



June 2010: Part 2 Minnesota Department of Natural Resources

Minnesota Forest Resource Strategies

Positioning the State of Minnesota
for Forest Resources Sustainability
2010-2015





Minnesota Statewide Resource Strategy Report

A Strategic Plan to address forest-related conditions, trends, threats and opportunities as identified in the companion Minnesota Statewide Assessment of Forest Resources. June 2010

Acknowledgements:

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June 18, 2010

Dear Interested Citizen:

I am pleased to present to you the first edition of the Minnesota Forest Resource Assessment (Part 1-Assessment) and Minnesota Forest Resource Strategies (Part 2-Strategies). This is the first effort under new requirements of the 2008 Federal Farm Bill (Farm Bill). The Farm Bill requires that each state complete a state assessment and resource strategies document by June 2010 in order to continue receiving federal funding through the federal Cooperative Forestry Assistance Act.

The Farm Bill requirement for states to undertake this effort is driven by growing pressures on the nation's forests and a growing scarcity of available resources. The intense competition for scarce federal, state and other resources accentuates the need to make sure that available resources are focused on the greatest priority needs. Integration and spirited cooperation among programs and organizations that share common objectives is paramount to the optimal use of available resources. It is with that spirit that the Minnesota Assessment and Strategies documents have been developed.

It is important to note that these documents are not intended to be a comprehensive compilation or compendium of information about Minnesota's forests and forest management strategies. Rather they are intended to provide a broad general overview of the main trends, conditions, and issues affecting Minnesota's forests and correlating general response strategies that might be employed. The vast majority of the information presented has been gathered from numerous existing sources (i.e., reports, surveys, studies) and ongoing efforts, repackaged and reformatted for this effort. The 2008 Farm Bill requires periodic updates, so it is also important to view these as "living" documents subject to change as new information becomes available. At a minimum, the documents will need to be revised every five years.

The Minnesota Assessment and Strategies documents are the result of efforts and review by numerous agencies, organizations, and individuals engaged in forest management in Minnesota. I want to extend my thanks to those who have taken the time to make this a richer product. I hope that the documents and the dialogue initiated with their development will serve as a useful resource for the many ongoing efforts within Minnesota's forestry community.

If you have any suggestions for improving this effort or corrections to information that has been presented, please be sure to submit your thoughts to Helen Cozzetto (Helen.cozzetto@state.mn.us).

Thank you for your continued interest in Minnesota's forests.

Sincerely,

A handwritten signature in blue ink, appearing to read "Dave Epperly". The signature is fluid and cursive, with a large loop at the end.

Dave Epperly, Director
MNDNR Division of Forestry



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Chapter 1: Introduction

The 2008 federal Farm Bill (Title VIII: Forestry) sets out new priorities and planning standards for the USDA Forest Service (USFS) State and Private Forestry (S&PF) program and adjusts cooperative relationships for federal, state, and private forest systems. This effort, referred to as S&PF Redesign was in direct response to increased impacts on the nation's forests and decreased S&PF funds and resources. Under this new S&PF Redesign, all 50 states are required to analyze their forest conditions and trends in a *Statewide Forest Resource Assessment*. The bill recognized the need for forest planning by requiring the 50 states to complete the statewide assessment by June 2010, in order to receive federal funds under the Cooperative Forestry Assistance Act (CFAA).

Further, based on the statewide assessment, a "*Statewide Forest Resource Strategies*" document is also required, which is anticipated to become the foundation for formulating S&PF competitive project proposals and future guiding of S&PF program direction.

The 2008 Farm Bill establishes three new federal priorities for the S&PF program including the following national themes and objectives.

National S &PF Redesign Themes and Objectives

Conserve and Manage Working Forest Landscapes for Multiple Values and Uses

- Identify and conserve high priority forest ecosystems and landscapes
- Actively and sustainably manage forests

Protect Forests From Threat

- Restore fire-adapted lands and/or reduce risk of wildfire impacts
- Identify, manage, and reduce threats to forest and ecosystem health

Enhance Public Benefits From Trees and Forests

- Protect and enhance water quality and quantity
- Improve air quality and conserve energy
- Assist communities in planning for and reducing forest health risks
- Maintain and enhance the economic benefits and values of trees and forests
- Protect, conserve, and enhance wildlife and fish habitat
- Connect people to trees and forests, and engage them in environmental stewardship activities
- Manage trees and forests to mitigate and adapt to global climate change

Under the S &PF Redesign program, national and statewide forest resource assessments and strategies will be used to develop competitive proposals for S&PF funds. To receive these federal funds under the S&PF Redesign program, projects will have to follow the annual direction being developed by the USFS, and address directly one or more of the three national priorities as laid out above. To ensure that future S&PF resources are focused on high priority issues and areas, with the greatest opportunity for measured success, Minnesota continues to work collaboratively with neighboring states and the USFS to identify these key priority areas and identify landscapes where an investment of federal competitive grant funding, (future annual report of use of funds still being developed), can most effectively accomplish forest goals or leverage desired outcomes.

Minnesota Overview of Strategies Development

Minnesota is located at the convergence of three major vegetation biomes: coniferous forests, deciduous forests and tall-grass prairies. Over one-third of the state remains forested, and over 12,000 lakes and rivers grace the landscape. Minnesotans value their natural resources and tie these back to a high quality of life and standard of living. These values are intertwined with sustained economic prosperity, which in turn depends on healthy and sustainable environments. The state has continually recognized the need to balance long-term plans for conserving and protecting the valuable natural resources with those that ensure a healthy public and robust economy. Minnesota supports and is actively engaged in addressing the USFS national S&PF themes and associated objectives.

The state of Minnesota has chosen to complete the 2008 federal Farm Bill requirement in two phases and has split the project into two documents. The first document (Part 1), entitled – “*Minnesota Forest Resource Assessment: Important Facts, Information, Trends and Conditions About Minnesota’s Forests-*”, is under separate cover and was completed to meet the USFS Checklist Requirements.¹

This second document (Part 2), entitled - “*Minnesota Forest Resource Strategies: – Positioning the State of Minnesota for Forest Resources Sustainability 2010-2015-*”, (Strategies) seeks to outline broad long-term strategies (5+ years) for the 10 issues and priority areas discussed in chapters 4 and 5 of the “*Assessment*” document. This “*Strategies*” document relies heavily on several key planning documents that have recently been published with extensive stakeholder and public/private involvement. All federal public agencies and tribes holding land within the state were consulted as well as those federal agencies and tribes that have direct impact or interact cooperatively on forest programs such as wildfire protection or invasive species control. Key stakeholder groups that directly influence or are intimately involved with the state’s forest resources, were also consulted through established councils or committees, in both stages of the required process.² Minnesota has always recognized the need for informed collaborative planning efforts and continues to be a leader in these endeavors in the nation.

¹ Checklist for Statewide Forest Resource Assessments and Strategies Requirements of the 2008 Farm Bill. Available for viewing at

<http://www.northeasternforests.org/FRPC/files/1253211897Checklist%20State%20Assessment%20and%20Strategy.doc>

² Minnesota Forest Resources Council, Minnesota Forest Resources Partnership, Minnesota Forest Stewardship Council, State and Private Forestry Technical Committee, Minnesota Shade Tree Advisory Committee

Chapter 2: Current Plans & Strategies

Minnesota has a rich tradition of planning for the sustainable use of its forest resources. The unique land ownership patterns which include major holdings by federal, tribal, state, county, municipal, industry, timber investment management organizations (TIMO), non-governmental organizations (NGO), and non-industrial private forests (NIPF), creates a myriad of planning processes managed by the relevant jurisdiction or controlling party. Further complicating the inventory and assessment of current forest resource plans and strategies, are plans directed at specific programmatic areas or topics. And last, a third area of planning, includes efforts focused on related conservation initiatives.³ The inventory of plans in this section is provided in the following manner:

- A. Forest Management Plans Based on a Geographic/Land Ownership Basis
- B. Programmatically Based Plans
- C. Related Conservation Planning Efforts

Forest Management Plans Based on a Geographic/Land Ownership Basis

Forest management plans based on geography or land ownership have been developed by a variety of entities responsible for their management. The plans have been prepared by various agencies and organizations principally responsible for the management of lands under their jurisdiction.

Minnesota covers over 54 million acres. Today, forest land covers approximately 16.7 million acres of the state or 30.9%. About 50% of the forest land is publicly owned and 50% is privately owned. The following provides an overview of forest management plans currently developed in the state for the respective geographies or jurisdictions:

- **Minnesota Forest Resources Council Plans Landscape Plans:** These plans focus on six major forested landscapes statewide: East Central (EC), Northern (N), North Central (NC), North Eastern (NE), South Eastern (SE) and West Central (WC) regions. Landscape plans for the Twin Cities metro area and prairie landscapes are still in the process of being planned. The landscape plans include desired future conditions (100-year visions), and goals and strategies, with the intent of promoting sustainable forest management across all ownerships. The six MFRC landscape plans cover approximately 34.5 million acres across the state.
- **National Forest Plans:** These are 10 to 15 year plans for the Superior National Forest, including a companion plan for the Boundary Waters Canoe Area Wilderness, and the Chippewa National Forest. They cover approximately 3 million acres of federally owned lands in northern Minnesota.
- **Tribal Forest Plans:** Some of Minnesota's 11 tribes have forest plans for the several hundred thousand acres of tribal forest land.
- **State Subsection Forest Resource Management Plans:** These plans are long-term (50-plus years) and short-term (10 years) vegetative management plans, including timber harvest, wildlife habitat, and rare features for 4.8 million acres of state forest land managed by DNR Forestry and Fish and Wildlife divisions. Plans are based on ecological classification system subsections rather than administrative boundaries.

³ Minnesota has been involved in several strategic planning efforts in the past few years and has chosen to reference these efforts as the basis for overarching strategies to fulfill the federal 2008 Farm Bill requirements for statewide forest planning. Rapid changes related to the state's increased population growth, changes in land uses and fragmentation pressures on previously intact forested landscapes, downturns in the timber industry economy, climate changes, increased threats of new incoming exotic species, and shifts in outdoor recreation patterns are precipitating many of these strategic efforts. With the passage of the Clean Water, Land and Legacy Act in 2008 (discussed on pg. 18 of this document), protection and enhancement of the state's natural resources have risen in priority and will be better addressed through this new funding source coupled with federal US Forest Service Cooperative Forestry Assistance funds.

- **County Land Management Plans:** Fifteen northern and central Minnesota counties manage 2.8 million acres of forest land. These plans developed on the county level, guide land management including timber harvest on most of these acres.
- **Industrial Land Forest Plans:** Forest and other industrial forestland owners have plans for about 1 million acres of owned land.
- **NIPF Stewardship Plans:** To date 22% of Minnesota's 175,000 family forest owners have plans covering approximately 25% of the 5.7 million acres of privately owned family forest land.

Programmatically Based Plans

Topic specific plans or programmatically based plans relating to aspects of forest management have been developed as key forest plans related to the USFS Cooperative Forestry Program including:

1. **Forests for the Future (MFF) 2008 Strategic Report:**
This plan highlights major trends affecting Minnesota's forests statewide and set's the purpose, goals, strategies, and broad implementation guidelines for the establishment of the MFF program.
2. **2010 - 2015 Forest Stewardship Program Strategic Plan:**
This plan provides a framework for the next five years and is intended to guide the development of the program and actions related to its mission of helping private forest landowners plan and implement sustainable forest management practices on their lands.
3. **2010 Wildfire Protection Program Strategic Plan:**
This plan provides a yearly framework for wildfire protection across ownership and agency boundaries
4. **Community Wildfire Protection Plans (CWPP):**
These are preventative wildfire plans on county levels which are based on national themes

2008 Minnesota Forests for the Future (MFF)

"Minnesota's forests face a big challenge today: development pressures are increasing and impacting the state's ability to sustain its working forest. The state's private and public forests lands interact with each other across the landscape to create a working forest that provides many essential benefits Minnesotans care deeply about. In northern Minnesota timber and mining companies are selling thousands of acres of Minnesota's private forest lands in large chunks to financial investors. This change in ownership opens the doors to parcelization and fragmentation of large tracts of working forest land that have long been valued and used for public recreation, forest products production, and wildlife habitat. In central and southern Minnesota, key small, forested parcels are at risk of being developed, further reducing the region's already fragmented forest cover. Time may be short. At present, DNR and partners have an opportunity to acquire or permanently gain easements on these private lands that will allow Minnesotans to continue to reap the economic, social, and ecological benefits these forests provide."⁴

For more in-depth information refer to the "*Forests for the Future*" report available at http://files.dnr.state.mn.us/assistance/backyard/forestlegacy/forestsfortheFutureReport_2008.pdf

In 2007, the state DNR formed a forest legacy advisory team charged with reviewing past forest conservation easement activities and recommending a new program that would work with public and private partners to use conservation easements and other tools for retaining healthy working forests in the state. The Team was also charged with tackling the challenge of land-ownership changes that threaten working forests and asked to come up with a set of recommendations that could stem the tide of forest fragmentation and parcelization.

Key findings from the MFF strategic report include the following:

- **Protecting Minnesota's forest requires a comprehensive conservation strategy that recognizes differences in regional forest conditions.** (i.e. different forest cover types and land ownership patterns require different land management strategies)

⁴ Text from "*Minnesota Forests for the Future*"—Executive Summary: 2008

- **The greatest threat to sustaining Minnesota’s working forests lies in the conversion of private forest lands to other uses.** (i.e. investments must be made to support sustainable management infrastructure for future working forests).
- **Many factors are converging that could lead to the breaking up of Minnesota’s working forest land base and the potential loss of public access for recreation, timber production and jobs, wildlife habitat, wetlands, and other forest values.** (i.e. forest land prices are increasing, the timber industry is restructuring, major land ownership changes are occurring, parcelization is leading to development).
- **Changes in ownership and parcelization can threaten the future of public recreational access to large tracts of forest land.** (i.e. smaller forest land parcels face increases from invasive species, decreases in timber production, water quality and wildlife habitats are compromised).
- **Forest conservation evokes strongly held and differing views to the public.** (i.e. the public holds strong and differing views on how best to retain forest lands and values).
- **Among the many tools to protect the wide array of forest values provided by Minnesota’s public and private working forests, working forest conservation easements (WFCEs) are a cost-effective tool for maintaining recreational opportunities, wood products production, fish and wildlife habitat, and many other forest amenities.**⁵
- **The state can meet its fiduciary responsibilities to the permanent School Trust Fund on lands with WFCEs.** (i.e. conservation values are protected, while legal responsibilities are fulfilled).

Goals and Strategies for the Forests for the Future program include:

- **Retain and conserve forests with high public benefits (economic, recreation, and ecological)**
 - Preferentially pursue projects that provide public recreational access
 - Preferentially protect properties that provide economic opportunities from forest products
 - Preferentially pursue projects that provide multiple or single exceptional environmental, ecological, and habitat benefits
- **Promote strategic conservation of private forests**
 - Preferentially protect the largest, most intact blocks of forest
 - Preferentially pursue projects that will result in the greatest amount of consolidation, linkage, and contiguity of protected forest lands
 - Preferentially encourage projects that are linked to regional and statewide conservation efforts and that create a cumulative conservation effect
 - Preferentially pursue projects that provide management access to public lands
- **Practice sustainable forestry and maintain productive forest lands**
 - Preferentially pursue projects that maintain productive forests through sustainable forest management that supports forest-based jobs and industry
 - Ensure sustainability of managed forests through required forest management plans, adherence to best management practices (BMPs) and third-party forest certification
- **Establish and maintain sound and accountable program processes, practices, and procedures**
 - Ensure that all transactions meet statutory requirements and DNR policies regarding legal descriptions, appraisals, environmental review, easement drafting, record keeping, title review, etc.
 - Define a set of indicators to be used to track, measure, and manage progress toward program success
 - Require transparency in transactions between DNR,, non-government organizations, and lease sellers by documenting the roles of all parties such that the transaction is readily understood and require accounting of the expenditure of all public funds related to the easement
 - Operate the program in a manner consistent with standards of DNR in place at the time of the transaction as the guiding principles for operation. Such standards may govern program aspects such as project selection, acquisition processes, and monitoring

⁵ Implementation of easements are in effect and continue to be used extensively as a working forest protection tool in the state

- Develop a Web page to deliver public information on program projects
- **Implement a comprehensive easement stewardship program**
 - Develop agency capacity sufficient to ensure that the necessary monitoring and stewardship can be accomplished⁶
- **Establish and maintain diverse partnerships**
 - Work with partners to identify and protect priority forest land
 - Work with partners to secure and leverage project funds
 - Work with partners to continuously improve program performance

Further details on implementation of the goals and strategies are available through the full report at <http://www.dnr.state.mn.us/grants/forestmgmt/stewardship.html>

Forest Legacy Program (FLP) and Assessment of Need (AON)

The Forest Legacy Program (FLP) is a partnership program between the USFS and the states to protect important forest areas that are threatened by conversion to non-forest uses. The program provides matching funds to the states to acquire fee title or conservation easements to protect priority forests. All states joining the Forest Legacy Program must prepare a plan, referred to as an assessment of need (AON). The AON lists the specific goals and objectives to be accomplished, spells out the guidelines the state uses to determine project priorities, describes eligibility criteria and maps the specific Forest Legacy Areas for designation.

Minnesota's AON was completed in 1999 and approved by the Secretary of Agriculture on February 29, 2000. The AON identified the following program goals for the FLP in Minnesota:

- preventing of forest conversion in areas of the state where private forest land has a greater chance of being developed in the next decade
- encouraging all eligible organizations and agencies in the state to focus on the most threatened forests and protect them
- working with organizations and agencies in the state in protecting specific forest tracts from development

The AON further details the goals:

- to prevent the outright loss of productive timberland
- to prevent the fragmentation of forests
- to prevent the parcelization of ownership

Fifteen candidate Forest Legacy Areas (FLA) meeting the eligibility criteria to achieve these goals were proposed, described and mapped in the AON. Activation of individual candidate FLAs is necessary in order that federal funds may be used to undertake projects within the FLA. Minnesota has activated six candidate FLAs to official FLAs through a formal process outlined in the AON. These six include Rice County Big Woods, Brainerd Lakes, North Duluth, Lower St. Croix, Grand Rapids and Wabasha Blufflands FLAs. A seventh area, the Laurentian FLA is pending.

FLP will be implemented according to the FLP - AON which was approved by the Secretary of Agriculture on February 29, 2000. The AON includes the approved eligibility criteria for the FLAs, the approved FLAs, specific goals and objectives to be accomplished by the Minnesota FLP and the process by which the state lead agency will evaluate and prioritize projects to be considered for inclusion in the FLP. A copy of the state lead agency designation letter, the AON, and the AON approval letter can be found in the office of Richard Peterson, Minnesota Forest Legacy Coordinator located at 1810-30th Street NW, Faribault, MN 55021.

⁶ This strategy is being implemented and administered by the Board of Water and Soil Resources

2010-2015 Forest Stewardship Program Strategic Plan

In Minnesota, the Forest Stewardship Program has been providing technical assistance, through state forestry agency partners, to NIPF owners since 1947. While still based on landowner goals, the program has expanded to include all aspects of long-term ecosystem management as well. Completion of a forest stewardship plan helps make landowners eligible for many state and federal cost-share programs including state cost-share, federal cost-share including Environmental Quality Incentives Program (EQIP), Wildlife Habitat Incentive Program (WHIP), Conservation Stewardship Program (CRP), Biomass Crop Assistance. Registering a stewardship plan and agreeing to implement the plan's recommendations also allows landowners to enroll their lands into one of Minnesota's property tax programs through the Sustainable Forestry Incentive Act (SFIA), 2c Managed Forest Land (2c), and Rural Preserve (RP).

The latest Forest Stewardship Program strategic plan was completed in July 2009. The plan provides a framework for the next five years and is intended to guide the development of the program and actions related to its mission of helping private forest landowners plan and implement sustainable forest management practices on their lands. The plan was developed with the input of a diverse range of stakeholder interest and oversight from the Forest Stewardship Committee, which represents private woodland organizations, service agencies and family forestry advocates statewide. The plan lays out the challenges that private landowners will face in Minnesota over the next five years and recommends actions that will help the program grow and assist private forest landowners achieve their stewardship objectives.⁷

The four main **goals** identified in the next five year Forest Stewardship Program strategic plan are as follows:

- **The Next Million Acres:** includes developing a million acres of new stewardship plans by 2015.
- **Building Capacity for Service Delivery:** includes evaluating existing programmatic capacities, setting specific performance goals, monitoring outcomes and implementing strategies that will enhance services, strengthen relationships with partners and expand program accomplishments.
- **Capitalizing on Incentives and Building Awareness:** includes enhancing incentives for private land stewardship in Minnesota
- **Moving Forward with Partners and Collaboration:** includes offering a forum for collaboration through participation on the Forest Stewardship Committee and the strategic decision-making opportunities it provides.

These goals are directly related to the **leading forest resources issues** that the program is committed to address including:

- **Sustaining a Forested Landscape:** includes protecting intact forest landscapes through conservation easements, tax law and incentive programs, working with partners to identify opportunities for forest protection, enhancement or restoration, exploring new opportunities for rewarding forest stewardship, including forest certification and carbon credit markets and raising awareness of the value and importance of intact forest landscapes.
- **Managing Diverse and Healthy Forest Ecosystems:** includes collaboration between the Forest Stewardship Program, private woodland owners and their service providers to proactively implement management strategies that protect, enhance and restore diverse forest ecosystems in the face of climate change and fragmentation of forest landscapes.
- **Protecting and Enhancing Soil and Water Resources:** includes protecting the more than 5.3 million acres of private non-industrial forest lands as part of surrounding watersheds and popular lakes, rivers and streams. Intact forest systems provide significant protection for water run-off, increase infiltration and groundwater recharge, improved water filtration, protection of drinking water resources as well as ensuring healthy water-based recreational activities such as swimming, boating and fishing.
- **Managing for Timber and Nontimber Forest Products:** includes supporting private forest owners with multiple objectives for their land including harvesting traditional wood and fiber products as well as non-traditional products such as balsam boughs, birch bark and maple syrup.

⁷ Refer to "Forest Stewardship Program Strategic Plan" 2010-2015 pg. 6

- **Recreation, Aesthetics and Cultural Heritage:** includes the recognition that cultural heritage and historic resources must be protected; while protection of non-industrial private forests is under increased public pressure for outdoor recreation, aesthetics and scenic enjoyment.

Several strategies as written in the five year plan are included in the matrices located within this document under Chapter Four, with corresponding identification of stakeholders, partners and resources. The plan can be accessed through <http://www.dnr.state.mn.us/grants/forestmgmt/stewardship.html>

2010 Wildfire Protection Program Strategic Plan

Minnesota works cooperatively with its partners to prevent and suppress wildland fires within the state so that lives, property and natural resources are protected. The **mission and goal** is: *to provide the citizens of the state with an effective, efficient and coordinated wildland fire management program that reduces impacts of wildfires while supporting ecosystem management needs.*

Strategies are tied directly to achieving the mission and goal including:

- developing and maintaining an internal workforce capacity
- maintaining and enhancing current cooperative partnerships and developing new partnerships
- monitoring and adjusting the scope of wildfire protection coverage, necessary planning levels and suppression resources required to support fire and all risk protection missions
- enhance fire prevention and enforcement efforts
- improve utilization of available technologies
- develop or redesign business systems specifically to enhance fire management, accountability and to reduce costs
- promote the role of fire in the ecosystem by strengthening the prescribed burn program
- implement an efficient and cost effective fire program

These strategies are laid out in the Reducing Wildfire Risks matrix under Chapter 4 with corresponding identification of stakeholders, partners and resources. Further information on wildfire and prescribed burning is available through www.dnr.state.mn.us/forestry/fire

Community Wildfire Protection Plans (CWPP)

Minnesota encourages all communities or local units of government (LGUs) to develop CWPPs as defined by the federal Healthy Forests Restoration Act (HFRA). The plans enable communities to plan how they will reduce the risk of wildfires through identifying strategic sites and methods for fuel reduction projects across landscapes and jurisdictional boundaries. Benefits of having a CWPP include National Fire Plan funding priority for projects that are identified in the CWPP. The USFS can help expedite the implementation of fuel treatments that have been identified in a CWPP through alternative environmental compliance options offered under the HFRA.

The Minnesota Division of Forestry is working with 87 counties to develop CWPPs to meet the federal requirements. The state is also working with 100 communities on Firewise programs and assisting these communities with the assessment process and will continue to support communities through the planning process. In 2010, four northern forested Minnesota counties including Cook, Itasca, Lake and St. Louis have completed their plans.

Further information is available through http://www.na.fs.fed.us/ss/04/nfp_mn.pdf and <http://www.dnr.state.mn.us/firewise/community.html>

Related Conservation Planning Efforts

Numerous conservation plans have also recently been developed that can significantly influence forest resource management including climate change, habitat needs, key water issues and outdoor recreation needs in Minnesota. They are as follows:

1. **2008 Statewide Conservation and Preservation Plan**
2. **2009 - 2013 Strategic Conservation Agenda**
3. **2006 Tomorrow's Habitat for the Wild and Rare: An Action Plan for Minnesota Wildlife**
4. **2008-2012 Adapting to Change - SCORP Minnesota's State Comprehensive Outdoor Recreation Plan**

2008 Statewide Conservation and Preservation Plan

In 2007, the Minnesota Environmental and Natural Resources Trust Fund funded a unique partnership between the University of Minnesota and the consulting firms of Bonestroo and CR Planning to evaluate the state's natural resources, identify key issues affecting those resources, and making recommendations for improving and protecting them. More than 125 experts including University of Minnesota scientists, public and private natural resource planners and professionals, participated in the 18 month effort. The final report with detailed geo-spatial analysis was published and released in November 2008 and is now available through http://www.lccmr.leg.mn/statewideconservationplan/SCPP_FinalPlan.html

In the first phase of the project, Minnesota's constitutionally identified natural resources of air, water, land, wildlife, fish, and outdoor recreation were identified and assessed based on past and present conditions. This led to identification of drivers of change immediately impacting the six natural resources and key issues that could be addressed to protect and conserve these resources in an integrated fashion.

The second phase of the project concentrated on the key issues in depth, developing recommendations to positively impact the widest range of natural resources as possible while taking into account demographic changes, public health, economic sustainability, and climate change. The recommendations were then paired with five strategic areas. Recommendations were identified as being either policy and action (i.e. put into effect directly by the Legislature) or adding to the knowledge base (research needs, data gathering and monitoring needs, or educational activities).

The plan identifies key drivers of change⁸ that negatively impact each natural resource and maps them as to their relationship and proximity by order of importance. These mapped relationships have been laid out as follows:

- land and water habitat fragmentation, degradation, loss, and conversion
- land use practices
- impacts on resource consumption
- invasive species
- energy production and use including toxic contaminants
- transportation

These drivers of change then led to a strategic framework for recommendations which were designed to consider conserving and protecting the state's natural resources in a comprehensive, holistic fashion. The recommendations were developed to reflect main strategic areas and tie to recommendations for action, policy changes or knowledge infrastructure. Included in these strategic areas are Integrated Planning, Critical Land Protection, Land and Water Restoration and Protection, Sustainable Practices, Economic Incentives for Sustainability and Knowledge Infrastructure.⁹ These broad policy and action recommendations were grouped by topic (e.g. habitat, land use) and then ordered starting with those recommendations having the broadest impact across multiple resource values followed by those having more targeted impact. Recommendations

⁸ Refer to Minnesota Statewide Conservation and Preservation Plan- Appendix 1 pgs 209-214

⁹ Refer to Minnesota Statewide Conservation and Preservation Plan – pgs. 23-28

were then delivered to the state Legislature for consideration of implementation based on the most pressing issues facing Minnesota's natural resources and providing benefits to multiple resources. While the report and matrices are focused on all natural resources throughout the state, they have been reviewed and incorporated as appropriate for the state's forest lands under Chapter 4 of this document.¹⁰

2009 - 2013 Strategic Conservation Agenda

The "*Strategic Conservation Agenda*" articulates DNR's mission, goals, trends, strategic directions, and performance indicators and targets that the agency uses to measure progress. First released in 2003, the latest iteration of the "*Conservation Agenda*" includes two parts. "*Part I: Strategic Directions*" highlights three key trends that shape DNR's ability to achieve its mission and goals. It describes eight strategic directions the agency is pursuing to achieve its goals in the context of these trends. "*Part II: Performance and Accountability Report*" describes more than 90 performance indicators and conservation targets DNR uses to measure and communicate progress as the agency works to achieve its conservation goals. The "*Conservation Agenda*" is available at <http://www.dnr.state.mn.us/conservationagenda/index.html>

The main natural resources **trends** in the state include:

- **changes in outdoor recreation participation** (need to connect more people to the outdoors)
- **changes related to energy and climate** (need for climate change mitigation and adaptation)
- **landscape changes from growth and development** (need for private lands conservation assistance; need for community conservation assistance; need for integrated approaches to public and private land management; water protection and planning)

These three key trends shape the state's natural resources and the ability to achieve the conservation goals. They are cross cutting and have significant influence on forest resource sustainability.

DNR's long-standing **goals** include:

- Minnesota's **natural lands and habitats will be conserved and enhanced**
- Minnesota's **water resources and watersheds will be conserved and enhanced**
- Minnesota's **fish and wildlife populations will be healthy and provide great recreation opportunities**
- Minnesota **will have a high-quality and diverse outdoor recreation system**
- Minnesota **will provide for sustainable economic use of its abundant natural resources**

For each of these goals, DNR envisions the following:

Minnesota's natural lands and habitats will be conserved and enhanced

- **Remaining natural ecosystems are conserved.** Healthy habitats are connected by natural corridors. Native prairies are protected, and grasslands and riparian forests are restored through donations, purchases, and easements. Uncommon and rare habitats are protected.
- **Degraded habitats are restored.** Lakes, wetlands, and rivers are renewed. Grasslands and forests are restored. Marginal cropland is enrolled in long-term conservation easement programs. Corridors such as public rights of way support rich natural resources.
- **Natural resources thrive in the context of human influences.** Invasive species are under control. Natural lands continue to provide ecological, recreational, and economic benefits in the face of climate change. Fire is a part of forest and grassland ecosystems, while people and property are protected from wildfire.
- **The forest resource is substantial and enduring.** The future forest resource is larger than the forests of today. With state assistance, private landowners manage forests for multiple values. Corridors link tracts of forest land and provide the extensive habitat wildlife needs to thrive.
- **Urban and developing areas support a diversity of plant and animal communities and offer diverse recreational opportunities.** Surface and ground water is clean and abundant enough to meet

¹⁰ Refer to "*Minnesota Statewide Conservation and Preservation Plan*"- pgs. 23-28 and Appendix 1 pgs 209-214

the needs of ecosystems, businesses, and residents. Local decisions are supported by public-private partnerships, with the state providing technical assistance and coordination.

Minnesota's water resources and watersheds will be conserved and enhanced

- **Waterways have integrity.** Natural characteristics of shorelines, aquifers, and wetlands are protected. Formerly disrupted stream flow has been restored whenever possible. Storm water is managed in ways that protect downstream resources. Point and nonpoint source pollution is minimized. Harmful invasive species have been reduced, and no new invaders are introduced.
- **Water resources are conserved.** Ground water and other water resources are used in a way that preserves their integrity for future generations. They are shared fairly among recreation, residential, and commercial uses while retaining their ability to sustain natural systems. Sensitive and rare aquatic communities, such as trout streams and calcareous fens, are protected.

Minnesota's fish and wildlife populations will be healthy and provide great recreation opportunities

- **Fish and wildlife populations and the habitats that support them are healthy.** Habitat types in jeopardy, such as prairies, wetlands, and shallow lakes, are restored. Endangered and threatened species, species of special concern, and species in greatest conservation need are conserved.
- **Conservation partnerships and stewardship ethics are strong.** Public and private-sector partners work together to support Minnesota's resources and promote conservation. Natural resources education and enforcement help citizens safely enjoy outdoor recreation and provide decision makers with the information they need to make wise resource-related decisions.

Minnesota will have a high-quality and diverse outdoor recreation system

- **Natural resources provide a diverse, sustainable range of outdoor recreation opportunities.** Recreation landscapes span the spectrum from primitive areas to heavily used urban trails. Natural features are celebrated and protected. Fish, wildlife, and plants are conserved.
- **A comprehensive outdoor recreation system serves all Minnesotans.** People of all backgrounds, interests, abilities, and geographic settings have access to high-quality recreational resources and to the knowledge needed to appreciate and use them. Opportunities are coordinated across ownerships.
- **Recreational facilities and settings provide safe, high-quality visitor experiences.** Programs, signs, and other resources help users become aware of, understand, and enjoy outdoor recreation opportunities. Educational programs promote safe behaviors that lead to increased participation and memorable experiences.
- **Minnesotans have a lifelong stewardship ethic.** Natural resources education is woven through formal and informal education. The state, informed citizens, and community leaders work together to care for Minnesota's natural resources.

Minnesota will provide for sustainable economic use of its abundant natural resources

- **Healthy forests are sustainably managed to provide ecological, economic, and recreational benefits.** State forest lands are certified as well-managed. Scientific management tools and diversified management practices keep the forest-based industry vibrant while maintaining forest health and our ability to meet non timber needs. Forests are valued for carbon sequestration. Recreational opportunities are many and varied.
- **Healthy, working farmland and critical habitat are protected as land is used for food, fiber, and energy production.** Expanded renewable energy production promotes restoration and maintenance of land in natural perennial vegetation. Wildlife habitat, outdoor recreation, water quality, and carbon sequestration increase.

To achieve these goals in the context of the three key trends, DNR is pursuing eight strategic directions. These are focused on particular trends, but also cut across trends.

Trend: Changes in Outdoor Recreation Participation

Strategic direction: Connecting people to Minnesota's great outdoors

Trend: Changes Related to Energy and Climate

Strategic directions: Climate change mitigation and adaptation; Conservation-based energy sources; Energy efficiency

Trend: Landscape Changes from Growth and Development

Strategic directions: Private lands conservation assistance; Community conservation assistance; Integrated approaches to public and private land management; Water protection and planning.

2006 Tomorrow's Habitat for the Wild and Rare: An Action Plan for Minnesota Wildlife

In 2001, the United States Congress created the State Wildlife Grants Program and required all states to develop a comprehensive wildlife conservation strategy (CWCS), to identify and manage species in greatest conservation need. This mandate, which is to be revisited every ten years, provides an historic opportunity to consider the condition of all native wildlife, including birds, mammals, fish, amphibians, reptiles, mussels, spiders, and insects. In response to this request, the Minnesota 2006 CWCS effort created a process which engaged well over 100 conservationists from around the state and served as the baseline for future efforts and tracking of the state of Minnesota's wildlife. The final document comprehensively reviewed the best available information and data to create a set of species in greatest conservation need (SGCN) and a conservation approach that seeks to ensure the survival of all Minnesota's wildlife for future generations to experience and enjoy. It is intended that this document will be revised on a 10-year cycle and articulate actions for a 100-year period and beyond.

Minnesota is a biologically diverse state with thousands of known native wildlife species including spiders and insects. Of these, 292 have been identified as species in greatest conservation need by the CWCS project. Recognizing that habitat loss and degradation are the primary reasons for these declines (more research is needed to assess the threats and declines due to climate change), the CWCS project identified key habitats which are most important to protect based on the following factors:

- **Key habitats used by the greatest number of SGCN**
- **Key habitats that have experienced the most alteration over the past 100 years**
- **Key habitats that contain high percentages of SGCN that are habitat specialists**
- **Key habitats that are designated by The Nature Conservancy as important stream segments**

Minnesota's CWCS must coexist with current or proposed land uses within the state and work alongside agricultural and forestry interests, mining and urban development. Therefore, the habitat goal is to encourage targeted conservation work that benefits species in greatest conservation need. Strategies in this document are diverse and can be applied at multiple scales depending on the conservation issues and challenges at hand. Actions may include providing technical assistance and financial incentives to private landowners, habitat management, preservation (such as the use of conservation easements) and/or restoration, research to address a particular management challenge, or other habitat protection options.

Three goals were articulated in the 2006 CWCS plan:

- **Stabilize and increase SGCN populations**
- **Improve knowledge about SGCN**
- **Enhance people's appreciation and enjoyment of SGCN**

Each goal discussed a specific management challenge and key strategies. These strategies are listed under Chapter 4 of this document.

For more detailed information on specific action items and lists of SGCN keyed to habitat types go to the full report "*Tomorrow's Habitat for the Wild and Rare – An Action Plan for Minnesota Wildlife*" at

www.dnr.state.mn.us/cwcs

2008-2012 Adapting to Change – SCORP Minnesota’s Comprehensive Outdoor Recreation Plan

The state comprehensive outdoor recreation plan is a requirement of the National Park Service to maintain eligibility to participate in the federal Land and Water Conservation Fund (LWCF) and is updated on a five-year cycle. This fund which is often referred to as the LAWCON fund, was created by Congress in 1964 to address increasing participation in outdoor recreation and conservation efforts. The program has assisted with the acquisition of over 7 million acres of park land nationwide and funded over 40,000 state and local recreation and natural areas since its inception.

Although the LWCF is a relatively low-key program, its impact in Minnesota has been over \$68 million in investments to the outdoor recreation system, mostly in the 1960s-1980s. State and local funds match this program funding projects creating 698 state parks, recreation areas and waysides, 35 state forest campgrounds and recreation sites, 20 scientific and natural areas, 16 public access sites, 12 wildlife management areas, seven state wild and scenic rivers, five state trails, four Minnesota Historical Society recreation sites, three University of Minnesota recreation sites and hundreds of local government park projects throughout the state.

The state 50% match program supports the acquisition and development of the State Outdoor Recreation System as defined in Minnesota Statutes, Chapter 86A. The local program, funded through the Outdoor Recreation Grant Program and Natural and Scenic Area program, provides grants to local units of government and recognized native Tribal governments for acquisition and development of outdoor recreation and natural areas.¹¹

A single important goal was set out by the SCORP Advisory Group for the 2008-2012 report which states: **Increase participation in outdoor recreation by all Minnesotans and visitors.**

The one goal is based on several challenges facing the state including:

- **Pressures on natural resources base**, especially around rapidly urbanizing areas of the state
- **Sustaining existing facilities** to ensure they are accessible, safe, energy efficient, economical to operate and maintain and flexible enough to accommodate changing needs
- **Healthy Lifestyle** connections with the outdoors need to be encouraged as obesity rates a 132% rise in the state since 1990
- **Connecting People to Nature** by providing close to home access to nature for children and time for unstructured play and exploration
- **Population Changes** in the state indicates an older and more culturally and ethnically diverse population which translates into differing views and participation rates in outdoor recreation activities

Four strategies were identified in the report to address the above challenges including:

- **Acquire, protect and restore Minnesota’s natural resource base, on which outdoor recreation depends. This includes obtaining prime outdoor recreation areas throughout the state prior to anticipated land use changes.**
- **Develop and maintain a sustainable and resilient outdoor recreation infrastructure.**
- **Promote increased outdoor recreation participation through targeted programming and outreach.**
- **Evaluate and understand the outdoor recreation needs of Minnesotans and the ability of Minnesota’s natural resources to support those needs.**

For further details on the SCORP plan go to http://files.dnr.state.mn.us/aboutdnr/reports/scorp_final_3308.pdf

¹¹ “Adapting to Change: Minnesota’s 2008-2012 State Comprehensive Outdoor Recreation Plan.” (SCORP)

Clean Water, Land and Legacy Constitutional Amendment

In November 2008, the citizens of Minnesota overwhelmingly voted for a constitutional amendment entitled the Clean Water, Land and Legacy Act or Green Initiative to increase funding for the outdoors and the arts by a 3/8^{ths} of one% sales tax increase over a 25 year period beginning on July 1, 2009 and sun-setting on June 30, 2034.¹² Over 1.6 million voters stated they wanted funds constitutionally dedicated to preserving the state's outdoor heritage, which is the largest such dedication to natural resources in the United States. It is estimated that over \$481 million will be generated for outdoor land and habitat protection, restoration, and enhancement within the next two years alone.

In 2009, the state Legislature created four Legacy Amendment funds to oversee funding requests and provide annual recommendations to the legislature on how funds should be expended. To determine the best way to allocate these Legacy Amendment funds, lawmakers worked closely with an array of conservation, natural resource agencies and sportsmen's groups, along with arts, education and historical agencies. The initial breakdown of the approximately \$231 million annually is reflected below:¹³

- **Lessard-Sams Outdoor Heritage Fund (LSOHC):** 33% or \$77 million to be used to protect forests, prairies, wetlands, and fish, game, and wildlife habitat.
- **Clean Water Fund:** 33% or \$77 million to be used for testing and clean-up of the state's lakes, rivers, and streams; shoreline protection and restoration; and education and public engagement efforts.
- **Parks and Trails Fund:** 14.25% or \$33 million for park and trails priorities and needs including improved visitor services, enhanced natural resources protection, facility maintenance and educational/interpretive programming.
- **Arts and Cultural Heritage Fund:** 19.75% or \$44 million to help fund the Minnesota Arts Board, Minnesota Historical Society, Minnesota Humanities Center, Perpich Center for Arts Education, Minnesota's Science and Children's museums, and the state's zoos.

Projects funded through the Legacy Amendment will not only be good for the state's environment but will also provide for economic development opportunities as well. As an example, one of the first recipient projects under the Outdoor Heritage Fund is the protection of a 187,277, acre Upper Mississippi Forest landscape, which is believed to be the largest private-land conservation effort in state history and among the largest in the nation. A binding agreement between the state DNR and UPM/Blandin Paper Company has been signed for the purchase of a working forest conservation easement and includes forests, wetlands and shoreline protection. This project complements the goals of the state's DNR MFF initiative and is supported by a large coalition of conservation, local government and economic development organizations including The Nature Conservancy (TNC) and the Forest Legacy Partnership (FLP). The agreement will provide permanent public access and numerous land and water safeguards for the future under the Sustainable Forestry Initiative (SFI), and would not have been possible without the recent passing of the Clean Water, Land and Legacy Act.

Fifty Year Vision – Conservation for Minnesota's Future

In 2007, the Minnesota Campaign for Conservation, (a coalition of citizens and organizations committed to developing long-term conservation strategies, funding sources and policies for the preservation of the state's priceless outdoor traditions) completed a 50-year vision for the state. The 50-year vision was developed over several years and relied on the expertise of numerous individuals and organizations. This vision sets out an agenda to use Clean Water, Land and Legacy funds responsibly and to get the maximum impact from them for the present and future generations. The focus is on cleaning up lakes and rivers; protecting and restoring natural resources; and promoting nature as a place to enjoy through parks, trails, hunting and fishing. Many organizations including The Nature Conservancy, Trust for Public Land, League of Conservation Voters,

¹² See: Minnesota Constitutional Amendment – Article XI www.lsohc.leg.mn

¹³ Based on sales tax revenues which can vary year to year with economic conditions..

Minnesota Center of Environmental Advocacy, Minnesota Department of Natural Resources, Parks & Trails Council, Theodore Roosevelt Conservation Partnership, Audubon, Ducks Unlimited, USDA, US Forest Service, US Fish & Wildlife Service, Minnesota Forest Resource Council, Explore Minnesota, Board of Soil and Water Resources, Conservation Biology Institute, were consulted and provided input into this effort.

The full report is available through www.belwin.org/50yearvision

Key findings and challenges identified in the plan include the following:

- **Population Growth:** Projections are that the state's population will increase by 27.4% by 2030 and shift from rural/urban to urban/suburban. Strategies include protection of large land tracts through conservation easements and fee acquisitions.
- **Water Quality Degradation:** Only 15% of the state's waters have been tested for impairments but four out of ten have failed to meet water quality standards. Optimal strategies for restoring lakes, rivers and streams include reducing urban and agricultural run-offs, through riparian buffers, porous surface materials and rain gardens; upgrading poorly performing septic and wastewater systems; addressing shoreland development and drainage.
- **Shoreland Development:** Minnesota's lakes are seeing increased development pressures. Developed shorelines average 66% less aquatic vegetation than undeveloped ones resulting in degraded water quality and lower fish production. Strategies include revisions of the shoreland rules and education of the public.
- **Drainage:** Minnesota has 5 million acres of drained land with a vast system of tiling and drainage ditches. Wetlands are still being drained which compromises water quality at receiving lakes and rivers. Swift drainage and tiling also increases pollution and excess nutrients into water systems. Strategies include riparian buffers and restoration of wetlands.
- **Habitat Degradation:** Minnesota continues to lose wildlife habitats. 50% of pre-settlement forests are gone and 99% of grasslands have disappeared resulting in losses to wildlife species. 292 species are at risk today. Remaining habitats are at risk for degradation from fragmentation, fire suppression, invasive species and climate change. Strategies include protection of intact landscapes, conservation easements, fee acquisitions of key forest landscapes.
- **Forest Fragmentation:** Commercial forest harvest decline through land ownership pattern changes and breaking up of continuous land bases, negatively affect economic viability of forests for timber production. Strategies include stabilization of large forested tracts undisturbed forests.
- **Fire Suppression:** Some Minnesota landscapes depend on fire disturbance as a management tool for healthy growth. Transition zones between forests and grasslands are particularly affected. Strategies include Prescribed Burning and education of the public.
- **Invasive Species:** Minnesota is facing an onslaught of increasing exotic invasive species. Cooperation between agencies, organizations is vital to combat this effort. Strategies include targeted management of key habitats, research funding for new management techniques.
- **Climate Change:** Global climate change will alter wildlife and plant habitats in Minnesota. Strategies include research and monitoring of changing conditions to key species and protection of forest lands in order to adapt to new climate change patterns.
- **Biofuels:** Minnesota is exploring moving from the production of corn ethanol to conversion of conservation lands (CRP) for perennial plant production. Strategies include cooperation and partnerships with federal agencies on continuing the CRP program; exploration of new bio-fuels technology.
- **Seasonal Use and Resource Consumption:** Seasonal residences and communities form a large part of Minnesota's landscapes. Infrastructure needs including water supply, wastewater services, impervious surfaces and large developed lots place severe pressure on waters and wildlife outside larger communities. Strategies include shoreland regulations and education of the public.
- **Shrinking Public Access to Natural Areas:** Increasingly, Minnesota shorelines and landscapes are being closed to the public by retirement homes and private properties. Strategies include conservation easements and fee acquisition of access sites and trails for the public to enjoy traditional outdoor opportunities.
- **Outdoor Recreation Conflicts:** While outdoor participation is seeing a percentage decrease, population growth will place increased demand on outdoor activities as well as conflicts among users.

Expanded recreational opportunities that are not compatible are already creating multi-use conflicts that will need increased management during a time of decreased revenues and state budgets. Strategies include buffering Wildlife Management Areas from increased residential development and separating conflicting uses within landscapes.

- **Indoors Culture:** Minnesota has a rich history of participating in outdoor activities including hunting, fishing, skiing, playing in the woods and enjoying the great outdoors. However, statistics show that there is a loss of the outdoors ethic, which is leading to less participation or care about the outdoors. Loss of participation and easy access to natural lands, impacts the way the public thinks about the outdoors. For Minnesotans to continue to have a healthy environment and functioning natural systems, its citizens will need to value their natural surroundings. Strategies include education of the public and providing outdoor experiences through natural resource programs.
- **Governance:** Many conservation issues facing Minnesota could be addressed through government policies and funding. However, agencies and/or local governments often cannot or will not look at appropriate planning, zoning, or funding levels. Additionally, when governments are attempting to make progress in conservation, they can find themselves challenged by an inability to coordinate with other jurisdictions and opposition to public land ownership.¹⁴

Minnesota's Climate Change Initiatives

The Minnesota Climate Change Advisory Group (MCCAG) was formed in December 2006 as a broad-based group of Minnesota citizens and leaders charged with developing a comprehensive plan to reduce the state's emissions of greenhouse gases. The group had assistance from the Center for Climate Strategies (CCS) and were tasked with developing a "*Minnesota Climate Mitigation Action Plan*", which included a comprehensive set of state-level policy recommendations to the governor, through a stakeholder-based consensus building process. The plan was completed and released in 2008. Chapter 6 of the plan is focused on agriculture, forestry, and waste management and contains detailed and specific strategies and recommendations for carbon sequestration opportunities within agricultural, forestry and waste management systems, including opportunities for reforestation of over 1 million acres of trees within the state. The MCCAG recognized the importance of forests in greenhouse gas reduction by suggesting that nearly 30% of the state's 2025 greenhouse gas reduction goals as set by the governor, could be achieved through forest management initiatives.

The full report is available on-line at <http://www.mnclimatechange.us/MCCAG.cfm>

In 2008, the state Legislature directed the Minnesota Forest Resources Council (MFRC) to review the MCCAG recommendation to increase carbon sequestration in forests by planting 1 million acres of trees. The Legislature requested recommendations on implementing such an effort and an analysis of the number and ownership of acres available for tree planting, the types of native species best suited for planting, the availability of planting stock, an potential costs. The final report, "*Assessing Forestation Opportunities for Carbon Sequestration in Minnesota*" was completed and presented to the legislature on January 15, 2010.

The full report is available on-line at http://www.frc.state.mn.us/initiatives_policy_carbon.html.

Recommendations from both the above plans, especially as they relate to the states forest resources, are comprehensive and the DNR is periodically asked to report to the legislature on the progress of implementation of the recommendations.

¹⁴ Text adapted from "*A Fifty-Year Vision: Conservation for Minnesota's Future*".
Available at: www.campaignforconservation.org

Public and Protected Lands Management

Importance of Publicly Owned and Protected Lands

Minnesota is nationally known for its abundance of public lands that are important assets and greatly valued by the public. These forest lands which cover approximately one-third of the state, ensure that forest and water resources, are protected for the greatest public good. Traditionally, forests in the state provided important economic revenue and were an important resource in creating wealth for the people of the state. Today public forest lands must fulfill additional management objectives under agency mandates for conservation and sustainability and are generally protected from conversion to other uses such including urban development or fragmentation. In many cases, public forests offer large tracts of undisturbed forest land and are often the best refuges to protect and maintain biodiversity, while providing outdoor recreational opportunities for the public to enjoy. Public forests provide a wide range of outdoor activities including hunting, fishing, camping, wildlife watching, berry picking, bough harvesting, mushroom picking and motorized and non-motorized trail riding.

Although, Minnesota's publically owned forests are managed by a variety of agencies, which have differing missions and management protocols, they all highly value forest and grasslands health and sustainability.

The **Minnesota Department of Natural Resources (DNR)** is the largest public landowner in the state and manages over 5.5 million acres of state-administered land including forests, wildlife management areas, parks, trails, forest campgrounds, aquatic management areas, scientific and natural areas and water access sites. The mission of DNR is: *"to work with citizens to conserve and manage the state's natural resources, to provide outdoor recreation opportunities, and to provide for commercial uses of natural resources in a way that creates a sustainable quality of life."*

The **USFS** manages two national forests in Minnesota. The mission of the USFS is: *"to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations."* The two national forests are outlined as follows:

- The **Superior National Forest** which owns and manages over 3,900,000 acres of woods and waters in the northern northeast corner of the state. Approximately one-quarter of the forest is set aside as a wilderness preserve known as the Boundary Waters Canoe Area Wilderness (BWCAW), which straddles between the Superior National Forest, Voyageurs National Park and Quetico Provincial Park in Ontario, Canada.
- The **Chippewa National Forest** boundary encompasses about 1.6 million acres, with over 666,000 acres managed by the forest. Water is abundant with over 1,300 lakes, 925 miles of streams, and 400,000 acres of wetlands. The forest is also one of the largest breeding population areas of bald eagles in the lower 48 states. The forest contains both a working forest and the 'Lost Forty', a remnant of the state's old growth forest. Recreation developments, wildlife habitat projects and timber harvest are evident. The forest's unique situation within the national forest system includes most of the Leech Lake Indian Reservation overlying the national forest.

The **Bureau of Indian Affairs (BIA)** administers 1,036,394 million acres in trust for 11 tribes. Of these acres, approximately 1,400 are in the public domain. The mission of the BIA is: *"to enhance the quality of life, to promote economic opportunity, and to carry out the responsibility to protect and improve the trust assets of American Indians, Indian Tribes and Alaska Natives."*

The **US Fish and Wildlife Service (USFWS)** owns and manages 13 national wildlife refuges in Minnesota totaling more than 216,000 acres. USFWS also manages 8 Wetland Management Districts totaling over 272,000 acres. The mission of the USFWS national wildlife refuge system is: *"to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans."*

The **National Park Service** (NPS) owns and manages Voyageurs National Park which is over 218,000 acres and is the largest water-based park in the National Park System. The mission of the National Park Service is: *“to preserve unimpaired, the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. The Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.”*

The **Board of Water and Soil Resources** (BWSR) manages and monitors over 210,000 acres of permanent conservation easements within Minnesota. BWSR is the state soil and water conservation agency and administers programs that prevent sediment and nutrients from entering lakes, rivers and streams; enhance fish and wildlife habitat; and protect wetlands. The agency works in partnership with local units of government such as counties and soil and water conservation districts (SWCD), state and federal agencies, tribes and other organizations. The mission of the BWSR is: *“to improve and protect Minnesota’s water and soil resources by working in partnership with local organizations and private landowners.”*

The **US Army Corps of Engineers** (USACE) owns and manages approximately 9,000 acres of Mississippi River floodplain forest within Minnesota¹⁵. Nearly all this land is also included in the Minnesota State Wildlife Management Area (Gores) or the Upper Mississippi River National Wildlife and Fish Refuge (USFWS) through real estate out grant or cooperative agreements. In addition, the USACE manages 6 recreation areas in the Mississippi River Headwaters area of Minnesota. These are located at Leech Lake, Lake Winnibigoshish, Sandy Lake, Gull Lake, Cross Lake and Pokegama Lake. These recreation areas total approximately 300 acres. The Civil Works Mission of the USACE is: *“to contribute to the national welfare and serve the public, by providing the Nation and the Army with quality and responsive development and management of the Nation’s water resources; protection, restoration, and management of the environment; disaster response and recovery; and engineering and technical services in an environmentally sustainable, economic, and technically sound manner through partnerships.”*

¹⁵**Note:** As of June 2010, the USACE is in the final public review stages of their “*Upper Mississippi River Systemic Forest Management Plan*” which includes the combined floodplains of the Upper Mississippi, Illinois, Kaskaskia, Minnesota, Black and St. Croix rivers covering approximately 2.6 million acres. The purpose of the plan is to provide a guide for the sustainable management of Upper Mississippi River System (UMRS) forests, including opportunities for their restoration and to ensure that the UMRS maintains its recognition as a nationally treasured ecological resource. The draft report can be accessed online at: <ftp://ftp.usace.army.mil/pub/mvp/UMR%20Forest%20Plan/>

• Table 1 Forest Land and Grasslands Acreages Managed by Federal, State Agencies and Tribes¹⁶

Public Agency	Acres of Forest/Grasslands
MN Department of Natural Resources ¹⁷	5,500,000
Superior National Forest (includes Boundary Waters)	3,900,000
Chippewa National Forest	666,620
Bureau of Indian Affairs (public domain managed under Trust)	1,421
• Red Lake Band	806,698
• White Earth	77,249
• Grand Portage	47,024
• Bois Forte	42,131
• Leech Lake	27,391
• Fond du Lac	24,709
• Mille Lacs	4,189
• Prairie Island	1,807
• Lower Sioux	1,785
• Upper Sioux	1,329
• Prior Lake Shakopee	661
US Fish & Wildlife Service (National Refuges and Wetland Districts)	488,000
National Park Service (Voyageurs)	218,000
Board of Water and Soil Resources (permanent easements) ¹⁸	210,000
US Army Corps of Engineers	9,300
TOTAL ACRES:	11,818,314

State Forest Land Management

The Division of Forestry is an integral component of the state Department of Natural Resources and has prime responsibility for forest management on all state lands. Sustaining Minnesota's forest ecosystems in a healthy, resilient, and productive state is the best way to ensure that current and future generations enjoy a full range of forest benefits. Several programs have standing goals and strategies for achieving sustainable forestry including the following:

- **Cooperative Forest Management:** To support the efforts of private landowners and communities in maintaining their forest resources.

The Division of Forestry provides technical and cost-share assistance to non-industrial private forest landowners and Minnesota communities with urban forests. This includes acquiring and monitoring permanent conservation easements to ensure that working forests continue to provide Minnesotans with recreational opportunities, forest products, and ecosystem services.

- **Fire Management:** To protect citizens, property, and natural resources from wildfires

The Division of Forestry provides wildfire protection to avoid loss of life and minimize the loss of property and natural resources. This includes responding to fires and natural disaster emergencies in Minnesota and other states, and supporting the effective use of prescribed fire as a natural resource management tool.

- **State Land Asset Management:** To manage state administered forest lands for multiple forest values, including quality timber, wildlife habitat, recreation, and aesthetics, over the long term

¹⁶ Source: Land acreages from USFS, USFWS, BIA, NPS, USACE

¹⁷ This figure does not include forest easements which are currently at 66,000 acres with an additional 270,000 pending

¹⁸ See: http://www.bwsr.state.mn.us/maps/Website/Easements/RIM/BWSR_State_Funded_Easements.pdf

The Division of Forestry manages state-administered lands by sustaining and enhancing forest ecosystems, ensuring a sustainable supply of high quality forest products and recreational opportunities, and providing revenue to the permanent school trust fund.

- **Core Program Support:** To support forestry activities, those of other DNR divisions and other state agencies and stakeholders

The Division of Forestry produces and sells trees and shrub seedlings for conservation plantings on public and private lands. Forestry monitors the health, growth, and composition of Minnesota's forests and checks on the implementation and effectiveness of forest management practices and guidelines. Forestry develops, and evaluates new management approaches, assists county land managers, and provides marketing assistance to forest-related businesses. Forestry also coordinates forestry related education programs in schools.

Sustainable Forest Resources Act (SFRA)

In addition to the above responsibilities of the state Division of Forestry, the division also partners with the MFRC to implement the state Sustainable Forest Resources Act (SFRA). The act was established by the state legislature in 1995 (Minnesota Statutes, chapter 89A) as a result of over five years of analysis and consensus building on forest resource management and policy. The SFRA established a number of innovative programs to promote the sustainable use and enjoyment of the state's forest resources. The SFRA recognizes a broad range of forest resources values ranging from recreation to wildlife, and timber to aesthetics. Similarly, the SFRA program initiatives reflect diverse interests in the use, management and protection of the state's extensive and diverse forest landscapes.¹⁹

The SFRA created the MFRC as a policy focused entity to help implement the act and advise the governor, legislature and public management agencies. The council consists of seventeen members representing a range of forest resource interests. The MFRC brings together the state's varied forest resource interests to develop and implement programs that promote sustainable site and landscape based forest management practices. The MFRC also acts as a forum for forest stakeholders to solve problems in forest management collaboratively, and addresses conflicts between economic, ecological and social values associated with forests.²⁰

County Lands Management

Minnesota has approximately 2.8 million acres of land in county ownership, a result of 1930s depleted and abandoned farms and forest land that were acquired through tax-forfeits. Fifteen counties located primarily in the northern regions of the state, began to appoint land commissioners to serve as stewards of the lands, adopt forest resource policies, and initiate forest management programs. These professional forest managers founded the Minnesota Association of County Land Commissioners and began the daunting task of renewing the soils and growing trees on a sustainable-yield basis. In 1979, the state Legislature enacted "Payment in Lieu of Taxes" that encouraged the counties to retain the lands and manage them sustainably. While tax relief is a primary objective, a portion of the payment is dedicated to intensifying the management and improvements of natural resources. Counties now supply 38% of all wood commercially harvested from public lands in Minnesota.

County land managers are united in their ethic of forest land stewardship but do not share one uniform plan or prescription for forest land management. Each county manages its forest lands differently, depending on the vitality of the land, species that grow best on soils, and demands of the public on these lands. Continuing pressures include losses of forest lands to development, non-forest uses, and ever-increasing population in

¹⁹ SFRA source: www.frc.state.mn.us/

²⁰ MFRC source: www.frc.state.mn.us/

some counties. In addition, state funding sources to counties are dramatically falling, which poses further needs for innovative management goals and techniques in the future.

For further information see www.mncountyland.org

Cooperative Public-Private Lands Management

Privately-owned forests are often managed for sustainability with assistance from programs such as forest certification and forest stewardship plans, but these programs are voluntary and rely on good relations between public agencies and private landowners. As such, private forests are more vulnerable to threats of poor harvesting practices, parcelization and conversion to other uses outside of forest management. Private lands can also be managed with voluntary programs through the US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) programs, which target forest lands/grasslands and soil/water conservation through Environmental Quality Incentives Program (EQIP), Conservation Reserve Program (CRP), Conservation Stewardship Program (CSP) and Conservation Reserve Enhancement Program (CREP). In addition, the Environmental Protection Agency (EPA) offers water conservation programs specifically targeted to riparian zones along streams and rivers and oversees the Total Maximum Daily Load (TMDL) program aimed at protection and restoration of healthy water quality systems. These programs rely on cooperative partnerships between private landowners and public agencies such as the Minnesota Pollution Control Agency (MPCA), Board of Water and Soil Resources (BWSR) and DNR Waters Division.

A vital partner that works daily with NIPF landowners and other partners on many forestry issues are the local soil and water conservation districts (SWCD). SWCDs work with counties on their efforts to link water quality and forest management. County water plans connect forest and water quality issues with both local policy and actions and are a vital link to the maintenance of healthy forests. SWCDs provide many services and cost-shares for erosion control, water quality practices, conservation easements on sensitive riparian lands, stewardship planning services, promotion of urban forestry with municipalities, education and outreach for forest health, diseases and pest control, management of tree sale programs that provide low volume conservation grade trees and shrubs to NIPF landowners at low costs for reforestation projects facilitating hundreds of thousands of trees planted across the region.

In addition, SWCDs work to secure funding for the Re Invest in Minnesota (RIM) program, are heavily involved with total maximum daily load (TMDL) studies and implementation projects, have varying roles across the state's forested regions with cities in storm water management including technical assistance, monitoring, and financial assistance, and are working with county staff to promote and implement planning requirements for SFIA, Rural Preserves, Green Acres and 2c.

SWCDs are also involved with conservation easement work for forested lands and encourage collaborative work in this arena. A good example is the conservation easement work at Camp Ripley using the Army Compatibility Use Buffer (ACUB), which has been developed in a team fashion including Camp Ripley, Morrison County SWCD, DNR, and BWSR. This collaborative approach is a good model for other forest conservation easements.

Further information on this example is available through www.co.crow-wing.mn.us/swcd/ACUB1.htm and www.bwsr.state.mn.us/academy/2009/RIM_Reserve-A-to-Zzzz.pdf

Management Challenges

Forests are key landscape components of Minnesota but face many challenges now and in the future. Balancing competing interests and demands on all state forest land regardless of ownership, is becoming an increasingly daunting prospect for all administrating parties, whether public or private. With ever-increasing 'instant access' to issues facing forests, the public are elevating competing demands, which underscores the importance of long-held forest agency mission statements and management priorities. Often the public reacts to management practices without understanding the whole picture or may have a totally differing perspective for land management. A specific example could be clear-cutting or brush-hogging an important area that is needed for declining game birds such as the American woodcock, while allowing the clear-cut to provide needed sunshine to improve regeneration of important tree species that rely on sunshine for their growth. The use of this management tool is meant to roughly replicate natural historic fires, which are increasingly dangerous options especially in the rural-urban interface. While better communication and providing information to the public is desirable, continued loss of funding and cost constraints within many agencies are contributing to a loss of these services and therefore an increasing lack of understanding on the public's side as to why certain forest management techniques are employed or even needed. This coupled with escalating land prices in many parts of the state have sometimes led to loss of forests for other land uses which may be in direct opposition to forest management. New tools to protect vulnerable forest ecosystems including conservation easements and public outreach on threats and challenges, offer forest managers opportunities to balance some of the challenges.

On a broader global scale, changes in climate will bring both challenges and opportunities to forests and forest management. Minnesota ecosystems will be in transition for at least the next 50 to 100 years. Forest managers will need to find new ways to sustain the health and diversity of forests and ecosystem services they provide during land and cover type changes brought on by both climate change and fragmentation of forest landscapes. This includes the protection of habitats and water quality and quantity, which are so intertwined with healthy forest systems now and into the future.

Temperature increases and shifts in the distribution and timing of precipitation will likely threaten the health and productivity of Minnesota's forests and exacerbate the effects of other stressors (e.g., invasive species, pests, and diseases). Boreal forest species such as black and white spruce and balsam fir may migrate northeastward out of the state to Canada, which is of particular concern to forest managers in the northern parts of the state . Some forests may become savannas, and hardwood forests may persist only in isolated locations with favorable conditions making it increasingly difficult to manage for these species. While climate change driven 'drying effects' may create conditions more suitable for some forests, this could come at the cost of losing wetlands. Warmer weather conditions will also pose a challenge to timber harvesting, as it is difficult to accomplish harvesting and other activities that require frozen ground, if this condition is no longer guaranteed as part of the expected Minnesota winter landscape.

Finally, forests are becoming increasingly identified as important 'sinks' of greenhouse gases and forest managers will need to be more mindful of the role of forest products in, and the consequences of, forest management on carbon stocks. Cap-and-trade systems designed to help mitigate climate change may influence forest management choices and create new management options by offering revenue sources not readily available today.

Chapter 3: Minnesota Forest Resources Council (MFRC) – Advancing the Vision

MFRC Landscape Program

The MFRC is the state's agency responsible for promoting sustainable forest management. Since 1995, the MFRC has received nearly \$10 million in annual operational appropriations from the Minnesota legislature, plus over \$2 million to support sustainable forest resources research and related projects. The MFRC's landscape program which focuses on six major forested landscapes within the state, has been recognized nationally as a model for "integrating diverse interests across multiple ownerships for sustainable forest landscapes and desired long-term outcomes," according to Dr. John Fedkiw, a senior policy adviser for the USDA and Gerald Rose, former Minnesota state forester. "The Minnesota Approach clearly provides an effective democratic and decentralized enabling governance and societal integration of the diverse interests in sustainable forest landscapes. It is commendable to other states for adoption or adaptation... and is also worthy of federal encouragement and support to facilitate its extension to other states.²¹" The capacity for replicating the six MFRC forested landscapes to other regions of Minnesota as well as to other states, is greatly enhanced by the ongoing collaborative work by the council.

Members of the regional landscapes committees are committed to developing partnerships with private landowners, public officials, and resource managers on a wide range of natural resource management projects. For more information about the MFRC, the landscape program and the regional committees, please see the council's website at www.frc.state.mn.us

As each of the six forested landscapes successfully advances its various stages of development, the MFRC will convene the regional committees and work groups to periodically review the projects and explore ways to resolve any issues. This will help facilitate improved delivery of coordinated services to private landowners. The committees and their partners will gain valuable insights through the sharing of lessons learned on the pilot projects.

Landscape-level management in Minnesota is a voluntary, consensus-based approach to the planning of forest and natural resources and their management. It brings people together who have an interest in the long-term health and vitality of a particular region or landscape. It is a process that helps landowners and resource managers better understand how an individual property or site (be it a forest, a wetland or a prairie) fits into the larger landscape.

Participation on regional committees is voluntary. The committees have established an open and public process that fosters landscape-level forest resource management by addressing the unique needs and resources of each landscape region. These volunteer, citizen based committees are central to carrying out the landscape level management processes. All regional committee meetings are open to the public. Broad support and involvement on project coordination and implementation are fundamental to the MFRC landscape approach.

Over 100 people currently serve on the six regional committees. There are approximately 100 additional project work group and coordination team volunteers. Members serving on regional landscape committees include the following:

- landowners
- loggers/sawyers/foresters
- industry/wood products manufacturing

²¹ "Stewardship and Landscape Coordination for Sustainable Forests." J. Fedkiw and G.A. Rose. The Pinchot Institute for Conservation. Washington, D.C.

- business and development community
- education community
- environmental/conservation/sporting organizations
- local units of government (counties, SWCDs)
- regional, tribal, state and federal agencies

The following is a list of working principles established in the SFRA that guide the regional committees:

- Give equal consideration to long-term **ecological, economic and social** needs and limits.
- Foster **no net loss** of forest land.
- Encourage **appropriate mixes** of types and age classes.
- Acknowledge **multiple ownerships** (work across all ownerships).
- Encourage **collaboration and coordination**.
- **Voluntary** basis

MFRC Major Goals

The following 11 major goals have been identified by MFRC to best advance the vision of the state's forest resources over time. Many of these goals are achievable through the "*State Forest Resource Assessment and Strategies*" documents.

1. **Minnesota's forest land base is enlarged and protected.** No net loss of forest land occurs and some previously forested areas are returned to forest cover. The forest land base is protected from decreases and fragmentation caused by land-use changes.
2. **Forest ecosystems are healthy, resilient and functioning.** Forests are composed of appropriate mixes of cover types and age classes required to maintain wildlife and biological diversity.
3. **Forests are sustainably managed.** Forests are managed to ensure economic, social and ecological sustainability. Forest management activities enhance the diversity of the state's forests and support the long-term sustainability and growth of the many sectors that depend on them.
4. **Forest-based economic and recreational opportunities are numerous.** The role and contribution of forests to the state's economic and social well being is acknowledged. Economic opportunities for Minnesota's forest-based industries, including tourism and wood-based industries, are numerous, sustainable and diverse.
5. **Forest practices are implemented in effective and efficient manners.** Forest practices are implemented in ways that maximize their effectiveness while minimizing the costs of their administration. Guidelines suggesting appropriate practices are scientifically-based, practical and easy to understand; their rationale is clearly stated and their application consistent where possible and appropriate.
6. **Forest landscape level planning is coordinated and involves collaboration.** Landscape level planning is based on ecological landscapes and involves collaboration between public & private landowners, users, stakeholders and the public at large.
7. **Public and private rights and responsibilities are recognized.** Forest practices that achieve certain public benefits recognize and respect the inherent rights, responsibilities, interests and financial limitations of public and private forest landowners.
8. **Forest research programs are effective and adaptive.** Information is provided by effective and coordinated, basic and applied research programs. Forest practices and landscape planning/coordination activities are based on the best available information and technology, and can be readily adapted to new information or changing resource conditions.
9. **Multi-resource information systems are compatible and comprehensive.** Public and private landowners, managers and stakeholders have access to information systems that are capable of providing comprehensive information about forest resources.
10. **Forest policy development is effective and supportable.** Policies and programs focused on forest resources are developed and supported by processes that collaboratively move forward to resolve issues and accommodate a wide range of constituencies.
11. **Program funding is committed and sustained.** Sustainable, adequate and long-term funding is available to accomplish the vision and goals for the state's forests.

25-Year Vision for Lessard-Sams Outdoor Heritage Council (LSOHC)²²

Investments in Minnesota Forests

In 2010, at the request of the Lessard-Sams Outdoor Heritage Council (LSOHC) chair Dr. Michael Kilgore, the MFRC and the Minnesota Forest Resources Partnership (MFRP), collaboratively developed a 25-year vision for Minnesota forests as a framework for the LSOHC to use in advising the Minnesota Legislature on funding for forest projects that improve forest health, productivity and diversity, thereby improving fish and wildlife habitat for game and nongame species as well as for fishing, hunting, and wildlife watching opportunities.

This advisory role is consistent with the MFRC's charge to advise "federal, state, county, and local governments with respect to forest resource policies and practices" (Minnesota Statute, chapter 89.03, Subd. 2), the MFRP charge to advise the MFRC (Minnesota Statute, chapter 89.04), and the collective effort by both organizations to provide "a range of practical and sound practices based on the best available scientific information" (Minnesota Statute, chapter 89A.05, Subd.1) in relation to sustainable forest management.

While this vision is not the overall MFRC or MFRP vision for Minnesota forests or forest resources, (as defined in Minnesota Statute, chapter 89A.01, Subd. 7 and Minnesota Statute, chapter 89.001, Subd. 8), it is the recommended vision for the LSOHC to use in achieving its unique mission to advise the legislature on making investments that protect, restore, and enhance Minnesota's forests for fish, game, and wildlife habitat.

Statewide Forest Vision

"Investments from the LSOHC in Minnesota forests are made with primary consideration given to maintaining forest habitat and diversity, which provides the foundation for improved fish, game, and wildlife habitat; long-term ecosystem integrity;²³ and public access for hunting, fishing, and other wildlife-oriented recreation. 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 about their use, management, and protection."²⁴

Goals to Accomplish the Forestry Vision

- **Minnesota forests are restored and enhanced** by forest land management practices that improve fish, game, and other wildlife habitat; water quality; and the health, productivity, and resiliency of Minnesota forests.
- **Minnesota's forest land base is enlarged and protected** through permanent conservation easements and fee title acquisition. No net loss of forest land occurs and some previously forested areas are returned to forest cover. The forest land base is protected from decreases and wildlife habitat fragmentation caused by land use and ownership changes.
- **Forest-based recreational and economic opportunities are numerous.** Forest policy decisions result in no net loss of access for fishing, hunting, and other types of wildlife-oriented recreation.
- **Forests are managed to ensure healthy fish and wildlife populations and ecological, economic, and social sustainability.** Forest management activities enhance the diversity of the state's forests and support the long-term sustainability and growth of the many sectors that depend on them.

Recommended priorities are divided between statewide and regional landscapes with preference to cross-ownership coordination projects and acknowledging the interests, concerns and recommendations of local communities in which funds are to be expended.

²² Refer to Emerging Opportunities section of this document for more information on the Lessard-Sams Outdoor Heritage fund.

²³ Maintaining long-term ecosystem integrity means that native plants, animals, and microorganisms continue to function together within forest ecosystems and that ecosystem services (e.g. nutrient recycling, water filtration, carbon sequestration) continue to be provided.

²⁴ MFRC & MFRP approved vision statement for LSOHC - 12.02.09

Chapter 4: State Issues and Strategies

All states are required by the USFS to develop strategies to address priority issues and landscape areas. This chapter outlines a series of integrated strategies to address the forest management challenges facing the priority issues and landscape areas outlined in the “*Minnesota Forest Resource Assessment*” document. These strategies cross all levels of ownership and are generally accepted by all parties as posing continued or future threats to the long-term viability of healthy and sustainable forests. Through the implementation of the following strategies, the state of Minnesota and its partners will proactively and comprehensively address the three national themes established in the USFS Redesign process. The 10 identified issues listed below in text form are followed by multiple strategies but do not occur in any priority ranking.

- **Maintenance of Minnesota’s Forest Land Base: Increasing Threats of Forest Fragmentation and Parcelization**

Historically Minnesota has enjoyed a large forest land base. However, recent multiple pressures including fragmentation, changes in land ownership patterns, increasing invasive pest pressures (forest health), economic changes in the timber industry and climate changes are demanding restructuring of forest management practices for present and future multiple needs. Collaboration with like-minded partners in tackling these many-faceted issues will be key to sustaining a healthy forest land base in the state.

- **Maintenance and protection of water quality and quantity**

Minnesota has abundant water supplies in both surface and underground systems. However, demand for water is increasing faster than population growth, which presents challenges to balancing water quality and consumptive needs. Coupled with climate change threats of increased storm severity, runoff, flood damages and drought, the protection and sustainable management of the state’s forest lands are a critical component in ensuring that clean water supplies will continue to be available in the future. Changing land use and population growth also threaten aquatic habitats in the state. Protecting and maintaining high quality aquatic habitats and healthy water ecosystems are essential for sustaining not only human water needs and quality of life, but also the multi-million dollar hunting and fishing industries that are large economic drivers for which the state is well known.

- **Forest Health and Productivity**

Minnesota’s forests and trees are critical to the ecological health and financial economy of the state. Ensuring healthy ecosystems, productive forests and quality trees exist well into the future is a collaborative goal between federal, state, tribal and county agencies, and community partners both public and private, throughout the state.

- **Reducing Wildfire Risks**

The state of Minnesota is a partner in the Minnesota Incident Command System (MNICS), which is a collaborative effort involving federal, state, county, local community and tribal fire fighting personnel. Agreements with federal agencies including USFS, USFWS, BIA, and the NPS, allow for the sharing of personnel and fire-fighting equipment, resulting in quick initial responses to wildfires throughout the state. In addition, these partnerships are also called upon for prescribed burning management purposes.

- **Mitigation and Adaptation to Climate Change**

Climate change is a global phenomenon that has the potential to significantly affect Minnesota forest resources. Climate change will cause the greatest change in forests that are stressed with disease, pests, ground compaction or altered hydrology, and could result in reduced quality of wood, water, and wildlife habitat. The state is committed to a collaborative approach of working with partners to mitigate and adapt to climate change.²⁵

- **Support of a Healthy Forest Products Industry**

Minnesota is a leader in timber production in the continental United States. However, downturns in the economy necessitate the continued need for investments to maintain strong and diverse markets for forest products and maintain active sustainable forest management.

- **Use of Woody Biomass for Energy**

The development and harvest of woody biomass must be pursued as part of a broader strategy to create well managed, healthy and productive forests. The utilization of woody biomass must be considered in the context of goals and policies pertaining to energy, the environment and broad economic goals of the state. The use of biomass should be done in an efficient manner and integrate both forest biomass and agriculture biomass strategies.

- **Maintenance and Enhancement of Rare Ecological Features**

Minnesota is committed to identifying, protecting, monitoring and maintaining rare species and ecological systems that contribute to the state's biodiversity and viability of forest ecosystems. Efforts such as forest certification, the "*State Wildlife Action Plan*" (SWAP), the DNR "*Native Plant Community Field Guides*", the Minnesota County Biological Survey (MCBS), plus new efforts such as the Ecological Classification System (ECS), coupled with federal and non-profit identification and restoration efforts, provide guidance for preservation of rare ecological features and systems for the future of forests within the state.

- **Recreational Use of Forest Lands**

Minnesota has always had a strong tradition of nature-based outdoor recreation with participation in outdoor activities well above the national average, especially in hunting, fishing and boating. These activities and increasingly bird-watching, motorized and non-motorized activities all rely on access and interaction with abundant natural resources such as forest lands, lakes, rivers, blufflands, grasslands and parks and recreation facilities. The state is committed to preserving and enhancing outdoor recreational use for both present and future generations to enjoy.

- **Urban and Community Forestry**

Urban and community forestry programs face many challenges throughout the state with increasing threats to tree health and decreasing funds and personnel to address these challenges. Technical assistance and education remain the top priorities for addressing threats to tree health and other environmental degradations.

²⁵ Mitigation includes those activities that reduce the emission (via energy conservation and biofuel use) or increase the uptake (via biological sequestration) of greenhouse gases. Adaptation includes activities that enhance ecosystem resilience to climate changes (e.g. increases in diversity) or reduce the vulnerability of ecosystems and wildlife to climate changes (e.g. wildlife corridors or expanded buffers).

Minnesota Issues and Strategies for Forest Management – 5 year Plan

Issue: Maintenance of the State’s Forest Land Base

Historically Minnesota has enjoyed a large forest land base. However, recent multiple pressures including fragmentation, changes in land ownership patterns, increasing invasive pest pressures (forest health), economic changes in the timber industry and climate changes are demanding restructuring of forest management practices for present and future multiple needs. Collaboration with like-minded partners in tackling these many-faceted issues will be key to sustaining a healthy forest land base in the state.

→This issue relates to the USFS National Themes and Objectives: Conserve and Manage Working Forest Landscapes for Multiple Values and Uses; Protect Forests From Threat; Enhance Public Benefits From Trees and Forests

Strategies	Key Stakeholders	Partners	Resources
Work with partners to identify opportunities for forest protection, enhancement, restoration	Private landowners, federal, state, local, tribal gov’ts, forest industry landowners	MFRC, USFS, NRCS, USFWS, DNR, FSA, NPS, BWSR, SWCD	FSP, DNR Working Lands Initiative, Forest Legacy Easement Program, EQIP, CRP, CREP, CSP), WHIP, BWSR - RIM, SWCD, ACUB project-Camp Ripley
Implement Forests for the Future (MFF) program	Private landowners, federal, state, local gov’ts, forest industry landowners	Outdoor Heritage Council, USFS, TNC, MLT, TCF, TLP, Forest Legacy Partnership	Conservation easement funding (L-SOHC, TNC, Blandin Fndn; Forest Legacy, Bonding, LCCMR), SWCD
Identify and acquire key priority forest lands through fee-title acquisitions	Federal, state, local gov’ts, citizens of MN	Outdoor Heritage Council, TNC, MLT, TCF, TPL	MN Outdoor Heritage Fund, Bonding, LCCMR, MFF
Promote and support landowner participation in tax law and incentive programs that support, encourage and reward forest land retention and enhancement	NIPF landowners, SWCD, private consultants	FSP, Tree Farm, Minnesota Forestry Association, SWCD, Dept. of Revenue, consulting foresters, U of M Extension, county land departments	FSP, SWCD, SFIA, 2c, Rural Preserves
Encourage retirement and reforestation (where appropriate) of marginal, erodible farmlands (including riparian areas) and tie	Private landowners, MFRC regional committees, MFRP, federal, state, local ,tribal gov’ts	NRCS, DNR ,FSA, SWCD	FSP,CRP,CREP, SWCD, RIM, CRP

to MFRC regional landscape goals			
Target forest stewardship services to critical watersheds as supported through federal, local programs & agencies	NIPF landowners, citizens of MN	USFS, EPA, MPCA, FSP, Minnesota Forestry Association, SWCD	Clean Water Legacy, FSP
Ensure that forest stewardship plans include guidance for forest management, harvesting, regeneration	NIPF landowners	DNR, consulting foresters, SWCD, Stewardship Committee	DNR PFM database, FSP
Continue to implement Forest Certification programs for private landowners	NIPF landowners, Certification “chain-of-custody” businesses, SWCD, Tree Farm	FSC, SFI, U of M, consulting foresters	Aitkin County SWCD private certification program
Continue to support logger certification	NIPF landowners, forest industry, private consultants	MLEP, MMLC, MFA, MFI	MMLC, DNR
Support and expand sustainable practices on working private forested lands	NIPF landowners	DNR, MFRC, SWCD, MLEP, loggers, private consultants, FSP, other private landowner assistance programs	FSP
Increase understanding of the magnitude, causes, and impacts of forest land parcelization in the state. Assess general public’s understanding of issues and develop targeted education programs	Citizens of Minnesota	DNR, MFRC, MFRP, SWCD, U of M Extension	MFF, Wild Rice watershed project, MFRC
Assess and analyze a broad and integrated set of policy tools to mitigate the adverse effects of forest parcelization and provide recommendations to the state legislature	NIPF landowners, state legislature, citizens of Minnesota	DNR, MFRC, U of M, state legislature	MFF, ACUB project, MFRC
Provide forest products marketing assistance to private landowners in order to improve landowner income	NIPF landowners, wood industry	DNR, USFS, NRCS, U of M, State Technical Committee, SWCD	<i>Undetermined: needs funds & technical assistance</i>

Minnesota Issues and Strategies for Forest Management – 5 year Plan

Issue: Maintenance and Protection of Water Quality and Quantity

Minnesota has abundant water supplies in both surface and underground systems. However, demand for water is increasing faster than population growth, which presents challenges to balancing water quality and consumptive needs. Coupled with climate change threats of increased storm severity, runoff, flood damages and drought, the protection and sustainable management of the state’s forest lands are a critical component in ensuring that clean water supplies will continue to be available in the future. Changing land use and population growth also threaten aquatic habitats in the state. Protecting and maintaining high quality aquatic habitats and healthy water ecosystems are essential for sustaining not only human water needs and quality of life, but also the multi-million dollar hunting and fishing industries that are large economic drivers for which the state is well known.

→This issue relates to the USFS National Theme and Objective: Conserve and Manage Working Forest Landscapes for Multiple Values and Uses; Protect Forests From Threat; Enhance Public Benefits From Trees and Forests

Strategies	Key Stakeholders	Partners	Resources
Protect and manage forests and wetlands in forested areas (ag/prairie excluded) under identified MPCA watersheds with key partners & stakeholders to ensure high-quality aquatic habitats and healthy eco-systems remain viable	NIPF landowners, adjacent landowners, citizens of MN	USFS, MPCA, BWSR, NPS, USFWS, BIA, Tribes, MFA, Watershed Managers, DNR, MFRC, NRCS, SWCD	EPA, State Clean Water Legacy Fund, FSP, Site-level Guideline monitoring program, USFWS Partners for Wildlife program, Ducks Unlimited, DNR Long-range Duck Recovery Plan, DNR Aquatic Mgmt Area Acquisition Plan, TNC MN Lake Conservation Portfolio, RIM, WRP, CSP, CREP, CRP, SWCD
Protect and enhance critical riparian corridors in key watersheds (to include water quality practices, conservation easements and erosion control)	NIPF landowners, adjacent landowners	USFS, NRCS, MPCA, DNR, MFA, MFRC, Inter-Agency work group (BWSR, MDA, Mn DOT, DNR, NRCS), SWCD	State Clean Water Legacy Fund, “Sustaining Minnesota Forest Resources” resource guide, FSP, CPR, CREP, RIM, NRCS (& GLRI), SWCD
Protect high-quality aquatic habitats within healthy watersheds	NIPF landowners, adjacent landowners, citizens of MN	USFS, MPCA, BWSR, NPS, USFWS, BIA, Tribes, Watershed Managers, DNR, MFRC, MidWest Glacial Lakes Partnership,	Outdoor Heritage Fund, State Clean Water Legacy Fund, National Fish Habitat Action Plan, MN Environmental & Natural Resources Trust Fund, Wild Rice

		SWCD	Lakes project, NRCS (& GLRI)
Ensure protection of water resources in urban areas by evaluating and improving current programs (LID, BMPs, TMDL compliance)	Urban & rural communities	MnSTAC, LMC, DNR, FSA, SWCD, Interagency work group (BWSR, DNR, MPCA, MDH, MDA)	State Clean Water Legacy Fund, EPA, BWSR, SWCD, FSP, NRCS (& GLRI)
Enact a forest/water quality media campaign and education package	NIPF landowners, citizens of MN	DNR programs including "Healthy Rivers" & "Gateway Initiative", MN Master Naturalist, SWCD, MFI	State Clean Water Legacy Fund, EPA, BWSR, SWCD
Map and monitor forested watersheds for potential impairments (TMDLs)	NIPF landowners, citizens of MN	USFS, MPCA, SWCD	State Clean Water Legacy Act
Target forest stewardship services and conservation easements to critical watersheds as supported through federal, local programs & agencies	NIPF landowners, citizens of MN	USFS, EPA, MPCA, FSP, FLP, SWCD, BWSR, MFF	State Clean Water Legacy Act, FSP, FLP, MFF
Evaluate, refine and apply regulatory tools that conserve water supply and promote forest land and water-use practices that protect water quality	Forest land managers, private forest and shore land owners, citizens of MN	MPCA, BWSR, SWCDs, DNR, state legislature	State Clean Water Legacy Act, State Shore land Standards
Support research and programs that seek to increase public understanding, acceptance and implementation of aquatic habitat stewardship practices and their relationship to watershed protection	Forest land owners, youth, citizens of MN	State Shoreland Habitat Restoration Program, State MinnAqua Program, DNR, NPS, SWCD, Extension, public schools	U of M, Research Institutes <i>Undetermined: needs funds & technical assistance</i>
Promote and implement planning requirements for SFIA, Rural Preserves, Green Acres, and 2C.	NIPF landowners, counties, municipalities	DNR, SWCD, consulting foresters, Dept of Revenue	FSP, Technical assistance capacity, cost-share dollars
Support continuing monitoring of implementation and effectiveness of Site-Level forest management guidelines especially water quality guidelines	Forest land managers, MFRC, DNR	DNR, MFRC, U of Minnesota, SWCD, MLEP	<i>Undetermined: Needs ongoing funding for monitoring</i>
Support continuing ed programs like MLEP and SFEC which provide Forest Mgm't Guideline implementation training	Loggers, foresters, landowners, land managers	MLEP, SFEC, MFRC, DNR, MFI	MLEP, SFEC, DNR, MFRC

Minnesota Issues and Strategies for Forest Management – 5 year Plan

Issue: Forest Health and Productivity

Minnesota's forests and trees are critical to the ecological health and financial economy of the state. Ensuring healthy ecosystems, productive forests and quality trees exist well into the future is a collaborative goal between federal, state, tribal and county agencies, and community partners both public and private, throughout the state.

→This issue relates to the USFS National Themes and Objectives: Conserve and Manage Working Forest Landscapes for Multiple Values and Uses; Protect Forests From Threat; Enhance Public Benefits From Trees and Forests

Strategy	Key Stakeholders	Partners	Resources
Identify high-risk, low-volume stands and create prescriptions to increase stocking and health	Public and private forest landowners, tribes	USFS,DNR, counties, industrial landowners, NIPF, U of M, SWCD, BIA, tribal natural resources departments	FMIA, Bonding, LSOHC, LCCMR, FSP
Reduce average age of even-aged managed cover types and promote vigorous young forest stands through harvesting	Public and private forest landowners, tribes	DNR, Counties, USFS, Industrial landowners, NIPF, U of M, SWCD, BIA, tribal natural resources departments	FMIA, Bonding, LSOHC, LCCMR, FSP
Develop and maintain a better balanced and complete age class distribution for plant communities managed primarily with even-aged silvicultural systems, while at the same time allowing some stands to transition to older growth stages	Public and private forest landowners, tribes	USFS,DNR, counties, industrial landowners, NIPF, U of M, SWCD, BIA, tribal natural resources departments	FMIA, Bonding, LSOHC, LCCMR, FSP
Thin overcrowded stands to improve vigor and reduce competition	Public and private forest landowners, loggers, industry, tribes	USFS,DNR, counties, industrial landowners, NIPF, U of M, SWCD, BIA, tribal natural resources departments	FMIA, Bonding, LSOHC, LCCMR, FSP
Match tree species and management techniques to individual sites through use of Ecological Classification Systems (ECS)	Public and private forest landowners, tribes	DNR, Counties, USFS, industrial landowners, NIPF, U of M, SWCD, BIA, tribal natural	FMIA, Bonding, LSOHC, LCCMR, FSP

		resources departments	
Promote species diversity in community and urban plantings	Public and private forest landowners, communities, tribes	DNR, USFS, MnSTAC, U of M, SWCD	Bonding, LSOHC, LCCMR, SWCD, \$, technical assistance
Use eradication, suppression, and outreach to respond to new and expanding EAB and gypsy moth populations in the state.	Public and private forest landowners, communities, tribes	DNR, MDA, S&PF, USFS Nat Forests, counties, APHIS-PPQ, SWCD, landowner groups, MFRC and MFRP, GMSTS, Co Ag Inspectors	Bonding, LSOHC, LCCMR, SWCD, \$, technical assistance
Identify and develop partnerships with public/private stakeholders and community groups to develop the relationships and infrastructure needed to support integrated early detection and rapid response efforts, a collaborative prevention approach, and a unified outreach effort.	Public and private forest landowners, communities, tribes	DNR, MDA, S&PF, USFS Nat Forests, USFWS, BIA, Tribes, NPS, counties, APHIS-PPQ, SWCD, landowner groups, MFRC and MFRP	USFWS, NEPA, USDA, Bonding, LSOHC, LCCMR, SWCD, \$, technical support
Develop new and expand existing markets for ash to provide the means and incentive to manage ash stands ahead of EAB infestation and to address ash mortality when EAB infests stands.	Public forest landowners and managers, wood industry	DNR, USFS, U of M, MFI, MLEP	Bonding, LSOHC, LCCMR, \$, technical assistance
Encourage communities and local governments to formally inventory their ash resource on public and private lands so they know what is at risk and more effectively take preventative actions where needed.	Municipalities and private homeowners	DNR, MnSTAC, MDA, USFS, S&PF	Bonding, LSOHC, LCCMR, \$, Technical assistance
Work with communities to help develop sanitation and utilization strategies.	Municipalities and private homeowners	DNR, MnSTAC, MDA, USFS, S&PF	Bonding, LSOHC, LCCMR, \$, technical assistance
Implement EAB mitigation strategies in ash stands to maintain forested communities in predominate ash types at risk from EAB.	Public and private forest landowners, communities, tribes	DNR, MDA, USFS, S&PF, USFS Nat Forests, USFWS, BIA, Tribes, NPS, counties, APHIS-PPQ, SWCD, landowner groups, MFRC and MFRP, SWCD, MLEP	USFWS, NEPA, USDA Bonding, LSOHC, LCCMR, SWCD, \$, technical support
Develop restoration guidelines for both urban and rural lands forests, and modify landowner assistance program to support restoration.	Public and private forest landowners, communities, tribes	DNR, counties, USFS, industrial landowners, NIPF, U of M, SWCD, BIA, tribal natural	FMIA, Bonding, LSOHC, LCCMR, FSP

		resources departments	
Work with private campgrounds, resorts, and other agencies to explore and implement the means to minimize the movement of unregulated firewood.	Resort and campground associations, MN citizens	DNR, MDA, Aphis-PPQ, USFS, NPS	Bonding, LSOHC, LCCMR
Work with public and private nurseries to explore alternatives to growing and planting ash and explore how to replace ash in large blocks of forests	MNLA, other private nurseries	DNR, MDA, USFS S&PF, U of M	Bonding, LCCMR
Explore revenue sources and opportunities to ensure EAB preventative efforts are adequately funded.	Public and private forest landowners, communities, tribes	DNR, MDA, USFS , S&PF, APHIS-PPQ, MnSTAC, MFRC , MFRP, Tribes	USDA, USFS, USFWS, Bonding, LSOHC, LCCMR \$, Technical support
Support research into bio-control, chemical control, resistance, and “slowing the spread” for EAB and other threats.	Public and private forest landowners, communities, tribes	DNR, MDA, USFS , S&PF, APHIS-PPQ, USFWS, MnSTAC, MFRC , MFRP, GMSTS	USDA, USFS S&PF, USFWS, Bonding, LSOHC, LCCMR U of M, \$, technical assistance
Develop risk assessment for oak wilt in MN and prioritize outreach efforts based on risk.	Public and private forest landowners, communities	DNR, USFS , S&PF, Aphis-PPQ, U of M	USDA, USFS S&PF, USFWS, Bonding, LSOHC, LCCMR U of M, \$, technical assistance
Identify high-risk, low-volume stands and create prescriptions to increase stocking and health	Public and private forest landowners, communities, tribes	DNR, USFS, U of M, SWCD	USDA, USFS S&PF, USFWS, Bonding, LSOHC, LCCMR U of M, \$, technical assistance

Minnesota Issues and Strategies for Forest Management – 5 year Plan

Issue: Reducing Wildfire Risks

The state of Minnesota is a partner in the Minnesota Incident Command System (MNICS), which is a collaborative effort involving federal, state, county, local community and tribal fire fighting personnel. Agreements with federal agencies including USFS, USFWS, BIA, and the NPS, allow for the sharing of personnel and fire-fighting equipment, resulting in quick initial responses to wildfires throughout the state. In addition, these partnerships are also called upon for prescribed burning management purposes.

→This issue relates to the **USFS National Themes and Objectives: Protect Forests From Threat; Enhance Public Benefits From Trees and Forests**

Strategy	Key Stakeholders	Partners	Resources
Develop and maintain an interagency workforce capacity to meet the wildfire needs of all cooperating agencies and tribes.	MNICS Agencies, State Fire Chiefs, Forestry Industry	USFS, USFWS, BIA, NPS, DNR, MN DPS-HSEM, GLFFC, NFFS, MN Fire Chiefs, MDH, FEMA	MIFC, Annual Fire Academy, Out of State Training and Wildfire Assignments, Cooperative Agreements
Maintain and enhance current interagency cooperative partnerships with other wildland fire and emergency management agencies.	MNICS Agencies, State Fire Chiefs, National Wildfire Mobilization System, NFFs, GLFFC	USFS, USF&W, BIA, NPS, DNR, MN DPS-HSEM, GLFFC, NFFS, MN Fire Chiefs, MDH, FEMA	Cooperative Agreements, Federal Excess Property and Firefighter Property Programs, MIFC
Monitor and adjust the scope of wildfire protection coverage, necessary planning levels and suppression resources required to support wildfire and all hazard missions.	MNICS Partners, Forest Landowners, Forest Industry	All above partners, MN Fire Chiefs Assoc.	MIFC Information and Intelligence units, MNICS partners, SEOC
Enhance wildfire prevention and enforcement efforts to reduce the risk of damage and loss due to wildfires and reduce the number of human caused ignitions. Educate prosecutors and the courts on impacts of arson on forests.	MNICS Partners, GLFFC, Forest Landowners and Industry, State Taxpayers	MN DNR Enforcement, County Sheriffs	Local, Regional, Statewide and National Prevention Programs, Firewise, CWPPs
Improve utilization of available technologies in wildfire prevention and suppression efforts.	MNICS Partners, GLFFC, NFFS	MN State Fire Marshall, GLFFC, MNICS	DNR and MNICS Agency GIS Specialists, RAWs, CFDRS, NFDRS, Resource Ordering and Tracking

			Systems
Develop or redesign business systems specifically to enhance fire management, accountability, and to reduce costs.	MN Legislature, USDA-Forest Service –NA, MN taxpayers, MNICS partners	MNICS, FEMA, GLFFC, NFFS	DNR Forestry Fire Business Manual, FEMA grants
Promote the role of fire in the ecosystem by strengthening all agency and tribes prescribed burn programs.	MNICS Partners, GLFFC, NFFS, TNC	USFS, BIA, USFWS, DNR, MNICS, Tribes, TNC	DNR Prescribed Fire Committee, MNICS Rx Fire WT, National Rx Fire Qualifications Standards
Develop, promote and facilitate market solutions to fuel management issues and needs, e.g., expanded markets for brush and small diameter material	Rural landowners, forest managers, wood industry, biofuels industry	USFS, DNR, counties, U of M	\$, Technical assistance

Minnesota Issues and Strategies for Forest Management – 5 year Plan

Issue: Mitigation and Adaptation to Climate Change

Climate change is a global phenomenon that has the potential to significantly affect Minnesota forest resources. Climate change will cause the greatest change in forests that are stressed with disease, pests, ground compaction or altered hydrology, and could result in reduced quality of wood, water, wildlife habitat. The state is committed to a collaborative approach of working with partners and to mitigate and adapt to climate change.²⁶

→This issue relates to the USFS National Themes and Objectives: **Conserve and Manage Working Forest Landscapes for Multiple Values and Uses; Protect Forests from Threat; Enhance Public Benefits From Trees and Forests**

Strategy	Key Stakeholders	Partners	Resources
Develop methods for quantifying and monitoring forest carbon pools	Forest managers, Forest landowners, future participants in carbon markets, U of M, AURI, citizens of MN	Operations Managers Climate and Energy Steering Team, Interagency Climate Change Mitigation Team, Biofuels Team, MN Climate Change Advisory Group, NRRRI	LCCMR grant proposals, dedicated agency staff time
Evaluate and implement approaches for increasing carbon sequestration through improved forest management	Forest managers, forest industry, policy makers, U of M, DNR, USFS	Operations Managers Climate and Energy Steering Team, Interagency Climate Change Mitigation Team, Biofuels Team, MN Climate Change Advisory Group	LCCMR grant proposals, dedicated agency staff time
Influence the development of national and regional protocols for creating marketable carbon credits in forest offset projects	DNR, MDA	NRCS, Operations Managers Climate and Energy Steering Team, Interagency Climate Change Mitigation Team, Biofuels Team, MN Climate Change Advisory Group	RC&D councils
Develop tools to examine the effects of forest management decisions on forest carbon pools	Forest managers, policy makers, U of M, DNR, USFS	Operations Managers Climate and Energy Steering Team, Interagency Climate Change	LCCMR grant proposals, dedicated agency staff time

²⁶ See footnote # 25 for explanation

		Mitigation Team; Biofuels Team, MN Climate Change Advisory Group, MFRC, MFRP	
Develop markets for biofuels that offset consumption of fossil fuels.	Forest managers, forest landowners, citizens of MN, RC&Ds, NRRRI, U of M, AURI	Operations Managers Climate and Energy Steering Team, Interagency Climate Change Mitigation Team, Biofuels Team, MN Climate Change Advisory Group, DNR, MFRP, MFRC	<i>Undetermined: needs funds & technical assistance</i>
Identify opportunities for establishing new forests for carbon sequestration	NIPF landowners, citizens of MN, carbon market participants	MFRC, NRCS, DNR, consulting foresters, industrial forest landowners, NIPF landowners	MFRC carbon study to state legislature, several NRCS programs cost-share afforestation and reforestation activities
Develop, promote and facilitate market solutions to climate change management issues and needs, e.g., expanded markets for species of greatest adaptation likelihood	Landowners, forest managers, wood industry	DNR, USFS, U of M	\$, Technical assistance
Initiate a carbon sequestration aggregation program in Minnesota	NIPF landowners	DNR and Tree Farm	FSP, Tree Farm Program
Reduce fossil fuel consumption; quantify the carbon footprint of forest management and establish efforts to minimize the magnitude of the footprint.	Landowners, forest managers, wood industry, citizens of MN	State legislature, federal laws & programs, wood industry	Gas tax, min. mileage ratings
Maintain healthy, vigorous and viable native plant communities	Landowners, forest managers, wood industry, loggers, fish and game interests, citizens of MN	DNR, USFS, USFWS, TNC, Audubon, wood industry, biofuels industry, loggers	FSP, funding for non-commercial management activities; support for forest management infrastructure (loggers, working forests, industry)
Explore planting diverse tree species and genotypes from more southerly ranges to ensure healthy forests in the future	Landowners, forest managers, wood industry	USFS, DNR, Tree Farm, U of M	LCCMR, possible USFS funding
Continually monitor the rapidly growing body of climate change science and incorporate the best available science relating to climate change species viability when deciding which tree species and	Landowners, forest managers, wood industry	USFS, DNR, Tree Farm, U of M	LCCMR, possible USFS funding

genotypes to promote or establish			
Contribute to renewable energy and greenhouse gas reduction goals	NIPF landowners, MFA, Tree Farm, state legislature, citizens of MN	FSP, MFA, Tree Farm Program, NRCS	FSP registered stewardship plan holders, NRCS cost-shares for afforestation and reforestation (tree planting) projects
Conduct assessments of the vulnerability of native plant communities including native forest cover types and native animal populations to changes in climate	All landowners, (federal, state, tribal, county, municipal and private) forest managers, wood industry, fish and game interests	Operations Managers Climate and Energy Steering Team; Interagency Climate Change Adaptation Team, DNR, USFS, USFWS, TNC, Audubon	IIC website
Train and provide continual support to staff to address climate change as part of ongoing management efforts	All landowners, forest managers, wood industry	DNR, USFS, USFWS, S&PF	SFEC training programs, FSP
Modify resource management plans and management activities to help forest systems to (as appropriate) resist, be resilient to, or respond to the anticipated effects of changes in climate including planting tree species and genotypes from more southerly ranges to ensure healthy forests in the future	Landowners, forest managers, wood industry	MFRC, DNR, S&PF, USFS, USFWS, NRCS, U of MN, Tree Farm, Tribes, industry, counties	Update landscape plans to address climate change
Conduct (fund) human dimensions research to better understand public attitudes about climate change.	Citizens of MN	DNR, U of M	LCCMR, possible USFS funding
Expand climate and climate impact monitoring and reporting efforts.	Landowners, forest managers	DNR, S&PF, USFS, USFWS, NRCS, U of MN, NRRI, SWCD, MN State Climatologist	Rain gauge and temperature network

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Issue: Support of a Healthy Forest Products Industry

Minnesota is a leader in timber production in the continental US. However, downturns in the economy necessitate the continued need for investments to maintain strong and diverse markets for forest products and maintain active sustainable forest management.

→This issue relates to the USFS National Themes and Objectives: Conserve and Manage Working Forest Landscapes for Multiple Values and Uses; Enhance Public Benefits From Trees and Forests

Strategy	Key Stakeholders	Partners	Resources
Provide marketing assistance to private landowners in order to improve management, increase wood supply for industry, and improve landowner income	NIPF landowners, wood industry	USFS, NRCS, State Technical Committee, DNR, RC&Ds, SWCD	FSP, \$, Technical assistance
Maintain public and expand private land 3 rd party certification	Wood industry, forest managers	Counties, MFA, MFRC, consulting foresters, SWCD	\$, Technical assistance
Maintain strong wood industry technical and wood supply information and assistance	Wood industry	USFS, U of M, NRRI, DNR, SWCD	\$, Technical assistance
Provide forest and forest-industry related information and education to the public and other key audiences	Industry, forest managers, citizens of MN	DNR, USFS, U of M, wood industry, SWCD	FSP, SWCD \$, Technical assistance,
Support collaborative development of new or improved markets and products	Industry, forest managers	DNR, U of M, NRRI	\$, Technical assistance
Provide wood marketing and utilization assistance to forest product companies to increase industry health and promote efficient wood utilization and greater use of underutilized species and resources	Industry, forest managers	DNR, U of M, NRRI	\$, Technical assistance
Assist with continuous development of skilled forest industry workers through engagement with partner training efforts	Industry	DEED, MLEP and U of M Extension	DEED, MLEP and U of M Extension
Increase planting of short rotation woody crops on private lands, where appropriate, to improve wood supply	NIPF and wood industry landowners	DNR, U of M, USFS, SWCD	SWCD tree sales programs

Strategically provide financial assistance to forest product companies that are important for maintaining forest management through markets	Industry, forest land managers	USFS	\$, Technical assistance
Market low grade wood material for increased income for private landowners and public land managers.	NIPF landowners, public land managers, DNR, U of M, USFS	USFS, NRCS, State Technical Committee, MFA, FSP, SWCD	FSP, SWCD

Minnesota Issues and Strategies for Forest Management – 5 year Plan

Issue: Use of Woody Biomass for Energy

The development and harvest of woody biomass must be pursued as part of a broader strategy to create well managed, healthy and productive forests. The utilization of woody biomass must be considered in the context of goals and policies pertaining to energy, the environment and broad economic goals of the state. The use of biomass should be done in an efficient manner and integrate both forest biomass and agriculture biomass strategies.

→This issue relates to the USFS National Themes and Objectives: Conserve and Manage Working Forest Landscapes for Multiple Values and Uses; Enhance Public Benefits From Trees and Forests

Strategy	Key Stakeholders	Partners	Resources
Through active industry engagement, facilitate the emerging woody biomass industry synergistically “fitting” existing industry and resources.	Industry, forest managers, citizens of MN	DNR Biomass & U&M Programs, USFS, U of M, wood industry, MLEP	\$, Technical assistance
Encourage utilization of tree species and other woody resources that both minimize competition with existing industry, and enhance the ability of forest landowners to achieve management goals.	Industry, forest managers, citizens of MN	DNR Biomass & U&M Programs, USFS, U of M, wood industry, MLEP	\$, Technical assistance
Follow Biomass harvest guidelines as laid out in the current version of “Sustaining Minnesota Forest Resources Guidelines.”	NIPF landowners, land managers, loggers, consulting foresters, MFA	DNR’s FSP, Minnesota Forestry Association, MLEP, MFRC, biofuels industry	FSP foresters and list of registered stewardship plan holders, MFRC site level FM Guidelines
Monitor the implementation and effectiveness of biomass harvesting guidelines	Industry, forest managers, NIPF landowners, citizens of MN	MFRC, DNR-Forestry, U of M, MLEP	<i>Undetermined: need funds for monitoring and research</i>
Contribute to attainment of broad ambient air quality goals, including regional haze attainment goals for northern MN	Industry, forest managers, NIPF landowners, citizens of MN	MPCA, EPA, DEED-Green Enterprise Assistance	<i>Undetermined</i>
Avoid increases in net demand for water in locations where water resources are not adequate to meet project demand	Industry, forest managers, NIPF landowners, citizens of MN	MPCA, EPA, DEED-Green Enterprise Assistance	<i>Undetermined</i>

Minimize the thermal and chemical loadings on surface or ground water	Industry, forest managers, NIPF landowners, citizens of MN	MPCA, EPA, DEED-Green Enterprise Assistance	<i>Undetermined</i>
Support community development goals and needs to pursue economic development and investments through partnerships to attract firms or expand biomass use for retention and expansion of jobs and future wealth creation	NIPF landowners, Minnesota Forestry Association, Tree Farm, rural communities	DNR, DEED-Green Enterprise Assistance, biofuels industry, MFRC, MFRP, SFEC, MLEP, MFA, rural communities, Chambers of Commerce	SS, Technical assistance, FSP
Encourage investors to pursue projects, that don't undercut the ability of existing value-added industries to procure wood fiber	NIPF landowners, MFA, Tree Farm, rural communities	DNR, DEED-Green Enterprise Assistance, biofuels industry, MFRC, MFRP, SFEC, MLEP, MFA, rural communities, Chambers of Commerce	<i>Undetermined</i>
Focus on applications (for woody biomass) for which other renewable energy resources are not well suited	NIPF landowners, MFA, Tree Farm, rural communities	DNR, DEED-Green Enterprise Assistance, biofuels industry, MFRC, MFRP, SFEC, MLEP, MFA, rural communities, Chambers of Commerce	<i>Undetermined</i>
Encourage applications that efficiently utilize the BTUs contained within the wood product	NIPF landowners, MFA, Tree Farm, rural communities	DNR, DEED-Green Enterprise Assistance, biofuels industry, MFRC, MFRP, SFEC, MLEP, MFA, rural communities, Chambers of Commerce	<i>Undetermined</i>
Create new income through working lands conservation opportunities for farmers	NIPF landowners, MFA, FSP	DNR, NRCS, FSA	FSP, NRCS (via Environmental Quality Incentive Program), FSA (via Conservation Reserve Program)
Exploit synergies and complimentary characteristics in systems that mix woody biomass and agricultural crops	NIPF landowners, MFA, FSP, Agricultural communities	DNR, NRCS, DEED-Green Energy businesses, Green Enterprise Authority	NRCS programs and practices that support agroforestry and silvipasture type farming

			systems
Support the use and development of BMPs for emerging forest products, including biomass and bioenergy products	Landowners, industry	DNR, USFS, NRCS, RC&Ds, SWCD, MLEP	NRCS has conservation practice standards cost-shares for harvesting biomass for energy in environmentally friendly ways

Minnesota Issues and Strategies for Forest Management – 5 year Plan

Issue: Maintenance and Enhancement of Rare Ecological Features

Minnesota is committed to identifying, protecting, monitoring and maintaining rare species and ecological systems that contribute to the state's biodiversity and viability of forest ecosystems. Efforts such as forest certification, the state wildlife action plan (SWAP), the DNR native plant community field guides, the DNR Minnesota county biological survey (CBS), plus efforts such as the in-process ecological classification system (ECS), coupled with federal and non-profit identification and restoration efforts, provide guidance for preservation of rare ecological features and systems for the future of forests within the state.

→This issue relates to the USFS National Themes and Objectives: Protect Forests From Threat; Enhancing Public Benefits From Trees and Forests

Strategy	Key Stakeholders	Partners	Resources
Develop, maintain and continually improve tools necessary to clearly identify where rare ecological features and resources are located in forest systems to help forest landowners manage for them	NIPF landowners, forest managers, consulting foresters, citizens of MN	DNR, NRCS, FSA, Tree Farm, TNC, USFS, USFWS, Tribes	FLP, MFF, FSP
Identify Key Habitats for SGCN and apply management or protection efforts that complement the State Wildlife Action Plan to maintain or enhance viability.	NIPF landowners, forest managers, consulting foresters, citizens of MN	DNR, USFS, TNC, USFWS, Audubon, NPS, Tribes	USFWS, Outdoor Heritage Fund
Provide technical assistance on rare ecological features to interested individuals and organizations	NIPF landowners, forest managers, consulting foresters, citizens of MN	DNR, USFS, TNC, USFWS, Audubon, NPS	USFWS, TNC, FSP, Audubon, Outdoor Heritage Fund
Incorporate SWAP priorities (e.g. SGCN Key Habitat concerns) in existing forest management planning	NIPF landowners, forest managers, consulting foresters, citizens of MN	USFS, TNC, USFWS, DNR, MFRC, NPS, BIA, Tribes	DNR SFRMP Plans, FSP, OHV Recreation Plans
Manage to reduce the spread of invasive species ; manage to control and reduce existing invasive species populations (see also Forest Health and Productivity)	NIPF landowners, forest managers, consulting foresters, citizens of MN	USFS, TNC, USFWS, DNR, MFRC, NPS, BIA, Tribes	FSP, MIPN, CWMA's, existing laws (noxious weeds), best mgmt. practices
Protect and manage federal and state listed species to maintain or enhance their viability	NIPF landowners, forest managers, consulting foresters, citizens of MN	USFS, TNC, USFWS, NPS, DNR Div of Eco-Resources , BIA, Tribes	USFWS, Outdoor Heritage Fund
Identify and incorporate emerging issues affecting	NIPF landowners, forest	USFS, USFWS, NPS, BIA,	USFWS, Outdoor Heritage

specific SGCN populations into management plans	managers, consulting foresters, citizens of MN	DNR	Fund
Use prescribed fire and other practices to maintain habitat for rare ecological features associated with fire disturbance	NIPF landowners, forest managers, consulting foresters	USFWS, DNR, USFS, NPS, NRCS, Tribes	NRCS cost-share on prescribed burns within program guidelines
Encourage habitat restoration efforts	NIPF landowners, forest managers, consulting foresters, citizens of MN	DNR, USFS, NRCS, USFWS, BIA, USACE, Tribes, TNC	FSP, NRCS cost-share restoration programs for specific habitats (e.g. oak savannahs)
Enforce existing rare species laws	Citizens of MN	USFS, USFWS, EPA, MPCA, BWSR, Tribes	WCA, NEPA, State laws
Provide protection opportunities –selective acquisition of Key Habitats, SNA designation, Natural Area Registry Sites, old-growth	NIPF landowners, forest managers, consulting foresters, citizens of MN	USFWS, DNR, TNC, TPL, state legislature, counties	DNR, USFWS, Outdoor Heritage Fund
Research aspects of SGCN Key Habitat conservation necessary to more effectively maintain or enhance their viability	NIPF landowners, forest managers, consulting foresters, citizens of MN	TNC, Audubon, DNR, USFWS, U of M	U of M, research institutions
Assess the amount and quality of Key Habitats for SGCNs and map their locations	NIPF landowners, forest managers, consulting foresters, citizens of MN	TNC, Audubon, DNR, USFWS, U of M	DNR, USFWS, Outdoor Heritage Fund
Research important aspects of people’s understanding of SGCN	Citizens of MN	TNC, Audubon, DNR, USFWS, U of M	U of M, research institutions
Monitor long-term trends in SGCN populations and habitats and apply adaptive management that incorporates monitoring results into management plans on an ongoing basis	NIPF landowners, citizens of MN	USFS, USFWS, NPD, DNR Div of Eco-Resources , Tribes	USFWS, Outdoor Heritage Fund, U of M
Maintain and update information management systems for inventory and monitoring of rare ecological features and delivery of such data to partners	NIPF landowners, forest managers, consulting foresters, citizens of MN	TNC, Audubon, DNR, USFWS, U of M	USFWS, Outdoor Heritage Fund

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Issue: Recreational Use of Forest Lands

Minnesota has always had a strong tradition of nature-based outdoor recreation with participation in outdoor activities well above the national average, especially in hunting, fishing and boating. These activities and increasingly bird-watching, motorized and non-motorized activities all rely on access and interaction with abundant natural resources such as forest lands, lakes, rivers, blufflands, grasslands and parks and recreation facilities. The state is committed to preserving and enhancing outdoor recreational use for both present and future generations to enjoy.

→This issue relates to the USFS National Theme and Objective: Enhance Public Benefits From Trees and Forests

Strategy	Key Stakeholders	Partners	Resources
Ensure that SAF address applicable regulations and landowner objectives for recreation, aesthetics and cultural resource protections	Forest landowners, citizens of MN	MFA, Tribes, federal and state agencies	<i>Undetermined</i>
Ensure that Forest Legacy Easement and Minnesota Forests for the Future Programs consider recreational access when ranking and scoring potential acquisitions	Various user groups (trail users, both motor and non-motor), hunters, hikers, skiers, etc., general recreational public	FSC, MN Forests for the Future Advisory Committee	Time and involvement of the private sector
Ensure that the state continues to have periodic public input discussions or meetings with a broad variety of user groups to listen to their ideas about improving recreational opportunities on forest lands	Mn Deerhunters Assn, All-Terrain Vehicle Assn of MN, Mn Audubon, Sierra Club, International Mountain Bike Assn, Other Assn's	USFS, county land dept's, Tribes	MFRC regional landscape committees, county recreation dept's
Improve connectivity of multi-agency trail systems and access to outdoor recreation opportunities	Citizens of MN, user groups	USFS,NPS,USACE, USFWS, BIA, Tribes, counties, municipalities	\$, Technical assistance
Ensure implementation of the 2007 MN DNR Trail Planning, Design, and Development guidelines	Citizens of MN, user groups	DNR, GIA partners, counties, communities	\$, Technical assistance
Invest Clean Water, Land and Legacy funds in high priority, sustainable projects that efficiently deliver a broad variety of recreational uses of forest lands	Natural resource management agencies, lakeshore owners associations, zoning authorities	State legislature, user groups	<i>Undetermined</i>
Pursue recreation investments that provide the basis for expanding wealth creation, ecosystem health, and job	Citizens of MN	State legislature, DNR, USFS, communities,	Adequate appropriations

retention within the state of MN		Chambers of Commerce, user groups, counties	
Develop long-term funding that will assure maintenance and replacement of recreation infrastructure on all state forest lands (e.g. campgrounds, boat launches, trails, etc.)	Citizens of MN, user groups	USFS, DNR, USACE, state legislature	Adequate appropriations
Assure that large acreages of public land that are used for recreation remain public and are not sold into the private sector because of economic pressures on government agencies	Citizens of MN, user groups	DNR, USFS, congress, counties , state legislature, user groups, conservation organizations	<i>Undetermined</i>
Promote harmony among forest users by searching for ways to help exclusive use activities to co-exist with other activities that compete for the same space	Citizens of MN, user groups	User groups, natural resource management agencies, forest managers, DNR, counties, USFS, Tribes	<i>Undetermined</i>
Measure and monitor recreational use impacts to determine when ecosystems or recreation sites are being negatively affected	Citizens of MN, user groups	DNR, USFS, USACE, user groups, counties, Tribes	Adequate appropriations
Investigate partnerships among levels of government (federal, county , municipal for providing recreational opportunities)	Citizens of MN	USFS, USFWS, NPS, USACE, MDA, DNR, Tribes	<i>Undetermined</i>

Minnesota Issues and Strategies for Forest Management – 5 year Plan

Issue: Urban and Community Forestry

Urban and community forestry programs face many challenges throughout the state with increasing threats to tree health and decreasing funds and personnel to address these challenges. Technical assistance and education remain the top priorities for addressing threats to tree health and other environmental degradation issues.

→This issue relates to the USFS National Themes and Objectives: Protect Forests from Threat; Enhancing Public Benefits From Trees and Forests

Strategy	Key Stakeholders	Partners	Resources
Involve more statewide organizations to improve coordination with the MDA in monitoring and planning for greater state investments in exotic invasive pest control (Gypsy Moth, EAB, etc.)	LUGs, private forest land owners, green industry	MnSTAC, LMC, Webinar partners	DNR, MDA FRP funds, U of M EAB Rapid Response Project, DNR annual contract w. U of M, MDA, U of M staff
Clarify UCF role with Gypsy Moth, EAB, and MN Forest Protection Plans (do not overlap with USDA or MDA)	LUGs, Green Industries, MDA, DNR, U of M, USFS, USDA	USDA, USFS, MDA	State funds for invasives management, all stakeholder organizations
Involve more private and public tree practitioners in MSA efforts to improve the standards of practice among green professionals statewide	MSA, Green Industries, MNLA	MNLA, MSA	DNR contract w/U of M, MDA, U of M staff, MNLA
Increase promotion and expand the DNR-led statewide Tree Inspector Certification Program to include cities, townships, SWCDs in Greater Minnesota who are facing the greatest threat from EAB	LMC, SWCD, MN Assoc. of Municipalities, Townships	U of M, MnSTAC, LMC	DNR contract w/U of M, MDA, U of M staff
Use USFS “Midwest Community Tree Guide” to promote trees as public assets and identify pilot programs to promote urban forestry among municipalities	LUGs, Green Industries, LMC, SWCDs, MN Assoc of Municipalities, Counties, Townships	USFS, MnSTAC, LMC, APWA (Public Works), SWCD	DNR, MDA, U of M staff, DNR contract with U of M publications (eg. “Beyond the Suburbs” and “Best Management Practices”), SWCD
Renew efforts to engage and assist underserved communities in local urban programs	Ethnically diverse communities, large city neighborhood organizations, non-profits	MnSTAC, non-profits, DNR Southeast Asian	LMC, large population centers

		program, LMC	
Promote and facilitate market solutions to UCF management issues and needs (eg. expanded markets for ash to treat EAB mortality)	UCF managers, Communities, Wood Industry	DNR, USFS, U of M	\$\$, Technical assistance
Educate, engage APL and city foresters in the use of Rapid Assessment for management planning. Promote use of “City Tree Guidelines” standards and codes in local and community planning efforts	Communities, SWCD, private consultants	DNR, MPCA, LMC, SWCDs	SWCD, MPCA storm water coalition
Build upon the partnership with the USFS iTree Team to promote the use of identified tools by public and private practitioners, and continue to build upon the awareness created by the “Trees Pay Us Back” publicity campaign to garner greater state and local investments in the Urban and Community Forest programs.	LMC, SWCD, Mn Assoc of Municipalities, Townships	USFS, USFWS/Backyard Wildlife Habitats	MDA, U of M staff, DNR FS UCF grant
Develop clean water strategy with MPCA Clean Water Council and USFS Watershed Team	LMC, SWCDs, MNnAssoc of Municipalities, Townships	USFS, MPCA, LMC, Clean Water Council	DNR FS UCF grant, Clean Water Legacy Fund, LMC Stormwater Coalition
Collaborate with MPCA staff on integrating CFM into pilot MN Green Corps and recognize communities implementing UF sustainability programs through MN Green Step Cities Program and support ALSA Green Streets for infra-structure design	Communities and green industry, APWA	MPCA, LMC, MSLA, MNLA	MDA FRP funds, U of M EAB Rapid Response Project, DNR annual contract w/ U of M, MSLA, MNLA
Expand efforts to recognize model exemplary programs and civic organizations through national Arbor Day foundation programs	Communities and civic organizations, local and regional utility companies	MNSTAC, MSA, NADF, local and regional utility companies	NADF (Tree City and Tree Line USA), MSA, LMC, local and regional utility companies

Chapter 5: State Geo-Spatial Priorities

Methodology and Analysis documentation

Four spatial models were created to depict significant areas in Minnesota's Forests. This chapter describes the models and methodology & data layers used to identify these areas.

The **Threats and Risks map** and **Economic Impact map** were created by simple overlay analysis. GIS layers (described for both maps in more detail below) that represent individual contributions to each theme were developed or converted to raster layers. The cells in each layer represented the presence or absence of the input phenomenon (0 = not present in this area) and in most cases a low, medium or high value (1,2,3 respectively) to represent the amount or impact of the phenomenon in any pixel of interest. Once each contributing layer was created, they were added together to create a map with values from 0 to max, where max was the sum of highest values from each contributing layer. In this intermediate layer, pixels with a value of 0 represented areas on the ground with none of the contributing factors, and pixels with a value of max represented areas with all of the highest contributing factors.

Once the layers were added, the values of the resulting maps were again grouped into values of high, medium, low and None. The exact thresholds were determined by creating example maps and asking subject area experts to determine which map most closely represented the Risk/Impact for areas of Minnesota's forests.

The **Ecological Values map** and **Recreational Values map** were created for a different project with goals very similar to this statewide assessment. The project, entitled *Minnesota Forests for the Future*, intends to use the results of the four spatial models to identify areas with the highest return for long term forest easements. The two maps developed by MFF project staff used a more specialized approach to identify target areas. Although the outcome (a map of high value areas) is the same for all maps, the reader may notice the difference between these two methodologies when reviewing this chapter. The methodology used to create the final maps is described after the contributing layers for these maps.

Threats and Risks map

This model is the result of an overlay analysis of five datasets important to assessing Minnesota's vulnerability to fire, insect & disease, invasive species threats and the risk of development. The model created from this overlay highlights areas of low, moderate and high risk.

Economic Impact map

To depict the potential economic impact of Minnesota's forested areas, seven datasets were evaluated and used in the overlay analysis; including lands with permanent forest conservation easements (e.g., forest legacy lands), trust fund lands, lands with Forest Stewardship plans, and mill locations. The resulting model highlights areas of low, moderate and high potential economic impacts.

Ecological Values map

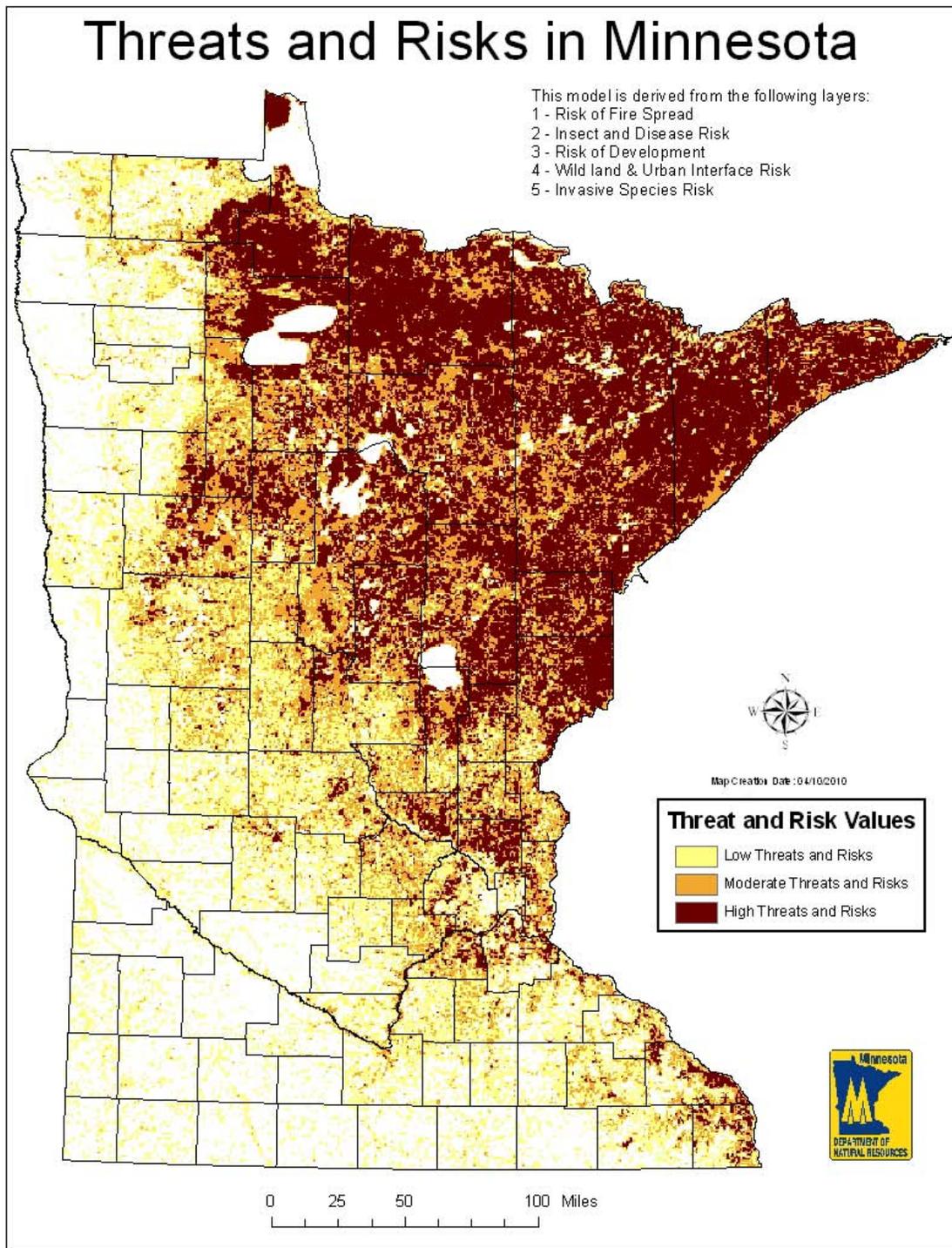
The DNR created these habitat models to help determine what remaining natural areas should be protected in the face of rapid suburban development. The results are not meant to be the definitive locations of important ecological areas, but rather as a starting point for future field assessments. This landscape scale product is useful for region wide planning efforts, such as park planning, locating conservation corridors or countywide general planning and zoning.

These habitat models evaluate terrestrial and wetland areas based on land cover characteristics: size, shape, connectivity, species diversity, and compatibility of adjacent land uses.

Recreational Values map

This map was created to identify areas with high opportunities for scenic outdoor recreation such as bicycling, walking, camping and sightseeing.

• Figure 1. Threats and Risks in Minnesota



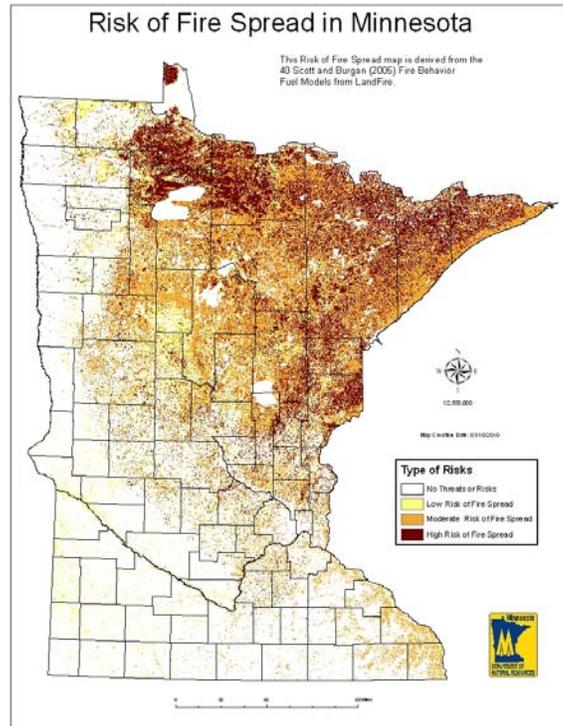
Low Threats and Risks	= 7,709,975 Acres
Moderate Threats and Risks	= 7,594,246 Acres
High Threats and Risks	= 14,197,492 Acres

The following five data layers were used to create the **Threats and Risks** map.

1. Risk of Fire

This LANDFIRE fuel data describe the composition and characteristics of both surface fuel and canopy fuel. This layer shows areas at elevated risk from wildfire damage. It was created from the LANDFIRE 40 Scott and Burgan (2005) Fire Behavior Fuel Models. The layer was then re-classified to three fuel types, low, moderate and high risk of fire spread based on the original fuel type models.

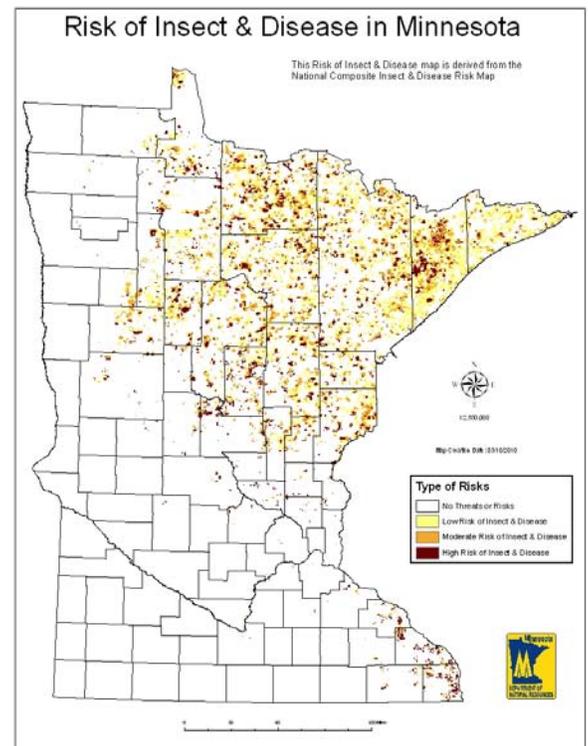
• Figure 2. Risk of Fire Spread



2. Risk of Forest Pests

A national “risk mapping” effort performed by the U.S. Forest Service, Forest Health Technology Enterprise Team formed the layer used to identify forest areas at risk of mortality from insect and disease infestation. The layer was classified to three risk categories, low, moderate & high based on percentage of predicted loss of basal area. This layer was a national effort, and as such the resolution of the data is 2 kilometers by 2 kilometers. Areas at risk are shown in gradation from yellow (lowest) to dark red (highest).

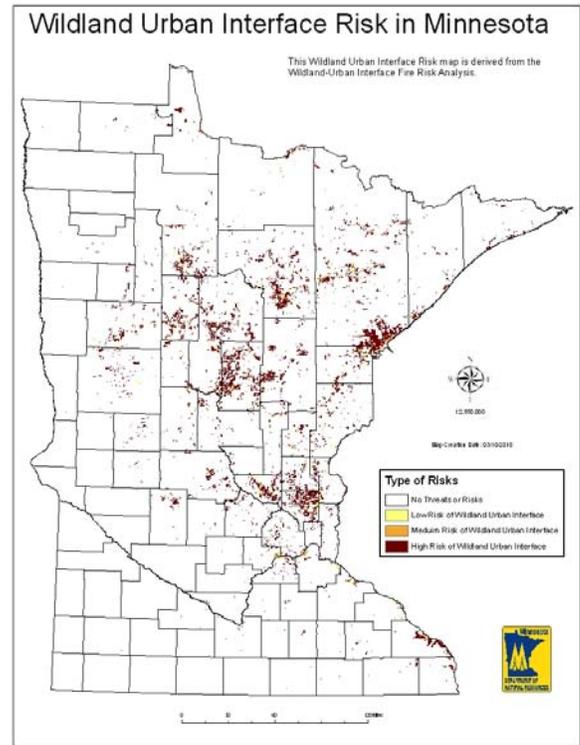
• Figure 3. Risk of Insect & Disease



• Figure 4. Wildland Urban Interface Risk

3. Risk from the Wildland-Urban Interface

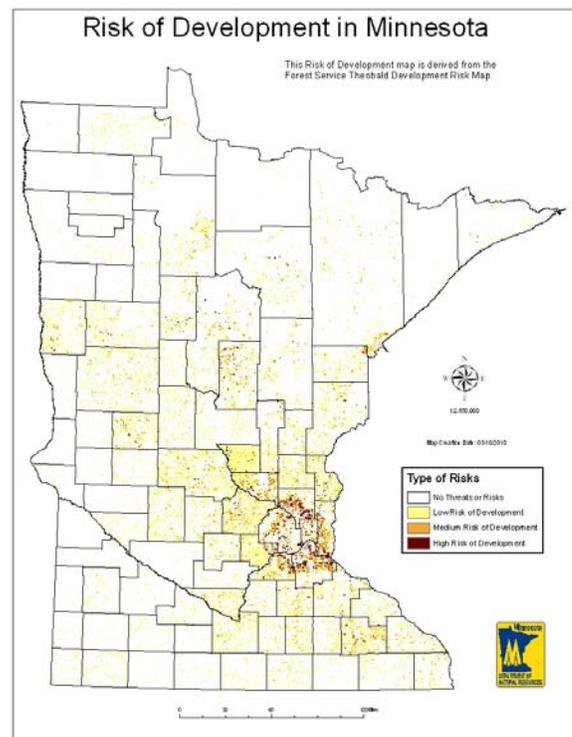
The “Wildland-Urban Interface (WUI) is the area where houses meet or intermingle with Undeveloped Wildland vegetation”. This WUI layer was created by integrating U.S. Census and USGS National Land Cover Data to map the Federal Register definition of WUI explained above. The layer was then classified to three specific types of risk, low, moderate & high risk based on population density and vegetation intermix.



• Figure 5. Risk of Development

4. Risk of Development

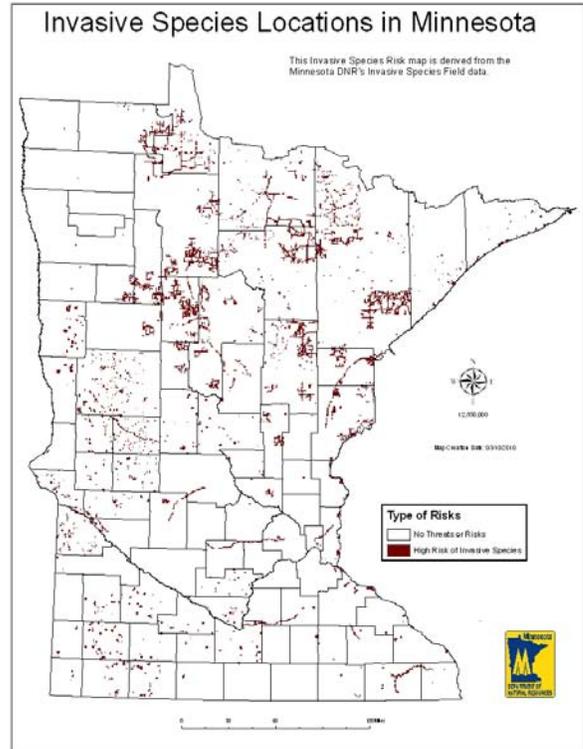
This Development Risk layer is the result of a subtraction of the US Census Bureau Block 2030 and 2000 datasets to produce a classification of predicted housing density. The development risk data layer is intended to emphasize areas that are projected to experience increase housing development in the next 30 years. The Development Risk layer was then classified to three housing density types, low, moderate & high development risk based on the original definitions.



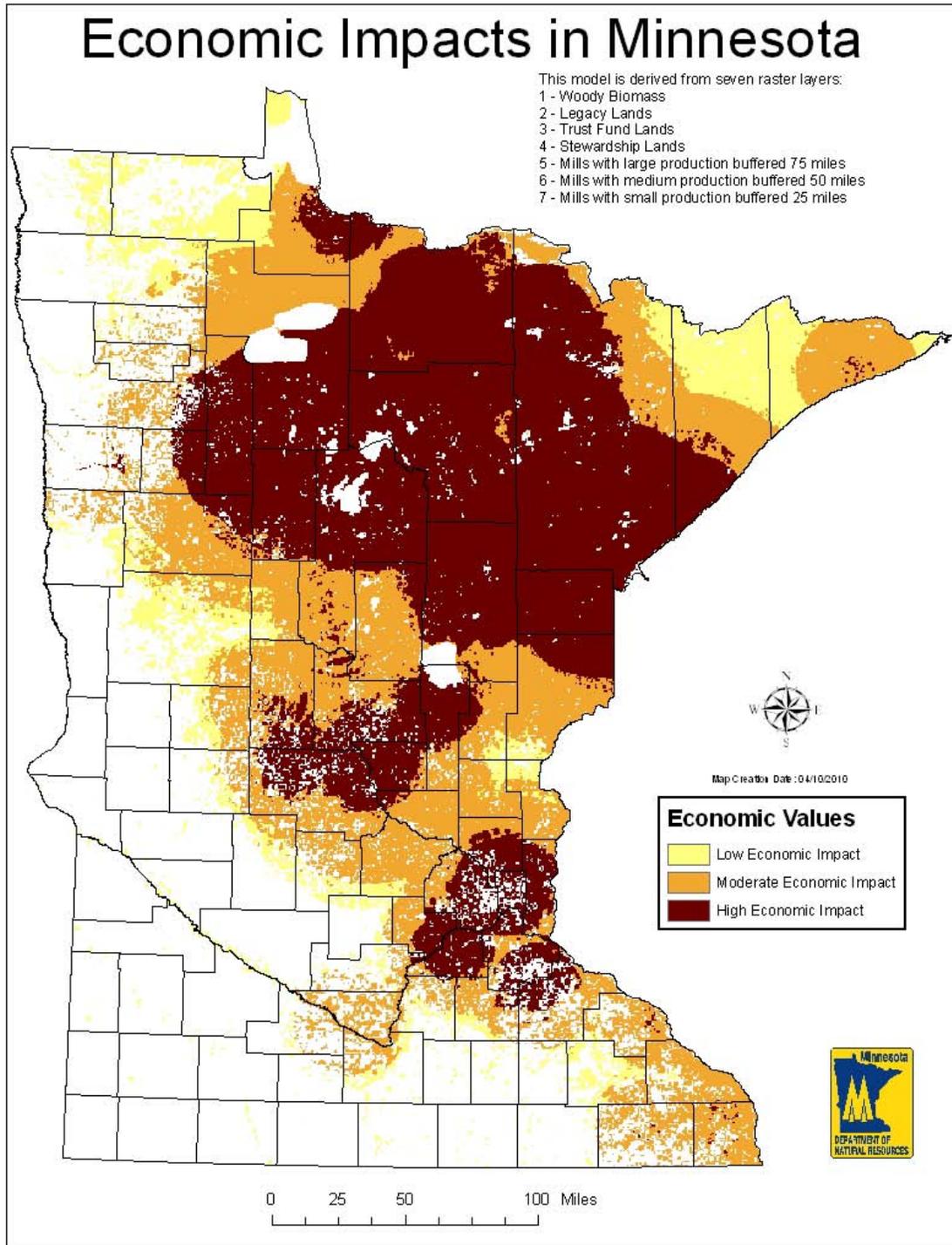
• Figure 6. Invasive Species Locations

5. Terrestrial Invasive Species

This layer is an ongoing Multi-Divisional effort to record GPS locations of selected terrestrial invasive plants on Minnesota DNR land and other selected locations. The original dataset is a point file containing estimated area of infestation. This dataset was buffered to the estimated area then re-classified to a binary raster.



• Figure 7. Economic Impacts



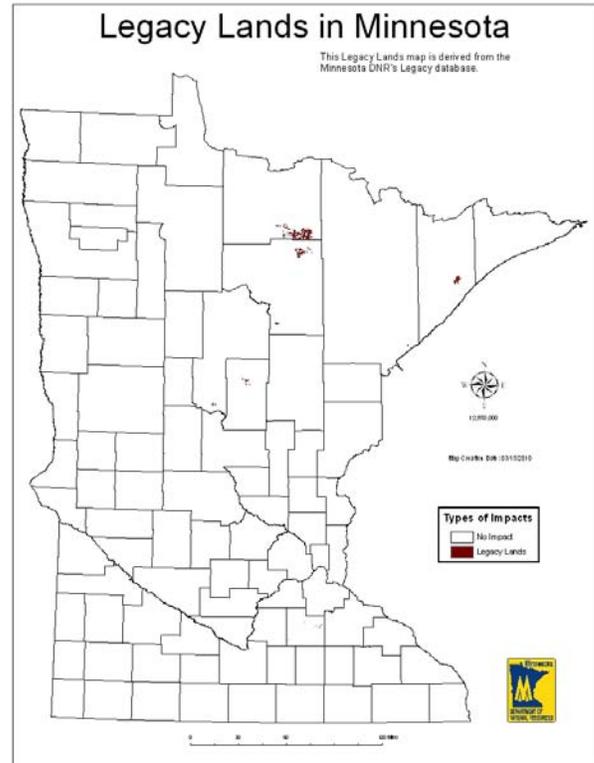
Low Economic Impacts	= 3,309,209 Acres
Moderate Economic Impacts	= 9,750,477 Acres
High Economic Impacts	= 13,753,919 Acres

The following seven data layers were used to create the **Economic Impacts** map.

1. Legacy Lands

The Minnesota Forest Legacy Program protects environmentally important forests throughout the state threatened by conversion to non-forest uses. Federal funds and local matching funds are used to purchase development rights and conservation easements on these forests in targeted areas of Minnesota to keep them intact and continuing to provide forest benefits. This layer is included given the importance placed on these conservation easement lands as “working forests.”

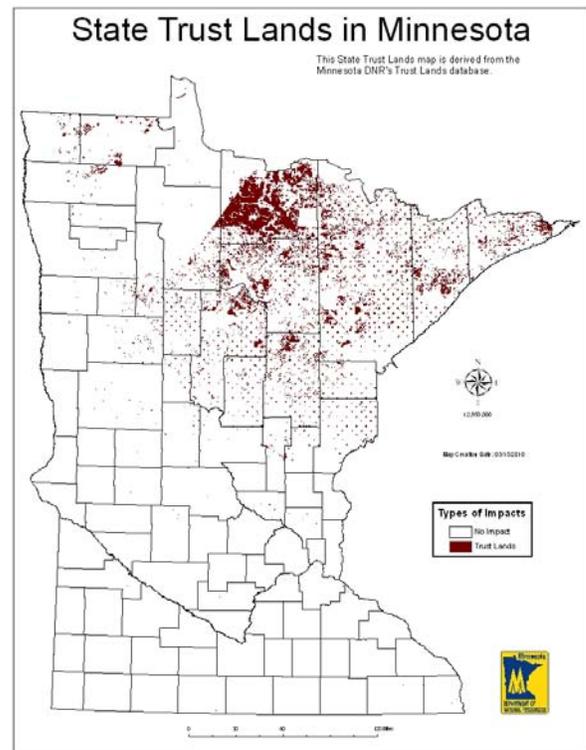
• Figure 8. Legacy Lands



• Figure 9. State Trust Lands

2. State Trust Lands

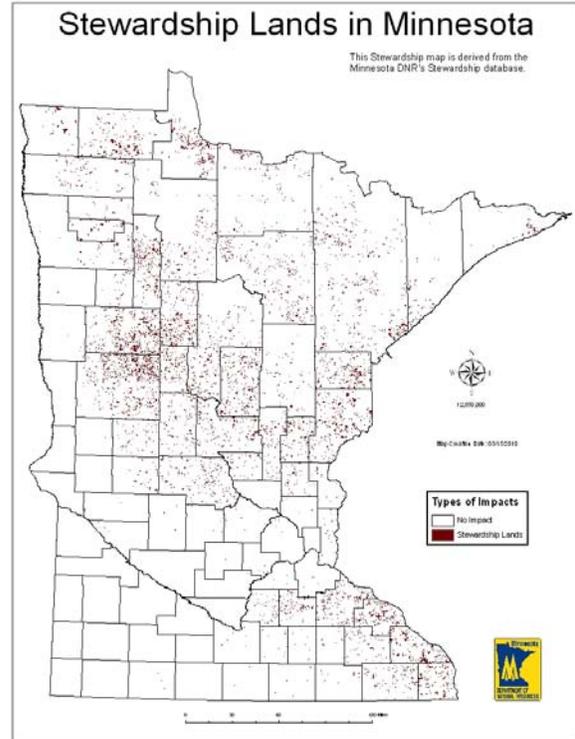
This State Trust Fund Lands layer merges the DNR Control Point Generated PLS layer with IBM mainframe-based land records. The data are limited to a PLS forty or government lot level of resolution. This layer shows the location of Trust Fund lands in Minnesota. It is included in the analysis given the importance of these lands in generating revenue for the permanent School Trust Fund.



• Figure 10. Stewardship Lands

3. Stewardship Lands

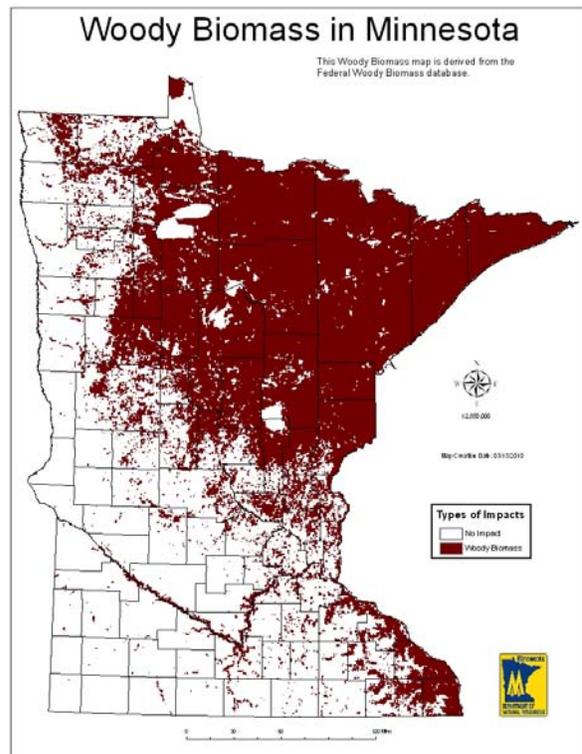
In the fall of 2004, Minnesota DNR and the U.S. Forest Service began working together to create a digital database of existing forest stewardship plans and also a GIS layer representing the level of “benefit” gained from potential forest stewardship work. This layer was included in the analysis given the investments and interest of associated landowners in carrying out active forest management.



• Figure 11. Woody Biomass

4. Woody Biomass

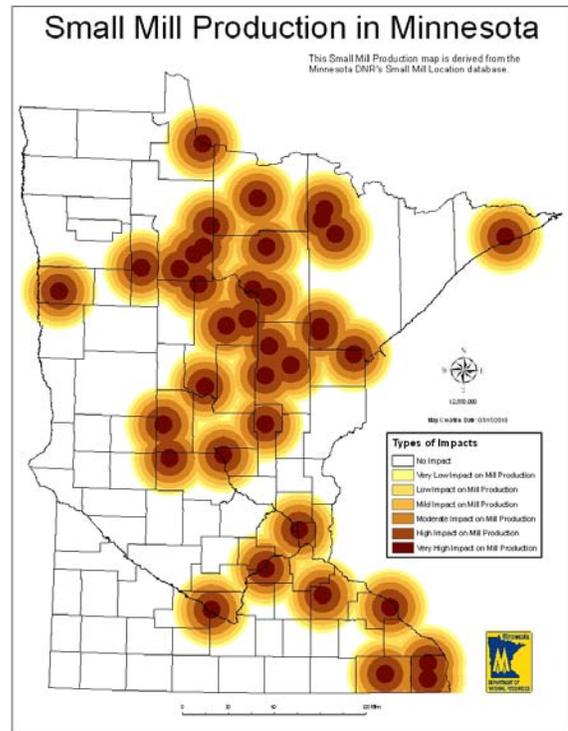
The USDA Forest Service FIA, Remote Sensing Applications Center created this layer. It is a spatially explicit dataset of aboveground live forest biomass was made from ground measured inventory plots for the conterminous U.S., Alaska and Puerto Rico. The plot data are from the USDA Forest Service Forest Inventory and Analysis (FIA) program. Models were then developed to relate field-measured response variables to plot attributes serving as the predictor variables. The geospatial predictor variables included MODIS, NLCD, topography, climate parameters and other ancillary variables.



5. Small Mills

For this model, small sized mills are defined as having a production rate of less than 75 board feet annually. To demonstrate the economic impact small mills will have on an area these mills were extracted from the DNR's mill location database and buffered using a Euclidean distance of 25 miles. The resulting layer was then re-classified to six specific buffer zones depicting the relative proximity and potential importance of an area to the associated mill.

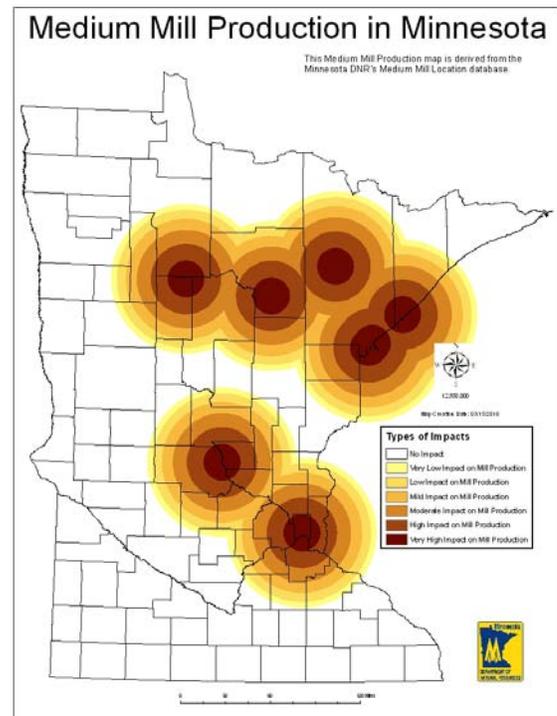
• Figure 12. Small Mill Production



6. Medium Mills

For this model, Medium sized mills are defined as having a production rate of 75 to 200 board feet annually. To demonstrate the economic impact medium mills will have on an area these mills were extracted from the DNR's mill location database and buffered using a Euclidean distance of 50 miles (woody biomass energy mill were included in this category). The resulting layer was then re-classified to six specific buffer zones depicting the relative proximity and potential importance of an area to the associated mill.

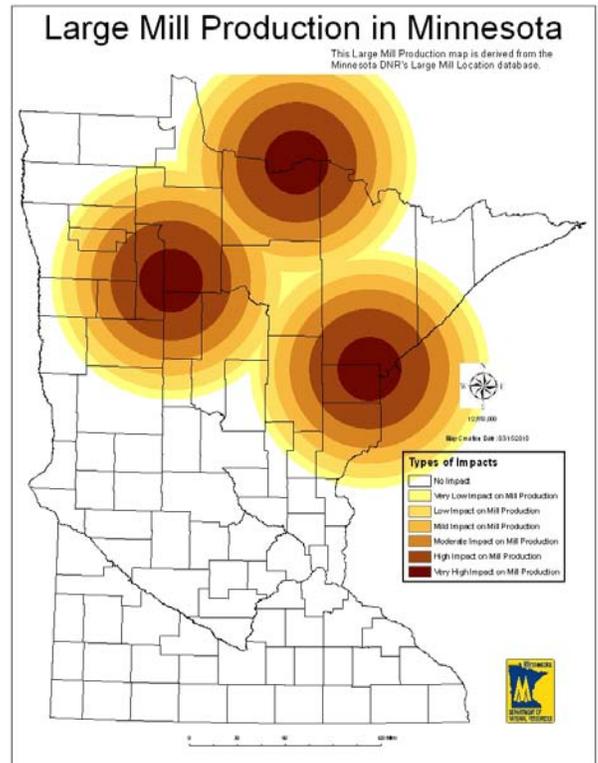
• Figure 13. Medium Mill Production



• Figure 14. Large Mill Production

7. Large Mills

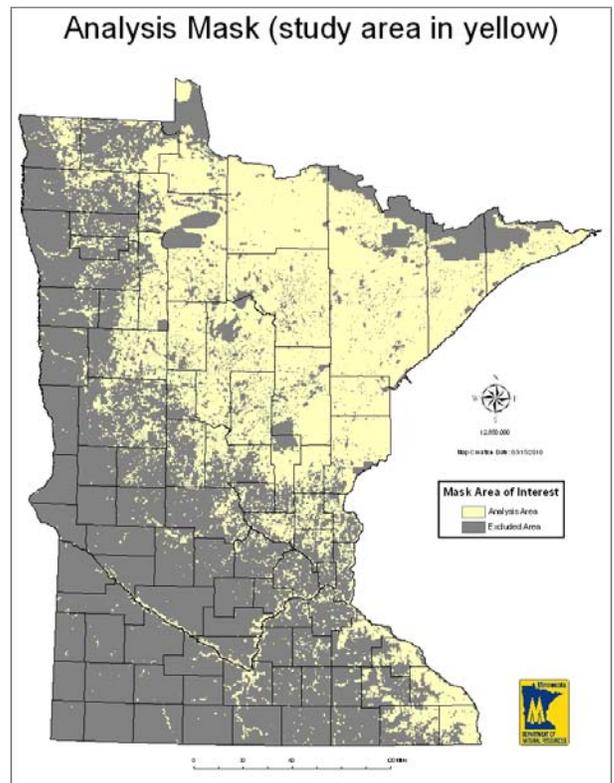
For this model, large sized mills are defined as having a production rate of greater than 200 board feet annually. To demonstrate the economic impact large mills will have on an area these mills were extracted from the DNR's mill location database and buffered using a Euclidean distance of 75 miles. The resulting layer was then re-classified to six specific buffer zones depicting the relative proximity and potential importance of an area to the associated mill.



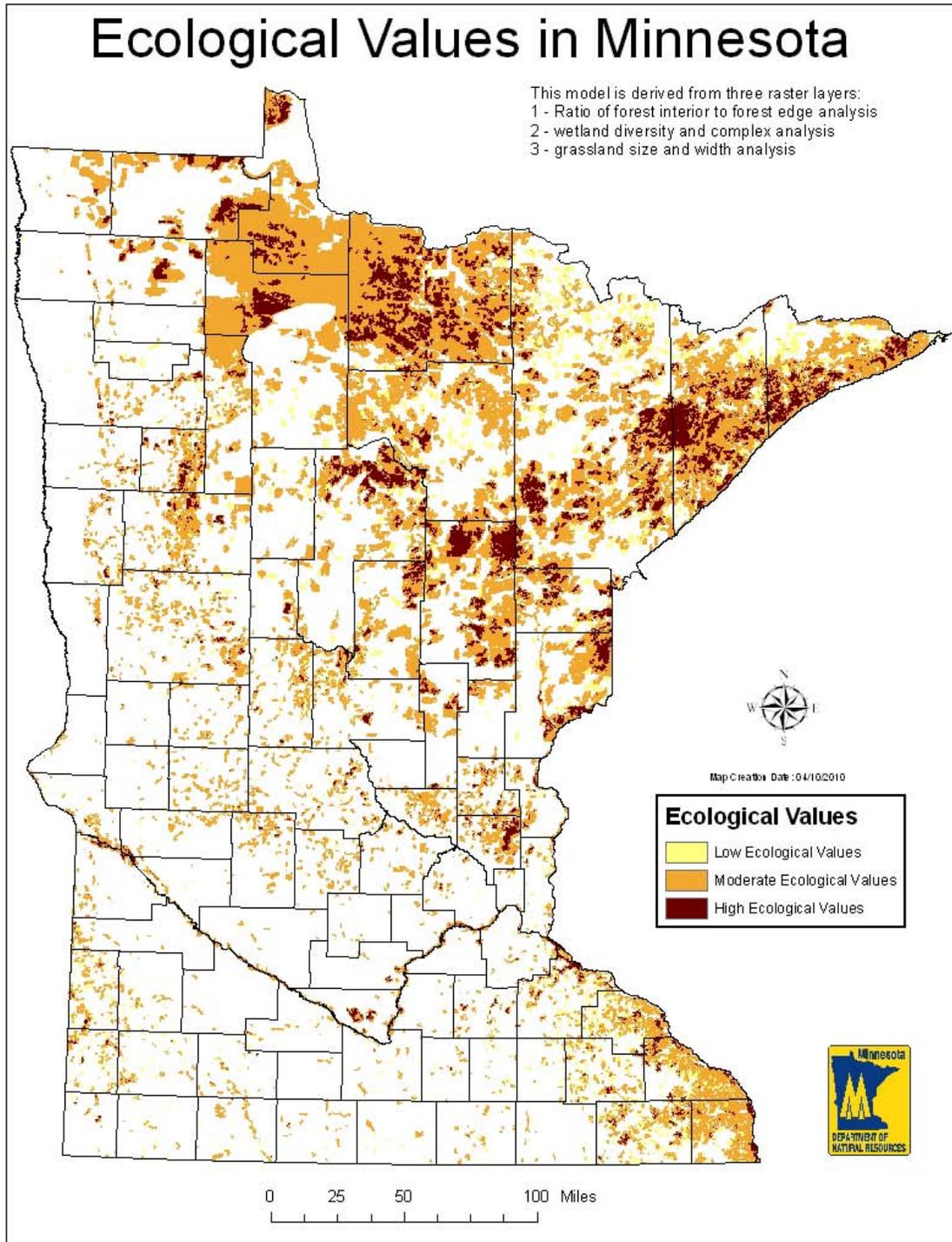
• Figure 15. Analysis Mask

Analysis Mask

The area of interest for the Economic Impact and Threats & Risks models was constrained to areas of the state with woody biomass excluding the Boundary Water Canoe Area Wilderness, Voyageurs National Park and Minnesota State Park Lands.



• Figure 16. Ecological Values



Low Ecological Values = 834,907 Acres
Moderate Ecological Values = 8,243,558 Acres
High Ecological Values = 2,590,333 Acres

The following models were used to create the **Ecological Values** map.

Due to the limitations of satellite interpretation and land use data layers, the forest models were run using land cover that included natural forest stands as well as semi-natural working forests including tree farms, nurseries, and plantations.

1. Ratio of Forest Interior to Forest Edge Analysis

The habitat requirements of 5 bird species, the red-eyed vireo, wood thrush, scarlet tanager, ovenbird and eastern wood pewee, were used to map interior forest. Interior forest (core) patches were identified and scored based on:

- forest patch size (minimum patch size was 24 hectares)
- edge effect (edges, by definition not forest interior, were 120 meters wide)
- percent of total patch that was core
- distance to a source patch (i.e., forest patch 100 hectares or greater in size with more than 40% core)
- additional forest areas at least 150 meters wide and connected to a forest core patch were included for their habitat, buffer, and connectivity benefits

2. Wetland Diversity and Complex Analysis

While many wetlands are regulated under state and/or federal laws, this model evaluates wetlands on 2 characteristics: A. connectivity to uplands and other wetlands; B. diversity of wetland and upland cover types associated with the wetland.

- A. **Wetland Complex:** The model finds wetlands that are close enough to separated by thin strips of upland natural vegetation. Wetlands were identified and scored based on:
- wetland size (minimum wetland size 10 hectares)
 - connection to other wetlands (3 or more wetlands connected by natural vegetation within 120 m of a wetland)
 - complex size (minimum 60 hectares)
- B. **Wetland Diversity:** The model finds large wetlands with a diversity of cover types. Wetlands were identified and scored based on:
- wetland size (minimum 10 hectares)
 - diversity of cover (individual wetlands must have at least 2 different natural cover types, one being at least 25% of the total area)

3. Grassland Size and Width Analysis

Due to satellite limitations some of the grasslands used in the model may be semi-natural vegetation, such as: hayfields, fallow fields or infrequently mowed grass. Grasslands in the GAP data used in the models is not well represented, and most likely has been under counted.

This model identifies 'tall grasslands', which are relatively large areas of unmowed grasses, both native and non-native.

Grasslands were identified and scored based on:

- size (minimum size for tall grasslands was 16 hectares with a minimum width of 90 meters)
- maintained grasslands (i.e., infrequently mowed hayfields and pastures) at least 90 meters wide and connected to tall grasslands 16 hectares or greater in size were included for their habitat, buffering, and connectivity benefits

MCBS mapped native plant communities

All native plant communities mapped to date by the Minnesota County Biological Survey (MCBS) were incorporated. These native plant communities were ranked according to the Biodiversity Significance Rank of the MCBS sites within which they occurred. Biodiversity Significance Ranks have been applied to sites by the MCBS program. All sites with ranks of outstanding, high and moderate are considered by the MCBS program to be significant, but relative ranks help to prioritize sites for preservation. Brief definitions of these ranks follow:

Outstanding biodiversity sites contain the best occurrences of the rarest species and/or the most outstanding examples of the rarest native plant communities, and/or the largest, most intact ecological landscapes present in the state.

High biodiversity sites contain very good quality occurrences of rare species and/or high quality examples of rare native plant communities, and/or important ecological landscapes. These areas may be smaller in size, or have fewer occurrences of rare plants and/or plant communities than have the outstanding sites.

Moderate biodiversity sites contain important occurrences of rare species, and/or moderately disturbed native plant communities, and/or landscapes that have a strong potential for recovery

Ecological Patch Composite Model

Patch Scores

Natural areas identified through the individual forest, wetland, and grassland models are integrated with Minnesota County Biological Survey sites to identify the final ecological patches. The patches are then assigned a final score of 3, 2, or 1 (3 being the highest) based on how well the area meets standards for size, shape, connectivity, adjacent land use/cover, and species diversity.

Score 3 - These areas tend to be larger in size, and/or with few adjacent land cover types or land uses that could adversely affect the area; may have greater diversity of vegetation cover types; or the area may be an isolated native plant community mapped and given a score of outstanding biodiversity significance by the Minnesota County Biological Survey.

Score 2 - These areas tend to be moderate in size and/or with more adjacent land cover types or land uses that could adversely affect the area and may have less diversity of vegetation cover types; or the area may be an isolated native plant community mapped and given a score of high biodiversity significance by the Minnesota County Biological Survey.

Score 1 - These areas tend to be smaller in size while still meeting the minimum size requirements for regional significance (minimum size is variable based on cover type); may have less diversity of vegetation cover types; may have more adjacent cover types or land uses that could adversely affect the area; or the area may be an isolated native plant community mapped and given a score of moderate biodiversity significance by the Minnesota County Biological Survey.

Patch Composite Methodology

Integrate the results of the habitat models (forest interior, forests with wetlands, floodplain forests, grasslands, and wetlands) with the MCBS native plant community data. Use a maximum score rule where patches overlap, such that the highest score overlapping data is given to area.

Identify lakes associated with these integrated patches and incorporate the lakes into the patch. Select lakes where at least 60% of the lake is surrounded by a preliminary patch.

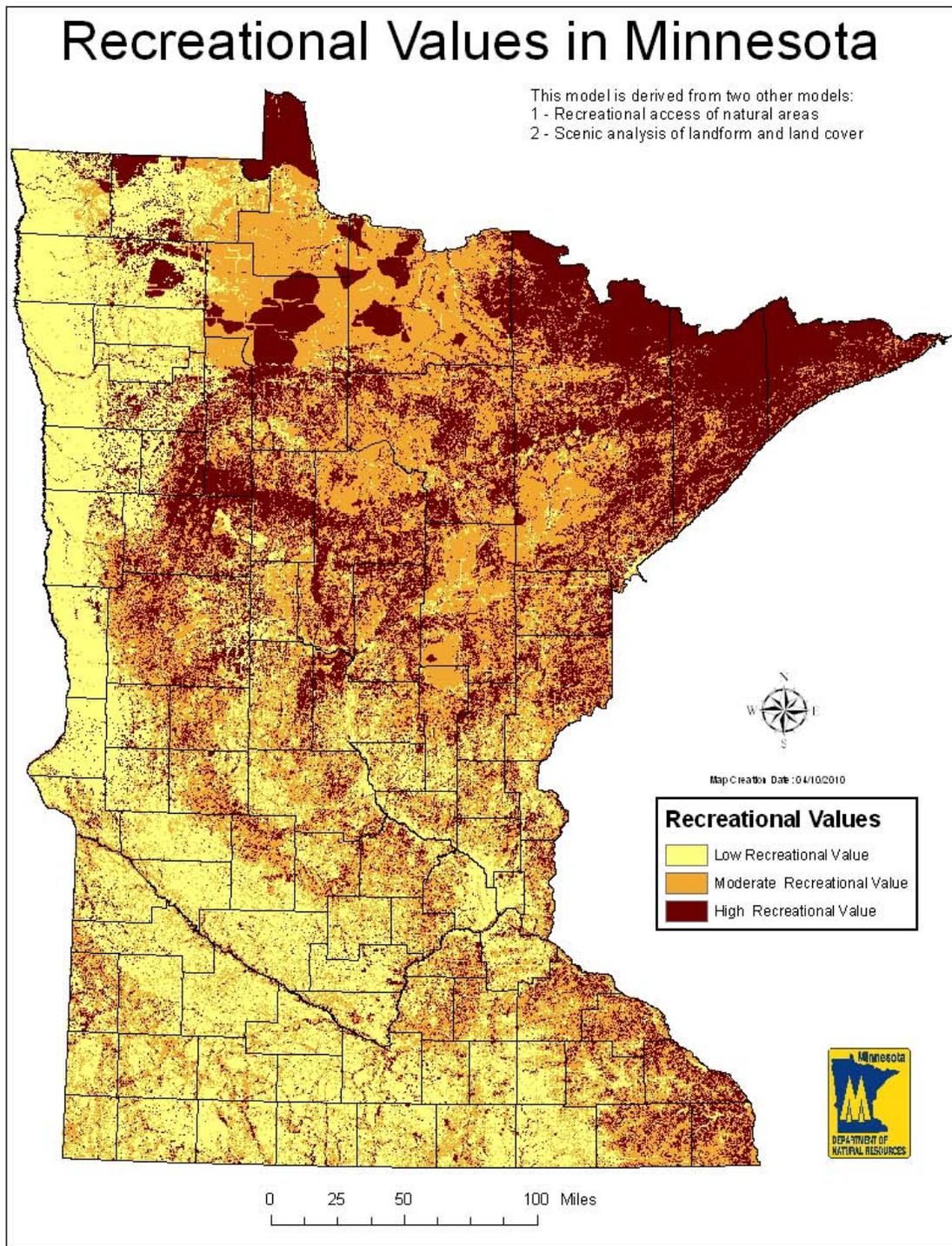
Fill the holes in the patch when the holes are natural vegetation (referencing the Hybrid Land Cover data). Merge the natural vegetation holes with the preliminary patches.

Score the patches using a majority rule. After identifying the percentages of scores within each patch, apply the following rules:

- Score 3: 51% or greater of the entire patch area is score 3
- Score 2: 51% or greater of the entire patch area is score 2
- Score 1: 51% or greater of the entire patch area is score 1, and no score 3s are present
- Score 2: 51% or greater of the entire patch area is score 1, and score 3's are present.

Delete patches that are less than 10 hectares.

• Figure 17. Recreational Values



Low Recreational Values	= 1,856,188 Acres
Moderate Recreational Values	= 20,029,023 Acres
High Recreational Values	= 14,820,982 Acres

The **Recreational Values** map is based on integrated scores of the degree of public access to natural areas via roads, trails or waterways, and a scenic assessment that integrates topographic diversity (elevation change and aspect variations), the degree of naturalism, and road density.

The public access analysis used the refined National Land Cover Data (NLCD) land cover data to identify “natural areas”. Minnesota Department of Transportation (MnDOT) roads, DNR Forest Roads and DNR trails (including waterways), were used as routes of access. The natural areas adjacent to the access routes were given the highest score, while those furthest away were given the lowest score.

The scenic assessment used the NLCD data and 30 meter Digital Elevation Model (DEM) data and was composed of a topographical analysis, a land cover analysis and a road density analysis. For the topographical analysis, separate models were run that identified 1) areas with the most elevation change, and 2) areas with the most curved surfaces or variety of hills (aspect variety). These results were added together, and the areas with the highest scores had the most landform scenic potential. The scenic land cover analysis gave each cover type a scenic potential score – with natural areas having the highest and built up areas having the lowest. The road density analysis was conducted on MnDOT road data layer.

The final scenic assessment was created by adding the landform and land cover scenic layers together and then subtracting the road density values. Areas with the highest scores are natural areas with the most variety in topography and the least amount of road density.

The following models were used to create the **Recreational Values** map.

Access to natural areas

1. Convert all roads and trails to 30 meter grid, value = 1
2. Conduct a Euclidean distance analysis [road_trail_access]
3. Create a binary grid of natural and non-natural cover types – [natural_cover]
 - a. 0 = land cover values < 30
 - b. 1 = land cover values >= 30
4. Using a conditional statement, remove all non-natural areas from the Euclidean distance grid
5. Using slice, natural areas closer to roads and trails (lower cell values) are given higher a higher score [r_t_slice2]

Scenic Assessment

Land cover

1. Reclass the land cover to scenic value [scenic_landcover_lookup_table and landcover_scenic_score]

Topography – aspect variety

1. Using the 30 DEM grid, create an aspect grid
2. Using the 30 DEM grid, set all the areas in the aspect grid that have a slope < 1 degree “flat”
3. Group the aspect data into 8 ordinal classes, plus value 9 for no aspect (flat) [aspect]
4. Run a majority filter on the grouped aspect grid 10 times. [mmaj_10]
5. Find the aspect variety by running focal statistics on the above grid, using a 5 cell circle and VARIETY. [asp_var_5]
6. Score the results with the look up table [aspect_reclass and aspect_score]

Topography – range variety

1. Using the 30 DEM, the range of elevation by running focal statistics, using a 3 cell circle and RANGE. [range_c_3]
2. Score the results with the look up table [range_reclass and range_score]

Topography – final

1. The final score is the average of the aspect and range. Add the aspect score and range score together and divide by 2. [topo_score]

Road density

1. Using the MnDOT road layer, create a road density grid with the LineDensity command.
2. Score the density layer using SLICE and natural breaks. [road_score]

Final Scenic score

1. Average the land cover scenic score and the topography scenic score and subtract the road density score
[topo_score] – [road_score] + ([landcover_scenic_score] *0.8) = [scenic_score]
2. Create a grid of 10 natural breaks using slice [scenic_slice]

Final Recreation Score

1. Create the final recreational score by running weighted sum of the final scenic and access grids –
[scenic_slice], factor 2 + [r_t_slice2] , factor 1 = [recreational_score]

Chapter 6: Multi-State Priorities

Introduction:

During a one-year period of 2009-2010, the USFS Northeastern region worked with the states of Minnesota, Wisconsin, Iowa, Michigan, Missouri, Illinois and Indiana to identify important multi-state priority issues and areas where future partnership coordination and funds could potentially be invested. The listed states were involved in several conference calls and follow-up emails to narrow down key multi-state issues and areas that were deemed most important for follow-up work. The USFS led discussions included input and edits from all listed states with a final product of separate multi-state issues and multi-state areas. Not all states have chosen to include all multi-state issues and areas discussed during the conference calls. The following USFS briefs were identified and chosen by Minnesota with input and edits from the state's perspective and review from the state forester²⁷. These areas and issues are in no particular order and do not represent a hierarchy of importance.

Major Watersheds that Cross State Boundaries

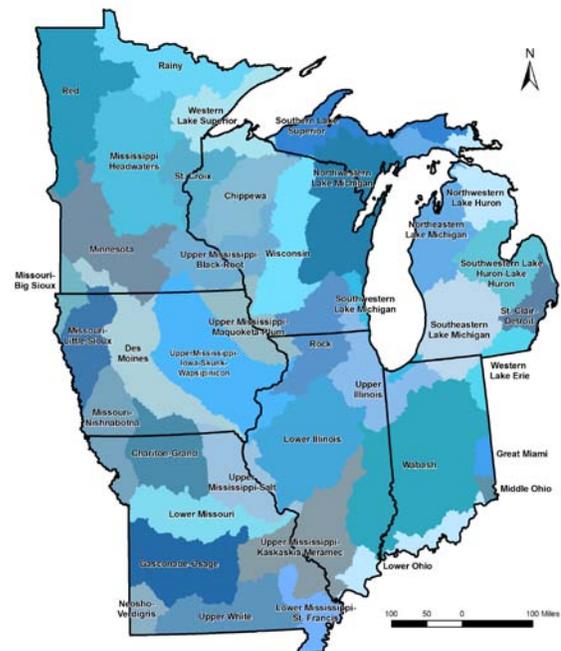
States: All Midwest SPFO states: Iowa, Illinois, Indiana, Michigan, Minnesota, Missouri, and Wisconsin. Note that these watersheds by definitions will spill over into the neighboring states (ND, SD, NE, KS, AR, OK, KY, OH) and Canada (Manitoba, Ontario)

Issues associated with the area:

These watersheds have been delineated at a large scale (over 500,000 acres) and at this scale the resource issues are fairly similar: maintaining a functioning natural resource base in the face many threats including population growth, resource decline due to the existing or new invasive species, and climate change to name a few.

The challenge of watersheds that cross state boundaries lies in coordination and prioritization. All units of governments-federal to local-ultimately implement programs at a state or local level, so addressing resource concerns that cross state boundaries is challenging. Often non-profit organizations are more flexible in being able to assess and implement projects across state boundaries but their capacity is limited.

Another issue is that addressing all natural resource concerns ultimately depends on someone making a decision to take some kind of action. For example, if the concern is declining forest diversity due to invasives, the landowner needs to take action to address this problem and probably get his or her neighbors involved also. The chance that would happen is much more likely if they can see the connection to the local watershed where they live, Hamilton Creek for example. The fact that Hamilton Creek flows into the Meramec, which flows into the Mississippi River is not as strong of a motivator.



Source: Watershed Boundary Dataset (WBD), Generalized 4-digit Hydrologic Unit Boundaries (Subregions) of the United States (2009)

²⁷ The multi-state priorities in this document differ slightly from the Assessment document. In particular, the Assessment included the North Country Trail which has been completed in other neighboring states but is not yet complete in Minnesota.

Existing efforts:

- Great Lakes Restoration Initiative
- Upper Mississippi Forest Partnership
- Middle Mississippi River Partnership

Watersheds where opportunities for additional forestry involvement exist:

- Missouri River Basin
- Ohio River Basin
- Lake Superior Basin
- Red River Basin
- Rainy River Basin

Key contacts:**Great Lake Restoration Initiative**

<http://www.epa.gov/greatlakes/glri/index.html>

Northeastern Area, S&PF

Steven Davis

stevendavis@fs.fed.us

610-557-4151

Upper Mississippi Forest Partnership

http://www.na.fs.fed.us/watershed/upper_mississippi_partnership/

Richard Peterson, Chairperson, steering committee

507-333-2012 ext. 222

Richard.peterson@state.mn.us

Teri Heyer, USFS Coordinator

651-649-5239

theyer@fs.fed.us

Middle Mississippi River Partnership

<http://www.swircd.org/mmrp/>

Janet Sternburg, Chair

Missouri Department of Conservation

573-751-4115

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Upper Mississippi Watershed

States: Illinois, Indiana, Iowa, Minnesota, Missouri, Wisconsin

Issues associated with the area:

Water Pollution--Sediment, nitrogen and phosphorus are the main pollutants in the Upper Mississippi watershed. A significant portion of sediment, nitrogen and phosphorus loads to the Mississippi River comes from human activities: runoff and groundwater from farming, discharges from sewage treatment and industrial wastewater plants, and stormwater runoff from city streets. The delivery of high amounts of nitrogen to the Gulf of Mexico causes a hypoxia zone (abnormally low levels of dissolved oxygen in bottom waters) to expand each summer. About 90% of the nitrate load to the Gulf of Mexico comes from nonpoint sources, and over 31% of that load comes from the Upper Mississippi River.



Loss of Migratory Bird Habitat--The north-to-south orientation of the Upper Mississippi River and its contiguous habitat make it critical to the life cycles of many migratory birds. It is a globally important migratory flyway for 40% of all North American waterfowl and 60% of all the bird species in North America. The loss of more than 50% of historic floodplain and valley hardwood forests creates a problem for many waterfowl, raptors, songbirds, and shorebirds.

Forest Loss and Fragmentation--Forests and prairies are the most beneficial land use in the Upper Mississippi River Basin in terms of protecting watersheds and water quality. Nearly all of the prairies and about 70% of the forest land have been converted to agriculture and urban land uses. The remaining forest land is critical to watershed health and clean water. The ability of forests to produce abundant clean water declines as they are broken up (fragmented) and eventually lost. Fragmentation is a process where large, contiguous forest landscapes are broken into smaller, more isolated pieces, often surrounded by human-dominated uses. The loss and continued break up of forest land increasingly impairs water flow and quality, forest health and diversity, and other economic and recreational benefits.

Opportunities for partnership, cooperation, and projects:

There are many overlapping initiatives in the Upper Mississippi Basin. Recently the Northeastern Area and the Upper Mississippi Forest Partnership participants analyzed where several major initiatives have set priorities, trying to find areas of overlap where efficiencies may exist. The initiatives included in this analysis are:

- Upper Mississippi Forest Partners GIS analysis
- Northeastern Area, Stewardship Analysis Project
- Northeastern Area, Forest-Water-and People
- NRCS, Mississippi River Basin Initiative
- National Fish and Wildlife Foundation
- State Wildlife Plan-conservation opportunity areas
- Audubon Society-Important Bird Areas

Through this analysis and talking to local partners a list of priority watersheds for the Upper Mississippi Forest Partnership was completed.

The National Fish and Wildlife Foundation also manages an Upper Mississippi Watershed Fund for the Upper Mississippi Forest Partnership. An annual RFP is sent out to about 250 potential partners.

As of May 2010, The US Army Corps of Engineers is in the final stages of public review for the *Upper Mississippi River Systemic Forest Management Plan* which includes the combined floodplains of the Upper Mississippi, Illinois, Kaskaskia, Minnesota, Black and St. Croix rivers covering approximately 2.6 million acres.

Existing efforts:

The current Upper Mississippi Forest Partnership (UMFP) Action Plan (2009-2013) includes the following priorities. However, it should be noted that the UMFP steering committee in March of 2010 decided to focus partnership priorities on bottomland forest restoration through 2013.

Sustainable Forests--Demonstrate through partnership conservation efforts the application of sustainable forestry to protect, maintain, and restore healthy forests.

OBJECTIVE #1—Identify several forest watershed demonstration sites within the Upper Mississippi watershed to highlight sustainable forestry.

OBJECTIVE #2—Develop an Action Plan for each forest watershed demonstration site.

OBJECTIVE #3—Develop a tool kit for forest watershed demonstration sites consisting of similar projects done elsewhere and financial and technical resources.

OBJECTIVE #4—Develop guidelines on how to identify forest fragmentation, how to monitor change over time, and look for opportunities to address negative impacts.

Water Quality --Improve water quality to support healthy and productive aquatic ecosystems with forest-based strategies at the site, watershed, and basin scale.

OBJECTIVE #1—By 2013, we have resources available to assist in the restoration and management of bottomland forests.

OBJECTIVE #2—Restore and actively manage at least 25,000 acres of bottomland forests by 2013 to meet multiple objectives—flood control, sediment and nutrient capture, carbon sequestration and more.

OBJECTIVE #3—Strengthen partnership and coordination between local, state, and federal agencies, NGO's, and other partners to work together on common water quality and forestry concerns.

OBJECTIVE #4—We have boots on the ground working with landowners on forestry and water quality problems.

Migratory Bird Habitat--Increase migratory bird habitat quality and quantity to support stable or increasing forest bird populations.

OBJECTIVE #1—Develop a forest bird conservation toolbox tailored for the different ecosystems and forest types found within the Upper Mississippi River (UMR) basin.

OBJECTIVE #2—Create a network of BIRDs (Bird-Intensive Restoration Demonstrations) strategic demonstration/restoration landscapes representing the major forest types in the UMR. For example: upland forest (Cerulean Warbler), bottomland hardwood forest (Prothonotary Warbler), and transitional/successional forest (Golden-winged Warbler or Woodcock.)

OBJECTIVE #3—Develop a framework for monitoring bird response to forest management activities.

Key contact persons, resources, organizations for the area:

Upper Mississippi Forest Partnership

http://www.na.fs.fed.us/watershed/upper_mississippi_partnership/

Richard Peterson, Chairperson, steering committee

507-333-2012 ext. 222

Richard.peterson@state.mn.us

Teri Heyer, USFS Coordinator
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theyer@fs.fed.us

**Upper Mississippi Watershed Fund
National Fish and Wildlife Foundation**

www.nfwf.org/uppermiss

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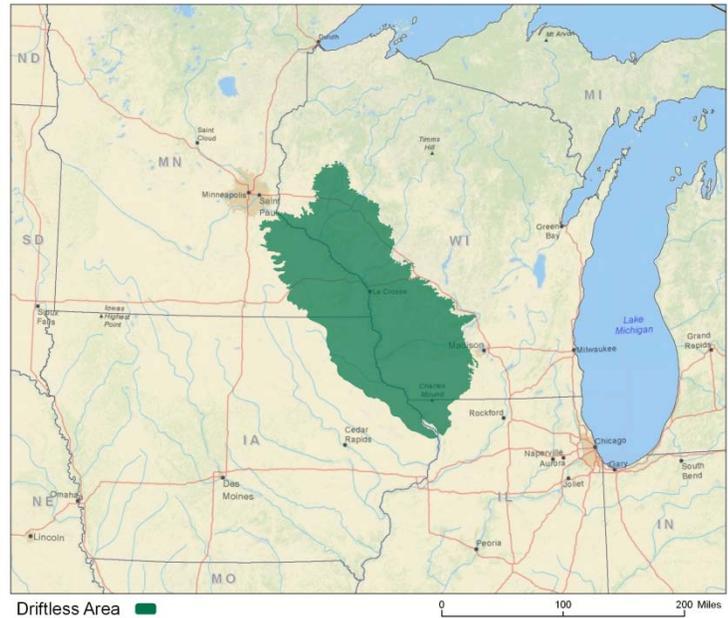
The Driftless Area

States:

Illinois, Iowa, Minnesota, Wisconsin

Issues associated with the area:

- Cold water, spring fed, streams that are sensitive to non-point source pollution due to the karst geology.
- Oak forest loss and regeneration in key areas
- Loss of private woodlands due to escalating land costs; need to encourage property tax relief and government incentives
- Need to encourage growth of high value timber, veneer walnut and new uses for low grade wood products
- Maintenance of a high value recreational resource-Trout Unlimited has estimated that anglers generate an annual \$1.1 billion economic benefit
- Forest fragmentation impacting forest-interior bird habitat
- Lack of forest management related to limited market accessibility
- Loss of native plant life due to invasives such as Emerald Ash Borer, leading to increased steep slope soil erosion and loss of biodiversity



Opportunities for partnership, cooperation, and projects:

- The Driftless Area Initiative is a partnership of 6 RC&D Areas in four states; maintaining a high quality forest resource is a priority.
- Several watersheds in the Driftless Area have been designated as priority watersheds for the Upper Mississippi Forest Partnership.
- The Root River watershed has been selected as a priority watershed for several initiatives: Upper Mississippi Forest Partnership, NRCS Mississippi River Basin Initiative, and the Midwest Natural Resources Group.
- Sub-section of Karst Topography area but concentration on forest issues rather than sensitive species which are identified by the states of Illinois, Indiana, Iowa, Kentucky and Missouri

Existing efforts:

Several projects have been funded in the Driftless Area through the National Fish and Wildlife Foundation's Upper Mississippi Watershed Fund accomplishments include:

- 4 landowners are continuing as demonstration sites for "Bird Friendly Forestry"; totaling 964 acres of forestland all of which have a FSC certified management plan
- 30 forest management plans completed on 2,200 acres
- 184 acres of forest marked for harvest
- 10 acres of trees and 14 acres of prairie planted
- Landowners on their own implemented 1,887 acres of forest mgmt. practices as designated in their management plans
- 316 acres of oak savanna prescribed burned
- 215 acres of invasive species control
- Over 2,200 landowner and professional were reached in a variety of forestry workshops

- Several natural resource professionals were trained and completed Forest Stewardship Council certified management plans
- Two publications produced highlighted bird friendly forestry: *Managing From a Landscape Perspective: A Guide for Integrating Forest Interior Bird Habitat Considerations and Forest Management in the Driftless Area* and *A Bird's Eye View*.
- Digitized natural resources and landownership data to better target forest management activities to benefit neotropical migratory songbirds
- Three "bioblitzes" were held on a Iowa Natural Heritage Foundation property providing critical biological baseline information that will be helpful as management occurs on the property
- Trout Unlimited (TU) organized 11 workdays on five "showcase" projects in the region resulting in 7,720 feet of streambank stabilization
- TU trained many local natural resource professionals on cold water stream restoration techniques.
- A test biomass marking and harvesting study with 11 landowners on 313 acres have found an average harvest cost of \$43.50/cord. A total of 4,054 cords of pulpwood were sold and 283 cords of sawtimber. No market exists yet for woody biomass but one is coming on line very soon and the 19 landowners with 710 acres of forest land marked and ready for harvest could benefit from this.

Key contact persons, resources, organizations for the area:

The Driftless Area Initiative

<http://www.driftlessareainitiative.org/>

John Walsh, executive director

608-723-6377 ext. 135

Jwalsh12@mchsi.com

Great Lakes Forest Alliance

States: Michigan, Wisconsin, Minnesota

Difficult and complex forestry issues as well as alluring opportunities in the forestry profession often span political boundaries. In many cases, the best approach to addressing these issues and opportunities involves a concerted effort that exceeds the reach of individual state forestry organizations and their partners.

Minnesota, Wisconsin, and Michigan are ideally situated to capture the synergy of working across their state boundaries in addressing forestry issues. Their forest cover types are similar. All three states contain large areas of mixed northern hardwoods as well as northern conifer forests. In addition, they all are charter members of the Great Lakes Forest Alliance.

Issues associated with the area:

Examples of forestry *problems* include: climate change, invasive species and watershed health.



Great Lakes Forest Alliance

Capitalizing on ecosystem markets to promote more active forest management of non-industrial forests is an example of an *opportunity* that forest managers struggle to take advantage of.

Opportunities for partnership, cooperation, and projects:

The Great Lakes Forest Alliance, (GLFA) is a non-profit organization whose mission is to advance and promote healthy, sustainable forests in the upper Midwest. The GLFA has a diverse membership from Michigan, Wisconsin, Minnesota, and Ontario. Members include public land managers at the federal, provincial, state, and county level; non-industrial private forest landowners; forest industry; academia; and conservation organizations. The GLFA is uniquely positioned to help address issues and opportunities that span Michigan, Wisconsin, and Minnesota.

It is the intent of these states to engage the GLFA in addressing multi-state issues identified in the states' statewide assessments.

Past and existing efforts:

The GLFA recently completed a series of workshops to inform the retail forest products sector of green building principles, trends, and terminology so that they could better promote and take advantage of the “green” movement in the construction trade. Also, the GLFA is preparing to conduct a series of workshops and a regional conferences to inform non-industrial private forest (NIPF) landowners of potential opportunities available to them in new “ecosystem markets.” By informing landowners of these new markets they might more actively manage their land. The subject of new markets may also foster increased communication between NIPF owners and the professional forestry community.

Key contact:

Michael Prouty, Executive Director, GLFA

mwprou@gmail.com

651-468-8006

<http://www.greatforests.org>

Great Lakes Regional Collaborative

The Great Lakes Regional Collaborative (GLRC) was assembled as a collective group of federal, state, and local governments, tribes, and other stakeholders to develop a strategic plan for the restoration, protection and sustainable use of the Great Lakes. This strategy was completed in December 2005.

States:

Illinois, Indiana, Michigan, Minnesota, Ohio, Pennsylvania, New York, Wisconsin, Canadian Province of Ontario

Issues associated with the area:

- Aquatic invasive species
- Habitat and species loss
- Coastal health
- Cleanup of 31 Areas of Concerns (related to sewer overflow discharges)
- Nonpoint source pollution
- Contaminated sediments, sewage disposal, agricultural run-off and toxic pollutants
- Coordination of data collection and communication
- Development of Indicators for measuring the health of the Great Lakes
- Need for sustainable development

Opportunities for partnership, cooperation, and projects:

- Partner with land trusts, conservation organizations, local communities and state agencies to protect or restore riparian forests and upland habitats.
- Partner with state water quality regulatory agencies to promote the use of urban forests for storm water reduction and on-site infiltration.
- Partner with Great Lakes Restoration Initiative to protect and restore priority watersheds in the region

Existing efforts:

- Several plans have been created to respond to the recommendations of the GLRC Strategy with specific implementation actions, including:
 - Great Lakes Restoration Initiative, <http://www.epa.gov/greatlakes/glri/index.html>
 - Lake Erie Protection & Restoration Plan 2008, <http://lakeerie.ohio.gov/>
 - MI Great Lakes Plan, http://www.michigan.gov/deq/0,1607,7-135-3313_3677_51091---.00.html
 - Wisconsin Great Lakes Strategy, <http://www.dnr.state.wi.us/org/water/greatlakes/wistrategy/>
 - Midwest Great Lakes Partnership, www.midwestglaciallakes.org



- USFWS Upper Midwest and Great Lakes Landscape Conservation Cooperative, www.fws.gov/midwest/climate/LCC/UpperMidwest/

Key contact persons, resources, organizations for the area:

1. Great Lakes Regional Collaborative, <http://www.glrc.us>
2. Council of Great Lakes Governors, <http://www.cglg.org/>
3. Great Lakes and St. Lawrence Cities Initiative, <http://www.glslcities.org>
4. Great Lakes Congressional Task Force, <http://www.nemw.org/index.php/congressional-coalitions-and-task-forces/great-lakes-task-force>
5. Great Lakes Indian Fish and Wildlife Commission, <http://glifwc.org/>
6. Midwest Great Lakes Partnerships, www.midwestglaciallakes.org
7. U.S. Environmental Protection Agency, Great Lakes National Program Office , <http://www.epa.gov/greatlakes/>
8. USFWS Upper Midwest and Great Lakes Landscape Conservation Cooperative, Teresa A.N. Woods, USFWS, Midwest Region, Climate Change Coordinator, teresa_woods@fws.gov

Climate Change

Questions about the affects of climate change on forests remain unanswered. Will a rise in global temperature affect the composition of forest ecosystems? Will a change in forest ecosystem composition affect the timber industry and if so, how? Are anticipated climate change effects avoidable? Uncertainty about changing climate severely impacts our ability to plan for the future.

States: Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Wisconsin

Issues:

- Uncertainty about temperatures increases makes long-term planning and decision-making difficult to predict.
- Carbon sequestration and storage in forests and forest products may increase interest in forest management. However, price volatility in the current carbon market has hampered an expansion of interest in forest-related carbon activity.
- Tourism is a major industry in much of the region and the forested landscapes of the north make this area a prime destination for tourists and vacationers. Changes in the region's forests could diminish its appeal as a tourist destination.
- Forestry and the forest products industry are important to the economy of the region. Changes in forest species composition due to climate change would likely hurt the forest industry and regional economies significantly.
- Greater investments in reforestation including the development of new silviculture varieties and regeneration of more southerly native species will likely be needed to maintain viable forest cover in many areas.
- Hunting, fishing and wildlife watching are also important contributors to the economy in parts of this region. Changes in forests that alter fish and wildlife populations will negatively affect the constituents of hunters, anglers and wildlife watchers.
- Trees under stress due to a changing climate would be increasingly vulnerable to insects and diseases.
- Invasive plant problems will likely increase as climate change increases opportunities for invasion.



Issues identified by the US Global Climate Change Research Program for the Midwest:

<http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/regional-climate-change-impacts/midwest>

1. During the summer, public health and quality of life, especially in cities, will be negatively affected by increasing heat waves, reduced air quality, and increasing insect and waterborne diseases. In the winter, warming will have mixed impacts.
 - a. Heat waves that are more frequent, more severe, and longer-lasting are projected. The frequency of hot days and the length of the heat-wave season will both be more than twice as great under a higher emissions scenario than a lower one (see full report for information on emission scenarios). Insects such as ticks and mosquitoes that carry disease will survive winters more easily and produce larger populations in a warmer Midwest.
 - b. Significant reductions in Great Lakes water levels, which are projected under higher emissions scenarios, lead to impacts on shipping, infrastructure, beaches, and ecosystems.
 - c. Higher temperatures will mean more evaporation and hence a likely reduction in Great Lakes water levels. Reduced lake ice increases evaporation in winter, contributing to the

- decline. This will affect shipping, ecosystems, recreation, infrastructure, and dredging requirements. Costs will include lost recreation and tourism dollars and increased repair and maintenance costs.
2. The likely increase in precipitation in winter and spring, more heavy downpours, and greater evaporation in summer would lead to more periods of both floods and water deficits.
 - a. The projected pattern of increasing precipitation in winter and spring and heavy downpours is expected to lead to more frequent flooding, increasing infrastructure damage, and impacts on human health. Heavy downpours can overload drainage systems and water treatment facilities, increasing the risk of waterborne diseases. In summer, with increasing evaporation and longer periods between rainfalls, the likelihood of drought will increase and water levels in rivers and wetlands are likely to decline.
 3. While the longer growing season provides the potential for increased crop yields, increases in heat waves, floods, droughts, insects, and weeds will present increasing challenges to managing crops, livestock, and forests.
 - a. Spring flooding is likely to delay planting. An increase in disease-causing pathogens, insect pests, and weeds cause additional challenges for agriculture. Livestock production is expected to become more costly as higher temperatures stress livestock, decreasing productivity and increasing costs associated with the needed ventilation and cooling equipment.
 4. Native species are very likely to face increasing threats from rapidly changing climate conditions, pests, diseases, and invasive species moving in from warmer regions.
 - a. All major groups of animals including birds, mammals, amphibians, reptiles, and insects will be affected by climate change impacts on local populations and by competition from species moving into the Midwest. The potential for animals to shift their ranges to keep pace with the changing climate will be inhibited by major urban areas and the presence of the Great Lakes.

Key contact persons, resources, organizations for this issue:

<http://epa.gov/climatechange/index.html>

http://www.pewclimate.org/global-warming-in-depth/all_reports/forests_and_climate_change

<http://www.climatehotmap.org/impacts/greatlakes.html>

<http://www.fs.fed.us/climatechange/>

<http://www.ipcc.ch/>

Wildfire risk

In state priority areas where wildfire risk is identified as a critical issue, planning and management are likely to reduce a relatively high risk of wildfire. Wildland fire management programs utilize preparedness and suppression actions in wildfire control. These actions are augmented by planning, hazard mitigation and prescribed fire practices targeted toward high risk areas. Fire management practices may also be integrated into overall forest management strategies employed while addressing management in areas of critical wildfire risk.

States:

Minnesota, Michigan, Wisconsin, Iowa, Missouri, Indiana, Illinois, Canadian Provinces of Ontario and Manitoba

Issues:

- Fire regime condition class change which has been occurring over the decades. Vegetative cover and fuel loading has changed due to change in the land management practices and settlement patterns.
- Urbanization of wildland and other forest and grassland areas. Increased urbanization has led to a strong need for rapid, coordinated responses to wildfires in Wildland Urban Interface (WUI).
- Prescribed burning and its use as a multi-purpose land management tool. There are common issues in the states regarding training, qualifications and the number of people available for burning as well as the environmental issues, such as smoke management, associated with prescribed fire.
- Significant weather events which have damaged the forest and changed fuel composition: Ice storms and wind events are examples that have affected large acreages throughout the region.
- Grassland Management and prairie restoration: Mid west and parts of southern MN. The use of fire is needed to maintain or restore these systems.
- Insect damage - northern tier of the Lake States - Beetle killed spruce and jack pine stands contribute to increased fuel loading.
- Community Wildfire Protection Planning – Successful community planning efforts can mitigate losses and lessen the unwanted impacts of wildfire to ecosystems. Planning to reduce wildfire risk can be incorporated into overall land management planning or specifically identified for communities at risk of wildfire.
- Aging of personnel is an overriding issue for all the states. As the workforce ages, results are indicating a decrease in the state's fire management program capacity.

Opportunities for partnership, cooperation, and projects:

Hazard mitigation—activities focus on hazard fuels reduction, development and implementation of Community Wildfire Protection Plans (CWPPs), prevention and mitigation education, Firewise programming, and community hazard mitigation.

Prescribed burning—hazard mitigation; ecosystem maintenance/restoration; control of invasives and wildlife habitat improvement; silvicultural practices including site preparation and oak regeneration; management activities for rare, threatened, and endangered species; watershed management and forest health practices all can be achieved with prescribed burns.



Cooperating Agreements - State Strategies should also identify the existence of any cooperative agreements for suppression activities on federal lands and state lands, or areas where wildfire protection is shared or exchanged between federal, tribal and state agencies.

Key contact persons, resources, organizations for this issue:

Federal Land Management Agencies: USFS National Forest System, National Park Service, US Fish and Wildlife Service, Bureau of Indian Affairs

Tribal Lands Programs

Great Lakes Forest Fire Compact - <http://www.glffc.com/content/>

Big Rivers Forest Fire Compact - <http://www.brffmc.org/>

The Nature Conservancy – local chapters

Chicago Wilderness - <http://www.chicagowilderness.org/>

Ecosystem Services

Healthy forest ecosystems are ecological life-support systems. Forests provide a full suite of goods and services that are vital to human health and livelihood, natural assets we call **ecosystem services**.

Many of these goods and services are traditionally viewed as free benefits to society, or "public goods" - wildlife habitat and diversity, watershed services, carbon storage, and scenic landscapes, for example. Lacking a formal market, these natural assets are traditionally absent from society's balance sheet; their critical contributions are often overlooked in public, corporate, and individual decision-making.

When our forests are undervalued they are increasingly susceptible to development pressures and conversion. Recognizing forest ecosystems as natural assets with economic and social value can help promote conservation and more responsible decision-making. The Forest Service is exploring national opportunities to advance markets and payments for ecosystem services. With help from our partners and others, we will encourage broader thinking and collaboration that stimulates market-based conservation and stewardship.



Note: Text & content taken from: <http://www.fs.fed.us/ecosystemservices/>

States: Minnesota, Wisconsin, Michigan, Iowa Missouri, Illinois, Indiana

Issues:

As population, income, and consumption levels increase, humans put more and more pressure on the natural environment to deliver these benefits. The 2005 *Millennium Ecosystem Assessment*, prepared by a group of over 1300 international experts, found that 60 percent of ecosystem services assessed globally are either degraded or being used unsustainably. Seventy percent of the regulating and cultural services evaluated in the assessment are in decline. Millennium Ecosystem Assessment scientists predicted that ecosystem degradation could grow significantly worse in the first half of the 21st century, with important consequences to human well-being.

Opportunities for partnership, cooperation, and projects:

Cross agency (federal and state) cooperation in partnership with land trusts, private landowners and communities can identify important landscapes to protect and manage. Community officials who are educated on forest conservation and have good planning tools to use can decide zoning ordinances and practices that benefit forests and watersheds. Working with urban communities to promote and implement healthy trees and urban forests can contribute to improved air and water quality, watershed function, energy conservation and social well-being.

Regulations, land acquisitions, conservation easements, and tax incentives are some of the conservation approaches that aim to protect and conserve the Nation's forests and grasslands. Over the past decade, advances in sustainable forest management and forest certification have complemented conservation objectives. Traditional conservation programs, however, may not be enough to safeguard natural landscapes and biodiversity, and traditional markets may not provide landowners with a sufficient economic incentive to own and sustainably manage forestland. To reverse the loss and degradation of ecosystem services, economic and

financial motivations must include a conservation objective, and the value of ecosystem services needs to be incorporated into any decision-making.

How can we make good stewardship profitable?

Mechanisms are needed by which private forest landowners can seek returns on their forestland *in addition* to those commonly associated with commercial forest products. The ability to capture the financial value of ecosystem services may help landowners who currently do not benefit from the true value of their land and all of the goods and services forests provide. Because ecosystem services are not traded and do not have a “price,” landowners are not typically compensated for the critical benefits forests naturally deliver to the public. New natural revenue streams might help forest owners cover the costs of owning forestland and provide them with incentives to hold onto their land and practice sustainable forest management. Valuing ecosystem services will encourage forest restoration and may provide a new means to finance reforestation and afforestation activities. Valuing forests as natural assets will increase society’s appreciation and support of lands that are already protected and healthy.

Existing efforts:

New approaches to conservation are emerging that may financially compensate landowners for providing ecosystem services. Markets and payments for carbon sequestration, watershed management, ecotourism, and a host of other services may supplement traditional forest revenues and promote good stewardship, especially when used together with other conservation tools.

Key contact persons, resources, organizations for this issue:

- USDA Forest Service, Valuing Ecosystem Services - <http://www.fs.fed.us/ecosystemservices/>
- EPA Ecosystem Services Research Program - <http://www.epa.gov/ord/esrp/quick-finder/mid-west.htm>
- Conservation Marketplace of Minnesota - <http://www.conservationmarketsofminn.org/>
- Integrated Valuation of Ecosystem Services Tool (INVEST) - <http://www.invest.wri.gvsu.edu/>

Forestation-Reforestation

Healthy diverse forests are essential for providing a broad range of goods and services from our forested ecosystems. Maintaining a balance of the many forest-types within the landscape is increasingly difficult due to the many and diverging interests of various forestland owners/managers. Further, many forest-types are becoming increasingly harder to maintain and/or regenerate due to a variety of factors including climate, disease, insect activity, deer herbivory, and invasive plants to name a few.

States: Minnesota, Wisconsin, Michigan, Iowa, Missouri, Illinois, and Indiana

Issues:

- Invasive plants such as European buckthorn, garlic mustard, Japanese stilt grass and reed canary grass have literally taken over the understory on many locations out-competing the native vegetation, including tree seedling, reducing or eliminating natural regeneration on these sites.
- Extremely high deer populations reduce natural regeneration or shift species composition by favoring some tree species as browse over another. This has contributed to a trend towards increasing amounts of red maple (less favorable browse) in some areas and a complete lack of white cedar (highly preferred browse) regeneration in other areas.
- The low-land hardwood forest type has been severely impacted by the loss of American elm due to Dutch elm disease. Now the Emerald Ash Borer threatens to eliminate ash species, especially black ash that is another important low-land hardwood species.
- Oak regeneration has proven to be extremely difficult to achieve on many sites that have historically been oak dominated systems.
- Historically, large-scale forest disturbance patterns initiated forest regeneration, these include fire, tornadoes/wind. Fire suppression has virtually eliminated large-scale fire as a disturbance agent. Large scale-wind events are still with us; however their impact on the landscape is often tempered by forest fragmentation and land-use patterns.
- Climate change is forcing us to rethink our notion of species range. As temperatures rise, many tree species may no longer be able to thrive in locations where they existed historically.
- Forest fragmentation has created many smaller blocks of forest and greatly increased the amount of forest “edge” that has existed historically. Edges tend to favor sun-loving species where shade tolerant species may have once dominated.
- Management practices have altered natural species and age distribution patterns. Pine plantations and other even-age practices reduce biodiversity and age-class variability.
- Many forest tree nurseries in the region have closed or are producing at greatly reduced capacities. Adequate stocks of planting material may be an issue with reduced capacity.



Opportunities for partnership, cooperation, and projects:

- Wildlife habitat considerations drive many reforestation efforts. By partnering with wildlife agencies and non-governmental wildlife interests, forest managers might increase opportunities for mutually beneficial tree planting efforts.
- Water quality issues provide opportunities for non-traditional partnerships. Establishment and expansion of riparian forest buffers provide opportunities to increase tree cover while providing the benefit of clean drinking water.
- The current interest in carbon markets and carbon sequestration creates an opportunity to increase tree cover and provide other ecosystem benefits while achieving the goal of increasing carbon storage and sequestration.
- NRCS offers a variety of programs to off-set the costs of forest establishment for a variety of purposes including enhancing wildlife habitat and active forest management

Existing efforts:

- **US Forest Service “Plant a Tree Program”** – An effort to get the public involved in reforestation efforts while providing a mechanism to fund reforestation efforts.
http://www.fs.fed.us/forestmanagement/infocenter/reforestationpartnership/documents/History_of_PAT.pdf
- **National Seed Laboratory** - Most native plants used for ecosystem conservation and restoration are propagated exclusively from seeds. Sufficient quantities of seeds are, therefore, needed to restore and sustain native plant communities that are increasingly affected by invasive species, pest infestations, wildfire, and climate change. Successful seed production requires knowledge of seed development, cleaning, germination, and storage procedures, known collectively as seed science and technology. The National Seed Laboratory (NSL) is currently addressing these complex challenges and is serving as the primary national strategic resource for forest ecosystem seed science and technology.
<http://www.nsl.fs.fed.us/>

Key contact persons, resources, organizations for this issue:

- US Forest Service, Reforestation, Nurseries, & Genetics Research - <http://www.rngr.net/>
- Natural Resources Conservation Service – <http://www.nrcs.usda.gov/>

Invasive Species

Non-native invasive species have the potential to reduce forest diversity and cause huge economic and ecological damage to forests. Insect species such as the Emerald Ash Borer, Gypsy Moth and Asian Long Horned Beetle have already caused major damage in forests and in urban areas in the Midwest. Non-native disease causing organisms, typically fungi, that cause mortality such as those that cause White Pine Blister Rust, and Dutch Elm Disease are well documented historically. More recent examples include Beech Bark Disease and Sudden Oak Death. Dozens of invasive plants species spread and flourish in both urban and used forested areas. Resource agencies must have evolving and adaptive responses to detect and reduce the potential for the introduction and spread of new invasive species.

States:

Iowa, Illinois, Indiana, Michigan, Minnesota, Missouri, Wisconsin

Issues:

- Prevention of invasive insects and plants is time consuming and costly. Eradication efforts are very expensive. Doing nothing has far-reaching cost consequences.
- Invasive species management must be integrated with good land stewardship on millions of acres of privately owned forest.
- Invasive plant populations influence, and are influenced by, environment and co-occurring plant and animal species. An integrated ecosystem-based approach is therefore essential but difficult to achieve.
- Quarantines on timber product movement placed on states in infested areas cause economic hardship as well as difficult utilization and marketing challenges
- The loss of forest diversity reduces the ecological stability of forests
- Control techniques and methodologies need to be developed, shared and implemented for new invaders.
- The inability to effectively control plants introduced via the horticultural industry allows many problem plants to continue to be bought and sold in the marketplace.
- Our ability to identify and detect new invaders is extremely limited due to lack of knowledge.
- A changing climate may make our forests more susceptible to invasive species.

Opportunities for partnership, cooperation, and projects:

States realize that a cooperative approach to costly survey, detection and eradication efforts that focus on those infestations which pose the greatest threats to natural resource values are the highest priority. Developing invasive species best management practices, educating and instructing foresters, landowners and land managers to detect and control invasive species can be completed and shared across the 7 states. Cooperating to conduct coordinated survey and detection work is a multi-year task. Monitoring for spread of insects and plants as well as evaluating the threat to natural resources can be shared across landscapes. Rehabilitation of lands and forests adversely impacted by invasive plants and insects is crucial.



Existing efforts:

All states have forest health units within their respective natural resource management agency that are charged with detection and control responsibilities of invasive insects and disease pests and in some cases invasive plants. They also typically share some of that responsibility with their counterparts in their state's department of agriculture or its equivalent. The states' efforts are augmented by federal agencies such as the U.S. Forest Service and the Animal and Plant Health Inspection Service to assist states in the detection, management and control of damaging invasive species.

The development of local Cooperative Weed Management Areas (CWMA's) are popular grassroots efforts that mobilize land managers and other interested parties to work across political and jurisdictional boundaries to establish a cooperative "unified front" to address invasive species.

Many states have established information-sharing invasive plant groups such as the Invasive Plant Association of Wisconsin or advisory groups such as Minnesota Invasive Species Advisory Council and the Michigan Invasive Plant Council

The Midwestern Invasive Plant Network is a regional organization of land managers, resource professionals, landowners, and private citizens who are dedicated to reducing the impact of invasive plant species in the Midwest.

Key contact persons, resources, organizations for this issue:

- Midwest Invasive Plant Network - <http://mipn.org/>
- River to River Cooperative Weed Management Area - <http://www.rtrcwma.org/>
- The Emerald Ash Borer Detection Project - <http://www.emeraldashborer.org/>
- Northeastern Area Forest Health protection - <http://www.na.fs.fed.us/fhp/index.shtm>
- Gypsy Moth Slow the Spread Foundation – www.gmsts.org

Sustaining Forest Industry and Markets

The loss of forest products industries and markets constrains opportunities to manage forests and diminishes options for the production and enhancement of an array of ecosystem services.

States: Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Wisconsin

Issues:

- Competition for forest resources amongst various industrial users of low quality wood is likely to increase as biomass markets (eg pellet production) grow rapidly .
- New state and federal energy/climate policies will increasingly stimulate demand for forest resources. For instance, proposed federal Renewable Energy Standards are already catalyzing coal fired power plants to co-fire with wood. Large scale fuel switching could cause an enormous drain on resources.
- Requests for resource information (inventory and timber product outputs) will increase as resource use patterns change.
- Which forest products industries and commercial users of wood create the most jobs per volume of wood utilized will become a frequent area for debate.
- Pulp and paper product issues. Though still a very large part of US demand for wood , pulp production has declined for more than 10 years. US still the global leader in wood pulp production, although percentage of total continues to decline. Switch from newsprint to electronic media, declining demand for packaging grade papers as US industries continue to move offshore. Growth in demand and production is focused now in Europe and Asia. Losses in paper output range from -54% for newsprint to -10% for containerboard.²⁸
- Acute shortage of loggers as boomers retire and industry fails to recruit new entrants
- Discussion and information needs regarding forest products production and bioenergy application impacts on carbon lifecycles will increase.
- Housing. Softwood lumber demand associated with homebuilding has been off dramatically. As the economy collapsed and home foreclosure rates accelerated resale values of homes plummeted and new starts turned down as well. Predictions are a return to normal housing starts of 1.5-1.7 million starts by 2012.²⁹ Homeowner improvements and remodeling are expected to begin a gradual rebound in 2010.³⁰ Some suggest a trend towards smaller homes with less use of hardwoods for flooring and millwork as homebuyers try to economize on housing costs.
- Hardwood, solid wood products. Recent years outsourcing of furniture, kitchen cabinets, millwork and flooring production to China and other Asian countries has caused many companies to close with a permanent loss of 25-35% of productive capacity nationally. Indexed prices since 2004 show decline in all graded hardwoods with only lumber prices for pallets and railroad ties remaining stable or increasing slightly. 60% of hardwood now used for low priced industrial applications vs. 32% in 1972³¹. Growing capacity/efficiency of remaining mills. Downward pressure on hardwood grade logs probable³²



²⁸ Peter Ince. USDA Forest Products Lab. Forests in Transition. New England Society of American Foresters Winter Meeting

²⁹ National Association of Homebuilders. March 24, 2010. Urs Buehlman, Virginia Tech personal communication

³⁰ Harvard Joint Center for Housing Research. Urs Buehlman, Virginia Tech personal communication

³¹ William Luppold. Condition of U.S. Hardwood Markets. Allegheny Society of American Foresters. 11/5/2009

³² Paul Lyskava. Status and Future of Wood Products Markets. Allegheny Society of American Foresters. 11/5/2009

- Green building is experiencing significant interest and is one of the few areas in forest products trending upward. Currently, green building volume as a proportion of the market remains rather low.

Existing efforts:

Michigan: Michigan Forest Advisory Council, Forest Industry Work Group (informal entity among state agency leadership), Michigan Forest Products Council, Michigan Association of Timbermen. Lake States Lumberman's Association, Michigan Sustainable Forestry Initiative Implementation Committee, Great Lakes Forestry Alliance, Biomass Utilization and Restoration Network in the Upper Peninsula (BURN-UP), Michigan Forest Resource Alliance

Wisconsin: Wisconsin Country Forest Association, Great Lakes Regional Timber Producers Association, Governor's Council on Forestry, Wisconsin Woodland Owners Association, Wisconsin Paper Council, Wisconsin Consulting Foresters, US Congressman Steve Kagen's Forest Advisory Committee.

Minnesota: Governor's Forestry Subcabinet, MN DNR Forest Products Utilization & Marketing Program; University of Minnesota Biobased Products for MN; University of Minnesota Duluth – Natural Resources Research Institute, Blandin Foundation, Minnesota Forest Industries, Minnesota Forestry Association, Minnesota Forest Resources Council, Minnesota Green Enterprise Assistance Team (The Minnesota Department of Employment and Economic Development manages the GEA program). Minnesota forestry sub-cabinet Forest BioEconomy Strategy
http://files.dnr.state.mn.us/aboutdnr/legislativeinfo/2010/2010_factsheet_forestrysubcabinet.pdf

Indiana: Indiana Hardwood Lumber Association, Hoosier Historic Hills RC&D, Lincoln Hills RC&D, Sycamore Trail RC&D, Indiana Forest Woodland Owners Association.

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6. Mike Seidl, Program Manager for Hardwoods, Indiana State Department of Agriculture

Promoting Sustainable Active Private Forest Management

The Upper Midwest contains some of the highest levels of private forestland ownership in the nation. Unfortunately, the vast majority of these private forestlands are unmanaged, undermanaged, or mismanaged. This represents a huge untapped resource of timber, fiber and associated forest-related employment opportunities. By promoting sustainable active management of these forestlands, the productivity of the regions' forestlands could be enhanced, thereby reducing pressure on existing productive forests and reducing the nations' dependence of outside sources of wood fiber. Active forest management can help to off-set the rising costs of forest ownership, while contributing to the health and resiliency of the regions forests.

States: Minnesota, Wisconsin, Michigan, Iowa Missouri, Illinois, Indiana

Issues:

- Most land owners own woodlands for reasons unrelated to forest management. Typically private citizens own forests for hunting, recreation, or other reason unrelated to forest and ecosystem health and management³³.
 - Landowner turnover rates are increasing due to the aging demographic of current forest owners. This creates opportunities to engage these new landowners who may be more receptive to active forest management.
 - Average woodland parcel size is decreasing which leads to increasing the numbers of woodland owners. This creates a capacity issue for those agencies charged with providing landowner assistance.
 - Rising land values, and associated property tax rates, are making woodland ownership less appealing to many would-be landowners. Existing landowners may be increasingly tempted to sub-divide large holdings for financial benefit or to reduce their tax burden.
 - Many woodland owners are not knowledgeable about forest management and are not aware of programs or cost-share opportunities that might enable them to take an active role in the management of their woodlands.



³³ Climate change, pollution, over-exploitation, and land-use change are some of the drivers of forest and ecosystem loss, as well as resource challenges associated with globalization and urbanization. Land use change is an immediate issue in the United States. Today, the Nation is experiencing a loss of open space and a decline in forest health and biodiversity, particularly on private lands. Approximately 57% of all forest land in the United States, or 429 million acres, is privately owned. Non-industrial interests – families, organizations, and communities that own the land for the aesthetics and uses that forests provide or for income generated from the sale of forest products and services - own 85% of the nation's private lands. Recent trends in parcelization and divestiture of private lands in the United States suggest that private landowners are commonly under economic pressures to sell their forest holdings. Rising property values, tax burdens, and global market competition are some of the factors that motivate landowners to sell their lands, often for development uses. The loss of healthy forests directly affects forest landowners, rural communities, and the economy. As private lands are developed, we also lose the life-supporting ecosystem services that forests provide.

Opportunities for partnership, cooperation, and projects:

- Most states have non-governmental woodland owner organizations that encourage woodland stewardship and provide educational opportunities for woodland owners. Supporting or otherwise partnering with these organizations can help to increase their effectiveness.
- Cooperation with forestry extension could be expanded to help reach and educate landowners and to inform them of landowner assistance opportunities with the state and federal agencies.
- Peer-to-peer networks of forest landowners have proven very effective at conveying forest management information to private woodland owners who might otherwise be reluctant to take advantages of opportunities presented by well-intentioned “strangers”.

Existing efforts:

- Call Before You Cut – Several Midwestern states have partnered together to create the Call Before You Cut campaign. The effort is targeted at those forest landowners who do not have a forest management plan, but are at the point of undertaking a harvest activity. It encourages these folks to seek out the help of a professional forester before making management decisions. The effort shares the same name and slogan despite operating in multiple states and they share a common website where landowners can find contact information. <http://www.callb4ucut.com/>

Key contact persons, resources, organizations for this issue:

- American Forest Foundation - <http://www.forestfoundation.org/>
- National Woodland Owners Association - <http://www.woodlandowners.org/>
- Call Before You Cut - <http://www.callb4ucut.com/>

Increase Urban Forest Inventory and Analysis

The Forest Service's Forest Inventory and Analysis (FIA) Program provides the information needed to assess America's forests. FIA reports on status and trends in forest area and location; in the species, size, and health of trees; in total tree growth, mortality, and removals by harvest; in wood production and utilization rates by various products; and in forest land ownership. The Forest Service has significantly enhanced the FIA program by changing from a periodic survey to an annual survey, by increasing capacity to analyze and publish data, and by expanding the scope of data collection to include soil, under story vegetation, tree crown conditions, coarse woody debris, and lichen community composition on a subsample of our plots.

States: Wisconsin, Minnesota and possibly others.

Issues:

- The current FIA program does not consider urban areas as “forested” and therefore does not inventory urban forests.
- Continuous inventory data is currently lacking for urban forests, thus limiting the ability of state and regional managers to track conditions and trends.

Opportunities for partnership, cooperation, and projects:

- Partner with neighboring states that share contiguous urban areas for funding and data collection.

Existing efforts:

- Pilot projects were completed in Indiana, Wisconsin, and New Jersey in 2001, 2002, and 2003, respectively. Reports can be found at: http://na.fs.fed.us/urban/monitoring_projects.shtml
- Pilot projects have also been completed (4 panels over 4 years) in Colorado and Tennessee.

Key contact persons, resources, organizations for this issue:

1. Angie Rowe, Training Supervisor for Data Acquisition, U.S. Forest Service, Southern Research Station, 865-862-2052, krowe@fs.fed.us (regarding current urban FIA projects in Colorado and Tennessee)
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3. Pam Louks, Indiana State Urban Forestry Coordinator, 317-591-1170, plouks@in.dnr.gov
4. Mike D'Errico, New Jersey State Urban Forestry Coordinator, 609-292-2532, michael.d'errico@dep.state.nj.us



Lake States Branding

There is a need to improve marketing and awareness of forest products from the Lake States.

States:

Wisconsin, Minnesota, Michigan, Indiana and possibly others.

Issues:

- Some companies may hesitate to adopt a regional brand because of competition among states or the need to use products from outside of the Lake States to fill some orders.
- Some states may have already developed a state brand.

Opportunities for partnership, cooperation, and projects:

- Regional coordination of state brands.
- Creation of a regional Lakes States brand.

Existing efforts:

- Indiana Brand, <http://www.indianawoodisgood.org>
- June 2008 Conference: Crisis or Opportunity? Sustaining and Strengthening Forest-Based Industries in the Great Lakes Region, <http://www.greatforests.org/initiatives.html>
- Minnesota Wood Campaign (True North Woods Brand): <http://www.truenorthwoods.com/home.ashx>

Key contact persons, resources, organizations for this issue:

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4. Michigan Forest Products Specialist, Anthony Weatherspoon, 517-335-3332, weathera@michigan.gov
5. Great Lakes Forest Alliance, www.greatforests.org
6. Wood Education and Resource Center, USDA Forest Service, werc@fs.fed.us



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Abbreviations

2c	2c Managed Forest Land
ACLT	Association of Contract Loggers and Truckers
ACUB	Army Compatible Use Buffer
AON	Assessment of Need
APWA	American Public Works Association
APHIS-PPQ	Animal Plant & Health Inspection Service Plant Health, Plant Protection & Quarantine
ASLA	American Society of Landscape Architects
BIA	Bureau of Indian Affairs
BMPs	Best Management Practices
BWSR	Board of Water & Soil Resources
CAR	Corrective Action Request
CFA	Cooperative Forestry Act
CFDRS	Canadian Fire Danger Rating System
CoC	Chain of Custody
CRP	Conservation Reserve Program
CREP	Conservation Reserve Enhancement Program
CSP	Conservation Security Program (pre-2009) and Conservation Stewardship Program (2009 to present)
CWPP	Community Wildfire Protection Plans
DEM	Digital Elevation Model
DNR	Department of Natural Resources
DOF	Department of Forestry
DU	Ducks Unlimited
EAB	Emerald Ash Borer
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
FEMA	Federal Emergency Management Agency
FIA	Forest Inventory & Analysis
FLP	Forest Legacy Program
FRP	Forest Resource Protection Fund
FSA	Farm Service Agency
FSC	Forest Stewardship Council
FSP	Forest Stewardship Program
GIS	Geographic Information System
GLFA	Great Lakes Forest Alliance
GLFFC	Great Lakes Forest Fire Compact
GLIFWC	Great Lakes Indian Fish & Wildlife Commission
GLRC	Great Lakes Restoration Collaborative
GMSTS	Gypsy Moth Slow the Spread Foundation
GRG	Great River Greening
L-SOHC	Lessard-Sams Outdoor Heritage Council
LCCMR	Legislative Citizens Commission of Minnesota Resources
LMC	League of Minnesota Cities
LUG	Local Units of Government
MACF	Minnesota Association of Consulting Foresters
MCCAG	Minnesota Climate Change Advisory Group
MSA	Minnesota Society of Arboriculture
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
MFA	Minnesota Forestry Association
MFF	Minnesota Forests for the Future
MFI	Minnesota Forest Industries

MFRC	Minnesota Forest Resource Council
MFRP	Minnesota Forest Resource Partnership
MIFC	Maritime Intelligence Fusion Center
MLEP	Minnesota Logger Education Program
MLT	Minnesota Land Trust
MMLC	Minnesota Master Logger Certification
MNICS	Minnesota Incident Command System
MNLA	Minnesota Nursery and Landscape Association
MnDOT	Minnesota Department of Transportation
MnSTAC	Minnesota Shade Tree Advisory Committee
MPCA	Minnesota Pollution Control Agency
MSA	Minnesota Society of Arboriculture
NF	National Forest
NFF	National Forest Foundation
NGO	Non-governmental Organization
NIPF	Non-Industrial Private Forests
NLCD	National Land Cover Data Set
NPS	National Park Service
NRCS	Natural Resource Conservation Service
NRRI	Natural Resources Research Institute
RAWS	Remote Automated Weather Systems
RC&D	Resource Conservation & Development
REIT	Real Estate Investment Trust
RIM	Reinvest In Minnesota
RMZ	Riparian Management Zone
RP	Rural preserve
RRBB	Red River Basin Board
RRWMB	Red River Water Management Board
SAF	Society of American Foresters
SAP	Spatial Analysis Project
SFEC	Sustainable Forests Education Cooperative
SFIA	Sustainable Forestry Incentive Act
SFI	Sustainable Forestry Initiative
SFRA	Sustainable Forest Resources Act (Minnesota)
SGCN	Species of Greatest Conservation Need
S&PF	State & Private Forests
SWAP	State Wildlife Action Plan
SWCD	Soil & Water Conservation District
TCF	The Conservation Fund
TI	Tree Inspector
TIMO	Timber Investment Management Organization
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
TPL	Trust for Public Lands
UA	Utility Arborist
U&CF	Urban & Community Forestry
U&M	Utilization & Marketing Program
U of M	University of Minnesota
USACE	US Army Corps of Engineers
USDA	US Department of Agriculture
USFS	US Forest Service
USFWS	US Fish & Wildlife Service
WFCE	Working Forests Conservation Easements
WHIP	Wildlife Habitat Incentive Program
WMA	Wildlife Management Area

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