



Sustainable Forest Resources Act Implementation in 2000

**Minnesota Forest Resources Council
Annual Report to the Governor
and Legislature**



A Vision for Minnesota's Forest Resources

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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Minnesota Forest Resources Council Annual Report to the Governor and Legislature

**Respectfully submitted by the
Minnesota Forest Resources Council**

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Message from the Chair

We are pleased to submit the 2000 report of the Minnesota Forest Resources Council (MFRC). This report highlights the work and accomplishments of the MFRC and its many partners during 2000 to implement the Sustainable Forest Resources Act (SFRA, M.S. 89A). Notable accomplishments of the MFRC in 2000 include:

- ***We conducted a science-based review of Minnesota's guidelines for managing riparian forests and seasonal ponds.***

The 1999 Minnesota Legislature directed the MFRC to conduct a science-based peer review of its recently developed timber harvesting and forest management guidelines for protecting forest riparian areas and seasonal ponds. In response, the MFRC commissioned a panel of eight scientists representing expertise in hydrology/soil science, terrestrial ecology, silviculture, and aquatic ecology.

The panel provided input to the MFRC in two forms: 1) formal written reviews prepared by scientists in each of the four disciplines; and 2) collective responses from the eight scientists to various scientific aspects of riparian forest ecology, management, and protection. In response to the input, the MFRC developed a plan for

education, research, and monitoring of riparian forests. Examples of the MFRC's recommended actions include incorporating input from the peer review into training for loggers, natural resource managers, and private forest landowners; integrating peer review findings into planning processes used by the state's public forest management agencies; monitoring the extent of timber harvesting in riparian areas; and encouraging additional research on the effects of various timber harvesting methods on forested riparian areas and seasonal ponds.

- ***We completed the first field-based evaluation of timber harvesting and forest management practices.***

In December 1998, the MFRC completed the preparation of voluntary timber harvesting and forest management guidelines and published them as a guidebook, *Sustaining Minnesota's Forest Resources: Voluntary Site-Level Forest Management Guidelines*. The guidebook provides advice for conducting timber harvesting and forest management in a way that considers riparian areas, wildlife habitat, soil productivity, water quality, wetlands, visual quality, and historical and cultural resources.

In fall 1999, the MFRC developed a process to assess how the guidelines

are being implemented through field reviews of randomly selected harvest sites. The first field reviews, which examined 108 recently harvested sites across Minnesota, were conducted by the Minnesota Department of Natural Resources (DNR) during 2000. Information from the field reviews will be reported to the MFRC in January 2001, and will provide a baseline against which to measure changes in land management harvesting practices resulting from the use of the guidelines over time. The DNR and the MFRC have begun work on a second field review, to be carried out in 2001.

- ***We developed our landscape planning and coordination program.***

The MFRC's landscape planning and coordination program continues to develop. Major program accomplishments during 2000 include:

- ***Completing regional assessments in the north-central and southeast landscape regions.*** Ecological, economic, and social assessments of forest resources in the north-central and southeast landscape regions have been prepared within the time lines established in the SFRA.
- ***Identifying desired future outcomes, key issues, and strategies in the***





northeast landscape region. The northeast regional forest resource committee identified a desired future condition, key issues, and strategies for sustaining the forest resources of northeastern Minnesota within the time lines established in the SFRA.

- *Establishing a regional committee in the north-central landscape region.* Approximately 50 individuals, representing a range of interests, are participating in the north-central regional forest resource committee to develop desired future conditions for that landscape, identify key forest resource issues, and develop strategies for sustaining the forest resources of north-central Minnesota.
- *Integrating forest road information in northeastern Minnesota.* Inventories of forest roads developed and maintained by public and private organizations in northeastern Minnesota have been integrated into a single geographic information systems (GIS) layer to aid in coordination of forest planning and management.
- *Integrating forest inventories in northeastern Minnesota.* Forest inventories maintained by public

and private organizations in northeastern Minnesota have been integrated into a single GIS layer to aid in coordination of forest planning and management.

- *We initiated a project to develop better tools for assessing changes to forest landscapes.*

The MFRC, in partnership with The Nature Conservancy (TNC), DNR, Minnesota Forest Industries, Minnesota Audubon Council, and others, is developing tools to improve understanding of historical landscape patterns and possible future forest conditions under different forest management scenarios. This spatial analysis project aims to provide forest managers better information with which to make management decisions. The project will assess how past management has affected the abundance and distribution of forest cover across the landscape. It will also give forest planners and managers tools for evaluating the consequences of alternative decisions on the extent and spatial patterns of forest vegetation, and for assessing how those patterns affect biological diversity and habitat availability. The plan is to have these assessments complete and tools available in late 2001.

- *We identified changes needed in forest tax policy to encourage long-term sustainable management of privately owned forests.*

As directed by the 2000 Legislature, the MFRC examined the state's tax policies applied to forest land to identify opportunities for encouraging non-industrial private forest landowners to sustainably manage their forests. The MFRC looked at ways to use tax policy to encourage forest productivity, maintain land in forest cover, and encourage sustainable site-level forest management practices. Currently, only a modest number of private landowners are enrolled in tax programs designed to encourage sustainable forest management. Further, the effectiveness of these programs has greatly diminished in recent years as the tax incentives have decreased.

To encourage the state's 130,000 private nonindustrial forest landowners (who collectively own 6 million acres of forest land) to adopt and implement forest management plans and adhere to the forest management guidelines, the MFRC recommended a new sustainable forest tax law be established. In return for favorable tax treatment, landowners would make a long-term commitment to keeping the land in forest cover, obtain and use a forest management plan, and use the

MFRC's guidelines in conducting timber harvesting and forest management. The MFRC's recommendations were transmitted to the Minnesota Department of Revenue (DOR), which in turn forwarded them to the House and Senate tax committee chairs. The DOR also is examining ways of integrating the MFRC's recommendations into the large set of tax reform initiatives being developed by the Administration.

● *We are assessing the accuracy and availability of information about Minnesota's forests.*

The MFRC has identified access to accurate information on the state's forest resources as one of the top issues affecting Minnesota's ability to sustainably manage its forests. To address this issue, the MFRC initiated a major review that evaluates whether: 1) Minnesota's data collection efforts are gathering the right data to meet information needs for effective forest resource planning and management; and 2) the information is sufficient to develop a comprehensive understanding of the overall status and condition of Minnesota's forest resources. In January 2000, the MFRC adopted a series of baseline questions and corresponding indicators needed to assess Minnesota's progress toward sustainable forestry. The MFRC is currently evaluating the

degree to which information needed to answer these baseline questions exists. The MFRC will develop recommendations for strengthening the state's forest resource information capacity based on the findings of this evaluation. A final report describing the MFRC's findings and recommendations will be prepared in 2001.

Looking ahead, 2001 will be a pivotal year for the SFRA. The act is scheduled to sunset at the end of the 2000-2001 biennium. Consequently, the Legislature will need to decide whether the policies and programs established under the SFRA—including the MFRC—are worthy of continuing and, if so, at what level of investment.

For the past five years, the MFRC has served as a focal point for bringing together a wide range of forestry interests to work collaboratively to develop sustainable forest management policies and practices. While a great deal has been accomplished, much work remains. The MFRC stands ready to continue its role in promoting sound forest management in Minnesota.



Sincerely,
Gene Merriam
Chair



The Minnesota Forest Resources Council

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The MFRC is a 17-member organization working to promote long-term sustainable management of Minnesota's forests. It does so by coordinating implementation of the SFRA and advising the governor and federal, state, county, and local governments on sustainable forest resource policies and practices. Created in 1995, the MFRC advances the SFRA's mission to "pursue the sustainable management, use, and protection of the state's forest resources to achieve the state's economic, environmental, and social goals." It does so 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 public and private sectors in the management of the state's forest resources;
- recognize and consider forest resource issues, concerns, and impacts at the site and landscape levels; and
- recognize the broad array of perspectives regarding the manage-

ment, use, and protection of the state's forest resources, and establish processes and mechanisms that seek these perspectives and incorporate them into the planning and management of the state's forest resources.

Interests represented on the MFRC are listed below. Fifteen members and the chair are appointed by the governor. The Minnesota Indian Affairs Council appoints its representative.

commercial logging contractors
conservation organizations
county land departments
*environmental organizations **
forest products industry
game species management organizations
labor organizations
Minnesota Indian Affairs Council
*nonindustrial private forest landowners **
research and higher education
resort and tourism industry
secondary wood products manufacturers
USDA Forest Service (USFS)

* two representatives



Peer Review of Riparian and Seasonal Pond Guidelines

Riparian forest management has long been an important and widely discussed issue in Minnesota. *Sustaining Minnesota's Forest Resources: Voluntary Site-Level Forest Management Guidelines* contains a number of guidelines for managing riparian forests. To ensure these guidelines are grounded in the best available science, the 1999 Legislature directed the MFRC to commission a science-based peer review of its timber harvesting and forest management recommendations for protecting forest riparian areas and seasonal ponds.

The review was conducted by eight scientists representing expertise in hydrology/soil science, terrestrial ecology, silviculture, and aquatic ecology. The peer review panel provided input to the MFRC in two forms: 1) formal written reviews prepared by scientists in each of the four disciplines discussing the consistency of the guidelines with available scientific understanding; and 2) collective responses from the eight scientists to various scientific aspects of riparian forest ecology, management, and protection. After considering the information contained in these reviews, the MFRC concluded the following:

- The peer reviews represent a range of scientific perspectives not always in agreement on manage-

ment practices required to sustain riparian areas and seasonal ponds.

- The MFRC's guidelines are a major advancement in promoting sustainable management of riparian areas and seasonal ponds in Minnesota's forests.
- Recommendations for even-aged management may inhibit the ability of plants with low and intermediate shade tolerance to become established within riparian management zones.
- Science cannot specify with certainty the riparian management zone (RMZ) width needed to protect riparian functions. RMZ width will vary according to the type of water body, site conditions, and specific riparian functions and values needing the most protection.
- The types and intensity of land use (e.g., the extent of harvest, conversion to nonforested status, and development) within a landscape will have a greater influence on aquatic ecosystems than specific RMZ parameters (e.g., width, amount of residual vegetation). Therefore, management of forested riparian areas needs to consider both site-specific and landscape perspectives.

- MFRC programs that evaluate use and effectiveness of the guidelines, and the condition and management practices within forested riparian areas and around seasonal ponds, are critical to understanding how to sustain these resources.
- Site conditions (e.g., type and condition of vegetation, slope, and soil type) and patterns of harvest (e.g., patterns of residual trees) will greatly affect the future condition and functions of riparian forests.

The MFRC agreed that when it undertakes its legislatively mandated review of the entire set of guidelines (to be completed by June 30, 2003), any changes to the riparian and seasonal pond guidelines should be generally consistent with scientific information and understanding (biological, social, economic) on managing forested riparian areas and seasonal ponds and informed by research and monitoring. In addition, the MFRC developed a plan to emphasize education, research, and monitoring of riparian forests. Recommendations include:

- incorporating input from the peer review into training for loggers, natural resource managers, and private forest landowners;

- integrating peer review findings into planning processes used by the state's public forest management agencies;
- monitoring the extent of timber harvesting in Minnesota's riparian areas; and
- encouraging research that looks at the effects of various timber harvesting methods on forested riparian areas and seasonal ponds.

MFRC and several partners are now implementing this plan.





Monitoring

In 1999, the MFRC began developing programs to monitor the application of Minnesota's timber harvesting and forest management guidelines. The SFRA calls for two separate programs: guideline compliance monitoring and guideline effectiveness monitoring. The former is a way to track how widely the guidelines are used and how the guidelines are applied. The latter is a way to learn whether the guidelines are achieving the intended goal of protecting forest resources.

Compliance Monitoring

The SFRA directs the DNR, with oversight and program direction provided by the MFRC, to monitor "application of the timber harvesting and forest management guidelines at statewide, landscape, and site levels" (M.S. 89A.07 Subd. 2).

The goal of this monitoring program is to provide information to forest land managers and policy makers on the application of sustainable harvesting and management practices as defined in the guidebook *Sustaining Minnesota's Forest Resources: Voluntary Site-Level Forest Management Guidelines*. Prepared by the MFRC, this guidebook contains recommendations for addressing water quality, wetland, wildlife habitat, riparian

management, historical and cultural resources, and visual quality issues associated with conducting timber harvesting and forest management activities. The guidebook was published as an integrated manual for use by the state's loggers, forest landowners, and forest resource managers in 1999.

While the MFRC is responsible for designing and overseeing the guideline compliance monitoring program, the DNR has the task of putting the plan into action. The DNR coordinated field monitoring and processed the monitoring data to determine how widely the forest management guidelines are used.

Random site selection and monitoring protocols were developed from April to July 1999, and the monitoring plan was approved by the MFRC in October 1999. The first round of monitoring, conducted by independent contractors from April to August 2000, evaluated 108 timber harvesting sites on public and private forest land. These sites were identified using a sampling procedure that randomly selected blocks of land one-half of a township in size throughout the forested area of the state. Within these blocks aerial photography was used to identify recently harvested forest land. Landowners were asked for permission to visit the site and gather site background infor-

mation prior to conducting the field reviews. The field reviews focused on describing conditions and practices in the context of quantifiable timber harvesting and forest management guidelines.

It is important to note that for all sites monitored in 2000, harvesting and/or stumpage sales occurred before publication of the timber harvesting and forest management guidebook. Therefore, with the exception of water quality and wetland protection practices (for which guidelines have existed for several years), the report describes baseline harvesting and management practices (i.e., those that existed prior to publication of the guidebook). Subsequent annual field monitoring will describe how harvesting and management practices change over time, and assess the extent to which the management practices recommended in the guidebook are being applied across the state.

The number of sites monitored in each landowner category are shown in Table 1.

Some of the important findings from the first year's baseline monitoring are given below.

- Twenty-six percent of the monitored sites were visually sensitive. Landowner and loggers were aware of the visual sensitivity classifica-

tion on 36 percent and 29 percent of these sites, respectively.

- Landowners and/or resource managers checked cultural/historic resource inventories on 52 percent of the sites monitored prior to timber harvesting. Inventories for endangered, threatened, and special concern species were checked on 67 percent of the sites monitored prior to timber harvesting.
- Filter strip compliance with the guideline recommendation (less than 5 percent mineral soil exposure, dispersed over the filter strip) was 70 percent.
- For lakes, perennial streams, and open water wetlands, 50 percent of riparian management zones (RMZ) met the guideline recommendations for width and residual basal area. A higher proportion of RMZs that met the guideline recommendations were adjacent to the harvest area compared to those for water bodies that were on or traversed the harvest area.
- A high percentage of skid trail and road approaches to wetlands and streams did not have the appropriate water diversion devices installed to divert surface runoff from directly entering these water bodies.

Table 1. Number of Sites Monitored, by Landowner Category

state	27
county	31
USFS	17
private industry	5
nonindustrial private forest owners	25
other government:	3 *
Total	108

* one city forest and two University of Minnesota-managed forests

- The guidelines recommend that site infrastructure (e.g., roads, landings) should occupy no more than 3 percent of the harvest area. The statewide average was at the recommended 3 percent level.
- Landings were kept out of filter strips and wetlands 95 percent and 99 percent of the time, respectively.
- Slash was retained at the stump or redistributed back on the site for 73 percent of the sites monitored.





Effectiveness Monitoring

The SFRA directs the DNR, with oversight and program direction from the MFRC, to carry out a program to evaluate “effectiveness of practices to mitigate impacts of timber harvesting and forest management activities on the state’s forest resources” (M.S. 89A.07 Subd. 3).

Effectiveness monitoring will help evaluate the extent to which the timber harvesting and forest management practices recommended in the MFRC’s guidebook are achieving their intended objectives. Information gathered through this type of monitoring will help answer important questions such as what management and harvesting techniques are most appropriate for sustainably managing forested ripari-

an areas, and what practices promote long-term site productivity.

Through the MFRC’s research advisory committee, a proposal was developed to study the effectiveness of Minnesota’s timber harvesting and forest management guidelines. The study would provide an opportunity to conduct long-term assessments of various practices recommended in the guidebook. In early 2000 the proposal was submitted to the Legislative Commission on Minnesota Resources (LCMR) for funding consideration. The LCMR has recommended funding for the project which, if appropriated, would enable the study to begin in July 2001.

Riparian Monitoring

Riparian forests—forests adjacent to water—are an important component of the state’s forest land base. To ensure good information exists on these resources, the SFRA (M.S. 89A.05 Subd. 4) directs the DNR, with program advice from the MFRC, to accelerate monitoring of various aspects of the state’s riparian forest resources—specifically, their condition and extent, the extent of harvesting occurring within riparian management zones and seasonal ponds, and the use and effectiveness of guidelines applied in riparian management zones and seasonal ponds. In 2000,

the DNR presented to the MFRC a plan for developing a riparian resource monitoring program. Results from the initial work on riparian resource monitoring will be presented to the Legislature and the MFRC in spring 2001.

Citizen Concerns Monitoring

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” (M.S. 89A.07 Subd. 5). It gives citizens a way to voice concerns about timber harvesting and forest management practices they see in Minnesota and lets landowners, foresters, and loggers know about the concerns. Although it is not a program for taking punitive measures to stop logging or resolve disputes over contractual issues or specific forest management activities, it does encourage sustainable management of Minnesota’s forests.

Through the PCRP, citizens can:

- formally let the MFRC know their concerns about forest management activities they see;
- be a catalyst for mitigation of any problems on a site; and
- 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. Summaries of concerns registered through the PCRCP 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.

Since January 2000, four concerns have been registered with the PCRCP. The harvest sites involved were in Itasca, Wabasha, Pine, and Aitkin counties. Two of the concerns were on state land, and one each on county and private land. Of the four, three generated a full report by the MFRC. The fourth was an issue of timber trespass, which is beyond the purview of PCRCP; the citizen who registered the concern was advised on how to resolve the situation.

The three concerns that the MFRC did look into involved clear-cutting, the

adequacy of riparian management areas, rutting in wet areas, soil erosion, logging on steep slopes, stream crossings, slash in wet areas, and high stumps left on site. In each instance after the landowner and forest manager were contacted, mitigation was planned or underway.

Since its inception in 1998, the PCRCP has received a total of 11 concerns. The MFRC will review the PCRCP's goals and evaluate its operational procedures in early 2001.



Landscape-Level Forest Resource Planning and Coordination

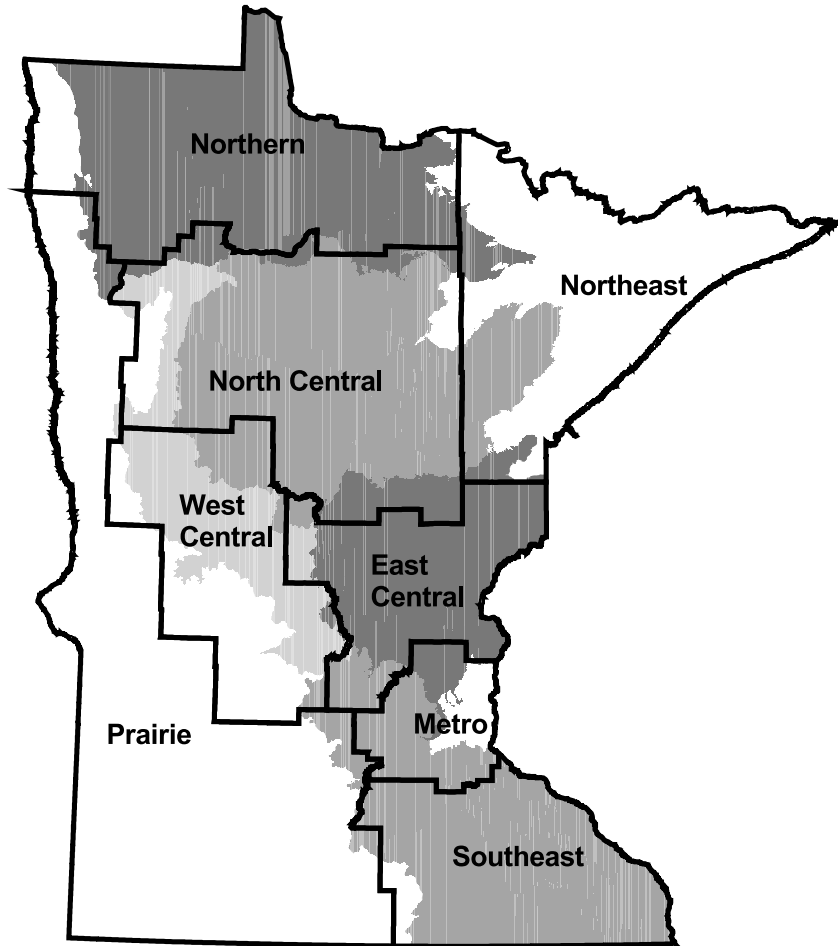


Figure 1. MFRC's eight landscape program regions are: northern, northeast, north central, west central, east central, southeast, prairie, and metro.

Landscape-level forest resource planning and coordination is a way of assessing and promoting forest sustainability across large areas. The MFRC's landscape program provides a forum where forest landowners and stakeholders can collaboratively address forest resource issues over broad regions.

The MFRC divided the state into six forested regions plus two unforested (metro and prairie) regions (Figure 1). In each region committees of citizens and representatives of various organizations are being developed to:

- gather and assess information on the region's ecological, economic, and social 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 on goals and strategies to achieve those conditions; and
- coordinate agreed-upon strategies, activities, and plans among forest landowners and managers to achieve desired future forest conditions.

Progress to Meet SFRA Revisions

The Legislature revised Section 89A.06 of the SFRA in 1999, setting deadlines and expanding expectations for the regional forest landscape committees. The table on the following page highlights those revisions and the accomplishments made in 2000 to meet them.

Regional Committee Highlights

Northeast

The committee continues to hold citizen and organizational interest, with 50 people on the mailing list. Average attendance at the committee's three meetings was 25. The three work groups established by the committee meet every four to six weeks with eight to 12 people attending. Among its accomplishments, the committee:

- contracted with the Natural Resources Research Institute (NRRI) to map current ecological conditions. The map will be used to help quantify existing ecological

conditions in order to compare to desired future forest conditions for the region.

- developed a matching grant with University of Minnesota, Duluth, (UMD) Department of Sociology-Anthropology to study two communities' ability to adjust to change in timber supply and other natural resource-based economies (the greater the ability to adjust to change, the more sustainable the community).
- developed a proposal with UMD to collect current economic diversity information for future use in analyzing the impact of moving toward desired future forest conditions.
- coordinated road information to provide a single map of forest roads for forest management planning. The committee is using existing county road committees to obtain information and to field-check for accuracy. All major landowners are represented on the road committees.

Implementation of 1999 SFRA Revisions of M.S. 89A.06

REVISION	MFRC RESPONSE
<p>■ Subd. 2. (4) integrate its report with existing public and private landscape planning efforts in the region</p>	<p>■ We worked with the DNR, the USFS, UPM-Blandin Co., and TNC to incorporate desired future forest conditions into forest planning. All parties involved are committed to integrating desired future forest conditions with their efforts.</p>
<p>■ Subd. 2. (5) facilitate landscape coordination between existing regional landscape planning efforts of land managers, both public and private</p>	<p>■ We convened a meeting in May for those involved in forest planning efforts in the northern one-third of the state. Participants included TNC; representatives from county planning efforts; the DNR; the USFS; Boise Cascade; and UPM-Blandin Co. A follow-up meeting was held in December to discuss the coordination of projects statewide and to define how the various levels of planning overlap.</p>
<p>■ Subd. 2. (6) identify and facilitate opportunities for participation in existing landscape planning efforts in this region</p>	<p>■ We worked with the USFS to develop and analyze economic diversity information for 12 counties in northern Minnesota. We also worked with the DNR to incorporate landscape-level information into its Border Lakes Subsection planning effort.</p>
<p>■ Subd. 2a. (2) by July 1, 2000, the council will complete assessments for the council's north-central and south-east landscape regions</p>	<p>■ We completed current conditions and trends assessments for the north-central and southeast landscapes by July 2000. Assessments will be complete for the remaining forested landscape regions (east-central, northern and west-central) in 2001.</p>

The landscape program expanded in 2000. A committee was established in the north-central landscape region and meetings were held in the southeast landscape region to form partnerships that will lead to establishing a committee next year. The northeast regional landscape committee sought information to quantify desired future forest condition and begin analyzing social and economic conditions in the region.



North Central

The first organizational meetings were held in June with 65 people expressing interest in participating. The committee meets bimonthly with an average attendance of 30. Among its accomplishments, the committee:

- identified key issues in the landscape, of which ecological sustainability is the highest priority.
- used ecological data put together by the DNR, the USFS, UPM-Blandin Co., Interagency Information Cooperative, and other partners to start looking at the biological makeup of the landscape.
- started to describe desired future forest conditions for the landscape.

Future Direction

The landscape program requires scientifically based ecological, social, and economic information. The committees have been heavily involved in defining and understanding regional information during the past year. The focus for 2001 will be on using the information to make decisions that will produce desired future conditions. The spatial analysis project will provide tools to look at various future



forest scenarios. This information is important to determine what impacts land use decisions will have on the landscape and will provide direction about how to obtain the desired future forest conditions.

The north-central regional committee is working to meet the intent of the SFRA by completing draft desired future outcomes, key issues, and strategies by July 1, 2001. Both the northeast and north-central committees will begin to implement, through coordination with landowners and managers, the strategies to move toward desired conditions. In the

southeast landscape, we will continue to pursue cooperating with the University of Minnesota Extension Service and the Sustainable Development Partnership to establish a landscape committee. In the following year the landscape program has potential to expand to the other forested landscapes.

Spatial Analysis of Forest Landscape Conditions

The MFRC's landscape spatial analysis project was initiated in 2000 to improve understanding of historical and current landscape patterns and possible future conditions as a guide for forest planning and management. The project will work to determine the value and limitations of using spatial pattern data in the development of science-based management strategies. The tools resulting from this project will be used to evaluate the consequences of future forest and land use decisions.

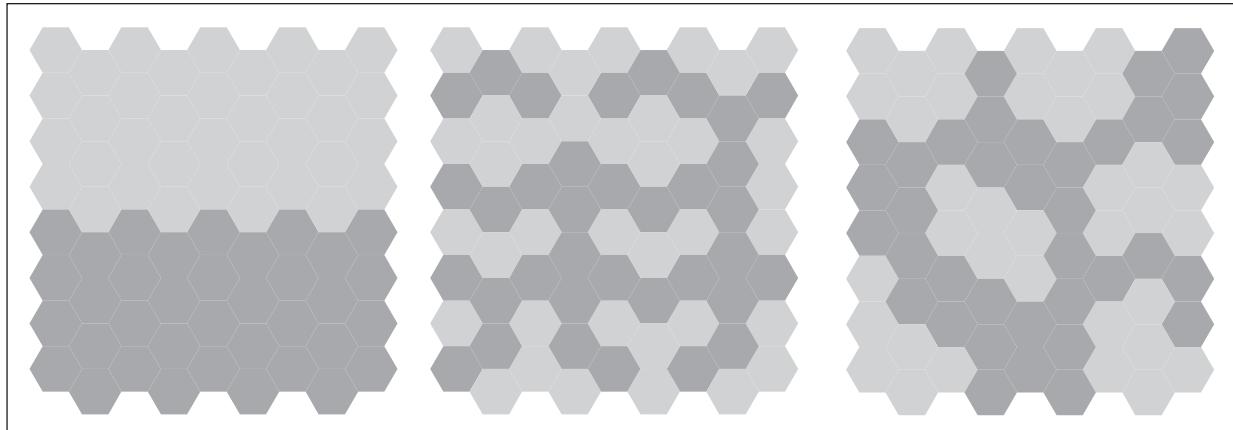
Project Accomplishments

Secured Sponsorship

Financial sponsors of the project are the MFRC, the DNR, Minnesota Forest Industries and its members, TNC, and Minnesota Audubon Council. In addition to sponsors, several institutions are contributing staff time. These cooperators include the USFS, the NRRI, the University of Minnesota College of Natural Resources (CNR), the Minnesota Association of County Land Commissioners, and others.

Formed Strategic and Technical Leadership Teams

The MFRC formed two teams to design and carry out the spatial



analysis project. The project strategy team (PST) and the project technical team (PTT) provide strategic and technical leadership, respectively.

The PST is composed of 11 members from a variety of organizations, including public land management agencies, environmental groups, forest industry, conservation groups, and research organizations. It is guiding development of analyses and tools by identifying pressing questions related to forest landscape management, such as:

- What are the landscape patterns of vegetation and disturbance, how have they changed, and how might they change in the future?
- How do changes in landscape patterns of vegetation affect ecosystem processes and valued

Spatial patterns refer to the distribution of elements (e.g., habitat, forest types, land use classes) in a space. For example, although the above diagrams each have 36 units of habitat A (light shade) and 36 units of habitat B (dark shade), the three are very different because the units are distributed differently. Different spatial patterns may affect forest functions (e.g., wildlife populations, ecological processes, recreation opportunities, disturbance spread) in a different manner.

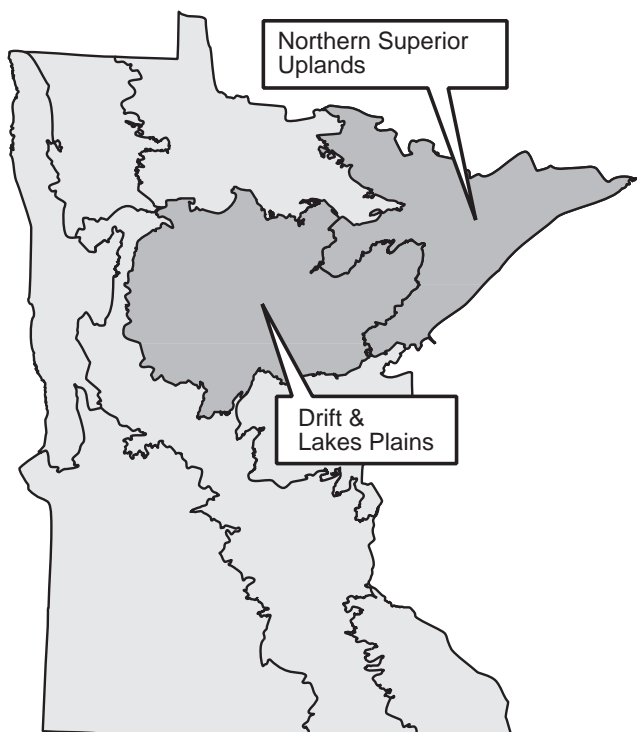


Figure 2. Work plan sampling areas

resources, including plant and animal population dynamics, insects and disease, forest productivity, hydrology, and aquatic systems?

- What factors determine landscape patterns of vegetation, and how do they operate (e.g., landforms, soils, and development)?

Answering these broad questions will ensure the project addresses the needs of forest managers, policy makers, and interested citizens.

The PTT is composed of scientists and researchers, each with expertise in at least one of the following fields: remote sensing, landscape ecology, wildlife management, forest biometrics and modeling, and GIS. It is developing a work plan for answering the questions identified by the PST. Team members' collective expertise will ensure that project deliverables are relevant, credible, and accurate.

The two teams met extensively throughout 2000. They will continue to meet well into 2001 and beyond. The project is expected to be completed in May 2002.

Developed a Work Plan

The PTT and PST have jointly developed a work plan to examine historical and current landscape patterns. The work plan includes sampling areas from the Northern Superior Uplands and the Drift and Lakes Plains ecological classification sections (Figure 2). Aerial photos dating to the 1930s, 1970s, and 1990s will be collected and interpreted for the sample areas. Additionally, information on the types and patterns of disturbance (e.g. wind, fire) that existed at the time of the General Land Office (GLO) surveys in the late 1800s will be collected. Satellite image classifications of the current forest will be obtained. These data will help us identify changes that have occurred and begin to assess the implications of those changes.

In addition to past and current landscape patterns, the project aims to explore future landscape patterns through modeling. Landscape patterns will be generated for several hypothetical forest harvesting scenarios.

These project tasks and additional analysis and interpretation will pro-

duce a combination of maps and technical data. Scientists and others will work to synthesize the technical data so that a wider audience will be able to use the information. Such synthesis and interpretation of maps and technical data will result in deliverables that are meaningful to scientists, resource professionals, policy makers, and citizens.

The teams expect to complete work plans for these steps in January 2001.

Began Analyses

The work plan presented by the PTT and PST was adopted by the MFRC in November 2000. Collection of aerial photos and satellite imagery and interpretation of GLO data began in December 2000. Work on these components will continue throughout 2001. Development of the tools for future scenario modeling and interpretation will start in early 2001 and is likely to continue throughout the year.





MFRC Research

The research advisory committee was established by the MFRC in 1996 as required by the SFRA. Consisting primarily of representatives of the state's major forest research institutions and natural resource employers, this group is charged with periodically conducting research assessments, promoting forest resources research, and fostering linkages between researchers and practitioners.

Research Assessment

The SFRA requires a periodic assessment of the state's forest resources research needs. The MFRC, through its research advisory committee, completed the first assessment in 1998. Its report, *Forest Resources Research in Minnesota: Meeting the Information Needs of the Next Decade*, identifies four priority research areas:

- understanding forest ecosystem function and integrity;
- assessing economic and social aspects of forest resources;
- developing information and technology to support forest resource planning and management; and
- designing policies and programs for management, use, and protection of Minnesota's forests.

MFRC-Sponsored Forest Resources Research

The research projects funded by the MFRC meet the research goals laid out in the SFRA. In selecting projects for funding, the MFRC strives to: 1) support collaboration among organizations that conduct forest resources research; 2) link forest resources researchers in various disciplines; and 3) maintain interaction and communication between researchers and practitioners in the development and use of forest resources research.

Project Completed in 2000

The following research project was completed in 2000:

Assessing the Financial Effects Associated with Implementing Minnesota's Timber Harvesting and Forest Management Guidelines

This study is the second assessment commissioned by the MFRC to improve understanding of the costs associated with implementing the timber harvesting and forest management guidelines. Use of guidelines in addition to normal procedures could have both direct and indirect financial implications for loggers and landowners. This study addresses several

issues related to the cost of applying forest management guidelines. It deals only with the financial implications of harvest practice change (expenditures and revenues that show up in the accounts of participant landowners and firms). It does not address benefits and costs external to the market participants. The report states, “based on scattered data and on the economic reasoning followed in this portion of the report, we would conclude that guidelines compliance costs are likely to be borne ultimately by the landowner, not by the logger or the consumer.”

Ongoing Research

Since 1996, the research advisory committee has been supporting a series of studies in three areas: 1) forested riparian zones; 2) wildlife species and forest landscapes; and 3) forest resource productivity and forest management. Results from these studies will be used in reviewing the voluntary site-level timber harvesting and forest management guidelines.

Evaluating Riparian Area Dynamics, Management Alternatives, and Impacts of Harvesting Practices

This project considers both pre- and post-harvest conditions of aquatic insects and their habitat, fish populations and their habitat, riparian vegetation composition and development, blow-down of residual trees, soil in riparian and upland areas, model archaeological artifacts, leaf litter inputs to streams, and the amount and size of coarse woody debris in and around the streams.

Preliminary findings indicate that overstory retention of 35 square feet per acre does not greatly inhibit early aspen regeneration in the partially cut riparian buffer. Over time, a decline in average sucker density and vigor relative to the adjacent clear-cuts may occur. Significant reductions in leaf litter input to the stream occurred with upland clear-cutting and riparian thinning, but also (to a lesser extent) with upland clear-cuts and no riparian harvest within 100 feet of the stream. The research also detected significant reductions in canopy cover and increases in blown-down trees in the riparian harvest sites and a related increase in woody debris at these sites; however, the increase in woody debris did not persist. There were



minor changes in fish community structure attributable to riparian harvest, most notably an increase in mudminnows (a pollution tolerant species) in the full-tree harvest sites.

Wildlife Species: Response to Forest Harvesting and Management in Riparian Stands and Landscapes

This study examines the relationship between harvest levels and harvest systems in riparian areas and breeding bird populations. Preliminary results (reporting one year post-harvest in one watershed) suggest that riparian buffers increase the amount of edge habitat. This is significant because many forest bird species have lower reproductive success along edges. Only two “riparian-dependent” species, the northern waterthrush and the common merganser, were observed; several “riparian-associated” species, which occur in many for-

est types in northern Minnesota, were also identified. We found that bird community composition changed in response to harvest and harvest system in forests adjacent to small (1 to 3 meters in width) streams in northern Minnesota. As expected, bird communities where basal area was removed to 25 to 35 feet square feet per acre changed more relative to the control sites than sites where the riparian forest was left uncut. A full report on the results of this research will be completed in January 2001.

Impacts of Harvesting on Regeneration, Productivity, and Floristic Diversity of Quaking Aspen and Northern Hardwood Ecosystems

This study examines the impacts of harvest on soil properties, the ability of trees to regenerate, productivity of harvested sites, and the diversity of vegetation in quaking aspen and northern hardwood ecosystems. Preliminary results indicate lower soil compaction on sites harvested in winter than on sites harvested in summer. Other seasonal differences seem to be independent of compaction (e.g., regeneration density was higher on winter sites, even if compaction was eliminated as a factor). Residual overstory decreased the density and

growth of tree regeneration, and the influence of a residual overstory was stronger in areas with higher compaction.

Preliminary analysis also seem to suggest a shift in vegetation composition with the initial entry (lighter disturbance). Residual overstory basal area was also related to vegetation composition. There seems to be little difference in vegetation composition between areas with light disturbance and areas with heavy disturbance. Increased richness of understory species with disturbance level is due to an increase in pioneering species on both hardwood and aspen sites.

Proposed Research

Evaluating the Sustainability of Minnesota's Forest Management Practices

The SFRA charged the MFRC with coordinating development of voluntary site-level timber harvesting and forest management guidelines. Finalized in 1998, these guidelines recommend practices to address riparian areas, wildlife habitat, soil, water quality, wetlands, visual quality, and historic and cultural resources. Application of the guidelines is now beginning throughout the state on many of the



approximately 200,000 acres harvested annually. Potential guideline users include approximately 1,500 timber harvesters, 130,000 private forest landowners, DNR, county land departments, the USFS, and major forest products companies. A proposal submitted on behalf of the MFRC, to evaluate how well the guidelines protect forest resources especially in forested riparian areas, has been recommended for funding by the LCMR.

Education

As a result of the SFRA, two continuing education programs were established. Loggers created the Minnesota Logger Education Program (MLEP) to promote high operation standards and enhance professionalism for loggers. The Institute for Sustainable Natural Resources (ISNR—now the Center for Continuing Education, CCE) was established by the CNR to provide innovative education programs for natural resources professionals.

Guideline Education

The MFRC continues working with the MLEP, the CCE, and others to provide continuing education for loggers and natural resource professionals on the voluntary site-level timber harvesting and forest management guidelines. These programs are vital to bringing new research, technologies, and forest practices to the forestry and logging communities.

MLEP and CCE provide training opportunities that facilitate understanding of on-the-ground application of sustainable harvesting and management practices.

During 1999 and 2000, two training programs were delivered to resource managers and logging professionals throughout Minnesota. The first was a full-day classroom training opportuni-

ty to introduce the forest management guidelines.

The second was a field training session to allow practitioners to practice skills gained from the introductory course. In the past two years, 38 day-long sessions have been attended by more than 1,500 practitioners. Forest management training programs will continue in 2001.

As a result of the MFRC's compliance monitoring program, future training will focus on specific topical areas such as riparian and seasonal pond guidelines, road building, and stream crossing options.

Continuing Education

The CCE continues to be an active MFRC partner in promoting excellence in natural resource management. It offers a broad range of technical and professional education programs for practicing natural resource managers in all sectors of the forestry profession. It has been a coleader in the planning and implementation of guideline education programs. Other featured programs of the center in 2000 include: Increasing Forest Productivity While Decreasing Fragmentation; Demonstration of Landscape Based Ecosystem Management Process in Minnesota; Collaborative Learning Process; Landscape Level Planning, Forestry



Field Skills, and Technology; and Managing Amphibians and Reptiles. The center recently teamed up with the state's Forest Stewardship Program, as it implements new continuing education requirements for stewardship plan preparers. The center will develop new educational offerings to meet plan preparer needs, and will manage a new continuing education tracking system to monitor credits taken.

Information Sharing

The MFRC has continued its support of the Interagency Information Cooperative (IIC). In 2000 the IIC enhanced the access and use of forest resources data in Minnesota by:

- maintaining and updating a web site (<http://www.iic.state.mn.us>) that contains a wide variety of forest resources data, from wildlife to strategic plans to land use (average requests, or number of times an Internet page is viewed from the site, per day have increased from 380 at the beginning of the year to more than 580);
- providing forestry inventory (GIS) data on public lands to managers, planners, and researchers (<http://deli.dnr.state.mn.us/metadata/full/ccsa1py3.html>); and
- helping create forest road GIS data for northeastern Minnesota (Figure 3) (<http://www.iic.state.mn.us/finfo/roads/trans2.htm>).

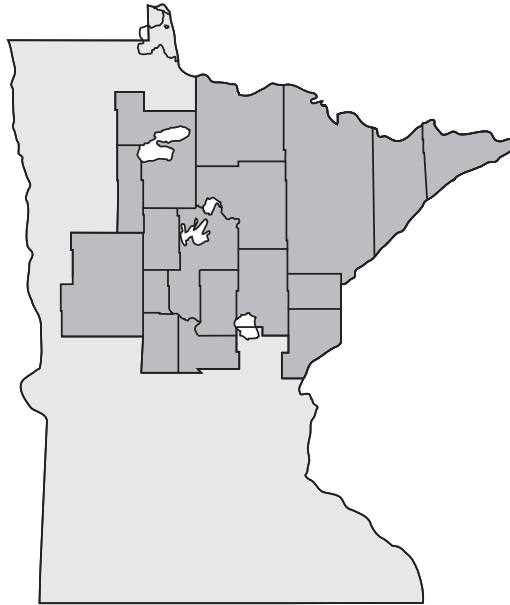


Figure 3. Public forest inventory collection completed in 2000



Outreach

The MFRC continued to improve and expand its outreach in 2000 by:

- mailing the MFRC's semiannual newsletter to more than 500 subscribers;
- hosting forestry field tours for the Minnesota Department of Finance and House and Senate Environment and Natural Resources Committee members and staff;
- distributing news releases throughout the year regarding MFRC activities;
- supplying more than 2,100 nonindustrial private landowners with the MFRC's landowner guideline information brochure;
- establishing new web links between natural resource organizations and the MFRC's website;
- hosting an information booth at the Rural Summit in Rochester, Minnesota; and
- advertising the PCRIP in newsletters and magazines.



Strategic Forest Resource Issues



The forests of Minnesota are important to all its citizens. The goal of long-term sustainability of these forests is what brings the diverse perspectives of the MFRC together. Each year the MFRC commissions projects that will better the forest resources of the state in the long term.

Promoting Sustainable Forest Management of Private Forest Lands Through Tax Policy

The 2000 Minnesota Legislature directed the MFRC to work with DOR to study the taxation of forest land in Minnesota. The study was to review the current application of property taxes to forest lands; compare Minnesota's forest property tax structure with those elsewhere; and develop recommendations for changes in tax policy to encourage forest productivity, maintain land in forest cover, and encourage application of MFRC sustainable site-level forest management guidelines. Additionally, the study was to assess impacts of the state's current forest property tax structure and of proposed changes on local government revenue.

The study identified a number of problems. Current tax policies do not encourage forest productivity, encourage the use of sustainable forest man-

agement guidelines, or promote retaining forested land in forest cover because 1) only a modest number of private landowners have enrolled in tax programs which may (or may not) encourage sustainable management of forests generally; and 2) private forest landowners do not have access to a tax program specifically targeted at accomplishing these objectives.

To encourage Minnesota's 130,000 private nonindustrial forest landowners, who collectively own 6 million acres of forest land, to adopt and implement forest management plans and adhere to MFRC forest management guidelines, the MFRC recommended the following reforms:

- Create a single rural land property tax class for all unimproved rural land, including private forest land. This would simplify taxes, reduce administrative costs, and provide more tax uniformity.
- Establish a new Sustainable Forest Tax Law that would provide a state-paid property tax refund to owners of forest land who enroll and manage their forest lands according to approved management plans and MFRC guidelines. The refund would equal the difference between the property tax that would be paid under regular ad valorem taxation and that which would result from a current-use valuation, or one-third of the regular ad valorem tax amount, whichever is larger. The MFRC recommended current-use valuation be determined using the present value of the annual net income associated with the forest land.
- Limit the tax refund program to forest lands of at least 20 contiguous acres whose owners agree to keep the land enrolled in the program for a minimum of eight years, with penalties for early withdrawal. There would be partial reimbursement for unreimbursed investments in certain management activities that enhance the productivity and sustainability (e.g., reforestation expenses). These reimbursements would not be available to owners of more than 1,000 acres of forest land.
- Repeal the Tree Growth Tax Law, with no termination penalties for currently enrolled lands. Lands currently under the Tree Growth Tax Law would be eligible for enrollment in the Sustainable Forest Tax Law program. Forest land now under the Tree Growth Tax Law would be placed back on local tax rolls and taxed under the regular ad valorem tax, even if enrolled in the Sustainable Forest Tax Law program.

- Require landowners enrolling more than 1,000 acres in the Sustainable Forest Tax Law program to provide nonmotorized public access to fish and wildlife resources. Other landowners would not be required to provide such access. (Public access is required of all lands currently enrolled in the Tree Growth Tax Law.)

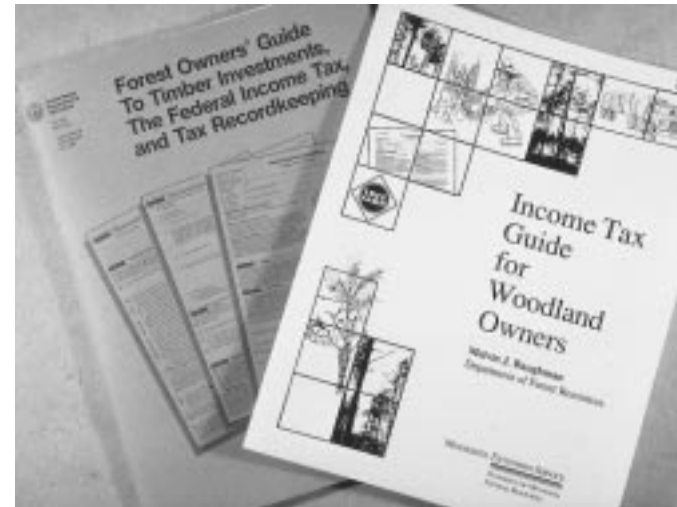
The MFRC believes the Sustainable Forest Tax Law would address several problems with Minnesota's current system of forest taxation. First, it would promote retention and stabilization of the state's forest land base by requiring landowners to make a minimum commitment of eight years. It also would encourage increased management on private forest lands, increased forest productivity, increased supply of wood fiber, and increased habitat and environmental management by requiring preparation and use of a forest management plan, and use of timberland and forest management guidelines.

From the standpoint of tax assessment, the Sustainable Forest Tax Law would provide greater equity by taxing forest lands based on their ability to generate income—as opposed to the current Tree Growth Tax Law, which directly taxes annual unrealized gross capital gains at a 30 percent rate.

Since the property tax on land enrolled in the Tree Growth Tax Law program is tied to stumpage prices, the recent rise in stumpage prices has greatly diminished the tax incentive for forest landowners interested in making a long-term commitment to forest management. Under the Sustainable Forest Tax Law, taxable property values would be capped at one-third of the property's ad valorem value, thereby ensuring tax incentives for lands committed to long-term forest management irrespective of stumpage prices.

Finally, the Sustainable Forest Tax Law would benefit local government and reduce county administrative costs by expanding the tax base to include land currently enrolled under the Tree Growth Tax Law and replacing the Tree Growth Tax Law with a state refund program. This would result in lower property tax rates and greater uniformity of taxation across counties.

The MFRC's recommendations were transmitted to the DOR, which in turn forwarded them to the House and Senate tax committee chairs. DOR is also examining ways of integrating the MFRC's recommendations into the large set of tax reform initiatives being developed by the Administration.





Availability and Accuracy of Forest Resource Information

Throughout 2000 the MFRC addressed a particularly significant issue: the availability and accuracy of forest resource information.

In 1998 the MFRC determined that the availability and accuracy of information about forests is one of the top issues affecting Minnesota's ability to sustainably manage its forests. To address this issue, the MFRC created the forest resources information management committee (IMC) and charged it with reviewing information about Minnesota's forests.

This review centers on two questions:

- 1) Are Minnesota's data collection efforts gathering the right data to meet the information needs for effective forest resource planning and management?
- 2) Is the information sufficient for a comprehensive understanding of the overall status and condition of Minnesota's forest resources?

The IMC initiated a two-phase review of forest resource information in Minnesota. Phase one identified baseline questions and indicators for sus-

tainable forestry. Baseline questions are questions by which progress toward MFRC goals can be measured; indicators are specific quantitative or qualitative measures that answer baseline questions. For example, one goal is to enlarge and protect Minnesota's forest land base. A baseline question for this goal is, "How much forest land is there?" An indicator for this question is the specific acreage of forest land across the state. These baseline questions and indicators were completed and accepted by the MFRC in January 2000. See the MFRC report *Review of the Availability and Accuracy of Information about Forests: Phase I Report* for a complete list of baseline questions and indicators.

Phase two, which is evaluating existing programs that collect data on various forest resources, was initiated in mid-2000. The two primary questions to be addressed are:

- 1) Do the data generated by existing programs that collect data on various forest resources answer the baseline questions identified in phase one of the review?
- 2) Which baseline questions are not adequately addressed by existing information resources?

The second phase will be completed in spring 2001. The IMC will prepare a final report on the status of the state's information resources. Based on this information, the MFRC will develop recommendations for strengthening the state's forest resource information capacity.

Minnesota Forest Resources Council Documents

MFRC documents are available via the World Wide Web at <http://www.frc.state.mn.us>.

Council Documents

Biennial Report to the Governor and Legislature: Sustainable Forest Resources Act Implementation, 1997–1998 (CP-0299)

Developing a Common Vision for Minnesota's Forest Resources (CP-0198)

MFRC Response to the Report of the White Pine Regeneration Strategies Work Group (CP-0197a)

Minnesota's Forest Resources: A Biennial Report to the Governor and Legislature on the Implementation of Minnesota's Sustainable Forest Resources Act (CP-0197b)

Review of Minnesota's Strategic Forest Resource Planning Requirements (CP-0896)

Review of the Availability and Accuracy of Information about Forests: Phase I Report (CT-0100)

Continuing Education

Guidelines for Forest Management "How-to's" for Private Forest Landowners (Nonindustrial Private Forest Landowner Guideline Informational Booklet, ER-0999)

Interagency Information Cooperative

Interagency Information Cooperative: Forest Information Needs Assessment (IP-0397)

Landscape Program

Atlas of Background Information for Minnesota's Northeast Regional Landscape (LT-0798)

General Planning Process: Implementing the Landscape-Based Planning and Coordination Program (LP-1197a)

Landscape Program Evaluation Report, Pilot Project: Establishing the NE Regional Forest Resource Committee (LT-1299)

MFRC Landscape-Level Planning and Coordination Process Principles and Goals (LP-0797)

MFRC Landscape Region Delineation Map (LP-0697)

Minnesota Northeast Regional Landscape Current Conditions and Trends Assessment (LT-0799)

Minnesota Northeast Regional Landscape Desired Future Forest Conditions Report (draft, LT-1299)

Minnesota North Central Landscape Current Conditions and Trends Assessment (LT-0500)

Minnesota Southeast Landscape Current Conditions and Trends Assessment (draft, LT-0700)

Regional Forest Resource Committees: Implementing the Landscape-Based Planning and Coordination Program (LP-1197b)

Monitoring

Guideline Implementation Monitoring Protocols (MP-1099)

Status of Minnesota Timber Harvesting and Silvicultural Practice in 1996 (MP-1098)

Research

Assessing the Financial Effects Associated with Implementing Minnesota's Timber Harvesting and Forest Management Guidelines (RR-0900)

Forest Resources Research: Meeting the Information Needs of the Next Decade (RP-0798)

Site-Level Program

Economic Implications of Proposed Forest Management Guidelines for Minnesota (SE-0998)

Implementation Goals for Timber Harvesting and Forest Management Guidelines (SI-1298)

Minnesota Forest Resources Council Response to Peer Reviews of Riparian and Seasonal Pond Guidelines (SA-0400)

Sustaining Minnesota Forest Resources: Voluntary Site-Level Forest Management Guidelines (SI-0998-1)

Sustainable Forest Resources Act
Implementation in 2000:
Minnesota Forest Resources Council
Annual Report to the Governor and
Legislature

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