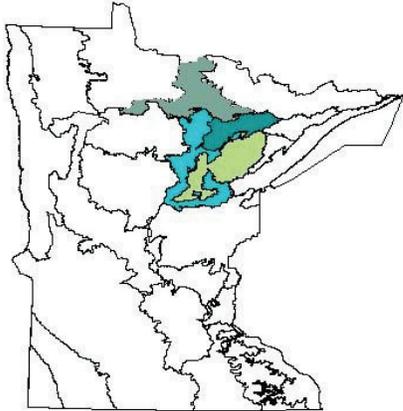


Minnesota
Department of Natural Resources
Division of Forestry



**St. Louis Moraines, Tamarack
Lowlands, Nashwauk Uplands,
and Littlefork-Vermilion Uplands
Subsections**

**Subsection Forest Resource
Management Plan (SFRMP)**

**Strategic Direction and
Stand Selection**



December 2010 – FINAL

Division of Forestry Planning Document
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This document and additional information about the Division of Forestry Subsection Resource Management Plan (SFRMP) process can be found on the Internet at:
<http://www.dnr.state.mn.us/forestry/subsection/index.html>

This information is available in an alternative format upon request.

Executive Summary

This subsection forest resource management plan (SFRMP) includes management direction, goals and strategies, and a 10-year stand examination list. It is intended to guide vegetation management on state forestlands administered by the Department of Natural Resources (DNR), divisions of Forestry, Fish and Wildlife, and Trails and Waterways, and covers the years 2010 – 2019. The St. Louis Moraines, Tamarack Lowlands, Nashwauk Uplands, and Littlefork-Vermilion Uplands subsections landscape units cover approximately 5.5 million acres. State lands comprise 22 percent (1,240,000 acres) of the land ownership in these subsections; 70,000 of those acres are in state parks and Scientific and Natural Areas (SNAs) and are beyond the scope of this management plan. Of the remaining state lands, 712,415 acres (61 percent) are considered timber lands i.e., lands suitable for timber production.

Minnesota Statute 89A.02 states, “It is the policy of the state to: (1) pursue the sustainable management, use, and protection of the state's forest resources to achieve the state's economic, environmental, and social goals”; this is the underpinning of the entire SFRMP process. MS 89A.01 defines sustainability as, “Meeting the needs of the present without compromising the ability of future generations to meet their own needs.” The ecological, economic, and social considerations used in developing the cover-type change goals for these subsections include:

- Historic forest composition,
- Historic disturbance regimes,
- Range of natural variation,
- Wildlife habitat,
- Forest insects and diseases,
- Forest productivity (e.g., match the species to the site using NPC Field Guide),
- Increase availability of certain forest products (e.g., sawtimber), and
- Recreational values.

Under the direction of the Minnesota Forest Resource Council Landscape Program, the Northeast Regional Landscape Committee completed a report in 2003 that included desired future forest conditions for all forest lands in the Northeast Landscape Region, which includes Cook, Lake, St. Louis, and Carlton counties. The North Central Landscape Regional Landscape Committee report was completed in 2004, covering Itasca, Aitkin, Cass, Becker, Clearwater, Crow Wing, Hubbard, Mahnommen, east half of Polk, and south half of Beltrami counties. The Northern Landscape Committee report was also completed in 2004, and included all of Koochiching and the northern two thirds of Beltrami County. The goals and strategies in this subsection plan for state-administered forest lands are generally consistent with those recommended by these regional landscape committees.

Both young and old forest will be maintained on state lands. Goals for maintaining old forest in forest types typically managed using even-aged management regimes (aspen, birch, and jack pine) vary by subsection, between 11 and 16 percent. In an effort to achieve this, the subsections have between 39 and 53 percent of the acres in these cover types designated as extended rotation forest (ERF). Old forest conditions will also be provided in uneven-age managed cover types

(e.g., northern hardwoods), ecologically important lowland conifers (EILC), and designated old-growth stands.

The 0-30 age classes of aspen, balsam poplar, birch, and jack pine cover types represent young, early succession forest in this plan. Currently, these four cover types comprise 40 percent of the timber land acres while the long-term goal is that to have them comprise 35 percent of the acres. Currently, 66 percent of these cover type acres (185,000 ac) is in the 0-30 age classes while the long-term goal, after improving the age class distribution in these cover types, is 63 percent young forest, or 158,000 acres.

Upland conifer cover types, including white pine, red pine, white spruce, jack pine, upland black spruce, and upland white cedar are planned to increase. Historically, these species were more common in these subsections. To increase these cover types, a decrease will occur in the aspen, balsam poplar, birch, and balsam fir cover types. Aspen and birch are currently the predominant cover types and that will continue to be the case. Most cover type conversions will occur during the 10 years covered by this plan, and many will be “soft” conversions that take place gradually, often without the use of a final harvest.

It is a goal of this plan to maintain or increase within-stand species and structural diversity in some stands. Long-lived conifers (white pine, red pine, and white spruce) will be increased as a component in other cover types such as aspen and birch. Mixed species now comprise many plantations. Some stands will be managed using techniques such as variable retention and variable density, and will retain some trees of species and sizes typically found in older growth stages. Moving northern hardwoods stands toward an uneven-aged structure and providing a multiple-age structure in some white pine and white spruce stands are desired outcomes of forest management.

Maintaining *and* creating large (greater than 640 acres) and medium-large (251 to 640 acres) old patches of managed upland forest on the landscape is a priority of this plan. The North 4 team, with input and review from field staff, identified 53 patches and future patches for patch management emphasis. All 53 designated patches have a long-term goal of patch management directed towards managed old forest. These patches total 26,704 acres, or slightly less than 4 percent of the state timber lands in the planning area. Where possible, the state will cooperate with other landowners in patch management to reduce habitat fragmentation.

Vegetation management will provide a broad range of habitats that meet the needs of most game and nongame species (coarse filter approach) while providing specific habitat needs for individual species (fine filter approach) when needed. There are 42 game species and 214 nongame species found in the subsections. The goal is to provide healthy, self-sustaining populations of all native and desirable introduced plant, fish, and wildlife species. In some cases, strategies will attempt to reduce the negative impacts caused by wildlife species on forest vegetation.

Riparian areas will be managed to provide habitat for fish, wildlife, and plant species. The Minnesota Forest Resources Council Voluntary Site-Level Forest Management Guidelines will

be applied on all state lands. Management of riparian areas along streams is important from a fisheries perspective because the cold-water streams are very important for native and introduced fish species. Forest management strategies to maintain water quality and cold-water temperatures will be implemented.

Minnesota County Biological Survey (MCBS) work is currently not completed in these subsections. MCBS sites with statewide biodiversity significance rankings of Outstanding, High, and preliminary survey of High were determined to be the greatest concern or importance in this plan. Strategies have been developed to manage forest land in these MCBS sites while minimizing the loss to the biodiversity significance factors on which the MCBS sites were ranked. On all state lands, known locations of rare plants and animals and their habitats and rare native plant communities will be protected, maintained, or enhanced in these subsections.

The treatment level recommended by the 10-year plan is approximately 13,500 acres per year, compared to an estimated 15,000 acres per year (192,000 cords) during the decade preceding this planning period. This reflects a return to sustainable harvest levels after some years of attempting to address a backlog of wood that was over its maximum rotation age. With the addition of another 7,200 acres of black spruce and approximately 1,000 acres of red pine final harvest over that proposed in the draft plan, the current plan proposes a harvest in the range of 185,000 – 205,000 cords per year. So the current plan does not offer a volume of timber that differs significantly from past available volumes. Based on cover type treatment modeling using a Remsoft harvest-scheduling model, treatment levels will fluctuate each decade as the model attempts to achieve the desired age-class distributions in all the cover types. Strategies such as intermediate treatments and harvests in younger age classes have been implemented to increase timber productivity and quality, and to increase the average harvestable volume per acre growing on state lands over time.

Other topics addressed in the plan include: protecting wetland and seasonal ponds; limiting damage from insects, disease, and exotic species; minimizing forest management impacts on visual quality; mitigating climate change effects on forest lands; planning of new road access; protecting cultural resources; and evaluating disturbance events (e.g., fire and wind).

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Note: The maps (in color) and this report are available on CD and also the DNR Web site at <http://www.dnr.state.mn.us/forestry/subsection/north4/index.html>

1. Introduction

Planning Area Description

This Subsection Forest Resource Management Plan (SFRMP) process considers state forest lands administered by the Department of Natural Resources (DNR), Divisions of Forestry, Trails and Waterways, Fish and Wildlife – Wildlife Section in the *North-4 Subsections* subsection landscape units (*St. Louis Moraines, Tamarack Lowlands, Nashwauk Uplands, and Littlefork-Vermilion Uplands*). These four units cover approximately 5.5 million acres in an area from near Tower on the east to Blackduck on the west, and from Aitkin on the south to International Falls on the north. (See *Map i—slm, Map i—tl, Map i—nu, and Map i—lvu.*) For more detailed land descriptions, refer to chapters 1 through 3 of the Preliminary Issues and Assessment, at <http://www.dnr.state.mn.us/forestry/subsection/north4/index.html#chapters>

Recreation, forestry, and tourism are major uses of land in these four subsections. Public agencies administer 50 percent of the land, with the state portion being 1.24 million acres or 22 percent. Approximately 1.17 million acres of the state land is timber land that will be considered for wood products production and other resource management objectives in this plan. Other state lands totaling 70,000 acres include state parks and Scientific and Natural Areas, which will not be considered under this plan.

In addition, the federal government owns 300,000 acres (5.5 percent) that are managed by the U.S. Forest Service as part of the Chippewa and Superior National Forests. Aitkin, Crow Wing, Cass, Itasca, Beltrami, Koochiching, St. Louis, and Carlton counties own and manage 1.23 million acres (22 percent). Private owners control 2.7 million acres (49 percent). Of that, industry owns 700,000 acres. For more details about land ownership, refer to Chapter 2 of the Preliminary Issues and Assessment, at <http://www.dnr.state.mn.us/forestry/subsection/north4/index.html#chapters>

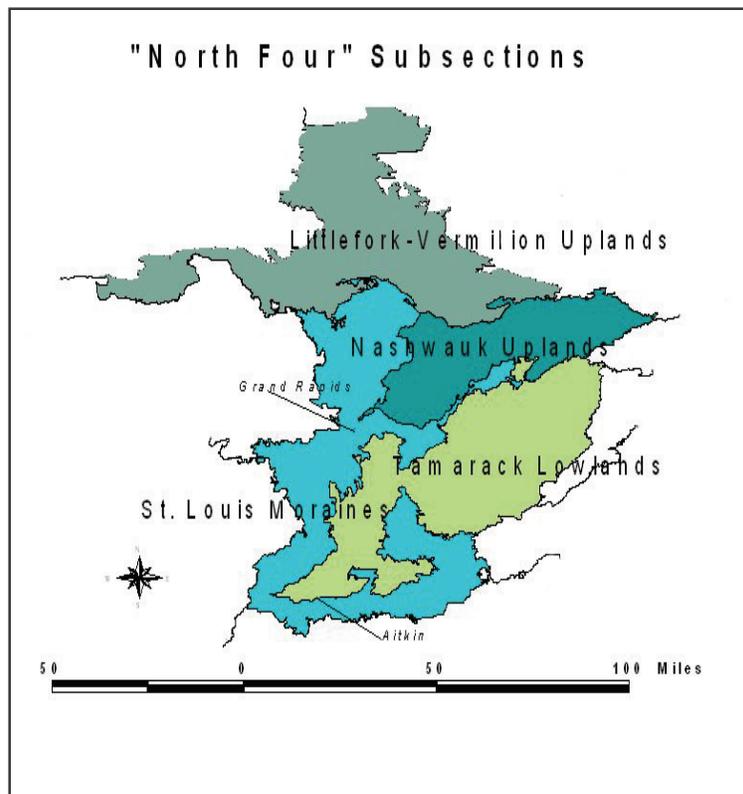
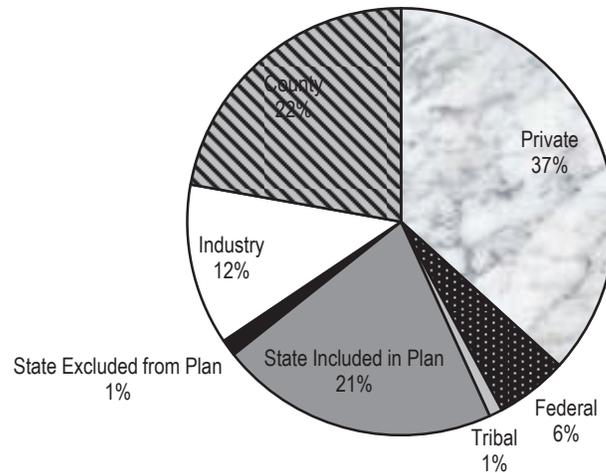


Figure 1.1a: Land Ownership in the St. Louis Moraines, Tamarack Lowlands, Nashwauk Uplands, and Littlefork-Vermilion Uplands

**St. Louis Moraines / Tamarack Lowlands /
Nashwauk Uplands / Littlefork-Vermilion Uplands**



Source: 1976 to 1998 Minnesota DNR GAP Stewardship <Updated 2007>

Table 1.1a: Land Ownership by Subsection (Acres)¹

	St. Louis Moraines	Tamarack Lowlands	Nashwauk Uplands	Littlefork- Vermilion Uplands	North Four Subsections Total
Private	704,410	641,424	264,277	418,426	2,028,537
Federal	157,413	12,477	92,401	39,126	301,417
Tribal	627	113	0	54,279	55,019
State Included in Plan	203,903	344,426	76,903	541,539	1,166,771
~ Forestry	196,010	293,776	76,864	540,704	1,107,354
~ Wildlife	7,813	47,096	39	835	55,783
~ Trails	80	3,554	0	0	3,634
State Excluded from Plan	19,292	10,843	8,724	31,231	70,090
State - All²	223,195	355,269	85,627	572,770	1,236,861
Industry	168,346	80,341	231,908	193,767	674,362
County	335,470	432,780	129,249	328,779	1,226,278
TOTAL	1,589,461	1,522,404	803,462	1,607,147	5,522,474

¹ Source: 1976 to 1998 Minnesota DNR GAP Stewardship <Updated 2007>

² Includes all lands administered by units of DNR including Forestry, Wildlife, Fisheries, Parks, and Ecological Resources. SFRMP only covers Forestry, Wildlife, and Trails and Waterways administered lands

Based on the Gap Analysis Program (GAP) classification completed by the DNR Division of Forestry using satellite imagery of all lands in the subsection, 66 percent of the land area (non-water) is covered by forest. Aspen and birch cover types comprise 49 percent of this forest. Three percent of the subsection land area is cropland. Based on the DNR forest inventory of timber land that will be considered in this plan, aspen, birch, and balm of gilead comprise 271,000 acres and non-forested lowlands comprise 225,000 acres. Table 1.1b shows the general cover type percentages for all ownerships based on GAP data for forested classes of land and for state lands in this SFRMP based on state land forest inventory data (CSA – Cooperative Stand Assessment).

Table 1.1b: Generalized Forest Cover Type Composition in these Subsections

Cover Type Group	All Ownerships (GAP) ¹	State Lands in SFRMP ²
Aspen, birch, and balm of gilead	1,636,900	277,300
Other upland hardwoods (maple, basswood, oak)	182,400	32,300
Lowland hardwoods (ash, elm, and silver maple)	187,400	59,500
Pine (red pine, white pine, and jack pine)	194,700	37,800
White spruce, balsam fir, and upland black spruce	98,800	35,700
Lowland conifers (black spruce, tamarack, and white cedar)	760,500	296,500
Stagnant conifers (black spruce, tamarack, and white cedar)	206,700	213,700
Other	73,800	293,900

¹ Source: 1976 to 1998 Minnesota DNR GAP Stewardship <Updated 2007>

² Includes all lands administered by units of DNR including Forestry, Wildlife, Fisheries, Parks, and Ecological Resources. SFRMP only covers Forestry, Wildlife, and Trails and Waterways administered lands: [FIM1d-April 2007]

For additional information, see the North 4 Preliminary Issues and Assessment (August 2007) or <http://www.dnr.state.mn.us/forestry/subsection/north4/index.html>

Scope of Subsection Forest Resource Management Plan

Subsection Forest Resource Management Plan (SFRMP)

A SFRMP is a DNR plan for vegetation management on forest lands administered by the DNR divisions of Forestry, Fish and Wildlife, and Trails and Waterways. Vegetation management includes actions that affect the composition and structure of forest lands, such as timber harvesting, thinning, prescribed burning, and reforestation. The geographic area covered by these plans is defined by Ecological Classification System (ECS) subsections (Appendix A). Previous forest management plans were based on administrative boundaries (e.g., DNR forestry areas). The SFRMPs will also consider the condition and management of forest lands not owned by the DNR, but will only propose forest management direction and actions for DNR lands. The amount of DNR-administered forest lands within forested subsections will vary across the state. Examples of forest resource management planning activities that are beyond the scope of SFRMPs are: OHV trail system planning, comprehensive road access plans, state park land management planning, old growth forest designation, SNA establishment, wilderness designation, wildlife population goals, cumulative effects analysis at the watershed-level, fire management, and recreation facilities/systems planning.

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 SFRMP process is divided into three steps. In Steps 1 and 2, the subsection team prepares information to assess the current forest resource conditions in the subsection and identify forest resource management issues that will be addressed in the subsection plan. In Step 3, the subsection team finalizes the issues and develops general directions and strategies to address these issues. The strategies will help in developing the cover type management recommendations, stand-selection criteria, and stand treatment levels. In this step, stands to be evaluated for treatment during the 10-year plan period are also selected and preliminary prescriptions are assigned. There are two opportunities for public input.

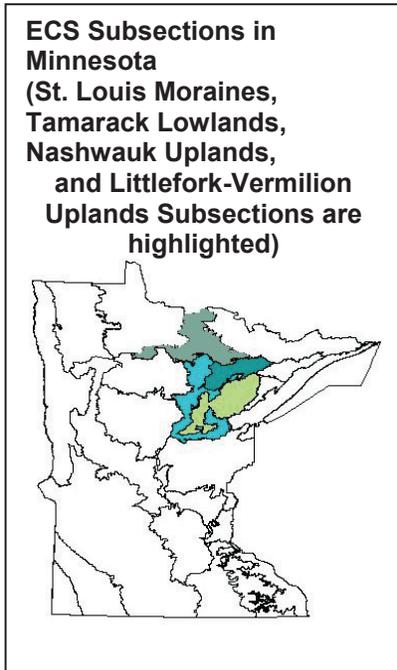
ECS Subsections

The DNR has developed an ECS as a tool to help identify, describe, and map ecosystems. ECS units are defined by climatic, geologic, hydrologic, topographic, soil, and vegetation data. The DNR ECS divides the state into six levels of ecological units, each level nested together within the next higher level. Subsections are the third level down in the ECS hierarchy in Minnesota. There are 17 forested subsections in the state, ranging in size from 339,285 to 3,657,011 acres.

Goals for the Planning Effort

While the planning process will produce many tangible “products,” such as assessment information, issues, and strategies, the end result of the planning process will be two key products:

- **Desired Future Forest Composition (DFFC) goals:** The goals will include long-term (50 years or more) and short-term (10 years) desired changes in the structure and composition of DNR forest lands in the subsection. Composition goals could include the amount of various cover types, age-class distribution of cover types, and their geographic distribution across the subsection. DFFC goals for state forest lands will be developed from assessment information, issues, the general direction identified in response to the issues, and strategies to implement the desired management direction.
- **List of DNR forest stands to be treated over the next 10-year period.** SFRMPs will identify forest stands on DNR Forestry- and Fish 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 DFFCs. 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 1) identifying areas to be managed as older forest or extended rotation forest (ERF); 2) identifying areas to be managed at normal rotation age; 3) identifying areas for various sizes of patch management; 4) management of riparian areas and visually sensitive travel corridors; 5) age and cover type distributions; and 6) regeneration, thinning, and prescribed burning needs. Decisions will be made based upon the



management activities (including no action) that will best move the forest landscape toward the DFFC goals for state forest lands.

Who Develops SFRMPs?

SFRMP team members include DNR forestry, wildlife, and ecological services staff. A list of SFRMP team members for the North Shore subsections is on Page i. These teams have primary responsibility for the work and decision making involved with the subsection plans. Decision-making by the team is through an informed consent process. Managers of adjacent county, federal, tribal, and industrial forest lands may be invited to provide information about the condition of their forest lands and their future management direction. Data relating to all ownerships is used in the planning process. This information will help the DNR make better decisions on the forest lands it administers.

SFRMP and MFRC Regional Landscape Planning

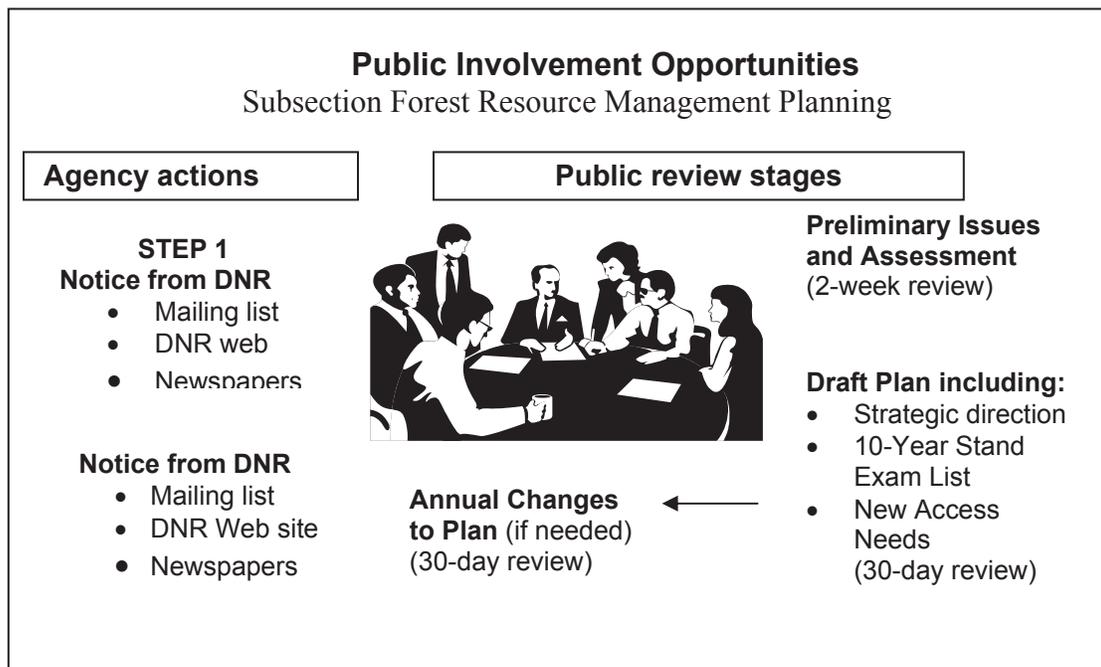
The recommended desired outcomes, goals, and strategies developed for the Northeast and North Central Landscape regions by regional landscape committees under the direction of the Minnesota Forest Resources Council (MFRC) Landscape Program were considered in developing this SFRMP. By considering the recommendations from the landscape region plans, the decisions for management of DNR-administered lands incorporate recommendations from a broader landscape perspective across all ownerships and assists in cooperation across ownerships in this larger landscape area.

SFRMP Process Overview

Table 1.1c outlines the steps in the DNR SFRMP process. As of this printing, this SFRMP is in the fourth step of the process, i.e., the DNR interdisciplinary team has developed general directions and strategies to address the final list of issues, established desired future forest composition goals for DNR lands in the subsection, developed stand-selection criteria, and identified stands to treat over the 10-year planning period. Figure 1.1b shows the opportunities for public involvement during the planning process.

Table 1.1c: SFRMP Process Overview

<p>Step 1</p>	<p>Initiating the Planning Process</p> <ul style="list-style-type: none"> • DNR forms interdisciplinary team for the subsection(s). • DNR staff assembles base assessment information. • Web page is established for the subsection on the DNR Web site. • DNR develops mailing list of public/stakeholders. • Public is informed that the planning process is beginning in the subsection, the estimated schedule for the planning process, and how and when they can be involved.
<p>Step 2</p>	<p>Assessment and Issue Identification</p> <ul style="list-style-type: none"> • Subsection team adjusts and supplements the base resource assessment information for the subsection. • Team identifies the preliminary issues to be addressed in the plan. • DNR distributes assessment information and the preliminary issues for public review and input.
<p>Step 3</p>	<p>Strategies, Desired Future Forest Composition, and Stand Selection Criteria</p> <ul style="list-style-type: none"> • DNR finalizes the list of issues to be addressed in the plan based on public input from Step 2. • Subsection team develops general direction statements (GDSs) in response to the final list of issues. • Subsection team and work groups develop strategies and desired future forest composition (DFFC) goals consistent with the general direction. • Team develops stand-selection criteria to help identify DNR forest stands for treatment over the 10-year planning period to move toward the goals. • DNR distributes GDSs, DFFC goals, strategies, and stand-selection criteria for public review and comment. <p>Draft List of Stands to be Treated and New Access Needs</p> <ul style="list-style-type: none"> • Subsection team finalizes DFFC goals, strategies, and stand-selection criteria. • DNR personnel identify state forest land stands to be considered for treatment over the 10-year planning period. • DNR personnel identify new access needs associated with the list of stands proposed to be treated. • Draft list of stands to be treated and new access needs is distributed for public review and comment.
<p>Step 5 <i>Current Step</i></p>	<p>Final Plan</p> <ul style="list-style-type: none"> • Subsection team summarizes public comments and develops DNR responses. • A summary of comments, responses, and plan revisions are presented to the department for commissioner’s approval. • Commissioner approves final plan. • Final plan is distributed, including summary of public comments and DNR responses.

Figure 1.1b: Public Involvement Opportunities

Public involvement will, at a minimum, occur through:

- Distribution of the initial assessment information (mailings and Web site).
- A public comment period 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, and DFFCs proposed by the DNR to address identified issues) along with the 10-year list of stands proposed for treatment and associated new access needs.
- Public review and comment on proposed plan revisions.

Contents of Document and Focus of Current Review

This document is the final product developed by the SFRMP interdisciplinary team after revisions based on public review in Step 3 in the planning process. It includes the final list of issues addressed in the plan, GDSs and strategies to address the issues, DFFC goals, stand-selection criteria, cover type management recommendations, final 10-year stand examination list, a list of new access needs, and a summary of public comments from Step 3 (Chapter 5).

In Step 3, the subsection team developed GDSs and strategies to address the final list of issues. Strategies developed by the work groups are based on existing DNR policies/mandates, technical expertise from within and outside the subsection team, forest resource information from the Preliminary Issues and Assessment and other sources, and public input from Step 2 of the process. Strategies developed to address the various issues were then examined to ensure consistency with each other, to identify and group similar strategies, and to address strategies that might be contradictory. The strategies in this document are the product of that effort to

develop a refined list of strategies to address the final list of issues, as well as input from stakeholders and partners within the DNR.

The subsection team developed the DFFC goals based on current conditions on DNR forest lands in the subsection, and on the output of the Remsoft harvest-scheduling model. DFFC goals are most commonly expressed in terms of desired changes in the age-class structure, the amount of various forest types within the subsection, and the geographic distribution of forest types and age-classes across the subsection.

GDSs, strategies, DFFC goals, and cover type management recommendations were used to define proposed criteria to select a pool of forest stands for treatment over the 10-year planning period. Stand selection criteria can include: “normal” rotation ages (i.e., ages at which most forest stands will be harvested); extended rotation forest rotation ages (i.e., ages at which stands designated for older forest management will be harvested); potential productivity of the site for timber (i.e., site index); soil types; stand density, or stocking measures (e.g., basal area); tree species composition; brush and ground cover; stand size; stand location; insect and disease occurrence; and other specific criteria needed to address issues. Stand selection criteria presented in this document are those identified by the subsection team as best moving DNR forest lands toward the identified DFFC goals for the North Shore subsections.

The subsection team summarized comments received during Step 3 of the process (Chapter 5). Specific references are provided as to where and how comments and concerns were incorporated into the final issues, strategies, DFFC goals, or stand-selection criteria.

Viewing the Final Plan Documents

The GDSs, strategies, DFFC goals, stand-selection criteria, cover type management recommendations, stand examination list, and list of new access needs in this plan will be available on the DNR Web site. This document is available on the DNR web site at: <http://www.dnr.state.mn.us/forestry/subsection/north4/index.html> , or upon request as hard copy or CD. Requests for a copy of the plan can be submitted via the Web site or submitted to:

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