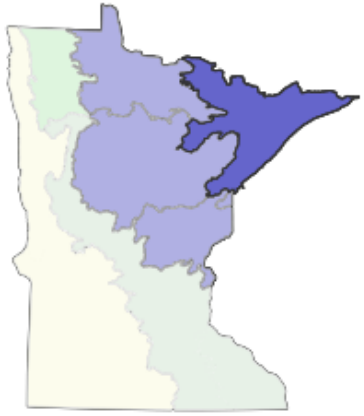
Northern Superior Uplands

Section Forest Resources Management Plan



Preliminary Issues and Assessment Chapter 1: Background and Preliminary Issues

MNDNR

Data and maps borrowed from the Minnesota Forest Resources Council Northeast Landscape Plan are credit as follows:
Minnesota Forest Resource Council. 2014. Northeast Landscape Conditions & Trends Report. Landscape Program Document #LT0114. Minnesota Forest Resource Council, St. Paul, Minnesota. Available online at the Minnesota Forest Resource Council web site www.frc.state.mn.us

Notes relating to this document:
This Preliminary Issues and Assessment document and color maps may be viewed as PDF files on the Northern Northern Superior Uplands Section Forest Resources Management Plan website at:
Northern Superior Uplands SFRMP
Information about the Section Resource Management Plan (SFRMP) process can be found at:
Information about SFRMP
Alternative Formats available on request.
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Contents

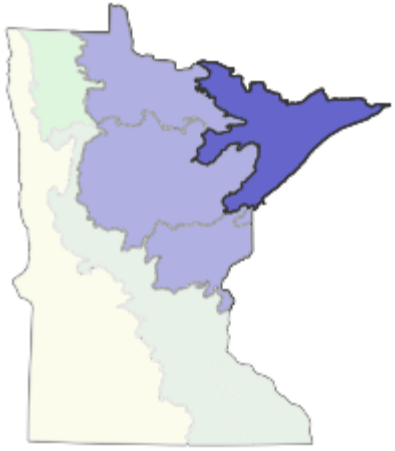
Notes: A basic set of large format color maps showing subsection characteristics is available for viewing at DNR Grand Rapids Region Forestry Office. The NSU SFRMP Assessment is available on the Minnesota DNR Web site at: www.dnr.state.mn.us/forestry/subsection/nsu/index.html

A Glossary of Terms used in forest management planning is located at http://www.dnr.state.mn.us/forestry/subsection/glossary.html

A list of commonly used acronyms is located at http://files.dnr.state.mn.us/forestry/subsection/north4/finalplan/n4chapter6.pdf

For all tables, figures, and maps: Northern Superior Uplands (NSU) ECS Section includes Border Lakes, Laurentian Uplands, Nashwauk Uplands, North Shore Highlands, and, Toimi Uplands Subsections

Background: Brief Description of the Planning Area



This Subsection Forest Resource Management Plan (SFRMP) process considers state forest lands administered by the Department of Natural Resources (DNR), Divisions of Forestry, Parks and Trails, and Fish and Wildlife – Wildlife Section in the Northern Superior Uplands (NSU) Ecological Classification System (ECS) Section's subsection landscape units (Border Lakes, Laurentian Uplands, Nashwauk Uplands, North Shore Highlands, and Toimi Uplands). These five units cover an area from Lake Superior in the east to Grand Rapids in the west, and from Cromwell in the south to International Falls in the north.

Figure 1.1 Location of Northern Superior Uplands Section. This is a locator map showing the location of the NSU Section in the context of the State of Minnesota and the Laurentian Mixed Forest Province. The NSU Section is shown in dark blue on the map, and is located in the far northeastern part of Minnesota.

The NSU largely coincides with the extent of the Canadian Shield in Minnesota. The NSU is characterized by glacially scoured bedrock terrain with thin and discontinuous deposits of coarse loamy till and numerous lakes. The section has high relief, reflecting the rugged topography of the underlying bedrock. The NSU receives more of its precipitation as snow than any section in the state, has the longest period of snow cover, and the shortest growing season. The upland vegetation is remarkably uniform relative to that of other sections in the Laurentian Mixed Forest (LMF) Province, consisting mostly of fire-dependent forests and woodlands. Forests with red and white pine were widespread in the past, mixed with aspen, paper birch, spruce, and balsam fir; much of the pine was cut in the late 1800s and early 1900s, leaving forests dominated mostly by aspen and paper birch. Jack pine forests are present on droughty ridges and bedrock exposures, as well as on local sandy outwash deposits. The highlands along Lake Superior have a local climate moderated by the lake that favors forests dominated by sugar maple with some white pine, yellow birch and white cedar. Peatlands and wet forests are present across the section as inclusions within broader upland forest areas; sparsely vegetated cliffs and bedrock outcrops are common in the rugged terrain along Lake Superior and in the border lakes region of the northern part of the section.

Much of this landscape remains forested; some forest types retain similar stand composition and structure to original forests. In others the once extensive white pine-red pine forests have been replaced by forests of quaking aspen and paper birch. Logging, forest management, tourism, recreation, and mining are important industries. There are extensive areas of forested public land which are managed for wood products and recreation.

For more details about land ownership, refer to Preliminary Issues and Assessment Chapter 2, .*Land Use and Land Cover*.

Section Forest Resource Management Planning

Introduction

For many years, the Minnesota Department of Natural Resources (DNR) directed timber harvesting on lands it administered through five-to 10-year forest resource management plans developed for each of its administrative forestry areas. Opportunities for public involvement were limited in the development and review of these timber management plans.

In response to growing public interest in DNR timber management planning, the original DNR Subsection Forest Resources Management Planning (SFRMP) process was designed to provide a more standardized, formal process and opportunities for increased public involvement. In addition, it was based at the subsection level of the DNR's ECS system rather than on DNR administrative-area boundaries, as was the case in the past.

The first generation of SFRMPs for the State of Minnesota was completed in 2013; the NSU and the Northern Minnesota and Ontario Peatlands section plans are the first of a second generation. Several changes have been made to the process, based on feedback from DNR staff and the stakeholders to our process. Some of the more significant changes are:

- Subsections grouped by ECS Section
- SFRMP teams now include an additional Ecological and Water Resources (EWR) member.
- SFRMP templates are being developed to further reduce plan preparation time.
- SFRMP modeling scenarios will be used to determine the final forest harvest scheduling model for each plan.
- Early stakeholder engagement process has been developed and approved; implementation is underway.
- Old forest management complex (OFMC) direction has been revised and clarified to reflect changes with respect to extended rotation forests (ERF).
- SFRMP Process Work Group (PWG) finalized a special management area (SMA) template and completed revisions of Old-Growth Amendment #5.
- Patch management direction has been revised and clarified.
- The new Adaptive Old Forest Management Approach has been incorporated into the SFRMP process.
- Watershed Analyses are being incorporated in SFRMPs as needed, and as data are available. This is a post-stand selection adjustment.
- Climate change adaptation is being incorporated in SFRMP.
- SFRMP teams are making more extensive use of new ECS data to identify additional management options.

- SFRMPs will incorporate local market information as a post-stand selection adjustment.
- Carbon sequestration: based on direction from the Commissioner's Office, DNR staff is working to incorporate carbon stock modeling in RemSoft for SFRMP (i.e., as an output of modeling scenarios).
- Incorporating pre-commercial thinning: a pool of acres for potential treatment in the event markets develop will be identified, but not included on a stand list. The focus would be on upland conifers and hardwoods (non-aspen), and perhaps brushlands. Desired prescriptions would be developed if and when markets emerge.
- Invasive species are receiving additional focus in SFRMPs.
- New opportunities are being investigated for using ECS data to identify silvicultural opportunities in adjacent stands to those being officially examined for timber harvest.

The SFRMP process is divided into two phases. In Phase I, the planning Team will prepare a Preliminary Issues and Assessment document. This document will identify important forest resource management issues that need to be addressed in the section plan and assess the current forest resource conditions in the covered subsections. In Phase II, the planning team will prepare a draft SFRMP which includes Desired Future Composition goals (DFCs); General Direction Statements (GDSs) to further refine the DFCs; and recommended stand level management strategies to support the DFCs and GDSs. Stand selection criteria leading to a ten year stand exam list are an important plan product. Minnesota DNR will seek stakeholder input on the Draft NSU Section Forest Resource Management Plan (NSU SFRMP).

The Preliminary Issues and Assessment begins with the field organization updating its forest inventory and other management data in preparation for the "clip" of data from the Forest Inventory Module (FIM) that forms the basis of the next SFRMP. This part of the plan is mainly a collection of data that the SFRMP team will use to identify progress toward goals established in the previous plan(s); changes to the physical, political, economic, or social landscape that require adjustments to forest management; and changes to administrative areas, or special management areas that require changes to the way the data are displayed and analyzed. The team also reviews the list of issues from the previous plan and if necessary, adds language about new issues that have to be addressed during the development of the new plan.

The second part of the SFRMP process is the team's work to develop recommendations for vegetation management that will address the issues identified in the Assessment. Goals and strategies form the backbone of the Plan, along with recommendations for management of specific forest types and Native Plant Communities (NPCs). In addition to guidance, an outcome is a list of stands to be examined during the plan implementation period (ten years).

Goals for the Planning Effort

SFRMPs constitute a DNR plan for vegetation management on state forest lands administered in the subsections by the Divisions of Forestry, and Fish and Wildlife. The focus of this effort will be:

- **Identifying a desired future composition (DFC) goal** for 50 years or more. Composition could include the amount of various cover types, age-class distribution of cover types, and their geographic distribution across the subsection. The desired future composition goals for state forest lands in the subsections will be guided by assessment information, key issues, general future direction in response to issues, and strategies to implement the general future direction.
- **Identifying forest stands to be treated over the next 10-year period.** SFRMPs will identify forest stands on DNR Forestry- and Wildlife-administered lands that are proposed for treatment (e.g., harvest, thinning, regeneration, and re-inventory) over the 10-year planning period. Forest stands will be selected using criteria developed to begin moving DNR forest lands toward the long-term DFC goals. Examples of possible criteria include stand age and location, soils, site productivity, and size, number, and species of trees. Many decisions and considerations go into developing these criteria and the list of stands proposed for treatment. Examples include:
- **Assessing the adequacy of older forest on the landscape by**
  1. identifying areas needing management action during the planning period;
  2. identifying areas for various sizes of patch management,
  3. recommending management of riparian areas and visually sensitive human travel corridors,
  4. evaluating age and cover-type distributions, and
  5. identifying regeneration, thinning, and prescribed burning needs.

The DNR will select management activities (including "no action") that best move the forest landscape toward the desired future condition (DFC) goals for state forest lands.

Consistent with state policy (Minnesota Statutes 89A), the SFRMP process will pursue the sustainable management, use, and protection of the state's forest resources to achieve the state's economic, environmental, and social goals.

The Planning Process

The objectives of the DNR SFRMP process are:

- to effectively inform and involve the public and stakeholders;
- to complete the process in each planning area (ECS section or subsection) within a reasonable amount of time (the target is to complete each SFRMP in 12 months);
- to conduct a process that is reasonable and feasible within current staffing levels and workloads; and
- to develop plans that are credible to most audiences and enable good forest management.

Experience, new information, new issues, changing conditions, and the desire to broaden the focus of SFRMP in the future will demand a flexible and adaptable process. The plans will need to be flexible to reflect changing conditions. The SFRMP process will provide for annual reviews by DNR planning teams for the purpose of monitoring implementation and determining whether plans need to be updated to respond to unforeseen substantial changes in forest conditions.

DNR subsection teams will include staff from the DNR divisions of Forestry, Fish and Wildlife, and Ecological and Water Resources; and other agency personnel as needed. These subsection teams will have primary responsibility for the work and decision-making involved in crafting subsection plans.

The subsection team will invite managers of adjacent county, federal, tribal, and industrial forest lands to provide information about the condition of their forest lands and future management direction. This information will help the DNR make better decisions on the forest lands it administers. In the NSU subsections, the goals, strategies, and coordination efforts of the Minnesota Forest Resources Council (MFRC) Northeast, North Central, and Northern Landscape Committees will be considered and/or incorporated into the SFRMP.

In the first phase of the SFRMP process, the subsection team will 1) identify important forest resource management issues that will need to be addressed in the subsection plan and 2) develop an assessment of the current forest resource conditions in the subsection. The assessment document developed by the team will consider at least eight basic elements that will form the basis of the chapters in this document:

1. Introduction and preliminary issues list;
2. Land Use and Land Cover;
3. Administration and ownership;
4. Forest composition and structure;
5. Forest product harvest;
6. Ecological information;

7. Forest health;
8. Wildlife species and trends;
9. Appendices

Public Involvement

At a minimum, there will be public involvement opportunities through:

- Distribution of the Preliminary Issues and Assessment information (mailings and Web site).
- A public involvement initiative to help identify key forest management issues and solicit public opinion of preferred management direction.
- A public comment period to review the draft plan and strategic direction (i.e., general direction, forest management strategies, DFCs proposed by the DNR to address identified issues, the 10-year list of stands proposed for treatment, and any associated new access needs.
- Public review and comment on proposed plan revisions.

For this new generation of SFRMPs, DNR intends to use electronic communication technology to improve access early in the planning process so that public involvement occurs in a more timely way to influence DNR forest management planning decisions. Stakeholders, affected Indian nations, and interested parties are being invited to attend one or more "webinars", or internet seminars, that will explain the process, solicit input through questions and surveys, and provide the data participants need to enable their meaningful input into the process. The webinars will be presented by DNR professional resource managers and will be recorded so that people can participate at times convenient to them in the event the live webinar is at a time when they cannot participate.

The first webinar will deal mainly with the changes to the SFRMP process since the first generation of plans. Some of these changes are in response to things the planning staff has learned. Others are in response to new legislation or policy regulating forest management. At the end of the webinar, participants will be asked one or two questions about how the process worked for them.

A second webinar will present alternative harvest levels, age class distributions, and climate change adaptation strategies; and will explain the models used to develop forest stand examination lists. A final webinar toward the end of 2015 will present the draft plan that the teams developed with consideration of participants' input in the earlier webinars. Additional webinars will be scheduled as needed.

SFRMP planning documents will be available on the DNR Web site www.dnr.state.mn.us/forestry/subsection/nsu/index.html and summary information will be available upon request.

Table 1.1. Public Involvement and Process Timelines for the NSU SFRMP

SFRMP Task	Notification/Participation	Comment Period	Length of Step	Proposed Dates
Preparation to Begin the Planning Process Assemble initial assessment information and data sets. Designate team and facilitator, and conduct team training.	DNR develops mailing list of public/ stakeholders. Establish web-site for subsection.	N/A	Complete prior to official start of process	12/1/2013 – 1/24/2014
Assessment and Issues Identification	Inform the public of planning efforts, schedule, and how and when they can be involved. Provide complete maps and documents on web/CD.	N/A	195 days +/- (overlaps with start of full team meetings)	12/01/2013 – 6/15/2014
Early Public Involvement Webinars	Letters will be sent to invited participants representing a balance of stakeholders. Stakeholders will be invited to participate in webinars, surveys, and review processes.	30 days +/-	This is a new process; length is still being determined.	6/15/2014 – 10/15/2015
Forest Scheduling Model Development	Stakeholders will be involved in identifying desired model scenarios; no public review of model	N/A	45 days	3/1/2015 – 4/15/2015

SFRMP Task	Notification/Participation	Comment Period	Length of Step	Proposed Dates
	at this stage.			
Strategic Direction Document (GDSs, Strategies, DFCs to address issues, and Stand Selection Criteria) Draft Stand Examination list and New Access Needs	Mail summary to mailing list. Provide complete maps and documents on web/CD. Identify SFRMP contacts for questions. Offer meetings by appointment.	45 days 45 days	~26 weeks	4/15/2015 – 7/1/2015 7/1/2015 – 8/15/2015
Finalize Plan Planners summarize public comments and DNR responses. Present revised plan to Department for Commissioner's approval. Commissioner approves final plan and posts written notice in Minnesota State Register.	Inform public of final plan. Provide summary of public comments and DNR responses. Provide final plans on web/CD and in key public libraries. Email executive summary of plan to email list.	None	~6 weeks	9/1/2015 – 10/15/2015

Issue Identification

One of the first steps in the SFRMP process is to identify issues that the plans will address. SFRMP teams will use assessment information; local knowledge; existing plans, policies, and guidelines; and public input to help identify issues relevant to the scope of the plans. Subsection teams will begin with the common set of issues developed from previous SFRMP plans. These common SFRMP issues will then be refined and supplemented based on subsection-specific conditions and considerations.

What Is an SFRMP Issue?

A SFRMP issue is a natural resource-related concern or conflict that is directly affected by, or directly affects, decisions about the management of vegetation on lands administered by the Minnesota DNR Division of Forestry and Division of Fish and Wildlife. Relevant issues will likely be defined by current, anticipated, or desired forest vegetation conditions and trends, threats to forest vegetation, and vegetation management opportunities. The key factor in determining the importance of issues for SFRMP will be whether the issue can be addressed in whole or substantial part by vegetation management decisions on DNR-administered lands.

What Is Not an SFRMP Issue?

Issues that cannot be addressed in whole or substantial part by vegetation management decisions on DNR-administered lands are outside the scope of the SFRMP process. For example, SFRMP will not address recreation trails system issues or planning. However, aesthetic concerns along existing recreational trail corridors can be a consideration in determining forest stand management direction in these areas. Another example is wildlife populations; the plan will establish wildlife habitat goals but not goals for wildlife population levels.

Each issue needs to consider four pieces of information:

- What is the issue?
- Why is this an issue? (i.e., what is the specific threat, opportunity or concern?)
- What are the likely consequences of not addressing this issue?
- How can this issue be addressed by vegetation management decisions on DNR-administered lands?

Public Review

The assessment document and preliminary issues for the subsection will be made available electronically through the DNR Web site.

The following pages contain the preliminary issues identified by the subsection team. These issues were developed based on the common issues from previous SFRMP plans, general field knowledge of Department staff, and by reviewing forest resource information for the subsections. Then the SFRMP team will determine how vegetation management on DNR-administered lands can address these issues.

Preliminary Issues List

This plan will provide guidance for forest management on state lands for the next 10 years and establish goals for the next 50 to 100 years. The NSU SFRMP team reviewed the standard list of issues that affect our forests and could be mitigated or avoided by forest planning and vegetation management. In response to several new and emerging issues, several new issues have been added to the standard list.

1. How should the age classes of forest types be represented across the landscape?

    a. **Why is this an issue?** Representation of all age classes and growth stages, including old-forest types, provides a variety of wildlife habitats, timber products, and ecological values over time.
    b. **How might DNR vegetation management address this issue?** Vegetation management can provide for a balance of all forest types and age classes.
    c. **What are possible consequences of not addressing this issue?** A forest without representation of all age classes and growth stages exposes itself to increased insect and disease problems, loss of species with age-specific habitat requirements, and loss of forest-wide diversity. Such a forest would also provide a boom-and-bust scenario for forest industries that depend on an even supply of forest products.

2. What are appropriate mixes of vegetation composition, structure, spatial arrangement, growth stages, and plant community distribution on state lands across the landscape?

    a. **Why is this an issue?** These subsections have experienced decreased ecological diversity over time. Since European settlement, forest composition and structure have been simplified, e.g., mature, diverse pine stands were harvested and replaced by early sucessional and less diverse forest types such as aspen, birch, and jack pine. Certain important component tree species and forested communities have declined, such as paper birch, mixed pine, lowland conifers, and jack pine. Existing landscape patterns do not reflect natural disturbance patterns and the composition, structure, and function of native plant community complexes that developed historically over long periods of time. Current vegetation management often does not replicate the characteristics of natural disturbance events. Forest fragmentation results in a loss of ecologically intact landscapes as forests are converted to other uses, e.g., residential development.
    b. **How might DNR vegetation management address this issue?** DNR can develop vegetation management strategies that produce effects similar to natural disturbances and can begin to restore certain species and conditions that were once more prevalent.

c. **What are possible consequences of not addressing this issue?** 1) Loss of wildlife habitat and associated species; 2) increase in invasive exotics; 3) loss of biodiversity; 4) simplification of stand and landscape communities; 5) loss of ecologically intact landscapes; and 6) loss of the ability to produce a diversity of forest products, e.g., saw timber, balsam boughs and other non-timber products, and tourism. 7) being less resilient to adapt to climate change.

3. How can we address the impacts of forest management on riparian and aquatic areas?

a. **Why is this an issue?** Riparian areas are critical to fish, wildlife, and certain forest resources.
b. **How might DNR vegetation management address this issue?** The Minnesota Forest Resources Council (MFRC) site-level guidelines are the DNR's standard for vegetation management in riparian areas. At the site level, managers may want to exceed those guidelines. When planning vegetation management adjacent to aquatic and riparian areas, managers can consider specific conditions associated with each site such as soils, hydrology, desired vegetation, and consider enhancements to the MFRC guidelines.
c. **What are possible consequences of not addressing this issue?** Failure to consider vegetation management that affects riparian and aquatic areas could result in increased run-off and erosion; more conspicuous run-off events; less stable stream flows; and negative impacts to water quality, stream stability, and fish and wildlife habitat; including disruptions to temperature regimes.

4. How can DNR develop new forest management access routes that minimize damage to other forest resources?

a. **Why is this an issue?** Routes are necessary to access forest stands identified for management during the 10-year planning period. These routes provide access for a variety of forest management activities and recreation. Negative impacts include costs, land disturbance, losses to the timberland base, increased spread of invasive exotic species, potential for user-developed trails, and habitat fragmentation.
b. **How might DNR vegetation management address this issue?** Using existing access routes or closing access routes after forest management activities have been completed might meet needs while minimizing negative impacts. Clustering stands to be harvested is an example of a management strategy that could reduce the amount of new access needed.
c. **What are possible consequences of not addressing this issue?** Not planning for access needs could result in unfulfilled management goals; poorly located access routes; negative impacts on wildlife habitat; and excessive costs for development, maintenance, and road closure. Unnecessary access potentially provides a route for the spread of invasive exotic species.

5. How might we maintain or enhance biodiversity, native plant community composition, and retain within-stand structural complexity on actively managed stands where natural succession pathways are cut short?

a. **Why is this an issue?** Areas of biodiversity significance provide reference areas to help us evaluate the effects of management on biodiversity. Forest management has altered the rate and direction of natural change. Some current practices tend to reduce within-stand structural complexity and diversity of vegetation.
b. **How might DNR vegetation management address this issue?** DNR will incorporate management techniques that maintain or enhance biological diversity and structural complexity into vegetation management plans. The Minnesota Forest Resources Council, which was established by the Minnesota Sustainable Forest Resources Act, is mandated to "encourage appropriate mixes of forest cover types and age classes within landscapes to promote biological diversity and viable forest-dependent fish and wildlife habitats."
c. **What are possible consequences of not addressing this issue?** 1) Degradation of existing biodiversity and ecosystem function; 2) fewer opportunities for maintaining or restoring ecological relationships; 3) reduction of species associated with declining habitat; and 4) social and economic losses resulting from a decline in recreational activity associated with wildlife viewing and hunting 5) being less resilient to adapt to climate change.

6. How might we provide habitat for all wildlife and plant species and maintain opportunities for hunting, trapping, and nature observation?

a. **Why is this an issue?** Forest wildlife species are important to society. A wide range of factors, from timber harvest to development, influences wildlife species and populations.
b. **How might DNR vegetation management address this issue?** DNR can select vegetation management techniques that provide a variety of wildlife habitats; maintaining or increasing the diversity of habitat has the added benefit of increasing resilience in the face of climate change.
c. **What are possible consequences of not addressing this issue?** 1) Reduction of some types of wildlife habitat; 2) reductions of species associated with declining habitats; and 3) economic and social losses resulting from a decline in recreational activity associated with wildlife viewing, hunting, and aesthetics.

7. How might we address the impacts on forest ecosystems from forest insects and disease, invasive species, nuisance animals, herbivory, and natural disturbances such as fires and blowdowns?

a. **Why is this an issue?** All of the above-mentioned processes can impact the amount of forest land harvested and regenerated during the 10-year planning period. They can also influence the long-term desired future forest composition (DFFC) goals of the subsection plans.

b. **How might DNR vegetation management address this issue?** DNR can design flexibility into the plan to deal with specific stands that are affected by these processes.
c. **What are possible consequences of not addressing this issue?** 1) Reduced timber volume and recreational enjoyment of the forest; 2) long-lasting change to native plant and animal communities; and 3) increased fire danger.

8. What are sustainable levels of harvest for timber and nontimber forest products?

a. **Why is this an issue?** Some cover types have pronounced age-class imbalances. Demand for nontimber forest products, e.g., balsam boughs and decorative trees, has been increasing; markets for some forest products have changed or declined.
b. **How might DNR vegetation management address this issue?** The DNR can develop a 10-year harvest plan for state lands in these subsections that promotes a balance of all age classes for all cover types. It could implement regulations to protect some nontimber species, and conduct training about sustainable harvest of nontimber forest products.
c. **What are possible consequences of not addressing this issue?** 1) Possible unsustainable harvest of these resources; 2) adverse impact to wildlife habitat and native plant communities; 3)reduced ability to accomplish forest management goals without markets, and 4) unintended overharvest of rare nontimber species.

9. How might the quantity and quality of timber products on state lands be increased?

a. **Why is this an issue?** The demand for timber from state land remains strong and Minnesota's forest industry requires a sustainable and predictable supply of wood.
b. **How might DNR vegetation management address this issue?** Vegetation management planning can identify forest stands for treatments that will increase timber productivity (e.g., harvesting at desired rotation ages, thinning, control of competing vegetation, and reforestation to desired species and stocking levels).
c. **What are possible consequences of not addressing this issue?** A less-predictable or unsustainable supply of timber would be available for logging and the forest products industry, likely resulting in higher procurement, chemical, and waste management costs. Alternatively, wood and wood product imports might increase from countries that have fewer environmental controls, effectively exporting U.S. environmental issues.

10. How can we implement forest management activities and minimize impacts on visual quality?

a. **Why is this an issue?** Scenic beauty is the primary reason people choose to live or use their recreation and vacation time in or near forested areas.

b. **How might DNR vegetation management address this issue?** DNR managers will continue to follow Best Management Practices (BMPs) for visual quality and identify areas that may need additional mitigation strategies**.**
c. **What are possible consequences of not addressing this issue?** Not addressing this issue may result in a negative experience for the public living, vacationing, and recreating in our forests.

11. How will land managers achieve desired results and continue to uphold various state and federal statutes?

a. **Why is this an issue?** Divisions within the DNR must follow legal mandates, while fulfilling both department and division missions. For example, State Trust Fund lands must generate income for various trust accounts under state law, and timber sales are currently the primary tool for this process. Wildlife habitat management and preservation, not timber sales, is the mandate for acquired Wildlife Management Area (WMA) lands.
b. **How might DNR vegetation management address this issue?** Vegetation management will take administrative land status and relevant statutes into consideration during the planning process.
c. **What are possible consequences of not addressing this issue?** Failure to follow these mandates and legislative intent may be a violation of federal or state law.

12. How will cultural resources be protected during forest management activities on state-administered lands?

a. **Why is this an issue?** Cultural resource sites possess spiritual, traditional, scientific, and educational values. Some types of sites are protected by federal and state statutes.
b. **How might DNR vegetation management address this issue?** DNR managers will continue to have all vegetation management projects reviewed for known cultural resources. They will survey unidentified sites and if cultural resources are found, modify the project to protect the resource. If cultural resources are discovered during a project, the project will be modified to protect the resource. Coordinate with other governments to determine location-specific concerns.
c. **What are possible consequences of not addressing this issue?** Loss or damage to cultural resources.

13. How can we ensure that rare plants and animals, their habitats, and other rare features are protected in these subsections?

a. **Why is this an issue?** Protecting rare features (endangered, threatened, and special concern species) is a key component of ensuring species, community, and forest-level biodiversity in these subsections.
b. **How might DNR vegetation management address this issue?** The Minnesota Biological Survey (MBS) has been completed in some counties and is in progress in other counties. DNR managers will check the Rare Features Database for the location of

known rare features. The needs of rare features will be addressed in the management plan. The State Wildlife Action Plan (SWAP) will be used as a guide for the protection of rare species and their habitats.

c. **What are possible consequences of not addressing this issue?** 1) Loss of rare species at the local and state level; 2) rare species declines leading to status changes; 3) rare habitat loss or degradation; and 4) loss of biodiversity at the species, community, and/or landscape level.

14. How can we ensure that forest management actions help maintain or enhance healthy watersheds?

a. **Why is this an issue?** Forested lands act as a water filter and are a key component in the hydrologic cycle for sustaining high quality water and hydrology. Forest management operations can have a direct impact on surface water quantity and quality.
b. **How might DNR vegetation management address this issue?** Forest management impacts can be planned to result in practices and promote a forest condition that maintains or enhances watershed conditions.
c. **What are possible consequences of not addressing this issue?** 1) Missed opportunities to improve the health of watersheds; 2) loss of the ability of streams in impaired watersheds to maintain cold-water attributes in a possibly changing climate; and 3) further degradation of watershed health.

15. How can we ensure that forest management actions consider the effects of climate change on forest resources and the environment?

a. **Why is this an issue?** Forest ecosystems in northern Minnesota will be affected directly and indirectly by global climate change. These forest ecosystems are predicted to undergo many changes as a result of a changing climate; forest management practices can have an important influence on the way that forests respond to climate change. Climate change will likely result in altered forest composition or lead to areas of deforestation, which could reduce the forest's capacity to sequester and store carbon. Site-level carbon debt of forest management may exceed site-level forest carbon sequestration for increasingly longer periods of time.
b. **How might DNR vegetation management address this issue?** DNR can incorporate climate change adaptation strategies into forest management decisions. The three main climate change adaptation strategies are: 1) Resistance - improve the forest's defenses against change (i.e., protect forests from severe fire and wind disturbance), 2) Resilience - improve the forest's ability to accommodate some degree of change (i.e., maintain and enhance species and structural diversity), and 3) Response – actively facilitate forest change (i.e., promote landscape connectivity to enhance species migration). DNR can incorporate carbon debt minimization strategies into forest management decisions.

c. **What are the possible consequences of not addressing this issue?** Forest ecosystems would be less resilient to climate change. Forest managers would miss opportunities to help forest ecosystems more smoothly adjust to climate change. Forest impacts due to climate change may be more drastic over time. Forest ecosystems will have reduced abilities to mitigate climate change. Forest carbon stocks may be reduced. Forest carbon sequestration may be reduced. Forest land managers will miss opportunities to reduce management's carbon debt; if as a result carbon stocks are reduced, climate change could be more pronounced.

16. How will we ensure that Permanent School Trust Fund policy is implemented on state lands without compromising sound natural resource management?

a. **Why is this an issue?** Trust Fund lands comprise approximately 80 percent of state lands in the NSU. By statute, Trust lands are to be managed for long-term revenue maximization using sound resource management principles. Strategies for revenue maximization on these lands will have a higher profile in SFRMP than they have in the past, as well as influencing on-the-ground decision making.
b. **How might DNR vegetation management address this issue?** Strategies for income maximization include using normal (economic) rotation ages for stand selection, and grouping these selections when possible to increase timber sale marketability and reduce road construction/costs. Management activities will remain consistent with direction set forth by SFI/FSC Forest Certification, Minnesota Forest Resource Council Voluntary Site-Level Guidelines, and statutes such as Shipstead-Newton-Nolan and Endangered Species protections.
c. **What are the possible consequences of not addressing this issue?** The Commissioner of Natural Resources has been entrusted by the Minnesota Legislature to manage Permanent School Trust Fund lands according guidelines set forth in state statute, that is, long-term income maximization using sound resource management principles. A consequence of failing to manage School Trust lands according to statute could result in DNR losing management authority over those lands.

17. The DNR reviewed its 1994 Extended Rotation Forest (ERF) policy in 2012 and agreed to new direction for monitoring and managing older forests on DNR timberlands. How is the DNR going to ensure that adequate amounts of old forest remain on the landscape?

a. **Why is this an issue?** Older forest provides important habitat for a variety of native plants and animals. Older forest also provides timber products, ecological values, and aesthetic appeal.
b. **How might DNR vegetation management address this issue?** The DNR has adopted an "Old Forest Adaptive Management" approach. As part of this approach, the DNR will monitor the amount of older forest on all ownerships. DNR may adjust management of DNR older forest in response to changing conditions across all ownerships. DNR will revisit the amount of

planned acres of older forest on DNR lands if acreage of older forest for a cover type on all ownerships is predicted to fall below the desired conditions outlined in the original SFRMP (generally 10-15% of the landscape). Other management objectives that will benefit old forest on DNR lands include application of riparian management guidelines, old forest management complexes, large old patches, and management objectives applied in designated High Conservation Value Forests (HCVF).

c. **What are possible consequences of not addressing this issue?** Loss of old forest habitat for some native plants and animals, a decline in species dependent on old forest habitat, loss of forest-wide diversity, and reduced climate change resiliency.