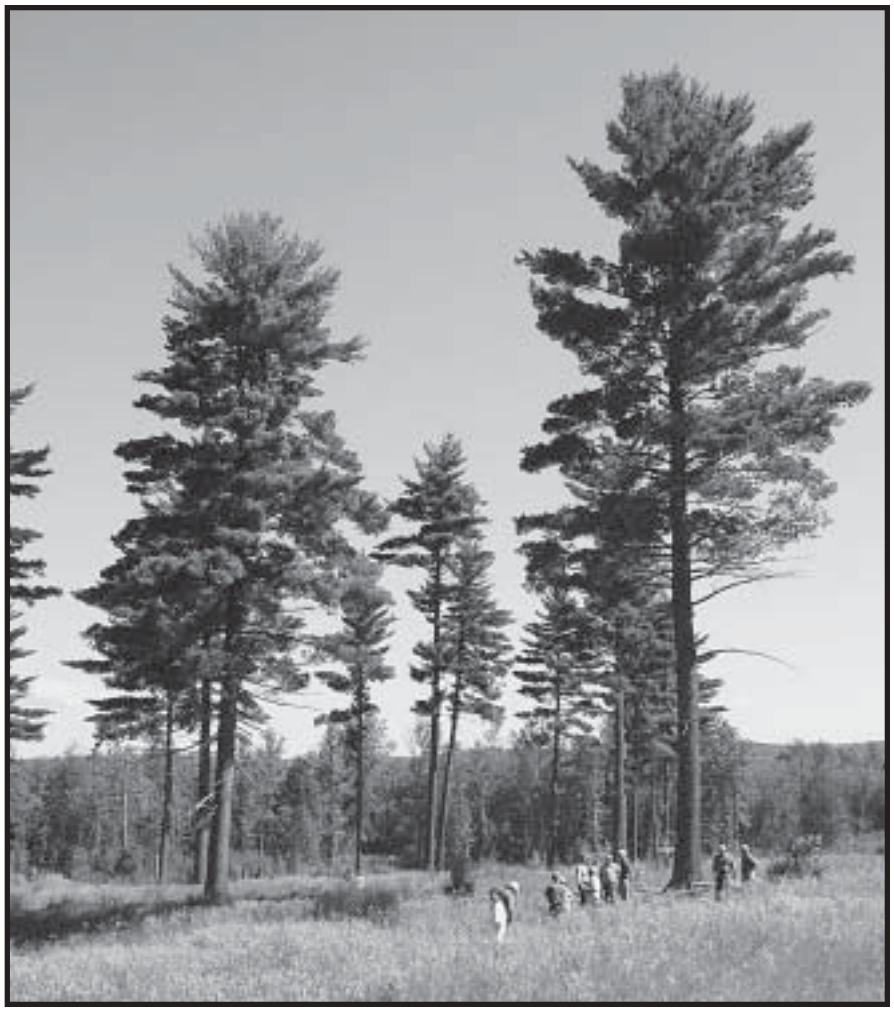

Photo by Chad Skally/Minnesota Forest Resources Council

Mature white pine is retained during some timber harvests to provide a seed source, as well as to provide aesthetic and wildlife benefits.

Monitoring

Why are monitoring efforts necessary?

The SFRA obligates the DNR, in consultation with the MFRC, to undertake efforts in four broad areas of monitoring:

➤ Monitor the **use** of timber harvesting and forest management guidelines on public and private forest lands. This initiative is called **compliance monitoring.**

➤ Evaluate the **effectiveness** of the timber harvesting and forest management guidelines to protect specific resource functions. This initiative is called **effectiveness monitoring.**

➤ Accelerate monitoring of the use and effectiveness of timber harvesting and forest management guidelines in protecting **riparian management zones.** This initiative is called **riparian monitoring.**

➤ Monitor broad trends and conditions in the state's forest resources at the statewide, landscape, and site levels. This initiative is called **future resource monitoring.**

What was done in the area of compliance monitoring in 2003?

Compliance monitoring is the process of identifying and recording the combination of guidelines applied to specific sites where timber harvesting or other forest management activity occurred. The DNR's monitoring program in Minnesota is based on the guidelines contained in *Sustaining Minnesota's Forest Resources: Voluntary Site-Level Forest Management Guidelines.*

The field component of compliance monitoring was deferred in 2003, in part because of resource and funding limitations. This field monitoring hiatus provided the MFRC with the opportunity to accomplish the following, in preparation for resumption of field monitoring in 2004:

➤ **Evaluate current and alternative site selection methodologies** for compliance monitoring.

➤ **Review alternative approaches** for conducting future field compliance monitoring.

➤ **Complete a comprehensive analysis of the first three years** of compliance monitoring data (2000-2002) to establish a statewide baseline for timber harvesting and forest management guideline use. A three-year baseline report will be prepared for the Legislature prior to the 2004 legislative session.

➤ **Establish a program to evaluate forestland use change.** (See Land Use Change Monitoring section, page 25.)

How will compliance monitoring be different in 2004?

➤ Field evaluation sites will be reduced from 120 to 90. Statistical tests indicated that fewer than 120 sites (the target number of sites for previous audits) were needed to define trends in guideline application.

➤ Site selection will employ the use of satellite imagery in combination with aerial photography, the same methodology used for site selection for 2002.

➤ Compliance monitoring will be conducted by third-party auditors who have expertise in hydrology, soil science, and forest management.

What kinds of effectiveness monitoring occurred in 2003?

The MFRC has sponsored or supported three ongoing research projects that directly relate to monitoring effectiveness of the timber harvesting and forest management guidelines in protecting specific forest resources. These three projects focused on:

➤ Assessing the effectiveness of riparian guidelines

➤ Assessing and minimizing wind damage to leave trees

➤ Assessing the impact of skid trails on soil compaction and regeneration

These three research studies and future efforts are critical to the MFRC to ensure that decisions on guideline development and revision are based on sound science.

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Minnesota Forest Resources Council photo

Riparian areas (areas that form a transition from aquatic to terrestrial ecosystems) are among the most important and diverse parts of forest ecosystems. MFRC's voluntary guidelines recommend riparian management zones to minimize potential adverse impacts from timber harvesting.

1. Assessing the effectiveness of riparian guidelines

At the MFRC's request, a proposal was submitted to the Legislative Commission on Minnesota Resources in 2000 by the University of Minnesota. The proposal sought to evaluate how well the MFRC's voluntary guidelines protect forest resources in northern Minnesota riparian areas.

The 2001 Legislature appropriated $200,000 in the 2002-03 biennium for the project, titled *Evaluating the Sustainability of Timber Harvesting and Forest Management Practices in Riparian Areas*. These funds are available until June 30, 2004.

During 2003, researchers identified eight pairs of northern Minnesota sites. Each pair of sites included 1) a riparian control site with an upland clearcut and no harvesting within the riparian management zone, and 2) a site where varying amounts of trees are harvested and retained within the riparian management zone.

The study is well under way but will not be complete until 2004-2005. Pre-harvest sampling for the research plots has been completed and graduate students have been hired to assist in data collection.

Harvest of sites will occur during the 2003-2004 winter season. Compliance monitoring of all sites will occur after harvesting is completed.

Limited funding is currently available to monitor post-harvest impacts. The MFRC will be working actively with University of Minnesota researchers and other partners to obtain adequate funds to monitor these impacts in coming years, as these data will provide important insights into the effectiveness of Minnesota's guidelines in protecting riparian areas.

When the analyses are completed in 2004, the results will provide valuable information for use in either revising the leave tree recommendations or reinforcing existing recommendations.

2. Assessing and minimizing wind damage to leave trees

This study is a follow-up to riparian research funded in 1999 by the MFRC, which focused on the fate of leave trees following harvest.

The data from this research describe the species and size classes of riparian leave trees that were subject to wind damage in the three years following clearcuts in adjacent uplands and thinning in the riparian areas.

Additional analyses of these field data are under way by MFRC staff to identify the type of harvest practices and the characteristics of individual trees that minimize subsequent wind damage.

When the analyses are completed in 2004, the results will provide valuable information for use in either revising the leave tree recommendations or reinforcing existing recommendations.

3. Assessing the impact of skid trails on soil compaction

Additional analysis is under way as part of a multi-year study of soil compaction that began in 1999. This MFRC-funded study has progressed as follows:

➤ **1999:** Pre-harvest data collected

➤ **2000:** Timber harvested

➤ **2000 and 2003:** Post-harvest data collected

➤ **2004:** Report findings and recommendations

The objectives of this study are to identify the following:

➤ The extent and pattern of soil compaction on and adjacent to skid trails by number of passes

➤ Regeneration response to soil compaction on and adjacent to skid trails

Findings from this study will be used to support the retention or modification of: 1) existing timber harvesting and forest management guidelines related to establishing designated skid trails, and 2) the percentage of the harvest site that should be allocated to primary and secondary skid trails.

Minnesota Forest Resources Council photo

Retaining leave trees (live trees left after timber harvest) in clumps reduces their susceptibility to wind damage.

Why is riparian monitoring being discontinued?

The SFRA calls for better monitoring of Minnesota's riparian forests.[26] After two years of accelerated monitoring in riparian areas, results suggest that a very small portion of the state's riparian forests is affected by timber harvest. About 0.4% of riparian forests are harvested annually.

Given that timber harvesting in riparian areas is not widespread and that its impacts likely are small relative to other influences (see Land Use Change Monitoring section below), the DNR has decided that accelerated monitoring of riparian timber harvest monitoring will be discontinued.

How is land use change being monitored in 2003?

The DNR and the MFRC believe that land use decisions that result in the loss of productive forestland may have more significant and more enduring effects than timber harvesting in riparian areas.

Beginning in 2003, the DNR's Resource Assessment Unit began focusing its monitoring efforts on forestland use changes, using change detection methods and satellite imagery similar to those used in riparian monitoring.

In particular, the MFRC is interested in documenting:

➤ Regional losses of forestland

➤ How spatial configurations of forestland vary across the state

There is continuing pressure to convert forestland to other land uses, such as agriculture and development. *Photo courtesy of University of Minnesota Agricultural Experiment Station*

After two years of accelerated monitoring, results suggest that a very small portion of the state's riparian forests is affected by timber harvest, with about 0.4% of riparian forests harvested annually.

In the first year of analysis, the DNR's Resource Assessment Unit will estimate the acreages that changed from:

➤ Forest to harvested forest (including an estimate for riparian forest harvest)

➤ Forest to urban development

➤ Forest to water (from flooding, for example, or from the impact of beaver dams on hydrology)

➤ Forest to agriculture

A report on these forestland conversion trends will be issued by June 2004.

[26] Specifically, Minnesota Statutes, Chapter 89A.05, Subd. 4, states: "Monitoring riparian forests. The commissioner, with program advice from the MFRC, shall accelerate monitoring the extent and condition of riparian forest, the extent to which harvesting occurs within riparian management zones and seasonal ponds, and the use and effectiveness of timber harvesting and forest management guidelines applied in riparian management zones and seasonal ponds."

Citizens Concern Monitoring

What is the Public Concerns Registration Process?

The Public Concerns Registration Process (PCRP) was set up in 1998 to accept "comments from the public on negligent timber harvesting and forest management practices."[27]

The PCRP provides a way for citizens to inform landowners, foresters, and loggers of specific concerns about timber harvesting and forest management practices that they see in Minnesota. Since its inception in 1998, the PCRP has received a total of 18 concerns.

Although it is not a regulatory or punitive program to stop timber harvests or resolve disputes over contractual issues or forest management activities, the PCRP does encourage sustainable management of Minnesota's forests by emphasizing education of those involved.

Who benefits?

➤ **Citizens benefit** because the PCRP allows citizens to:

- Formally advise the MFRC of their concerns about forest management activities they see.
- Be a catalyst for mitigation of any problems on a site.
- Learn more about forest management and sustainable forestry.

➤ **Landowners, loggers, and foresters benefit** by becoming more aware of public concerns regarding forest management, and by learning more about guidelines for sustainable forest management.

➤ **The MFRC benefits** from receiving summaries of concerns registered through the PCRP. These summaries help the MFRC understand citizens' expectations for how Minnesota's forests should be managed.

The MFRC can use these insights to decide which, if any, additional guidelines are needed and to identify continuing education programs needed for forest managers, forest owners, loggers, and citizens.

What two citizen concerns did the MFRC investigate in 2003?

In 2003, two complainants filed concerns that were investigated by the PCRP program. The concerns dealt with 1) harvesting of old-growth cedar, and 2) rutting near a riparian area due to a recent timber harvest. A third concern, sent to the MFRC in late December, will be investigated in early 2004.

In both cases that were investigated, the landowner and logger were contacted and given educational material relatingto forest management, including specifics on protecting waterbodies and the impacts of rutting. One of the complainants initiated contact with local newspapers, which resulted in media coverage of the old-growth harvest issue.

The registered concerns through the PCRP provide an opportunity to improve participant knowledge on forest management and communicate ways to mitigate the impacts on the sites involved.

[27] Minnesota Statutes 89A.07, Subd. 5

Education

What is the Minnesota Logger Education Program?

Loggers created the Minnesota Logger Education Program (MLEP) in response to the SFRA. The goal of MLEP was to promote high operational standards and assist loggers in meeting the ever-challenging demands of their profession through training in the areas of sustainable forest resource management, workplace safety, and business management. (For more information, visit www.mlep.org.)

In 2003, MLEP achieved a membership of 577 logging business owners and associates. Independent research has determined that **MLEP's membership currently represents more than 85% of Minnesota's annual timber harvesting activities.**

Minnesota Logger Education Program membership represents more than 85% of Minnesota's annual timber harvesting activities.

What is the Center for Continuing Education?

The Center for Continuing Education in the University of Minnesota College of Natural Resources (CNR-CCE) was established in response to the SFRA to provide innovative education programs for natural resource professionals by providing training on current research findings, new technologies, and state-of-the-art practices. (For more information, visit www.cnr.umn.edu/CCE.)

The CNR-CCE continues to be an active partner in promoting excellence in natural resource management. The Center offers a broad range of technical and professional education programs for practicing natural resource managers in all sectors of the forestry profession.

The Center has been a co-leader in the planning and implementation of guideline education programs. Nearly 800 participants attended CNR-CCE workshops during 2003.

The CNR-CCE continues to be an active partner in promoting excellence in natural resource management. Nearly 800 participants attended CNR-CCE workshops during 2003.

What continuing education did loggers receive in 2003?

An important training program was conducted cooperatively by MLEP and CNR-CCE for loggers and resource managers. Forest management guideline monitoring results from 2000 and 2001 directed the areas of focus for this training.

Two workshops were held in the spring of 2003, attracting 75 participants, including 68 loggers and seven resource managers:

➤ The first, titled *Minnesota's Forest Management Guidelines*, provided participants with an overview of the guidelines, focusing on cultural resources, forest soils, riparian areas, and wildlife habitat.

➤ The second, titled *Protecting Site Quality: Forest Management and Timber Harvesting*, emphasized increasing the application of those water and soil quality protection practices identified through guideline monitoring as having the lowest rates of implementation.

Primary participants assisting in the development of these continuing education activities include: MLEP, University of Minnesota, DNR, USDA Forest Service, county land departments, Minnesota Forestry Association, and the primary forest products industry.

What continuing education did natural resource professionals receive in 2003?

As in previous years, educational programming for natural resource professionals in 2003 addressed a wide variety of topics, including forest management guidelines, economics, land classification, new research findings, and new technologies:

➤ Guidelines training included a continuation of both introductory and field sessions for the forest management guidelines, as well as developing the curriculum and instructor training for the new workshops on protecting soil and water quality.

➤ In January 2003, CNR-CCE held the second iteration of the popular and successful symposium titled *Forest and Wildlife Research Review.*

The 2003 symposium was held at the University of Minnesota Duluth campus to accommodate more than 200 participants.

The MFRC continues to be a financial sponsor of this symposium. In January 2004, the third iteration will include research presentations on wildlife, spatial analysis, economics, silviculture, policy and management, and forest watersheds.

➤ **CNR-CCE also coordinated 12 workshops and conferences** during 2003.

➤ **In addition to workshops and conferences,** CNR-CCE continues to manage a database that tracks continuing education credits for the Minnesota Forest Stewardship Program.

Plan preparers are required to complete 60 units of continuing education every three years to remain eligible to write plans for private woodland owners.

This new requirement is the first official qualification program for foresters in Minnesota and is receiving high participation due to the criteria established for participation in the recently passed Sustainable Forestry Incentive Act.[28]

[28] Minnesota Statutes, Chapter 290C

Forest Information

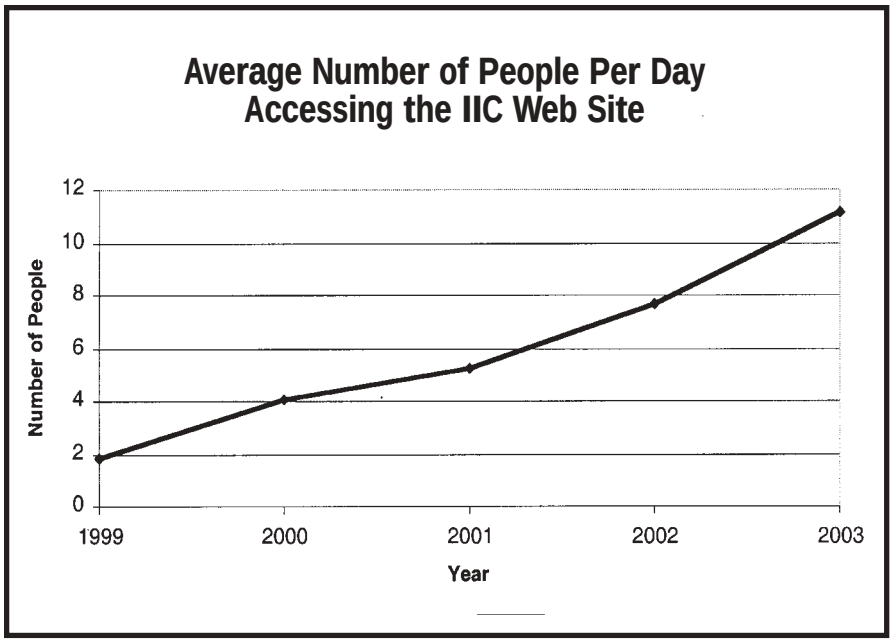

Figure 14. Average number of people per day accessing the Interagency Information Cooperative website.

How is information shared among forest resource agencies?

The Interagency Information Cooperative is part of the SFRA and was established to increase information-sharing among forest resource agencies. The website that was established in 1998 continues to provide information about forest resources to increasing numbers of people (Figure 14).

There has been no funding for the Interagency Information Cooperative over the last four years.

A proposal to amend the SFRA by transferring statutory responsibility for this cooperative from the commissioner of the DNR to the dean of the University of Minnesota College of Natural Resources is likely to be introduced during the 2004 legislative session.

The University of Minnesota is better suited than the DNR to carry out the statutory mandates related to this program, as well as to seek non-state funding for its efforts.

What important information gap did the MFRC address in 2003?

In 2003, the MFRC's Information Management Committee determined that the most important information gap is the lack of a good estimate of statewide harvest by acres. Harvest levels are commonly reported on a volume basis rather than by acres affected.

The MFRC surveyed public landowners and land managers (USDA Forest Service, the DNR, 15 forested counties, and six Indian bands) to obtain estimates of the extent of acres harvested.

The results showed that about one percent of the approximately eight million acres owned by public landowners in Minnesota were sold for harvest in 2001.

Similar data are not available for harvests on private lands because of the difficulty of collecting information from more than 140,000 private woodland owners. By continuing to conduct the survey annually with public landowners, the MFRC can better understand timber harvest trends and impacts. The final report is available on the MFRC website.[29]

[29] The report is titled *Minnesota's Publicly Owned Forestlands: Request for Information on Acres of Timber Sold in 2001 (December 2003).*

Outreach

The MFRC and SFRA programs all require the participation of individuals interested in forest resources in Minnesota.

How is information about MFRC and its activities made available to the public?

➤ The MFRC regularly posts new reports and information on its website, www.frc.state.mn.us.

➤ Information about the MFRC periodically appears in the press. Recent articles and citations include coverage of MFRC's landscape planning program, discussion of MFRC-sponsored research efforts, and announcements of new MFRC members.

How is the public encouraged to participate in forest resources programs?

The MFRC and SFRA programs all require the participation of individuals interested in forest resources in Minnesota. There are many ways for interested individuals to become involved:

➤ **Attend MFRC meetings.** Scheduled MFRC meetings are posted on MFRC's website at www.frc.state.mn.us/Info/calendar.htm, or call 651-603-0109 for meeting dates.

➤ **Participate in landscape regional committees.** Contact Dave Miller for more information at 218-720-4256 or dmiller@nrri.umn.edu

➤ **Use the Timber Harvesting/ Forest Management Guidelines.** They are available on MFRC's website at www.frc.state.mn.us/FMgdline/Guidebook.html, or contact the MFRC at 651-603-0109 for a paper copy.

➤ **Notify the MFRC of specific timber harvesting or forest management activities that concern you.** Call toll-free 1-888-234-3702, or register your concern online at www.frc.state.mn.us.

➤ **Attend forest resources educational programs.** Additional information can be obtained from:

• CNR-CCE by calling 612-624-1234 or visiting the CNR-CCE website at www.cnr.umn.edu/CCE.

• MLEP by calling 218-722-5442 or visiting the MLEP website at www.mlep.org.

➤ **Access data regarding Minnesota's forest resources** from the Interagency Information Cooperative at www.iic.state.mn.us.

MFRC Documents Produced in 2003

All MFRC documents are available on the Internet at www.frc.state.mn.us/Info/MFRCdocs.html.

MFRC Annual Report

Sustainable Forest Resources Act Implementation in 2002: Minnesota Forest Resources Council Annual Report to the Governor and Legislature, January 2003

Landscape Program

Recommended Desired Outcomes, Goals, and Strategies: Northeast Landscape Region, March 2003

Recommended Desired Outcomes, Goals, and Strategies: North Central Landscape Region, March 2003

Recommended Vision, Goals, and Strategies: Southeast Landscape Region, June 2003

Monitoring Program

Harvest of Riparian Forests in Minnesota: A Report to the Legislature, March 2003

Forest Spatial Analysis and Modeling Project

Contemporary forest composition and spatial patterns of north central and northeastern Minnesota: An assessment using 1990s LANDSAT data, December 2003. Prepared by George E. Host and Mark A. White.

Changes in disturbance frequency, age, and patch structure from pre-European settlement to the present in north central and northeastern Minnesota, December 2003. Prepared by Mark A. White and George E. Host.

Changes in forest spatial patterns from the 1930s to the present in north central and northeastern Minnesota: An analysis of historic and recent air photos, December 2003. Prepared by George E. Host and Mark A. White.

Potential future landscape change on the Nashwauk Uplands in northeastern Minnesota: An examination of alternative management scenarios using LANDIS, December 2003. Prepared by Smita Mehta, Lee E. Frelich, and Malcolm T. Jones.

Scheduling old forest interior space and timber production: Three large-scale test cases using the DP space model to integrate economic and ecological objectives, December 2003. Prepared by Howard M. Hoganson, Josh Bixby, and Susan Bergman.

Background paper: Relationships between forest spatial patterns and plant and animal species in northern Minnesota, December 2003. Prepared by Cynthia P. Lane, Carolyn Carr, and Ethan Perry.

Project summary: Results from the Minnesota forest spatial analysis and modeling project, December 2003

Research

An Assessment of the Extent to Which Forest Landowners Bear Additional Cost Resulting from Implementation of Minnesota's Timber Harvesting Guidelines, May 2003. Prepared by Michael A. Kilgore and Charles R. Blinn.

Willingness To Pay for Stumpage Requiring Timber Harvesting Guidelines: An Evaluation of Bidder Characteristics, Strategies, and Perceptions, June 2003. Prepared by Michael A. Kilgore and Charles R. Blinn.

Minnesota's Publicly Owned Forestlands: Request for Information on Acres of Timber Sold in 2001, A Report from the Information Management Committee of the Minnesota Forest Resources Council, December 2003

Additional Resources

All MFRC documents: www.frc.state.mn.us/Info/MFRCdocs.html
Center for Continuing Education, College of Natural Resources, University of Minnesota: www.cnr.umn.edu/CCE
Concerns regarding timber harvesting or forest management activities: www.frc.state.mn.us/monitor/PCRP.htm
Data regarding Minnesota's forest resources from the Interagency Information Cooperative: www.iic.state.mn.us
Information about forest resources educational programs: www.cnr.umn.edu/CCE *and* www.mlep.org
Landscape program brochure and fact sheets: www.frc.state.mn.us/Landscp/Landscape.html
MFRC meeting schedule: www.frc.state.mn.us/Info/calendar.htm
Minnesota Forest Resources Partnership: Contact Jan Hacker, Executive Director, at resanalytics@msn.com
Minnesota Logger Education Program: www.mlep.org
Participation in landscape regional committees: Contact Dave Miller at dmiller@nrri.umn.edu
Spatial Analysis and Modeling Project: www.frc.state.mn.us/Spatial/SpatialIntro.html, or contact Jim Manolis at jim.manolis@dnr.state.mn.us
Timber Harvesting/Forest Management Guidelines: www.frc.state.mn.us/FMgdline/Guidebook.html
Vital Forest/Vital Communities Initiative: www.blandinfoundation.org/strategy/strat_public_vitalfor.html

Acronyms

CNR-CCE	Center for Continuing Education, University of Minnesota College of Natural Resources
DNR	Department of Natural Resources
MLEP	Minnesota Logger Education Program
MFRC	Minnesota Forest Resources Council
MFRP	Minnesota Forest Resources Partnership
PCRP	Public Concerns Registration Process
SFRA	Sustainable Forest Resources Act

Minnesota Forest Resources Council 2003 Annual Report to the Governor and Legislature on the Implementation of the Sustainable Forest Resources Act

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