Minnesota
Department of Natural Resources

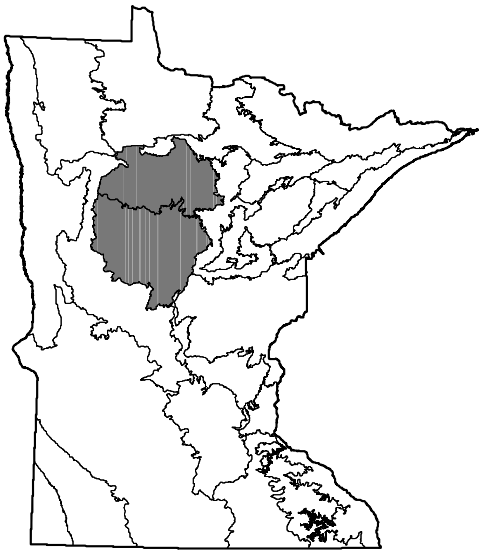
Division of Forestry

Final Plan

Chippewa Plains-Pine Moraines and Outwash Plains

Subsection Forest Resource Management Plan

Fiscal Years 2009 through 2018



Minnesota Department of Natural Resources
February 2009

Executive Summary

This subsection forest resource management plan (SFRMP) includes management direction, strategies, and goals for vegetation management on state forestlands administered by the Department of Natural Resources (DNR), Divisions of Forestry, and Section of Fish and Wildlife. The Chippewa Plains and the Pine Moraines and Outwash Plaines subsection landscape covers approximately 4.6 million acres in north central Minnesota. Of this, State lands comprise approximately 14 percent (682,986 acres) of the land ownership in these subsections. Of the state lands, approximately 59 percent (401,160 acres) is considered managed timberlands or lands suitable and available for timber production.

The CP-PMOP SFRMP takes into consideration all appropriate legislative requirements and DNR directions. In addition, this plan has considered and coordinated with forest management plans of other forest managers, in particular the Minnesota Forest Resources Council's North Central Regional Landscape Plan. The strategies and desired future forest composition as contained in this CP-PMOP Plan for state-administered forestlands are consistent with those identified in the North Central Regional Landscape Plan.

Primary elements of the CP-PMOP SFRMP includes analysis of existing forest conditions, development of desired future forest conditions (DFFCs), and a Stand Exam List which identifies stands to be field visited during the 10-year plan implementation period to determine specific stand treatments. The CP-PMOP SFRMP recommends the following:

1. move toward a balanced age-class distribution;
2. provide a sustainable supply of forest products;
3. identify and maintain old forests;
4. maintain adequate acres of young forests;
5. increase overall timber productivity, consistent with other strategies;
6. increase specific cover types across the landscape;
7. convert specific cover types to conifers;
8. implement specific within-stand management strategies;
9. identify and manage a portion of all cover types as extended rotation forests;
10. designate and manage forest patches, limit visual impacts;
11. implement strategies to maintain wildlife habitat and protect water quality;
12. identify and maintain cultural resources and important plant and animal species; and,
13. consider disturbance events to manage timber harvesting on a sustainable basis.

Old forest will be maintained on state lands. The long-term goal is to maintain 14.8 percent of the even-aged managed cover types (e.g., aspen and birch) acreage over the normal rotation age. Old forest conditions will also be provided in uneven-aged managed cover types (e.g., northern hardwoods), ecologically important lowland conifers (EILC), and designated old-growth stands.

Adequate young forest will be maintained on state lands. The 0-30 age-classes of aspen, balm of Gilead, birch, and jack pine cover types represent young, early succession forest in this plan. Currently, these four cover types comprise 53 percent of the timberland acres while the long-term goal is that they will comprise 48 percent of the total acres.

Of the upland conifers, the 10-year DFFCs are to increase the cover type acres of jack pine and white pine, maintain the current acreage of red pine, and decrease (convert to other cover types) white spruce (short term only) and balsam fir. To increase jack pine and white pine, conversions from the following cover types are recommended: aspen/ balm of Gilead, birch, northern hardwoods and balsam fir, from sites not conducive to balsam fir.

Of the upland hardwoods, the 10-year DFFCs are to decrease (convert to other cover types) total acres of aspen/balm of Gilead, northern hardwoods, and oak. These cover types will be converted primarily to upland conifers. It is recommended that the total cover type acres of birch be maintained during the planning period.

Of the lowland hardwoods and conifers the 10-year DFFCs are to decrease the total cover type acres of ash / lowland hardwoods, and increase total cover type acres of white cedar and tamarack. It is recommended to maintain the current total cover type acres of lowland black spruce.

In addition, some stands will be managed to maintain or increase within-stand species diversity and structural composition. Long-lived conifers (i.e., white pine, red pine, and white spruce) will be increased as a component in other cover types such as aspen and birch. Many stands across the CP-PMOP landscapes will be comprised of mixed species. 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.

Patch management within the CP-PMOP subsections, during implementation of this 10-year plan will emphasize maintaining existing larger (101+ acres) patches and increasing the average patch size over time. Sixteen percent of the DNR timberlands addressed by this plan have been designated as components of larger patches. Where possible, the DNR 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 game and nongame species, while providing for the specific habitat needs of individual species when needed. There are 440 wildlife species found in these two subsections. The goal is to provide healthy, self-sustaining populations of all native and desirable introduced plant, fish, and wildlife species. Specific strategies will be implemented that 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 MFRC's *Voluntary Site-Level Forest Management Guidelines* will be applied on all state lands. Specific vegetation management strategies are identified for riparian areas, (along all lakes, rivers and streams) to maintain water quality for fisheries and animal habitat, eliminate visual impacts, and provide for erosion control.

Minnesota County Biological Surveys (MCBSs) have been completed for two counties within these two subsections. In addition, nine counties have had MCBS field survey or work completed or started, the results of which were available as the 10-Year Stand Exam List was prepared. Strategies have been developed to manage forestland in these MCBS sites while sustaining or 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 (i.e., harvest, thinning, regeneration, prescribed burning, re-inventory, etc.) recommended for the 10-year plan ranges from 104,000 cords to 134,000 cords per year compared to approximately 104,000 cords per year for the period from 1995 –2004. A primary goal is to move toward a balanced age-class distribution in even-aged managed cover types. Harvest levels will fluctuate by cover type for each decade until the desired age-class distributions are reached. Strategies to increase timber productivity and timber quality have been developed in an effort to increase the average harvestable volume per acre on state lands over time.

Other issues 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; monitoring climate change effects on forest lands; protecting cultural resources; and evaluating disturbance events (e.g., fire and wind); and planning of new road access.

The Chippewa Plains – Pine Moraines and Outwash Plains SFRMP and all Appendices are available on the DNR Web site at: *http://www.dnr.state.mn.us/forestry/subsection/cp_pmop/index.html*

Chippewa Plains - Pine Moraines and Outwash Plains Subsection Forest Resource Management Plan (CP-PMOP SFRMP)

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Chapter 1. Introduction

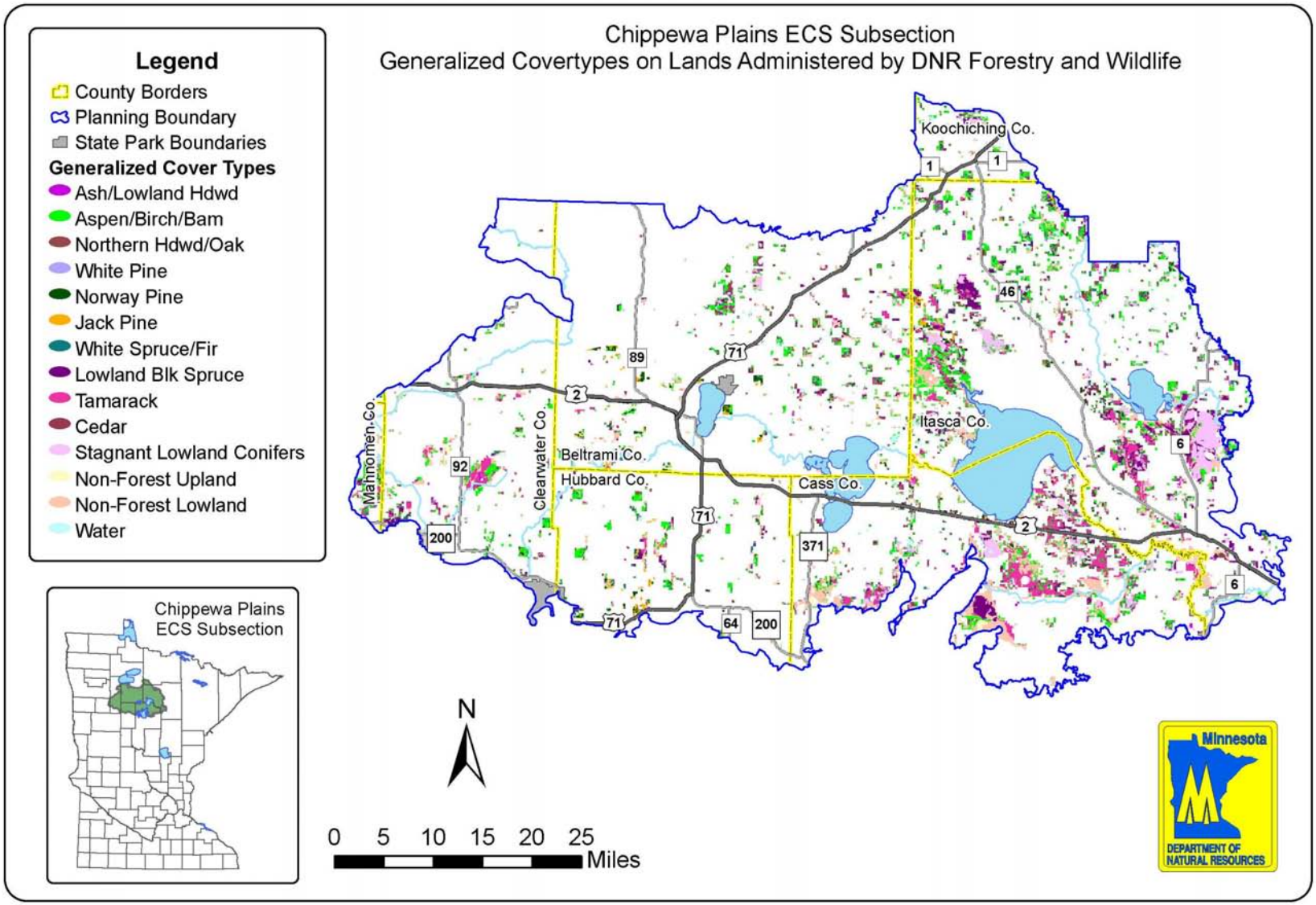
This Subsection Forest Resource Management Plan (SFRMP) process considers state forest lands administered by the Department of Natural Resources (DNR) divisions of Forestry and Fish and Wildlife in the *Chippewa Plains-Pine Moraines and Outwash Plains* subsection landscape units. These two units cover approximately 4.6 million acres in an area from near Deer River on the east to Detroit Lakes on the west, and from Camp Ripley on the south to Kelliher on the north. (See Map 1.1a and Map 1.1b).

1.1 Planning Area Description

Recreation, forestry, and tourism are major uses of land in these two subsections. Public agencies administer 42 percent of the land with the state portion being 682,986 acres or 14 percent. Approximately 429,229 acres (9 percent) of the state land is timberland that will be considered for wood products production and other resource management objectives in this plan. Other state lands include state parks and non-timberlands such as bogs and brush lands that will not be considered. As shown on Table 1.1a and Figure 1.1a the federal government owns 12 percent (560,314 acres) that are managed by the U.S. Forest Service as part of the Chippewa National Forest. Becker, Beltrami, Cass, Clearwater, Crow Wing, Hubbard, Itasca, Koochiching, and Wadena counties own and manage 16 percent (732,079 acres). Private lands comprise 54 percent (2,526,459 acres), of that, industry owns 3 percent and tribal governments own 1 percent.

Map 1.1a

Chippewa Plains ECS Generalized Cover Types



Note: The maps have been reduced and printed in grayscale in this document. It is recommended that these maps be viewed at a larger scale and in color. The colored maps and this report can be viewed at :
http://www.dnr.state.mn.us/forestry/subsection/cp_pmop/index.html

Map 1.1b

Pine Moraines and Outwash Plains ECS Generalized Cover Types

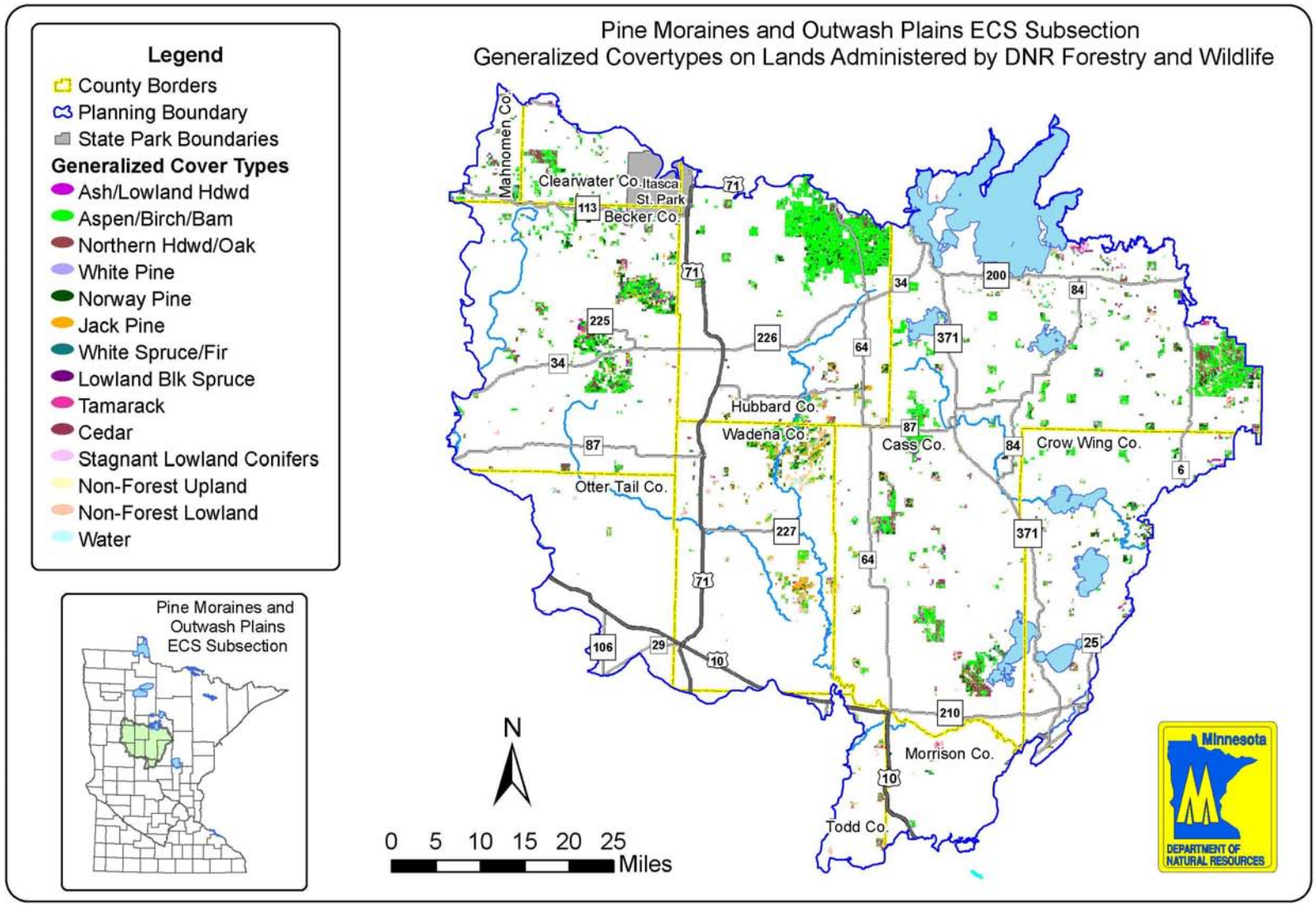


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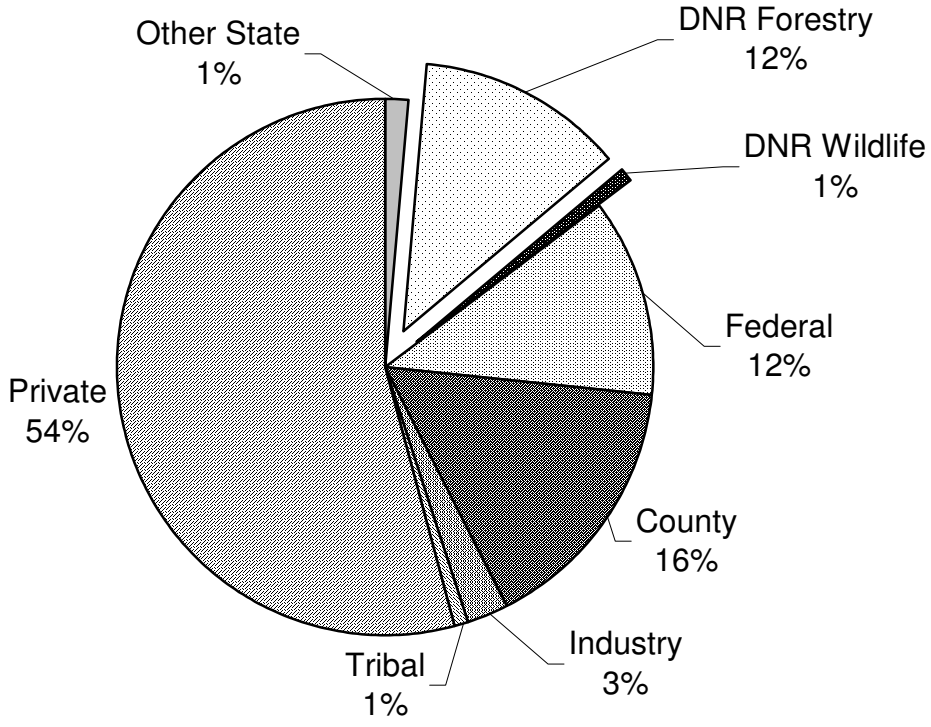
Table 1.1a Land Ownership – Total Acres by Subsection

	Chippewa Plains	Pine Moraines and Outwash Plains	Two Subsections Total
Private	854,295	1,672,164	2,526,459
Federal	427,607	132,707	560,314
Tribal	4,979	26,742	31,721
State – All*	340,001	342,985	682,986
Forestry	314,265	264,546	578,811
Wildlife	6,031	30,238	36,269
Industry	33,856	89,334	123,190
County	288,051	444,028	732,079
Total	**1,948,789**	**2,707,960**	**4,656,749**

Source: 1976 to 1998 Minnesota DNR GAP Stewardship---"All Ownership Types" data.
*Includes all lands administered by units of DNR including Forestry, Wildlife, Fisheries, Parks, Trails and Waterways, and Ecological Services. SFRMP only covers Forestry- and Wildlife-administered lands.

Figure 1.1a Land Ownership - Chippewa Plains - Pine Moraines and Outwash Plains 4,656,749 Total Acres



Based on the Gap Analysis Program (GAP) classification completed by the DNR Division of Forestry using satellite imagery of all lands in the subsection, 52 percent of the land area (nonwater) is covered by forest in the CP and 50 percent in the PMOP. Five percent of the CP land area is cultivated with 11 percent in the PMOP. Based on CSA forest inventory data, the primary cover types across both subsections are aspen/balm of Gilead and birch, making up approximately 48 percent of the total forested lands.

1.2 Scope of Subsection Forest Resource Management Plan (SFRMP)

Subsection Forest Resource Management Plan (SFRMP)
A SFRMP is a DNR plan for vegetation management on forestlands administered by the DNR Divisions of Forestry, and Fish and Wildlife, Vegetation management includes actions that affect the composition and structure of forestlands, such as timber harvesting, thinning, prescribed burning, and reforestation. The geographic area covered by these plans is defined by Ecological Classification System (ECS) subsections. In response to growing public interest in DNR timber management planning, the DNR SFRMP process was developed to provide a more standardized, formal process and opportunities for increased public involvement. In addition, it is based at the subsection level of the DNR's ecological classification system (ECS) rather than DNR administrative areas as in the past (i.e., DNR Forestry Area boundaries). The SFRMPs do 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.

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 planning process is divided into four steps. In Steps 1 and 2, the subsection planning 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 (preparation of the Draft CP-PMOP SFRMP), the subsection planning team finalizes the issues and develops general directions and strategies to address these issues. The strategies are used to develop cover type management recommendations, stand selection criteria, stand treatment levels, 10-year stand exam list, and new access needs list.

Step 4 (Final CP-PMOP SFRMP) is preparation of the final plan following public review of the draft plan, and incorporating changes resulting from comments received into the Final CP-PMOP SFRMP.

There are two opportunities for public input during the SFRMP process. First in review of the *Preliminary Issues and Assessment document;* and second, review and comment on the *Draft CP-PMOP SFRMP* which includes forest management strategies, desired future forest conditions, and the 10-year stand exam and new access needs lists.

ECS Subsections
The DNR has developed an ECS as a tool to help identify, describe, and map ecosystems (see Appendix A *Ecological Classification System*). 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 development of the CP-PMOP SFRMP including several key products, among them:

- **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 examined for treatment 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 plan implementation 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 planning team members include DNR forestry, wildlife, ecological services, and other agency staff. A list of SFRMP team members for the Chippewa Plains - Pine Moraines and Outwash Plains subsections is included in this plan. These planning teams have primary responsibility for the work and decision making involved in developing the subsection plans. Decision-making by the team is through an informed consent process. Managers of adjacent county, federal, tribal, and industrial forestlands may be invited to provide information about the condition of their forest lands and future management directions. As much as possible data relating to all ownerships are used in the planning process.

SFRMP and Minnesota Forest Resources Council Regional Landscape Planning

The recommended desired outcomes, goals, and strategies developed for the North Central Landscape Region by the North Central Regional Landscape Committee under the direction of the Minnesota Forest Resources Council (MFRC) Landscape Program were considered in developing this SFRMP. Members of the CP-PMOP Planning Team participated as members of the North Central Regional Landscape Committee. By considering the recommendations from the *North Central Landscape Region Plan*, the decisions for management of DNR-administered lands incorporate recommendations from a broader landscape perspective across all ownerships and assist in cooperation across ownerships in this larger landscape area.

1.3 SFRMP Process Overview

Table 1.3a outlines the steps in the DNR SFRMP process. Figure 1.3a shows the opportunities for public involvement during the SFRMP planning process.

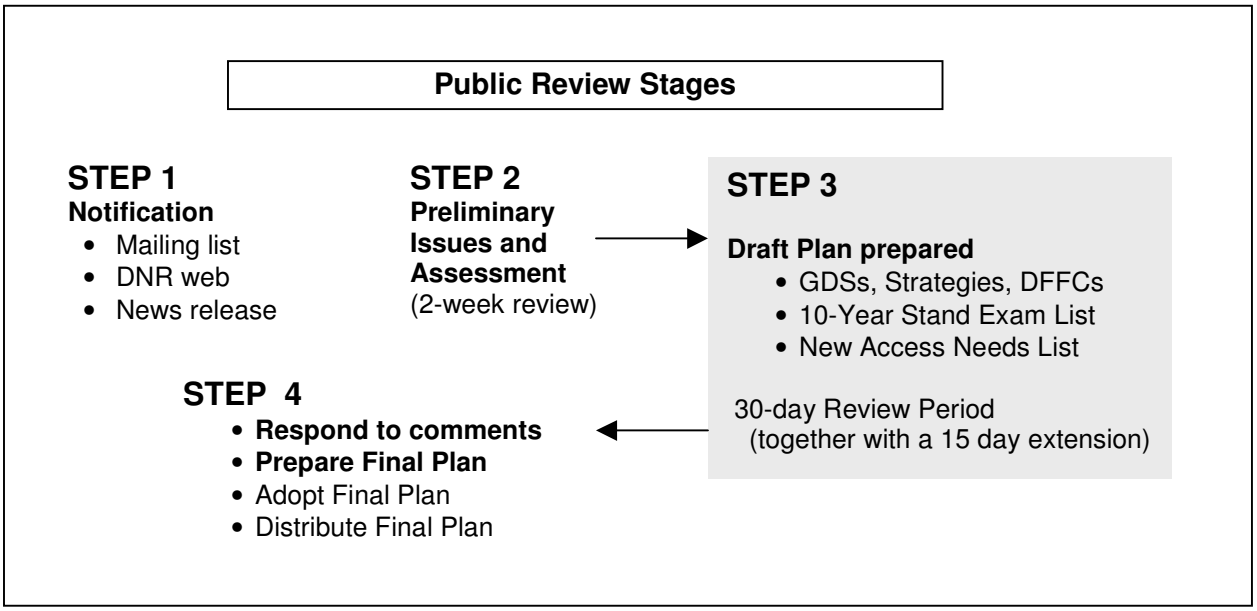
Table 1.3a SFRMP Process Overview

Step 1	**Initiating the Planning Process** • 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.
Step 2	**Preliminary Issue and Assessment Identification** • 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 *Preliminary Issues and Assessment* document for public review and input.
Step 3	**SFRMP Draft Plan including:** • 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 Draft Plan and stand selection criteria to help identify DNR forest stands for treatment over the 10-year plan implementation period to move toward the DFFC goals. • DNR staff identifies state forest land stands to be considered for treatment over the 10-year plan implementation period (10-Year Stand Exam List). • DNR staff identifies road access needs associated with the list of stands proposed to be treated. • *Draft CP-PMOP SFRMP* and draft 10-Year Stand Exam List are distributed for public review and comment.
Step 4	**Final Plan** • 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.

1.4 Contents of the CP-PMOP SFRMP

In Step 2 of the process, the CP-PMOP Team identified a preliminary list of Issues to be addressed in the plan. These Issues were developed based on the general field knowledge of department staff and forest resource information assembled by the team in the *Preliminary Issues and Assessment* document. The preliminary list of issues was distributed for public review and comment in October 2006. The preliminary list of issues was revised based on input from DNR staff and the public. This revised list of issues is presented in Chapter 2 of this plan as the final list of issues that have been addressed in the CP-PMOP plan.

Figure 1.3a SFRMP Public Involvement Opportunities



This plan contains products developed by the SFRMP CP-PMOP Team for public review as part of Step 3 in the planning process. These products include the final list of issues addressed, general direction statements (GDSs) and strategies to address the issues, desired future forest composition (DFFC) goals, stand selection criteria, cover type management recommendations, responses to public comments received from the *Preliminary Issues and Assessment* document, and the 10-year Stand Exam Lists and New Access Needs Lists.

In Step 3, the CP-PMOP Team, working with technical work groups, developed GDSs and strategies and DFFCs to address the final list of Issues. 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. The GDSs, strategies and DFFCs developed by the work groups are based on existing DNR policies/mandates, technical expertise from within and outside the planning team, forest resource information from the *Preliminary Issues and Assessment* document and other sources, and public input from Step 2 of the process. Strategies developed to address the various Issues were then examined to identify and group similar strategies, and to resolve strategies that might be contradictory.

GDSs, strategies, DFFC goals were used to develop cover type management recommendations as presented in Chapter 4 of this plan. These cover type management recommendations define proposed criteria to select a pool of forest stands for treatment over the 10-year plan implementation period as identified in Step 3. 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 the CP-PMOP Plan are those identified by the CP-PMOP Planning Team as best moving DNR forest lands toward the identified DFFC goals for the CP and PMOP subsections.

The CP-PMOP Planning Team summarized and developed responses to public comments received during Step 2 of the overall SFRMP planning process. These responses are included in Chapter 6 of this plan. In Chapter 6 specific references are provided as to where and how comments and concerns were incorporated into the issues, strategies, DFFC goals, or stand selection criteria identified in the plan.

Chapter 2. SFRMP Issues

2.1 How SFRMP Issues Were Identified

SFRMP teams used assessment information[1], DNR policies and guidelines, local knowledge, existing plans, and public input to identify the final issues relevant to the scope of this plan. The subsection team began with a common set of issues developed from previous SFRMPs. These common SFRMP issues were refined and supplemented based on subsection-specific conditions and considerations and public comments.

2.2 Issue Definition

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 Section of Wildlife. Relevant issues were 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 a SFRMP is whether the issue can be addressed in whole or substantially by vegetation management decisions on DNR-administered lands.

Issues that *cannot be addressed* in whole or substantially by vegetation management decisions on DNR-administered lands *are considered to be outside the scope of the SFRMP process*. For example, a SFRMP will not address recreational 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.

2.3 Preliminary Issues

Issue topics A through K, below, were identified as "Preliminary Issues" in the first step of the SFRMP process (*Preliminary Issues and Assessment document*).

Preliminary Issue Areas:

A. Desired age-class distribution
B. Forest composition, structure, spatial arrangement, growth stages, and plant community descriptions
C. Riparian and aquatic areas
D. Access to state lands
E. Biological diversity, native plant communities (NPCs), and structural complexity
F. Wildlife habitat
G. Managing forest impacts
H. Sustainable harvest levels
I. Timber quantity and timber quality
J. Visual quality
K. Vegetative management consistent with other statutes

From these Preliminary Issue Areas, revised and more focused Issues evolved based on public comment and continued team discussions. Identified below are the revised and more focused issues. Discussion and analysis of these more focused issues, general direction statements (GDSs), desired future forest composition (DFFCs) and strategies follows in Chapter 3.

[1] Minn. DNR, August 2006, *Chippewa Plains – Pine Moraines and Outwash Plains Preliminary Issues and Assessment*, Subsection Forest Resource Management Plan.

A. Desired Age-Class Distribution (from *Preliminary Issue and Assessment document*)

A1. What are the desired age-class and growth-stage distribution of forest types across the landscape? (revised and focused Issue)

Adequate representation of all age classes and growth stages provides a stable supply of wildlife habitats, timber products, and ecological values over time. This diversity of age classes and growth stages is important to wildlife, recreation, the forest products industry, and the local economies that depend on them. A diverse forest is healthier and more resilient to widespread insect and disease outbreaks than a less diverse forest. Therefore, a balance is needed that considers necessary habitats, forest diversity, and timber productivity levels.

Planning for desired future amounts of old forest, as well as young forests, will be a part of treatment level considerations identified in this plan, to ensure that forest of all age-classes is represented in adequate quantities and distribution in both subsections. The long-term goal is to narrow the peaks and valleys in annual harvest levels to provide a relatively stable supply of timber from state lands (i.e. balanced age-class distribution). Treatment levels may vary above or below the sustainable level until the age-classes are balanced. Adjustments will be made in some decades to reduce these variations. Moving toward, and eventually maintaining a balanced age-class distribution will ensure that old forest, as well as young forests, will exist on the landscape over time.

A2. What is the appropriate amount, type and distribution of old forest? (revised and focused Issue)

In the context of this Issue, old forest is defined as stands that exceed their normal rotation age. In most even-age managed cover types, with the exception of red pine, there is currently a surplus of acres beyond the normal and maximum rotation ages. . Old forest attributes provide diversity and necessary habitats for a variety of animal and plant species and communities. Conifer and mast tree species will be mature enough to provide winter cover and mast. Sites will contain producers of seeds/fruits/nuts used by wildlife. In some cases, it is believed that old forest can also reduce timber quantity and quality for forest products over time by holding timber longer between harvests and allowing more decay, windthrow, and mortality. Therefore, a balance is needed that considers necessary habitats, forest diversity, and timber productivity levels. Some old forest characteristics can be provided through uneven-aged management strategies.

A3. What is the appropriate amount, type and distribution of young, early successional forest? (revised and focused Issue)

The 0-30 age group of aspen, balm of Gilead, birch, and jack pine cover types represents young, early successional forest in the context of this Issue.

Maintaining acreage of young, early successional forest is an issue because it provides important habitat for several plant and animal species that must be represented on the landscape to maintain overall biodiversity. Plant, game, and nongame species associated with young, early successional forest are important to a significant number of state forest land user groups. Some species depend on dense young forests to provide cover from predation and provide an ample supply of foods. In addition, the patch size and spatial distribution of this young forest on the landscape as recommended in the CP-PMOP Plan is an important element of habitat quality.

If an appropriate amount of young, early successional forest does not occur in the landscape, the likely consequences of *not* addressing this issue are: 1) reduced populations of important game species, particularly ruffed grouse, deer, and American woodcock; 2) reduced recreational hunting opportunities associated with these game species; 3) reductions in some associated songbird populations; 4) loss of social, economic, and ecological value of these species; and 5) loss of traditional use of the natural resources associated with these young forests (e.g., berry picking).

B. Forest Composition, Structure, Spatial Arrangement, Growth Stages, and Plant Community Distributions (from *Preliminary Issues and Assessment document*)

B1. What is the appropriate forest composition at the landscape level and how will the important tree species that have declined, be restored? (revised and focused Issue)

Over time forest composition in these subsections has been changed and simplified, (e.g., mature, diverse pine stands were harvested and replaced by early successional and less diverse forest types such as aspen and birch). Tree species showing a significant increase since the mid-1800s are ash, aspen, basswood, red maple, sugar maple, and balsam fir. Tree species showing a significant decline are white pine, jack pine, white spruce, red pine, and tamarack. Current vegetation management often does not replicate the characteristics of natural disturbance events and tends to favor regeneration of certain forest types. This process may not always be consistent with ecological classifications.

The likely consequences of *not* addressing this issue are: 1) loss of wildlife habitat 2) loss or reduction of wildlife and plant species associated with declining habitats 3) increase in exotic and undesirable species 4) increase in populations of desirable species to the point where they reach undesirable levels 5) dominance of a few species (i.e., loss of biodiversity) 6) loss of ecologically intact landscapes and 7) loss of ability to produce a diversity of forest products (e.g., sawtimber, aesthetics, nontimber forest products, recreation, and tourism.

B2. What is the appropriate mix of patch sizes and forest conditions on the landscape considering the impacts of fragmentation? (revised and focused Issue)

Both subsections have experienced dramatic changes in spatial arrangement of forest habitats over time. Since European settlement, harvesting, lack of large natural disturbances, and other factors have greatly reduced forest patch size and increased habitat fragmentation. Forest fragmentation is also a concern as forests are converted to other uses (e.g., residential development), resulting in a loss of ecologically intact landscapes. Existing landscape patterns do not reflect natural disturbance patterns that developed in the past over long periods of time.

The likely consequences of *not* addressing this issue are: 1) loss of native tree species diversity within forest communities, 2) simplified forest stands and landscapes, 3) loss of native plant community composition, structure, and function, 4) loss of associated wildlife to the ecosystem, and 5) loss of the social, economic, and ecological values of these species and the forest communities that sustain them.

B3. How can landscape level connectivity between forest habitats be maintained? (revised and focused Issue)

Both subsections have experienced dramatic changes in spatial arrangement of forest habitats over time. In these subsections, harvesting and other factors such as road and trail construction and forest fragmentation have reduced forest patch size, composition, structure, and age. These changes represent a movement away from biodiversity and a forest able to produce a range of forest products. Ongoing sales of large tracts of land by private landowners can lead to further fragmentation. As a result, habitat connectivity has suffered. Forest fragmentation results in a loss of habitat and loss or reduction in the population of species associated with those habitats. Loss of connectivity will lead to the loss of ecologically intact landscapes and migration corridors for wildlife species.

The likely consequences of *not* addressing this issue are: 1) loss of examples of high-quality intact native plant communities used as controls to compare and monitor the effects of management on biodiversity, 2) continued forest stand and landscape simplification, and 3) loss of habitat for rare species.

B4. What are the appropriate mixes of forest structure and growth stages for state lands within the subsections? (revised and focused Issue)

Forests will be managed for structural and plant species diversity. A forest with a variety of tree species, native plant communities, and age classes provides habitat suitable for more species and has greater potential to provide a sustainable yield of timber. A diverse forest generally is healthier and more resilient than a less diverse forest. The objective is to establish and manage towards landscape goals that provide a diversity of age classes, habitats, patch sizes, and spatial configuration.

Forest stands, with an array of functional structures distributed across the landscape provide for the social, economic, and environmental benefits called for in the management direction for these lands. This includes sustainable timber and revenue, diverse habitats for indigenous species, a landscape level contribution to properly functioning ecosystems, and a forest that provides for recreational opportunities. Structural characteristics include the remnant old growth trees, residual live trees, snags, down woody debris, multi-layered forest canopies, multiple native tree species, gaps, herbs and shrubs within a stand. Retaining large-diameter structures provides micro-sites for seed germination, cavities for nesting and den sites, and important escape cover within stands.

A diversity of stand structures will provide for a broad range of ecosystems and biodiversity, including a wide range of wildlife habitats. The structural components associated with a broad range of stand structures will benefit long-term forest productivity by maintaining the key structural linkages for nutrient cycling and soil structure. A high level of biodiversity should result in a more resilient forest that will be less prone to large-scale damage from environmental or human stresses.

The likely consequences of not addressing this issue are increasing, including: 1) simplification of forest stand and landscape communities, 2) fragmentation of high-quality native plant communities, and 3) loss and fragmentation of habitat for associated wildlife species.

B5. How will native plant communities that historically occurred on the landscape be represented in the future? (revised and focused Issue)

In these two subsections, pre-settlement vegetation included a wide diversity of landscapes including: fire-dependent conifer; mesic hardwood forest; floodplain forest; wet forest; forested rich peatland; acid peatland; open rich peatland; wet meadow/carr; and marsh, river and lakeshore systems. The natural range of expected plant communities within these systems were all present and distributed depending on specific conditions such as topography, geology, soils and water table.

All of these plant communities continue to be represented in the subsections today, but to varying degrees. The two subsections are characterized by deep (200-600') glacial deposits in various glacial remnants. Certain systems, such as the peatland categories are more restricted geographically than others. Found within the subsections are mesic forests of maple-basswood birch, aspen and oak which occur on moraines or till plains, and fire-dependent communities on the sandy outwash plains. In the western portion of the subsections, mixed forests of pine, aspen and birch occur. In the lake plains of the eastern portion of the subsections (Glacial Lakes, Upham and Aitkin) are found expansive areas of acid peatland communities such as black spruce bogs, cedar and black ash. Several river border communities of alder and willow are present along the Mississippi and Leech Lake rivers. Although there have been some declines in the fire-dependent communities (such as those dominated by jack pine), due to disease and lack of fire on the landscape, these plant communities are still intact and well represented on the state lands within these two subsections.

Although all native plant communities continue to be represented, the existing landscape patterns do *not* reflect natural disturbance patterns and the composition, structure, and function of native plant community complexes that have developed historically over long periods of time. This has resulted in challenges with: 1) fragmentation and simplification of forest ecosystems at the landscape scale, 2) lowered availability of habitat complexes and associations, and 3) reduced habitat for native animals and plants.

The likely consequences of *not* addressing this issue are: 1) increasing isolation of wildlife and plant populations, 2) species loss or decline, 3) reduced resilience of forest ecosystems to disturbance events, and 4) increases of certain populations to undesirable levels resulting in negative impacts to forest communities.

C. Riparian and Aquatic Areas (from *Preliminary Issues and Assessment document*)

C1. How can the impacts of forest management on permanent wetlands, wetland inclusions, and seasonal ponds be addressed? (revised and focused issue)

Wetlands include wet forest (dominated by cedar or black ash), forested rich peatlands (including conifer swamps and alder swamps), wet meadow/carr (dominated by sedges or blue-joint grass), and marsh (dominated by cattail or bulrush), and seasonal ponds. These areas are protected using different site-level forest management guidelines than those required for riparian areas adjacent to lakes, streams, and rivers or permanent open water ponds.

Wetland functions include, but are not limited to: groundwater recharge; low flow augmentation; sediment trapping; nutrient assimilation; habitat for wildlife species including invertebrates, amphibians, reptiles, mammals, and birds; fish habitat, including northern pike nurseries; aesthetic values; outdoor recreation; outdoor education; and providing for non-timber forest products.

Site-level considerations and guidelines that are routinely applied without considering site-specific conditions may not be adequate to protect aquatic resources such as permanent wetlands, wetland inclusions, and seasonal ponds.

Relying strictly on existing guidelines without considering specific conditions associated with the site (e.g. soils, topography, hydrology, past management, existing vegetation, and desired vegetation) may negatively impact these ecosystems. These impacts include loss or degradation of these communities and loss of associated wildlife. There is also a concern for impacts to permanent wetlands from management activities in adjacent upland stands, such as skid trails along the wetland-upland boundary.

C2. How will the appropriate width of the riparian management zone (RMZ) be determined and what vegetation management activities will be allowed to take place? (revised and focused issue)

Riparian areas encompass the transition zone between the terrestrial and aquatic habitats that occur along lakes, streams, and open-water wetlands. A *riparian management zone* (RMZ) is that portion of the riparian area where site conditions and landowner objectives are used to determine management activities that address riparian resource needs. Riparian areas are among the richest habitats in these two subsections. The management of riparian areas can influence water quality, water temperature, erosion rates, and deposition of woody debris in lakes and streams and the overall diversity of wildlife and plant species found in the watershed. Riparian areas provide corridors and connecting links of habitat for plant and wildlife species. Well-managed riparian areas are critical to protect, maintain, or enhance aquatic and wildlife habitats, aesthetics, recreation, and forest products.

Management of riparian areas along streams, lakes, and other lentic habitats is extremely important from a fisheries and wildlife perspective in these two subsections. Riparian areas maintain streambank, channel, and shoreline stability; stream temperature; and water quality. They provide water storage and conservation, nutrient and food input to the aquatic system, in-stream structure of coarse woody debris, a moderated microclimate, and important habitat for many species of fish, mammals, birds, reptiles, amphibians, and insects. Riparian areas are also important for recreation, tourism, forest products, hunting, fishing, biological diversity, and other human values.

These two subsections include many lakes, rivers, and streams. Failure to protect riparian zone functions may cause negative impacts to the water quality, fisheries, and wildlife habitat within the CP and PMOP subsections.

C3. How can the cumulative impacts of forest management on aquatic resources and surface water quality at the watershed and sub-watershed level be addressed? (revised and focused issue)

The current rate and cumulative impacts of land clearing or structural development on non-state administered lands further emphasizes the importance of protecting sensitive riparian areas on state lands.

The cumulative impacts of forestry management activities on aquatic resources must be considered. Forest management activities on all forest lands can affect the hydrology within any specific watershed or sub-watershed because the amount and type of vegetative cover greatly influences the rate of hydrologic change. Failure to adequately assess the cumulative impacts can result in reduction or destruction of habitat for aquatic organisms. Factors which must be considered cumulatively include any vegetative management practice that increases run-off, leads to more conspicuous run-off events and causes stream bank erosion, or causes less stable flows over time. Further, as stand prescriptions are implemented too much or too little woody debris can have destabilizing effects on aquatic communities. Increases in acreage of open areas and young age class timber can increase the rate of overland flow of precipitation, including: snow melt. This increased flow can and destabilize streamflow, leading to erosion of streambanks; increased turbidity; and scouring. These potential impacts must be considered cumulatively as stand prescriptions are planned.

C4. How can adequate safeguards be implemented to provide old forest characteristics, including nesting cavities, in riparian areas? (revised and focused Issue)

Forest vegetation in riparian areas varies greatly in species composition and age. As a result, only some riparian areas can provide old forest habitat.

These old forests provide critical habitat for many organisms. Many bird species, including wood ducks, hooded mergansers, and common goldeneyes use cavities in old trees for nesting. Other wildlife species, including raccoons, porcupines, fishers, northern flying squirrels, pine martens, and red squirrels use cavities found in old trees for shelter. Old forests provide more niches than do young forests, including habitat for fungi, bacteria and lichens, as well as wildlife species.

C5. How can the adverse impacts of forest management activities on aquatic plant species, fisheries, and wildlife habitat be minimized? (revised and focused issue)

Forest management activities have the potential for impacting water quality. Loss of shading can increase water temperatures, impacting aquatic species. Forest activities can also change the oxidative state of aquatic minerals and nutrients. Sedimentation resulting from erosion also carries with it nutrients in excess of normal nutrient budgets and increases water turbidity. Changes in water quality affect species at all trophic levels.

D. Access to State Timberlands (from *Preliminary Issues and Assessment document*)

D1. How can new access to stands identified for management during the 10-year planning period be established without negative impacts on forest resources? (revised and focused Issue)

Access routes are necessary to effectively manage forest stands identified for management during the 10-year plan implementation period. These routes provide access for forest management activities, insect and disease control, fire response, and recreation. However, the development, construction, and maintenance of forest access routes may result in high costs, land disturbance, loss of acres from the timber land base, increase in the spread of exotic species and undesirable native plants and animals, conflicts with adjacent private landowners, potential for user-developed trails, degradation of water quality, destruction of fish and wildlife habitat, forest fragmentation, and road densities greater than needed. The likely consequences of *not* addressing this issue is the lack of a well thought-out forest access plan, potentially leading to negative impacts on forest, wildlife, and ecological resources.

E. Diversity and Complexity (from *Preliminary Issues and Assessment document*)

E1. Within stands, how are biodiversity, native plant community composition and structural complexity maintained or enhanced? (revised and focused Issue)

Diverse forest stands are more resilient than less diverse forest stands. A forest stand with a mix of tree species and ages provides habitat for a wider variety of associated species while providing a diversity of forest products. The net economic, social, and ecological values and functions of most forest stands is related to the composition of trees, shrubs, ground flora, and structural characteristics. Structural characteristics include the sizes of over story trees (diameter and height), the variety of understory vegetation, and their arrangement (scattered or clumped) within the stand. Structural characteristics also include the presence or absence of snags and coarse woody debris. Retaining large-diameter structures provide micro-sites for seed germination, cavities for nesting and den sites, and important escape cover within stands.

F. Wildlife and Plant Species Habitat (from *Preliminary Issues and Assessment document*)

F1. How can habitat for all wildlife and plant species be provided? (revised and focused Issue)

Wildlife species, both game and nongame, and a diversity of plant species are important indicators of the biological health of the forest. These forest characteristics are also important to society for their recreational, economic, and inherent values. Statutes, public expectations, the desires of interest groups, and the DNR internal policies require the consideration of wildlife species in the management of state-administered forestlands. The *DNR Strategic Plan, Directions 2000*, states the "objective is healthy, self-sustaining populations of all native and desirable introduced plant, fish, and wildlife species." This document also states an objective to maintain "populations of fish, wildlife and plant species to sustain recreational opportunities."

These two subsections are particularly important for wildlife-related recreational and economic values due to the abundance of lakes and rivers, and the related seasonal and permanent lake homes that exist as well as the abundance of public forestlands that draw many people to observe wildlife and/or hunt and trap. Recreational enthusiasts and tourists appreciate and seek out opportunities to observe nongame species found in these subsections, including species that are rare elsewhere, such as the timber wolf, bald eagle, trumpeter swan, and red-shouldered hawk. In addition, these subsections draw many hunters and trappers each fall to pursue white-tailed deer, black bear, ruffed grouse, and beaver. Both wildlife observation and hunting/trapping have long-standing traditions and are important to local economies.

Ecologically, there have been historic and more recent changes to these subsections that have affected wildlife species and their habitats, including:

- changes in the abundance of tree species, age structure of the forest, and structural and species diversity;
- loss of larger patches and connections between patches;
- increased habitat fragmentation from roads, trails, and development; and
- alteration of natural fire disturbance.

Both natural events and forest vegetation management through stand treatments, and their location, can potentially impact (negative or positive) wildlife species.

There are 250 wildlife species (14 amphibians, 9 reptiles, 174 birds, and, 53 mammals) that are either permanent residents or regular migrants that utilize habitats in these two subsections. Each species has different habitat requirements, some of which conflict. Accommodating the unique habitat management needs for each species is impossible to accomplish with a single approach across the planning area.

G. Wildlife Populations Management (new issue added as result of public comment on the *Preliminary Issues and Assessment document*)

G1. How can sustainable wildlife populations be provided at levels that are acceptable to user groups?

Wildlife (plants, game, and non-game animals) is important to society, contributes significantly to local and state economies, is critical to functioning ecosystems, and is fundamental to the Department's *Strategic Conservation Agenda and Sustainable Forest Management Act*. Statutes, public expectations and DNR internal policies require the consideration of wildlife in the management of state-administered lands. The *DNR Strategic Plan, Directions 2000* includes an objective of "healthy self-sustaining populations of all native and desirable introduced plant, fish, and wildlife species, especially those species listed as threatened or endangered."
As stated above, there are 250 wildlife species known or predicted to occur within these two subsections. Each species has different temporal and spatial habitat requirements. Individual consideration of management needs for each species to maintain sustainable populations is impossible to accomplish with a single DFFC or criteria within either subsection.

The amount of public forestland in these subsections provides recreational opportunities and supplemental income for many recreational enthusiasts. Ruffed grouse, woodcock, black bear, and white-tailed deer hunting traditions are long-standing and important to local economies.

Ecological changes resulting from residential and commercial development are affecting wildlife and plant communities, species and their habitats. Examples are: changes in the abundance of tree species, age structure of the forest, structural and species diversity, the loss of larger patches and connections between such patches, increased habitat fragmentation from roads and trails and development, and, the alteration of natural fire disturbance events.

Natural disturbance events and planned forest vegetation management can impact (both negative or positive) wildlife abundance and distribution. The likely consequences of *not* addressing wildlife habitat and wildlife populations are: 1) loss of wildlife habitat, 2) loss or reduction of species associated with declining habitats, 3) economic losses resulting from a decline in recreational activity associated with wildlife viewing and hunting, and 4) social losses because of a decline in enjoyment associated with wildlife viewing, hunting, and aesthetics.

H. Harvest Level (from *Preliminary Issues and Assessment document*)

H1. What is the appropriate timber harvest level on state lands with consideration for the sustainability of all forest resources? (revised and focused Issue)

Sustainability is the goal of forest management. It means, meeting the basic needs of the present generation without compromising the ability of forests to meet the needs of future generations.

The timber products industry, including small independent loggers, industrial loggers, locally owned sawmills, small and large wood products industries all help sustain the economy of the state and these

subsections. A dependable and predictable supply of timber products is necessary to maintain these industries.

Demand for most timber types has been increasing. However, due to market fluctuations, over time, some cover types show pronounced age-class imbalances where shortages of certain timber types could occur.

H2. How can an adequate and sustainable supply of non-timber forest products be ensured for the future? (revised and focused Issue)

Demand for non-timber forest products has been increasing. Non-timber forest products are a traditional harvest for some groups and provide diversification of local economies.

Non-timber forest products, also known as Special Forest Products (SFPs), can be categorized into five general areas: decoratives, foods, herbs, medicinals, and specialty items. Non-timber forest products include, but are not limited to: boughs, decorative trees, birch tops, lycopodium, diamond willow, bark, burls, conks, mushrooms, berries, Labrador tea, rose hips and blossoms, seedlings, cones, nuts,, native plant seed, aromatic oil,; and extractives.

Until recently, SFP inventory and monitoring efforts have been minimal, but a significant body of knowledge is emerging to guide research, policy and management of SFPs.

Demand for some of these types of forest products has been light, for others it is increasing. Nontimber forest products (e.g., balsam boughs and decorative trees) provide diversification for local economies and are a traditional harvest for some groups. Nontimber forest products are particularly important in areas where employment opportunities in the mainstream economy are limited. They help support local individuals, families, and cottage industries in an expanding worldwide market. For example, the Christmas wreath industry is a multi-million dollar enterprise in Minnesota that relies on thousands of individuals who collect boughs from forest lands.

The consequences of *not* addressing this issue include the possible unsustainable harvest of these resources, adverse impacts to wildlife habitat and native plant communities, and inadvertent harvest of rare species.

I. Timber Quality / Quantity (from *Preliminary Issues and Assessment document*)

I1. How can timber productivity be increased on state lands? (revised and focused Issue)

Within any forest land base, there is a broad continuum of forest management options available to achieve a range of forest management objectives, ranging from reserve prescriptions to intensive management. Along that continuum, the application of various techniques at various levels of intensity to increase timber productivity on DNR-administered timberlands is desirable and appropriate. For example, on the majority of DNR timberlands, generally accepted and proven silvicultural techniques (e.g., harvest at rotation age, intermediate thinning or selective harvesting, reforestation with proper species and stocking levels) can be applied to significantly increase timber productivity (both quality and quantity). This approach is consistent with multiple resource values and the sustainable management of a healthy, diverse forest.

Listed below are statements contained in the DNR *Conservation Agenda* that provide a context for efforts to increase timber productivity on state-administered lands.

- DNR currently increases wood fiber production by regenerating vigorous young forest stands through harvest; planting and seeding harvested and damaged sites; thinning overcrowded stands to improve vigor and reduce competition; monitoring and reducing the impacts of harmful insects, diseases, and exotic species; and matching tree species

and management techniques to individual sites through its Ecological Classification System (ECS).

- The "1994 Generic Environmental Impact Statement on Timber Harvesting and Forest Management in Minnesota" recommended increasing the wood fiber productivity of timberlands to help mitigate the potential effects of current and increased harvest levels. The "2003 Governor's Task Force on the Competitiveness of Minnesota's Primary Forest Products Industry" also listed increasing wood fiber productivity while conserving Minnesota's forestlands as a priority.

J. Visual Quality (from *Preliminary Issues and Assessment document*)

J.1. How will the impacts of forest management activities on visual quality be minimized? (revised and focused Issue)

Scenic beauty is a primary reason people choose to spend their recreation and vacation time in or near forested areas. Where recreational trails, lakes, waterways, public roads, and highways, are located in proximity to working forests, forest management must consider impacts on the visual quality of the site during and after management activities.

The DNR Strategic Plan document *Directions* 2000 states in *Objective 3*.3 that the "DNR will apply the appropriate guidelines so that visual quality is not adversely impacted during forest management activities."

The landscapes of these two subsections are a source of everyday enjoyment for residents, and a foundation for the tourism industry. The public and the Department recognize scenic landscapes as an integral component of the forest resource base. Visual resources are characterized as scenic areas and visual quality objectives.

Four essential planning components, which must be implemented to ensure visual qualities are taken into consideration. They include: stand selection resulting from the SFRMP planning, road layout and design, timber sale layout and design, and the selection of the appropriate silvicultural prescription.

Six of the nine counties in the CP-PMOP subsections have assigned visual sensitivity classifications to roads. These classifications are available to field foresters as stands are site visited and prescriptions planned.

In addition to individual county visual classifications, there are four state and two national scenic byways in the CP-PMOP:

- Lake Country Scenic Byway
- Otter Trail Scenic Byway
- Paul Bunyan Scenic Byway
- Avenue of Pines Scenic Byway
- Great River Road National Scenic Byway
- National Scenic Hwy County 10 (Cass County) and 39 (Beltrami County)

The likely consequences of *not* addressing this issue are visual impacts resulting from vegetative management on state lands that have negative impacts and lead to negative experiences for the public living who are driving, vacationing, and recreating in these subsections.

K. Other Statutes (from *Preliminary Issues and Assessment document*)

K.1 How will foresters and wildlife managers achieve the goals of this plan and remain consistent with state and federal statutes? (revised and focused issue)

The department is obligated and the public expects forest management activities to comply with all applicable statutes, policies and department guidelines as to how forest management is practiced.

Differences in land administration among divisions and the intent of the various land acquisition and land management statues results in higher levels of complexity for land managers who are charged with planning and implementing management for multiple resource purposes. Coordination policy such as the *Interdisciplinary Forest Management Coordination Framework, 2007* provides the Department's framework and process for resolving differences among Divisions concerning the application of management practices and treatments on different classes of DNR lands.

Land managers have a responsibility to be versed in all applicable directives that can affect forest management. Assuring that all applicable directives, and public review and input are considered is accomplished by implementation of multi-disciplinary long range planning through this CP-PMOP Plan. The SFRMP planning teams are charged with coordinating among the divisions and maintaining a working knowledge of other state and federal statues that may affect subsection planning.

L. Cultural Resources (from *Preliminary Issues and Assessment document*)

L1. How will cultural resources be protected during forest management activities on state-administered lands? (revised and focused issue)

Cultural resources are scarce, non-renewable features that provide physical links to our past. A cultural resource is an archaeological site, cemetery, historic structure, historic area, or traditional use area that is of cultural or scientific value. Cultural resources are remaining evidence of past human activities. To be considered important, a cultural resource generally has to be at least 50 years old. A cultural resource may be the archaeological remains of a 2,000-year-old Indian village, an abandoned logging camp, a portage trail, a cemetery, food gathering sites such as ricing camps and sugar bushes, or a pioneer homestead. Sites may possess spiritual, traditional, scientific, and educational values and should be treated as assets rather than liabilities. In addition to federal and state laws that protect certain types of cultural resources, the MFRC *Voluntary Site-Level Forest Management Guidelines* provide information and recommendations to assist private and public land managers in taking responsible actions when cultural resources are encountered.

Failure to follow the recommended management practices to protect cultural resources could result in loss of, or damage to the cultural resource.

M. Rare Features (from *Preliminary Issues and Assessment document)*

M1. How can rare plants and animals, their habitats, and other rare features be protected? (revised and focused Issue)

Minnesota's list of endangered, threatened, and special concern species created under Minnesota's Endangered and Threatened Species Statute, draws attention to species that are at greatest risk of extinction within the state. By definition, all species occurring on the federal endangered species lists are included on the Minnesota list. Special regulations are then applied to those listed as endangered or

threatened. By alerting resource managers and the public to species in jeopardy, vegetation management can be reviewed and prioritized to help preserve the diversity and abundance of Minnesota's flora and fauna. In addition, the Statewide Heritage Conservation Status Ranks for native plant community types lists, in terms of rarity, the native plant communities found in Minnesota.

The Minnesota County Biological Survey (MCBS) conducts systematic surveys for rare features and sites of biological diversity importance statewide. Six of the counties within these two subsections have MCBS fieldwork completed, although only two counties (Morrison and Mahnomen), are published. Five counties are currently being surveyed, and two counties (Beltrami and Koochiching) have not had any MCBS surveys started. In addition to information on rare plant and animal species as contained in MCBS survey information, some of the known locations of rare features from all counties in the two subsections are included in the Natural Heritage Database.

Appendix O (*Areas of High or Outstanding Biodiversity*) identifies unique resources requiring special consideration during SFRMP planning and during field site visits to plan vegetation management prescriptions.

The possible consequences of *not* addressing this issue are: 1) rare species extirpation at the local and state level; 2) rare species declines leading to status changes; (e.g., special concern species changed to a threatened or endangered species); 3) rare species habitat loss or degradation; and, 4) loss of biodiversity at the species (genetic), community, and landscape levels.

N. Managing Impacts (from *Preliminary Issues and Assessment document*)

N.1. How should the impacts of forest insects and disease on forest ecosystems be addressed?

Forest insects and disease organisms influence forest ecosystem dynamics. At acceptable levels, they promote diversity of tree species and generate important elements of forest structure that are important as habitat and in nutrient cycling, such as snags and coarse (large) woody debris. However, epidemic populations of insect pests can cause high levels of tree mortality, and can have significant ecological and economic consequences. Native and introduced diseases can cause significant species-specific losses in volume and mortality. Forest management will not attempt to eliminate native insects and diseases or their processes from the landscape, but rather to limit their impact on individual sites to a level that allows goals for timber production, water quality, aesthetics, recreation, wildlife, and biodiversity to be realized.

N.2. How will threats and invasions of exotic species be managed? (revised and focused Issue)

Natural resource managers are concerned about the introduction and establishment of exotic insect, disease, and plant species on public land. Invasion of forest ecosystems by exotic species can cause significant economic losses and expenditures for control. Once they become established, they can destroy or displace native plants and animals, degrade native species habitat, reduce productivity, pollute native gene pools, and disrupt forest ecosystem processes (e.g., hydrological patterns, soil chemistry, moisture-holding capability, susceptibility to erosion, and fire regimes). Examples of exotics with known adverse effects on Minnesota forest resources include: white pine blister rust, gypsy moth, Western larch beetle, exotic earthworms, and, European buckthorn (all of which have been documented in these subsections). There is potential for significant adverse impacts from other species present in these subsections, such as: tansy, spotted knapweed, garlic mustard, purple loosestrife, and leafy spurge. Management will seek to minimize impacts from these species, limit the introduction of new exotic species, and minimize the impact of control measures on vulnerable native species.

Local introductions and spread of harmful exotic plants can happen through many activities. Forest recreation, especially campers, motorized trail riders, and road building activities as management activities and land uses have significant potential as avenues for unintentional introductions of exotic

plants, especially in less developed portions of the subsections. Establishing and promoting practices that minimize these introductions will slow the spread of harmful exotics and reduce the associated losses.

N3 How will natural disturbances such as fire and blow down be considered in forest management decisions? (revised and focused Issue)

Wildfires and windstorms effect change on the landscape. Fire and wind are important naturally occurring events that recycle nutrients, contribute coarse woody debris to the forest floor, and open a forest to sunlight necessary for regeneration.

These events can also leave forests susceptible to damaging insect population buildups. In addition, these events reduce tree merchantability and create barriers to movement of large mammals.

N4. How can vegetation be managed to reduce animal damage, crop depredation, nuisance animals, potential spread of animal disease, and human health impacts (e.g., Lyme disease)? (revised and focused Issue)

High populations of wildlife species such as deer, snowshoe hare, porcupine, beaver, and mice impact forests and plant regeneration through browsing, stem damage, and girdling. Solutions require an understanding of the dynamics of herbivory, seasonal wildlife movements, population structure, population control tools and their effectiveness, and proven repellents or exclusion methods.

The likely consequences of *not* addressing this issue are 1) loss of public support for management programs, 2) undesirable competition between species, 3) increased exotic and undesirable species, 4) an increase in populations to the point they become a nuisance, 5) negative economic impacts, and 6) negative impacts to native plant communities.

N5. How should forest management respond to global climate change within the planning period? (revised and focused issue)

Several climate models (e.g., atmospheric-ocean general circulation models, or AOGCM[1]) in use around the world predict global climate change. The Intergovernmental Panel on Climate Change (IPCC) refers to climate change as any change in climate over time, whether due to natural variability or as a result of human activity. The models agree that average temperatures are increasing and predict more variable changes in precipitation. This global warming will affect forests and wildlife in Minnesota.[2,3]

Scientists believe the predicted climate change will affect the size, frequency, and intensity of disturbances such as fires and windstorms (blowdown). It will affect the survivorship of existing plant and animal species and the distributions of plants and animals. Even at modest levels, independent studies are finding mounting evidence that the current climate change influences plant and animal ranges and behavior[4]. Some plant and animal species may not be able to adapt to the rate of change. Increases in the reproductive capability and survivorship of exotic species, insect pests, and pathogens will impact forests and wildlife. Certain tree species, such as black spruce, balsam fir, birch, and jack pine will respond negatively to increased soil warming and decreased soil moisture. Carbon sequestration by forests and wetlands may be affected because of accelerated decomposition rates.

Most tree species in Minnesota reach the limit of their geographic range somewhere within the boundaries of the forested portion of the state. Predictions have been made on the potential future distributions of trees.[5] There is a need to facilitate species adaptation to change in response to possible rapid climatic changes.

The likely consequences of *not* addressing this issue are 1) acceleration and exacerbation of climate change impacts to forest communities; 2) lost opportunity to begin directing management toward mitigating and slowing the effect of climate change on most vulnerable species and native plant

communities; 3) species and community losses; and, 4) reduced habitat for use and occupation by native wildlife and plants.

2.4 From Preliminary Issues to General Direction Statements, DFFCs, and Strategies

Table 2.1a provides linkage between the Issues described in this chapter and the associated general direction statements, DFFCs, and strategies as discussed in Chapter 3.

[1] IPCC. 2001. Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). [Houghton, J.T., et al. (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. 881pp.

[2] Weflen, K., *The Crossroads of Climate Change*. Minnesota Conservation Volunteer, January-February 2001, Minnesota Department of Natural Resources, St. Paul, MN.

[3] Pastor, John, personal communication at March 13, 2003 SFRMP meeting. Natural Resources Research Institute, University of Minnesota-Duluth.

[4] Root, T. et al., *Fingerprints of Global Warming on Wild Animals and Plants*, Stanford University, Nature- January 2, 2003; and Parmesan, Camille, A Globally Coherent Fingerprint of Climate Change Impacts Across Natural Systems, University of Texas.

[5] Iverson, L, et al. 1999. *An Atlas of Current and Potential Future Distributions of Common Trees of the Eastern United States.* Gen. Tech. Rep. NE-265. Radnor, PA. USDA Forest Service. Northeastern Research Station. 245 p.

Table 2.1a: Focused Issues, General Direction Statements and Strategies Generated from CP-PMOP SFRMP Issues

Primary Issue Area(s)	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
A. Age Classes	**A1.** What is the desired age-class and growth-stage distribution for forest types across the landscape?	**A1a.** Forest resources will continue to represent multiple age classes, distributed across the landscape. **DFFC Statement** A range of age classes will be implemented, eventually moving the cover types toward a more balanced age structure. Harvest plans will be guided by the established rotation ages and acreage goals for each cover type as identified in the figures from Chapter 4 (Cover type Management Recommendations) that portray the 2017 through 2057 Desired Age-Class Distributions.	**1**. Consider ECS characteristics and other indicators when deciding where old forest and younger age classes are best suited. **2**. Provide representations of desired age-classes through forest composition goals**.** **3**. Develop and apply criteria to identify stands that are over rotation age but can be carried into subsequent 10-year planning periods to reduce age-class imbalances.

Primary Issue Area(s)	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
	A2. What is the appropriate amount, type, and distribution of old forests?	**A2a.** Forest managed for old forest characteristics will be distributed across the landscape. **DFFC Statement** ERF will be designated in the following percentages: Aspen / balm of Gilead: 13.3 % Balsam Fir 14 Birch 12.5 BSL 23-39 14 +40 11 Jack Pine 13.8 Oak <60 20 >60 13 Red Pine 22.4 Tamarack 13 White Spruce Natural 17 Planted 10	**4**. Designate ERF stands in the amounts and percentages prescribed by the Statewide ERF Work Group. **5**. Distribute ERF stands across the landscape consistent with ERF policy. **6**. Prescribe ERF stands across all age classes to maintain a constant supply of effective ERF. **7**. Manage ERF stands in even-aged cover types to achieve a declining age-class structure from normal rotation age to maximum rotation age. **8**. Maintain the current acreage of designated Old Growth stands. **9**. Manage designated old-growth stands and OFMCs according to individual OFMC plans and DNR *Old Growth Management Guidelines*. **10**. Continue to prescribe ERF stands adjacent to old growth to create OFMCs consistent with DNR OFMC policy. **11**. Prescribe ERF stands in steep areas, inaccessible terrain, riparian areas, habitat areas, travel corridors, visual corridors to achieve desired old forest attributes consistent with DNR OFMC policy. **12**. Consider ECS and range of natural variation (RNV) when identifying sites capable of growing older stands and/or providing winter cover and food sources for wildlife. **13**. Give priority to designating ERF in areas of the landscape that have historically supported the oldest forests and highest proportion of older forests.

Primary Issue Area(s)	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
	A3. What is the appropriate amount, type, and distribution of young, early successional forest?	**A3a.** Forests managed for young, early-successional stages will be distributed across the landscape. **DFFC Statement** Young forests will be distributed across the subsections in the cover types and percentages as identified in Table 3.1i of Chapter 3.	**14**. Consider ECS characteristics when locating sites capable of supporting young early-successional forests. **15**. Move aspen, balm of Gilead, paper birch, and jack pine cover types toward a balanced age-class structure. **16**. Maintain the amount of the paper birch cover type and the percent of stand component during the 10 planning period. **17**. Decrease the amount of birch as a cover type and stand component during subsequent 10 year planning periods (through five decades). **18**. Include areas of young, early-successional forest, adjacent to areas of extensive or expansive old forest (i.e. ERF, old growth, or OFMC). **19**. Maintain young, early-successional forest, in a variety of patch sizes to provide habitat for associated species.

Primary Issue Area(s)	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
B. Forest Composition	**B1.** What is the appropriate forest composition at the landscape level and how will the important tree species that have declined, be restored?	**B1.** Forest composition will be managed according to ecological classifications to more closely reflect vegetation that developed under natural disturbance regimes. **DFFC Statement** The DFFC of cover types on the landscape will be as shown on Table 3.2a. The CP-PMOP Plan will move these subsections toward more conifer cover type acreage in upland areas. Cover type increases over the next 10 years will occur in jack pine, white pine, tamarack, and white cedar. Cover type decreases will occur in the aspen, balsam fir, oak, white spruce, northern hardwoods and ash/lowland hardwoods cover types. The cover type acreages of red pine, birch and black spruce lowland will be maintained over the 10-year planning period.	**20**. Consider the *MFRC North Central Landscape Region Plan* forest composition goals and objectives. **21**. Increase mixed forest conditions in most stands in selected cover types **22**. Decrease the acres of aspen, northern hardwoods, oak, ash, and lowland hardwoods to favor conifer cover types. **23**. Increase the acres of the white pine, jack pine, tamarack and northern white cedar cover types. **24**. Increase the acres of the cedar and tamarack cover types on both upland and lowland sites. **25**. Maintain the acres of the black spruce cover type on both upland and lowland sites.

Primary Issue Area(s)	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
	B2. What is the appropriate mix of patch sizes and forest condition on the landscape considering the impacts of fragmentation?	**B2a**. Minimize forest fragmentation and manage habitat fragmentation to provide an ecologically appropriate variety of patch sizes distributed across the landscape. **DFFC Statement** The average forest patch size on state lands and the patch size within designated forest patches will increase through implementation of this plan.	**26**. Inventory current and potential patches by subsection. **27**. Manage patch sizes to more closely resemble those created under natural disturbance regimes. **28**. Retain and create larger patches, where conditions allow, through state management activities and cooperation with other landowners and forest managers. **29**. When applying silvicultural treatments in an area, give priority to management of whole stands, groups of stands, or entire native plant communities to further patch management. **30**. Coordinate plan implementation with large land managers including the U.S. Forest Service, county land departments, local governments, industrial forest land managers and nonprofit organizations to identify causes and mitigate impacts of fragmentation.
	B3. How can landscape level connectivity between forest habitats be maintained?	**B3a**. Connectivity will be maintained between forest habitats using natural corridors and corridors maintained using forest management practices.	**31**. Identify existing and potential corridors between significant forest areas and assess cooperation opportunities with other landowners. **32**. Maintain or improve important corridors between forest areas. **33**. Give priority to riparian corridors to connect significant forest areas.

Primary Issue Area	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
	B4. What are the appropriate mixes of forest structure and growth stages for state lands within the subsections?	**B4a**. Representations of all growth stages with vertical and horizontal structural diversity will be distributed across the landscape. **DFFC Statements** All silvicultural prescriptions for uneven aged management cover types will ensure that all tree sizes, ages and species present in the stand at the time of the site level visit will be well represented following the stand treatment. All stands designated for final harvest prescriptions will have 15 or more scattered older live trees per acre or will have clumps that meet or exceed 5% of the sale acreage retained to provide future snags and cavity nesting trees. Prescribed ERF and effective ERF stands will be assessed and if necessary will have silvicultural treatments prescribed to enhance the older forest features. The forest inventory data set will include a field to record the observed growth stage represented at the time of the site level visit. All field personnel will receive the training necessary to consistently assess forest growth stages. Cover type conversions to meet management objectives will use natural regeneration methods when possible and minimal site preparation when artificial regeneration is necessary.	**34**. Retain structural components of old forest, when managing uneven-aged cover types and at the final harvest of even-aged cover types. **35**. Use variable density techniques during intermediate stand treatment and variable retention techniques during final harvest to move selected stands toward desired growth stages and desired within-stand structure. **36**. Develop a methodology to measure growth stages, within-stand age diversity, plant species diversity and vertical/horizontal structure and use this methodology to quantify and monitor changes.

Primary Issue Area	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
	B5. How will native plant communities that developed under natural disturbance regimes be represented in the future?	**B5a**. The full range of common and uncommon native plant communities and the community viability that developed under natural disturbance regimes will be well represented in the future.	**37**. Use ECS information to assist in determining management direction for stands on state lands. **38**. Protect significant plant communities as they are identified. **39**. Encourage initiation of the Minnesota County Biological Survey in Beltrami, Itasca and Koochiching counties and completion of the survey in all other counties in the CP-PMOP. **40**. Delineate and manage ecologically important lowland conifer sites to enhance their unique characteristics. **41**. Document and manage known locations of NPCs with a statewide rank of Critically Imperiled (S1), or Imperiled (S2) and other plant communities that are rare in the landscape to maintain their ecological integrity. **42**. Identify stands with known locations of Critically Imperiled (S1) or Imperiled (S2) NPCs and monitor those stands during Annual Stand Exam List review.
C. Riparian/ Aquatic Areas	**C1**. How can the impacts of forest management on permanent wetlands, wetland inclusions, and seasonal ponds be addressed?	**C1a**. Forest management on state lands will protect permanent wetlands and seasonal ponds.	**43**. Implement the MFRC *Voluntary Site-level Forest Management Guidelines.* **44**. Protect non-target species from pesticide translocation by following the division's *Pesticide and Pest Control Operational Order #59.* **45**. Reduce negative impacts by selecting and implementing treatments that consider site-specific conditions such as soils, topography, hydrology, past management, existing vegetation and desired vegetation. **46**. Employ measures that maintain normal seasonal flows within wetland inclusions and seasonal ponds. **47**. Use access routes with the least impact when necessary to freeze-down winter crossings.

Primary Issue Area	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
	C2. How will the appropriate width of the riparian management zone (RMZ) be determined and what vegetation management activities will be allowed to take place?	**C2a**. Management activities will protect or enhance riparian areas.	**48**. Establish widths of RMZs consistent with MFRC *Voluntary Site-level Forest Management Guidelines.* **49**. Field identify the boundaries of RMZs prior to applying treatments. **50**. Maintain a filter strip between aquatic resources and treatment areas consistent with MFRC *Voluntary Site-level Forest Management Guidelines.* **51**. Implement treatments within identified RMZs consistent with *MFRC Voluntary Site-level Forest Management Guidelines*. **52**. Distribute slash evenly within RMZs to adequately protect soils and provide nutrient retention. **53**. Retain a selection of live and dead trees in a variety of sizes and species adequate to provide a mixed age structure when conducting management within an RMZ.
	C3. How can the cumulative impacts to aquatic resources of forest management on a watershed/sub-watershed level be addressed?	**C3a.** The management and administration of state land will minimize negative cumulative impacts on aquatic resources.	**54**. Continue to implement all MFRC *Voluntary Site-level Forest Management Guidelines* directing forest management practices that pose potential impacts to surface waters. **55**. Collect baseline ecological data on surface water quality across the subsection. **56**. Implement ongoing surface water quality monitoring. **57**. Coordinate and cooperate with other landowners and water resource managers to establish guidelines that determine and minimize cumulative impacts. **58**. Implement site level surface water quality monitoring on water that may be impacted by logging activities when there is cause for concern.

Primary Issue Area	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
	C4. How can adequate safeguards be implemented to provide old-forest characteristics, including nesting cavities, in riparian areas?	**C4a.** Forest management activities will provide old- forest characteristics in defined riparian areas.	**59**. Define where management for old forest is appropriate in riparian areas and implement needed management. **60**. Manage RMZ forest composition to favor uneven-aged management of longer-lived species and extended rotations. **61**. Manage to meet or exceed DNR *Forestry-Wildlife Habitat Management Guidelines'* minimum requirements for cavity nesting trees within RMZs
	C5. How can the adverse impacts of forest management activities on aquatic plant species, fisheries, and wildlife habitat be minimized?	**C5a.** Riparian areas will be managed to provide critical habitat for fish, wildlife, and aquatic plant species.	**62**. Manage stands within RMZs for longer-lived, uneven-aged, mixed-species to provide shade, moderated microclimate, coarse woody debris, microhabitat diversity, resiliency to natural catastrophes, bank stability, nutrient cycling, and carbon and nutrient input. **63**. Manage for long-lived conifers, near water bodies, to discourage beaver related damming and siltation. **64**. Maintain a filter strip between aquatic resources and treatment areas consistent with MFRC *Voluntary Site-level Forest Management Guidelines.* **65**. Follow MFRC *Voluntary Site-level Forest Management Guidelines* regarding approaching water crossings at or near right angles to stream flow to minimize stream bank disturbances and chose construction materials that minimize sediment input and flow obstruction. **66**. Follow MFRC *Voluntary Site-level Forest Management Guidelines* regarding the appropriate timing of water crossing installations to minimize disturbance to fish spawning and migration patterns in areas identified by Fisheries staff. **67**. Leave snag trees, mast sources, and den trees, as directed in DNR *Forestry-Wildlife Habitat Management Guidelines*.

Primary Issue Area	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
D. Access	**D1.** How can new access to stands identified for management during the 10-year planning period be established without negative impacts on forest resources?	**D1a.** Forest access routes will be well planned, with an increased level of collaboration among federal, county, private and local units of government to share access, minimize new construction, and close access routes no longer needed for forest management purposes.	**68**. Complete a timber access plan. **69**. As Annual Stand Exam Lists are prepared, continue to cooperate with other forest landowners to retain existing access to state land and to coordinate development and maintenance of new access routes across mixed ownerships. **70**. Develop long-term agreements with the United States Forest Service, county land departments, local governments, and private landowners where necessary to gain access to state lands. **71**. Gate, barricade or obliterate all roads constructed during the life of this plan that are not needed for future stand management.
E. Diversity/ Complexity	**E1**. Within stands, how are biodiversity, native plant community composition, and structural complexity maintained or enhanced?	**E1a.** Diversity of plant species within stands will be maintained or increased.	**72**. Maintain the highest soil productivity possible by favoring regeneration and growth of native vegetation and trees using the MFRC *Voluntary Site-level Forest Management Guidelines*. **73**. Utilize harvest systems, methods and sale regulations (e.g., process at stump) that protect advanced regeneration and maintain or improve the patterns, diversity and composition of forest vegetation present in the stand prior to harvest. **74**. Preserve legacy patches and inclusions in stands for seed sources and native plant diversity, as well as to favor regeneration and seeding of native vegetation. **75**. Establish and manage plantations to more closely resemble naturally occurring stands by planting a variety of tree species using variable-density thinning techniques, preserving existing natural vegetation, and preserving advanced regeneration. **76**. Develop methods to measure and monitor the within-stand diversity of plant species, and provide ongoing education and training on these techniques and methods.

Primary Issue Area	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
		E1b. Age diversity as well as vertical and horizontal structure within-stands will be maintained or increased where compatible with other strategies in this plan.	**77**. Apply techniques during the young forest growth stage that encourages age and vertical/horizontal structure. **78**. Use intermediate treatments to provide age diversity and vertical/horizontal structure in the young forest, transition and mature forest growth stages. **79**. Design final harvest projects in a way that will transmit a legacy of age diversity, and vertical/horizontal structure. **80**. Develop a methodology for measuring growth stages, within stand age diversity, plant species diversity, and vertical/horizontal structure, and use this methodology to quantify and monitor changes.

Primary Issue Area	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
		E1c. Native plant communities and their ecological functions will be conserved within stands and stand level ecological function will be maintained or improved.	**81**. Design and implement training that allows field staff to identify native plant communities, growth stages, natural disturbance intervals, suitable tree species, and soil operability ratings. **82**. Control non-native invasive species. **83**. Control herbivory through management of wildlife populations, through the use of repellents, fencing or other practices that prove to be effective. **84**. Plan and execute stand maintenance and stand replacement silvicultural activities in a way that corresponds with the natural stand dynamics of the NPC. **85**. Ensure that regenerating tree species are suitable as indicated in the DNR's ECS *Suitability of Tree Species by Native Plant Community* tables. **86**. Provide growing conditions (i.e., sunlight, periodic fire, etc.) that will encourage species diversity in the ground, shrub and sub-canopy layers. **87**. Use soil operability ratings to avoid rutting and compaction when applying stand treatments. **88**. Use herbicide and heavy site preparation methods sparingly, or find alternative techniques. **89**. Restore or mitigate impacts to NPCs following heavy mechanical or chemical site preparation, frequent and/or intense disturbance, or establishment of species that are not native to the NPC. **90**. Meet MFRC *Voluntary Site-level Forest Management Guidelines* (i.e. 5 percent minimum) for retention of large living trees, snags, down logs, tree regeneration, and undisturbed forest floor within stands after harvest.

Primary Issue Area	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
F. Wildlife Habitat	**F1.** How can habitat for all wildlife and plant species be provided?	**F1a.** Adequate landscape-level habitat and habitat components will be maintained for wildlife and plant species found within these two subsections.	<u>Landscape/Coarse Filter</u> **91**. Provide for both young and old forests distributed across the landscape. **92**. Retain or increase the amount of coniferous forest, coniferous woodland, and mixed coniferous/deciduous forest as a cover type. **93**. Maintain conifers as a component of deciduous cover types where suitable to the site. **94**. Retain or increase white cedar and oak as cover types and components of other cover types as they provide significant wildlife habitat. **95**. Maintain or enhance existing large patches. **96**. Provide a variety of patch sizes across the landscape to reflect patterns produced by natural disturbances. **97**. Provide a balanced age-class structure in cover types managed with even-aged silvicultural systems. **98**. Increase the productivity and maintain the health of even-aged cover types. **99**. Consider impacts to wildlife populations and habitat utilization in the design, management and regulation of forest management access and recreational trail systems. <u>Stand/site-level</u> **100**. Favor and promote robust NPCs and retain elements of biodiversity significance (e.g., variety and abundance of native plants, intact ecological function and intact structure within communities). **101**. Retain the integrity of, or improve riparian areas as habitat for dependant wildlife species and protect seasonal and permanent wetlands.

Primary Issue Area	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
			102. Maintain the productivity of forest soils to favor regeneration and growth of native vegetation and trees. **103**. Provide for the needs of species that depend on snags, cavity trees, bark foraging sites, and dead downed-woody debris. **104**. Reserve a minimum of 5 percent undisturbed vegetation as legacy or reserve patches in clumps or strips to benefit wildlife, as well as to provide scattered super canopy long lived conifers, legacy or seed trees in each harvest unit. **105**. Provide sufficient amounts of soft and hard mast in a way that will meet the needs of wildlife. **106**. Retain and perpetuate aspen and birch inclusions/clones within all cover types, especially long lived conifer types. **107**. Support research needs concerning the impacts of forest thinning on wildlife species that rely on high stem density regeneration for habitat, particularly in aspen cover types. **108**. Retain conifers and protect conifer regeneration in clumps or strips to provide thermal cover, food, nesting cover, and structural attributes beneficial to wildlife. **109**. Retain or increase white cedar and oak as a stand component. **110**. Use harvest systems, and sale regulations that protect advanced regeneration and maintain or improve patterns, diversity and composition of forest vegetation representative of the stand prior to harvest. **111**. Establish and manage plantations to more closely resemble naturally occurring stands by planting diverse tree species, preserving existing natural vegetation, and preserving advanced regeneration by using variable density thinning techniques, varying stem density, and using less intense methods. **112**. Give consideration to within stand occurrences of species that are endangered, threatened, or of special concern.

Primary Issue Area	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
			Fine Filter **113**. Designate special management areas for the benefit of wildlife species. **114**. Consider Natural Heritage Program data and other rare species information during development and implementation of both the 10-Year Stand Exam List and Annual Stand Exam Lists.
G. Wildlife Populations	**G1.** How can sustainable wildlife populations be maintained at levels that are acceptable to user groups?	**G1a.** Forests will be managed to provide sustainable wildlife populations.	**115**. Enhance habitat while completing land treatments by using practices and procedures outlined in the DNR *Forestry-Wildlife Habitat Management Guidelines* and the DNR's *Interdisciplinary Forest Management Coordination Policy*. **116**. Implement corridor planning and management. **117**. Adhere to the recommendations in the MFRC *Voluntary Site-Level Forest Management Guidelines* regarding RMZs, leave trees, legacy patches, woody debris, etc. **118**. Identify and acquire critical habitat land parcels for management and protection of important species. **119**. Develop cooperative procedures with other land management agencies to coordinate wildlife management efforts. **120**. Use the openlands assessment and planning process to develop necessary strategies and DFFCs for the designated open lands. **121**. Identify habitat components and habitat distributions needed to sustain wildlife populations at levels that are acceptable to user groups, but not detrimental to forest vegetation.

Primary Issue Area	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
H. Sustainable Harvest	**H1.** What is the appropriate timber harvest level on state lands, with consideration for the sustainability of all forest resources?	**H1a.** Forests will be managed to provide a sustainable supply of forest products for human use, while minimizing negative impacts to wildlife habitat and forest biodiversity. **DFFC Statement** The treatment levels for even-aged cover types will be established with the DFFC of achieving a balanced age-class as shown in Chapter 4, Cover type Management Recommendations.	**122**. Move even-age managed cover types toward a balanced age-class structure. **123**. Achieve a declining age-class structure in ERF stands from normal rotation age through maximum rotation age. **124**. Improve the distribution of ages and quality of timber in uneven-age managed cover types. **125**. Designate lowland conifer old growth from EILC stands and return undesignated stands to the harvest pool**.** **126**. Implement recommendations identified in the MFRC's *Voluntary Site-Level Forest Management Guidelines, Biomass Harvesting Guidelines for Forestlands, Brushlands, and Open Lands*.

Primary Issue Area	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
	H2. How can an adequate and sustainable supply of non-timber forest products be ensured for the future?	**H2a.** Forests will be managed to provide a sustainable supply of non-timber forest products for human use while minimizing negative impacts to wildlife habitat and forest biodiversity.	**127**. Implement the recommendations of the Special Forest Products (SFP) planning process. **128**. Increase supervision of SFP harvest permits and increase enforcement of rules against illegal harvesting activity. **129**. Manage selected forest stands for non-timber forest products. **130**. Support research to determine sustainable harvest levels for SFPs (e.g., decorative spruce tops), criteria for managing harvests and methods of propagation. **131**. Use all available information including "*Careful Harvest Fact Sheets*" (Extension Web site), and the DNR Forestry's Utilization and Marketing Web site that supports sustainable harvest of non-timber forest products when approving SFP Permits. **132**. Apply knowledge of existing traditional gathering areas of non-timber forest products when managing other forest resources. **133**. Identify managers with local expertise in managing non-timber products and utilize their knowledge when managing non-timber forest products at the landscape and statewide levels. **134**. Reduce impacts by coordinating non-timber product harvests with timber harvest. **135**. Increase public knowledge about the sustainable use of non-timber forest products through dissemination of educational information and training.
I. Timber Quality and Quantity	**I1.** How can timber productivity be increased on state lands?	**I1a**. Forests will be managed to increase overall timber productivity.	**136**. Support research that maximizes timber productivity (e.g., optimal stocking levels, mixed species management, treatment timing) without impacting wildlife and plant species. **137**. Apply management techniques to improve stocking and stand composition on general forestry lands.

Primary Issue Area	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
J. Visual Quality	**J1**. How will the impacts of forest management activities on visual quality be minimized?	**J1a.** Impacts of forest management on visual quality will be minimized.	**138**. Apply the MFRC *Voluntary Site-level Forest Management Guidelines* and the *Visual Quality Best Management Practices for Forest Management in Minnesota,* as they apply, to all vegetative management activities. **139**. Review and update as appropriate the *Visual Sensitivity Classification* county maps.
K. Other Statutes	**K1.** How will foresters and wildlife managers achieve the goals of this plan and remain consistent with state and federal statutes?	**K1a.** Forest management activities will continue to adhere to state and federal statutes.	**140**. Invite comment from, and coordinate with adjacent landowners. **141**. Ensure that forest resource managers maintain a working knowledge of all applicable state and federal statutes, rules, guidelines and policies. **142**. Ensure that DNR forest managers have access to and consider appropriate related resource management policy, guidelines and plans of other divisions when vegetative management is prescribed.
L. Cultural Resources	**L1**. How will cultural resources be protected during forest management activities on state administered lands?	**L1a.** Forest management activities will protect cultural resources on state administered lands.	**143**. Subsection plans will consider the impacts of forest treatments on cultural resources consistent with all adopted DNR policy and guidelines. **144**. Share data on known cultural sites and consider impacts to these sites as silvicultural treatments are applied. **145**. Increase cultural resource training for field staff, stress the importance of preserving cultural resources, and encourage the reporting of new sites. **146**. Evaluate the existing Cultural Resource Review procedure to improve efficiency and reduce time required for site review.

Primary Issue Area	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
M. Rare Species/Features	**M1.** How can rare plants and animals, their habitats, and other rare features be protected?	**M1a.** Forest management will continue to implement measures to sustain or enhance existing biodiversity. **DFFC Statement** The full range of all growth stages is well represented on the landscape.	**147**. Complete the Minnesota County Biological Survey (MCBS) for all counties within the subsections. **148**. Maintain the ecological integrity of Native Plant Communities (NPCs) by documenting and managing known locations with a statewide rank of Critically Imperiled (S1) or Imperiled (S2), and those with S-ranks of S3 to S5 that are rare or otherwise unique in these subsections. **149**. Consult the Natural Heritage database (including the rare features database) prior to prescribing or implementing forest management activities.
N. Managing Impacts	**N1.** How should the impacts of forest insects and disease on forest ecosystems be addressed?	**N1a.** Forest management will minimize damage to forests from native insects and diseases.	**150**. Manage identified forest insect and disease occurrences to contain and reduce impacts, using techniques appropriate for the species involved. **151**. Identify, document, and monitor native insect and disease populations (e.g. jack pine budworm, ips bark beetle, two lined chestnut borer, or diplodia shoot blight), as part of the *Forest Health Monitoring Program* and establish occurrence levels above which management action should be taken. **152**. Manage the vegetative content and structure of stands to reduce the potential impact of insects and disease.

Primary Issue Area	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
	N2. How will threats and invasions of exotic species be managed?	**N2a.** Damage to forests from exotic species will be minimized.	**153**. Identify, document and monitor exotic species populations (e.g., gypsy moth, garlic mustard, common buckthorn, emerald ash borer, and earthworms) as part of the *Forest Health Monitoring Program* on state-managed lands. **154**. Contain and reduce impacts caused by exotic species using proven techniques**.** **155**. Manage the impact of exotic species using techniques such as aggressive containment or seasonal timing.
	N3. How will natural disturbances such as fire and blow down be considered in forest management decisions?	**N3a.** Natural disturbance events will be evaluated to determine the appropriate forest management response to address the effects on the landscape.	**156**. Accept a higher level of disturbance in ERF stands, provided the level of impact does not jeopardize the ability to regenerate the stand to the desired cover type or jeopardize the management goals of surrounding stands. **157**. Evaluate large-scale (i.e., hundreds to thousands of acres) and small-scale (i.e., tens of acres) disturbance events to determine appropriate action. **158**. Implement efforts to salvage usable timber stumpage from damaged stands in a timely manner to minimize losses due to decay and staining.
	N4. How can vegetation be managed to reduce animal damage, crop depredation, nuisance animals, potential spread of animal disease, and possible human health impacts (e.g., Lyme disease)?	**N4a.** Negative impacts caused by wildlife species on forest vegetation will be reduced.	**159**. Expand the knowledge of field staff related to preventing or reducing damage caused by wildlife through training and/or field level information sharing. **160**. Consider the potential for wildlife damage to artificial or natural regeneration when prescribing site management measures. **161**. Incorporate damage prevention strategies at all phases of forest management. **162**. Focus artificial forest regeneration efforts in areas less likely to be impacted by wildlife species. **163**. Apply mitigation strategies where wildlife damage is anticipated (e.g., considering stock sources that are less palatable to wildlife).

Primary Issue Area	Focused Issues	CP-PMOP General Direction Statements that address the issue	CP-PMOP Strategies
	N5. How should forest management respond to global climate change within the planning period?	**N5a.** Forest management practices will consider the impacts of climate change on forest lands and will attempt to mitigate these impacts using current knowledge and future research findings.	**164**. Reference the MFRC *Voluntary Site-level Forest Management Guidelines* for identification and management of tree species currently found at, or near the edge of their range. **165**. Maintain or increase species diversity across the subsections. **166**. Ensure connectivity that encourages the migration of plants and animals as climate changes the landscape. **167**. Evaluate site conditions with respect to climate change when selecting tree species for future forest stands. **168**. Apply the concept of carbon sequestering to remove carbon dioxide from the atmosphere.

Chapter 3. Focused Issues, General Direction Statements, DFFCs, and Strategies

3.0 Background

In response to the final list of Issues identified in Chapter 2, the CP-PMOP Planning Team developed general direction statements (GDSs) to address the Issues, strategies to achieve the general directions, and desired future forest composition (DFFC) goals. General direction statements consider direction provided in state statues and rules; Department policies, guidelines, and direction (e.g., *Directions 2000, The Strategic Plan* or *A Strategic Conservation Agenda 2003-2007)*; and management that will sustain forest resource on state-administered forest lands in the subsections. GDSs provide general direction such as: increase, decrease, maintain, or protect a certain condition, output, or quality. Strategies were developed for each of the GDSs to move toward the general direction as specified. Where possible (i.e., current ability to measure and quantify), DFFC goals were identified. DFFC goals are expressed both in short term (during the 10-year SFRMP plan implementation period) and long-term (50+ years) goals for the ultimate desired condition of DNR forest lands in the subsections. Examples of DFFC goals are: cover type acres, age-class distribution, amount of young and old forest, and cover type treatment levels (e.g., harvest level).

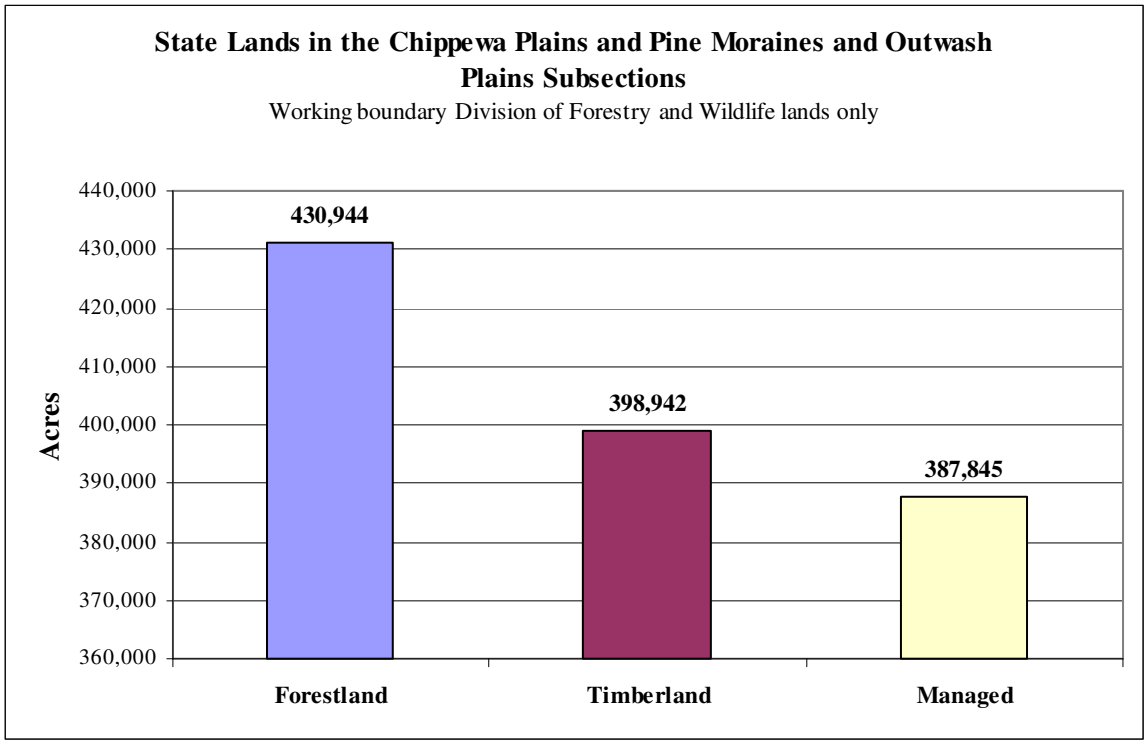
DFFC goals, general direction statements, strategies, as identified in this Chapter, and Cover type Management Recommendations as identified in Chapter 4, were used to determine stand treatment levels and define stand selection criteria to identify a pool of stands from which to select stands to be treated during this 10-year plan. This plan recommends treatment levels by cover type to move toward the DFFC goals and establishes the 10-year Stand Exam List that identifies specific forest stands selected for site-visit and possible treatment. The GDSs, strategies, and DFFC goals presented in this chapter have been used to guide the selection of the 10-Year Stand Exam List for the CP-PMOP SFRMP.

The following summarizes the sequence from Issues to Strategies:

1. 14 forest management Preliminary Issue Areas were identified in the *Preliminary Issues and Assessment document*; from these,
2. 29 more Focused Issue statements were drafted; from these,
3. 31 General Direction Statements and DFFCs were developed, relating to each Issue; then,
4. 168 Strategies were drafted to implement the GDSs and DFFCs.

As background to this chapter, Figure 3.0a shows the state land acres administered by the Division of Forestry and the Management Section of Wildlife in the two subsections. The state park lands within the CP-PMOP are not addressed in this plan. "*Forest land"* consists of all lands included in the forest inventory from aspen and pine cover types to stagnant conifers, and lowland brush. "*Timberland* " includes those cover types that are capable of producing merchantable timber. In this plan, "*managed"* acres are those acres available for timber management purposes. These managed acres make up approximately 90 percent of the total forest land (both divisions) in the two subsections. State lands reserved from harvest such as designated old-growth stands and scientific and natural areas (SNAs) are not included in managed acres, meaning they are not available for harvest.

Figure 3.0a Forest land, Timberland, and Managed Acres



Note: Due to updates to the forest inventory and other data sources during the planning process, there may be slight differences in acreages shown between various tables and figures in this planning document. These differences will not have a significant effect on the recommendations in this plan

Relationship of the CP-PMOP SFRMP with other forestry planning efforts

While the SFRMP process focuses on developing vegetation management plans for state-administered forestlands within the subsection, other department planning efforts, policy and guidelines also guide vegetative management. All of these directions have been considered by the CP-PMOP Planning Team in developing this plan. In addition, the CP-PMOP Plan has also, when possible, taken into consideration and coordinated with other state, federal, and local resource management planning efforts affecting the subsections.

The following sections highlight the more prominent directions, documents and processes that influence the SFRMP process.

Minnesota Forest Resource Council (MFRC) Landscape Planning Efforts

The 1995 Sustainable Forest Resources Act (Minn. Stat. Chapter 89A) directed the MFRC to establish a landscape-level forest resources planning and coordination program to assess and promote forest resource sustainability across ownership boundaries in large forested landscapes.

Volunteer, citizen-based regional forest resource committees are central to carrying out the general planning process. Within each landscape region, committees of citizens and representatives of various organizations work to:

1. gather and assess information on a region's current and future ecological, economic, and social characteristics;
2. use information about a region to identify that region's key forest resource issues;
3. plan ways to address key issues in order to promote sustainable forest management within the region; and,
4. coordinate various forest management activities and plans among a region's forest landowners and managers in order to promote sustainable forest management.

The MFRC north central landscape encompasses much of the Chippewa Plains and Pine Moraines and Outwash Plains subsections. Recommended "desired outcomes, goals, and strategies" for the North Central Landscape Regional Plan were completed in March 2003. These recommendations have been considered and are incorporated into the CP-PMOP SFRMP planning process.

For more information on the MFRC landscape planning program, visit the MFRC Web site at: http://www.frc.state.mn.us/Landscp/Landscape.html.

Minnesota Forest Resource Council's (MFRC) *Voluntary Site-level Forest Management Guidelines*

The MFRC's *Voluntary Site-Level Forest Management Guideline*s June 2005 as amended, including 2007 amendments addressing biomass harvest, establish integrated forest resource management practices intended to provide cultural resource, soil productivity, riparian, visual, water quality, wetlands, and wildlife habitat protections in a balanced approach. These *guidelines* were developed through a collaborative statewide effort and received extensive input during development from stakeholders, DNR staff, and other agency staff. The *Voluntary Site-Level Forest Management Guidelines* developed through that collaborative process have been adopted and are implemented as the DNR practices forest management. These *guidelines* are the standard in managing DNR lands, (i.e., they are not voluntary but are required practices on DNR-administered lands. However, as recognized in the *guidelines*, deviation is allowed on a case by case basis, where written documentation is provided of the need to meet other goals or strategies that conflict with the strict application of the *guidelines*.

DNR Strategic Conservation Agenda 2003–2007 and DNR *Directions 2000, The Strategic Plan.*

The department's strategic planning documents, *DNR Strategic Conservation Agenda 2003–2007* and *Directions 2000*, *The Strategic Plan* provide broad goals, strategies, and performance indicators for forest resources in Minnesota (see DNR *Directions 2000, The Strategic Plan* Forest Resources Section in Appendix A and DNR *Strategic Conservation Agenda*, *2003-2007* Forests Section at http://www.dnr.state.mn.us/conservationagenda/index.html). This broad statewide direction is used as a platform from which to develop additional complementary/supplemental goals and strategies specific to each subsection.

Old-Growth Forest Guidelines

The 1994 DNR *Old-Growth Forest Guideline* was developed via a stakeholder involvement process that led to consensus on old-growth forest goals by forest type by Ecological Classification System (ECS) subsection for DNR lands. Following the completion of the *guideline*, the DNR undertook and completed an old-growth nomination, evaluation and designation process for DNR lands. The latest information on old-growth forest policy and results can be found at:
http://www.dnr.state.mn.us/forests_types/oldgrowth/index.html

Extended Rotation Forest Guideline

The 1994 DNR *Extended Rotation Forest (ERF) Guideline* was developed through a public and stakeholder input process. The primary purpose of the *ERF guideline* is to provide adequate acreages of forest cover types older than their normal rotation ages to provide for species and ecological processes that require older forest characteristics. During the SFRMP process for all subsection planning, the *ERF guideline* is to be applied to landscapes by designating particular areas of forest or stands for ERF management. An area designated for ERF management will include all cover types and age classes within that designated ERF area.

Normal rotation ages are established for each forest type managed primarily under even-aged silvicultural systems within the subsection based on site-quality characteristics related primarily to timber production (e.g., site index, growth rates, soils, insect and diseases, etc.). Maximum rotation ages for these forest types are also established based on the maximum age at which a stand will retain its biological ability to regenerate to the same forest type and remain commercially viable as a marketable timber sale.

The statewide *ERF guideline* requires that a minimum of 10 percent of the DNR Forestry- and Wildlife-administered timberlands within a subsection be managed as ERF. Determining the amount of DNR

timberlands to be managed as ERF within each subsection involves many considerations including wildlife habitat needs, visual and riparian corridors, and implications for timber production (both quantity and quality).

Incorporating Biodiversity Considerations in SFRMP

Biological diversity is defined in Minnesota statute as the *"variety and abundance of species, their genetic composition, and the communities and landscapes in which they occur, including the ecological structure, function, and processes occurring at all of these levels."* (Minnesota Statutes 89A). Protecting areas of significant biodiversity is consistent with state policy that seeks to pursue the sustainable management, use, and protection of the state's forest resources to achieve economic, environmental, and social goals.

The SFRMP process incorporates biodiversity considerations in planning for forest systems on DNR lands. The Ecological Resources Division has provided ecological information pertinent to managing for biodiversity within the two subsections (e.g. *Minnesota's Comprehensive Wildlife Conservation Strategy; An Action Plan for Minnesota Wildlife, 2006;* Minnesota County Biological Survey data; Natural Heritage information; and, Scientific and Natural Area biodiversity management techniques experience). SFRMP direction in addressing issues and developing GDSs, Strategies, DFFCs, and the 10-Year Stand Exam List and New Access Needs List reflect vegetative management to maintain biodiversity.

Interdisciplinary Forest Management Coordination Framework

The purpose of the *Interdisciplinary Forest Management Coordination Framework*, December 2007, is to ensure effective coordination between the divisions of Forestry, Fish and Wildlife, and Ecological Resources to improve decision-making and achieve sustainable forest management. The *framework* applies primarily to planning and implementing forestry and fish and wildlife management practices on land administered by the divisions of Forestry, and Fish and Wildlife. While each division has different mandates and functions, they have mutual responsibility for sustainable forest management. Interdisciplinary cooperation is designed to ensure integrated decision-making necessary to comprehensively manage forest ecosystems and their interrelated resources.

Although adopted near the completion of the CP-PMOP Plan, many of the coordination policies of the *Interdisciplinary Forest Management Coordinating Framework* have been implemented as the CP-PMOP Plan was developed. The *framework* will serve as the process to guide interdisciplinary coordination among the DNR divisions.

DNR *Forest-Wildlife Habitat Management Guidelines*

DNR *Forest-Wildlife Habitat Management Guidelines* provide direction to DNR wildlife and forestry staff for integrated forest / wildlife management on state-administered lands. Some areas of the guideline overlap with the MFRC *Voluntary Site-Level Forest Management Guidelines*. MFRC *guidelines* will prevail if overlaps are found in the field. Relevant species-specific sections of the *Forest-Wildlife Habitat Management Guidelines* have been applied to the SFRMP process in determining management around known species locations (i.e., eagles nests) or in the management of areas for particular types of habitat (e.g., open landscapes, ruffed grouse management areas, deer yards, etc.).

Management Section of Wildlife Plans, Goals and Guidelines

SFRMP plans are not wildlife habitat plans, however, forest management efforts affect forest habitats and consequently wildlife distribution and abundance. Because state forest management, under a multiple-use policy, requires consideration of wildlife habitat, wildlife plans have been consulted during the SFRMP process including:

1. The Division of Fish and Wildlife's *Strategic Plan* that establishes population and or harvest objectives for many of the state's wildlife species that are hunted and trapped;
2. Division of Fish and Wildlife's *Restoring Minnesota's Wetland and Waterfowl Heritage Plan*; and,
3. Management Guidance Documents for Wildlife Management Areas.

Off-Highway Vehicle (OHV) Planning Process

SFRMP planning is not a recreational vehicle planning process. During development of the CP-PMOP Plan, the DNR was involved in a significant OHV planning process that has impacts and intersects with forest resource management. This OHV planning process has been used in the CP-PMOP planning

process primarily as a tool to identify New Access Needs as part of the 10-Year Stand Exam List (Chapter 7 of this plan). For more information about the OHV planning process, see the DNR Web site at http://www.dnr.state.mn.us/input/mgmtplans/ohv/designation/index.html.

Minnesota State Park Unit Planning Process

The SFRMP process will not address the management of DNR forest lands within the boundaries of state parks. The management of state parks (i.e., facilities and natural resources) is established through a separate state park planning process.

The SFRMP process has considered state park plans in making decisions on forest stand management adjacent to state parks. Likewise, as future state park plans are developed they will consider the vegetation management direction and objectives in CP-PMOP SFRMP. Additionally, the SFRMP process has considered the role of state parks in the subsection for meeting desired future compositions and associated goals (e.g., biodiversity, wildlife habitat, community types, etc.).

Summary

As discussed, the DNR uses a variety of written vehicles (e.g., policies, guidelines, recommendations, memos, operational orders, agreements) to communicate vegetative management policy direction to DNR staff. This policy direction covers the broadest range of issues practical including: forest productivity, old-growth management, ecologically important lowland conifers, coordination among all DNR divisions, site-level mitigation, rare habitats and species, and extended rotation forest management. All of these plans, guidelines and processes have been used to develop the CP-PMOP SFRMP.

General Direction Statements, Strategies and Desired Future Forest Condition

Identified below are the Issues, general direction statements (GDSs), desired future forest conditions (DFFCs) and strategies developed to guide forest vegetation management on state forest lands. Each Issue, GDS, DFFC, and Strategy has been developed from specific Issue areas as first identified in the *Preliminary Issues and Assessment document, August 2006* prepared for the CP-PMOP. These GDSs, Strategies, and DFFCs together with the specific Cover Type Management Recommendations (Chapter 4) provide the guidance and direction as the 10-Year Stand Exam List and New Access Needs List were developed.

3.1 Primary Issue Area: Age Classes

Focused Issue A1 What is the desired age-class and growth-stage distribution for forest types across the landscape?

GDS A1a Forest resources will continue to represent multiple age classes, distributed across the landscape.

Forests will be managed to provide a representation of forest age classes that are sustainable over time, balanced with the need to provide a stable timber supply and increased timber productivity, with both old forests and early successional forest habitat represented within the landscapes. One goal is to minimize large fluctuations in harvest levels to the extent possible. Over time, age-classes for each cover type will approach a balanced condition, with approximately equal amounts in each 10-year age class up to normal rotation ages.

The current age-class distributions of the aspen, balm of Gilead, birch, balsam fir, black spruce, jack pine, and tamarack cover types show imbalance in age structure. This imbalance is a result of broad-scale harvest and subsequent fires in the early 1900s. This, coupled with a lack of markets and low harvest rates for many years continued to skew the age class distributions. As second growth forests have evolved and moved beyond normal rotation age, together with increased timber demand in recent years has provided opportunities to create more younger age classes and move these cover types toward a more balanced age structure. The amount of forest above maximum rotation age is decreasing due to harvest, insects and disease, and succession to other cover types such as from the in-growth of secondary species (e.g, balsam fir understory in a declining aspen stand.) Table 3.1a identifies the total cover type acres by age-class for the CP-PMOP subsections.

Table 3.1a reflects the forest cover type dataset as included in the CP-PMOP *Preliminary Issues and Assessment document* and is included here to provide continuity from the *Preliminary Issues and Assessment document* to the CP-PMOP Plan.

It is the DNR's objective to use the best available information as forest management plans and plan components are developed. As information concerning forest cover types, age classes and condition etc, is improved, this information is used to provide the most up-to-date information upon which to make forest management decisions. During development of the CP-PMOP SFRMP the following three databases came into consideration:

1. 2004 databases as shown on Table 3.1a was used in development of the *Preliminary Issues and Assessment document* and development of the GDSs, DFFCs and strategies;
2. January 2007 database (update and improvement to the 2004 dataset) was used to develop treatment levels and conversion targets; and,
3. July 2007 database was used to develop the 10-Year Stand Exam List and New Access Needs List.

Due to these updates to the forest inventory and other data sources during the planning process, there may be slight differences in acreages shown between various tables and figures in this planning document. These differences do not have a significant affect on the recommendations in this plan.

Table 3.1a Chippewa Plains/Pine Moraines and Outwash Plains State[1] Timberland[2] Cover Type Acres by Age-Class (2004)

Cover type	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-120	121 +	TOTAL
Ash/Lowland Hdwds.	90	191	507	280	355	426	1,210	2,366	2,852	2,795	3,176	2,279	16,520
Aspen/Balm	36,419	47,127	28,309	14,755	6,413	11,867	19,624	15,803	4,514	45	39	321	181,231
Balsam Fir	213	232	819	1,232	1,261	1,032	1,367	1,529	420	333	57	0	8,494
Birch	236	177	176	177	342	1,210	3,906	3,197	1,671	616	225	170	12,102
Black Spruce Upland	0	66	28	0	0	0	12	0	0	0	0	0	106
Black Spruce Lowland	1,081	1,618	1,952	3,250	1,121	1,088	1,450	2,129	3,020	2,845	5,643	2,527	27,721
Cutover Area[3]	3,044	721	200	7	24	11	0	0	0	0	0	19	4,025
Jack Pine[4]	1,483	1,546	1,750	662	2,902	5,453	2,403	1,477	375	27	9	0	18,088
Northern White Cedar	4	90	119	85	203	76	213	390	959	1,796	4,644	3,909	12,487
Northern Hardwoods[5]	308	615	508	726	131	720	3,040	3,983	2,287	2,626	839	1,029	16,809
Red (Norway) Pine	4,533	5,478	7,500	5,081	1,748	1,017	1,099	715	1,739	2,466	1,923	1,428	34,726
Oak	125	155	294	180	148	540	4,827	4,891	2,592	945	469	435	15,598
Tamarack	1,354	713	3,806	3,256	4,712	2,839	2,371	2,843	4,015	4,517	9,774	3,691	43,889
White Pine	572	86	38	106	215	185	844	51	113	75	254	144	2,683
White Spruce	664	2,035	1,966	1,028	480	146	278	60	5	9	13	0	6,681
Total	50,126	60,850	47,972	30,825	20,055	26,610	42,644	39,434	24,562	19,095	27,065	15,952	401,160

[1] Includes only Forestry- and Wildlife-administered lands within the Ecological Classification System (ECS) subsection boundary and based on Minnesota DNR 2004 Cooperative Stand Assessment (CSA) forest inventory.

[2] Timberland is defined as forest land capable of producing timber of marketable size and volume at the normal harvest age, not including lands withdrawn from timber utilization by law or statute (see Appendix V: *Glossary*). However, 4,427 acres of designated old-growth stands have been included in the 2004 data to more accurately depict the change over time and the range of age classes on the landscape.

[3] Cutover Area is defined as a site that was harvested within the last three years with no timber species present or visible when the site was last inventoried. Usually, the site is in the process of regeneration. This code is used less frequently than in the past. Now, stands are usually classified according to the best estimate of what the regeneration species will be on the site. The inventory data is updated upon completion of the first regeneration field survey, usually one, three, or five years after harvest.

[4] Contains 13 acres of Scotch pine forest that will be planned and managed along with the jack pine type.

[5] Contains six acres of Central Hardwoods forest that will be planned and managed along with the northern hardwoods type.

In addition to planning for early successional forests, old forest considerations in subsection planning will ensure adequate representation of older growth stages in even-aged cover types to address visual goals and recreation needs, help maintain the integrity of forested riparian areas, complement or connect old-growth stands and other old patches, provide habitat for wildlife species associated with old forest, and provide for older growth stages of native plant communities.

Forest stand is considered to be old forest whenever its age exceeds the normal rotation age. Generally *old forest conditions* refers to forest that has the age and structural conditions typically found in mature to very old forests, such as large-diameter trees, large snags, downed logs, mixed species composition, and greater structural diversity. These older forest conditions typically develop at stand ages greater than the normal rotation ages identified for even-aged managed forest cover types.

Sites best suited for various age classes can be determined from ECS classifications and other tools that identify a site's capabilities. Determining the appropriate extent and locations of old forest to be sustained requires balancing landscape level factors including: timber productivity, economic impacts, historical forest conditions and habitat requirements, as well as site level considerations such as proximity to existing old growth stands, proximity within visual corridors, steep terrain, or in riparian areas, etc.

Strategies

A1a. 1 Consider ECS characteristics and other indicators when deciding where old forest and younger age classes are best suited.

This strategy can be implemented by identifying ECS classifications, and locating major disturbance regimes, bearing tree information and native plant communities to help categorize land type associations (LTAs) by their ability to develop and maintain various aged forests. This information can then be used to identify locations best suited to support old forest characteristics and young age classes.

A1a. 2 Provide representations of desired age-classes through forest composition goals.

This strategy can be implemented by:

1. Maintaining young, early successional forest in a variety of patch sizes to provide habitat for associated species.
2. Managing riparian management zones (RMZs) primarily to reflect old forest conditions.
3. Allowing some stands to naturally succeed to other cover types.
4. Using silvicultural treatments that retain old forest components in some stands, striving to emulate the within-stand composition, structure and function of older growth stages.
5. Taking into account the contributions of non-timberland cover types (e.g., stagnant conifers), inaccessible or inoperable stands, and reserved areas (old growth, SNAs, state parks) in providing representations of growth stages on the landscape.
6. Increasing mixed forest conditions in some stands.

A1a. 3 Develop and apply criteria to identify stands that are over rotation age but can be carried into subsequent 10-year plan implementation periods to reduce age-class imbalances.

One primary goal of the CP-PMOP SFRMP planning effort is to target the selection of stand treatment acres to the appropriate age classes to achieve DFFCs. Stands found to be over rotation age can be identified, re-evaluated and deferred for treatment to the next planning cycle in an effort to balance age classes over decades. Chapter 4, Cover type Management Recommendations, identifies each cover type, the current age-class distribution by cover type acres and the future stand management for that particular cover type.

Table 3.1b identifies total cover type acres that are either under normal rotation age or over normal rotation age. This table identifies that several cover types (ash, lowland hardwoods, northern

hardwoods) have an excess of acres over the normal rotation age, meaning that in past decades less than optimal harvest (to maintain balanced age classes) in these cover types has occurred. This results in imbalances in age class distributions that the CP-PMOP Plan addresses through the recommended treatment levels.

Table 3.1b Cover Type Acres by Under Normal Rotation and Over Rotation Age

Covertype	Acres less than or equal to normal rotation age	Acres over normal rotation age
Ash	80	13,968
Lowland Hardwoods	12	2,622
Aspen	152,434	25,704
Birch	4,629	4,925
Balm of Gilead	1,780	873
Northern Hardwoods	727	15,465
Oak	7,669	8,194
Central Hardwoods	0	6
White Pine	873	2,267
Red (Norway) Pine	29,927	5,929
Jack Pine	11,484	6,202
White Spruce	5,825	1,414
Balsam Fir	3,709	3,933
Lowland Black Spruce	16,916	10,869
Tamarack	23,037	21,762
Cedar	154	13,398
Upland Black Spruce	0	76

The desired future age class distributions will be achieved by reducing the imbalances of under normal rotation age and over normal rotation age for particular cover types as shown in Table 3.1b.

DFFC Statement

A range of age classes will be implemented, eventually moving the cover types toward a more balanced age structure. Harvest plans will be guided by the established rotation ages and acreage goals for each cover type as identified in the figures from Chapter 4 (Cover Type Management Recommendations) that portray the 2017 through 2057 Desired Age-Class Distributions.

Focused Issue A2 What is the appropriate amount, type and distribution of old forests?

GDS A2a Forest managed for old forest characteristics will be distributed across the landscape.

A forest stand of any particular even-aged managed forest cover type is considered old forest whenever its age exceeds the normal rotation age for that cover type. "Old forest" includes extended rotation forest (ERF), old growth forest (OG), ecologically important lowland conifers (EILC) and old forest management complexes (OFMCs). Historically, forests were not evenly distributed by age throughout these two subsections, but were clustered or dispersed according to site characteristics and environmental influences. The western portions of these subsections were likely dominated by younger forests, where regular burning influenced vegetation, while older forests may have been concentrated on the eastern side of the subsections, particularly on the east side of large lakes, where they may have had more favorable micro-site conditions and protection from fires.

Determining the amount of old forest to be sustained in these subsections required balancing several factors: timber productivity, economic impacts, forest conditions representative of natural disturbance regimes, and habitat requirements. The goal is to provide a representation of old forest that is sustainable over time, balanced with the need to provide a stable timber supply, increased timber productivity, and also maintaining adequate early successional forest habitat.

As background to develop the CP-PMOP SFRMP, selection of ERF, OG, EILC and OFMCs was completed with input from all department disciplines as reflected on the CP-PMOP Planning Team and input from field staff (meaning including forestry, fisheries, ecological resources and wildlife staff) from across the subsections. The overall goal is to maximize old forest habitat values while minimizing potential economic impacts. If all appropriate factors are not adequately considered, allocation of ERF, for example, among DNR Forestry Areas could affect timber harvest levels and possibly local economies. Failure to determine the most appropriate distribution of old forest and ERF in the CP-PMOP subsections could result in less than optimal economic, ecological and social benefits being derived from state forest lands.

Following are examples of factors that assisted in balancing old forest characteristics with other management objectives. Some advantages of managing for old forest characteristics include:

1. ensures an adequate representation of older growth stages in even-aged cover-types;
2. addresses visual concerns and recreation desires;
3. helps maintain the integrity of forested riparian areas;
4. complements or connects old-growth stands and other old patches;
5. provides habitat for wildlife species associated with old forest;
6. provides for older growth stages of natural community types; and,
7. provides large-diameter timber products.

Uneven-aged managed stands and other state lands (e.g., state parks and SNAs) also contribute to old forest conditions. In addition, compositional changes to more long-lived conifers will provide more forest with longer rotations in the future.

Strategies

A2a. 4 Designate ERF stands in the amounts and percentages prescribed by the Statewide ERF Work Group.

In order to designate ERF, a series of management ages first needed to be established that were unique to each cover type. To assist in this effort, a Statewide Rotation Age Workgroup developed and provided to the planning team normal rotation ages, maximum rotation ages, and merchantable ages for each of the even-aged managed cover types as shown in Table 3.1c.

Table 3.1c Division of Forestry Recommended Rotation Ages for Forest Stands in the CP-PMOP Subsections

Cover type	Chippewa Plains				Pine Moraines-Outwash Plains			
	Site Index Class	Merchantable Age	Normal Rotation Age	Maximum Rotation Age	Site Index Class	Merchantable Age	Normal Rotation Age	Maximum Rotation Age
Aspen	All	30	45	80	All	30	40	75
Balsam Fir	All	30	45	60	All	30	45	60
Balm of Gilead	All	30	40	60	All	30	40	60
Birch	All	30	50	65	All	30	50	60
Black Spruce	40+	30	65	95	40+	30	65	95
	23-39	50	95	130	23-39	50	95	130
Jack pine	All	30	40	65	All	30	40	65
Oak	60+	35	80	120	60+	30	80	120
	< 60	35	50	80	<60	30	50	80
Red (Norway) Pine	All	30	100	170	All	30	100	170
Tamarack	All	30	60	105	All	30	70	105
White Cedar		None						
White Spruce	Natural Planted	30 30	60 50	90 60	Natural Planted	30 30	60 50	90 60

In addition to normal, maximum and merchantable ages for each cover type, extended rotation forest age-class distribution must also be established as well as percentage goals of ERF by cover type. Extended rotation DFFC goals for each cover type were developed by a Statewide ERF Workgroup and provided to the CP-PMOP Planning Team as shown in Table 3.1d (expressed as Effective ERF Percent Goal). This table shows the total timberland cover type acres, the Prescribed ERF percentage, Prescribed Acres, Effective ERF Goal percentage, Effective ERF Acres and the current acres percentage over normal rotation ages by cover type.

Table 3.1d State Timberland ERF by Cover Type

Cover Type	Timberland[1] Acres	Prescribed ERF %[2]	Prescribed ERF Acres[3]	Effective ERF % Goal[4]	Effective ERF Acres	Current Acres % > NRA[5]
Aspen/balm of Gilead	182,505	30.45	54,820	13.50	24,671	27.8
Birch	9,450	56.25	5,711	12.50	1206	90.1
Red (Norway) Pine	34,198	63.25	21,672	25.00	8786	10.0
Jack Pine	14,339	42.00	6,071	15.00	2163	62.1
White Spruce (Natural)	1,061	68.00	727	17.00	180	62.9
White Spruce (Planted)	6,028	60.00	3,064	10.00	603	6.3
Balsam Fir	7,690	56.21	4,278	14.00	1085	63.8
Oak (<60)	9,468	70.00	5,952	20.00	1920	93.4
Oak (>=60)	6,458	44.20	2,807	13.00	839	15.2
BSL (SI 29-39)	23,461	53.90	12,930	14.00	3285	37.4
BSL (SI >=40)	4,217	43.18	2,343	11.00	434	65.2
Tamarack	44,269	37.24	16,107	14.00	6198	31.2

[1] Timberland Acres: Forestry and Wildlife lands considered available for timber harvest.
[2] Prescribed ERF %: percentage goal of the timberland acres in designated as ERF.
[3] Prescribed ERF Acres: acres designated as ERF.
[4] Effective ERF % Goal: Percent goal of cover type timberland acreage to be managed beyond the normal rotation. Effective ERF is the percent of the timberland acreage that is above the normal rotation age.
[5] Percent of timberland acreage older than the normal rotation age(s) established for the cover type.

The Effective ERF Percent Goals as identified in Table 3.1d, were used as a guide during treatment level modeling of each cover type to maintain acceptable amounts of old forest and effective ERF through time. Using the effective ERF percent goals, Table 31e identifies effective ERF percentages resulting over the five-decade plan implementation period.

Table 3.1e Effective ERF Percent 2007 – 2057

Cover Type	2007	2017	2027	2037	2047	2057	DFFC Goal*
Aspen/Balm of Gilead	9.7%	9.0%	10.2%	13.3%	14.9%	14.6%	13.5%
Birch	54.3%	37.5%	24.2%	13.0%	5.6%	4.0%	12.5%
Red (Norway) Pine	6.3%	10.1%	11.3%	11.9%	12.6%	10.0%	25.0%
Jack Pine	28.5%	16.5%	11.1%	7.1%	7.7%	13.6%	15.0%
White Spruce Planted	4.1%	6.7%	5.5%	10.7%	8.3%	10.8%	10.0%
White Spruce Natural	12.6%	12.2%	15.0%	25.2%	21.5%	19.1%	17.0%
Balsam Fir	34.6%	27.8%	21.3%	14.7%	7.4%	11.4%	14.0%
BSL (SI 40+)	34.9%	32.6%	26.0%	20.4%	17.4%	14.7%	11.0%
BSL (SI 29-39)	22.0%	19.4%	20.1%	15.4%	12.4%	8.4%	14.0%
Oak <60	57.8%	44.6%	29.3%	22.2%	12.7%	4.9%	20.0%
Oak >60	6.6%	26.1%	27.2%	27.0%	19.2%	13.8%	13.0%
Tamarack	22.2%	21.8%	14.6%	13.8%	12.2%	7.8%	14.0%

*DFFC Goal provided by Statewide ERF Workgroup

A2a. 5 Distribute ERF stands across the landscape consistent with ERF policy.

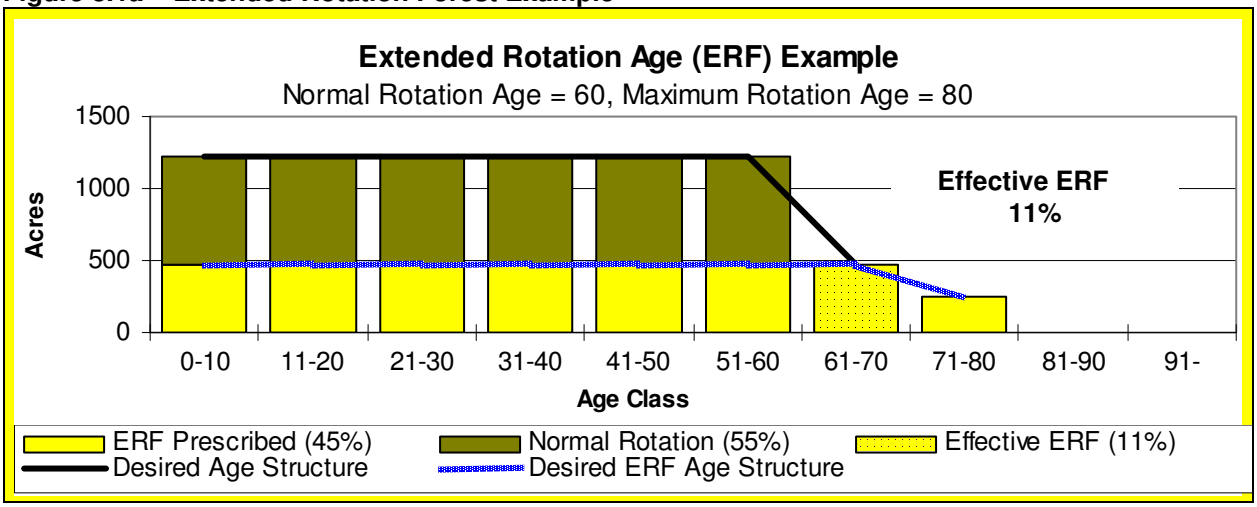
In identifying ERF on the landscape, the CP-PMOP Planning Team used the ERF goals by cover type as provided by the Statewide ERF Workgroup. In distributing ERF across the landscape the ERF percentage goals were allocated to each Forestry Area based on the cover type percentages of each individual Forestry Area to total cover type acreage within the two subsections.

A2a. 6 Prescribe ERF stands across all age classes to maintain a constant supply of effective ERF.

The amount of prescribed ERF was determined by modeling to provide the desired amount of effective ERF by cover type as the DFFC age-class distribution is achieved. Table 3.1d shows the percentage of prescribed ERF necessary to achieve the effective ERF, and the current acreage, by percent, over the normal rotation by cover type. Designation of ERF stands included strategies to maintain similar acreages in each age class over time and to provide for a sustainable supply of old forest and old forest benefits. Fluctuations in the amount of effective ERF will be seen until a balanced age-class distribution is reached, after which, fluctuations may occur periodically due to major disturbances such as wind or fire. See the Figures in Chapter 4, Cover type Management Recommendations that portray the ERF acreage by age-class distributions for each decade from 2017 through 2057, resulting from application of the treatment levels.

In describing and understanding ERF levels, two terms are used: Prescribed ERF and Effective ERF. Prescribed ERF is the cover type acreage designated for management as ERF. Stands designated as ERF will be held beyond the recommended normal rotation (harvest) age out to the appropriate age at or before maximum rotation age(s). A stand at any age can be prescribed as ERF. Effective ERF is defined as the portion of the prescribed ERF acreage that is actually over the normal rotation age for the cover type. Figure 3.1a illustrates an Extended Rotation Forest Example showing prescribed ERF and effective ERF for a cover type that has an even-aged class distribution with a declining acreage from normal rotation age to the maximum rotation age.

Figure 3.1a Extended Rotation Forest Example



A2a. 7 Manage ERF stands in even-aged cover types to achieve a declining age-class structure from normal rotation age to maximum rotation age.

Extended rotation forests are representative of old forest characteristics. In implementing this strategy, ERF levels in an age class will be adjusted through specific stand treatments over time. Planning for desired amounts of old forest was a factor in treatment level considerations. Holding non-ERF stands past the established normal rotation age ensures higher levels of old forest on the landscape, as well as helps to balance the age classes. In some cover types, because stands will not be held past their established maximum rotation age, a temporary drop below desired levels will occur for one or two

decades. Some cover types exceed the ERF DFFC because of the need to hold some stands past normal rotation age to move more quickly toward meeting the goal of balancing the age classes.

Table 3.1f identifies the projected old forest percentage by cover type resulting from application of the treatment model spreadsheets to each even-aged managed cover type.

At the end of the CP-PMOP 10-year plan implementation period (FY2018), the percentage of acres over normal rotation age will be reduced for all cover types except oak (high site index), red pine and white spruce planted. This acreage provides old forest conditions. For most cover types the percentage of old forest remains higher out through the decades than the DFFC goal because of the large acreages currently over the normal rotation ages.

Table 3.1f Old Forest: Percent of Managed Acres Over Normal Rotation Age

Cover type	Percent at start of Decade						
	2007	2017	2027	2037	2047	2057	DFFC Goal*
Aspen/BG	27.8	15.8	14.9	18.0	17.3	18.4	13.5%
Birch	88.0	65.0	38.8	19.9	8.2	5.6	12.5%
Jack Pine	62.1	33.8	17.9	12.4	11.7	27.5	25.0%
Balsam Fir	63.8	44.9	28.8	17.0	9.1	16.8	15.0%
Tamarack	61.2	43.9	30.9	30.1	26.2	20.9	10.0%
Oak <60	92.0	61.6	35.2	25.8	15.4	6.2	17.0%
Oak >60	15.2	44.1	48.8	39.7	24.6	13.8	14.0%
BSL 23-39	37.2	33.9	30.2	23.4	19.4	15.1	11.0%
BSL >40	62.3	53.6	41.6	30.0	24.0	18.8	14.0%
Red (Norway) Pine	8.7	12.0	12.1	11.9	12.6	10.1	20.0%
White Spruce Natural	16.7	12.9	15.0	25.2	30.5	19.1	13.0%
White Spruce Planted	6.3	6.7	5.5	17.3	15.5	17.9	14.0%

*Provided by the Statewide ERF Workgroup

A2a. 8 Maintain the current acreage of designated Old Growth stands.

The old growth stands that were designated as a result of the *Old Growth Forest Guidelines* process, completed in 2003 will generally be retained. In addition, a process has been identified in the *Old-growth Guideline Amendment # 2* by which acres of old growth that meet accepted criteria may be added, or acres deleted based on ongoing planning and discussions among DNR divisions throughout the 10-year plan implementation period. The goal is to maintain the acreage and previously identified stands of old growth forest statewide. Management of designated old growth stands and the surrounding special management zones (SMZs) and old forest management complexes (OFMCs) will be implemented consistent with all *Old Growth Forest Guidelines* and *Amendments*. Consideration to designate additional stands or remove currently designated old growth stands will also follow policies outlined in the *Old Growth Forest Guidelines and Amendments*.

Table 3.1g identifies the old growth stands and total acres by cover type as designated in the CP-PMOP. These stands are designated acres and reserved from harvest during this plan implementation period.

Table 3.1g Designated Old Growth for the CP-PMOP Subsections

Old Growth Type	Total Cover Type Acres on State Lands in these Subsections	Number of Stands Designated Old Growth	Total Designated Old Growth Acres	Percent of Cover type Designated as Old Growth
Ash	14,202	21	390	3%
Cedar	12,578	14	967	8%
Lowland Hardwoods	2,657	14	293	11%
Northern Hardwoods	16,141	59	1,726	11%
Red (Norway) Pine	35,144	59	956	3%
Oak	16,058	8	112	1%
White Pine	2,002	21	453	23%
Total Designated Old Growth	**98,782**	**196**	**4,896**	**5%**

In addition to designating old growth stands, OFMCs are also delineated. OFMCs were required under Department policy directives adopted prior to development of the CP-PMOP SFRMP. OFMCs include stands adjacent to designated old growth stands and are managed to complement and protect the old growth attributes of the designated stands. This includes managing for the unique goals of a SMZ, and extended rotation forest (ERF) in the vicinity of designated old-growth stands.

Table 3.1h identifies total stands and acres associated with OFMCs by cover type in the CP-PMOP.

Table 3.1h Acres by Cover Type of stands affected by an OFMC

Inventory Cover Type	Total Cover Type Acres on State Lands in these Subsections	Number of Stands in OFMC	Total Acres in OFMC	Percent of Cover Type
Ash	14,202	21	571	4.0%
Lowland Hardwoods	2,657	8	96	3.6%
Aspen	180,606	168	2,633	1.5%
Birch	9,653	16	290	3.0%
Balm of Gilead	2,662	2	12	0.5%
Northern Hardwoods	16,163	43	720	4.5%
Oak	16,103	21	259	1.6%
White Pine	2,027	5	37	1.8%
Red Pine	35,128	46	754	2.1%
Jack Pine	14,458	21	283	2.0%
White Spruce	7,080	4	107	1.5%
Balsam Fir	7,752	19	302	3.9%
Lowland Black Spruce	27,786	16	168	0.6%
Tamarack	44,275	20	572	1.3%
Cedar	13,195	47	674	5.1%
Stagnant Tamarack	4,209	3	455	10.8%
Stagnant Cedar	10,142	15	272	2.7%
Cut over area	4,781	5	57	1.2%
Lowland Grass	13,249	8	148	1.1%
Upland Grass	3,483	2	58	1.7%
Lowland Brush	54,746	60	1,345	2.5%
Upland Brush	1,129	1	7	0.6%
Industrial Development	1,340	2	13	1.0%
Recreational Development	333	3	10	3.0%
Roads	1,327	4	27	2.0%
Permanent Water	13,070	27	371	2.8%
Non-permanent Water	10,370	12	200	1.9%
Marsh	47,665	45	1,154	2.4%
Muskeg	4,632	3	29	0.6%

A2a. 9 Manage designated old-growth stands and OFMCs according to individual OFMC plans and DNR *Old Growth Management Guidelines.*

OFMCs were designated consistent with the process outlined in Appendix D (*Process Used to Determine Old Forest Management Complexes).* Designating OFMCs was a preliminary step to the CP-PMOP SFRMP planning process, (required under prior Department policy). The OFMCs as designated, are summarized on Table 3.1h. In addition, acres of EILC were also identified as a preliminary step to the SFRMP planning process (See Appendix F, *Ecologically Important Lowland Conifers: Stand Designation Process*). These EILC acres will be evaluated for their potential as "old growth". Approximately twice as much EILC acreage was identified compared to what is expected to be designated old growth because currently designated old growth stands do not include the lowland conifer types such as black spruce,

tamarack and cedar. Once old growth is identified from the EILC inventory, non-old growth EILC will be returned to the forest timberlands inventory.

Where OFMC plans have been completed, forest management will follow the management plans for designated old-growth stands and the surrounding acres. Foresters will use the *DNR Old-Growth Forest Guidelines, Amendments #5 and #6* as guides.

A2a. 10 Continue to prescribe ERF stands adjacent to old growth to create OFMCs consistent with DNR OFMC policy.

A2a. 11 Prescribe ERF stands in steep areas, inaccessible terrain, riparian areas, habitat areas, travel corridors, and visual corridors to achieve desired old forest attributes consistent with DNR OFMC policy.

As ERF stands were selected by DNR staff, stands were frequently designated in blocks to protect and enhance old growth and riparian corridors. Also, ERF facilitates patch management by maintaining some old patches now and ensuring that some patches will be held beyond normal rotation age in the future. During the selection of ERF stands, even-aged stands in riparian areas and adjacent to designated old growth were given priority for ERF designation. Site-level forest management guidelines recommend managing for longer-lived conifers throughout the landscape. In many cases, however, stands located in inaccessible terrain were tagged "inoperable" and excluded from designation as prescribed ERF.

A2a. 12 Consider ECS and range of natural variation (RNV) when identifying sites capable of growing older stands and/or providing winter cover and food sources for wildlife.

A2a. 13 Give priority to designating ERF in areas of the landscape that have historically supported the oldest forests and highest proportion of older forests.

In designating ERF by Forestry Areas, department staff (including Ecological Resources and Wildlife) had the opportunity to consider the historical and spatial distribution of old forests. Special consideration was given to designating ERF stands adjacent to designated old growth forests to further the objectives of OFMCs.

DFFC Statement
ERF will be achieved in the amounts identified on Table 3.1e.

Focused Issue A3 What is the appropriate amount, type and distribution of young early-successional forest?

GDS A3a Forests managed for young early-successional stages will be distributed across the landscape.

In the context of this GDS, "young early-successional forest" is represented by aspen, balm of Gilead, birch, and jack pine cover types in the 0-30 year age group. The amount of young forest to be sustained over time will be determined by desired long-term cover type acres and a balanced age-class distribution for these cover types. These four cover types comprise 53 percent of the total timberland acres in the CP-PMOP landscape. The 0-30 age group of aspen, balm of Gilead, birch, and jack pine cover types comprises 55 percent of the timberland acres in these cover types. Historically, younger forests may have been more prevalent along the western portions of these subsections, where they were subjected to frequent fires.

Young early-successional forest will be adequately represented over time using regulated harvesting in the aspen, balm of Gilead, birch, and jack pine cover types. Jack pine stands in the central floristic region generally don't originate as fully stocked stands (see Appendix R *Potential Pine Woodlands Areas*). Most harvest will occur through even-aged treatment. In appropriate areas, harvest prescriptions will attempt to mimic the intense wildfires and wind events that occurred naturally to initiate fully stocked, early successional forest. Silvicultural treatments which result in perpetuation of forest floor flora and

native plant community features will be favored when possible, particularly in the jack pine cover type. A variety of harvest sizes will be used while maintaining existing large patches and creating opportunities for large patches in the future by grouping of harvest activities.
For aspen, balm of Gilead, and jack pine, emphasis will be on maintaining an adequate amount of young age classes on the landscape through regulated harvest. For birch, the focus will be on increasing regeneration of birch stands back to birch, during this 10-year plan implementation period. Existing birch stands are being lost to natural conversion due to the over mature nature of many of these stands.

Moving toward and eventually maintaining a balanced age-class distribution will ensure that young forest (0-30 years old) exists on the landscape over time. The percentage of young forest per decade was considered when the 10-year treatment levels were determined. This ensured that there would be adequate young forest over the 50-year plan implementation period. In some cover types, higher levels of young forest will occur in the initial decades due to the accelerated treatment of the acres currently over the rotation ages. Table 3.1i summarizes the projected percentage of young forest by decade by cover type. This table shows that at the end of the 10-year plan implementation period there will be more young forest in all cover types except red pine and white spruce.

Table: 3.1i Young Forest Summary: Projected Percent of Cover type 0-30 Years Old

Cover Type	DFFC %	2007	2017	2027	2037	2047	2057
Aspen/BG	64	62	63	58	61	60	59
Birch	53	6	32	57	75	61	50
Jack Pine	65	32	58	75	77	58	49
Balsam Fir	57	14	37	63	80	57	42
Black Spruce Lowland 23-39	27	14	23	30	37	32	29
Black Spruce Lowland >40	41	19	26	32	47	46	44
Oak <60	48	4	34	61	73	47	34
Oak >60	33	3	23	41	57	52	47
Red (Norway) Pine	23	50	27	20	15	17	18
Tamarack	43	12	32	50	55	40	29
White Spruce Natural	42	40	32	36	35	38	45
White Spruce Planted	54	68	51	48	44	50	55

Strategies

A3a. 14 Consider ECS characteristics when locating sites capable of supporting young early-successional forests.

As field foresters site-visit stands during the 10-year plan implementation period, a *Silvicultural Prescription Worksheet* will be prepared. The purpose of the *worksheet* is to provide a process by which foresters can assess all site factors that may affect stand management. Those factors include ECS information such as land type association (LTA); the NPC; and, growth stage of the dominate species. As field foresters determine stands capable of supporting young forests, these ECS characteristics will be considered.

In implementing this strategy, priority will be given to cover types where acreage is declining on these landscapes. Of the four cover types associated with young, early successional forests (aspen, balm of Gilead, birch, and jack pine), jack pine and birch cover types are declining in total acres.

A3a. 15 Move aspen/balm of Gilead, paper birch, and jack pine cover types toward a balanced age-class structure**.**

A3a. 16 Maintain the amount of the birch cover type and the percent of birch as a stand component during the initial10-year plan implementation period.

This strategy will be implemented by increasing the treatment level for the birch cover type, with the goal to regenerate most birch harvest sites to well-stocked young birch stands, and monitor the success of these tactics.

A3a. 17 Decrease the amount of birch as a cover type and stand component during subsequent 10-year planning periods (through five decades).

A3a. 18 Include areas of young, early-successional forest, adjacent to areas of extensive or expansive old forest (i.e., ERF, old growth, or OFMC).

A3a. 19 Maintain young, early-successional forest, in a variety of patch sizes to provide habitat for associated species.

DFFC Statement
Young forests will be distributed across the subsections in the cover types and percentages consistent with Table 3.1i.

3.2 Primary Issue Area: Forest Composition

Focused Issue B1 What is the appropriate forest composition at the landscape level and how will the important tree species that have declined, be restored?

GDS B1 Forest composition will be managed according to ecological classifications to more closely reflect vegetation that developed under natural disturbance regimes.

Ecologic, economic, and social considerations used in developing the vegetation change goals for these subsections included information on current and historic forest composition, natural disturbance regimes, ecological classifications, wildlife habitat, forest insects and disease, forest productivity, recreational values, and aesthetics.

Within the CP-PMOP subsections, forest information was compiled for cover type/tree species and spatial summaries for multiple land ownerships (see Appendix N, *Land Type Association Assessment and Analysis Documents*). These *documents* allowed DNR staff to evaluate and compare forests in these subsections with the conditions consistent with those found under natural disturbance regimes. The CP-PMOP Planning Team reviewed and approved the forest composition goals, targets, and strategies that were recommended through the DFFC setting process (see Appendix G, *Process Used to Determine Forest Composition Goals*).

The CP-PMOP Plan identifies 10 and 50-year cover type DFFC acreage goals that balance acreage increases and decreases within subsections. Projected cover type treatment levels and cover type change goals will be used over the 10 and 50 year plan implementation periods to achieve the DFFCs (See Appendix H, *Ten and Fifty-Year Cover Type Conversion Goals*).

The proposed cover type change goals reflect increases of the acreage of cover types that have declined, generally longer-lived conifers, from hardwood cover types that are currently over represented. These DFFCs were designed to be aggressive but achievable and appropriate to the landscape. These increases will be implemented while maintaining or enhancing important wildlife habitats and plant communities, and providing a sustainable level of forest products.

Table 3.2a identifies the desired cover type acreage changes over 10-years and 50-years reflecting the DFFCs as applied to the forest cover types in the CP-PMOP.

Table 3.2a Desired Cover type Acreage Changes – 10-years and 50 Years

CP-PMOP		DFFC - 2017			DFFC - 2057		
Cover type	**Existing Acres**	**Acres**	**+/- Acres**	**(+/-)% Change**	**Acres**	**+/- Acres**	**(+/-)% Change**
Aspen/balm of Gilead	182,745	179,945	-2,800	-2%	168,376	-14,369	-8%
Ash/Lowland Hardwoods	16,856	16,256	-600	-4%	15,056	-1,800	-11%
Tamarack	44,269	45,069	+800	+2%	46,669	+2,400	+5%
Birch	9,645	9,645	0	0%	9,145	-500	-5%
Balsam Fir	7,750	7,550	-200	-3%	7,494	-256	-3%
White Pine	2,002	2,452	+450	+23%	4,252	+2,250	+112%
Red (Norway) Pine	35,144	35,144	0	0%	41,159	+6,015	+17%
Jack Pine	14,419	19,919	+5,500	+38%	26,588	+12,169	+84%
Black Spruce Lowland	27,678	27,678	0	0%	27,678	0	0%
White Spruce	7,088	7,038	-50	-1%	7,233	+145	+2%
Cedar	12,578	12,878	+300	+2%	13,239	+661	+5%
Northern Hardwoods	16,141	15,891	-250	-2%	14,391	-1,750	-11%
Oak	16,058	15,308	-750	-5%	14,308	-1,750	-11%
Total Acres	**392,373**	**394,773**	**2,400**		**395,588**	**3,215**	

In determining sites most conducive to cover type changes, foresters will use the following resources:

1. Preliminary stand-level direction recorded during development of the 10-Year Stand Exam Lists (e.g., preliminary stand prescriptions, preliminary management objectives, comments and the associated stand management recommendations and considerations);
2. Potential conversion sites and associated scores for cover types with planned increases (see Appendix K, *Stand Scoring System*);
3. ECS/NPC evaluations and considerations;
4. Conversion acreage allocations by Forestry Area;
5. CP-PMOP Plan GDS and strategies (Chapter 3 of the CP-PMOP Plan;
6. Cover type Management Recommendations (Chapter 4 of the CP-PMOP Plan);
7. Priority LTA for cover type increase (See Appendix N, Land Type Association *Assessment and Analysis Documents*);
8. Minnesota County Biological Survey (MCBS) site management recommendations;
9. Designated patch areas (See Appendix Q, *Patch Management in the CP-PMOP* and Appendix R, *Potential Pine Woodland Areas*); and,
10. *Silvicultural Prescription Worksheet* (see Appendix E).

Methods to change stand overstory composition will range from intensive site preparation to managing for the understory species. As stand prescriptions are applied, field foresters will favor less intensive efforts and more natural approaches including the following:

1. Allow natural succession of some aspen/balm of Gilead, birch and hardwood stands to conifers;
2. Use uneven-aged management to develop multi-aged conifer stands;
3. Manage plantations to resemble natural stands;

4. Use prescribed fire to maintain forest communities dependent on fire;
5. Use methods that favor natural regeneration, such as seed trees, harvest timing, slash management, etc.;
6. Increase mixed forest conditions in some stands in all cover types;
7. Utilize timber harvest systems or methods that protect advanced regeneration;
8. Seed or plant sites that don't contain an adequate natural seed source;
9. Vary silvicultural treatments across the landscape to promote the development of diverse stands; and,
10. Prescribe ERF in some stands to allow advanced conifer regeneration to develop.

Strategies

B1a. 20 Consider the MFRC's *North Central Landscape Region Plan* forest composition goals and objectives**.**

DNR staff routinely considers and have incorporated MFRC's north central landscape planning efforts, and also have incorporated the Recommended Desired Outcomes, Goals and strategies included in the *North Central Landscape Region Plan* dated January 27, 2004 in this CP-PMOP Plan. The GDSs, strategies and DFFCs identified in this CP-PMOP Plan are consistent with those recommended in the MFRC's *North Central Landscape Region Plan*.

The following identifies the desired future forest conditions from the MFRC's *North Central Landscape Region Plan:*

1. There will be an increased component of red, white and jack pine, cedar, tamarack, spruce and fir.
2. The forest will have a range of species, patch sizes, and classes that more closely resemble natural patterns and functions within this landscape.
3. The amount of forest land and timberland will not decrease using FIA definitions for timberland and forest land. Large blocks of contiguous forest land that have minimal inclusion of conflicting land uses will be created and/or retained for natural resource and ecological benefits, and to minimize land use conflicts (hereafter referred to as "natural resource emphasis areas).
4. In large blocks of contiguous forest land retain critical natural shoreline on lakes for scenic, wildlife, water quality, and other natural resource values.

Consistency with the above MFRC's desired future forest conditions can be found throughout the GDSs, strategies and DFFCs of the CP-PMOP Plan.

B1a. 21 Increase mixed forest conditions in most stands in selected cover types.

Mixed forest conditions in this plan refer to vegetative composition and structure that is moving toward the mix and relative proportion (e.g., dominated by common, occasional, or scattered) of species found in the NPC for that site.[1] Currently, many stands are composed of a mixture of species, but the proportion of the ecologically dominant species has declined. The lack of fire in some forests has led to an altered forest composition (such as more balsam in fire-dependent sites). Therefore, a key strategy in moving forest composition that considers range of natural variation (RNV) is the promotion of mixed-forest conditions while managing and maintaining cover types. Tree species mix and proportion depends not only on the targeted growth stage (based on the rotation age for the desired cover type) but also species found in older growth stages.

Mixed forests that are managed toward the NPC composition, structure, and natural disturbance regimes provide the range of conditions to which native organisms have adapted. Mixed forests are more likely to provide the variations in moisture, light, and nutrients necessary for the development of diverse microsites, and the compositional and structural components necessary for the development of niches.

[1] Minn. DNR. 2003. *Field Guide to Native Plant Communities of Minnesota: The Laurentian Mixed Forest Province.* Ecological Land Classification Program, Minnesota County Biological Survey, Natural Heritage and Nongame Research Program. Minnesota Department of Natural Resources, St. Paul, MN 55155.

Mixed forests increase the likelihood that natural successional pathways will develop toward desired NPC composition and growth stages. A mixed forest may ameliorate damage from wind, fire, drought, and flood. The increased tree species diversity provided in mixed forests also increases the likelihood that forests will persist in the face of global climate change. Mixed forests are preferred because they offer social, economic, and ecological benefits not found in single species forests.

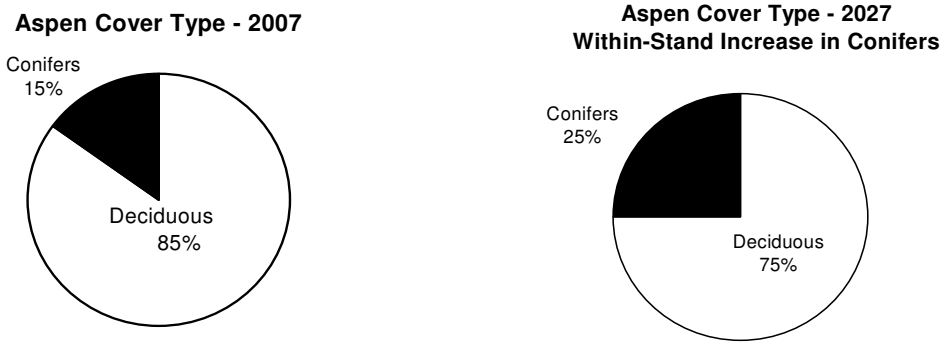
Mixed forests can buffer outbreaks of insect or disease infestations. Some examples of pest problems that can affect single-species stands more than mixed stands are jack pine budworm, spruce budworm, yellow-headed spruce sawfly, pine and tamarack bark beetles, forest tent caterpillar, hypoxylon canker, dwarf mistletoe, and blister rust. In other cases, certain mixtures of tree species may increase insect and disease damage (e.g., a balsam fir component in a white spruce stand will increase the risk of spruce budworm damage to the spruce). When managing for a mixed forest, the effects of insect or disease infestations on the stand will be considered.

While clearcutting for even-aged management will continue, in both single- and mixed-species stands, mixed forests provide additional silvicultural treatment options. More specific management recommendations by cover type to promote mixed forest conditions are provided in Chapter 4, Cover type Management Recommendations.

Implementation of this strategy may range from application of the MFRC's *Voluntary Site-Level Forest Management Guidelines* (e.g., legacy patches and conifer retention) in harvest operations to other management such as mechanical site preparation, prescribed burning, seeding, and planting within-stand. The strategy to increase mixed forest conditions is to favor species found in NPCs appropriate to the site, especially tree species that have significantly declined from past levels such as white pine, red pine, jack pine, white cedar (lowland and upland), white spruce, tamarack (lowland and upland) and birch.

Figure 3.2a illustrates an example of an increase in mixed forest conditions within an aspen stand. In this example, in 2007, the deciduous species are primarily aspen (e.g., 60 percent) with paper birch and other hardwoods present. Conifer species are primarily white spruce, balsam fir, white pine, and red pine. Through the application of appropriate strategies as identified in this plan, by 2027 an increase in conifers within the aspen stand (from 15 percent to 25 percent) occurs, but the stand remains primarily comprised of aspen and inventoried as an aspen cover type. Desired species composition would vary with NPC.

Figure 3.2a Generalized Example of an Increase in Mixed Forest Conditions



B1a. 22 Decrease the acres of aspen, northern hardwoods, oak, ash, and lowland hardwoods to favor conifer cover types.

Evaluation and understanding of cover type trends is important to determine the appropriate cover type changes to be included in this plan. The cover type change information has been evaluated as both recent trends and historic trends. Specific observations for general cover types is difficult as many factors will influence the trend such as: same cover type found in both upland and lowland sites; land ownership; trends across subsections or across LTAs may not be consistent; and within any one general cover type, several tree species are grouped, some of which may be increasing while others may be deceasing.

Beyond these complicating factors, the following general observations concerning the trends of cover types in these subsections can be made:

Considering recent trends:

1. The following cover types are increasing: red pine, white pine, white spruce, northern hardwoods, oak, tamarack, ash, and lowland hardwoods.
2. The following cover types are decreasing: balsam fir, jack pine, aspen, birch, black spruce, and cedar.

Considering historic trends:

1. The following cover types have increased: balsam fir, aspen, birch, northern hardwoods, oak, ash, and lowland hardwoods.
2. The following cover types have decreased: jack pine, red pine, white pine, white spruce, black spruce, cedar, and tamarack.

B1a. 23 Increase the acres of the white pine, jack pine, tamarack and northern white cedar cover types.

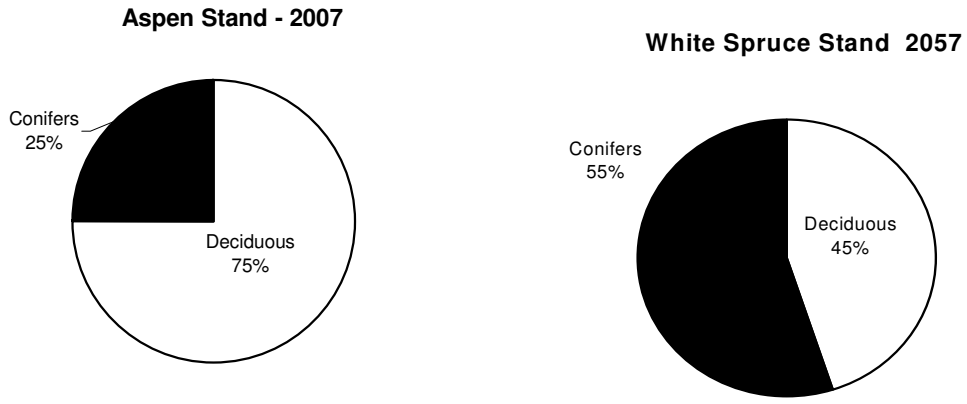
From the stands identified on the 10-Year Stand Exam List, this strategy will be implemented by using available tools and resources to guide the on-site evaluation of stands for conversion from one cover type to another or managing for mixed forest conditions (species composition and stand structure). Appendix S, *Stands with a White Pine Component*, identifies stands included on the 10-Year Stand Exam List that include white pine as the primary or as a secondary cover type component.

To meet these goals, foresters are advised to follow the specific cover type management recommendations as identified in Chapter 4, *Cover type Management Recommendations* such as:

1. Allow some stands to convert through natural succession to long-lived conifer cover-types without harvest. Emphasize this in stands with adequate advanced regeneration of long-lived conifer species.
2. Artificially convert some stands through mechanical site preparation, prescribed burning, planting, or seeding.
3. Selectively harvest some stands to move toward the desired cover type and within-stand composition.

Figure 3.2b illustrates an example of an aspen stand being converted to a white spruce stand over time. In 2007, the aspen stand is 60 percent aspen and 15 percent other hardwoods. Conifer species comprise 25 percent of the stand, consisting primarily of white spruce with some balsam fir, white pine, and red pine. Through stand treatments between 2007 and 2057, such as clearcut with reserves, selective harvest, site preparation, or tree planting, the stand has converted to become primarily conifers. In 2057, aspen comprises 30 percent of the stand and white spruce is 35 percent of the stand. With conifers becoming the predominant species group (55 percent) in the stand and white spruce comprising the largest portion, the cover type is now classified as white spruce. Species composition would vary with NPC for the site. Note that the stand retains a significant component (45 percent) of deciduous species such as aspen.

Figure 3.2b Generalized Example of an Increase in Conifer Cover type Acres: Aspen Stand Converts to a White Spruce Stand



B1a. 24 Increase the acres of the cedar and tamarack cover types on both upland and lowland sites.

Data from the CP-PMOP planning area suggests a long-term decline in lowland cedar and tamarack acreage. The MFRC *North Central Landscape Region Plan* recommends an increased component of upland cedar in Boreal Hardwood-Conifer Plant Communities and an increased component of upland tamarack in Boreal Hardwood-Conifer and Dry-Mesic Pine Plant Communities.

B1a. 25 Maintain the acres of the black spruce cover type on both upland and lowland sites. Despite both recent and historic black spruce declines in these subsections, the 10- and 50-year goal is to maintain current black spruce acreage on upland and lowland sites.

As shown on Table 3.2b, the acreage of the following cover types will increase during the 10-year period:

- tamarack
- white spruce (natural)
- northern white cedar (mostly lowland but some upland)
- white pine
- jack pine

The total acreage of the following cover types will decrease during the 10-year period:

- white spruce (net decrease, decreases from white spruce plantations on FD sites)
- balsam fir
- oak (on drier sites in PMOP)
- aspen
- northern hardwoods
- ash/lowland hardwoods

The acreage of the following cover types will be maintained during the 10-year period;

- birch
- lowland black spruce
- red (Norway) pine (no net change)
- balm of Gilead (generally managed with aspen)

Table 3.2b Cover Type Change Goals (DFFC) and Projected Increases and Decreases

Cover Type	10-year DFFC	50-year DFFC
Upland Conifers		
Jack Pine	38% increase	84% increase
White Pine	23% increase	112% increase
Red (Norway) Pine	maintain	17% increase
Lowland Conifers		
White Spruce	1% decrease	2% increase
Balsam Fir	3% decrease	3% decrease
Tamarack	2% increase	5% increase
Northern White Cedar	2% increase	5% increase
Lowland Black Spruce	maintain	maintain
Other Cover types		
Oak	5% decrease	11% decrease
Paper Birch	maintain	5% decrease
Aspen	2% decrease	8% decrease
Northern Hardwoods	2% decrease	11% decrease
Ash/Lowland Hardwoods	4% decrease	11% decrease

DFFC Statement

The DFFC of cover types on the landscape will be as shown on Table 3.2a. The CP-PMOP Plan will move these subsections toward more conifer cover type acreage in upland areas. Cover type increases over the next 10 years will occur in jack pine, white pine, tamarack, and white cedar. Cover type decreases will occur in the aspen, balsam fir, oak, white spruce, northern hardwoods and ash/lowland hardwoods cover types. The cover type acreages of red pine, birch and black spruce lowland will be maintained over the 10-year plan implementation period.

Focused Issue B2 What is the appropriate mix of patch sizes and forest condition on the landscape considering the impacts of fragmentation?

GDS B2a Minimize forest fragmentation and manage habitat fragmentation to provide an ecologically appropriate variety of patch sizes distributed across the landscape.

Forest fragmentation is defined as distinct contrasts between land uses, such as between heavily forested lands and agricultural lands or residential development. Forest fragmentation is more significant in the PMOP than in the CP.

Habitat fragmentation occurs where a contiguous or homogeneous forest area of a similar cover type and age is broken up into smaller, dissimilar units and is a concern in both of these subsections. Habitat fragmentation has the potential to interfere with species seasonal migration and dispersal, negatively affects survival requirements, and reduces habitat patch size to a level smaller than some animal species require. In some cases however, habitat fragmentation can be beneficial for species that thrive in forested areas with small patches and abundant edge habitats.

Forest landscapes that have evolved from traditional vegetation management practices are more fragmented and contain fewer large patches than landscapes where spatial patterns are determined primarily by natural disturbance and landform. The average overall patch size has declined nearly 50

percent since the 1930s in the north central Minnesota Drift and Lakes Plains section[1]. Incorporating spatial considerations into the CP-PMOP stand selection process and coordinating stand treatments through the life of this plan can reduce forest habitat fragmentation and maintain and promote larger patches over time.

Although the CP-PMOP Plan considered management activities of other ownerships, patch management is primarily focused on identifying opportunities that exist on large blocks of state land. To guide patch management on state lands, *a patch is defined as one or more adjoining stands that is relatively homogenous in structure, primarily in height and density, and is similar in vegetation cover and age*. Patch sizes (Table 3.2c) range from small (less than 40 acres) to large (greater than 640 acres). Patches may have smaller areas (e.g., 10-15 percent of the patch area) within them that are not in the same patch category as the main patch, such as inclusion pockets or stands, residual islands, corridors, and buffers.

Using Cooperative Stand Assessment (CSA) forest inventory data, an initial patch assessment was conducted for state lands in these subsections[2]. Patches were created in a GIS data layer by dissolving common stand boundaries between stands of the same cover type group and age-class. As part of the initial patch assessment, all stands were classified by size down to Class 5. Information on all forested patches from this assessment was then summarized and analyzed. As a result, the CP-PMOP Planning Team identified a general need for more larger and older forest patches on state lands within these landscapes. DNR staff then selected a pool of certain large patches to be considered for patch management. During meetings within Forestry Areas, designated patches were chosen from the pool. Stands within certain designated patches were assigned an ERF prescription if the patch goals included management on a longer rotation to generate an older age patch. These designated patches will be maintained or enhanced over time and their management should help ensure that a variety of large patches are retained in these subsections.

For purposes of identifying patches for patch management in the CP-PMOP Plan, designated forest patches included patch size classes 1-3 (101 acres and larger).

Table 3.2c Patch Size Classes for Patch Management in SFRMP

Size Class	Acre Range
Class 1	Greater than 640 acres
Class 2	251 - 640 acres
Class 3	101 - 250 acres
Class 4	41 - 100 acres
Class 5 - Small	Less than 40 acres

The result of this effort was identification of 146 patches that were then tagged in the forest inventory dataset and available to the Forestry Areas as the 10-Year Stand Exam Lists were prepared. Appendix Q (*Patch Management in CP-PMOP*) identifies the patches alphabetically by patch name for the CP-PMOP subsections. Coordinated management within these designated forest patches and application of the strategies below, to other forested areas, should reduce forest habitat fragmentation on state lands.

[1] Manolis, J. December 2003. *Project Summary: Results from the Minnesota Spatial Analysis and Modeling Project*. Minnesota Forest Resources Council (MFRC) and Minn. DNR.
[2] Minn. DNR. July 17,2007 Addressing Patch Management in SFRMP. SFRMP Process Guidebook IV .

Tables 3.2d and 3.2e summarize the patch designations for the CP-PMOP subsections.

Table 3.2d Designated Patch Summary by Age Class and General Forest Type (CP-PMOP Subsections)

Patch Summary by Age Class			Total Acres by General Forest Type			
Age Class	**Size Class**	**Number**	**Average Size**	**Deciduous**	**Conifers**	**Total Acres**
Old	Class 1	10	1808	3882	14197	18078
Old	Class 2	24	406	1301	8448	9749
Old	Class 3	27	154	1349	2807	4157
Total Old		**61**		**6532**	**25452**	**31984**
Intermediate	Class 1	2	2408	4815	0	4815
Intermediate	Class 2	12	410	1290	3632	4921
Intermediate	Class 3	22	156	1166	2270	3436
Total Intermediate		**36**		**7271**	**5902**	**13173**
Young	Class 1	8	2028	14950	1271	16222
Young	Class 2	16	404	4680	283	4963
Young	Class 3	25	150	1545	937	2481
Total Young		**49**		**21175**	**2491**	**23666**

Table 3.2e Designated Patch Summary by Size Class and General Forest Type (CP-PMOP Subsections)

Patch Summary by Size Class			Total Acres by General Forest Type			
Size Class	**Age Class**	**Number**	**Average Size**	**Deciduous**	**Conifers**	**Total Acres**
Class 1	Old	10	1808	3882	14197	18078
Class 1	Intermediate	2	2408	4815	0	4815
Class 1	Young	8	2028	14950	1271	16222
Total Class 1		**20**		**23648**	**15468**	**39115**
Class 2	Old	24	406	1301	8448	9749
Class 2	Intermediate	12	410	1290	3632	4921
Class 2	Young	16	404	4680	283	4963
Total Class 2		**52**		**7271**	**12363**	**19634**
Class 3	Old	27	154	1349	2807	4157
Class 3	Intermediate	22	156	1166	2270	3436
Class 3	Young	25	150	1545	937	2481
Total Class 3		**74**		**4060**	**6014**	**10074**

Strategies

B2a. 26 Inventory current and potential patches by subsection.

B2a. 27 Manage patch sizes to more closely resemble those created under natural disturbance regimes.

When implementing patch management strategies, foresters will give consideration to:

1. Harvest adjacent to other recently harvested sites to increase the size of young Patches;
2. Minimize the fragmenting of habitat with roads and forest access trails;
3. Leave live trees and snags within most even-aged managed timber harvests to mitigate the effects of habitat fragmentation; and,
4. Manage some patches as old forest, consistent with this GDS, as well as other departmental recommendations such as the Northern Goshawk Management Considerations.

B2a. 28 Retain and create larger patches, where conditions allow, through state management activities and cooperation with other landowners and forest managers**.**

B2a. 29 When applying silvicultural treatments in an area, give priority to management of whole stands, groups of stands, or entire native plant communities to further patch management goals.

B2a. 30 Coordinate plan implementation with large land managers including the U.S. Forest Service, county land departments, local governments, industrial forest land managers and nonprofit organizations to identify causes and mitigate impacts of fragmentation.

DFFC Statement

The average forest patch size on state lands and the patch size within designated forest patches will increase through implementation of this plan.

Focused Issue B3 How can landscape level connectivity between forest habitats be maintained?

GDS B3a Connectivity will be maintained between forest habitats using natural corridors and corridors maintained using forest management practices.

Because of the significant amount of public forest land in the Laurentian Mixed Forest Province, connectivity in this part of the state is likely adequate but needs to be specifically maintained as part of forest management activities. However, connectivity in some parts of these subsections, especially in the PMOP, has suffered due to forest fragmentation resulting from changes in ownership patterns, land use, and human population densities.

Maintaining habitat connectivity will allow diverse populations of wildlife to remain connected, so they can adapt and migrate in the future. Migration corridors are important because global warming will likely cause some animal species associated with the mixed coniferous-deciduous forests to move northward and others to enter the province from the south. Landscape level connectivity will also benefit biodiversity and help maintain ecologically intact landscapes.

Strategies

B3a. 31 Identify existing and potential corridors between significant forest areas and assess cooperation opportunities with other landowners.

B3a. 32 Maintain or improve important corridors between forest areas.

B3a. 33 Give priority to riparian corridors that connect significant forest areas.

Focused Issue B4 What is the appropriate mix of forest structure and growth stages for state lands within the subsections?

GDS B4a Representations of all growth stages with vertical and horizontal structural diversity will be distributed across the landscapes.

Harvest, reforestation, and protection strategies will guide management decision-making to reach a variety of objectives such as timber production, diversity of age classes, patch size distribution, native plant community retention (forest land, wetland, and open brush land communities), and connectivity (to provide habitat corridors and wildlife habitat).

Forest management prescriptions will be designed to emulate natural stand development patterns and to produce structural components found in natural stands, but will evolve in a shorter timeframe. By anticipating future patterns of forest development, foresters predict the potential for individual stands to produce specific characteristics such as a multi-layered canopy. Foresters can then develop appropriate silvicultural prescriptions and influence the rates of stand development and the types of structures, products, and habitats that forest stands actually produce. Individual stand management will vary greatly. Some stands will be managed to focus on timber production, with habitat structures such as snags and down wood incorporated. Others will be managed to produce stands that emulate habitat conditions normally associated with older forests. These stands are also expected to produce high volumes of timber.

Forests with a full range of growth stages and vertical and horizontal diversity across the landscape provide the range of conditions to which native organisms have adapted. A variety of growth stages are more likely to provide the variations in moisture, light, and nutrients necessary for the development of diverse microsites, as well as the compositional and structural components necessary for the development of niches.

Growth Stage Descriptions

1. **Young Forests and Woodlands-** are characterized as stands disturbed by timber harvest, fire, or wind where most or all of the larger trees have been killed or removed, or where brush fields have been cleared for planting; or where new trees, shrubs, and herbs no longer appear in the stand, and begin to die from shading and competition in a process called stem exclusion.

2. **Transition Forest-** This growth stage occurs after the stem exclusion process has created small openings in the canopy, when enough light and nutrients become available to allow herbs, shrubs, and new trees to grow again in the understory.

3. **Mature Forest and Woodlands-** This growth stage occurs as the process of understory re-initiation progresses where openings in the canopy persist. Shrub and herb communities are more diverse and vigorous, and two or more distinct layers of tree canopy appear.

4. **Old Forest-** This growth stage occurs when forest stands attain structural characteristics such as numerous large trees; multi-layered canopy; substantial number of large down logs; and large snags. It is not the same as old growth, although some of its structures are similar to old growth.

5. **Very Old Forests** / **Woodlands-** Typical characteristics of old growth include: moderate to high canopy closure; patchy, multi-layered, multi-species canopy with trees of several age classes, but dominated by large overstory trees with a high incidence of large living trees, some with broken tops and other indications of old and decaying wood;

numerous large, standing dead trees (snags); heavy accumulations of down woody debris; and the presence of species and functional processes that are representative of the potential natural community.

The present forest inventory for state lands does not monitor growth stages however, various growth stages can be observed in the field. The present inventory system does monitor some elements of growth stages but does not combine all the features needed into a model that can be readily monitored.

In the CP-PMOP landscapes forest cover types are managed as uneven-aged and even-aged types. The uneven-aged types can be managed to maintain old forest growth features. The even-aged cover types can be managed to include most of these growth stages, where appropriate with the LTA and other management objectives. Even-aged managed cover types that are subject to the normal rotation age harvest usually progress from the young forest stage through the mature stage at which time they are normally harvested to achieve the balanced age class objective. In the even-aged managed stands where prescribed ERF is planned, the stand will progress beyond the mature stage to the old forest structure stage and become effective ERF stands. Eventually some of the effective ERF stands may be retained to replace existing old growth stands that may not have retained their old growth functions due to catastrophic disturbance events. Old growth stands have been designated and receive management in accordance with objectives established to maintain the old-growth functions.

Strategies

Across the landscape and within the LTA's, the even-aged managed cover types will provide for a variety of growth stages important to wildlife habitat and ecological function. In addition, the cover types that are managed with an uneven aged prescription can, and do fill a valuable role in providing structural components associated with the older forest structure growth stage. These strategies will be applied to prescribed ERF and ERF stands, but if applied to all stands subjected to normal rotation management, the representation of all growth stages including vertical/horizontal structural diversity will be increased.

One primary goal from *Directions 2000, The Strategic Plan* indicates that all forest ecosystems will be healthy, resilient, and functioning. Forest ecosystem health and resilience ensures that forests can respond to disturbances and the demands society places on them. Measures of forest composition and ecosystem functions are useful in documenting forest health.

Examples of performance measures that focus on the distribution of forest plant communities, species, and ages are:

1. Acres of old growth forest by type; or,
2. Acres of forest by community or forest type and age class.

Examples of performance measures that focus on forest health are:

1. Number of species of plants and animals with significantly reduced;
2. geographic ranges or population sizes (compared to conditions resulting from natural disturbance regimes); or,
3. Tree growth rates.

B4a. 34 Retain structural components of old forest, when managing uneven-aged cover types and at the final harvest of even-aged cover types.

All stands designated for final harvest prescriptions including those subject to normal rotation age harvest and those at maximum rotations age will have live and dead trees retained that meet or exceed the MFRC *Voluntary Site-level Forest Management Guidelines*. These trees will form a population of legacy trees that will continue to provide some of the characteristics of old forest structures well into the early growth stages of the regenerating stand. The retention of these trees will not have densities high enough to have an impact on the productivity of the new stand and yet will continue to provide some of the benefits of the older forest.

The uneven age managed cover types have silvicultural treatments prescribed at intervals as the stand conditions change over time. Active management can be used to enhance and ensure the desired old-forest structures. Timeframes can be shortened to achieve those conditions. During the stand visit and

prior to setting up the harvest regulations, older and larger trees should be selected to be reserved to provide the vital functions of old-forest structures. These treatments will bring the stand to, and maintain it in the older forest structure.

B4a. 35 Use variable density techniques during intermediate stand treatment and variable retention techniques during final harvest to move selected stands toward desired growth stages and desired within-stand structure.

For a variety of forest health and economic reasons, intermediate silvicultural treatments are prescribed to stands younger than normal rotation age and ERF stands beyond normal rotation age. These intermediate treatments can be designed to manipulate the forest canopy to influence the amount of light and moisture available at the forest floor. Thinning prescriptions that allow significant light will stimulate the herb and shrub regeneration, the development of an understory, and layering in transition and mature stands. Use of variable density thinning will allow this development to be patchy in nature. The retention of a variety of the stand structures will move the stands toward the older forest structure growth stage. These treatments, applied throughout the landscape, will ensure a variety of stands of different growth stages to meet present and future forest needs.

Variable density techniques may be prescribed during the planning of timber sales and/or forest development activities. Harvest (clearcut or thinning) and planting (or seeding) would be accomplished in a pattern (clumped or dispersed) that more closely replicates patterns created after natural disturbance. For example, retain legacy patches versus scattered reserves in clearcuts to retain islands of residual vegetation that include tree species present at older growth stages.

The main objectives of variable retention are to retain the natural range of stand structure and forest functions. With retention systems, forest areas to be retained are determined before deciding which areas will be cut. Standing trees are left in a dispersed or aggregate form to meet objectives such as retaining old-growth structure, habitat protection, and visual qualities. Variable retention retains structural features (e.g., snags, large woody debris, and live trees of varying sizes and canopy levels) as habitat for a host of forest organisms. During harvest, foresters will retain tree species and diameters present at older growth stages, in clumps or dispersed, to more closely replicate patterns found after natural disturbance and include retention of large, downed logs. For example prescriptions may include leave legacy patches throughout the stand or leave islands of residual vegetation that include tree species present at older growth stages. In particular foresters will consider the legacy patch recommendations in *MRFC Voluntary Site-level Forest Management Guidelines*.

B4a. 36 Develop a methodology to measure growth stages, within-stand age diversity, plant species diversity and vertical/horizontal structure and use this methodology to quantify and monitor changes.

DFFC Statements

All silvicultural prescriptions for uneven-aged management cover types will ensure that all tree sizes, ages and species present in the stand at the time of the site-level visit will be well represented following the stand treatment.

All stands designated for final harvest prescriptions will have 15 or more scattered older live trees per acre or will have clumps that meet or exceed 5 percent of the sale acreage retained to provide future snags and cavity nesting trees.

Prescribed ERF and effective ERF stands will be assessed and if necessary will have silvicultural treatments prescribed to enhance the older forest features.

The forest inventory dataset will include a field to record the observed growth stage represented at the time of the site-level visit. All field personnel will receive the training necessary to consistently assess forest growth stages.

Cover type conversions to meet management objectives will use natural regeneration methods when possible, and minimal site preparation when artificial regeneration is necessary.

Focused Issue B5 How will native plant communities that developed under natural disturbance regimes be represented in the future?

GDS B5a The full range of common and uncommon native plant communities and the community viability that developed under natural disturbance regimes will be well represented in the future.

Thirty-four NPC classes are found in the CP-PMOP subsections. These plant communities are all well represented on state lands and include an array of community types from fire-dependent conifers to hardwoods, swamps, bogs and peatlands. The total extent of the natural community types has not been mapped, but releves do give ecologists information to map potential extent within the state for each of the various community types. The description of these NPCs and their extent within the state are found in the *Field Guide to the Native Plant Communities of Minnesota-The Laurentian Mixed Forest Province.*

Minnesota's NPCs have been evaluated and assigned an S-rank based on the Heritage Conservation Status Rank system developed by *NatureServe*. The resulting S-Rank is a value (S1 through S5) assigned to a NPC type (or subtype) that best characterizes the relative rarity or endangerment of the NPC statewide.

Within the CP-PMOP subsections there exist eight NPCs with a status rank of S1 (Critically Imperiled) or S2 (Imperiled) and are listed in Appendix J (*Native Plant Communities)*. Where Minnesota County Biological Surveys have been published or field surveys completed, the known locations of these rare plant community types (S1 and S2) have been documented. Because MCBS prioritizes survey efforts within MCBS sites, most documented locations of rare NPCs are within MCBS sites. However, there may also be locations of rare NPCs documented in areas outside MCBS sites. Field foresters are advised to observe and record all occurrences of rare NPCs and consider potential impacts as treatments are prescribed.

Strategies

B5a. 37 Use ECS information to assist in determining management direction for stands on state lands.

B5a. 38 Protect significant plant communities as they are identified.

B5a. 39 Encourage initiation of the Minnesota County Biological Survey in Beltrami, Itasca and Koochiching counties and completion of the survey in all other counties in the CP-PMOP.

B5a. 40 Delineate and manage ecologically important lowland conifer sites to enhance their unique characteristics.

B5a. 41 Document and manage known locations of NPCs with a statewide rank of Critically Imperiled (S1), or Imperiled (S2), and other plant communities that are rare in the landscape to maintain their ecological integrity.

These rare NPCs can be located outside of cover types managed as state timberland (e.g., swamp, marsh, or bogs). Where rare NPCs occur associated with a timberland cover type, vegetation management within and adjacent to these NPCs will protect, maintain, or enhance the ecological integrity of NPCs. Some locations of NPCs of concern are best managed by avoidance, while other sites can either be maintained or enhanced by using the appropriate harvesting or other forest management activities.

DNR staff is trained in the use of the *Field Guide to the Native Plant Communities of Minnesota: The Laurentian Mixed Forest Province* for identification of NPCs. Additional ECS products, such as silvicultural interpretations for management of NPCs, have been developed for use by field staff for implementing ECS-based management on state lands. The *Silvicultural Prescription Worksheet* will also provide direction on ECS considerations as stand prescriptions are developed.

B5a. 42 Identify stands with known locations of Critically Imperiled (S1) or Imperiled (S2) NPCs and monitor those stands during Annual Stand Exam List review.
To ensure that rare NPCs are taken into consideration, review by all divisions (Forestry, Management Section of Wildlife and Ecological Resources) occurs at the following points:

1. during development of the 10-year Stand Exam List;
2. before the 10-year Stand Exam List is published to seek public review as stated in the *Interdisciplinary Coordinating Framework;* and,
3. during review of Forestry Area Annual Stand Exam Lists.

Following any of these reviews, staff may determine if adjustments to proposed treatments are needed to protect, maintain, or enhance the ecological integrity of rare NPCs.

3.3 Primary Issue Area: Riparian / Aquatic Areas

Focused Issue C1 How can the impacts of forest management on permanent wetlands, wetland inclusions, and seasonal ponds be addressed?

GDS C1a Forest management on state lands will protect permanent wetlands and seasonal ponds.

Wetland areas include lowland forested areas (such as black ash, black spruce, tamarack, and white cedar cover types), lowland brush and lowland grass cover types, and seasonal ponds. When applying stand treatments these areas will be protected using site-level forest management guidelines different than those required for riparian areas (i.e., adjacent to lakes, streams, and rivers or permanent open water ponds). The intent of these site-level guidelines is to protect the resource and maintain its ecological function.

An overall objective is to meet or exceed the Forest Stewardship Council (FSC) and the Sustainable Forest Initiative (SFI) certification standards by avoiding impact to riparian and aquatic areas potentially affected from forest management practices.

Strategies

C1a. 43 Implement the MFRC *Voluntary Site-level Forest Management Guidelines*.

Representative *Guidelines* specific to seasonal ponds and wetlands include the following:

1. Identify, establish, and protect filter strips;
2. Avoid disturbances such as ruts, soil compaction, excessive disturbance to litter layer, and addition of fill;
3. Ensure, through timber sale planning and administration, that skidding and other equipment operation in upland stands takes place outside of wetland inclusions and seasonal ponds;
4. Ensure recommended leave tree guidelines are implemented, including leave trees in clumps, islands or strips centered around or that coincide with wetland inclusions and seasonal ponds;
5. Develop and implement prescriptions that consider site-specific conditions such as soils, topography, hydrology, past management, and existing and desired vegetation that reduce negative impacts;
6. Use routes with least impact when creating freeze-down winter crossings when they are necessary;
7. Employ measures to maintain normal seasonal flows within wetland inclusions and seasonal ponds. Use slash distribution, dips, and water-bars as appropriate to more evenly distribute concentration of water flow;
8. Site and design access routes to minimize interruption of water flow;

9. Distribute age diversity across the sub-watershed to promote consistent variability of water flow across the landscape; and,
10. Ensure adequate vegetation to intercept precipitation in RMZ as appropriate for the hydrology of a particular seasonal basin.

C1a. 44 Protect non-target species from pesticide translocation by following the division's *Pesticide and Pest Control Operational Order #59.*

In particular, field foresters will implement the following to reduce drift:

1. Use low-volatility formulations;
2. Use the proper size nozzle for the job, preferably the largest practical nozzle;
3. Operate at the lower end of the rated pressure range for the nozzle;
4. Release spray near the crop or soil surface;
5. Avoid spraying at high temperatures (at or above 85 degrees F); and,
6. Spray when the wind is low and blowing away from sensitive crops or areas. (5 mph or less).

Field foresters will implement the following guidelines to prevent surface or groundwater contamination:

1. Implement non-chemical pest management strategies when practical.
2. Select pesticides with low runoff and leaching potentials.
3. Use the lowest effective rates and frequency.
4. Implement appropriate setbacks to keep safe distances from water bodies when making applications.

C1a. 45 Reduce negative impacts by selecting and implementing treatments that consider site-specific conditions such as soils, topography, hydrology, past management, existing vegetation, and desired vegetation.

Site-specific prescriptions will be identified and implemented during the stand field visit. The *Silviculture Prescription Worksheet* will be used to guide foresters through on-site decisions concerning stand treatments.

C1a. 46 Employ measures that maintain normal seasonal flows within wetland inclusions and seasonal ponds.

C1a. 47 Use access routes with the least impact when necessary to freeze-down winter crossings.

Focused Issue C2 How will the appropriate width of the riparian management zone (RMZ) be determined and what vegetation management activities will be allowed to take place?

Forest management activities carried out within the RMZ can negatively affect the natural functions of riparian areas. RMZs are areas of special concern along streams, lakes, and open water wetlands and are among the most important and diverse components of the forest ecosystem. As vegetation management is implemented, RMZs will be identified and managed to retain a relatively continuous forest cover for the conservation and maintenance of aquatic and wildlife habitat, aesthetics, water quality, recreation, and forest products.

GDS C2a Management activities will protect or enhance riparian areas.

Vegetation management adjacent to surface waters has an impact on water quality and subsequently wildlife and aquatic habitat. Failure to implement appropriate standards can have negative impacts on water quality, water temperatures, visual qualities and aquatic and terrestrial habitat. Vegetation management practices will be implemented that serve to maintain the environmental qualities of surface waters.
Historically, some streams in these subsections maintained cold-water temperatures, but over the last 100 years the vegetation has changed dramatically due to several factors including logging with subsequent fires, and changes in land use (agricultural, commercial and residential development near or impacting lakes and streams). These changes can lead to impacts including increases in stream temperatures, siltation, and flooding events that affect water quality. Implementation of the following strategies will protect and enhance the qualities of riparian areas.

Strategies

C2a. 48 Establish widths of RMZs consistent with MFRC Voluntary *Site-Level Forest Management Guidelines*.

A RMZ is that portion of the riparian area where site conditions and landowner objectives are used to determine management activities that address riparian resource needs. The extent of each RMZ is unique and the MFRC *guidelines* allow flexibility to determine the most appropriate RMZ based on all land and water characteristics including the hydrology, topography, and existing vegetation of the site.

C2a. 49 Field identify the boundaries of RMZs prior to applying treatments.

During development of both the 10-Year Stand Exam Lists and the Forestry Area's Annual Stand Exam Lists, staff from all divisions have the opportunity review and identify, for joint site visit, the stands that fall within RMZs. The purpose of the joint site visit is to ensure that the interests of Wildlife, Ecological Resources and Forestry are reflected as stand treatments are applied.

C2a. 50 Maintain a filter strip between aquatic resources and treatment areas consistent with MFRC *Voluntary Site-level Forest Management Guidelines*.

C2a. 51 Implement treatments within identified RMZs consistent with MFRC *Voluntary Site-level Forest Management Guidelines.*

DNR forestry staff will apply riparian guidelines as a part of timber sales supervision and inspections. Also, the MFRC site-level monitoring program will periodically sample sites in these subsections. The objective of this monitoring program is to evaluate the implementation of the *MFRC Voluntary Site-Level Forest Management Guidelines* through field visits to randomly selected, recently treated sites.

C2a. 52 Distribute slash evenly within RMZs to adequately protect soils and provide nutrient retention.

C2a. 53 Retain a selection of live and dead trees in a variety of sizes and species adequate to provide a mixed age structure when conducting management within an RMZ.

Focused Issue C3 How can the cumulative impacts to aquatic resources of forest management on a watershed/sub-watershed level be addressed?

GDS C3a The management and administration of state land will minimize negative cumulative impacts on aquatic resources.

The CP-PMOP Plan contains forest vegetation management goals and objectives for both the relative short term (10-year plan implementation period) and the long term (50 years or more). Over long periods of time, land use activities, including recurring forest management practices, can have significant cumulative impacts on natural resources.

All MFRC *Voluntary Site-Level Forest Management Guidelines* will be implemented as they apply to managing potential impacts on aquatic resources. In addition, other relevant guidelines and policy will be implemented in an effort to minimize cumulative impacts including *Directions 2000, The Strategic Plan: Water Resources. Goal 1. Objective 1.5: "Pollution in aquatic systems will be reduced".*

The Department will continue efforts to monitor, coordinate with other agencies, and take a proactive approach to address potential water quality impacts to water resources through the Clean Water Legacy Program.

The following specific strategies will be implemented as stand management prescriptions are identified.

Strategies

C3a. 54 Continue to implement all MFRC *Voluntary Site-level Forest Management Guidelines* directing forest management practices that pose potential impacts to surface waters.

C3a. 55 Collect baseline ecological data on surface water quality across the subsection.

C3a. 56 Implement ongoing surface water quality monitoring.

C3a. 57 Coordinate and cooperate with other landowners and water resource managers to establish guidelines that determine and minimize cumulative impacts.

C3a. 58 Implement site level surface water quality monitoring on water that may be impacted by logging activities when there is cause for concern.

These strategies will be implemented as described below:

1. Complete stream surveys, including physical habitat inventory such as stream cross section, bottom substrate, and other stream survey parameters;
2. Complete lake surveys, to include nursery ponds and shallow lakes;
3. Complete the Minnesota County Biological Survey to include an inventory of flora, fauna, and plant communities;
4. Monitor ecological conditions including those identified in *Directions 2000, The Strategic Plan, Environmental Indicators Initiative; and Natural Resources Stewardship 2001;*
5. Implement the CP-PMOP monitoring function of SFRMPs; and,
6. Implement forest certification monitoring.

Focused Issue C4 How can adequate safeguards be implemented to provide old-forest characteristics, including nesting cavities, in riparian areas?

GDS C4a Forest management activities will provide old-forest characteristics in defined riparian areas.

Old forests provide the best source of woody debris in aquatic systems and habitat for a wide variety of wildlife species. Within riparian areas, extended rotation age forests reduce the frequency of harvest activities, thereby reducing the potential for water quality impacts. Old forest management complexes (OFMCs) and ecologically important lowland conifers (EILC) stands within riparian areas will be managed to maintain or increase old forest conditions. During the selection of ERF, even-aged stands in riparian areas received a high priority for ERF designation.

In addition, managing for OFMC, EILC and ERF adjacent to riparian areas furthers recreational, visual, wildlife habitat and water quality management objectives. Maintaining old forest characteristics in riparian areas furthers goals of the MFRC's *North Central Landscape Region Plan*, and is consistent with MFRC's *Voluntary Site-Level Forest Management Guidelines*. Further direction is provided in DNR's *Forestry-Wildlife Habitat Management Guidelines*, which provides specific guidelines for snags, mast, and leave trees, and in *Directions 2000, The Strategic Plan, Forest Resources, Objective 2.4: "Forests will be connected by natural corridors (streams and rivers, old forest)".*

Strategies

C4a. 59 Define where management for old forest is appropriate in riparian areas and implement needed management.

C4a. 60 Manage RMZ forest composition to favor uneven-aged management of longer-lived species and extended rotations.

C4a. 61 Manage to meet or exceed DNR *Forestry-Wildlife Habitat Management Guidelines'* minimum requirements for cavity nesting trees within RMZs.

Focused Issue C5 How can the adverse impacts of forest management activities on aquatic plant species, fisheries, and wildlife habitat be minimized?

GDS C5a Riparian areas will be managed to provide critical habitat for fish, wildlife, and aquatic plant species.

Riparian areas encompass the transition zone between the terrestrial and aquatic habitats that occur along lakes, streams, and open-water wetlands. Riparian areas are among the most diverse and sensitive habitats found in these subsections. The management of riparian areas can influence water quality, water temperature, erosion rates, and deposition of woody debris in lakes and streams and the overall diversity of wildlife and plant species found in the watershed. Riparian areas provide corridors and connecting links of habitat for plant and wildlife species. Well-managed riparian areas are critical to protect, maintain, or enhance aquatic and wildlife habitats, aesthetics, recreation, and forest products.

Strategies

Specific strategies that provide for and promote management of critical habitat for fish, wildlife, and aquatic plant species are identified below.

C5a. 62 Manage stands within RMZs for longer-lived, uneven-aged, mixed-species to provide shade, moderated microclimate, coarse woody debris, microhabitat diversity, resiliency to natural catastrophes, bank stability, nutrient cycling, and carbon and nutrient input.

C5a. 63 Manage for long-lived conifers, near water bodies, to discourage beaver related damming and siltation.

C5a. 64 Maintain a filter strip between aquatic resources and treatment areas consistent with MFRC *Voluntary Site-level Forest Management Guidelines*.

C5a. 65 Follow MFRC *Voluntary Site-level Forest Management Guidelines* regarding approaching water crossings at or near right angles to stream flow to minimize stream bank disturbances and chose construction materials that minimize sediment input and flow obstruction.

C5a. 66 Follow MFRC *Voluntary Site-level Forest Management Guidelines* regarding the appropriate timing of water crossing installations to minimize disturbance to fish spawning and migration patterns in areas identified by Fisheries staff.

C5a. 67 Leave snag trees, mast sources, and den trees, as directed in DNR *Forestry-Wildlife Habitat Management Guidelines*.

3.4 Primary Issue Area: Access

Focused Issue D1 How can new access to stands identified for management during the 10-year planning period be established without negative impacts on forest resources?

GDS D1a Forest access routes will be well planned, with an increased level of collaboration among federal, county, private, and local units of government to share accesses, minimize new construction, and close access routes no longer needed for forest management purposes.

Access routes (provided by a network of federal, state, county, and private forest access roads) are needed to effectively manage forest stands identified for treatment during this 10-year plan. A network of forest roads and trails exists across all ownerships. Road inventory data are available for some public ownerships however only limited data are available for private and private industrial lands for these subsections. Though implementation of the New Access Needs component of this plan, which included review and use, as appropriate, of all existing access, and cooperation with other landowners, the overall density of roads in specific geographic areas will be minimized. Existing roads or previously used corridors of disturbance will be followed whenever feasible. The access routes that are selected must be developed in a way that minimizes the negative impacts on all resources potentially affected.

The objectives of the New Access Needs component of the CP-PMOP Plan is to first identify stands on the 10-Year Stand Exam List that are lacking access, then identify the type of road classification required, identify potential coordination and cooperation with other land managers, identify permits or approvals necessary, identify winter or summer access, recommend disposition after use, and miles of new access necessary.

The post-sale disposition for new access is of particular concern, requiring consideration during development of the New Access Needs List and as stands are placed on Annual Stand Exam Lists by Forestry Areas. New access roads and trails can be used for ongoing forest management, can be closed (e.g., gate, sign, slash, or berm), or can be abandoned, or reclaimed (e.g., with natural or planted vegetation). Limiting unplanned secondary usage should be a primary consideration in post-sale road planning. The timber sale appraiser will refine the proposed road access and post-sale disposition as part of the design of the timber sale. Final adjustments may be made at the pre-sale meeting between the timber sale administrator and the permittee.

Strategies

D1a. 68 Complete a timber access plan.

This strategy will be implemented through the following actions:

1. Completion of the New Access Needs List as required by SFRMP planning process;
2. Analyze existing road and access system and close any that are not needed for future management;
3. Identify new, permanent, or temporary access routes required to access stands identified for field visit and/or treatment;
4. Assess road and access fragmentation and density concerns;
5. Plan for maintenance, closure, or abandonment of new roads and access routes required for timber sales and post-sale treatments;
6. Obtain road use agreements to share corridors from agencies or easements where needed;
7. Identify and maintain access routes for stands requiring multiple entries; and,
8. Re-use existing access route footprints where possible, to minimize disturbance.

D1a. 69 As Annual Stand Exam Lists are prepared, continue to cooperate with other forest landowners to retain existing access to state land and to coordinate development and maintenance of new access routes across mixed ownerships.

This strategy will be implemented through the following actions:

1. Maximize the efficiency of the transportation system by involving all affected landowners in cooperative road planning efforts whenever possible;
2. Conduct road meetings with other agencies and share data;
3. Obtain road-use agreements to share corridors or easements among agencies where possible;
4. Retain access, over time across changing private land ownership and leasing patterns;
5. Implement forestry management by serving as many acres of forest land with as few miles of road as possible;
6. Plan access and locate roads and trails to minimize impacts on rare features and other cultural resources; and,
7. Minimize habitat fragmentation by roads and access routes.

D1a. 70 Develop long-term agreements with the United States Forest Service, county land departments, local governments, and private landowners where necessary to gain access to state lands.

Cooperative road planning that involves all affected landowners will be implemented to maximize the efficiency of the forest access system. The objective is to serve as many acres of

forest land with as few miles of road as possible. This objective will be realized by completion of timber access plans.

D1a. 71 Gate, barricade, or obliterate all roads constructed during the life of this plan that are not needed for future stand management.

This strategy will be implemented by closing non-essential accesses.

3.5 Primary Issue Area: Diversity / Complexity

Focused Issue E1 Within stands, how are biodiversity, native plant community composition, and structural complexity maintained or enhanced?

GDS E1a Diversity of plant species within stands will be maintained or increased.

Diverse forest stands are more resilient than less diverse forest stands. A forest stand with a mix of tree species and ages provides habitat for a wider variety of associated species while providing a diversity of forest products. The net economic, social, and ecological values and functions of most forest stands are related to the composition of trees, shrubs, ground flora, and structural characteristics. Structural characteristics include indicators such as the sizes of overstory trees (diameter and height), understory vegetation, and their arrangement (scattered or clumped) within the stand. Structural characteristics also include the presence or absence of snags and coarse woody debris. Retaining large-diameter structures provide micro-sites for seed germination, cavities for nesting and den sites, and important escape cover within stands.

Strategies

E1a. 72 Maintain the highest soil productivity possible by favoring regeneration and growth of native vegetation and trees using the MFRC *Voluntary Site-level Forest Management Guidelines.*

E1a. 73 Utilize harvest systems, methods, and sale regulations (e.g., process at stump) that protect advanced regeneration and maintain or improve the patterns, diversity, and composition of forest vegetation present in the stand prior to harvest.

When desirable to protect the existing seedlings and saplings in a stand, timber sale regulations will specify outcomes to protect these regenerating trees, such as delineating only a portion of a stand for treatment activity. To enhance seedling recruitment of some species, a partial canopy may be retained to meet needed moisture and light requirements of the seedlings.

E1a. 74 Preserve legacy patches and inclusions in stands for seed sources and native plant diversity, as well as to favor regeneration and seeding of native vegetation.

Foresters when selecting seed trees will consider resistance to windthrow, insect and disease risks, and the number and distribution of seed trees. Timber harvesting techniques and site preparation methods that expose mineral soil may be used on some sites to facilitate natural seeding. In general, foresters will use the least intensive site preparation necessary to successfully regenerate the site, while favoring retention of the existing ground-layer plant species.

E1a. 75 Establish and manage plantations to more closely resemble naturally occurring stands by planting a variety of tree species using variable-density thinning techniques, preserving existing natural vegetation, and preserving advanced regeneration.

E1a. 76 Develop methods to measure and monitor the within-stand diversity of plant species, and provide ongoing education and training on these techniques and methods.

In selected stands, foresters will manage for a mix of tree species and ages, and for diversity of structural characteristics (e.g., tree diameter, tree height, and scattered or clumped distribution) to provide conditions that promote within-stand diversity.

GDS E1b Age diversity as well as vertical and horizontal structure within-stands will be maintained or increased where compatible with other strategies in this plan.

Foresters will manage for the variety of species found in the stand, rather than single species management. Based on current stand composition and other considerations (e.g., insect and disease concerns or wildlife habitat), foresters will take advantage of opportunities to diversify stands when thinning is prescribed. Thinning intensities in stands may vary depending on current stand condition such as trees per acre, tree size, and species composition, or the future desired within-stand composition.

Strategies

E1b. 77 Apply techniques during the young forest growth stage that encourages age diversity and vertical/horizontal structure.

Field techniques that support this strategy include accepting initial lower stocking levels where significant within-stand diversity is an objective, and inter-plant low density and partially stocked stands with other species to further promote a mixed stand.

E1b. 78 Use intermediate treatments to provide age diversity and vertical/horizontal structure in the young forest, transition, and mature forest growth stages.

Field techniques that support this strategy include the following:

1. Implement variable-density thinning techniques to increase vertical and horizontal structures. Incorporate species and age diversity considerations into thinning projects;
2. Create canopy gaps to encourage growth of shade-intolerant trees and plants;
3. Manage stands so that they appear and function naturally by growing a variety of tree species. and by conserving existing natural vegetation;
4. Use uneven-aged management in lowland hardwood, ash, northern hardwood and long-lived mixed-conifer cover types to develop multiple ages and complex structure within the stand;
5. Use intermediate treatments in ERF stands to encourage advanced reproduction of desirable trees and develop structural complexity;
6. When planning intermediate treatments, consult the ECS *Field Guide* for information on the timing and nature of natural disturbance events and the successional paths of NPCs;
7. Provide coarse woody debris that will serve as habitat and nurse logs for tree seedlings; and,
8. Reserve trees that show signs of decadence, such as multiple and dead tops, bole and top decays, and cavities; or other features such as large diameter branches or distinctive bark features.

E1b. 79 Design final harvest projects in a way that will transmit a legacy of age diversity, and vertical/horizontal structure.

E1b. 80 Develop a methodology for measuring growth stages, within stand age diversity, plant species diversity, and vertical/horizontal structure, and use this methodology to quantify and monitor changes.

GDS E1c Native plant communities and their ecological functions will be conserved within stands and stand level ecological function will be maintained or improved.

A native plant community is a group of native plants that interact with each other and the surrounding environment in ways not greatly altered by humans or by introduced plant or animal species. These groups of native plants form recognizable communities (e.g., northern mesic mixed forest, northern mesic hardwood forest, and northern basin-rich spruce swamp NPC classes) that tend to repeat across the landscape and overtime. The DFFC goal is to retain the characteristics typically found in NPCs in some managed stands.

Native plant communities are basic elements within ecological classification systems. The Ecological Classification System (ECS) used in preparing the CP-PMOP Plan consists of maps, databases, and field guides that provide a scientific framework for managing natural resources. Implementing ECS as a management tool provides a more comprehensive understanding of the forests' full potential to produce timber and wildlife and protect water and soil resources. Using ECS information is essential for interdisciplinary communication and forest resource assessment and is the link between landscape-level goals and stand-level management. In addition, ECS supports other indicators of sustainable forest management as required by third-party forest certification systems.

Native plant communities are units of vegetation identified from the analysis of thousands of vegetation plots in Minnesota where the presence, height, and abundance of all vascular plants were measured. NPC *systems* are units linked by ecosystem functions such as nutrient cycling, seasonal availability of water, or particular types of disturbances. *Systems* have a significant number of species that occur in no other *system* because their physiological traits and functions are linked. Subordinate to NPC *systems* are NPC *classes*, which are units of vegetation that generally have uniform soil texture, soil moisture, soil nutrients, topography, and disturbance regimes. The NPC *classes* change rather gradually along ecological gradients, especially as amounts of water and nutrients available to plants change. Therefore, NPC c*lasses* within a NPC s*ystem* overlap broadly with one another in species composition.

Field Guides to the Native Plant Communities are available for use by land managers to aid in field identification. NPCs are identified by their vascular plants, soils, and characteristic landforms, which must be examined during the growing season. NPC *systems* and *classes* are the vegetation units most applicable for making management decisions. The *Field Guides* and associated ECS materials provide information on tree species suitability, patterns in recruitment/advanced reproduction opportunities, operability limitations of soils, natural history and historic fire return intervals, which is intended to help inform management decision-making.

Natural events, such as fire, windstorms, climatic cycles, and flooding are integral to the functioning of NPCs. These events alter the structure and composition of NPCs at the stand scale, but the overall structure and composition is rather stable across landscapes. Landscape summaries address the natural rotations of stand-altering events that affect NPC *classes*. Such summaries provide general guidance for the timing, intensity, and species selection of management activities in individual stands.

NPCs provide a range of ecological functions that are increasingly recognized as contributing to the quality of life in Minnesota. Among these functions are water filtration, flood moderation, carbon storage, moderation of water-table level, local temperature, erosion control, and development and enrichment of soil. Large tracts of NPCs provide opportunities for sustainable resource use, such as logging systems that mimic natural cycles in forests and help to perpetuate the beneficial functions that NPCs provide while supplying commercial products.

In Minnesota, NPCs provide habitat for thousands of plant and animal species. Many are uncommon in the state and many, such as the western prairie fringed orchid *(Platanthera praeclara)* and the Karner blue butterfly *(Lycaeides melissa samuelis*are) are quite dependent on specific NPCs for their long-term survival and viability in Minnesota. Four hundred-forty of these plant and animal species are uncommon enough that they are listed under state or federal endangered species legislation. In addition to relatively conspicuous plant and animal species, NPCs also are likely to be reservoirs of species that have not been thoroughly surveyed or studied in Minnesota. These include microorganisms such as fungi and bacteria (which often play important roles in uptake of nutrients by plants), and insects and other invertebrates (which can help to cycle nutrients in ecosystems or to pollinate plants).

Native plant communities have also played an important role in the development of Minnesota's cultural history and heritage. For several thousand years, humans have been closely connected with the resources available from plant communities including sources of food, shelter, clothing, fuel, and medicine. In the last 150 to 200 years, the products and byproducts of NPCs have been a source of economic wealth in addition to sustenance, and have fueled trade, civic and cultural development across the state and even globally. The cultures that have grown up around the prairie farms, the fur trade, and the northern logging operations are conspicuous examples of how the byproducts of plant communities have shaped human communities in Minnesota. Finally, NPCs such as the northern pine forests, the

prairie marshes, and the eastern deciduous forests provide diverse aesthetic and recreational experiences for hunters, anglers, hikers, campers, bird-watchers, and other outdoor enthusiasts. (http://www.dnr.state.mn.us/npc/index.html)

The *Field Guides* present a concept of ecologically intact, "healthy" plant communities against which are weighed the effects of management activities in a particular stand. Stand management can conserve species composition, structural elements, and ecological function; enhance composition and structure of intact stands by moving their current state to one that is more desirable for any of a variety of reasons (wildlife habitat, more valuable trees, etc.) provided ecological function is not compromised; enhance composition, structure, and function of stands in poor ecological condition; impair intact communities by creating compositional and structural states that are less desirable or that threaten function; or destroy communities by altering function beyond recovery. The overriding goal of following strategies is to protect and enhance native plant communities through careful forest management.

Strategies

E1c. 81 Design and implement training that allows field staff to identify native plant communities, growth stages, natural disturbance intervals, suitable tree species, and soil operability ratings.

DNR staff from all divisions maintains access to the most up-to-date rare features locations and databases.

If rare feature locations occur in stands proposed for treatment, land managers confer with the appropriate Wildlife and Ecological Resource staff to determine if adjustments to proposed treatments are needed to protect the rare plant or animal, its habitat, or other rare features. The rare features database is regularly updated and available to Forestry Area offices. Area staff is trained in the use of the Natural Heritage Information System and routinely consult the rare features database as management or development activities are planned and implemented. Often joint site visits among DNR divisions are scheduled to provide comment concerning proposed preliminary treatments. As a result, stand selections or treatments can be adjusted, or stand prescriptions can include mitigation measures to protect rare plants or animals and habitats within the stand.

E1c. 82 Control non-native invasive species.

E1c. 83 Control herbivory through management of wildlife populations, through the use of repellents, fencing, or other practices that prove to be effective.

E1c. 84 Plan and execute stand maintenance and stand replacement silvicultural activities in a way that corresponds with the natural stand dynamics of the NPC.
Prescriptions for stands selected for treatment, development of access routes, and other forest management or development activities will include mitigation measures that protect the rare feature(s) within the stand. Mitigation includes measures that reduce the likelihood of the introduction or spread of exotic species (and the impacts of the control measures for exotic species, e.g., effects on rare species and/or habitat from use of herbicides to eradicate exotic species). Mitigation measures will be prescribed as part of the *Silvicultural Prescription Worksheet.*

E1c. 85 Ensure that regenerating tree species are suitable as indicated in the DNR's ECS *Suitability of Tree Species by Native Plant Community* tables.

E1c. 86 Provide growing conditions (i.e., sunlight, periodic fire, etc.) that will encourage species diversity in the ground, shrub, and sub-canopy layers.

E1c. 87 Use soil operability ratings to avoid rutting and compaction when applying stand treatments.

E1c. 88 Use herbicide and heavy site preparation methods sparingly, or find alternative techniques.

E1c. 89 Restore or mitigate impacts to NPCs following heavy mechanical or chemical site preparation, frequent and/or intense disturbance, or establishment of species that are not native to the NPC.

E1c. 90 Meet MFRC *Voluntary Site-level Forest Management Guidelines* (i.e. 5 percent minimum) for retention of large living trees, snags, down logs, tree regeneration, and undisturbed forest floor within stands after harvest.

3.6 Primary Issue Area: Wildlife Habitat

Focused Issue F1 How can habitat for all wildlife and plant species be provided?

In general, the health of wildlife and plant habitat can be measured by the number and diversity of species found and sustained on the landscape. Wildlife and plant species are an important indicator of the biological health of the forest and are important to society for their inherent values. Statutes, public expectations, interest group priorities, and DNR policies require the consideration of forest management on wildlife and plant species found on state-administered lands.

Several techniques have been developed to ensure that vegetation management is implemented to maintain diverse habitat for wildlife and plant species.

These techniques are:

A *landscape/coarse filter* approach emphasizes management of forest resources from a local to landscape scale to: *maintain the integrity of ecosystems processes, maintain components of the range of historic habitats and age classes, and retain/enhance structural attributes within habitats.* In using a landscape/coarse filter approach, it is assumed that a broad range of habitats encompassing the needs of most wildlife/plant species, and that their populations, will remain viable on the landscape. Habitat analysis and management emphasis in this plan were primarily completed at this level.

A *stand-level* approach emphasizes management of forest resources that are important wildlife habitat features (i.e., riparian areas, seasonal ponds, leave trees, snags, coarse woody debris, mast, etc.) at a stand or site scale. Stand-level management is achieved primarily through implementation of the MFRC *Voluntary Site-level Forest Management Guidelines.*

A *fine filter* approach considers the specific habitat needs of selected individual species that may not be met by the broader coarse filter approach. Providing habitat at this level will be guided primarily by department policies and guidelines that provide recommendations for habitat management at this finer level for a number of species. Examples include state or federally listed species (i.e. goshawk, red-shouldered hawk).

The DNR *Directions 2000, The Strategic Plan* calls for an objective of *"healthy self-sustaining populations of all native and desirable introduced plant, fish, and wildlife species, especially those species listed as threatened or endangered."*

There are 250 wildlife species (14 amphibians, 9 reptiles, 174 birds, and, 53 mammals) that are either permanent residents or regular migrants that use habitats within the CP and PMOP. Each species has different habitat requirements, some of which conflict. Consideration of management needs for each individual species is impossible to accomplish with a single approach across the planning area thus leading to the *landscape/course filter, stand-level* and *fine filter* techniques.

GDS F1a Adequate landscape-level habitat and habitat components will be maintained for wildlife and plant species found within these two subsections.

The MFRC *Voluntary Site-Level Forest Management Guidelines* identifies specific practices that are used to provide for and maintain landscape level habitat components. All applicable *guidelines* will be

implemented by foresters. Further direction is provided foresters in the DNR *Forestry-Wildlife Habitat Management Guidelines*; *Interdisciplinary Forest Management Coordination Framework; Directions 2000*, *The Strategic Plan;* and, the MFRC's *North Central Region Landscape Plan*.

Strategies

Landscape / **course filter strategies** include those listed below.

F1a. 91 Provide for both young and old forests distributed across the landscape.

Young forest in this plan refers to stands that are 0-30 years old. The stands in this age class generally have conditions characteristic of young forests such as seedling and/or sapling successional stages. Examples of species that rely on young forest conditions are chestnut-sided warbler, red-tailed hawk, woodcock, and golden-winged warbler. Management will provide young forest habitat across the subsections over time.

Old forest includes stands that are beyond the normal rotation age established for the cover type. Old forest characteristics include forest conditions such as large-diameter trees, presence of snags and large amounts of coarse woody debris, and/or uneven-aged successional stages. Examples of species that rely on old forest conditions include boreal owl, hairy woodpecker, and northern flying squirrel. Designation and maintenance of areas to be managed for old forest conditions across the landscape over time such as ERF and designated old growth forests will ensure available habitat for many of these species.

F1a. 92 Retain or increase the amount of coniferous forest, coniferous woodland, and mixed coniferous/deciduous forest as a cover type.

A number of wildlife species found within the subsections have some association or dependence on coniferous trees for food and/or cover needs, whether within conifer-dominated stands or in various mixes of conifer/hardwood stands (See Appendix M *Wildlife Habitat Relationships*). Several conifer species (white pine, white spruce, jack pine, and tamarack) have declined significantly from historic levels in these subsections.

Strategies have been included here that increase these cover types as the primary component, and increase conifer species as a component of other cover types.

F1a. 93 Maintain conifers as a component of deciduous cover types where suitable to the site.

Conifers provide important habitat characteristics to significant numbers of vertebrate fauna. Conifer stands, inclusions of conifers within mixed-species stands, conifer understory in mature aspen and birch stands are all important components of wildlife habitats. Clumped conifers are more windfirm, are better potential seed sources, can withstand snow and ice loads more successfully, and provide better cover.

F1a. 94 Retain or increase white cedar and oak as cover types and components of other cover types as they provide significant wildlife habitat.

Oak is often found as a component of other cover types. Because of the acorn mast they produce oak provides valuable food resources for wildlife and are often reserved from harvest. Mature oak also provides high quality cavities used by wildlife.

F1a. 95 Maintain or enhance existing large patches.
During selection of the 10-Year Stand Exam Lists, patch management, ERF, and OFMC designations, larger patches (101+ acres) were identified with a goal to maintain some of these areas on into the future. Stands that furthered patch management objectives were specifically identified as stands to which Forestry Areas (including Ecological Resources and Wildlife staff) gave particular consideration.

F1a. 96 Provide a variety of patch sizes across the landscape to reflect patterns produced by natural disturbances.

F1a. 97 Provide a balanced age-class structure in cover types managed with even-aged silvicultural systems.

A balanced age-class structure leads to relatively equal acreages in each age class out to the normal rotation age. To provide an even flow of early successional forest habitat, it is necessary to avoid large fluctuations in harvest levels within the aspen, balm of Gilead, birch, jack pine, and balsam fir cover types. By addressing current age-class imbalances to move toward a future balanced age-class structure (see aspen, balm of Gilead, birch, and balsam fir in Chapter 4, Cover type Management Recommendations), sustainability of game species habitat will be enhanced.

F1a. 98 Increase the productivity and maintain the health of even-aged cover types.

Managing to improve stocking levels and maintain health and vigor will help to ensure that density of young trees and shrubs will be suitable for game species.

Managing prescribed ERF aspen, balm of Gilead, birch, and balsam fir stands with a declining age-class structure from the normal to maximum rotation ages (see aspen, balm of Gilead, birch, and balsam fir in Chapter 4, Cover type Management Recommendations) will ensure that stands are harvested before they become too old to be regenerated back to the same cover type, thereby encouraging young growth stages beneficial to wildlife. Cover type change (facilitated or natural) of aspen, balm of Gilead, birch and balsam fir stands will be encouraged in stands that are currently decadent, inaccessible, mistyped, or beyond their maximum rotation age, again encouraging regeneration to young growth stages with positive impacts as wildlife habitat.

F1a. 99 Consider impacts to wildlife populations and habitat utilization in the design, management and regulation of forest management access and recreational trail systems.
This strategy will be implemented through:

1. following the MFRC's *Voluntary Site-Level Forest Management Guidelines* to minimize the amount of infrastructure length, width, and acreage needed to conduct forest management operations;
2. designing and building roads and forest access trails so they can be re-used if needed for future management;
3. avoiding lining road or forest access trail edges with long slash piles that serve as barriers to species movement; and,
4. considering rare features locations and MCBS sites of biodiversity significance when selecting locations for roads and trails to ensure critical habitats are not fragmented.

Stand/site-level strategies include those listed below.

F1a. 100 Favor and promote robust NPCs and retain elements of biodiversity significance (e.g., variety and abundance of native plants, intact ecological function, and intact structure within communities).

F1a. 101 Retain the integrity of, or improve riparian areas as habitat for dependant wildlife species and protect seasonal and permanent wetlands.

Riparian areas are among the most important parts of forest ecosystems. These areas have high plant diversity, both horizontally and vertically, from the water's edge, which contributes to the high diversity of animals that live in these areas. Minnesota also has a variety and abundance of wetlands including seasonal ponds. The mixture of land and water features across the landscape provides an important dimension to the habitats of many wildlife species.

F1a. 102 Maintain the productivity of forest soils to favor regeneration and growth of native vegetation and trees.

F1a. 103 Provide for the needs of species that depend on snags, cavity trees, bark foraging sites, and dead downed-woody debris.

A number of species rely on tree perches, existing tree cavities, or available trees that can be excavated to provide a cavity, insect foraging sites on dead or dying trees, or downed trees or slash for roosting, nesting, or cover. To provide for this habitat mitigation, measures will include implementing the snag retention recommendations found in the MFRC *Voluntary Site-level Forest Management Guidelines*. Historically, natural processes provided these habitat needs. More recently the extent of these natural processes has declined, resulting in fewer opportunities to maintain these unique habitats.

F1a. 104 Reserve a minimum of 5 percent undisturbed vegetation as legacy or reserve patches in clumps or strips to benefit wildlife, as well as to provide scattered super canopy long lived conifers, legacy or seed trees in each harvest unit.

Specific forest vegetation management practices will be implemented to provide adequate habitat for wildlife and plant species. In particular, legacy or reserve patches help to maintain the biological continuity of a harvested site. Biological continuity is defined as the perpetuation of the full complement of organisms (including fungi, soil invertebrates, ground layer plants, reptiles, amphibians, and small mammals) that have been successful in occupying the area. Reserve patches or strips also serve as wildlife travel lanes and corridors between habitats, and provide wildlife food and cover within recently harvested sites.

F1a. 105 Provide sufficient amounts of soft and hard mast to meet the needs of wildlife.

Soft mast such as blueberries, chokecherries, pin cherries, high bush cranberries, birch, aspen, alder catkins, etc. and hard mast such as acorns, hazel nuts, and ash and conifer seed are important foods for sustaining the wildlife populations that depend on them. Most shrubs that produce soft mast are associated with cover types requiring full sun such as aspen, oaks and pines. These communities require periodic severe disturbance such as fire or logging to set back competition and rejuvenate the mast producers.

F1a. 106 Retain and perpetuate aspen and birch inclusions/clones within all cover types, especially long-lived conifer types.

The aspen and birch community provides food and cover required by a broad range of wildlife species. High stem densities of regenerating aspen provide important habitat for grouse, snowshoe hares and other prey-based species. Preserving aspen inclusions and clones within other cover types will increase diversity and increase wildlife benefits and use of the stand.

F1a. 107 Support research needs concerning the impacts of forest thinning on wildlife species that rely on high stem density regeneration for habitat, particularly in aspen cover types.

F1a. 108 Retain conifers and protect conifer regeneration in clumps or strips to provide thermal cover, food, nesting cover, and structural attributes beneficial to wildlife.

Where available, deer strongly prefer white cedar as winter cover. Closed cedar canopies, (although not common), should be maintained as they protect deer against the most severe conditions. Clumps of cedar are also valuable during less severe winter conditions because they permit deer to use adjacent food sources. In addition balsam fir, white spruce and jack pine also provide important deer thermal cover.

F1a. 109 Retain or increase white cedar and oak as a stand component.

F1a. 110 Use harvest systems, and sale regulations that protect advanced regeneration and maintain or improve patterns, diversity and composition of forest vegetation representative of the stand prior to harvest.

F1a. 111 Establish and manage plantations to more closely resemble naturally occurring stands by planting diverse tree species, preserving existing natural vegetation, and preserving advanced regeneration by using variable density thinning techniques, varying stem density, and using less intense methods.

F1a. 112 Give consideration to within stand occurrences of species that are endangered, threatened, or of special concern.

The DNR has designated four hundred-forty plants and animals as endangered, threatened and species of special concern. All species are part of the natural forest ecosystem and contribute to its healthy functioning. Where these species are known to occur, special considerations may be made as stand prescriptions are implemented. Three levels of review for threatened, endangered or species of special concern are implemented: 1) as background data in preparing the 10-Year Stand Exam List; 2) as part of Area Annual Stand Exam list; and 3) as *Stand Silvicultural Prescription Worksheets* are prepared.

A number of wildlife species that are known to occur within the CP-PMOP are identified as Species of Greatest Conservation Need (SGCN)(see Appendix L *Terrestrial, Vertebrates Species List*). These SGCN are identified in *Tomorrow's Habitat for the Wild and Rare, An Action Plan for Minnesota Wildlife, 2006*. Key habitats for SGCN have been identified statewide with five found in the CP-PMOP. These key habitats are upland shrub/woodland (jack pine woodland), upland coniferous forest in CP, upland coniferous forest (red-white pine) in PMOP, non-forested wetlands, and headwater to large rivers. Foresters will consider these unique resources as stand prescriptions are implemented.

Fine filter strategies include those listed below.

F1a. 113 Designate special management areas for the benefit of wildlife species.

Most forest management activities that benefit wildlife species in these subsections will result from decisions designed to meet multiple forest management objectives; the application of these objectives will move across the landscape over time (coarse filter). However in some cases, areas have been and will continue to be identified as SMAs with the intent of maintaining these areas over time to provide specific wildlife species benefits (fine filter).

Special Management Areas (SMAs) are defined as areas where approved management techniques are performed to benefit specific plant or wildlife species or groups of species. SMAs have been identified and are managed to benefit certain wildlife species such as ruffed grouse, prairie chickens, sandhill cranes, or red-shouldered hawks. Open wet meadows are another type of SMA that has been identified. See Appendix P (*Special Management Areas and Priority Open Landscapes)* for identification of data layers that were available to or were considered by DNR staff as the 10-Year Stand Exam List was prepared.

F1a. 114 Consider Natural Heritage Program data and other rare species information during development and implementation of both the 10-Year Stand Exam List and Annual Stand Exam Lists.

Natural Heritage Program data will be available and considered during development of the 10-Year Stand Exam Lists and also during the Annual Stand Exam List selection process. Before groundwork begins, field staff will check the database for known locations of rare species in stands planned for treatment and, if present, will seek advice from staff from other divisions or refer to established guidelines/considerations on avoiding negative impacts on these species.

In summary, habitats for wildlife and plant diversity will be maintained, enhanced and protected through the application of a landscape/coarse filter (i.e., SFMRP effort), stand/site-level (i.e., *Voluntary Site-level Forest Management Guidelines*), and fine-filter approach (e.g., management policies, species plans).

3.7 Primary Issue Area: Wildlife Populations

Focused Issue G1 How can sustainable wildlife populations be maintained at levels that are acceptable to user groups?

GDS G1a Forests will be managed to provide sustainable wildlife populations.

The DNR maintains a multiple use policy managing the state's forest lands. In implementing this policy the following resources have been adopted that provide direction in managing for multiple uses. Examples of these resources are cited here as they impact forest management to sustain wildlife populations:

1. The Division of Forestry maintains:
    - *Forestry- Wildlife Habitat Management Guidelines*
    - *Interdisciplinary Forest Management Coordination Framework*
    - *Directions 2000, The Strategic Plan*
    - The *Strategic Conservation Agenda 2003-2007*
    - Identified SMAs and openlands designed to identify lands unique to wildlife management; (See Appendix P, *Special Management Areas and Priority Open Landscapes);*
2. The Division of Ecological Resources maintains: *Tomorrow's Habitat for the Wild and Rare, An Action Plan for Minnesota Wildlife, 2006;*
3. The MFRC maintains the *Voluntary Site-Level Forest Management Guidelines* that takes into consideration forest management impacts on wildlife populations; and,
4. Additional germane resources cited for consideration by foresters include:
    - Green, J.C. 1995. *Birds and Forests: A Management and Conservation Guide*
    - Hunter, Malcolm L.1990. *Wildlife Forests and Forestry: Principles of Managing Forests*
    - North Central Forest Experimental Series, *Manager's Handbooks for Tree Species* (habitat sections).

Strategies

G1a. 115 Enhance habitat while completing land treatments by using practices and procedures outlined in the DNR *Forestry-Wildlife Habitat Management Guidelines* and the DNR's *Interdisciplinary Forest Management Coordination Policy.*

G1a. 116 Implement corridor planning and management**.**

G1a. 117 Adhere to the recommendations in the MFRC *Voluntary Site Level Forest Management Guidelines* regarding RMZs, leave trees, legacy patches, woody debris, etc.

G1a. 118 Identify and acquire critical habitat land parcels for management and protection of important species.

G1a. 119 Develop cooperative procedures with other land management agencies to coordinate wildlife management efforts.

G1a. 120 Use the openlands assessment and planning process to develop necessary strategies and DFFCs for the designated open lands.

Important open landscape complexes can be designated as priority open landscapes either as an LTA or Special Management Unit (SMU). These areas are important for a number of wildlife species. A significant portion of these areas exhibit early successional stages of vegetation that is dominated by shrubs, grass, and young growth stages of early successional trees on dry and wet sites. These areas were originally formed by catastrophic events such as windstorms, insect outbreak, flooding, or fire. Today, human activity is largely responsible for creating and mimicking these landscape patterns.

Depending on the designated area, management techniques such as prescribed burning, brushland shearing, or timber harvest will be used to maintain or enhance prairie, brushland, woodland, young forest, and other open conditions in each unit. Forest management within these areas generally involves managing early successional tree species at normal rotation ages, favoring deciduous tree species over conifers, managing for larger younger patches, leaving fewer snags and live trees in harvest areas, and promoting increased private lands coordination. See Appendix P, *Special Management Areas and Priority Open Landscapes* for identification of data layers that were available to or were considered by DNR staff as the 10-Year Stand Exam Lists were prepared.

G1a. 121 Identify habitat components and habitat distributions needed to sustain wildlife populations at levels that are acceptable to user groups, but not detrimental to forest vegetation.

3.8 Primary Issue: Sustainable Harvest

Focused Issue H1 What is the appropriate timber harvest level on state lands, with consideration for sustainability of all forest resources?

One of the primary outcomes of the SFRMP process is to develop a timber vegetation management plan for state forest lands in these subsections to be implemented over the next 10 years. The treatment levels will determine the future age-class distribution of the forest. Several cover types in the CP-PMOP have a pronounced age-class imbalance. Treatment levels will be the primary tool used to correct this imbalance over time.

Establishing the appropriate timber treatment level will require the successful integration of economic, social, and ecological factors. Timber harvest provides forest products for society and jobs for those in forest-related industries. Long-term demand for timber continues to grow. Managing for sustainability requires a timber harvest balanced with other forest benefits. Sustainable forests support a thriving timber industry, provide diverse habitats for plant and animal species, maintain water quality, and provide recreational opportunities.

GDS H1a Forests will be managed to provide a sustainable supply of forest products for human use, while minimizing negative impacts to wildlife habitat and forest biodiversity.

DNR is committed to sustaining healthy and productive forest ecosystems. Predictable, abundant, and sustainable harvests of quality wood supports a viable forest products industry that helps to maintain a strong state and local economy. Sustainable forests also support and protect diverse habitats for plant and animal species, and maintain water quality.

Strategies

H1a. 122. Move even-age managed cover types toward a balanced age class structure.

Treatment levels were developed for this plan by considering all appropriate GDSs, strategies and DFFCs and specifically the following factors:

1. age-class imbalances for even-aged cover types;
2. acres over rotation age;
3. representation of old and young forest;
4. planned increases or decreases in cover type acreages through conversion;
5. supply of timber; and,
6. criteria for uneven-aged management and thinning.

The DFFC goal is to move toward a balanced age-class distribution with a declining distribution for the ERF designated stands. This DFFC goal was compared to the current age-class distribution for all even-aged managed cover types. A spreadsheet model developed by DNR, was used to project, by 10-year plan implementation periods, the outcome of various scenarios of treatment levels that best move the cover types toward the desired long-term DFFC goals. The modeling was used for forest cover types

managed under even-aged silvicultural systems. Treatment levels were developed for each of the next six decades to move the current age distribution closer to the balanced age-class distribution goal. Cover types where there will be no even-aged final harvest in this 10-year plan were not modeled. These cover types included white pine, and white cedar. All white cedar stands are designated ERF by department policy (see Chapter 4, *Cover Type Management Recommendations* for further discussion).

Certain cover types have large acreages in the younger rather than older, age classes. Efforts are made to move these cover types to a more balanced age class distribution. This requires identification of stands for treatment that are younger than the identified normal rotation age.

CP-PMOP Plan treatment levels reflect the number of acres that will be field visited over the 10-year period. From the 10-Year Stand Exam List, Forestry Areas will identify Annual Stand Exam Lists. Following field visits of each stand on the Annual Stand Exam List, and completion the *Stand Silvicultural Prescription Worksheet*, treatments will be established and may include timber harvest, re-inventory/alteration (i.e., correcting or updating forest inventory data), forest development without harvest, or deferring treatment (treat in a future plan implementation period).

Table 3.8a summarizes the total acres selected and placed on the 10-Year Stand Exam List. This table shows the acres in each cover type that:

1. are available for timber management (Management Pool Acres);
2. meet the stand selection criteria (Stand Selection Pool Acres); and,
3. meet the treatment levels recommended in the CP-PMOP Plan (Stand Exam Acres).

Both even-aged and uneven-aged managed cover types are displayed by normal rotation and extended rotation forests. This table identifies the progression of acres by cover type through the Management Pool Acres, Stand Selection Pool Acres and CP-PMOP Planned Treatment Level culminating in Total Plan Stand Exam Acres.

Table 3.8a Managed Cover Type Treatment Summary

Cover type	Rotation[2] Class	Planned Rotation Age	Management Pool Acres (all ages)[3]	Stand Selection Pool Acres)[4]	CP-PMOP Planned Treatment Level[5]			Total Plan Stand Exam Acres
					Even	Intermediate Treatment[1]	Visit	
Ash/Lowland Hardwoods	Un-even-aged	No set rotation age	16,858	3,026	47	1,524	747	**2,318**
Aspen/Balm of Gilead	N	45/40	128,337	36,960	21,117	539	3,235	**31,965**
	ERF	80/75/60	54,932	18,247	5,538	553	983	
Birch	N	50	3,754	2,790	748	10	456	**3,911**
	ERF	65/50	5,711	4,918	1,761	155	781	
Northern Hardwoods	Un-even-aged	No set rotation age	16,163	8,213	296	5,041	831	**6,168**
Jack Pine	N	40	8,307	4,722	1,881	50	272	**4,495**
	ERF	65	6,071	3,554	1,653	292	347	
White Spruce	N	60/50	3,298	452	118	1,430	113	**3,971**
	ERF	90/60	3,782	1,202	258	1,902	150	
Balsam Fir	N	45	3,414	2,217	721	139	312	**2,203**
	ERF	60	4,278	2,855	432	174	425	
Tamarack	N	60/70	26,095	14,692	4,747	37	914	**7,741**
	ERF	105	15,559	11,449	1,771	31	241	
Black Spruce Lowland – Low SI	N	95	9,842	3,925	759	0	360	**2,542**
	ERF	130	11,617	5,150	1,292	0	131	
Black Spruce Lowland - High SI	N	65	1,768	1,018	142	31	158	**542**
	ERF	95	2,236	2,128	166	0	45	
Red (Norway) Pine	N	100	12,535	1,433	366	7,016	346	**19,531**
	ERF	170	21,646	48	145	11,127	531	
Oak – High SI	N	80	3,650	2,401	1,022	165	108	**1,760**
	ERF	120	2,828	1,875	86	379	0	
Oak - Low SI	N	50	3,541	3,303	1,483	165	343	**4,780**
	ERF	80	5,952	5,553	1,932	121	736	
White Pine	ERF	No set rotation age	2,027	1,485	104	731	121	**956**
Total Acres			**374,204**	**143,616**	**48636**	**33,150**	**13,108**	**94,894**

[1] Includes prescriptions such as thinning, selective harvest, uneven-aged management.
[2] Rotation Class: N -managed under normal rotation; ERF –managed as extended rotation forest.
[3] Management Pool Acres are timberland acres that are available for potential timber harvest after reserves (e.g., designated old-growth stands) are subtracted at the beginning of this planning process.
[4] The Management Pool Acres that met the stand selection criteria for treatment and age criteria based on normal and maximum rotation ages. Also refer to Appendix T (*Stand Exam List Instructions*, Attachment D-3) for additional acres that were identified as an uneven-aged management pool.
[5] 10-year planned treatment level (acres) for this plan implementation period (includes site visit acres).

Table 3.8b summarizes average age of stands selected for treatment for the even-aged managed cover types. This table shows that, on average, stands selected for aspen, birch, jack pine, balsam fir, lowland black spruce, and tamarack were older than the target normal rotation ages. On average, stands selected for red pine were older than the target normal rotation age.

Table 3.8b 10-Year Summary: Average Age of Stands Selected for Treatment for Cover Types Managed Primarily by Even-Aged Harvest Methods

Cover Type	Rotation Age Type[1]	SFRMP Rotation Ages[1]		Average Age of Stands Selected in Chippewa Plains	Average Age of Stands Selected in Pine Moraines & Outwash Plains	Target (DFFC) Ave. Treatment Age (Both Subsections)	Average Age of Stands Selected for Both Subsections
		CP	PMOP				
Ash	N/A	N/A	N/A	101		N/A	101
Lowland Hardwoods	N/A	N/A	N/A		71	N/A	71
Aspen	Normal	45	40	59	65	42	63
	ERF	80	75	65	71	73	70
Birch	Normal	50	50	79	76	50	77
	ERF	65	60	71	76	62	75
Bam	Normal	40	40	72		42	72
	ERF	60	60	71	80	73	74
Northern Hardwoods	N/A	N/A	N/A	62	85	N/A	81
Oak	Normal	80/50[2]	80/50[2]	101	80	80/50[4]	80
	ERF	120/80[2]	120/80[2]	86	83	113/70[4]	83
White Pine	N/A	N/A	N/A	124	40	N/A	61
Red (Norway) Pine	Normal	100	100	114	89	100	105
	ERF	170	170	106	97	154	99
Jack Pine	Normal	40	40	63	60	40	61
	ERF	65	65	68	66	60	66
White Spruce	Normal	60	50	65	68	60/50[3]	66
	ERF	90	60	63	59	80/60[3]	61
Balsam Fir	Normal	45	45	68	68	45	68
	ERF	60	60	75	72	57	73
Lowland Black Spruce	Normal	65/95[2]	65/95[2]	113		95/65[4]	113
	ERF	95/130[2]	95/130[2]	123	122	126/87[4]	123
Tamarack	Normal	60	70	114	112	61	114
	ERF	105	105	113	127	95	117
Stagnant Cedar	N/A	N/A	N/A		58	N/A	58

[1]Rotation ages as determined by Division of Forestry. Rotation ages were only determined for cover types to be managed as even-aged.
[2]Rotation ages are different based on site index for these species. See Table 3.1c, Chapter 3.
[3]First target average treatment age is for natural stands. Second average is for plantations.
[4]Target average treatment age is split between two site index classes. See Table 3.1c, Chapter 3.

H1a. 123 Achieve a declining age-class structure in ERF stands from normal rotation age through maximum rotation age.

Stands that are over normal rotation age and that exceed ERF age class acreages will be identified for treatments. ERF rotation ages specific to each cover type were used to achieve the desired declining age-class distribution beyond the normal rotation age. Treatment levels were developed to address many of these acres in the next 10 years. This will effectively bring the average treatment age closer to the desired rotation ages for the even-aged cover types. For some cover types, the amounts are so large that treating them all in the next decade would exacerbate the current age-class imbalance. For these cover types, some over-rotation age stands will be carried through this 10-year period and into the following decade to facilitate balancing the age classes. (In Table 3.8a, this would be the difference between the Stand Selection Pool Acres and the CP-PMOP Planned Treatment Level). For some cover types over time, the average treatment ages decrease to bring them closer to normal rotation ages. For jack pine, red pine and white spruce the average age increases as a result of holding stands longer to better balance the age-class distribution over time.

H1a. 124 Improve the distribution of ages and quality of timber in uneven-aged managed cover types. Stands identified on the 10-Year Stand Exam List will be site visited, treatment will be prescribed through the *Silvicultural Prescription Worksheet* or will be re-inventoried with a treatment strategy developed. To ensure that these treatment strategies are retained, a record keeping system, the *Silviculture and Roads Module* (*SRM*) will be utilized.

H1a. 125 Designate lowland conifer old growth from EILC stands and return undesignated stands to the harvest pool.

EILC include stands of black spruce, tamarack, and cedar, including stagnant lowland conifer stands that are examples of high quality NPCs and representative of lowland conifer NPCs found in the subsections. Appendix F, *Ecologically Important Lowland Conifers (EILC): Stand Designation Process,* outlines how EILC was determined for these subsections. Table 3.8c provides a summary of the EILC acres designated by cover type. The designated EILC stands will be reserved from treatment during the 10-year plan implementation period. EILC acres have been included in cover type treatment acre calculations for this 10-year Plan, therefore, EILC designations do not reduce the treatment level in these cover types. These acres may be released for treatment in subsequent plan implementation periods. The EILC designated stands will be reviewed for continued protection during the next subsection planning process based on all appropriate policy and guidelines in place at that time as directed by *DNR Memo, July 3, 2000, Old-Growth Forest Guidelines and Protection of Important Lowland Conifer Sites.*

Table 3.8c Ecologically Important Lowland Conifer Designation Summary

Cover type	State Forestland Acres	EILC Acres Designated[1]	Percent of Cover type Designated as EILC
Black Spruce Lowland	27,786	2,657	10%
Tamarack	44,275	5,951	13%
Cedar	13,195	2,023	15%
Stagnant Spruce	17,111	9,551	56%
Stagnant Tamarack	4,209	1,328	32%
Stagnant Cedar	10,142	1,397	14%
Lowland Conifers Total	**116,718**	**22,907**	**20%**

[1]includes acres identified as a stagnant cover type

EILC stands were identified in the CP-PMOP SFRMP and reserved from harvest until old growth lowland conifers are defined and incorporated in the *DNR Old-Growth Forest Guideline.* After being defined, suitable acres will be designated. Stands selected as EILC are examples of high-quality native plant communities representative of the range of lowland conifer native plant communities found in the subsection. Wildlife species that benefit from EILC include among others great gray owl, hawk owl, Connecticut Warbler, spruce grouse, northern bog lemming, and wintering yards for white-tailed deer.

H1a 126 Implement recommendations identified in the *MFRC's Voluntary Site-Level Forest Management Guidelines, Biomass Harvesting Guidelines for Forestlands, Brushlands, and Openlands*.

DFFC Statement

The treatment levels for even-aged cover types will be established with the DFFC of achieving a balanced age-class as shown in Chapter 4, Cover type Management Recommendations.

Focused Issue H2 How can an adequate and sustainable supply of non-timber forest products be ensured for the future?

GDS H2a Forests will be managed to provide a sustainable supply of non-timber forest products for human use while minimizing negative impacts to wildlife habitat and forest biodiversity.

The cultural importance and ecological role of special forest products (SFPs) resources are only beginning to be understood. SFPs include resources such as balsam boughs, spruce tops, sugarbush, willow, birchbark, and blueberries). Improving our species-specific knowledge, as well as broadening forest inventories and developing appraisal methods for most types of SFPs, will make determining sustainable harvest levels more accurate in the future. Under current rules, guidelines, and policy, SFP permits are issued for specific SFPs to ensure that harvest operations do not damage the site's potential for future production. Permits are needed for any product that would be used commercially. No SFPs permits are needed if harvest is solely for personal use. Harvest of SFPs may be restricted on some state-administered forest lands such as WMAs, AMAs, and SNAs. Specifically on WMAs, no commercial harvesting is permitted; however, personal use harvest is permitted.

Illegal "poaching" of SFPs on DNR lands is likely common. While this is currently a minor issue in most locations, it is likely to become more significant as demand for SFPs grow. In addition to resource sustainability and management issues, the state forfeits potential income from illegal harvest activity.

Most harvesters make regular observations about the resources they harvest, but usually without recording them. Engaging harvesters in mutually beneficial relationships can help develop field information on the resource and sustainable guidelines. Guidelines can be proposed to protect SFP species from over-harvest, prevent adverse impact to wildlife habitat and NPCs and unintended harvest of rare species. In addition, third party forest certification standards require that sustainable SFP management be addressed. If engaged by resource managers in a positive manner, many harvesters will exhibit stewardship attitudes and concern about protecting the resources they harvest, as they are dependent on a sustained resource.

Harvest of balsam boughs is a significant SFPs resource in these subsections. Figure 3.8a and Table 3.8d show the number of balsam bough permits issued by fiscal year for the CP-PMOP. Figure 3.8b and Table 3.8e show the total number of special forest products permits issued for selected fiscal years.

Figure 3.8a Balsam Bough Permits by Fiscal Year

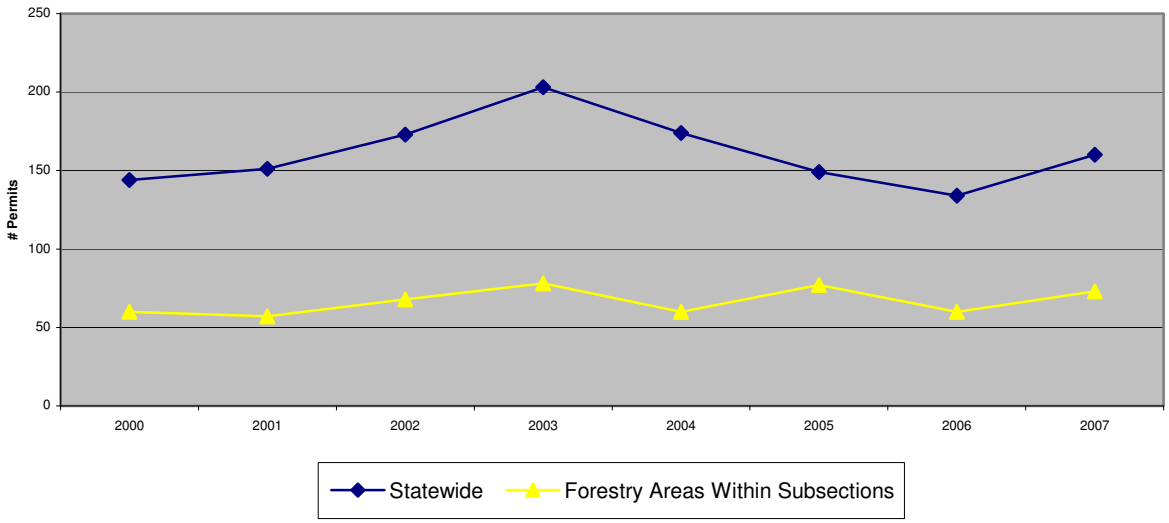


Table 3.8d Balsam Bough Permits by Fiscal Year

	2000	2001	2002	2003	2004	2005	2006	2007
Statewide	144	151	173	203	174	149	134	160
CP-PMOP Areas	60	57	68	78	60	77	60	73

Figure 3.8b Total Special Forest Products Permits by Fiscal Year (except balsam boughs)

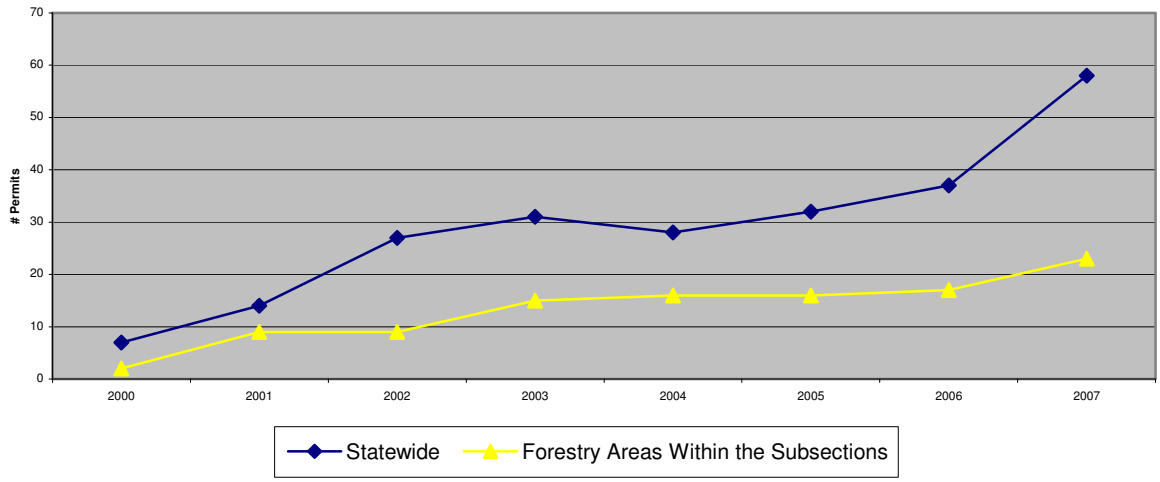


Table 3.8e Total Special Forest Products Permits by Fiscal Year (except balsam boughs)

	2000	2001	2002	2003	2004	2005	2006	2007
Statewide	7	14	27	31	28	32	37	58
CP-PMOP Areas	2	9	9	15	16	16	17	23

Strategies

H2a. 127 Implement the recommendations of the Special Forest Products (SFP) planning process.

H2a. 128 Increase supervision of SFP harvest permits and increase enforcement of rules against illegal harvesting activity.

H2a. 129 Manage selected forest stands for non-timber forest products.

H2a. 130 Support research to determine sustainable harvest levels for SFP (e.g., decorative spruce tops), criteria for managing harvests and methods of propagation.

H2a. 131 Use all available information including *"Careful Harvest Fact Sheets"* (Extension Web site), and the DNR Forestry's Utilization and Marketing Web site that supports sustainable harvest of non-timber forest products when approving SFP permits.

H2a. 132 Apply knowledge of existing traditional gathering areas of non-timber forest products when managing other forest resources.

For example, in implementing this strategy, field staff should consider the potential forest management impacts on known areas, such as those traditionally used for gathering maple syrup (sugarbushes) or gathering wild rice (ricing camps).

H2a. 133 Identify managers with local expertise in managing non-timber products and use their knowledge when managing non-timber forest products at the landscape and statewide levels.

H2a. 134 Reduce impacts by coordinating non-timber product harvests with timber harvest.

H2a. 135 Increase public knowledge about the sustainable use of non-timber forest products through dissemination of educational information and training.

3.9 Primary Issue Area: Timber Quality and Quantity

Focused Issue I1 How can timber productivity be increased on state lands?

The following, taken from the DNR *Conservation Agenda,* provides a context for efforts to increase timber productivity on state-administered lands.

> *"DNR currently increases wood fiber production by regenerating vigorous young forest stands through harvest; planting and seeding harvested and damaged sites; thinning overcrowded stands to improve vigor and reduce competition; monitoring and reducing the impacts of harmful insects, diseases, and exotic species; and matching tree species and management techniques to individual sites through its Ecological Classification System (ECS)."*

The *1994 Generic Environmental Impact Statement on Timber Harvesting and Forest Management in Minnesota* recommended increasing the wood fiber productivity of timberlands to help mitigate the potential effects of current and increased harvest levels. The 2003 Governor's Task Force on the Competitiveness of Minnesota's Primary Forest Products Industry also listed, as a priority, increasing wood fiber productivity while conserving Minnesota's forest lands.

GDS I1a Forests will be managed to increase overall timber productivity.

Managing to achieve an ***overall*** increase in the timber productivity of state forest lands is one way to continue to provide the current (or greater) harvest volume and improve timber quality. Managing for an

overall increase in productivity where possible and practicable, allows other lands to be managed with less emphasis on timber productivity. Increases in overall timber productivity can be achieved during this 10-year plan by accelerating the rate at which the age-class imbalances are addressed; increasing intermediate stand treatments; converting to site-appropriate species; and continuing to protect soil productivity by applying the MFRC *Voluntary Site-Level Forest Management Guidelines*.

Further, to increase the *overall* timber productivity on state forest lands, sustainable treatment levels were developed and applied that included all planned increases or decreases to each cover type over the next 60 years**.** While 10-year treatment levels will vary above or below the sustainable level until the age classes are balanced, adjustments were made in some decades to reduce these variations. The long-term goal is to narrow the peaks and valleys in harvest levels to provide a relatively stable supply of timber from state lands.

Both even-aged and uneven-aged cover types will be managed using selective harvest treatments. Even-aged cover types that may be thinned include: aspen, balsam fir, white spruce, jack pine, red pine, and white pine under 90 years. The uneven-aged managed cover types include ash, lowland hardwoods, northern hardwoods and white pine over age 90 years. All stands that met the stand selection criteria were placed on the 10-year list and will be field visited for possible selective treatment. Some stands of the ash, lowland hardwoods, and northern hardwoods may be initially treated through even-aged methods to improve long-term stand age-structure and timber quality (see Chapter 4 for specific cover type treatment recommendations). Additional acreage may be selectively harvested or thinned if field evaluation shows that the stand meets the stand selection criteria for the cover type. These additional stands will be available for review during the Annual Stand Exam List or Annual Plan Addition review process.

Table 3.9a identifies total acres to be treated by treatment prescription for the 10-year plan implementation period. This table shows a total of 96,991 acres of stands have been selected and placed on the 10-Year Stand Exam List for site visits. Preliminary prescriptions range from clearcut to re-inventory. The actual management objective and prescription to be applied will be determined following the site visit and completion of a *Stand Silvicultural Prescription Worksheet*.

Table 3.9a 10-Year Summary: Preliminary Prescription Acres by Subsection

General Prescription	Detailed Prescription[1]	Chippewa Plains	Pine Moraines & Outwash Plains	Total
Even-aged	Clearcut with Reserves	11,245	31,348	42,593
	Clearcut with Reserves - sprouting	0	62	62
	Salvage - Clearcut	0	11	11
	Salvage-w/Rsrv-Clearcut-I&D	0	42	42
Seed Tree	Seed Tree w/Rsrv	179	0	179
	Seed tree	4,437	224	4,661
Shelterwood	Shelterwood	234	866	1,100
Uneven-aged	Uneven-aged Harvest	3,407	2,296	5,703
	Group Selection	0	32	32
	Salvage Cut-Selective Harvest	86	51	137
	Sanitation Cut-Selective Harvest	0	60	60
	Intermediate Harvest	249	0	249
Thinning	Commercial Thinning	6,375	18,996	25,371
	Selective Thinning-Commercial	3	279	283
Manage for Understory	Manage for Understory	527	658	1,185
On-site Visit	On-site Visit	4,951	3,546	8,497
Re-inventory	Re-inventory	4,238	2,589	6,827
	Total	**35,931**	**61,060**	**96,991**

[1] Refer to Appendix I (*Standard Codes in SFRMP)* for prescription definitions

Table 3.9b identifies the total acres to be treated by Forestry Area for the CP-PMOP subsections. This table breaks down the overall landscape level treatment goals by cover type by Forestry Area, giving each Area specific targets to guide selection of the Annual Stand Exam Lists over the next 10-year plan implementation period.

Table 3.9b CP- PMOP: 10-Year Planned Stand Examination Acres by Forestry Area

Covertype	Bemidji	Blackduck	Brainerd	Park Rapids	Detroit Lakes	Deer River	Little Falls	Total
Ash	265	260	273	276	42	689	0	1,806
Lowland Hardwoods	121	121	37	12	8	125	0	425
Aspen	5,145	2,932	7,764	12,520	1,045	1,611	301	31,319
Birch	712	434	1,970	258	44	491	0	3,909
Balm of Gilead	154	146	54	15	0	277	0	646
Northern Hardwoods	2,022	1,317	1,122	739	587	357	42	6,186
Oak	532	30	4,428	998	255	32	265	6,539
White Pine	148	99	422	117	94	60	47	985
Red (Norway) Pine	3,675	824	5,284	9,799	254	1,336	0	21,170
Jack Pine	1,107	52	486	2,840	0	9	0	4,494
Scotch Pine	0	0	7	7	0	0	0	14
White Spruce	1,014	251	768	1,501	165	271	0	3,969
Balsam Fir	632	342	323	605	33	269	0	2,204
Lowland Black Spruce	543	1,188	31	0	0	1,322	0	3,083
Tamarack	1,876	1,082	142	792	98	3,594	157	7,740
White Cedar	81	58	0	0	0	23	0	162
Stagnant Tamarack*	8	0	0	0	0	0	0	8
Stagnant Cedar*	0	0	0	0	0	14	0	14
Offsite Oak*	11	0	0	104	0	5	20	140
Cutover Area*	544	0	43	338	6	21	0	952
Lowland Grass*	28	0	0	11	0	0	0	40
Upland Grass*	28	0	0	273	4	0	0	304
Lowland Brush*	106	197	0	18	0	336	0	657
Upland Brush*	13	0	0	82	0	0	0	96
Agriculture*	0	0	0	18	4	0	0	21
Industrial Dev*	0	0	0	8	0	12	0	20
Recreation Dev*	0	0	6	0	0	0	0	6
Roads*	0	0	0	0	0	12	0	12
Marsh*	71	0	0	0	0	0	0	71
Total	18,837	9,333	23,157	31,330	2,639	10,864	831	96,991

***** During selection of the 10-Year Stand Exam List, stands were selected and prescriptions recorded under these cover type designations based on field knowledge, experience and air photo interpretation. Final prescriptions will be determined following site visits.

Strategies

l1a. 136 Support research that maximizes timber productivity (e.g., optimal stocking levels, mixed species management, treatment timing) without impacting wildlife and plant species.

Suggested techniques that support this strategy include: create a dedicated position as liaison to the University of Minnesota to suggest forestry research topics and secure funding in cooperation with the University of Minnesota and other research institutions; and, continued cooperation with the Management Section of Wildlife and Ecological Resources research staff; and/or create a forestry research unit to investigate and disseminate information about specific challenges and solutions relating to timber productivity on DNR administered lands.

l1a. 137 Apply management techniques to improve stocking and stand composition on general forestry lands.

The frequency and intensity of silvicultural treatments designed to increase timber productivity can vary across the subsections depending on a number of factors, including:

1. the specific cover types (aspen, jack pine, red pine, white spruce, northern hardwoods and red oak);
2. site index;
3. proximity to existing access;
4. stand origin: stands eligible for treatments can be planted or natural; and,
5. the degree of overlap with other management objectives: stands not intersecting the buffer of rare, or natural heritage elements, not WMAs, or not old growth.

Treatments to increase timber productivity may be implemented where appropriate within some special management units (e.g., ruffed grouse management units, OFMCs, priority open landscapes). The joint notification and review of stands as outlined in the *Interdisciplinary Forest Management Coordination Framework* will be implemented on these special management units.

The following techniques support strategies to improve stocking and stand composition for cover types managed primarily by even-aged silvicultural systems

1. Propose "final" regeneration harvest levels that best move the stand toward the desired, more balanced age class distribution.
2. Work toward conducting final regeneration harvests on "normal rotation" stands
3. at the identified normal rotation age, adjusting as needed to best move toward the desired age-class distribution.
4. Harvest some portion of normal rotation stands between the identified merchantability age and normal rotation age to help move towards desired age-class distribution, thus increasing timber productivity and contributing towards wildlife habitat objectives.
5. Harvest ERF stands between normal and maximum rotation age, but not beyond the identified maximum rotation age, to best move toward the desired age-class distribution.
6. Conduct intermediate commercial thinning in cover types and stands meeting identified selection criteria (e.g., BA, age, time since last thinning, site index, proximity to existing access, stand origin, considerations for other management objectives, etc.).
7. Conduct pre-commercial thinning in types and stands meeting identified selection criteria (e.g., certain cover types, age, site index, proximity to access, extent of overlap with other resource objectives/values, etc).
8. Given the limited amount of naturally regenerated red pine stands established in the past 70+ years, and the unique management opportunities natural origin stands may provide, natural origin red pine stands selected for potential treatment will be jointly reviewed to determine appropriate treatments.
9. Aspen stands selected for commercial or pre-commercial thinning will require close coordination between the Division of Forestry and Management Section of Wildlife before this prescription is implemented.

In cover types managed primarily under uneven or multi-aged systems, selectively harvest and/or thin stands meeting identified selection criteria (e.g., BA, age, time since last thinning, site index, proximity to existing access, considerations for other management objectives, etc.)

Additional techniques that apply both to even-aged and uneven-aged managed cover types to improve stocking and stand composition include the following:

1. The SRM will be used to schedule, monitor, and archive treatment regimes, including site visits, harvest, thinning, regeneration, release, re-inventory, etc.;
2. As stands are field visited, insect and disease levels will be monitored, with efforts to reduce negative impacts;
3. Regeneration surveys will be completed according to statute and policy. If stocking or species composition problems are found, action will be taken to correct problems.
4. Use 'improved' seed and planting stock when available, and appropriate;
5. Detailed analysis of stand characteristics, including green season ECS evaluation, will be done on sites being considered for more intensive application of silvicultural treatments to

improve timber productivity. The NPC *Field Guide* and supplemental NPC references will be used to help identify more productive site-appropriate species;
6. Manage native species only and in concert with ECS principles;
7. MFRC *Voluntary Site-level Forest Management Guidelines* will be applied. Consult other forest management guidance documents that may be appropriate;
8. Management will be coordinated with other DNR divisions according to the *Interdisciplinary Forest Management Coordination Framework*; and,
9. Available development budgets will be focused on stands with higher productivity potential.

Volume Comparison Between the Past Volumes Sold by Forestry Areas and the Recommended CP-PMOP SFRMP Treatment Levels

The DNR develops annual planned treatment levels on a cover type acreage basis. Conversion from cover type acres to cord volumes is a necessary step in comparing past volumes harvested to what is anticipated from implementation of this CP-PMOP SFRMP. Table 3.9c identifies the average volume by cover type and survey age class (i.e., age class at the time it was inventoried). Volume used for each cover type is the average cords per acre from the FIM dataset for stands in a merchantable age class in these subsections. These averages were used to estimate total volume in cords projected to result from implementation of this Plan.

Table 3.9d identifies the estimated volume in cords resulting from implementation of this CP-PMOP Plan. Figure 3.9a identifies the methods used for estimating cover type and species volumes (from acres to cords) for the CP-PMOP SFRMP. The harvest volume estimate provided in Table 3.9d is based on treatment acres, treatment method, and cords per acre based on forest inventory data and preliminary prescriptions (cords estimated to result from even-aged harvests, partial cut acres and field visit cords). The cords estimated represents a culmination of past division experience as to the volume that can be anticipated from the various treatment methods cited.

The amount of timber actually offered for sale will differ from these projected acres and volumes for the following reasons:

1. Forest inventory volumes will differ from timber appraisal volumes. Inventory data is not designed to provide information accurate or specific enough for timber sale purposes more specific/precise information and evaluation is gained through site visits;
2. Stands may have changed since the stand was last field visited for inventory (old stands that are falling apart and/or converting to other types due to storm, fire, I&D, flooding damage). These observations are made and recorded under the “on site visit” prescription;
3. Refinement of stand boundaries. Field visits result in stand boundary adjustments that frequently result in fewer acres in the stand;
4. Errors in the inventory;
5. Complexity of management decisions go beyond the criteria that are used to identify stands for inclusion in the 10-Year Stand Exam List. This is particularly true for northern hardwoods and other uneven-aged types where age and basal area criteria do not capture considerations for quality; and,
6. Management plan (i.e., stand exam) acres represent acres to be treated (not necessarily harvested). Treatment can include harvest, partial harvest, manage for understory, inventory alteration, and even a decision to do nothing. Not all management plan (i.e., stand exam) acres result in timber sales.

Table 3.9c CP-PMOP Average Volume by Cover Type and Age Class

																	Merchantable age and over
Cover Type	**31 - 40**	**41 - 50**	**51 - 60**	**61 - 70**	**71 - 80**	**81 - 90**	**91 - 100**	**101 - 110**	**111 - 120**	**121 - 130**	**131 - 140**	**141 - 150**	**151 - 160**	**161 - 170**	**171 - 180**	**181 - 190**	**Average Cords/acre**
Ash		6	7	11	12	15	16	15	14	16	17	18	16	17	18	17	**14**
Lowland Hardwoods		5	8	9	12	16	17	13	11	17	12	22	20		27		**15**
Aspen*	15	17	19	22	24	26	21	17	10	5							**20***
Birch	7	13	15	17	18	19	18	17	18	16	10		14				**15**
Balm*	16	22	14	15	21	16	16		28								**17***
Northern Hardwoods		13	17	18	19	18	20	19	19	23	17	22					**19**
Oak	0	8	15	18	19	19	19	17	14	14	27	14			21		**17**
White Pine	21	21	19	29	17	17	13	12	8	8	3			5			**17**
Red Pine	21	25	23	27	18	21	19	16	15	13	12	19	15	9		8	**18**
Jack Pine	14	16	16	20	22	22	21	9									**17**
White Spruce	17	20	15	21	23	21	29										**21**
Balsam Fir	11	8	12	16	16	17	16	23	22								**16**
Black Spruce Lowland	2	7	5	9	10	10	11	11	11	11	11	10	8	6			**9**
Tamarack	3	3	5	9	11	12	13	13	13	14	13	10	11	15	11	20	**11**
Lowland White Cedar	11	2	10	10	13	17	18	19	18	22	20	19	20	20	22	22	**16**

*combined aspen / balm of Gilead averages 19 cords per acre considering total acres in each cover type

Table 3.9d CP-PMOP SFRMP Volume Estimations

MANAGEMENT PLAN	Ash /LH	Aspen/ BG	Birch	NH	Oak - High SI	Oak - low SI	White Pine	Red (Norway) Pine	Jack Pine	White Spruce	Balsam Fir	L Black Spruce - low SI	L Black Spruce - high SI	Tam-arack	Total
1. **Plan Total Acres**	**2,318**	**31,965**	**3,911**	**6,168**	**1,760**	**4,780**	**956**	**19,531**	**4,495**	**3,971**	**2,203**	**2,542**	**542**	**7,741**	**92,883**
2. Even-age Acres	47	26,655	2,509	296	1,108	3,415	104	511	3,534	376	1,153	2,051	308	6,518	**48,585**
3. Cords/Acre	14	19	15	19	17	17	17	18	17	21	16	9	9	11	
4. Even-age Cords	658	506,445	37,635	5,624	18,836	58,055	1,768	9,198	60,078	7,896	18,448	18,459	2,772	71,698	**817,570**
5. Partial cut Acres	1,524	1,092	165	5,041	544	286	731	18,143	342	3,332	313		31	68	**31,612**
6. Cords/Acre	4	6	5	6	5	5	5	5	5	6	5	3	3	3	
7. Partial Cut Cords	6,401	6,224	743	28,734	2,774	1,459	3,728	97,972	1,744	20,992	1,502	0	84	224	**172,581**
8. **Subtotal Cords**	**7,059**	**512,669**	**38,378**	**34,358**	**21,610**	**59,514**	**5,496**	**107,170**	**61,822**	**28,888**	**19,950**	**18,459**	**2,856**	**71,922**	**990,151**
9. Field Visit Acres	747	4,218	1,237	831	108	1,079	121	877	619	263	737	491	203	1,155	**12,686**
10. Field Visit Cords/Acre	7	10	8	10	9	9	9	9	9	11	8	5	5	6	
11. Field Visit Cords	2,615	20,036	4,639	3,947	459	4,586	514	3,947	2,631	1,381	2,948	1,105	457	3,176	**52,439**
12. Total Plan Cords	**9,673**	**532,705**	**43,016**	**38,305**	**22,069**	**64,099**	**6,010**	**111,117**	**64,453**	**30,268**	**22,898**	**19,564**	**3,312**	**75,099**	**1,042,590**
13. Annual Plan Cords	**967**	**53,270**	**4,302**	**3,830**	**2,207**	**6,410**	**601**	**11,112**	**6,445**	**3,027**	**2,290**	**1,956**	**331**	**7,510**	**104,259**

Figure 3.9a identifies the definitions and methods used to estimate the volumes identified in Table 3.9c.

Figure 3.9a Method Used for Estimating Cover type and Species Volumes for CP-PMOP SFRMP Plan

MANAGEMENT PLAN - data from SFRMP plan.
1. Management Plan Total Acres: The total cover type acres selected for harvest or stand examination in the management plan. These stand examination acres are determined for the subsection by cover type considering existing acreage, age-class distribution, rotation age, reserve areas, ERF, and application of other various forest management guidelines. *Note: Not all management plan acres result in timber sale acres.*
2. Even-age Acres: Acres from Step *1. Management Plan Total Acres* that have even-aged management prescriptions. Even-aged practices include prescription codes 1100 - 1299.
3. Cords/Acre: Average cord/acre figures for each cover type are obtained from reports based on forest inventory. Volume tables are based on subsection data and are gross volume figures. See *Table 3.9c: CP-PMOP Average Volume by Area by Cover type and Survey Age Class (i.e., age class at the time it was inventoried)*. Volume used for each cover type is the average cords per acres found in last column of the table: *Mgmt Age and Over.*
4. Even-Age Cords: This is a gross volume estimate of even-age harvest cords determined by multiplying *2.Even-age Acres* X *3.Cords/Acre*.
5. Partial Cut Acres: Acres from Step *1. Management Plan Total Acres* that have uneven-aged and thinning management prescriptions. Partial-cut practices include prescription codes 1300 - 1850.
6. Partial Cut Cords/Acre: Cords per Acre in *3. Cords/Acre* multiplied by 0.3. Assumes on the average, 30% of the volume is removed in a partial cut.
7. Partial cut Cords: This is a gross volume estimate of partial cut harvest cords determined by multiplying *5.Partial cut Acres* X *6.Cords/Acre*.
8. Subtotal Cords of Even-Age Acres and Partial Cut Acres
9. Field Visit (FV) Acres: This applies to acres with an "on site visit" prescription (9100).
10. FV Cords/Acre: Cords per Acre in *3. Cords/Acre* multiplied by 0.5. Assumes on the average, volume in FV stands is 50% of the average cords per acre for the cover type.
11. FV Cords: This is a gross volume estimate of FV harvest cords determined by multiplying *9. FV Acres* X *10. FV Cords/Acre.*/2 FV cords were divided by 2 since it is estimated that approximately one-half of these stands will result in a timber sale (other 50% would be alterations and/or succession to other cover types, etc.).
12. SFRMP Plan Total Cords: This is a gross volume estimate of cords available for timber harvest on the average in the subsection based on the SFRMP plan. Determined by adding *4. Even-age Cords*, *7. Partial cut Cords*, and *11. FV Cords* . These are gross volume figures that include acres that may not result in timber sales and volumes that will be reserved to meet site-level forest management guidelines or other guidelines and policies.
13. Annual Plan Cords: 12. *SFRMP Plan Total Cords* divided by 10.

Several methods are available to estimate cord volumes from stand selection acres. Table 3.9e identifies the estimated cords over the 10-year plan implementation period using the Walters-Ek method of volume estimating. This information includes cords resulting from the entire 10-Year Stand Exam List by cover type. The Walters-Ek method is shown here to provide a range of volume estimates which could result from implementation of this CP-PMOP SFRMP using this alternative method.

Table 3.9e CP-PMOP SFRMP Volume Estimations by Cover Type in cords (Walters-Ek Method)

Cover Type	Clearcut	Partial Cut	Field Visit	Cover Type Total
Ash	196	7,329	3,491	11,016
Aspen	671,268	7,556	10,262	689,085
Balm of Gilead	8,562	97	489	9,149
Balsam Fir	25,143	1,974	2,138	29,255
Birch	59,127	1,236	3,495	63,858
Jack Pine	79,159	1,913	1,805	82,877
Lowland Black Spruce	32,027	434	1,979	34,441
Lowland Hardwoods	392	1,467	649	2,508
Northern Hardwoods	6,890	41,578	3,772	52,240
Oak	110,101	7,084	6,639	123,824
Red (Norway) Pine	18,558	112,777	4,044	135,379
Scotch Pine	252	25		277
Tamarack	78,373	269	2,164	80,807
White Pine	2,116	6,120	473	8,710
White Spruce	6,568	10,695	633	17,896
Prescription Total	**1,098,733**	**200,554**	**42,034**	**1,341,321**

Table 3.9f summarizes the CP-PMOP estimated annual treatment in cords compared with past volumes sold by cover type. This table recites the annual volume estimates using both the Department FIM based method and Walters-Ek volume estimating methods. Two methods are included here to provide a range of cords based on the volume estimating method used. All summaries and references to volumes used throughout the CP-PMOP plan recites the cord volumes from the Department FIM based method. The Past Area Volumes (1995-2004) are an annual average of the total cords sold over that 10-year period.

Table 3.9f shows that past volumes from the CP-PMOP subsections equated to an average of 104,905 cords per year. The annual average volumes projected from implementation of the CP-PMOP Plan range from 104,259 cords (Department FIM based method, includes cords estimated to be derived from even-aged harvest, partial cut and field visit acres) to 134,132 cords (Walters-Ek).

In comparing past harvest volumes to proposed treatment levels resulting from this Plan the following should be considered:

1. the stable markets found in CP-PMOP leading to no backlog of wood;
2. past accelerated cuts carried out in the CP-PMOP landscape;
3. harvests in response to disease (budworm) and blowdown events; and,
4. consideration of multiple user groups (wildlife, recreation, cultural resources and unique habitats).

These factors may or may not be encountered during this next 10-year plan implementation period but can have an impact on the acres and volume of timber offered, actually sold or otherwise treated.

Table 3.9f Summary Estimated CP-PMOP Annual Treatment (cords) Compared With Past Area Volumes (cords)

Cover types	Past Area Volumes[2] 1995 - 2004	Projected Annual Treatment[1] 2008 – 2017 Dept FIM-based	Walters-Ek
Even-aged			
Aspen/BG	64,090	53,270	69,823
Birch	6,555	4,302	6,386
Jack Pine	10,708	6,445	8,288
Balsam Fir	4,410	2,290	2,926
Tamarack	3,780	7,510	8,081
BLS both site indexes	1,699	2,287	3,444
Oak both site indexes	4,191	8,617	12,382
Red (Norway) Pine	4,867	11,112	13,566
White Spruce	941	3,363	1,790
Cedar	194		
Uneven-aged			
NH	3,238	3,830	5,224
Ash LL HW		967	1,352
White Pine	232	601	871
Total	**104,905**	**104,259**	**134,132**

[1] 10-year planned volumes divided equally over plan years
[2] annual average of volume sold over the 10 year period
[3] includes scotch pine acres

3.10 Primary Issue Area: Visual Quality

Focused Issue J1 How will the impacts of forest management activities on visual quality be minimized?

Scenic beauty is a primary reason people choose to spend their recreation and vacation time in or near forested areas. Where working forests exist near recreational trails, lakes, waterways and public roads, field staff will consider the potential impacts of forest management activities on the visual quality of the site both during and following forest management activities.

GDS J1a Impacts of forest management on visual quality will be minimized.

In 1990, representatives of the Minnesota Resort Association and the Minnesota Forest Industries convened to address concerns about the specific impacts of various forest management practices on visual quality. A Timber and Tourism Steering Committee was formed to enhance communication, promote understanding and continue to discuss common concerns. Under the leadership of the steering committee, public and private forestry interests came together and developed a set of visual quality guidelines that are available to Forestry Areas. Prior to implementation of the SFRMP process, these guidelines were an early effort to consider visual issues as forest management was practiced.

Visual concerns were accommodated as the 10-Year Stand Exam Lists and New Access Needs lists were developed. Field staff consulted recreation trail / roads and highway layers and applied local knowledge and experience to avoid visual impacts when possible.

Further, as field foresters site visit and record stand objectives, as part of the *Silvicultural Prescription Worksheet* and also as a part of timber sales supervision and inspections, guidelines to maintain visual quality will be implemented. Particular consideration will be given to the *Visual Sensitivity Classifications* as developed between DNR and the following counties within the CP-PMOP: Becker, Beltrami, Cass, Clearwater, Crow Wing, Hubbard and Itasca; and, to nationally designated scenic routes including: the *Paul Bunyan Scenic Byway; Great River Road Scenic Byway*, and state designated *Lake Country Scenic Byway.* Foresters will also be alerted to resources such as *Visual Quality Best Management Practices for Forest Management in Minnesota, May 1994.*

Strategies

J1a. 138 Apply the MFRC *Voluntary Site-level Forest Management Guidelines* and the *Visual Quality Best Management Practices for Forest Management in Minnesota,* as they apply, to all vegetative management activities.

The MFRC *Voluntary Site-Level Forest Management Guidelines* contain recommended forest management techniques that will minimize the impacts of vegetative management activities on visual quality. *Directions 2000, The Strategic Plan, Objective 3.3,* states that the "*DNR will apply the appropriate guidelines so that visual quality is not adversely impacted during forest management activities."*

Examples of appropriate *MFRC Voluntary Site-Level Forest Management Guidelines* are listed below.

1. Reducing visual impacts due to alignment and location of roads by locating roads and trails to minimize visibility from nearby vantage points, such as scenic overlooks, streams, and lakes.
2. Reducing visual impacts of apparent harvest size by creating narrow openings into harvest areas to limit view from public roads, lakes and rivers, or recreation areas.
3. Reducing visual impacts of slash by favoring practices that allow for dispersed slash on the site, rather than piling slash, where dispersed slash does not conflict with management objectives or reforestation.
4. Reducing visual impacts of mechanical site preparation by use of low-impact site preparation methods, such as patch or row scarification.
5. Reducing visual impacts of timber stand improvement by timing logging so that it will not occur during periods of peak recreational use.

J1a. 139 Review and update as appropriate the *Visual Sensitivity Classification county maps.*

3.11 Primary Issue Area: Other Statutes

Focused Issue K1 How will foresters and wildlife managers achieve the goals of this plan and remain consistent with state and federal statutes?

Vegetative management on state forest lands is subject to a wide range and variety of existing statute, DNR policy, directives, and guidelines as well as vegetative management plans and guidelines for specific geographic units (i.e. WMAs). Chapters 2 and 3 of this plan summarized the range of documents and processes that must be considered as vegetative management decisions are made. These documents and processes must be considered at both the landscape planning level (during development of the CP-PMOP SFRMP, 10-Year Stand Exam List and New Access Needs List) and also at the stand specific level when field foresters site visit and determine specific treatments to apply through the *Silvicultural Prescription Worksheet.*

GDS K1a Forest management activities will continue to adhere to state and federal statutes.

Vegetative management will implement all appropriate statue, policy, guidance documents, and procedures such as the following:

1. Fish and Wildlife Directive No. 070205 *"Timber Harvesting on WMAs and AMAs";*
2. *Sustainable Forest Resources Act*, *1995;*
3. *Interdisciplinary Forest Management Coordination Framework*, *2007*;
4. State and federal-endangered species legislation and associated species lists;
5. Vegetative management related to Scientific and Natural Area guidelines and policy;
6. Coordinative agreements with U.S. Forest Service relating to the Chippewa National Forest;
7. Directives as established in the Trust Land Policy Act. MS 127A.31, and MS Chapter 90, The Timber Act, specifically 90.02, 90.041, 90.042, 90.41;
8. MS Chapter 84A, specifically 84A.31; and Chapter 89, specifically 89.001 thru 89.012; Chapter 89A, specifically 89.001 thru 89.012; and,
9. *Directions 2000, The Strategic Plan*.

Strategies

K1a. 140 Invite comment from, and coordinate with adjacent landowners.

K1a. 141 Ensure that forest resource managers maintain a working knowledge of all applicable state and federal statutes, rules, guidelines, and policies.

K1a. 142 Ensure that DNR forest managers have access to and consider appropriate related resource management policy, guidelines and plans of other divisions when vegetative management is prescribed.

3.12 Primary Issue Area: Cultural Resources

Focused Issue L1 How will cultural resources be protected during forest management activities on state administered lands?

GDS L1a Forest management activities will protect cultural resources on state administered lands.

A cultural resource is an archaeological site, cemetery, historic structure, historic area, or traditional use area that is of cultural or scientific value. Cultural resources are remaining evidence of past human activities. To be considered important, a cultural resource generally has to be at least 50 years old. Examples of cultural resources are archaeological remains of an historical or ancient Indian village, an abandoned logging camp, a portage trail, a cemetery, food gathering sites such as ricing camps and sugarbushes, or a pioneer homestead. They often possess spiritual, traditional, scientific, and educational values and are assets to be considered as forest management is applied.

The following are the primary guidelines and policy field foresters are directed by as cultural resources, or the potential of cultural resources, are encountered:

1. Division of Forestry Circular letter 3460-5 dated 6-1-99; which outlines data search procedures involving the division archeologist;
2. Division of Forestry *Timber Sales Manual*, policy and procedures;
3. MFRC *Voluntary Site-level Forest Management Guidelines*;
4. *National Historic Preservation act of 1966*; and,
5. *Archeological Resources Protection Act of 1979.*

In addition, the DNR will provide the 10-Year Stand Exam List, New Access Needs List and Annual Stand Exam Lists to the local tribal agencies as part of the public review and comment process.

Strategies

L1a. 143 Subsection plans will consider the impacts of forest treatments on cultural resources consistent with all adopted DNR policy and guidelines.

The DNR's forest archeologist maintains the latest information about recorded cultural resources in the area covered by the CP-PMOP Plan.

When Annual Stand Exam Lists are prepared or Annual Plan Additions are developed, DNR policy requires that they be reviewed by the DNR forestry archaeologist for known or suspected cultural resource locations. Stand locations are checked against the inventory of recorded cultural resources and are evaluated to assess their potential to contain unrecorded cultural resources. The archaeologist notifies the Forestry Areas regarding whether or not a cultural resource concern is identified for any of the planned or added stands. In addition, if an undocumented cultural resource is found during a stand site visit, it will be noted and reported to the forest archaeologist. If a stand has a cultural resource concern, specific management strategies for protecting the cultural resource will be incorporated into sale design and permit regulations or other forest management activities (e.g., site preparation and road construction).

The overall objective is that field foresters will have access to cultural resource information, be trained in field level identification of potential sites, and will share known information with the forest archaeologist and other field foresters. The cultural resources will be protected and preserved as forest vegetation management is implemented.

L1a. 144 Share data on known cultural sites and consider impacts to these sites as silvicultural treatments are applied.

L1a. 145 Increase cultural resource training for field staff, stress the importance of preserving cultural resources, and encourage the reporting of new sites.

L1a. 146 Evaluate the existing Cultural Resource Review procedure to improve efficiency and reduce time required for site review.

3.13 Primary Issue Area: Rare Species / Features

Focused Issue M1 How can rare plants and animals, their habitats, and other rare features be protected?

Protecting rare features on state lands is a key component of ensuring species, community, and forest-level biodiversity in these subsections. In 1978, the Minnesota Legislature, through the Legislative Committee on Minnesota Resources (LCMR), established requirements for the DNR (Natural Heritage Program) to collect and disseminate data on Minnesota's significant biological resources. Information on the distribution, abundance, and ecology of rare species, their habitats, and other rare features gathered by the DNR (Minnesota County Biological Survey and Natural Heritage and Nongame Research Program) provides much of the basis for determining the status of rare features in the state. The DNR acknowledges its leadership role in advocating for maintaining habitat of rare features throughout the state, regardless of ownership, and in protecting and providing habitat for rare and threatened species on state lands (*Directions 2000, The Strategic Plan*). Element occurrence information is maintained on the Natural Heritage data system that can be accessed by DNR personnel. These recorded locations are kept up-to-date, and continually being added to as additional data are received from qualified observers and from the County Biological Survey efforts. Appendix O, *Areas of High or Outstanding Biodiversity within the CP-PMOP* identifies where surveys have been completed and acreages of identified sites. Appendix J identifies *Native Plant Communities* and their S-Ranks as

GDS M1a Forest management will continue to implement measures to sustain or enhance existing biodiversity.

Biodiversity will be maintained and increased as forest management is practiced on state forestlands. The primary procedures that direct activities relative to maintaining and increasing biodiversity include the following:

1. In the department's *Directions 2000*, *The Strategic Plan,* DNR:
    - acknowledges a leadership role in advocating for and maintaining habitat for rare features throughout the state, regardless of ownership, and in protecting and providing habitat for rare and threatened species on state lands;
    - states that a forest with a variety of tree species, native plant communities, and age classes provides habitat for more species and has greater potential to provide a sustainable yield of timber;
    - states that DNR will develop compatible forest information across all ownerships, focusing on spatial features of landscape and coordinate access to databases that provide information on forest composition, wildlife habitat, rare species, and cultural resources; and,
    - states that forests will support self-sustaining fish and wildlife populations (especially those species listed as threatened or endangered);

2. The *MFRC's Voluntary Site-Level Forest Management Guidelines* for landowners, loggers, and resource managers advises that the best information on occurrence of sensitive native plants sites and communities is being gathered by the Minnesota County Biological Survey (and should be considered as forest management is implemented);

3. Minnesota Statutes, Section 84.0895: Endangered Species statute;

4. Minnesota Rules, Chapter 6134: *List of Endangered, Threatened, and Special Concern Species* (available on DNR Web site);

5. Federal Endangered Species Act of 1973 as amended (16 USC 1531-1544) (See Ecological Services on DNR Web site for list of Minnesota species included);

6. Coffin, B. and L. Pfannmuller, eds. 1989. *Minnesota's Endangered Flora and Fauna*. University of Minnesota Press, Mpls.;

7. Statewide Heritage Conservation Status Ranks (S-ranks) for Native Plant Community Types (elements) in Minnesota, Natural Heritage and Nongame Research Program and Minnesota County Biological Survey, Minnesota Department of Natural Resources; MN DNR, 2004.; and,

8. Bald and Golden Eagle Protection Act and Guidelines 2007.

Strategies

M1a. 147 Complete the Minnesota County Biological Survey (MCBS) for all counties within the subsections.

MCBS sites are areas of land, ranging from tens to thousands of acres in size, selected for survey because they are likely to contain relatively undisturbed native plant communities, large populations and/or concentrations of rare species, and/or critical animal habitat. The MCBS site provides a geographic framework for recording and storing data, and compiling descriptive summaries.

These MCBS sites currently provide intact, functional ecosystems and the ecological and social benefits of associated ecosystem services (e.g., water quality). Within areas of statewide biodiversity significance, high quality, representative NPCs generally predominate, providing habitat for associated plant and animal species. These areas often contain concentrations of rare species and rare NPCs. They also

serve as ecological reference areas to improve understanding of natural processes and ecosystem function, and to help evaluate the effects of management on biodiversity.

Through a systematic, statewide survey process conducted by the MCBS the counties within the CP-PMOP, subsections are being evaluated or have been scheduled for evaluation, to identify areas of statewide biodiversity significance (see Figure 3.13a).

MCBS sites are ranked according to the four levels identified below in order to communicate the relative significance for native biological diversity of surveyed areas to natural resource professionals, state and local government officials, and the public. Important factors in ranking MCBS sites include:

1. occurrences and types of rare species;
2. occurrences and types of rare NPC elements;
3. size of NPC occurrence and the context within which these elements occur;
4. exhibits the potential for intact landscape-level processes (e.g., natural disturbances); and,
5. encompasses examples of high quality NPCs.

MCBS site boundaries are initially determined through aerial photo interpretation and are revised following field inventory. Some MCBS sites may be split into additional MCBS sites or subsites, to reflect different biodiversity ranks. Contiguous MCBS sites forming a large, functional landscape may be ranked uniformly according to the landscape criteria. These guidelines are intended to be applied across the state, but not all criteria may be applicable to all regions -- e.g., portions of the state are highly fragmented and completely lack significant components of functional landscapes. Consultation with other plant and animal survey staff working within the same ECS subsection is essential to determine the overall statewide significance of MCBS sites across the subsection. In addition, biodiversity significance rankings may need to be updated as survey work is completed in these ECS subsections.

Based on the above process, MCBS sites receive one of the following ranks:

1. **O - OUTSTANDING.** MCBS sites containing the best occurrences of the rarest species, the most outstanding examples of the rarest native plant communities, and/or the largest, most intact functional landscapes present in the state;
2. **H - HIGH.** MCBS sites containing the “best of the rest” such as MCBS sites with very good quality occurrences of the rarest species, high quality examples of the rarest native plant communities, and/or important functional landscapes;
3. **M - MODERATE.** MCBS sites containing significant occurrences of rare species and/or moderately disturbed, native plant communities and landscapes that have a strong potential for recovery; and,
4. **B - BELOW MCBS MINIMUM BIODIVERSITY THRESHOLD (BMT) FOR STATEWIDE SIGNIFICANCE**. MCBS sites lacking significant populations of rare species and/or natural features to meet MCBS minimum standards for size and condition. These include areas of conservation value at the local level, such as habitat for native plants and animals, corridors for animal movements, buffers surrounding higher quality natural areas, and open space areas.

Figure 3.13a identifies the status of the MCBS surveys for counties within the CP-PMOP subsections.

Figure 3.13a Status of Minnesota County Biological Surveys Within the CP-PMOP, 2007

County	MCBS survey complete	MCBS survey partial	MCBS survey not started yet	MCBS Published
Becker		x		
Beltrami			x	
Cass	x			
Clearwater		x		
Crow Wing	x			
Hubbard		x		
Itasca		x		
Koochiching			x	
Mahnomen	x			x
Morrison	x			x
Ottertail	x			
Todd	x			
Wadena		x		

Upon completion of the survey, MCBS results include the following information about sites of statewide biodiversity significance:

1. MCBS biodiversity significance maps for each subsection;
2. MCBS ecological evaluations (recommendations) for MCBS sites of Outstanding and High statewide biodiversity significance;
3. Element Occurrence Records (EORs) for documented rare feature locations;
4. Vegetation plot data releve sampling of representative and high quality NPCs; and,
5. NPC mapping for MCBS sites of Outstanding and High statewide biodiversity significance.

Published MCBS sites of biodiversity significance have been completed for two counties within the CP-PMOP subsections: Morrison and Mahnomen. Within these two counties exist 29 sites ranked as High or Outstanding Biodiversity. Of these 29 sites, six are located at least partially within state forest boundaries and were available as the CP-PMOP Plan and 10-Year Stand Exam List was prepared (See Appendix O, *Areas of High or Outstanding Biodiversity*). In addition, the 10-Year Stand Exam List was reviewed by Ecological Resources staff against other known but not yet published locations of biodiversity sites. The CPMOP team considered this review, and resulting stand comments were incorporated into the SFRMP FIM database. This information will then be available to field staff as stands are site visited and management objectives determined. MCBS information is considered at three levels: 1) preparation of the Plan and 10-Year Stand Exam Lists; 2) preparation of Area Annual Plan Lists or Annual Plan Additions; and 3) as *Stand Silvicultural Prescription Worksheets* are prepared.

M1a. 148 Maintain the ecological integrity of Native Plant Communities (NPCs) by documenting and managing known locations with a statewide rank of critically imperiled (S1) or imperiled (S2), and those with S-ranks of S3 to S5 that are rare or otherwise unique in these subsections.

During site visit of stands on an Annual Stand Exam List, foresters will implement the *Stand Silvicultural Prescription Worksheet* process that among other factors considers the NPC Class characteristics to determine most appropriate management. NPC Class characteristics are outlined in the *Field Guide to the Native Plant Communities of Minnesota: The Laurentian Mixed Forest Province*. Additional information to help determine what NPC Class a stand is located in will become available as MCBS staff completes the NPC mapping for MCBS sites of Outstanding and High statewide biodiversity significance.

The NPC *Field Guide* and additional information (e.g., *Suitability of Tree Species by Native Plant Community*, http://www.dnr.state.mn.us/forestry/ecs_silv/index.html will provide foresters with a suite of options to help determine which tree species are most appropriate for the identified NPC.

M1a. 149 Consult the Natural Heritage database (including the rare features database) prior to prescribing or implementing forest management activities.

DFFC Statement
The full range of all growth stages is well represented on the landscape.

3.14 Primary Issue Area: Managing Impacts

Focused Issue N1 How should the impacts of forest insects and disease on forest ecosystems be addressed?

GDS: N1a Forest management will minimize damage to forests from native insects and diseases.

Forest insects and disease organisms influence forest ecosystem dynamics. At acceptable levels, they promote diversity of tree species and generate elements of forest structure that are important as habitat and in nutrient cycling, such as snags and coarse (large) woody debris. However, epidemic populations of insect pests can cause high levels of tree mortality, and can have significant ecological and economic consequences. Native and introduced diseases can cause significant species-specific losses in volume and mortality. Forest management will not attempt to eliminate native insects and diseases or their processes from the landscape, but rather to limit their impact on individual sites to a level that allows goals for timber production, water quality, aesthetics, recreation, wildlife, and biodiversity to be realized.

Minimizing impacts to forest resources from native insects and diseases is a priority element for field staff. The primary directives and resources which guide field staff in managing these potential impacts includes the following:

1. Division of Forestry's *Forest Development Manual - Section D -Cover type Management Guide;*
2. DNR Insect and Disease Program publication library, including:
    - *How to Identify and Manage Pine Bark Beetles* -DNR publication
    - *How to Manage Jack Pine to Reduce Damage from Jack Pine Budworm* - USDA Forest Service NA-FR-01-94
    - *Spruce -Fir Silviculture and the Spruce Budworm in the Lake States* - Mich Coop Forest Pest Management Program Handbook 83-2
    - *Two Lined Chestnut Borer* - USDA Forest Insect and Disease Leaflet 168
    - *The Bronze Birch Borer* - Mark E. Ascerno - Mn Extension Service - AG_FS_1417-A
    - *How to Identify and Minimize White Trunk Rot of Aspen* - USDA Forest Service publication HT-63
    - *How to Identify Hypoxylon Canker of Aspen* - North Central Forest Experiment Station - 1976 –5;
3. *MFRC's Voluntary Site-level Forest Management Guidelines; and,*
4. *Field Guide to the Native Plant Communities of Minnesota - The Laurentian Mixed Forest Province*

Strategies

N1a. 150 Manage identified forest insect and disease occurrences to contain and reduce impacts, using techniques appropriate for the species involved.

Information gathered and provided by the agencies and resources noted above is used as a basis for decisions regarding where and when insect and disease problems require action involving vegetation management. In responding to occurrences, field staff will prepare collaboratively developed intervention plans *before* pest outbreaks (e.g., the strategic plan for the cooperative management of gypsy moth in

Minnesota involving Minnesota DNR, Minnesota Department of Agriculture, USDA-APHIS, and USDA-FS). These plans detail appropriate integrated pest management strategies, circumstances under which strategies can be appropriately and effectively used, responsibilities, and cost-sharing arrangements. Containment and eradication measures will seek to minimize impacts from these species, while minimizing the impact of control measures on vulnerable native species.

N1a. 151 Identify, document, and monitor native insect and disease populations (e.g. jack pine budworm, ips bark beetle, two lined chestnut borer, or diplodia shoot blight) as part of the *Forest Health Monitoring Program,* and establish occurrence levels above which management action should be taken.

Early identification and risk assessment of new exotic species introductions improve the potential to develop and implement appropriate responses. Monitoring known insect and disease pests, conditions conducive to outbreaks, and populations of harmful exotic plants can provide useful information for predicting potential outbreaks and documenting and predicting range expansion. DNR staff will involve private landowners and local units of government in gathering and disseminating information concerning insect populations and disease outbreaks to help determine when and where preventive measures or control actions must be taken.

Mutually established protocols for data collection and information sharing among federal (EPA, USDA) and state agencies improve capacity to respond to the spread of established exotic species into new areas, new species introductions, and outbreaks of established pests and diseases.

N1a. 152 Manage the vegetative content and structure of stands to reduce the potential impact of insects and disease.

Focused Issue N2 How will threats and invasions of exotic species be managed?

GDS N2a Damage to forests from exotic species will be minimized.

Establishment of populations and subsequent damage to forest ecosystems by invasive, exotic species results partially from rapid intercontinental and global trade and travel. Natural resource managers are concerned about the introduction and establishment of exotic insect, disease, and plant species on public land. Invasion of forest ecosystems by exotic species can cause significant economic losses and expenditures for control because they destroy or displace native plants and animals, degrade native species habitat, reduce productivity, pollute native gene pools, and disrupt forest ecosystem processes (e.g., hydrological patterns, soil chemistry, moisture-holding capability, susceptibility to erosion, and fire regimes). Examples of exotics with known adverse effects on Minnesota forest resources include: white pine blister rust, gypsy moth, and European buckthorn (all of which have been documented in these subsections). There is potential for significant adverse impacts from other species present in these subsections, such as: tansy, spotted knapweed, purple loosestrife, and leafy spurge. Management will seek to minimize impacts from these species, limit the introduction of new exotic species, and minimize the impact of control measures on vulnerable native species.

Local introductions and spread of harmful exotic plants can occur through several activities. Forest management activities have significant potential as an avenue for unintentional introductions of exotic plants, especially in less developed portions of the subsections. Establishing and promoting practices that minimize these introductions will slow the spread of harmful exotics and reduce the associated losses. Quarantines, early detection, eradication and control measures need to be implemented when and where invasive and exotic species are found in order to minimize their impact on forest ecosystems. Further, to guard against the invasion of non-native species, DNR is considering adoption of policy and guidelines that require contractors to steam-clean equipment before use on new sites.

As stand-level decisions are made, field foresters are required to consider the stand location in relation to the ECS and LTA, to ensure that all prescriptions are consistent with the native plant communities that have evolved on the site (See Appendix E, *Silviculture Prescription Worksheet*). Also when decisions are

made which result in, or lead to stand conversions or replacements, consideration will be given to fully occupy the stand with native species.

Concerning emerald ash borer, this Plan recognizes the program to certify firewood vendors; enforcing statutes that specific species of wood not be imported into the state, and requiring that firewood not be transported more than 100 miles in an effort to curtail importation of wood potentially infested with emerald ash borer. Further, the ash cover type will be reduced by 4% over the next 10 years and 11% over the 50-year plan implementation period.

Strategies

N2a. 153 Identify, document and monitor exotic species populations (e.g. gypsy moth, garlic mustard, common buckthorn, emerald ash borer, and earthworms) as part of the *Forest Health Monitoring Program* on state-managed lands.
Resources that will be employed by field staff to identify, monitor and respond to damage from exotic species includes the following:

1. DNR invasive species Web site, - (http://www.dnr.state.mn.us/invasives/index.html);
2. Exotic Invasive Plant Species in Minnesota - Michael Brakke, August 2005 – Community Forestry Resource Center Web site http://www.forestrycenter.org/search.cfm contains references to use of controlled burning in managing buckthorn and garlic mustard;
3. *Field Guide to the Native Plant Communities of Minnesota - The Laurentian Mixed Forest Province,* Ecological Classification System, Minnesota County Biological Survey, and Natural Heritage and Nongame Research Program; and,
4. Gypsy Moth Status- *DNR Forest Insect and Disease Newsletter* Dec 2004.

N2a. 154 Contain and reduce impacts caused by exotic species using proven techniques.

N2a. 155 Manage the impact of exotic species using techniques such as aggressive containment or seasonal timing.

This strategy will be implemented by:

1. Developing management plans and stand treatment prescriptions using recognized exotic species management sources, while considering ecological processes and functions and impacts to native species and habitats;
2. Providing information and training via logger education programs to equipment operators and tree fellers regarding techniques that minimize spread or introduction;
3. Emphasizing the use of fire in management for prevention of spread of exotic species, where appropriate;
4. Modifying or timing harvest operations to minimize exotic species spread, (e.g., frozen ground operation);
5. Appling control measures one to two years prior to harvest operations when feasible: and,
6. Direct-seed all exposed mineral soil with native grasses and herbs immediately after site preparation.

Focused Issue N3 How will natural disturbances such as fire and blow down be considered in forest management decisions?

GDS N3a Natural disturbance events will be evaluated to determine the appropriate forest management response to address the effects on the landscape.

By evaluating known disturbance events (e.g., fire, wind, or insects and disease), land managers will be able to recommend what, if any, forest management activities are necessary to mitigate the impacts of the event. Depending on the scale of the event and potential positive or negative impacts, management

recommendations will range from no action to salvage harvesting and/or prescribed burning. Where quick action is needed to salvage timber from damaged stands, the Annual Plan Addition process including public review will be used.

The following resources will be used by field staff to evaluate events to determine the appropriate response:

1. Division of Forestry's *Forest Development Manual* - Section D -Cover type Management Guide:
    - How to Identify and Manage Pine Bark Beetles - Mn DNR publication
    - Two Lined Chestnut Borer - USDA Forest Insect and Disease Leaflet 168;
2. *Blue Stain- A Guide to the Causes, Identification and Prevention of Blue Stain Damage in Cut Logs*; University of Wisconsin Extension Publication GWQ043;
3. *Timber Salvage Guidelines*; published by North Carolina Dept. of Environment and Natural Resources, Division of Forest Resources at: www.dfr.state.nc.us/storm/storm_timbersalvageguidelines.htm;
4. *How to Evaluate and Manage Storm-damaged Forest Areas*; by Barry, Doggett, Anderson, and Swain; Management Bulletin RS-MB 63, Sept 1993, USDA Forest Service Southern Region, Forest Health, Asheville, NC. www.forestpests.org/storm;
5. Wallmo, O.C. and J.W. Schonen; 1980; *Response of Deer to Secondary Forest Succession in Southeast Alaska,*. For. Science 26: 448-462; and,
6. *Woodland Wildlife Management,* Miller, Brian K. Woodland Cooperative Extension Service, Purdue University, FNR-102.

Strategies

N3a. 156 Accept a higher level of disturbance in ERF stands, provided the level of impact does not jeopardize the ability to regenerate the stand to the desired cover type or jeopardize the management goals of surrounding stands.

N3a. 157 Evaluate large-scale (i.e., hundreds to thousands of acres) and small-scale (i.e., tens of acres) disturbance events to determine appropriate action.

N3a. 158 Implement efforts to salvage usable timber stumpage from damaged stands in a timely manner to minimize losses due to decay and staining.

Focused Issue N4 How can vegetation be managed to reduce animal damage, crop depredation, nuisance animals, potential spread of animal disease, and possible human health impacts (e.g., Lyme disease)?

GDS N4a Negative impacts caused by wildlife species on forest vegetation will be reduced.

The DNR's *Directions 2000, The Strategic Plan* directs foresters to reduce the vulnerability of forests that includes impacts from wildlife, to levels consistent with forest ecosystem sustainability. Further, *The Strategic Plan*, states that fish and wildlife population goals will continue to be an important consideration in planning timber harvests, old growth management, reforestation, and forest recreation. The Division of Fish and Wildlife advises that field staff use the expertise of the *Wildlife Depredation Program* when regeneration plans call for use of repellents or exclusion techniques. Also the North Central Forest Experiment Station *Manager's Handbook Series* advises field staff to avoid planting susceptible species in locations surrounded by habitat attractive to hare or deer without a plan for protection from browsing. Additional resources to control depredation can be found in *Eastern Deciduous Forest: Ecology and Wildlife Conservation*; Yahner, R.H. 1995, University of Minnesota Press, Mpls. (*Large Mammals as Forest Pests*, pg. 56-60).

Strategies

N4a. 159 Expand the knowledge of field staff related to preventing or reducing damage caused by wildlife through training and/or field level information sharing.

This strategy will be implemented by:

1. conducting training sessions that address the factors that affect damage, potential solutions, and prevention based on research and experience;
2. coordinating field visits at problem sites with area wildlife staff and the appropriate land manager; and,
3. collecting information from damaged sites for database entry and analysis of wildlife damage.

N4a. 160 Consider the potential for wildlife damage to artificial or natural regeneration when prescribing site management measures.

Before stand management objectives are identified, field foresters will work with area wildlife staff to identify sites where potential exists for significant wildlife damage.

N4a. 161 Incorporate damage prevention strategies at all phases of forest management.

In implementing damage prevention, field staff will consider:

1. planting on sites where edge (irregular boundaries) is minimized;
2. planting larger sites;
3. planting susceptible species away from the edge of the site;
4. using protective measures such as fenced enclosures, bud capping, repellents, tree shelters, etc.; and,
5. implementing more efficient protection control measures, clump plantings and/or locate them to be easily accessible.

N4a. 162 Focus artificial forest regeneration efforts in areas less likely to be impacted by wildlife species.

This strategy will be implemented by:

1. avoiding unprotected plantings of susceptible species (i.e., those known to be a preferred food source such as white cedar and white pine) near known seasonal concentrations of deer or other detrimental species';
2. avoiding planting susceptible species in locations surrounded by habitat attractive to ungulates without a plan for protection from browsing;
3. in mixed species plantations, scattering susceptible species among species that are less susceptible to wildlife damage; and,
4. in larger mixed species plantations, planting susceptible species in the middle of the site.

N4a. 163 Apply mitigation strategies where wildlife damage is anticipated (e.g., considering stock sources that are less palatable to wildlife).

Focused Issue N5 How should forest management respond to global climate change within the planning period?

GDS N5a Forest management practices will consider the impacts of climate change on forest lands, and will attempt to mitigate these impacts using current knowledge and future research findings.

Several climate models (e.g., atmospheric-ocean general circulation models, AOGCM[1]) in use around the world predict global climate change. The Intergovernmental Panel on Climate Change (IPCC) refers to climate change as any change in climate over time, whether due to natural variability or as a result of human activity. The models agree that average temperatures are increasing and predict more variable changes in precipitation. This global warming will affect forests and wildlife in Minnesota.[2,3]

Scientists believe the predicted climate change will affect the size, frequency, and intensity of disturbances such as fires and windstorms (blowdown). It will affect the survivorship of existing plant and animal species and the distributions of plants and animals. Even at modest levels, independent studies have found mounting evidence that the current climate change influences plant and animal ranges and behavior[4]. Some plant and animal species may not be able to adapt to the rate of change. Increases in the reproductive capability and survivorship of exotic species, insect pests, and pathogens will impact forests and wildlife. At a landscape level, certain tree species, such as black spruce, balsam fir, birch, and jack pine will respond negatively to increased soil warming and decreased soil moisture. Carbon sequestration by forests and wetlands may be affected because of accelerated decomposition rates.

Most tree species in Minnesota have reached the limit of their geographic range somewhere within the boundaries of the forested portion of the state. Predictions have been made on the potential future distributions of trees.[5] There is a need to facilitate species adaptation to change in response to possible rapid climatic changes.

Although there are uncertainties about the effects of climate change on forest vegetation at the subsection scale, the following strategies will be used to help mitigate the predicted effects of climate change on vulnerable species and native plant communities.

Strategies

The following strategies, as they are implemented, will begin to direct vegetation management towards mitigating and slowing the effect of climate change on most vulnerable species and native communities. Implementation of the appropriate *MFRC's Voluntary Site-Level Forest Management Guidelines* will guide field staff to management activities to maintain or promote or enhance ETS species on the site, and will avoid forest management activities that isolate or eliminate populations of tree species at the edge of their range.

N5a. 164 Reference *the MFRC Voluntary Site-level Forest Management Guidelines* for identification and management of tree species currently found at, or near the edge of their range.

N5a. 165 Maintain or increase species diversity across the subsections.

The forest composition and within-stand diversity goals of this plan will provide a more diverse forest across the two subsections. By maintaining a variety of species across these subsections, the forest will be more resilient and more genetically diverse, thus better able to adapt to the anticipated climate change. Maintaining species diversity within and among stands will minimize the risk of widespread insect and disease outbreaks that could result from adverse climatic change.

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[1] IPCC. 2001. Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). [Houghton, J.T., et al. (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. 881pp.

[2] Weflen, K., *The Crossroads of Climate Change*. Minnesota Conservation Volunteer, January-February 2001, Minnesota Department of Natural Resources, St. Paul, MN.

[3] Pastor, John, personal communication at March 13, 2003 SFRMP meeting. Natural Resources Research Institute, University of Minnesota-Duluth.

[4] Root, T. et al., *Fingerprints of Global Warming on Wild Animals and Plants*, Stanford University, Nature- January 2, 2003; and Parmesan, Camille, A Globally Coherent Fingerprint of Climate Change Impacts Across Natural Systems, University of Texas.

[5] Iverson, L, et al. 1999. *An Atlas of Current and Potential Future Distributions of Common Trees of the Eastern United States.* Gen. Tech. Rep. NE-265. Radnor, PA. USDA Forest Service. Northeastern Research Station. 245 p.

N5a. 166 Ensure connectivity that encourages the migration of plants and animals as climate changes the landscape.

Maintaining forest spatial patterns where patches of vegetation are connected will allow the flow of plants, animals, and processes (e.g., seed dispersal) between suitable habitats. The ability of species to move to a new more hospitable site is a critical survival tactic. The following are some of the techniques that have been used to address this strategy:

1. Stands selected for patch management were located to increase their effective patch size or to increase connectivity between patches, SNAs, riparian areas, and OFMCs;
2. OFMCs were designated around old-growth stands;
3. ERF stands were designated along riparian corridors; and,
4. EILC stand selection for this plan implementation period considered connectivity.

N5a. 167 Evaluate site conditions with respect to climate change when selecting tree species for future forest stands.

Boreal species such as balsam fir, spruce, tamarack, aspen, and paper birch should be selected for cool, moist soils, or northwest to east facing slopes where these species would suffer less temperature and moisture stress. On drier, warmer sites encourage species such as jack pine, red pine, white pine, red maple, oak, or other hardwoods. On deep clay or silty clay loams encourage sugar maple, basswood, and yellow birch.

N5a. 168 Apply the concept of carbon sequestering to remove carbon dioxide from the atmosphere.

Climate models (e.g., *Hadley Centre for Climate Prediction and Research-UK, carbon cycle models*) predict that, as future atmospheric carbon dioxide concentrations increase, global temperatures will increase. Forests have the ability to remove carbon dioxide through photosynthesis and to store the carbon as woody material. Carbon is stored in all forest components including living trees, dead trees, fallen leaves, and soil. The storage of carbon is called *carbon sequestration*. Carbon also remains stored in wood that is harvested and processed into wood products.[1] The carbon remains stored in wood until it is gradually released through slow decay or is released rapidly when it is burned.

Forest management activities, such as ensuring existing stands are adequately stocked and ensuring regeneration is adequate after harvest, sequester carbon. Basically, any activity that provides healthy and productive forests will increase carbon sequestration. Stands will be field examined to determine if there is sufficient advanced regeneration. If the site lacks adequate regeneration, it may be site prepped for planting or seeding with an appropriate species to result in a more fully stocked stand. Stands that contain a variety of species are more likely to fully occupy a site, increasing the overall wood volume grown on the site. Increasing the biomass over what is currently on these under-stocked sites will help sequester carbon.

The following are examples of forest management strategies in this Plan that will help in carbon sequestration:

1. Balance the age-class distribution in even-aged managed cover types;
2. Emphasize longer-lived species;
3. Use longer rotations on forested wetlands cover types;
4. Designate forest stands to be managed as extended rotation forest (ERF);
5. Reserve and maintain old-growth forests;
6. Increase timber productivity; and,
7. Retain leave trees, snags, and coarse woody debris on harvested sites.

[1] Heath, L. 2000. *Carbon Sequestration: Yet Another Benefit of Forests*. Forest Legacy Program. USDA Forest Service, Durham, NH.

Chapter 4. Cover Type Management Recommendations

4.1 Introduction

The purpose of this chapter is to provide background information and management recommendations by cover type. These management recommendations provide direction to field staff for on-the-ground management activities for stands in the various cover types. Some information from the general direction statements (GDSs) and strategies is incorporated into this chapter, but field foresters should be familiar with the full contents of the GDSs and strategies found in Chapter 3. Background information and management recommendations provided by cover type include:

- Current Condition
- Future Direction
- Stand Management
- Cover Type Conversion Management (as applicable)
- Stand Selection Criteria
- Stand Treatment Summary

These cover type management recommendations were developed by workgroups made up of DNR professionals from Forestry, Fish and Wildlife and Division of Ecological Resources. The intent was to gain a wide variety of disciples and input into drafting the cover type recommendations. These work groups drafted the cover type recommendations before adoption by the CP-PMOP planning team and incorporation into the CP-PMOP plan.

The following cover types are addressed with management recommendations:

- aspen/balm of Gilead
- birch
- ash / lowland hardwoods
- northern hardwoods
- oak
- white pine
- red pine
- jack pine
- black spruce lowland
- white spruce
- balsam fir
- tamarack
- white cedar
- stagnant spruce

For species of minor acreage, such as yellow birch and upland tamarack, within-stand composition strategies for cover types will be used to increase their presence.

Acreage figures in this chapter include state forestlands administered by the Division of Forestry, and Management Section of Wildlife. State lands in state parks, designated old-growth stands, and scientific and natural areas (SNA) are not included as managed acres in this plan.

In addition to the cover type management recommendations and background information that was used to develop direction on vegetation management for this plan, the following is a list of the more significant publications, guidelines, directives, and policies field foresters use as guides to manage state forest lands:

1. *Directions 2000, The Strategic Plan, September 2000*
2. Division of Forestry's *Forest Development Manual*
3. MFRCs *Voluntary Site-Level Guidelines including Biomass Harvesting guidelines for forestlands, brushlands and open lands* (DNR, December 2007
4. *North Central Landscape Plan, as amended January 2005*, Minnesota Forest Resources Council

5. *Preliminary Issues and Assessment*. Chippewa Plains / Pine Moraines and Outwash Plains, Minnesota DNR, August 2006
6. *Field Guide to the Native Plant Communities of Minnesota: The Laurentian Mixed Forest Province*. Minnesota DNR. 2003
7. *Forest Development Manual*. Minnesota DNR, 1994
8. *Voluntary Site-Level Forest Management Guidelines*. Minnesota Forest Resources Council. 1999
9. *Forestry-Wildlife Habitat Management Guidelines*. Minnesota DNR, 1985
10. Forestry - Wildlife Coordination Policy, *Interdisciplinary Forest Management Coordination Framework*, December 2007
11. *Cultural Resource Review Procedure*, Minnesota DNR;
12. *Old-Growth Forests Guideline Amendment #5*, Minnesota DNR, January 2002
13. OFMC Management Plans as prepared by forestry areas, various dates based on plan completion
14. Minnesota County Biological Surveys, Minnesota DNR, Division of Ecological Resources, various dates based on completion for each county
15. Natural *Heritage database, information, and survey,* various dates based on survey completion;
16. *Tomorrow's Habitat for the Wild and Rare: An Action Plan for Minnesota Wildlife, January 2006*
17. Manager's Handbooks for Cover types, North Central Forest Experiment Station, General Technical Reports, various dates for the individual publications for cover types common in the north central states
18. CP-PMOP *Stand Silvicultural Prescription Worksheet* (Appendix E)
19. *Forest Health Monitoring Program,* MN DNR
20. Wildlife management area management guidance documents as prepared by Minnesota DNR, Division of Fish and Wildlife
21. *Land Type Association Assessment and Analysis* documents, draft August 2007 (Appendix N)
22. *Biomass Harvesting Guidelines*, Minnesota DNR, November 2007
23. *Special Forest Products "Careful Harvest Fact Sheets," University of Minnesota Extension Service*
24. *Pesticide and Pest Control Operational Order #59*, Minnesota DNR, April 1989
25. *Visual Sensitivity Classifications* (inventories can be found at http://www.dnr.state.mn.us/forestry/visual_sensitivity/index.html)
26. *Visual Quality Best Management Practices for Forest Management in Minnesota" May 1994*
27. applicable local, state, federal, Indian band, private, and industrial vegetative
28. management policy, guidelines, and plans as these impact DNR forest management
29. *Environmental Indicators Initiative and Natural Resources Stewardship 2001*

Cover type determination is based on the stand composition at the time the stand was inventoried. The composition of a stand typically changes to some degree over time, sometimes resulting in a cover type change if the change is significant. Appendix B, *Tree Species in the CP-PMOP)* lists the tree species and cover types found in these subsections. Stand composition may range from a single species to several species. In general, a species or species group needs to comprise 40 percent of the stand composition to be called the cover type. For more details, see Appendix C, *Key for Main Cover type Determination*.

These cover type management recommendations are developed from background information concerning a wide range of existing forest conditions such as total acres, existing age classes, forest impacts, and issue identification, primarily as outlined in the Preliminary Issues and Assessment document. Using this background information, goals and strategies were developed and applied to the forest inventory to outline future forest vegetation management directions. These future directions are stated as desired future forest conditions (DFFCs).

These cover type management recommendations provide direction for the identified cover types in terms of conversions in-to and out-of other cover types; identification of NPCs and LTAs where conversions are most likely to succeed; stand management recommendations and identification of stand selection criteria from which the 10-Year Stand Exam Lists were developed. Although the plan includes a 10-Year Stand

Exam List, desired future forest conditions are expressed both as 10-year DFFCs and 50-year DFFCs, recognizing the long-term perspective of forest vegetation management.

The DFFCs provided guidance, as these cover type management recommendations were prepared. For example, for cover type conversions, several DFFCs recommend a decrease in the cover type acreage of specific cover types (e.g., aspen, birch, and balsam fir). These cover- type decreases will result in conversions through artificial (e.g., site preparation and planting) or natural conversion (e.g., natural succession) methods to other cover types (e.g., white pine, red pine, and white spruce). Stands may not be fully converted to the desired cover type for many years because of a gradual increase in the desired species over time. The composition of stands during conversion to cover types such as white pine or white spruce may also include significant portions of other species, such as aspen or birch. On some aspen, birch, and balsam fir stands where cover type conversion is desired, partial harvest, less intensive site preparation techniques, and/or successive prescribed fires may be appropriate for the conversion to long-lived conifers such as white pine, red pine, or white spruce.

DFFCs that influence cover type management recommendations for even-aged managed cover types include recommendations that balancing the distribution of the 10-year age classes is a long-term goal, which may take more than one rotation to achieve for most cover types.

Other clarifications of these cover type recommendations include that treatment acres determined in this plan comprise a stand-examination list that will be field-visited over the 10-year plan implementation period. Stands on the 10-year list will be field-visited based on the annual treatment acres recommended for each of the cover types. There may be a deviation from year to year, but the 10-year average should equal the annual treatment acres.

Several of these cover type management recommendations refer to a *Silviculture Prescription Worksheet* (Appendix E). This tool will be used by field foresters to assess management options for all stands that are identified for field visit. The *Stand Silvicultural Prescription Worksheet* is intended to provide guidance to appraisers when the field visit is made. As actual field decisions are made, all information assigned to a stand during the SFRMP planning process will be considered in determining stand-specific management objectives. This background information will be provided to appraisers after each Forestry Area Annual Stand Exam List is identified from the 10-year Stand Exam List as contained in this plan. Stands that are suitable for harvest will be appraised for a timber sale. For stands found not suitable for harvest, inventory data will be updated (i.e., alteration) and the appropriate prescription applied, such as manage for the understory, defer treatment, prescribe forest development activities (e.g., site preparation and tree planting), or alter (i.e., no treatment needed) to the current stand conditions or cover type.

4.2 Aspen/Balm of Gilead (A/BG)

4.2A Current Condition

1. Cover Type Characteristics: The aspen/balm of Gilead (A/BG) cover type includes quaking aspen, bigtooth aspen, and balm of Gilead. In 2007, the A/BG cover type comprised 42.6 percent (183,355 acres) of the state timberland (429,229 acres) managed in the CP-PMOP subsections. Of the total A/BG acres in the two subsections 63 percent (115,955 acres) occur in the PMOP and 37 percent (67,399 acres) are found in the CP subsection (See Table 4.2a). There are a total of 334 acres of the A/BG cover type reserved from harvest in these subsections.

Both aspen and balm of Gilead are combined into one cover type for the CP-PMOP Plan as the two cover types are commonly associated with each other and are managed using the same management prescriptions.

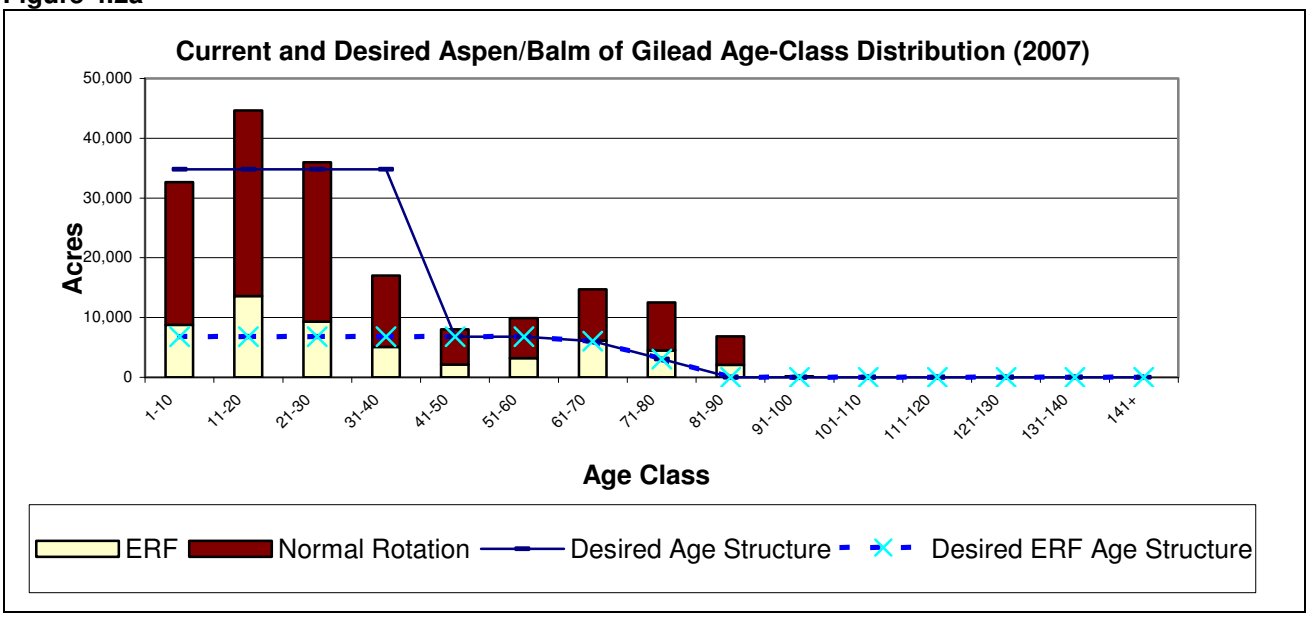
Table 4.2a Aspen/BG Cover Type Acres by Subsection

	CP	PMOP	Total
Aspen Acres	65,000	115,692	180,691
BG Acres	2,398	264	2,662
Total A/BG Acres	67,399	115,955	183,353
Percent	37	63	100

Aspen generally compete well on most sites within these two subsections, but quaking aspen is identified as not an excellent competitor in the following upland forest Native Plant Communities (NPCs): FDn12, FDc12, FDc23, FDs37, MHn47, MHc47, and MHs39. In early stages aspen is so prolific, it is typed as an aspen stand, however as the stand matures, other cover types, such as birch, come to dominate aspen stands, consequently changing the cover type classification.

2. Age-Class Distribution: The current A/BG age-class distribution does not reflect the balanced age-class structure desired for even-aged managed cover types. Figure 4.2a identifies the current and desired age-class distribution of the A/BG cover type.

Figure 4.2a



The normal rotation age for aspen is 45 years in the CP and 40 years in the PMOP. The normal rotation age for balm of Gilead is 40 years for both subsections. Considering the CP-PMOP combined, a total of 50,950 acres of A/BG (28%) are over their respective normal rotation ages (see Table 4.2b).

Table 4.2b Aspen/BG Cover Type Acres Over Normal Rotation Age by Subsection

Cover type	CP	PM	Total
Aspen	13,068 (45 years)	36,438 (40 years)	49,506
BG	1,198 (40 years)	246 (40 years)	1,444
Total Aspen/BG Acres	14,266	36,684	50,950 (28%)

The maximum rotation age for aspen is 80 years in the CP and 75 years in the PMOP. The maximum rotation age for balm of Gilead is 60 years in both subsections. Considering the CP-PMOP combined, a total of 15,193 acres of A/BG (8 percent) are over their respective maximum rotation ages (see Table 4.2c).

Table 4.2c Aspen/BG Cover Type Acres Over Maximum Rotation Age by Subsection

Cover Type	CP	PMOP	Total
Aspen	613 (80 years)	10,464 (75 years)	11,077
BG	4,003 (60 years)	113 (60 years)	4,116
Total Aspen/BG Acres	4,616	10,577	15,193 (8%)

3. Stand Composition: Mature aspen stands in the CP-PMOP subsections are typically comprised of a mixture of species, with aspen being 60 percent of the volume, followed by birch at 16 percent, balsam fir at 9 percent, and spruce species at about 6 percent. At times, the volume of these associated species may be quite high, nearly approaching the volume of aspen in the stand. It is not uncommon for the total volume of associated species to exceed that of the aspen.

4.2B Future Direction

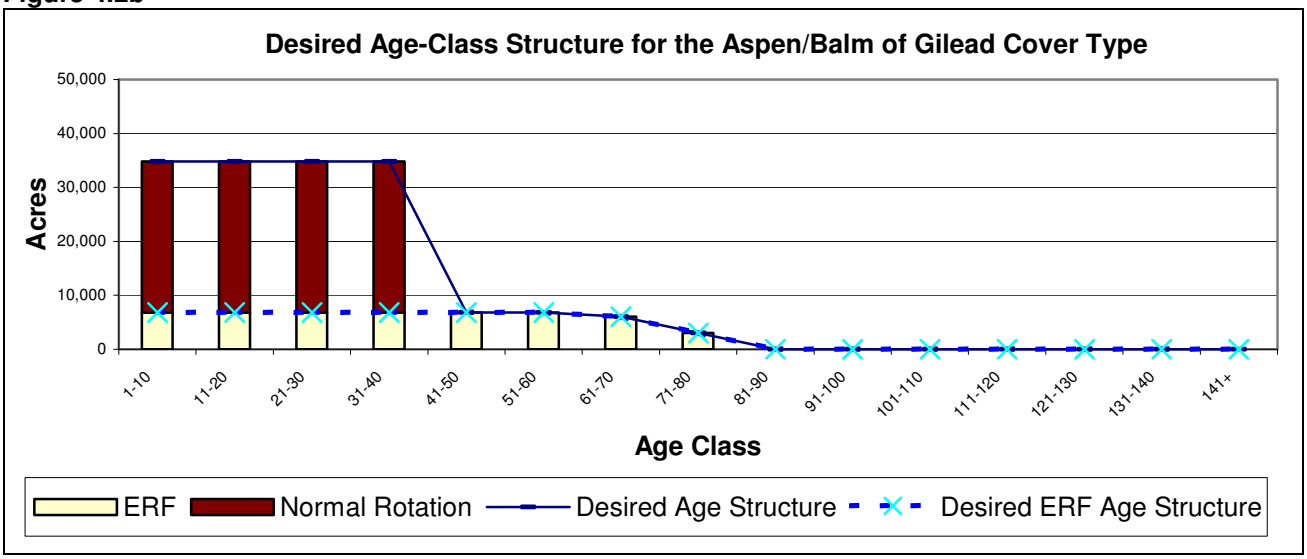
1. Cover Type Acres: Due to conversions to conifer cover types, the CP-PMOP plan recommends reducing the A/BG cover type by 2 percent (2,800 acres) during the next 10-year plan implementation period. These acres will be converted to white cedar (50 acres only within the CP Subsection), jack pine (1,500 acres), white spruce (700 acres), white pine (300 acres) and red pine (250 acres). The 50-year DFFC goal (which includes the first 10-year plan implementation period) is to convert 8 percent (14,369 acres) of the A/BG cover type to conifers. These A/BG acres will be converted to jack pine (5,169 acres); white spruce (1,700 acres); white pine (1,500 acres) and to red pine (2,000 acres in the CP with 4,000 acres to the PMOP) (See Table 4.2d). In terms of the dominant cover type in a particular stand it is difficult to predict how aspen stands will react with other cover types.

Table 4.2d Recommended A/BG Cover type Acres by Subsection by Selected Year

	2007	2017	2057
CP	67,166	66,600	NA
PMOP	115,579	113,345	NA
Total acres	182,745	179,945	168,376

2. Age-Class Distribution: A primary objective is to move the current age-class structure toward a more balanced condition. Figure 4.2a shows the current age-class distribution. Figure 4.2b shows the long-term desired age-class distribution or the desired future forest composition (DFFC) goal. Due to the current conditions, it will take more than 50 years to achieve this goal (see Figure 4.2d).

Figure 4.2b



The ERF goal for this cover type is to maintain 13.5 percent of the acres over normal rotation age (effective ERF), with a declining age-class distribution from normal rotation (45 years in CP and 40 years in PMOP) out to the maximum age (80 years in CP and 75 years in PMOP). Figure 4.2b illustrates the balanced age-class structure desired through the normal rotation age with a declining age-class structure following normal rotation age of 40 years.

3. Stand Composition: The desired future within-stand composition will range from pure aspen stands to a more diverse stand structure and/or mixed forest that includes long-lived conifers such as white pine, white spruce, red pine, and upland white cedar. Upland hardwoods such as birch, maple, and ash will be found in many stands. As part of the *Stand Silvicultural Prescription Worksheet,* field foresters will consider ECS and consult the appropriate Native Plant Community Fact Sheets in the *Field Guide to the Native Plan Communities of Minnesota: Laurentian Mixed Forest Province,* to determine most appropriate species composition as stand management decisions are made.

4. Patch Management: Patch management objectives are to maintain existing large patches consisting of aspen, and increase the size of patches where possible.

5. Limiting Factors: Increased prevalence of stem decay and butt rot are likely in trees wounded by falling trees, harvest activities, and storm damage. As aspen trees become older, the incidence and severity of white trunk rot increases. Aspen decline and decadence often occurs after forest tent caterpillar defoliation of over-mature stands. Hypoxylon cancers and Saperda stem borers cause tree mortality, especially in low-density stands and along stand edges. Aspen is also one of the preferred host species for gypsy moth.

4.2C Stand Management

1. Even-aged Management Direction: The A/BG cover type will be managed on an even-aged basis for pulpwood and bolts. The goal is to move toward a balanced age-class structure while maintaining or improving site productivity, forest wildlife habitat, and biodiversity.

2. Final Harvest: Aspen and balm of Gilead stands to be maintained in this cover type will be managed using clearcut or clearcut-with-reserves as the final harvest method. Natural stand boundaries or natural features such as topography or soil type should be used when possible to delineate timber sale boundaries. Harvest regulations and methods that favor maintaining or increasing within-stand diversity, with an emphasis on long-lived conifers, while retaining aspen or balm of Gilead as the main cover type are recommended. One strategy to accomplish this would be to reserve some existing individual trees or patches of long-lived conifer species from harvest. These reserve trees would maintain the within stand species diversity as well as add structural diversity for the newly regenerating stand. Reserve trees may also function as a seed source that could aid in increasing the abundance of these long-lived species in the new stand. Individual trees and patches of trees to be reserved should be healthy and able to last another rotation. Seed trees should be of good health and form.

A goal is to increase the average size of harvest areas. Selected larger blocks (100+ acres) should be harvested, where appropriate, using consolidated or natural stand boundaries. Small harvest blocks (less than 40 acres) will continue to be prescribed. Implementing a range of harvest block sizes will provide for a range of wildlife habitat needs.

3. Even-Aged Management Prescriptions: The following are the most common prescriptions that will be used on A/BG timber sales:

a. Clearcut-Sprouting
b. Clearcut with Reserves – Sprouting

Additional coding of objectives in the DNR's Forest Information System (FORIST) will be used to track accomplishments toward increasing within-stand diversity and mixed forest conditions.

4. Regeneration Methods after Final Harvest: Aspen and balm of Gilead stands regenerate naturally through root sprouting (suckering) and seeding. The recommended minimum stocking of aspen regeneration two years after harvest is 4000+ stems per acre scattered throughout the stand.[1]

Forest managers should consider the following strategies when the goal is to increase within-stand diversity or to create a more mixed hardwood-conifer composition in the future stand.

a. Direct seeding: This is most appropriate on sites where harvesting operations have scarified the soil creating a seedbed suitable for seed germination.
b. Planting: Planting long-lived conifers using small patches or variable density scattered plantings, with or without site preparation can be considered or implemented.

4.2D Cover Type Conversion Management

1. Conversion Goals: Over the next 10 years the DFFC is to convert 2 percent (2,800 acres) of the A/BG cover type to white cedar (50 acres in CP), jack pine (1,500 acres), white spruce (700 acres), white pine (300 acres) and red pine (250 acres). Over the next 50 years, it is recommended that approximately 14,369 acres of the A/BG cover type be converted to other cover types. Depending on site conditions, these stands will be converted to long-lived conifer species such as white pine, white spruce, red pine, or upland white cedar, as well as shorter-lived conifers such as jack pine. Some converted stands will be managed for a mixed conifer-hardwood composition. The decision of whether or not to convert a stand to another cover type will be determined when the stand is field-visited using the *Silviculture Prescription Worksheet* process. Conversion strategies include the following:

a. Conversion of aspen to the desired cover types will be accomplished using a range of management options, including: Allowing natural succession to occur on sites where the within-stand composition contains a high percentage of the desired species listed above, or there is adequate advanced regeneration of these species in the understory.
b. Using partial harvest in mixed stands to release existing understory conifers and to create mixed conifer-hardwood composition in the stand.

[1] *Manager's Handbook for Aspen in the North Central States*. Gen. Tech. Rep. NC-36. St. Paul, MN. USDA, Forest Service, North Central Forest Experiment Station.

c. Using post-harvest treatments such as herbicide application, mechanical site preparation, or prescribed burning; followed by hand planting or artificial seeding, to establish conifers on the site.
d. Underplanting long-lived conifers in thinned or existing stands where conditions are favorable for these seedlings to become established and grow.
e. Considering conversion to another species if more than 25 percent of the aspen stems in a stand contain hypoxylon canker (*DNR-Forest Development Manual*, page D-2.1).

As treatment and conversion is considered, field foresters should note that quaking aspen is not an excellent competitor in the following upland forest Native Plant Communities (NPCs): FDn12, FDc12, FDc23, FDs37, MHn47, MHc47, and MHs39.

4.2E Stand Selection Criteria

1. Normal Rotation Forest: Normal rotation ages of 45 and 40 will be used for calculating a regulated harvest level in the CP and PMOP respectively (see Table 4.2e).

Table 4.2e Aspen/Balm of Gilead Normal Rotation Ages and Maximum Ages

Subsection	Normal Rotation Age		Maximum Age	
	Aspen	Balm of Gilead	Aspen	balm of Gilead
CP	45	40	80	60
PMOP	40	40	75	60

The objective is to move the age classes toward a more balanced structure. The priority during the next 10 years will be to select the oldest and highest scoring stands for treatment. A *Stand Scoring System* was implemented which assigned scores to stands in the following priority: stands that were currently over maximum age; over maximum age within 10 years; currently beyond normal age; and, currently less than normal age. The *Stand Scoring System* considered both normal pool acres and ERF acres (see Appendix K).

2. Normal Rotation Harvest Treatment Level Calculations: The pool of stands considered for normal rotation (see glossary) harvest treatment in all stands:
a. not reserved from harvest (e.g. old growth, EILC);
b. not designated to be managed as extended rotation forest (ERF);
c. and near normal harvest rotation age.

Harvest treatment level is the sum of normal rotation acres to be harvested from each age class that will move the age class distribution towards a more balanced structure. Once a balanced age class distribution is achieved, stands can be scheduled for treatment upon reaching normal rotation age.

Adjustments to the normal harvest level were made to meet other goals such as balancing the age-class distribution and providing relatively stable harvest levels.

3. Extended Rotation Forest: Long-term DFFC goals are to retain 13.5 percent of the cover type acreage in Effective ERF and 30 percent in Prescribed ERF. This will provide a declining age-class structure out to the maximum harvest age as shown on Figure 4.2b.

The harvest level will be based on various harvest ages beyond the normal rotation ages, out to the maximum harvest ages as illustrated in Table 4.2e. The average rotation age for ERF stands, when the desired age-class distribution is reached, will be 73 years. The selection of older ERF stands for treatment will be emphasized to help move the population of ERF stands toward the desired declining age-class structure. Table 4.2f identifies the Prescribed ERF and Effective ERF total acres for the CP-PMOP subsections.

Table 4.2f A/BG ERF Acres (Plan Target Acres) and Maximum Age

Subsection	Prescribed ERF Acres	Effective ERF /DFFC Acres	Maximum Age			
			Aspen		BG	
			CP	PMOP	CP	PMOP
Total CP-PMOP	55,649	24,671	80	75	60	60

The previous Figure 4.2a showed the current age-class distribution of designated ERF and Figure 4.2b showed the desired declining age-class structure. Harvest of ERF stands during this 10-year period will be targeted at stands that are in the 61-100 year-old age classes. This will help maintain the desired 13.3 percent effective ERF into subsequent decades.

4. Extended Rotation Harvest Treatment (ERF) Level Calculations: The pool of stands considered for extended rotation harvest treatment is all stands:

a. not reserved from harvest (e.g. old growth, EILC);
b. designated to be managed as ERF;
c. and will be over normal harvest rotation age.

Extended rotation harvest treatment level is the sum of ERF acres to be harvested from each age class that will move the age-class distribution towards a more balanced structure, while attempting to retain the minimum level of effective ERF (see Glossary). A declining acreage of stands in each 10-year age class is desired between normal rotation age and maximum rotation age. Emphasis is on treating the oldest age classes first to minimize loss of fiber or tree mortality. Very few stands should be allowed to go untreated beyond the maximum rotation age (see Glossary).

4.2F Stand Treatment Summary

Table 4.2g shows the treatment acres, the recommended conversion acreage out of the A/BG cover type, old forest percent, effective ERF percent, and the average treatment ages for the next six decades. Based on the cover type management identified in this Plan, the average treatment age for aspen/balm cover type decreases during the plan implementation period with slight increases in later decades. There is considerable variation from decade to decade due to the current age-class distribution of the cover type. Old Forest Percent means acres that are over normal rotation age, except stands designated as Old Growth.

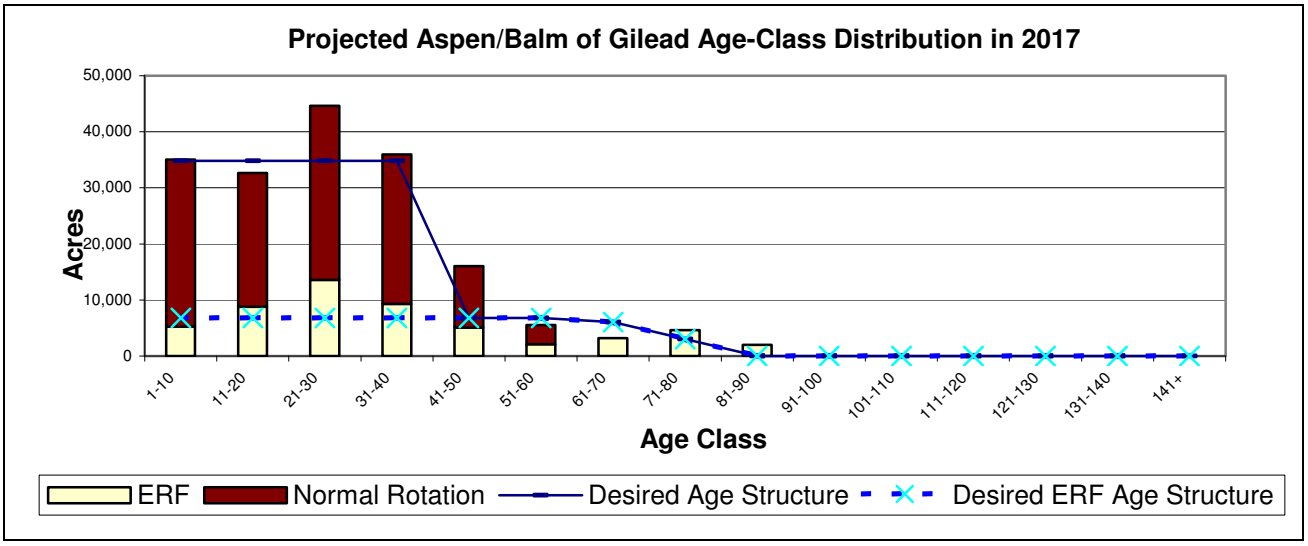
Table 4.2g Aspen/Balm of Gilead Treatment Summary by Decade for the CP-PMOP

Decades	Total Treatment	Conversion	Old Forest %	Effective ERF	Avg Treatment Age		Avg Age
					Normal	ERF	
1	37,864	2,800	27.8%	9.7%	71	81	31
2	37,844	2,631	15.8%	9.0%	46	68	27
3	39,339	4,198	14.9%	10.2%	43	62	26
4	35,707	3,900	18.0%	13.3%	43	66	26
5	33,491	840	17.3%	14.9%	42	73	27
6	29,587	0	18.4%	14.6%	43	78	28
Total	213,832	14,369					
DFFC	**34,802**[1]	**-14,364**[2]		**13.3%**	**41.9**[3]	**73.0**[3]	**25**[3]

[1] Total Treated Acres once a fully regulated forest is achieved.
[2] positive numbers are net acres into the cover type; negative numbers are net acres out of the cover type.
[3] anticipated age once a fully regulated forest is achieved.

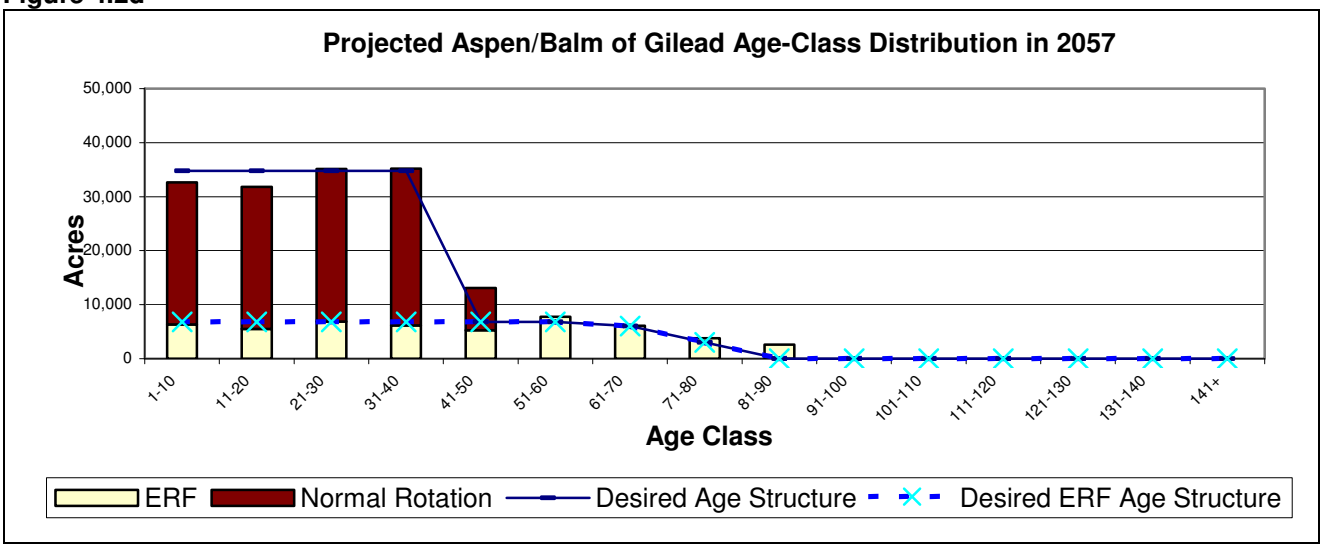
Based on modeling of the treatment levels by decade, Figure 4.2c shows the projected age-class distribution of the A/BG cover type in 2017, the end of the plan implementation period.

Figure 4.2c



Based on the modeling of the treatment levels by decade, Figure 4.2d shows the projected age-class distribution of the A/BG cover type in 2057.

Figure 4.2d



As each new 10-year plan is developed, the treatment levels by decade and modeling will be re-evaluated.

4.3 Paper Birch (Bi)

4.3A Current Condition

1. Cover type Characteristics: In 2007, the paper birch (Bi) cover type comprises 2.2 percent (9,946 acres) of the state timberlands (429,229 acres) under management in the CP-PMOP subsections. Approximately 41 percent (4,053 acres) of the birch cover type occurs within the CP and 59 percent (5,893 acres) occurs within the PMOP (see Table 4.3a). The birch cover type refers to stands of pure paper birch or mixed stands where paper birch is the species with the highest volume. Yellow birch may occur as individual trees on moist fertile sites but it is rare in these subsections. Because the birch cover type is quite often found mixed with young aspen/balm of Gilead, it can be expected that over time the acreage of the birch cover type will increase as it can dominate and overcome young aspen/balm stands. A total of 195 acres of the birch cover type has been reserved from harvest in these subsections.

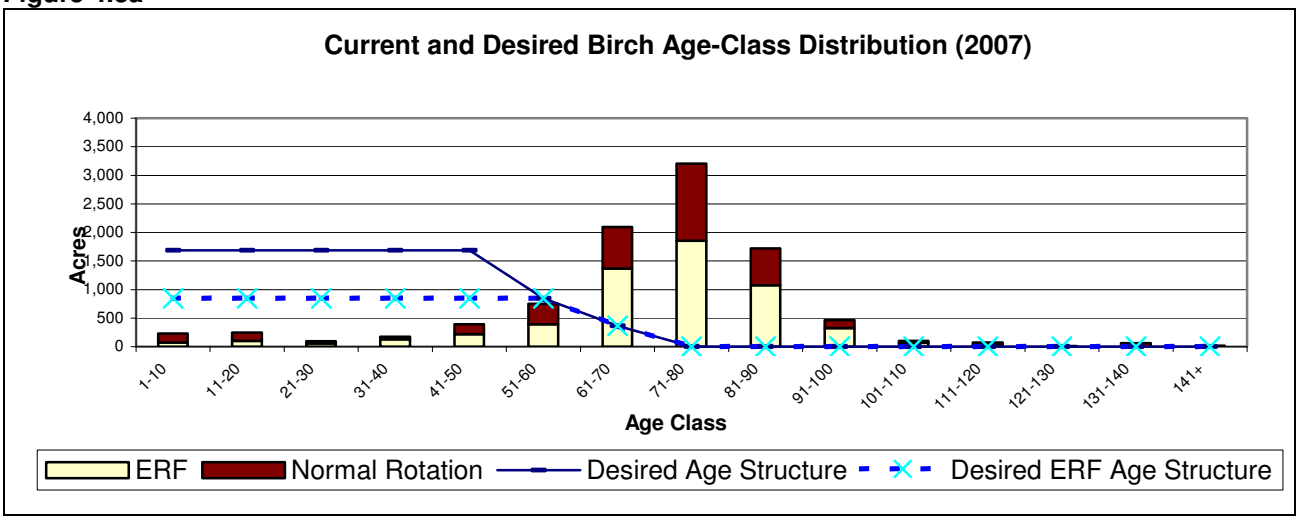
Table 4.3a Birch Cover Type Acres by Subsection

	CP	PMOP	Total
Acres	4,053	5,893	9,946
Percent	41	59	100

Paper birch is an excellent competitor in the following upland forest Native Plant Communities (NPCs): FDn33, FDn43, FDc25, FDc34, MHn35, MHn44, MHn46, MHc26, and MHc37.

2. Age-Class Distribution: The current birch age-class distribution is heavily weighted to age classes older than the maximum rotation age. It does not reflect the desired balanced age-class structure for even-aged managed cover types (see Figure 4.3a).

Figure 4.3a



Most of the birch cover type is located on mesic soils and originated after forest fires in the early 1900s, as can be seen by the acres of birch greater than 60 years old. Low acreage in the younger age classes is due to:

a. Natural conversion of birch stands to aspen following harvest.
b. Stand conversion from birch to plantations of other species, such as white spruce or pine.
c. High birch mortality that occurred in the late 1980's thru the mid-1990's resulted in conversion to other cover types. This mortality was caused by stresses to mature or over-mature stands from a combination of drought, attack by bronze birch borer, defoliation by forest tent caterpillar, and damage by birch leaf miner (often referred to as birch decline).

d. Historically, poor markets for birch have limited harvesting. Postponement of harvesting has resulted in many stands succeeding naturally to other cover types. (Note: Birch markets have improved in recent years so more young stands may become evident.)
e. Regeneration of stands has been inhibited because they are past their reproductive prime, resulting in lower seed production, poorer seed viability, and reduced sprouting vigor following harvest.
f. Herbivory near deer wintering areas.

In the two subsections, 71 percent (7,068 acres) of the birch cover type is over the recommended normal rotation age of 50 years. The goal is to maintain 12.5 percent of the timberland acres between the normal rotation age and the maximum rotation age. Currently, 32 percent (3,128 acres) is over the recommended maximum rotation age of 65 years for the CP and 60 years for the PMOP (see Table 4.3b).

Table 4.3b Birch Acres over Normal Rotation Age and Over Maximum Rotation Age

Cover Type	Over Normal Rotation Age (50)	Over Maximum Rotation Age (60 PMOP 65 CP)
Birch	71 percent 7,068 acres	32 percent 3,128 acres

4.3B Future Direction

1. Cover Type Acres: In the CP-PMOP subsections, the DFFC goal for the next 10-year period is to maintain the existing 9,946 acres of the birch cover type. The 50-year DFFC is to reduce the acreage in the birch cover type by 5 percent (500 acres) with conversion to conifer cover types. This change will take place as birch stands of site index less than 50 are examined for potential harvest. The primary conversion will be to red pine, mostly in the Pine Moraines Subsection (See Table 4.3c).

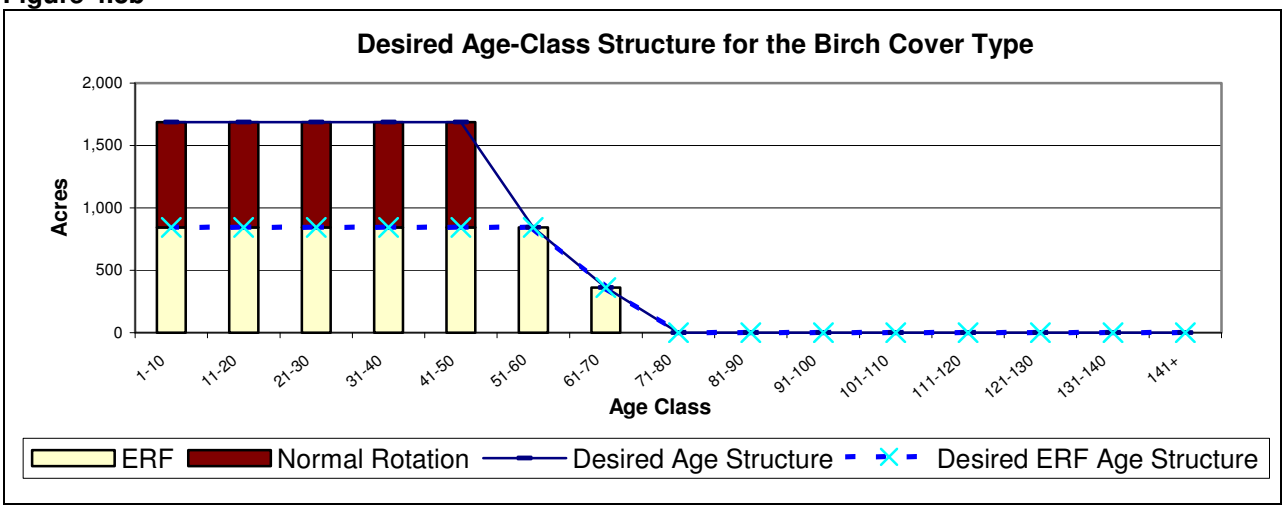
Table 4.3c Recommended Birch Cover Type Acres by Subsection and Selected Year

	2007	2017	2057
CP	4,053	4,053	NA
PMOP	5,893	5,893	NA
Total acres	**9,946**	**9,946**	**9,145**

2. Age-Class Distribution: A primary objective is to move the current age class structure toward a more balanced condition. Figure 4.3b shows the desired age-class structure. Due to the current imbalance, it will take more than 50 years to achieve this goal.

The ERF goal for the birch cover type is to maintain 12.5 percent of the acres over normal rotation age with a declining age-class distribution from normal rotation (50 years) to a maximum age of 65 years in CP and 60 years in PMOP. Figure 4.3b illustrates the desired gradual reduction in the size of age classes starting with the 51-60 age class.

Figure 4.3b



3. Stand Composition: The desired future within-stand composition will range from pure birch to a more diverse stand structure where birch is the majority species. Associated species will most often include aspen, red maple, balsam fir, and white spruce. As part of the *Stand Silvicultural Prescription Worksheet*, field foresters will consider ECS and consult the appropriate Native Plant Community Fact Sheets in the *Field Guide to the Native Plant Communities of Minnesota: Laurentian Mixed Forest Province,* to determine most appropriate species composition as stand management decisions are made.

4. Patch Management: Where possible, birch stands should be managed to maintain or increase the number of large patches (i.e. 250 acres or more).

5. Limiting Factors: Factors limiting birch management include: competition from other species (especially in over mature stands), browsing by deer and rabbits, insect damage from forest tent caterpillar and bronze birch borer, and drought impacts on poorer sites.

4.3C Stand Management

1. Even-aged Management Direction: Due to birch's shade intolerance, it is recommended to manage the cover type on an even-aged basis for pulpwood, bolts, and veneer products. The goal is to move toward a balanced age-class structure while maintaining or improving site productivity, forest wildlife habitat, and biodiversity.

2. Final Harvest: Birch stands will be managed using shelterwood, seed tree, clearcut, or clearcut with reserves as the final harvest method. Natural stand boundaries, or natural features such as topography or soil type, will be used to delineate timber sale boundaries.

3. Even-Aged Management Prescriptions: The following are the most common prescriptions that will be used on birch timber sale acres:

a. Shelterwood
b. Shelterwood with Reserves
c. Seed Tree
d. Seed Tree with Reserves
e. Clearcut - Sprouting
f. Clearcut with Reserves – Sprouting

4. Regeneration Methods after Final Harvest: Birch stands regenerate naturally through stump sprouting and seeding. Stump sprouting alone usually does not provide adequate stocking. A shelterwood or seed tree harvest method is preferred for regenerating a birch stand. A shelterwood provides the moderated environment preferred for the initial establishment of birch seedlings. Retention

of 20 to 40 percent crown cover is recommended for seed production and seedling development. Other recommendations include:

a. Scarification (e.g., summer harvest or disking) or prescribed fire to provide a mineral soil seedbed.
b. Site preparation, such as disking or anchor-chaining, to incorporate birch seed into the mineral soil. This is best done in late fall during seed fall, or within two years after a good seed crop.
c. Control competing vegetation on richer sites if aspen regeneration or shrubs are expected to overtop and suppress the birch seedlings.
d. The removal of shelterwood trees is an option after sufficient birch seedlings are established.

5. Intermediate Harvest Methods: Commercial thinning in merchantable birch stands is not recommended because it may result in unacceptable levels of damage to residual trees.

4.3D Cover Type Conversion Management

Conversion Goals: Over the 10-year period, the DFFC is to maintain the existing acreage of birch cover type. The DFFC over the next 50 years is to convert 5 percent (500 acres) of the cover type to red pine in the PM. It is expected that a majority of the conversion will be accomplished in birch stands with a site index below 50. Establishment of the desired cover type will be accomplished using post-harvest treatments such as mechanical site preparation, prescribed burning, and herbicide application, followed by hand planting of red pine seedlings.

4.3E Stand Selection Criteria

1. Normal Rotation Forest: The normal rotation age for birch in both subsections is 50 years. Maximum age is 65 years in the CP and 60 years in the PMOP (see Table 4.3d). The objective for the birch cover type is to move the age classes toward a more balanced structure. The priority during the next 10-years will be to select the oldest and highest scoring stands for treatment. Not all stands beyond the normal rotation age will be treated because of the large acreage of old stands.

Table 4.3d Birch Normal Rotation Ages and Maximum Age

Subsection	Normal Rotation Age	Max Rotation Age
CP	50	65
PMOP	50	60

2. Normal Rotation Harvest Treatment Level Calculations: The pool of stands considered for normal rotation (see Appendix V Glossary) harvest treatment in all stands:

a. not reserved from harvest (e.g. old growth, EILC);
b. not designated to be managed as extended rotation forest (ERF); and
c. and near normal harvest rotation age.

Harvest treatment level is the sum of normal rotation acres to be harvested from each age class that will move the age class distribution towards a more balanced structure. Once a balanced age class distribution is achieved stands can be scheduled for treatment upon reaching normal rotation age.

A *Stand Scoring System* was implemented which assigned scores to stands in the following priority: stands that were currently over maximum age; over maximum age within 10 years; currently beyond normal age; and, currently less than normal age. The *Stand Scoring System* considered both normal pool acres and ERF acres (see Appendix K).

3. Extended Rotation Forest: Long-term goals are to retain 12.5 percent of the cover type acreage as effective ERF and 56 percent as prescribed ERF to provide a declining age-class structure out to the maximum harvest age of 65 in the Chippewa Plains, and 60 in the Pine Moraines-Outwash Plains. (See Figure 4.3b.and Table 4.3e)

Adjustments to the normal rotation harvest level were made to meet other goals such as balancing the age-class distribution and providing relatively stable harvest levels.

Table 4.3e Birch ERF Acres (Plan Target Acres) and Maximum Age

	Prescribed ERF Acres	Effective ERF / DFFC Acres	Maximum Age
Total CP-PMOP	5,425	1,206	65 / 60

Selection of older ERF stands will be emphasized to help move the subset of ERF stands toward the desirable declining age-class structure.

4. Extended Rotation Harvest Treatment Level Calculations: The pool of stands considered for extended rotation harvest treatment in all stands:

a. not reserved from harvest (e.g. old growth, EILC);
b. designated to be managed as extended rotation forest (ERF); and
c. will be over normal harvest rotation age.

Extended rotation harvest treatment level is the sum of ERF acres to be harvested from each age class that will move the age class distribution towards a more balanced structure, while attempting to retain the minimum level of effective ERF (see Appendix V *Glossary*). A declining acreage of stands in each 10-year age class is desired between normal rotation age and maximum rotation age. Emphasis is on treating the oldest age classes first to minimize loss of fiber to tree mortality.

4.3F Stand Treatment Summary

Table 4.3e shows the total treatment acres, acres of recommended conversion out of the birch cover type, old forest percent, effective ERF percent, and the average treatment ages for the next six decades. Based on the cover type management identified in this Plan, the average treatment age for birch cover type decreases during the plan implementation period with a slight increase in the last decade. There will be considerable variation from decade to decade because of the current age-class distribution of the cover type. Old Forest Percent means acres that are over normal rotation age, except stands designated as Old Growth.

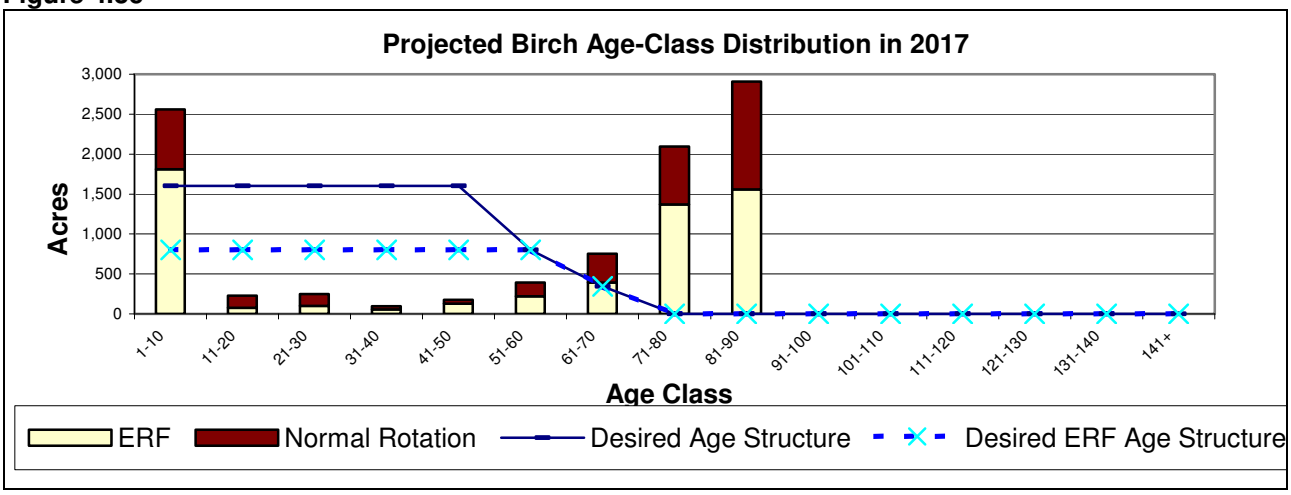
Table 4.3f Birch Treatment Summary by Decade for the CP-PMOP

Decades	Total Treatment	Conversion	Old Forest %	Effective ERF	Avg Treatment Age Normal	Avg Treatment Age ERF	Avg Age
1	2,558	0	88.0%	54.3%	94	92	69
2	2,850	500	65.0%	37.5%	90	90	54
3	1,782	0	38.8%	24.2%	90	91	38
4	1,295	0	19.9%	13.0%	87	95	30
5	1,366	0	8.2%	5.6%	48	55	27
6	1,370	0	5.6%	4.0%	47	53	29
Total	11,221	500					
DFFC	**1,600**[1]	**-500**[2]		**12.5%**	**50.0**[3]	**62.1**[3]	**29**[3]

[1] Total Treated Acres once a fully regulated forest is achieved.
[2] positive numbers are net acres into the cover type; negative numbers are net acres out of the cover type.
[3] anticipated age once a fully regulated forest is achieved.

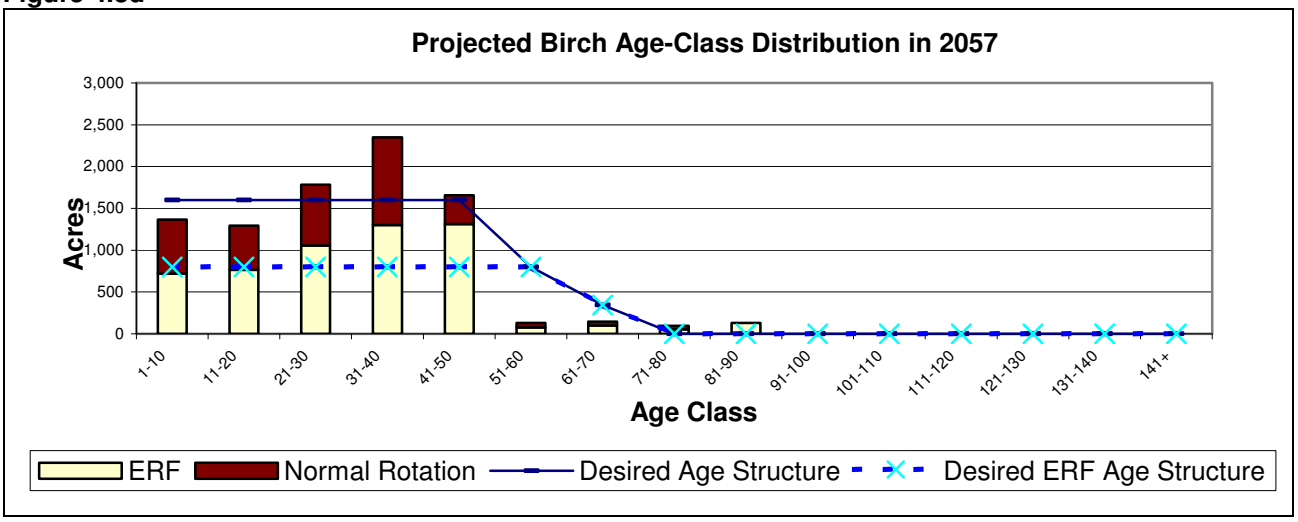
Figure 4.3c below illustrates the age-class structure of the birch cover type in 2017 at the end of the 10-year plan implementation period.

Figure 4.3c



Based on the modeling of the treatment levels by decade, Figure 4.3d shows the projected age-class distribution of the birch cover type in 2057.

Figure 4.3d



As each new 10-year plan is developed, the treatment levels by decade and modeling will be re-evaluated.

4.4 Ash/Lowland Hardwoods (Ash/LH)

4.4A Current Condition

1. Cover Type Characteristics: In 2007, the Ash and Lowland Hardwoods (Ash/LH) cover types comprise 3.9 percent (16,739 acres) of total state timberlands (429,229 acres) managed in the CP-PMOP. They are combined into one management category for CP-PMOP plan because they are commonly associated with each other and are managed under the same management prescriptions. There are a total of 672 acres of the ash and lowland hardwoods cover type reserved from harvest in these subsections.

Table 4.4a Ash/Lowland Hardwoods Cover Type Acres by Subsection

	CP	PMOP	Total
Ash	8,983	5,204	14,188
Ash Percent	63	37	100%
Lowland Hardwoods	1,778	890	2,668
LH Percent	67	33	100%
Ash/LH Total	10,761	6,094	16,856
Ash/LH Percent	64	36	100

Ash/Lowland Hardwoods is a broad cover type in that the lowland hardwood species can be found in a number of different Native Plant Communities (NPCs). The species that comprise the Ash/LH cover type are excellent competitors in the following NPCs: Black Ash-WFn55, WFn64; Green Ash-WFn55; Balsam Poplar-WFn55.

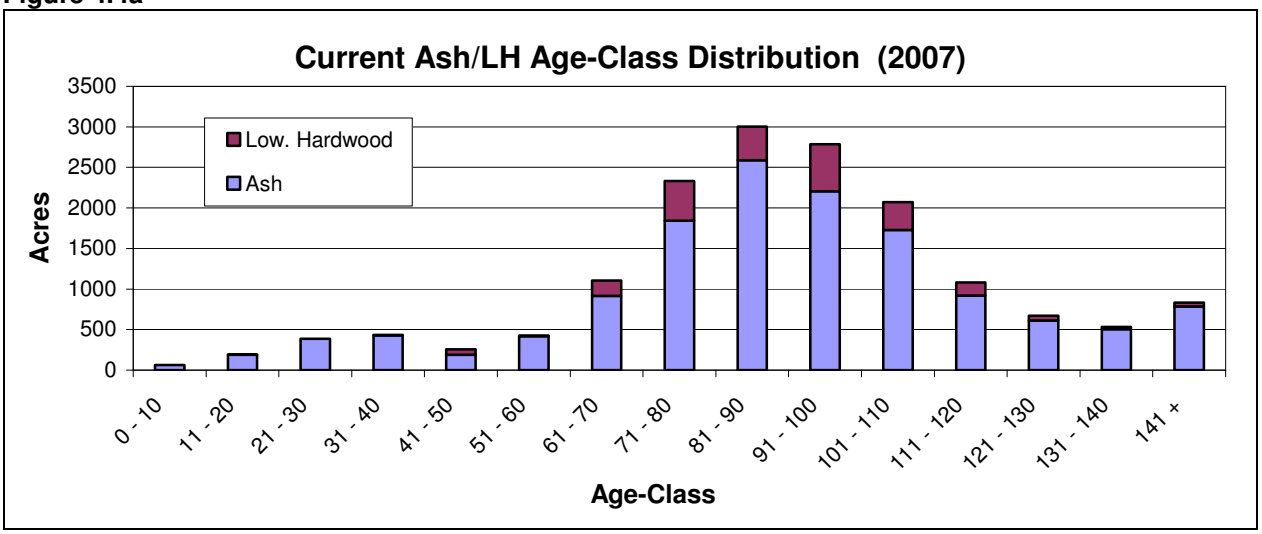
2. Age-Class Distribution: In both of the subsections, the current age-class distribution of these cover types reflects an aging forest with little acreage in the younger age-classes. Of the Ash/LH cover type, the ash component is summarized as 9 percent being under 50 years old, 23 percent between age 51 and 80 years, 36 percent between 81 and 100 years, and 32 percent is over 100 years old.

Summarizing the lowland hardwoods component of this cover type shows 2 percent is under 50 years old, 32 percent of the cover type is between age 51 and 80 years, 41 percent is between 81 and 100 years, and 25 percent is over 100 years in age.

3. Species Stand Composition: Ash/Lowland Hardwoods stands appear both as the dominant classification in FIM, and also as secondary tree species in other cover types.

4. Special Concerns: Although emerald ash borer (an exotic that kills ash trees) will eventually be found in Minnesota, it is unknown how quickly it will invade the state or where it will first be identified. Currently, there are no restrictions or limitations to managing ash stands in light of this threat, however, the DFFC for the ash / lowland hardwood cover type identifies a 4% acreage reduction over the 10-year period and an 11% reduction over the 50-year period..

Figure 4.4a



4.4B Future Direction

1. Cover type Acres: In the CP-PMOP Subsections, the 10-year DFFC is to convert this cover type by 4 percent or 600 acres (400 acres to tamarack and 200 acres to cedar cover types). The 50-year DFFC is to reduce the Ash/LH cover type by 11 percent or 1800 acres (1200 acres to tamarack and 600 acres to cedar). Because the Ash/LH cover type is quite often found mixed with young aspen/balm of Gilead, it can be expect that over time the acreage of the Ash/ LH cover type will increase, as it can dominate and overcome young aspen/balm stands.

2. Age-Class Distribution: The primary age-class distribution goal is to continue to move these cover types toward an uneven-aged structure in older age-classes.

3. Stand Composition: The stand composition goal is to maintain the species composition and structure that naturally occurs within these forest communities. Windthrow is a dominant natural disturbance in Ash/LH stands, resulting in large downed logs, hummocks, and hollows that promote tree seedling establishment and creates diverse sites for wet and mesic forest herbs. Recommendations for within-stand management are:

a. Maintain or restore associated tree species such yellow birch, white cedar, tamarack, silver maple, bur oak, box elder, elm, green ash, balm of Gilead, or basswood appropriate to the site.[1]
b. Retain the older forest characteristics within stands by retaining a component of large, old trees, coarse woody debris, and snags.
c. Retain large, old trees in the canopy for recruitment of future downed logs and the protection of hummock and hollow microtopography to promote seedling establishment.
d. Encourage multi-layered understory development.
e. Where practicing uneven-aged management, retain trees from all size-classes.

As part of the *Stand Silvicultural Prescription Worksheet*, field foresters will consider ECS and consult the appropriate Native Plant Community Fact Sheets in the *Field Guide to the Native Plant Communities of Minnesota: Laurentian Mixed Forest Province,* to determine most appropriate species composition as stand management decisions are made.

4. Patch Management: Patch management objectives are to retain the existing Ash/LH patches found within these subsections.

[1] Minn. DNR, 2003, *Field Guide to the Native Plant Communities of Minnesota: the Laurentian Mixed Forest Province.* Ecological Land Classification Program, Minnesota County Biological Survey, and Natural Heritage and Nongame Research Program. Minn. DNR. St. Paul, MN.

5. Limiting Factors: Although emerald ash borer, an exotic that kills ash trees, will eventually be found in Minnesota, we do not know when or where it will be first identified. Currently, there are some limitations, based on site index, to managing ash stands in light of this threat. To react to this threat:

a. Continue harvest activities in the higher site index (SI) black ash stands, and choose harvest methods that favor regeneration of species other than ash.
b. Avoid harvesting in low SI ash stands and be prepared to accept the loss of the sites due to high water tables if the ash die due to emerald ash borer infestation.

4.4C Stand Management

1. Management Direction: Ash and lowland hardwoods stands will be managed primarily as uneven-aged stands. However even-aged methods will be an option where a field visit determines it is the best method to regenerate the stand. During the field visit, staff will consider the hydrology, soils, existing stand composition, and riparian considerations of the stand in determining the stand treatment method. Stand density will be maintained at a level that promotes continued stand health and growth. Hydrologic alteration will be avoided. It is recommended that stands less than site index 45 not be managed through harvest but rather through the objective of maintaining wildlife habitat and water quality[2].

2. Even-Aged Management Direction: Manage some stands of Ash/LH on an even-aged basis, if warranted to regenerate the stands and improve site productivity and vigor while maintaining or improving wildlife habitat.

3. Even-Aged Management Prescriptions: The following are the most common prescriptions that will be used on Ash/LH timber sale acres where even-aged management is the objective:

a. Clearcut with Reserves - Sprouting
b. Clearcut with Reserves - Natural Seeding
c. Seed Tree with Reserves
d. Shelterwood
e. Shelterwood-with Reserves

4. Uneven-Aged Management Direction: Manage Ash/LH on an uneven-aged basis for pulpwood, bolts, sawtimber, and veneer products while maintaining or improving site productivity and wildlife habitat. Small group selection may be prescribed in even-aged stands to attain an uneven-aged condition. Selective harvest should retain trees from all size-classes, so that the residual basal area is approximately the same for trees under 10 inches as for those over 10 inches.

5. Uneven-Aged Management Prescriptions: The following are the most common prescriptions that will be used on Ash/LH timber sale acres where uneven-aged management is the objective:

a. Group Selection
b. Group Selection with Reserves
c. Single Tree Selection

6. Intermediate Harvest Methods: Some stands of Ash/LH may be thinned, or given an intermediate harvest prescription. Thinning will increase tree diameter and quality, resulting in more sawlog or veneer sized trees. Any harvest should reduce basal area to 75-90 square feet per acre in order to avoid adverse hydrological impacts and epicormic branching.

4.4D Cover type Conversion Management

Over the next 50 years, it is recommended that 1,800 acres of the Ash/LH type be converted to tamarack (1200 acres) or white cedar (600 acres). Conversion of Ash/LH to the desired cover types will be accomplished by conducting selective harvest in stands that already contain a tamarack component, a white cedar component, or have these species present as advanced regeneration. This will encourage tamarack or white cedar to become dominant in the stand.

[2] Erdman,G., et al., *Managing Black Ash in the Lake States*. Gen. Tech. Rep. NC-115. North Central Forest Experiment Station, 1987.

Conversion of Ash/LH to Tamarack should occur in WFn64, FPn72, FPn82, FPs63, and Apn81 NPC classes. Conversion to a stand dominated by white cedar will be accomplished in MHn46, WFn53, WFn55, and FPn63 NPC classes. The conifer component (white cedar and tamarack in these communities) generally increases in later growth stages.

4.4E Stand Selection Criteria

The Ash/ LH cover types will generally be managed on an uneven-aged basis. Stands to be managed as even-aged or thinned will be determined by the appraiser at the time of the field visit. The following criteria will be used for selecting stands to field visit and possible treatment during this 10-year plan:

a. Site index equals 45 or greater.
b. Basal area is greater than 100 square feet per acre.
c. Main species diameter is greater than 7 inches.
d. Basal area below 80 should not be examined/treated due to threat of conversion to lowland grass.

Forest inventory stand data was modeled forward to 2007 using the DNR's growth and yield models for determining which stands meet the stand selection criteria.

4.4F Stand Treatment Summary

Based on the above criteria, approximately 3,026 acres have been identified for possible treatment during this 10-year plan implementation period. Based on additional field evaluations (e.g., re-inventory) of Ash/LH stands during this plan implementation period, additional acres may be added for treatment if the stands meet the harvest criteria.

As each new 10-year plan is developed, the stand treatment level for the Ash/LH cover types will be determined.

4.5 Northern Hardwoods (NH)

4.5A Current Condition

1. Cover Type Characteristics: In 2007, the northern hardwoods cover type comprises 3.8 percent (16,142 acres) of state timberlands (429,229 acres) managed in the CP-PMOP. There are 1,583 acres of northern hardwoods reserved from harvest in these subsections. There is little variation in distribution of the cover type between the subsections: 45 percent of the northern hardwoods cover type is within the Chippewa Plains and 55 percent is in the Pine Moraines and Outwash Plains (see Table 4.5a).

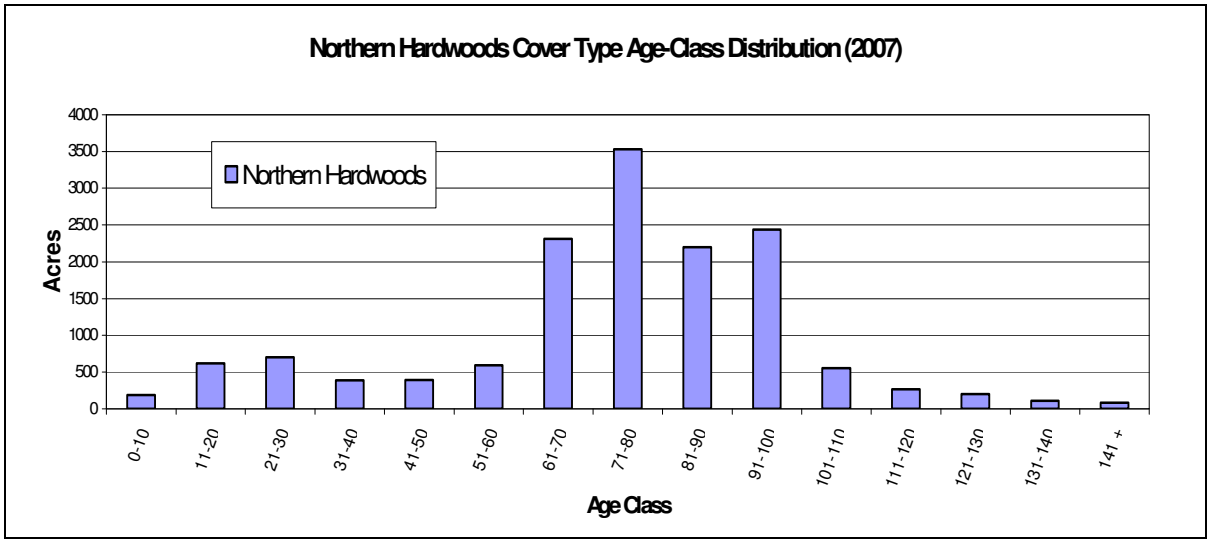
Table 4.5a Northern Hardwood Cover Type Acres by Subsection

	CP	PM	Total
Acres	7,260	8,882	16,142
Percent	45	55	100

Primary components of the NH cover type are sugar maple and basswood that are good competitors in most mesic Native Plant Communities (NPCs). These component species are listed as being not excellent competitors in the following NPC classes: Sugar maple is not an excellent competitor in the following upland forest communities: FDn12, FDn33, FDn43, FDc12, FDc23, FDc24, FDc25, FDc34, FDs37, and MHn44. Basswood is not an excellent competitor in the following upland forest communities: FDn12, FDn33, FDn43, FDc12, FDc23, FDc24, FDc25, FDc34, and FDs37. Ash / lowland hardwoods is a broad community that can be found in a number of NPCs.

2. Age-Class Distribution: The current age-class distribution shows an abundance of mature stands (61 - 100 years) while there is little acreage in the younger (<60 years) and older (>100 years) age-classes (see Figure 4.5a).

Figure 4.5a



3. Stand Composition: The northern hardwoods cover type is among the most diverse cover types in these two subsections with a distinct variation in tree species composition across the landscape. NH nearly always contains sugar maple mixed with basswood as the primary species. Found to varying degrees and in localized areas are a wide range of secondary species, including white pine, balsam fir, red oak, bur oak, ironwood, quaking aspen, bigtooth aspen, paper birch, red maple, white spruce, green ash, black ash, yellow birch, and white cedar. As part of the *Silvicultural Prescription Worksheet*, field foresters will consider ECS and consult the appropriate Native Plant Community Fact Sheets in the *Field Guide to the Native Plan Communities of Minnesota: Laurentian Mixed Forest Province,* to determine most appropriate species composition as stand management decisions are made.

Most stands are not regulated uneven-aged stands because they are lacking one or more size classes. A regulated uneven-aged stand has trees of many age or sizes that form a relatively homogeneous mixture. Periodically removing trees from all size-classes can achieve and maintain a specified diameter distribution. Regulated stands meet the desired stocking level for all size classes (see Table 4.5c and Figure 4.5b).

Almost all northern hardwood stands in these subsections are found on mesic soils, which are suitable for this cover type. But many of these stands are dominated by poor quality timber. Reasons for this include: stand history of fires, grazing, and past harvesting to remove higher quality trees; the key species of this cover type are living near the edge of their range; insect and disease attacks on trees of advancing age; frost cracks and canker damage; poor form; and gap size.

It is important to note that many species found in the northern hardwoods cover type are preferred host species for the gypsy moth and are likely to experience repeated prolonged defoliation and mortality. This may lead to changes in the composition of many northern hardwood stands.

4.5B Future Direction

Goals for the NH cover type are to improve the quality of the timber and ecological characteristics while enhancing or maintaining the aesthetic values.

1. Cover Type Acres: The 10-year DFFC is to reduce the northern hardwood cover type by 2 percent (250 acres), and by a total of 11 percent (1,750 acres) over the next 50 years. The decrease in northern hardwoods cover type will primarily come from re-inventory, particularly where over-mature hardwood types deteriorate, and conifer understory species such as white pine, white spruce or balsam fir become the dominant species. Other reductions in northern hardwood cover type acres may occur from natural succession or managed conversion to white pine, white spruce, red pine, or jack pine as indicated by soil conditions and native plant community indicators. Northern hardwoods can be a significant component of young aspen stands and under certain conditions can overcome young aspen and become the dominate cover type. Because of this, future inventories may show more NH on the landscape than presently shown.

2. Age-Class Structure: The cover type will be managed predominantly under uneven-aged management methods to move toward a regulated size-class structure within stands. No stands have been identified for even-aged management, but site visits may indicate that some stands may initially need to be managed through even-aged methods to move them toward desired uneven-age condition. Current age-class distribution shows significant acres of mature age-classes (see Table 4.5b). Regulated stands meet desired stocking level for all size classes (see Table 4.5c and Figure 4.5b).

3. Stand Composition: Within-stand composition goals will be to restore a more diverse stand structure and mix of species in most stands. It is desirable to increase the presence of birch, basswood, red oak, white pine, white cedar, aspen, and white spruce as components where NPC evaluations indicate. Artificial regeneration may be necessary where these species are no longer present, are not regenerating naturally, or there is a need to add species to the stand to meet various objectives. During selection or partial cuts, provide for at least six cavity trees, potential cavity trees or snags per acre as recommended in the MFRC *Voluntary Site-level Forest Management Guidelines*: Timber Harvest p.36 - and in TSI p. 7.

4. Patch Management: Patch management objectives are to maintain existing large patches consisting of primarily northern hardwoods and increase the size or number where possible. This includes maintaining any designated old growth stands.

5. Limiting Factors: Many species found in the northern hardwoods cover type, particularly oak, basswood, aspen and birch are preferred host species for the gypsy moth. In the next 20 years, these species are likely to experience repeated prolonged defoliation and increased mortality in stands that are stressed by drought, disturbance, or poor sites. This may lead to changes in the species composition of many northern hardwoods stands: a decrease of the preferred host species, with an associated increase in ash, maple, and conifer components.

4.5C Uneven-aged Stand Management

Note: A relatively small amount of harvest has occurred in recent years in the northern hardwoods cover type in these subsections. Therefore, additional forest management detail is provided below. Foresters are encouraged to study and use available stand management research data to formulate appropriate management strategies for northern hardwood stands.

1. Uneven-aged Management Direction

The first step in uneven-aged management decision-making is to evaluate the stand and determine if it is a regulated or unregulated stand. Regulated stands must meet the desired stocking level for all size classes (see Table 4.5c and Figure 4.5b).

Table 4.5b Current Condition Class of Northern Hardwoods in CP-PMOP Subsections

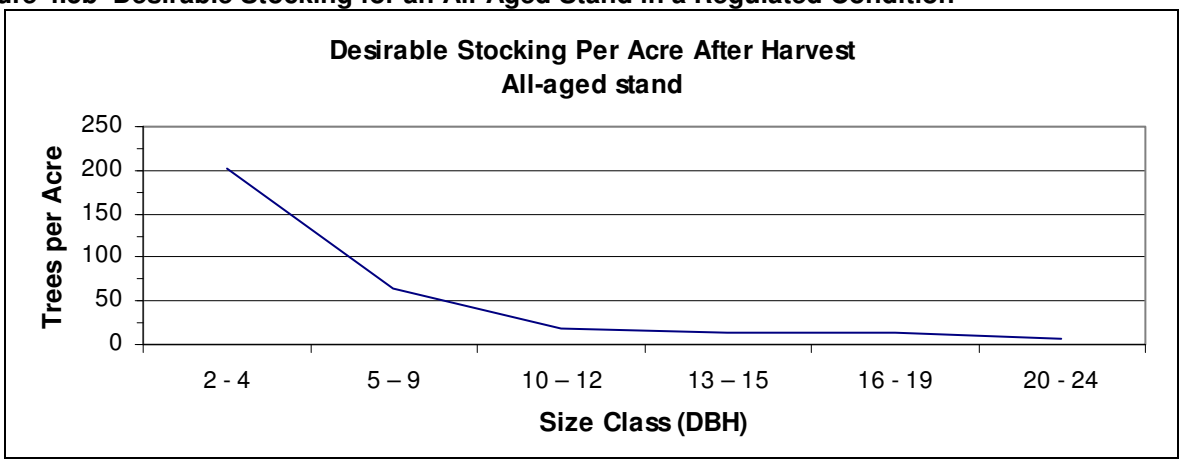
Current Condition Class of Northern Hardwoods in CP-PMOP		
Condition Class	**No. of Stands**	**Acres**
Nonstocked	4	36
Regenerating	48	745
Immature	536	10,763
Mature	203	4,012
High Risk	15	220

Table 4.5c Desirable Stocking Per Acre of Stems 2-inch DBH and Greater in a Regulated Stand for Good Continuous Growth of Northern Hardwoods Under Uneven-Aged (All-Aged) Management

Desirable Residuals after Harvest by Size Class			
Size Class	**DBH (inches)**	**No. of Trees**	**Basal Area (sq. ft.)**
Saplings	2-4”	200	20
Poles	5-9”	70	30
Small Sawlogs	10-12”	20	10
Medium Sawlogs	13-15’	15	15
Med-Large Sawlogs	16-19”	15	20
Large Sawlogs	20-24”	10	20
TOTAL		**330**	**115**

Adapted from Eyre, E.H. and W.M. Zillgitt. 1953. Partial cuttings in northern hardwoods of the Lake States. USDA Gen. Tech. Bull. 1076. 124 p.

Figure 4.5b Desirable Stocking for an All-Aged Stand in a Regulated Condition



1.1. Regulated Stands: Consider the following sequence when marking regulated stands for harvest:

a. Remove volume only from overstocked size classes.
b. Avoid harvest during and immediately following a drought or defoliation event. Selectively salvage oak, basswood, aspen, and birch mortality more than one year after a severe drought.
c. Remove high-risk and cull trees while retaining leave trees needed for plant and animal habitat, such as snags and recruitment of coarse woody debris. Retain a minimum of six cavity trees, potential cavity trees, and/or snags per acre.
d. Use three sawtimber size classes, 10-12", 13-15" and 16 - 24" for determining the basal areas to retain after harvest.
e. Remove crop trees that have reached the rotation size up to 24" DBH, depending on the species, while retaining two or more trees per acre beyond the rotation size DBH as leave trees (may include cull trees). Fell all stems in the gaps created by removing these mature trees. Gaps may be a range of sizes (depending on hardwood species) with the gap width limited to twice the height of the surrounding timber. Cuts in the pole-size class should be for improvement only, removing poorest quality trees.
f. Cut from the sapling size class only those saplings located within the canopy gaps.
g. Re-entry should be considered after 10-15 years when the stocking has increased to the point where another harvest is feasible.

1.2. Unregulated Stands: Typically, stands are overstocked in the smaller sawtimber size classes and lack adequate stocking in the sapling and large sawtimber size classes. Sawlog quality is generally poor. Within 3-4 cuts (30-50 years) these stands may become fully regulated with a marked improvement in log quality. Consider the following recommendations when moving an unregulated stand toward a regulated condition:

a. To increase the seedling and sapling size classes, apply the following gap management techniques:
    - Use individual tree and group selection to create gaps of various sizes ranging from 30 to 100-feet in diameter (depending on hardwood species) while retaining an average of 60 – 80 percent crown closure across the stand.
    - Fell or girdle culls and poor quality trees to create gaps. This provides space for the development of seedlings and saplings while retaining nurse logs and coarse woody debris.
    - For regenerating light seeded hardwoods, scarify, burn, or herbicide the gaps to prepare a seedbed and remove unwanted competition.
    - Remove all trees greater than one-inch diameter from the gaps.
b. To improve timber quality and desired stocking while retaining elements of structural diversity:
    - Leave additional high quality trees in the next smaller size class to allow them to grow into a deficient size class.
    - Remove poorer quality trees that compete with higher quality trees.
    - Remove trees infected with Nectria and Eutypella cankers.

- Retain leave trees needed for plant and animal habitat, such as snags and recruitment of coarse woody debris. Retain a minimum of six cavity trees, potential cavity trees, and/or snags per acre.
- Encourage drought-tolerant species on ridge-tops and southwest facing slopes.

After the initial entry, wait 10-20 years for the next entry. Subsequent entries may require repeated use of the above recommendations until the desired stocking level is reached for managing a regulated stand.

Depending on the hardwood species, 60 - 80 percent crown closure is recommended after selective harvest. Because basal area is not a good indicator of crown closure for different species with different crown shapes and sizes, stand densities to be left should be based on crown closure. For both regulated and unregulated stands, as a general guide, average stand basal area of trees greater than 5-inch DBH should be reduced to 60 – 80 square feet per acre. For stands with a larger average diameter of co-dominant trees, higher basal areas should be maintained.

2. Harvest Methods in Uneven-aged Managed Stands

2.1. Single Tree Selection: Single or individual tree selection will retain an unbroken and/or multistory canopy throughout the stand, providing aesthetic, wildlife, and ecological values. This technique favors shade tolerant species at the expense of moderately tolerant or intolerant species. If the objective is to increase intolerant species such as red oak or paper birch in the northern hardwood stand, use group selection to provide larger openings and more sunlight. Use harvest systems, methods, and sale regulations to protect advanced regeneration and maintain or improve the patterns, diversity, and composition of forest vegetation present before harvest.

Use the size-class distribution information in Table 4.5b as a guide for the desirable stocking in a stand when designing timber sales. See Page 24 of the *Manager's Handbook for Northern Hardwoods in the North Central States*[1] as a guide for selecting trees.

2.2 Group Selection: A second technique, group selection, should be used when attempting to maintain or encourage species that are intolerant or only moderately tolerant, where canopy gaps are acceptable, and for moving from an unregulated forest to a regulated forest. Group selection attempts to mimic natural disturbance patterns to meet species-specific regeneration requirements. Gaps are created naturally by ice or windstorm events, individual trees senescence, or during a large disturbance event where part of the stand is impacted.

Group selection should be used to encourage red oak, paper birch, yellow birch, white spruce, and white cedar. Landscape position (aspect), microclimate, and adjacency to seed source should be considered when cedar, birch, and white spruce are desired. Other methods that produce more shade should be used to increase white pine in northern hardwood stands, due to increased risk of white pine blister rust infection in small openings.

Group selection cuts should remove most or all timber in the gap, with the gap width limited to twice the height of the surrounding timber. Whenever possible, gaps should be oriented to take advantage of prevailing winds near the desired seed source trees. For heavier seed, such as oak, wind dispersal is not a concern.

Preserve legacy patches and inclusions in stands for seed sources and native plant diversity as well as to favor regeneration and seeding of native vegetation.

2.3. Uneven-aged Management Prescriptions: The following uneven-aged management harvest prescriptions will primarily be used:

a. Group Selection with Reserves
b. Single Tree Selection

[1] Tubbs, Carl H. 1977. *Manager's Handbook for Northern Hardwoods in the North Central States*. USDA Forest. Service General Technical Report NC-39, North Central Forest Experiment Station, St. Paul, MN.

4.5D Even-aged Stand Management

1. Even-aged Management Direction: Following a field visit, a very small portion of the northern hardwoods type may be harvested using even-aged methods, with long-term objectives of improving tree quality and eventually managing them as uneven-aged stands. Even-aged harvest methods may be needed because of undesirable conditions in some stands resulting from past management, or to move low quality even-aged hardwood stands toward an uneven-aged stand condition. A field visit to evaluate the site is required prior to deciding if a stand will be managed through even-aged methods.

Stands eligible for even-aged management option tend to be the poorest quality with the lowest site index (less than SI 45) and may be candidates for conversion to conifers or other drought-tolerant species, particularly on ridge-tops and southwest facing slopes. NPC indicators should be identified to determine if these stands are suitable for conifers. In the CP-PMOP subsections, eight northern hardwoods stands on 144 acres are found on very dry or moderately dry soils.

2. Shelterwood: Shelterwood systems are recommended because they have proven to be the most effective process for regenerating a wide variety of species. A two-aged shelterwood system is the most reliable method of regenerating an even-aged northern hardwood stand. This system works for both small seeded (birch) and large seeded species (sugar maple and red oak). The key is to establish adequate advanced (2-4 foot tall) reproduction prior to the removal of the overstory. Small seeded species will require scarification, herbicide application, and/or prescribed fire to prepare a seedbed.

To regenerate maples:

a. Cut from below down to 60 percent crown cover.
b. Logging in the winter is preferable to retain the leaf litter ground cover, which is more suitable for regenerating sugar maple over other northern hardwood species.
c. Do not scarify.
d. Remove overstory after regeneration is 2-4 feet tall (3-8 years).

To regenerate small seeded species in addition to maples:

a. Cut from below to 70-80 percent crown cover and remove trees infected with Nectria and Eutypella cankers.
b. Scarify, burn, or herbicide the site to prepare a seedbed and remove unwanted competition.
c. Remove overstory after regeneration is 2-4 feet tall (3-8 years).

3. Clearcut: Where the existing stand quality is very poor, and sugar and red maple dominate the stand, it may be desirable to use a clearcut technique. Advanced reproduction of preferred species is required prior to the final harvest. If advanced reproduction is absent, one or two thinnings should be done to encourage seedling establishment.

Consider the regeneration needs for the next stand when selecting the management prescription. Most northern hardwood species regenerate best in partial shade, but shade intolerant species require more sunlight. Species regenerating largely from stump sprouts may require thinning treatments in the future to reduce stems per clump.

4. Even-aged Prescriptions: The following even-aged management harvest prescriptions will primarily be used:

a. Clearcut with Reserves
    - Clearcut with Reserves – Sprouting
    - Shelterwood
    - Shelterwood with Reserves
    - Shelterwood with Reserves- Final Harvest

5. Intermediate Harvest Methods

a. Thinning in Even-Aged Pole-Sized Stands: Thinning in even-aged pole timber stands (5”-9” DBH) can be used to improve the quality of the timber, adjust the stands species composition, and capture volume that would otherwise be lost due to mortality. Following are recommendations:
    - Limit the harvest of trees 10 inches DBH or larger to retain these larger diameter trees in the stand for moving toward a regulated stand.

- Release crop trees (Class 1&2) down to 80 percent crown cover for trees greater than 5 inches diameter (DBH). A crop tree is one that is retained for future commercial harvest. Crop trees are desired species that have good form and quality, good crown vigor, a low risk to loss, are usually dominant or strong codominant trees, and have a good potential for producing high value sawlogs or veneer.
- Crown release, seven feet on at least three sides, on 60-75 crop trees per acre.
- Thin from below, removing primarily the culls, poorest formed, poorest quality, and suppressed trees, until the desired stocking level is reached.
- Leave an adjacent tree crown to correct for a fork.
- Avoid creating large canopy gaps (>15 feet).
- Delay next thinning until crown closure and lower branch mortality is achieved (15-20 years)
- Avoid harvest during and immediately following a drought or defoliation event. Selectively salvage oak, basswood, aspen, and birch mortality more than one year after a severe drought.

b. Thinning Prescription**:** Selective thinning is the most common prescription.

6. Regeneration Methods: When the stand is to be retained in the northern hardwoods cover type, harvest prescriptions are most often the regeneration methods. Consideration will be given to stand conversion for very poor quality stands or stands on offsite conditions (site index less than 45). Where conversion is the chosen option, see the desired cover type management recommendations for conversion methods. Conversion will favor white pine, white spruce, and red pine depending on soil conditions and native plant community indicators.

To artificially regenerate species that are present in low numbers or are no longer present, regeneration techniques including scarification, herbicide treatment, and/or fire is recommended, followed by direct seeding or planting. Species to consider are red oak, basswood, black and green ash, yellow birch, white spruce, and white cedar. White pine can be considered in shelterwood situations.

4.5E Stand Selection Criteria

The NH cover type will generally be managed on an uneven-aged basis. The few stands to be managed as even-aged or thinned will be determined by the appraiser at the time of the field visit. The following criteria will be used for selecting stands to field visit for possible treatment during this 10-year plan:

a. Basal area (BA) is greater than 100 square feet per acre, and
b. Main species diameter equals 5 – 9 inches will be assigned a thinning prescription, or
c. Main species diameter greater than 9 inches will be assigned a selective harvest prescription.

Two hundred fifty (250) acres will be targeted for conversion with 150 acres to white pine and 100 acres to white spruce.

Note: Site index was not used in the stand selection criteria because forest inventory (CSA) site indexes may not be accurate in NH stands. The use of site index is suspect because of the past history of some of these stands. Many stands were high-graded, removing the best quality trees and leaving poor trees behind, resulting in stands that may not accurately reflect site potential.

4.5F Stand Treatment Summary

It is recommended that 80 to 90 percent of stands be site visited every 10-years. Based on evaluations following site visits (e.g., re-inventory) on NH stands during this plan implementation period, additional acres may be added for treatment if the stands meet the harvest criteria.

As each new 10-year plan is developed, the stand treatment level for the NH cover type will be determined.

4.6 Oak (O)

4.6A Current Condition

1. Cover type Characteristics: In 2007, the oak cover type comprises 3.7 percent or 16,056 acres of the total state timberlands (429,229 acres) managed in the CP-PMOP subsections. There are 132 acres of the oak cover type reserved from harvest in these subsections. Historically the oak cover type has been relatively uncommon in both subsections, but particularly the Chippewa Plains. As shown on Table 4.6a, 94 percent of the oak cover type is found in the PMOP subsection, with 6 percent found in the CP. Across the CP-PMOP subsections, oak is more commonly found as a component of other cover types such as aspen, birch, and northern hardwoods. Oak is found as a component in 3,918 stands versus 810 stands where it is the defining cover type species. The oak cover type includes both northern red and bur oak.

Table 4.6a Oak Cover Type Acres by Subsection

	CP	PMOP	Total
Acres	964	15,092	16,056
Percent	6	94	100

Northern red oak is an excellent competitor in the following upland forest Native Plant Communities (NPCs): FDc34, FDs37, MHn35, MHc26, MHc36, MHc37, MHc47, and MHs39.

Bur oak is an excellent competitor in the following upland forest NPCs: FDc24, FDs37, MHn46, MHc26, MHc36, MHc37, and MHc47.

2. Age-Class Distribution: The current age-class distribution shows that the majority of the high site-index oak stands are greater than 50 years old (see Figure 4.6a). The current age-class distribution for low site-index oak stands shows the majority of stands are greater than 60 years old (see Figure 4.6b). The distribution currently found on both site index classes does not reflect the balanced age-class structure desired for the oak cover type.

Figure 4.6a

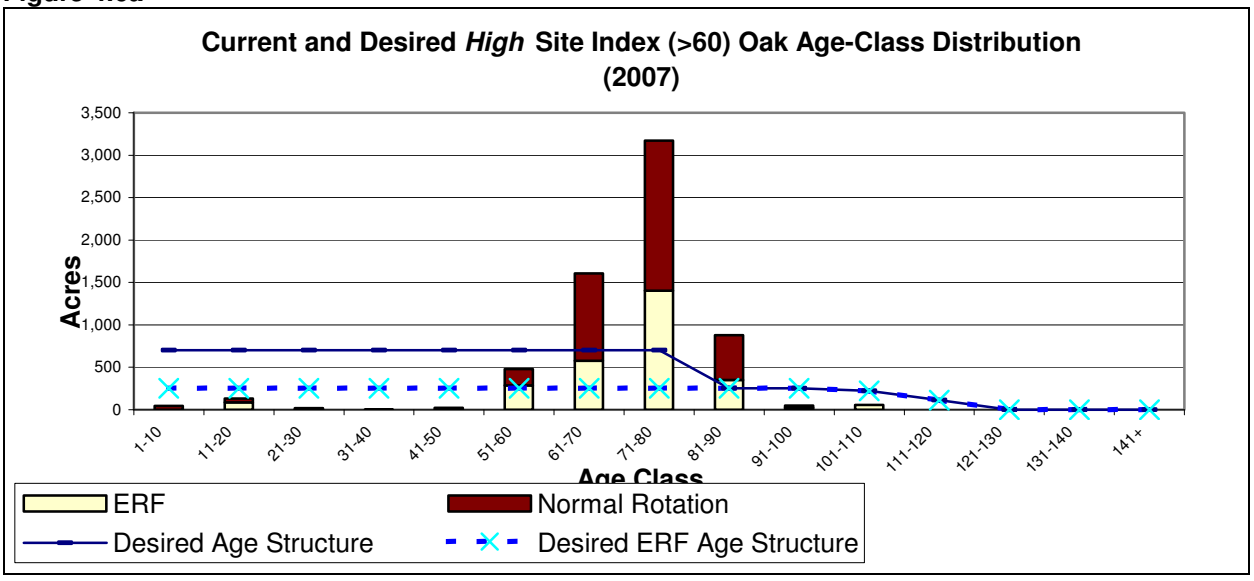
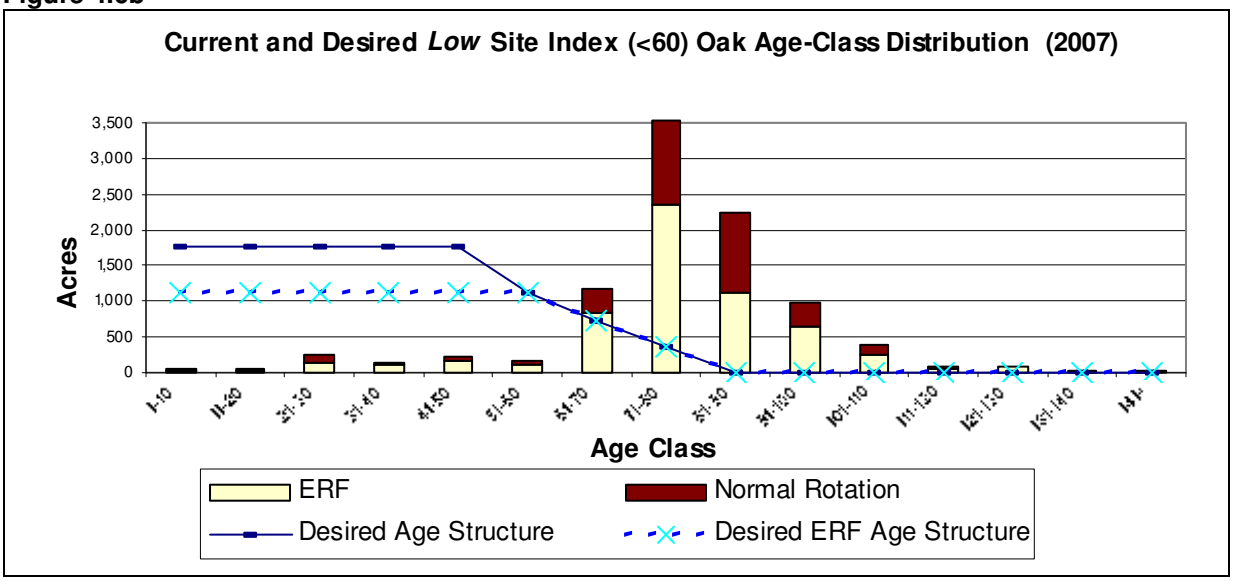


Figure 4.6b



4.6B Future Direction

1. Cover Type Acres: The 10-year DFFC is to convert 5 percent (750 acres) of the oak cover type in the PMOP to jack pine. The 50-year DFFC is to convert 11 percent (1,750 acres) of the oak cover type in the PMOP to jack pine. This conversion will generally occur in low site-index oak stands on drier sites, such as FDc24. Mesic oak communities such as FDc34, FDs37, MHn35, MHn46, MHc26, MHc36, MHc37, MHc47, and MHs39, will generally not be converted. An additional goal is to maintain or increase the oak component in other cover types where it occurs at present.

2. Age-Class Distribution: A goal is to move the oak age-classes toward a more balanced structure. Figures 4.6c and 4.6d show the desired age-class distribution of oak by site index. Due to the existing age-class imbalance, it will take more than 50 years to achieve the desired distribution for this cover type.

Figure 4.6c

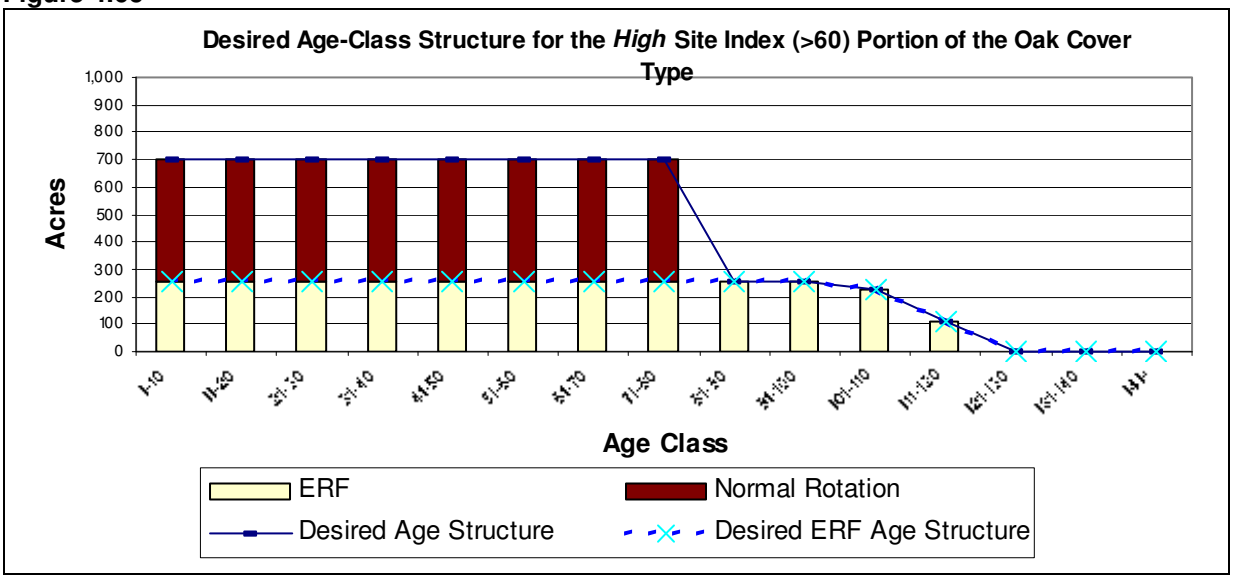
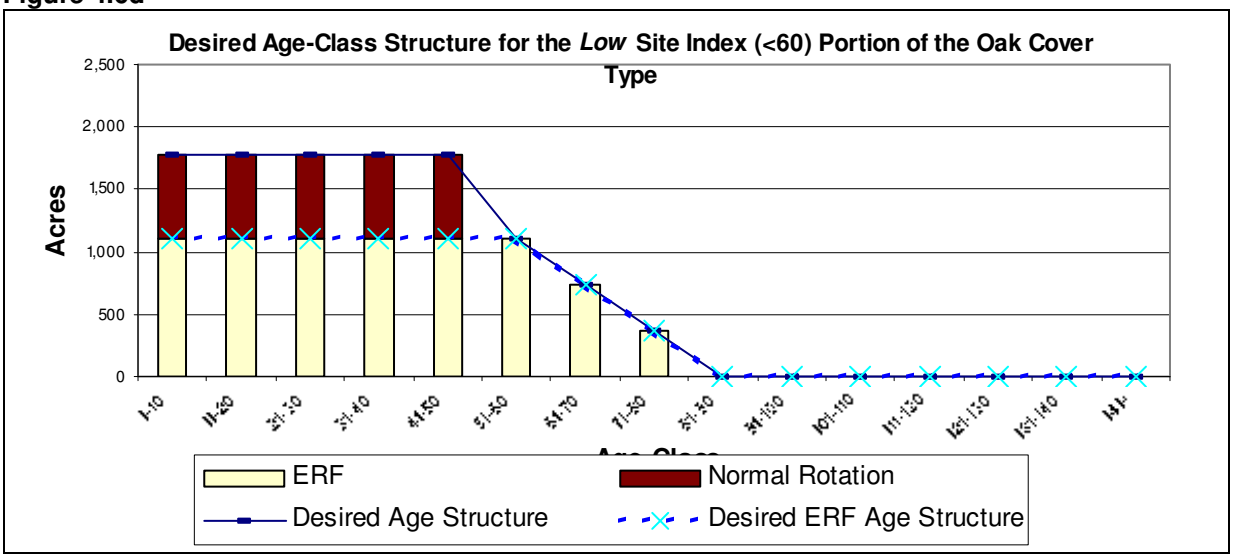


Figure 4.6d



The older oak age-classes will be managed with sufficient older stands deferred (ERF) to provide an adequate declining age-class distribution out to maximum age. The ERF goals for this cover type are to maintain 13 percent of the high site-index and 20 percent of the low site-index oak acres over the normal rotation age (i.e. as effective ERF) at any given time.

3. Stand Composition: The objective is to maintain the species composition and structure that naturally occurs within the oak forest communities. Recommendations for within-stand management include:

a. Maintain or restore associated tree species such paper birch, red maple, quaking aspen, big-toothed aspen, jack pine, red pine, sugar maple, basswood, black ash, green ash, white cedar, balsam poplar, ironwood, American elm, and white pine where appropriate to the site[1].
b. Retain the older forest characteristics within stands by retaining a component of large, old trees; coarse woody debris; and snags.
c. Retain large, old trees in the canopy for recruitment of future downed logs and cavity dens/nests.
d. Attempt to retain trees from all size-classes to retain mast production and availability to wildlife over time.
e. Increase mixed forest conditions in most stands. This will aid in reducing potential impacts of forest pests and diseases.
f. Maintain conifer component, where suitable to the site, according to NPCs.
g. Reserve legacy patches and inclusions within stands for seed sources and native plant diversity as well as to favor regeneration of native vegetation.

As part of the *Stand Silvicultural Prescription Worksheet*, field foresters will consider ECS and consult the appropriate Native Plant Community Fact Sheets in the *Field Guide to the Native Plant Communities of Minnesota: Laurentian Mixed Forest Province,* to determine most appropriate species composition as stand management decisions are made.

4. Patch Management Objectives: Patch management objectives are to retain the existing oak patches found within these subsections. Some oak stands will be managed together with adjacent hardwood stands to create larger, similarly aged hardwood patches.

5. Limiting Factors: Oak decline and mortality are caused by several factors, including drought stress and defoliation; it culminates in mortality caused by two-line chestnut borers (TLCB) and Armillaria root disease. Expect most losses on light soils, along ridge tops, and on steep slopes.

[1] Minn. DNR, 2003, *Field Guide to the Native Plant Communities of Minnesota: the Laurentian Mixed Forest Province.* Ecological Land Classification Program, Minnesota County Biological Survey, and Natural Heritage and Nongame Research Program. Minn. DNR. St. Paul, MN.

a. Avoid harvesting during, and immediately after a severe drought and/or defoliation by forest tent caterpillar.
b. Prepare oak stands for the future. Recognize competition from shade tolerant species. Anticipate oak wilt and gypsy moth defoliation in the next 20 years and subsequent TLCB attack. See *Gypsy Moth Tatum Guide* for management suggestions.

To minimize the potential impacts of these pests, it is important to maintain vigorous, structurally diverse forest stands, promote species diversity, avoid the transport of infected wood, and implement harvest strategies that minimize damage to reserve trees.

4.6C Stand Management

1. Even-aged Management Direction: Oak is shade intolerant and will be managed on an even-aged basis. Oaks are long-lived, with red and bur oak capable of exceeding 200 years of age.

2. Final Harvest: Oak stands will be managed using shelterwood, seed tree, clearcut, or clearcut with reserves as the final harvest method. Final harvest will be based on average tree diameter of the crop trees, depending on site index. The use of natural stand boundaries or natural features such as topography or soil type to delineate timber sale boundaries is recommended

3. Regeneration Methods: It is recommended to use harvest systems, methods and sale regulations that protect advanced regeneration and maintain or improve the patterns, diversity and composition of forest vegetation present prior to harvest. The preferred method of regenerating oak is to use the shelterwood system to establish advanced regeneration.

Some control of understory competition may be necessary after a shelterwood harvest or prior to planting. This will be particularly useful where advanced sugar or red maple reproduction is already established or where competition from sprouting aspen is anticipated. This can be accomplished using ground application of herbicide or by prescribed burning.

Advanced reproduction must be well distributed and well established (2-4 feet tall) to compete successfully with other woody vegetation in the new stand. Once advanced reproduction is adequate, the overstory should be removed. Legacy patches and inclusions will be preserved within stands for seed sources and native plant diversity as well as to favor regeneration and seeding of native vegetation.

Planted stands will be established and managed to more closely resemble naturally occurring stands by planting a variety of tree species and using a variety of variable density thinning techniques, with the objective of preserving existing natural vegetation and preserving advanced regeneration. In addition, protection of the seedlings from herbivory may be required.

4. Intermediate Harvest Methods: Where appropriate, thinning will be implemented according to standard stocking tables (See *Manager's Handbook for Oaks in the North Central States, Appendix IV*[2]) to increase the vigor of existing stands.

During the thinning process, crop tree selection criteria should include the following[3]:
a. Dominant/co-dominant trees with large crowns relative to DBH
b. No epicormic branches or dormant buds on the butt log
c. Trees should appear to have good life expectancy
d. Avoid selecting leaners, poor form trees as crop trees
e. Either stump sprouts or seedling origin stems are acceptable

Utilizing these criteria, it is possible to economically manage as few as five red oak pole or sawtimber crop trees (high value trees) per acre while maintaining wildlife habitat and biodiversity values from these trees and the others in the stand.

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[2] Sander, I.L. 1977. *Manager's Handbook for Oaks in the North Central States*. USDA Forest Service General Technical Report NC-37, North Central Forest Experiment Station, St. Paul, MN.
[3] Conference Proceedings, the Oak Resource in the Upper Midwest. 1991. Minn. Ext. Serv., U. of Minn.

5. **Intermediate Prescriptions:** The following are the most common prescriptions that will be applied:
    a. Shelterwood with Reserves-Interim Cut
    b. Selective thinning

4.6D Cover Type Conversion Management

1. Conversion Goals: The 10-year DFFC is to convert 5 percent (750 acres) of the oak cover type in the PMOP to jack pine. The 50-year DFFC is to convert 11 percent (1,750 acres) of the oak cover type in the PMOP to jack pine. This conversion will generally occur in low site-index oak stands on drier sites such as FDc24. Mesic oak communities, such as FDc34, FDs37, MHn35, MHn46, MHc26, MHc36, MHc37, MHc47, and MHs39, will generally not be converted.

4.6E Stand Selection Criteria

1. Normal Rotation Forest: To establish stand selection criteria, two site index groups have been identified (60+ and <60 SI), each with corresponding normal rotation and maximum ages and are identified on Table 4.6b. During this 10-year year plan implementation period, all merchantable oak stands will be field visited to determine current basal area and average diameter. This information will be used to determine if the stand is in need of thinning. Stands that are suitable for thinning will be marked and treated.

Table 4.6b Oak Normal Rotation Age and Maximum Age

Site Index	Normal Rotation Age	Maximum Age
60+	80	120
<60	50	80

The objective is to move the age-classes in each of the site index groups toward a more balanced structure. The priority during this 10-year management period is to select the oldest and highest scoring stands for treatment. A *Stand Scoring System* was implemented which assigned scores to stands in the following priority: stands that were currently over maximum age; over maximum age within 10 years; currently beyond normal age; and, currently less than normal age. The *Stand Scoring System* considered both normal pool acres and ERF acres (see Appendix K).

2. Normal Rotation Harvest Treatment Level Calculations: The pool of stands considered for normal rotation (see *Glossary*) harvest treatment is all stands
    a. not reserved from harvest (e.g. old growth, EILC);
    b. not designated to be managed as extended rotation forest (ERF); and
    c. near normal harvest rotation age.

Harvest treatment level is the sum of normal rotation acres to be harvested from each age-class that will move the age-class distribution towards a more balanced structure. Once a balanced age-class structure is achieved stands can be scheduled for treatment upon reaching normal rotation age.

Adjustments to the normal harvest level were made to meet other goals, such as balancing the age-class distribution and providing relatively stable harvest levels.

3. Extended Rotation Forest: Two site index classes (60+ and <60 SI) are recommended for oak management. The long-term DFFC goals are to retain 13 percent of the >60 site index oak and 20 percent of the <60 site index oak cover type acreage over the normal rotation age to provide a declining age-class structure out to the maximum harvest age. Varying harvest standards will be applied to age-classes beyond normal rotation age and out to the maximum age (see Table 4.6c).

Table 4.6c Oak ERF Acres (Plan Target Acres) and Maximum Age

Site Index	Prescribed ERF Acres	Effective ERF / DFFC Acres	Maximum Age
60+	2,854	839	120
<60	6,720	1,920	80
Total	**9,574**	**2,759**	

4. Extended Rotation Harvest Treatment Level Calculations: The pool of stands considered for extended rotation harvest treatment is all stands

a. not reserved from harvest (e.g. old growth, EILC);
b. designated to be managed as extended rotation forest (ERF); and
c. will be over normal harvest rotation age.

Extended rotation harvest treatment level is the sum of ERF acres to be harvested from each age-class that will move the age-class distribution towards a more balanced structure, while attempting to retain the minimum level of effective ERF. A declining acreage of stands in each 10-year age-class is desired between normal rotation age and maximum rotation age. Emphasis is on treating the oldest age-classes to minimize loss of fiber to tree mortality. Very few stands should be allowed to go untreated beyond the maximum rotation age (see glossary).

The selection of older aged stands will be emphasized to help move this subset of ERF stands toward a desirable declining age-class structure. The long-term goals are to retain at least 10 percent of the cover type acreage over the normal rotation age and to provide a declining age-class structure out to the maximum age.

4.6 F Stand Treatment Summary

Table 4.6d and Table 4.6e shows the treatment acres, conversion acres out of the cover type, old forest percent, effective ERF percent, and the average treatment ages for the next six decades by site index group. Based on the cover type management identified in this Plan, the average treatment age for both site index classes of oak cover type decreases during the plan implementation period. Old Forest Percent means acres that are over normal rotation age, except stands designated as Old Growth. There is variation from decade to decade, due to the current imbalance in the age-class distribution of the oak cover type.

Table 4.6d Oak (SI >=60) Treatment Summary by Decade

	Acres		Percent		Avg Treatment Age		Avg
Decade	Total Treatment	Conversion	Old Forest %	Effective ERF	Normal	ERF	Age
1	1,304	0	15.2%	6.6%	85	90	71
2	1,305	0	44.1%	26.1%	88	95	64
3	1,067	0	48.8%	27.2%	97	100	55
4	997	0	39.7%	27.0%	100	107	49
5	997	0	24.6%	19.2%	74	123	43
6	708	0	13.8%	13.8%	45	125	39
DFFC	**702**[1]	**0**[2]		**13.0%**	**80.0**[3]	**113.3**[3]	**47**[3]

[1] Total treated Acres once a fully regulated forest is achieved
[2] positive numbers are net acres into the cover type; negative numbers are net acres out of the cover type.
[3] anticipated age once a fully regulated forest is achieved.

Table 4.6e Oak (SI <60) Treatment Summary by Decade

	Acres		Percent		Avg Treatment Age		Avg
Decade	Total Treatment	Conversion	Old Forest %	Effective ERF	Normal	ERF	Age
1	3,605	750	92.0%	57.8%	92	96	77
2	2,664	600	61.6%	44.6%	90	96	55
3	1,124	400	35.2%	29.3%	90	100	38
4	820	0	25.8%	22.2%	90	105	36
5	1,075	0	15.4%	12.7%	53	105	35
6	1,106	0	6.2%	4.9%	53	67	34
DFFC	**1,256**[1]	**-1,750**[2]		**20.0%**	**50.0**[3]	**70.0**[3]	**32**[3]

[1] Total treated Acres once a fully regulated forest is achieved
[2] positive numbers are net acres into the cover type; negative numbers are net acres out of the cover type.
[3] anticipated age once a fully regulated forest is achieved.

Figures 4.6e and 4.6f shows the projected age-class distributions in 2017 for the two site index groups in the oak cover type.

Figure 4.6e

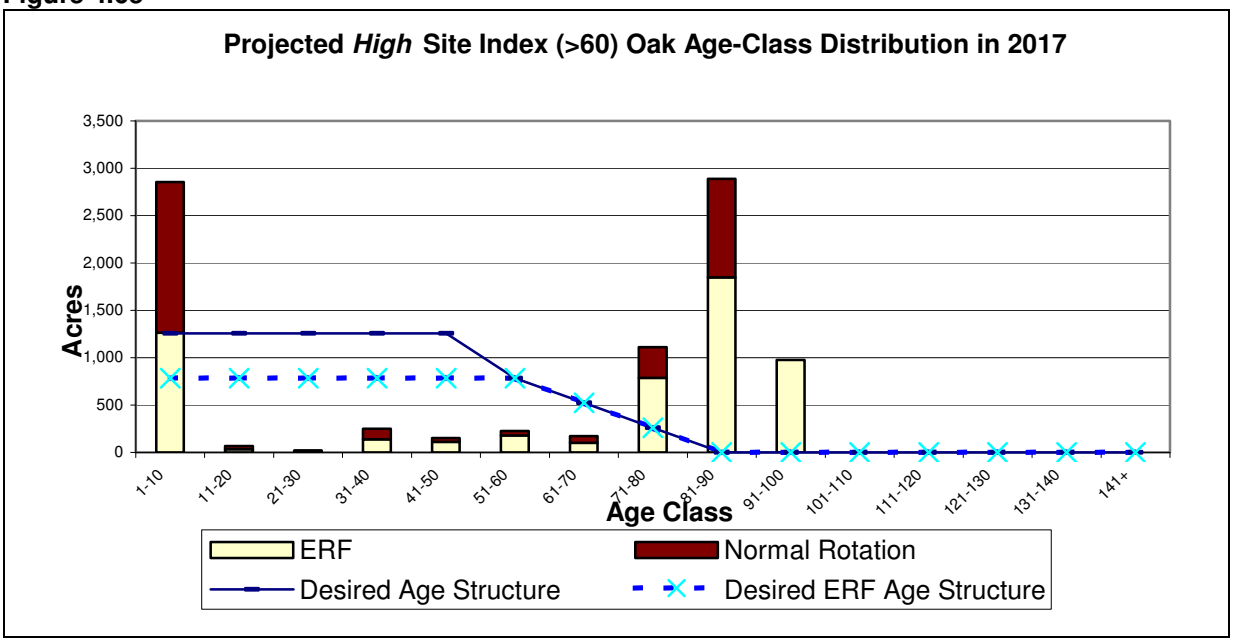
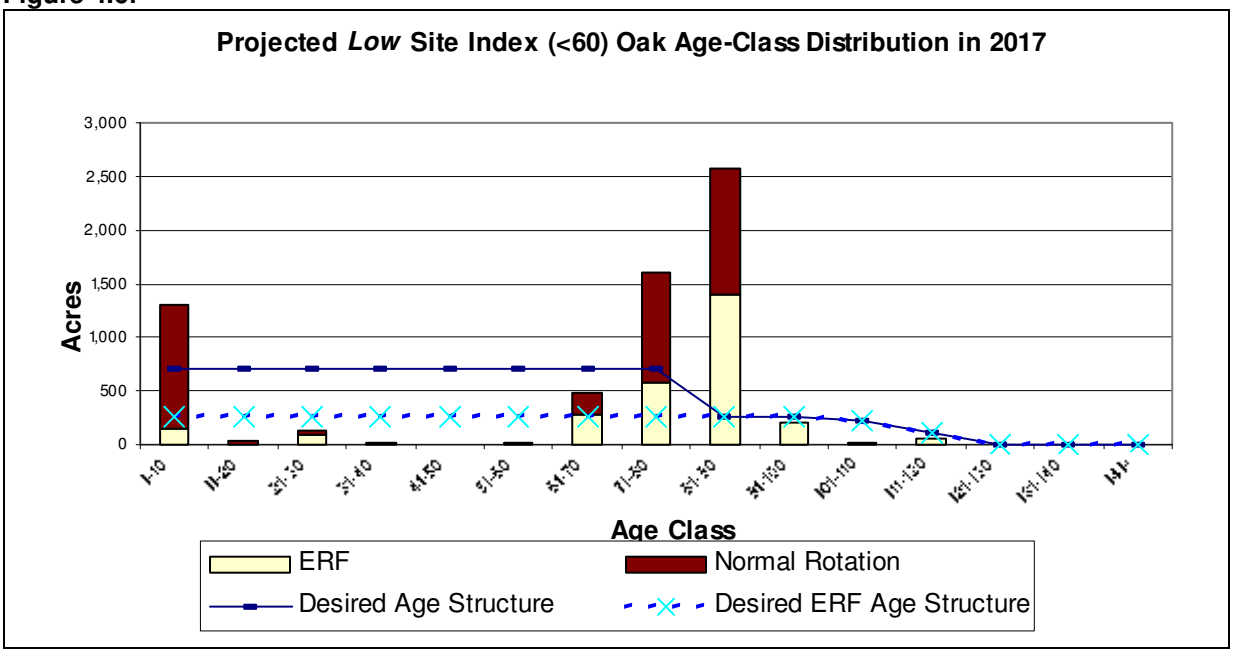


Figure 4.6f



Based on the treatment levels by decade, Figures 4.6g and 4.6h show the projected age-class distributions in 2057 for the two site index groups in the oak cover type.

Figure 4.6g

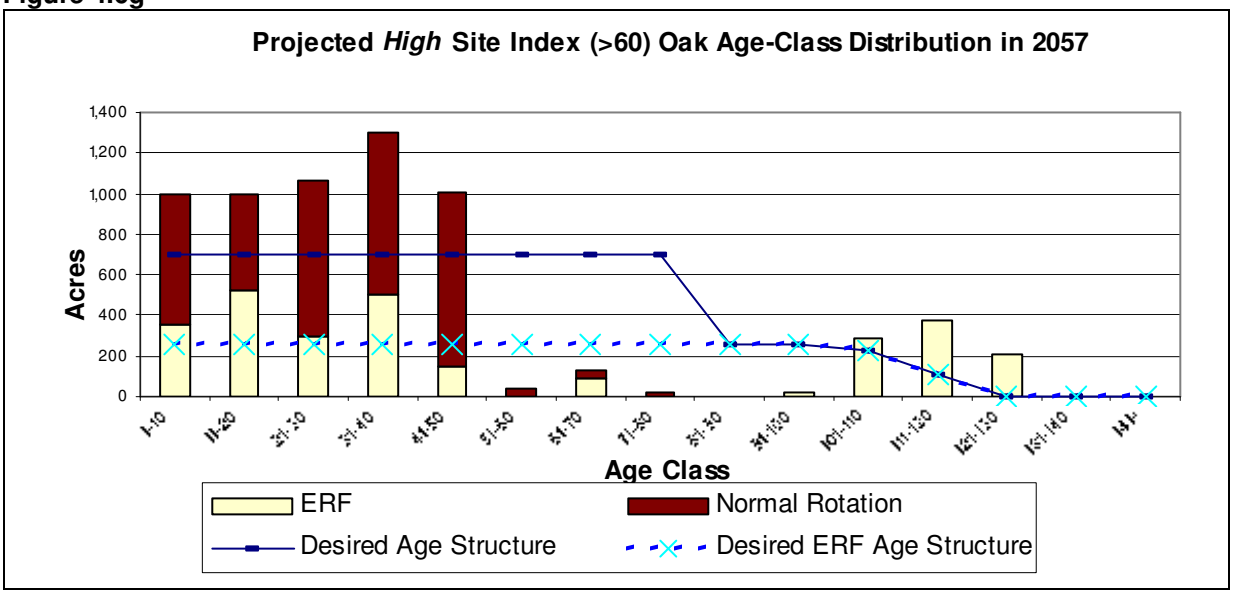
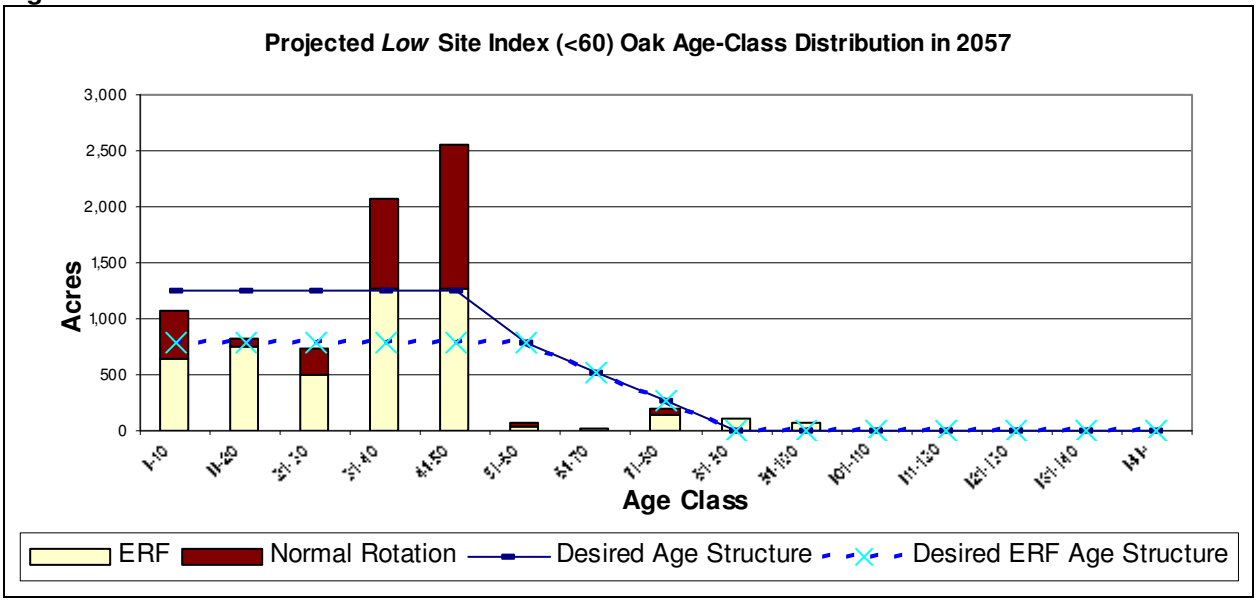


Figure 4.6h



As each new 10-year plan is developed, the treatment levels by decade and modeling will be re-evaluated.

4.7 White Pine (WP)

4.7A Current Condition

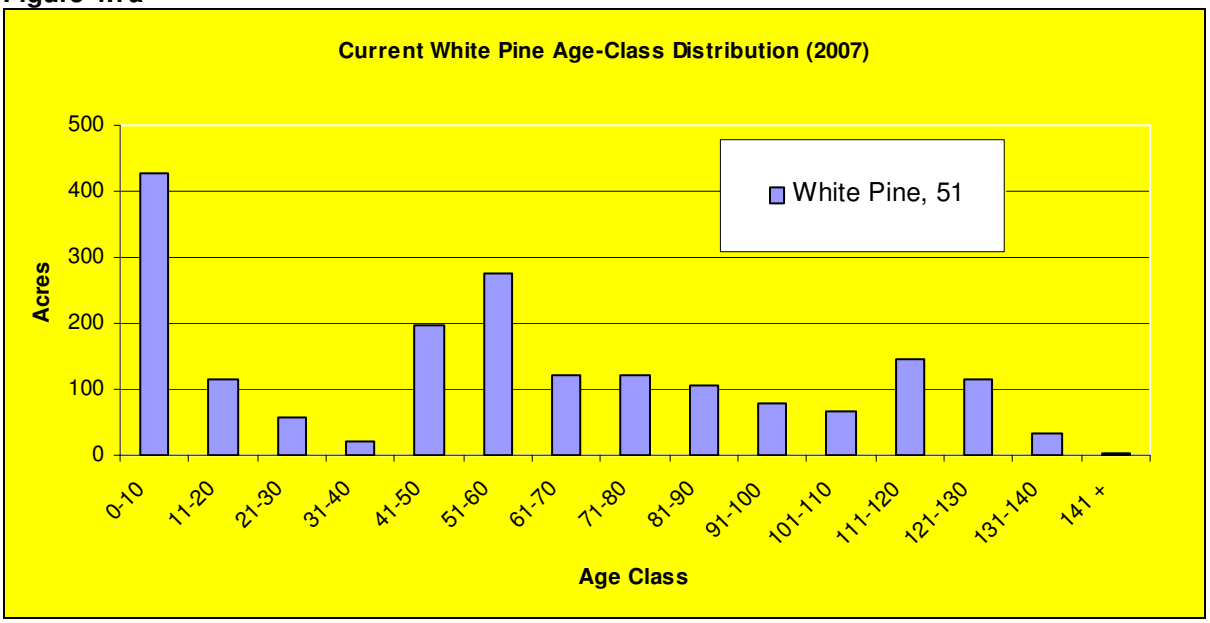
1. Cover Type Acres: In 2007, the white pine cover type comprised about 0.5 percent (2001 acres) of the state timberlands (429,229 acres). Seventy percent of this cover type is found within the PMOP. with 30 percent in the CP (see Table 4.7a). There are 116 acres of white pine reserved from harvest in these subsections. White pine can also be found as a component of most other cover types in these two subsections, typically on mesic sites. A stand will be considered a white pine stand for this plan if it contains ≥33 percent white pine by volume or basal area (see Appendix S, *Stands with a White Pine Component on the 10-Year Stand Exam List*).

Table 4.7a White Pine Cover Type Acres by Subsection

	CP	PM	Total
Acres	606	1,395	2,001
Percent	30	70	100

2. Age-Class Distribution: In each of the subsections, the current age-class distribution of the white pine cover type does not reflect the desired balanced age-class structure. This age-class imbalance is found across both subsections. There has been a dramatic increase in white pine acres in the 0 – 10 age-class (see Figure 4.7a). This is because of the increased emphasis and funding for regenerating white pine that started in 1998 with the DNR's white pine initiative. That initiative states that white pine will be managed under extended rotation forest guidelines to increase the acreage and distribution of older white pine stands and individual trees on the landscape.

Figure 4.7a



4.7B Future Direction

1. Cover Type Acres: The long-term goal is to double the white pine cover type acreage in LTAs containing state forestry or wildlife lands. The 50-year DFFC goal is to increase the white pine cover type by 112 percent (2,250 acres, 1,500 from aspen, and 750 from northern hardwoods). During the next 10 years, the DFFC goal is to increase the white pine acres by 23 percent (450 acres: 300 from aspen and 150 from northern hardwoods) (see Table 4.7b). A stand will be considered a white pine stand for this plan, if it contains ≥33% white pine by volume or basal area.

Table 4.7b Recommended White Pine Cover Type Acres in the Subsections by Year

	2007	2017	2057
CP	606	700	NA
PMOP	1,395	1,752	NA
Total acres	**2,001**	**2,452**	**4,252**

Approximately 79 percent of the acreage increase in the white pine cover type during the next 10 years is recommended to occur in the PMOP subsection.

Stands identified in the aspen and northern hardwood cover types will be site-visited during the next 10 years and assessed as to their native plant community (NPC) type and related capability for natural or artificial conversion to white pine as noted in the *Suitability of Tree Species by Native Plant Community* guide. This guide will also be used in other cover types to determine if a stand should be managed for, or converted to a white pine stand.

2. Age-Class Distribution: The long-term DFFC goal is to increase white pine on the landscape. Efforts will be made to protect advanced regeneration and maintain or improve diversity and composition of forest vegetation present in the stand prior to harvest.

3. Stand Composition: The 50-year DFFC is to increase the white pine cover type by an additional 2,250 acres with a 10-year DFFC of an additional 450 acres. White pine stands will range in species composition from nearly pure white pine stands to stands that are composed of mixed species (conifer-deciduous) with white pine being the predominant species. As *Stand Silvicultural Prescription Worksheets* are developed, field foresters will consider ECS information and consult the appropriate Native Plant Community Fact Sheets in the *Field Guide to the Native Plant Communities of Minnesota: Laurentian Mixed Forest Province,* to determine most appropriate species composition as stand management decisions are made.

4. Limiting Factors: Protective measures against insects, disease, and animal depredation need to be used for growing white pine in these subsections. The following summarizes limiting factors and selected management recommendations for white pine:

a. The presence of white pine blister rust (WPBR), an exotic disease, has altered the ability of white pines to grow and regenerate in northern Minnesota. Seedlings and saplings often die due to WPBR infections, especially if planted in open plantations. Establish white pines under an over-story to prevent dew formation on their needles and subsequent infection by WPBR. Once established, seedlings and saplings require tending: pathological pruning and deer browse protection. Pole-sized and mature trees can often live a long life and produce seed for many years, even though some branches have succumbed to WPBR. White pine weevil (WPW) repeatedly infests leaders when trees are young, causing stunting, cabbagy tree form, and forking of the stems. WPW attack can be prevented by planting/ regenerating seedlings under an overstory.

b. The CP subsection is in the Very High Hazard Zone for WPBR. Because this zone is characterized by abundant infections higher than nine feet, it is often difficult to grow disease-free pines. Strictly avoid open-field plantings of white pine. Instead, plant or regenerate white pine seedlings under a light overstory. Establishing solid blocks of white pine is not recommended, but rather scatter white pine seedlings among other species to become a component of the future stand. Be prepared to accept significant white pine losses.

c. The PMOP subsection is also in the High Hazard Zone for WPBR. As in the CP, avoid open-field plantings of white pine, plant or regenerate white pine seedlings under a light over-story.
d. In both subsections, protect natural and artificial regeneration from deer browse.

e. In both subsections, implement pathological pruning until there is nine feet of branch-free bole. See Silviculture Tip Sheet #10 for more information.

f. If natural regeneration is desired:
   - Mature white pines must be within 200 feet of each other to ensure pollination.
   - Scarification of the soil should be done just before seeds fall during a "good" seed year.

The establishment and follow-up management of new stands of white pine will be critical to the effectiveness of efforts to maintain and expand this cover type and to increase the white pine component in other cover types.

5. Patch Management Objectives: Patch management objectives are to retain the existing upland conifer patches found within these subsections and to manage upland conifers to create larger and older patches.

4.7C Stand Management

1. Management Direction: White pine stands will be managed primarily as uneven-aged stands with periodic intermediate thinnings, while maintaining or enhancing within-stand tree species diversity. Older white pine stands (90+ years) should be managed predominantly as multi-aged stands consisting of white pine and other species such as white spruce, balsam fir, red pine, birch, and aspen. In younger white pine stands (up to 90 years old), even-aged management treatments such as a 4-cut shelterwood treatment to establish long term goals of natural regeneration are recommended.

All white pine stands that are 15 years and older will be selected for a stand exam in the next 10 years.

2. Final Harvest Method: Due to the less-than-desired current acreage in older age-classes, no final harvest is planned in the white pine cover type during the next 10 years. Final harvest in the white pine cover type may occur in the future, but is recommended to occur only after a stand reaches 180 to 240 years old.

3. Intermediate Harvest Methods: Thinning will be used to capture mortality; reduce stand density to increase future tree growth, quality, and vigor; and to maintain or enhance species diversity.

Stands of merchantable size and basal area will be thinned at 10-25 year intervals, reducing the basal area usually to 90 square feet. In some stands, residual basal area may be modified to meet ERF or other objectives. Examples are: 1) thin to 60 BA versus 90 BA to encourage within-stand diversity and 2) maintain higher residual basal areas because of the larger diameter of older trees. Older stands may have longer intervals between thinnings to compensate for slower growth rates and to facilitate the growth of desirable understory species.

Thinning in stands will maintain or increase within-stand diversity, while retaining white pine as the main cover type. For example, the younger white pine stands may have a larger component of aspen and birch, while older stands (90+ years) may increase in white spruce and cedar with smaller amounts of aspen, birch, and balsam fir. Red pine may be present throughout the life of the stand. The following methods should be considered:

a. Consider creating or maintaining variable densities within stands when thinning ranging from unthinned areas to heavily thinned or group-selected areas within a stand.
b. Protect advanced regeneration of desirable understory species, where possible.
c. Higher stand densities (BA) are recommended along stand edges exposed to wind and along high visual quality corridors, such as major roads and lakes.

Shelterwood harvests may also be used as an intermediate harvest method to regenerate white pine in the understory. Some method of scarification may be needed to establish a suitable seedbed.

4. Intermediate Harvest Prescriptions: The most common prescriptions are:
a. Row Thinning (initial thinning only)
b. Strip Thinning (initial thinning only)
c. Selective Thinning
d. Shelterwood with Reserves-Intermediate harvest

5. Multi-Aged Stand Management: Older (90+ years) white pine stands will be managed primarily for a multi-aged stand structure using even-aged management techniques. The move toward a multi-aged structure will be accomplished through thinning and shelterwood harvests. A goal is to mimic light to high intensity surface fires and partial crown fires that historically occurred.

During thinning or shelterwood harvests, from 90 years old to final harvest, retain at least 25 percent of the largest white pine present, and manage out to the ERF age of 180 - 240 years. The goal is to retain a significant number of the largest cohorts out to the final harvest age, while creating or maintaining a multi-aged white pine stand.

Every third entry should be a group selection harvest, with goal of establishing a new age-class of white pine within the stand. The long-term goal is to create stands with layered age-classes (two or more). Timing of the first group selection harvest will depend on seed production and stand condition (age, density, and distribution of white pine).

6. Multi-aged harvest prescriptions: The most common prescriptions to use are:
a. Thinning
b. Shelterwood

4.7D Cover Type Conversion Management

Conversion of other forested cover types to a stand dominated by white pine will be accomplished primarily by converting aspen and northern hardwood stands. NPC classes where white pine competes well with all vascular plants and ranks excellent for suitability include: FDn33, FDc34 and FDn43. Most white pine stands will be in the latter growth stages of the Dry Pine, Dry-Mesic Pine/Oak, Dry-Mesic Pine, Mesic Northern Hardwoods, and Boreal Hardwood-Conifer Ecosystem Types that were delineated by Shadis (2000).

Priority LTAs for white pine cover type increase include: Rosey Lake Plain, Blackduck Moraine, Alida Till Plain, Becida Till Plain, Crow Wing Sand Plain, St. Croix Moraine, Spring Brook Till Plain, Itasca Moraine, Itasca Moraine Steep, Two Inlets Moraine, Bass Lake Moraine, and Naytahwaush Moraine. These LTAs currently contain 50+ acres of white pine cover type on state lands and have shown at least a significant decline (BT to FIA). The basic long-term goal is to double the white pine cover type acreage in LTAs with state forestry or wildlife land.

As stated, conversions of other cover types to white pine stands will be accomplished primarily by converting stands in the aspen and northern hardwoods cover types, and from other cover types that contain a major white pine component. A 10-year conversion pool of stands is identified in the aspen and northern hardwoods cover types that will be site-visited during the next 10 years and assessed for their potential for natural or artificial conversion to white pine.

The 10-year conversion pool criteria resulted in 2,075 total pool acres as identified below:

- Aspen: stands with white pine as a component (secondary species 2-10 with volume $\geq$ 1) and stand age $\geq$ 45 (1,545 acres); and,
- Northern hardwoods: stands with white pine as a component (secondary species 2-10) and stand age $\geq$ 50 (530 acres).

Where there is a significant component of white pine in other cover types, the *Stand Silvicultural Prescription Worksheet* and the NPC Field Guide will be used to determine if the stand should be managed toward developing into or converted to a white pine stand. The 10-year DFFC is to increase the white pine cover type by 23 percent (450 acres). The 50-year DFFC is to increase this cover type by 112 percent (2,250 acres).

4.7E Regeneration Methods

Following are recommendations to consider in regenerating white pine, both in stands that are white pine cover types now and stands of other cover types that will be converted to white pine.

1. Use a variety of site preparation techniques to provide the necessary ground scarification to prepare the seedbed or planting site.
    a. Site preparation techniques such as prescribed fire, anchor chains, broadcast skidding, disc-trenching, and/or herbicide will be favored over those that create more disturbance to the soil profile, such as deep rock raking.
    b. Decisions regarding whether or not site preparation is necessary, and the technique used, will be made following on-the-ground site evaluations.
2. Natural or artificial seeding, underplanting, and reserving advanced regeneration will be used to regenerate young white pine components in existing white pine stands.
    a. Varying proportions of aspen, birch, balsam fir, white spruce, white cedar, or red pine should co-exist as secondary stand components depending on site conditions and native plant community.
3. Reserving seed trees or clumps of mature or advanced regeneration of these secondary species will maintain their presence in the white pine cover type, especially in single species plantations.
4. Tending of white pine regeneration will be important to their survival. Site selection, bud capping, application of animal repellents, fencing, basal pruning, and release from competing vegetation are important for the long-term survival of young white pine.
    a. In some cases, areas of historically high incidence of white pine may be passed over for white pine regeneration efforts (e.g., near known deer yards), in favor of those sites where survival chances are more likely.

4.7F Stand Selection Criteria

1. Final Harvest: No final harvest is planned in this cover type during the next 10 years.

2. Thinning and Shelterwood Harvest: The following criteria will be used to establish a pool of stands to be field visited for evaluation for thinning or shelterwood harvest:

All white pine stands that are currently equal to or greater than 15 years old will be field visited to assess whether harvest is appropriate during this 10-year plan implementation period. The forest inventory will be updated, as needed, based on the field examinations. The field visit year will be scheduled based on the stand's current age or past thinning year. For example, 15-year-old stands should be scheduled for the last year of the plan, 16-year old for next to last, etc. This will capture those stands that grow into the recommended DBH and density for thinning during the plan implementation period. Stands that meet the criteria for thinning or shelterwood harvest will be treated through timber sales.

Stand treatment criteria includes:

a. Stands of merchantable size and volume.
b. Older (90+ years) white pine stands will be managed primarily for a multi-aged stand structure.

4.8 Red (Norway) Pine (NP)

4.8A Current Condition

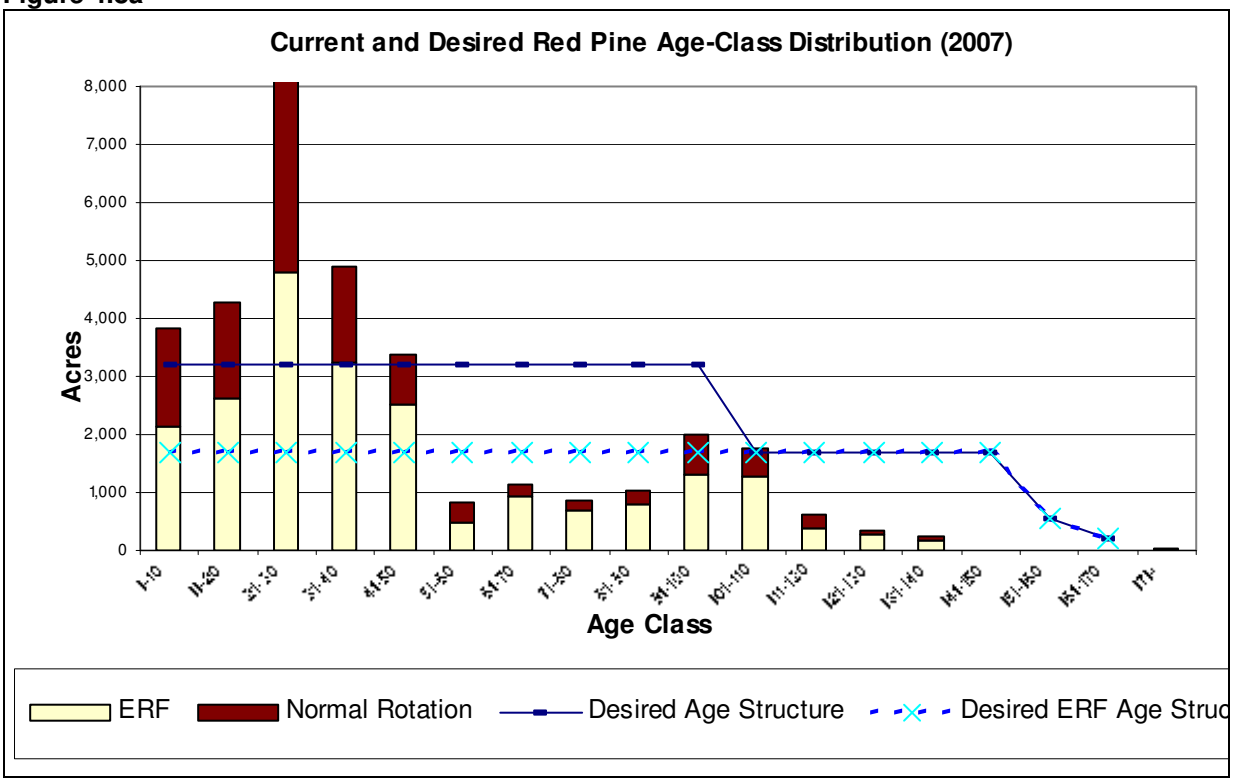
1. Cover Type Acres: In 2007, the red pine cover type comprised 8.2 percent (35,146 acres) of the state timberlands (429,229 acres) managed in the CP-PMOP subsections. Sixty-seven percent of the red pine cover type is found in the PMOP with 33 percent found in the CP. There are 946 acres of the red pine cover type reserved from harvest in these subsections.

Table 4.8a Red Pine Cover Type Acres by Subsection

	CP	PMOP	Total
Acres	11,637	23,507	35,144
Percent	33	67	100

2. Age-Class Distribution: In both subsections, the current age-class distribution of the red pine cover type does not reflect the desired balanced age-class structure for even-aged managed cover types. The current age-class distribution of the red pine cover type is skewed toward the younger age-classes. The primary reason for the large acreages found in the 0-40 age-classes is due to the planting of red pine on sites that were previously other cover types over the last 40 years. As a result, total acres predominate in the 0-40 year age-classes (see Figure 4.8a). This age-class imbalance is found across both subsections. Within the two subsections, less than 9 percent (2,985 acres) of the red pine cover type is currently over the recommended normal rotation age of 100 years.

Figure 4.8a



4.8B Future Direction

1. Cover type Acres: The DFFC goal over the next 50 years is a net increase of the red pine cover type by 17 percent (6000 acres). During the next 10 years, the DFFC goal is to maintain the current acreage due to the abundance of red pine stands in younger age-classes. However, it is recommended to convert 250 acres of red pine to jack pine during this initial 10-year plan implementation period. These are likely to be mature stands in the FDc23 native plant community. This conversion will be balanced by 250 acres converted from aspen to red pine, targeting the FDn33 and FDc34 communities (see Table 4.8b).

Table 4.8b Recommended Red Pine Cover type Acres in the Subsections by Year

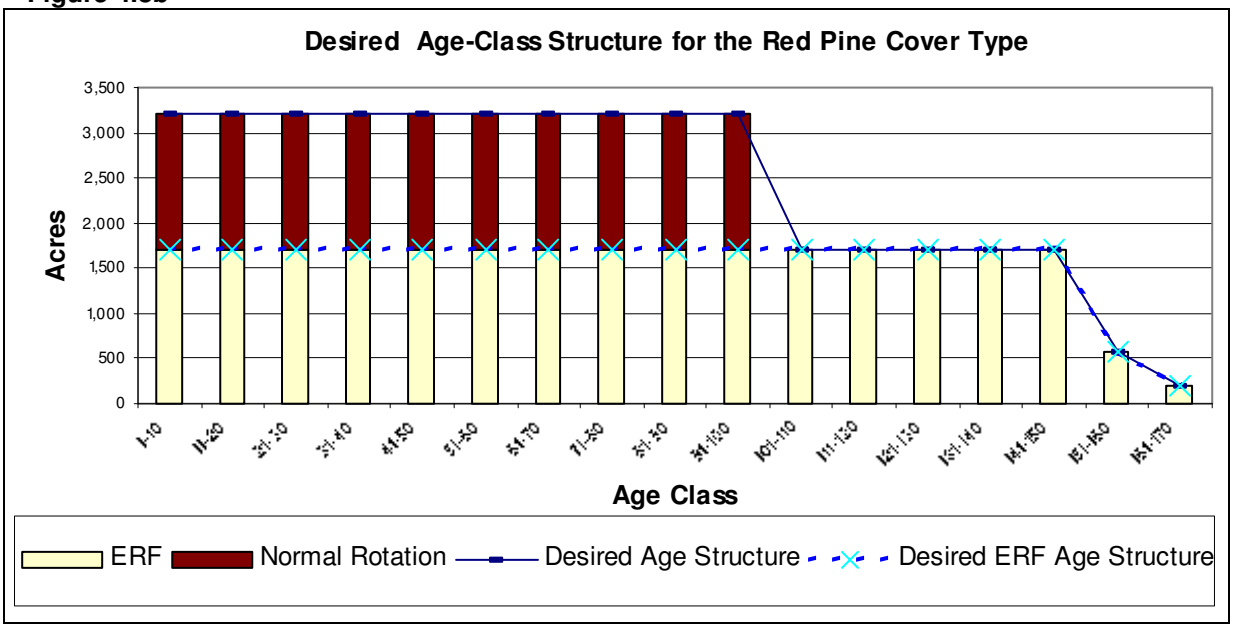
	2007	2017	2057
CP	11,637	11,572	NA
PMOP	23,507	23,587	NA
Total acres	**35,144**	**35,159**	**41,159**

Desired sites for conversion to the red pine cover type are sites that support a plant community where red pine is typically one of the dominant species. In these subsections, the plant communities that are likely to be associated with the red pine cover type are the FDn12, FDn33, FDn43, FDc12, FDc24, and FDc34.

2. Age-Class Distribution: A long-term DFFC goal is to move the age-class distribution in the red pine cover type toward a more balanced structure. Figure 4.8b shows the desired age-class distribution.

The ERF goal for this cover type is to maintain 25 percent of the acres over normal rotation age (effective ERF) with a declining age-class distribution from the normal rotation age (100 years) out to the maximum age (170 years). Figure 4.8b shows the desired age-class structure for normal rotation and ERF acres in the red pine cover type.

Figure 4.8b



3. Stand Composition: On drier sites, red pine forests range from nearly pure stands to mixtures of jack pine, eastern white pine, aspen, paper birch, and oaks. On wetter sites, red pine is found growing with eastern white pine, red maple, red oak, balsam fir, and white spruce. Red pine grows best on well-drained sandy to loamy sand soils, but is most common on sandy soils having site indices of 45 to 75 feet at 50 years of age.

The desired structure within the red pine cover type will range from predominantly single-canopied even-aged stands to multi-canopied, mixed-aged stands with red pine, other conifers, and deciduous species as co-dominants (as stands are thinned). See Appendix R (*Potential Pine Woodlands Areas*) for additional guidance.

In stands designated as ERF, an increase in compositional and structural complexity will be among the primary management objectives.

As *Stand Silvicultural Prescription Worksheets* are developed, field foresters will consider ECS information and consult the appropriate Native Plant Community Fact Sheets in the *Field Guide to the Native Plant Communities of Minnesota: Laurentian Mixed Forest Province,* to determine most appropriate species composition as stand management decisions are made.

4. Patch Management Objectives: Patch management objectives are to retain the existing upland conifer patches found within these subsections and to manage upland conifers to create larger and older patches.

4.8C Stand Management

1. Even-aged Management Direction: Red pine will be managed predominantly as an even-aged cover type for poles, high value sawtimber products, biological diversity, riparian buffers, recreation, aesthetics and wildlife habitat. As red pine stands age, manage to diversify within-stand species composition and increase within-stand structure to maintain or improve site productivity, wildlife habitat, and biodiversity.

2. Uneven-Aged Management: Isolated opportunities to manage red pine in uneven-aged stands include sites in the FDc12 NPC where feather moss provides an adequate seedbed. Removals of mature trees should not be so heavy as to allow the feather moss to dry out. Regeneration in uneven-aged red pine stands must be monitored for Diplodia and Sirococcus shoot blights.

3. Final Harvest Method: If the objective is to regenerate red pine, final harvest will occur using clearcut or clearcut with reserves. Shelterwood will be employed when converting to white pine. With either system, reserving biological legacies such as large, healthy, live trees, decadent trees, snags, and logs, and other coarse woody debris on the forest floor can carry some ecological complexity into the next rotation.[2]

4. Intermediate Harvest Methods: Thinning will be used to reduce stand density to increase future tree growth, quality, and vigor, and to obtain the desired composition of the stand. Recommendations are:

a. Normal rotation stand thinnings will occur in merchantable stands at approximately 10-year intervals, depending on site quality.
b. Older stands may have longer intervals between thinnings to compensate for slower growth rates and to facilitate the growth of desirable understory species.
c. Variable density thinning or other techniques will be incorporated to meet ERF or other objectives. Examples are: 1) thin 20 percent of the stand to 60 BA, 60 percent to 90 BA, and skip thinning in 20 percent to encourage within-stand diversity.
d. Large gaps (~3 ac) may be produced during early thinnings in mixed red pine/jack pine stands to encourage jack pine seeding, thereby ensuring that the species is not eliminated from the stand during later thinnings or due to early mortality.

Thinning in normal rotation and ERF stands will maintain (especially in natural origin stands) or increase within-stand diversity, while retaining red pine as the main cover type by the following methods:

a. Reserve from harvest individual trees or patches of other species appropriate to the site, where possible.
b. Consider creating or maintaining variable densities within stands when thinning.
c. Protect advanced regeneration of desirable understory species, where possible.
d. Higher stand densities (basal area) are recommended along stand edges exposed to wind and along high visual quality corridors, such as major roads and lakes.

e. Consider underplanting tolerant species, where seed sources or advance regeneration for these are lacking. For species suggestions, refer to the natural history section for the pertinent native plant community in the Field Guide to Native Plant Communities of Minnesota.
f. Provide for six cavity trees, potential cavity trees, or snags per acre as recommended in the MFRC *Voluntary Site-level Forest Management Guidelines*: Timber Harvest p.36 and TSI p. 7).

Potential impacts of bark beetles should be considered during intermediate harvest in the red pine cover type in these subsections. Bark beetle (*Ips pini)* feed and reproduce in the moist cambium of freshly cut, recently killed, or blown-down red pine, jack pine, and occasionally white pine. Bark beetles normally attack standing live trees in patches or pockets near the dead material in which they developed into adults. The DNR's bark beetle considerations should be followed when harvesting in pine stands.

5. Intermediate Harvest Prescriptions: The following are the most common management prescriptions that will be used for the red pine cover type:

a. Row Thinning
b. Strip Thinning
a. Selective Thinning
d. Variable Density Thinning

Where the goal is to artificially or naturally regenerate white pine in the understory of a red pine stand, the following prescriptions may be applied:

a. Shelterwood-Intermediate Cut
b. Shelterwood-With Reserves-Intermediate Cut

Intermediate thinning and even-aged management prescriptions should be modified to maintain or increase the proportion of other species in the canopy, understory, and ground cover.

6. Regeneration Methods: The following recommendations should be considered when regenerating red pine:

a. Plant using stock from local seed source.
b. Site preparation and herbicide use should consider maintaining within-stand diversity.
c. Scarify to encourage natural seeding of red pine and other species.
d. Scarify and artificially seed red pine and/or other species.
e. Prescribed surface fire in mature red pine stands can be an effective management tool for eliminating shrub competition, reducing thick duff layers, and preparing mineral seedbeds. Summer fires conducted over several growing seasons are most effective at controlling dense shrub competition and exposing mineral soil. This may be done before harvesting to prepare seedbeds, unless charred bark on harvested trees poses a problem. ("Red Pine Handbook").
f. Consider the risk of Diplodia tip blight and canker (*Sphaeropsis sapinea*) and shoot blight (*Sirococcus conigens*) infection on sites where taller infected red pine or jack pine are left on or next to sites being regenerated to red pine.
g. Provide for six cavity trees, potential cavity trees, or snags per acre as recommended in the MFRC *Voluntary Site-Level Forest Management Guidelines*.
h. Use natural regeneration in natural origin stands.

7. Limiting Factors: Pole-sized and mature stands can be attacked by bark beetles (*Ips* and *Dendroctonus* species) during (1) droughty weather, especially if basal area is high, (2) if bark beetles have built up in slash or cut products on the site or on an adjacent site, or (3) after a fire has scorched crowns and/or created or enlarged basal fire scars. Avoid creating pine slash, cut products, and wounding pines from March through August, especially when the weather is droughty.

Natural and artificial regeneration can succumb to infections caused by *Diplodia pinea*, an invasive pathogen. Fortunately, spores are spread in raindrops (and by cone insects), so this disease can be managed. Only seedlings growing directly beneath an infected overstory of red pines or growing within one chain of overstory trees are likely to be heavily infected and die when drought-stressed. The following are recommended:

a. Do not rely on the survival of understory red pine seedlings and saplings when they are growing under an overstory of red pine trees.
b. Planting red pine seedlings under red pine overstories should be discouraged.

c. Create a one-chain buffer between planted red pine seedlings and adjacent overstory red pines to minimize red pine losses. Do not plant jack pine in the buffer strip.
d. If red pine trees are retained as leave trees, choose locations where they are clumped together and are near the stand edges. This will minimize the area of disease impact.

4.8D Stand Selection Criteria

1. Normal Rotation Forest: The normal rotation age of 100 years will be used for calculating a regulated harvest level. Table 4.8c identifies normal and maximum rotation ages for red pine.

Table 4.8c Red Pine Normal Rotation Age and Maximum Age

Subsection	Acres	Normal Rotation Age	Maximum Age
CP	11,637	100	170
PMOP	23,507	100	170

The objective is to move the age-class toward a more balanced structure. The priority during this 10 year management period is to select the oldest and highest scoring stands for treatment. A *Stand Scoring System* was implemented which assigned scores to stands in the following priority: stands that were currently over maximum age; over maximum age within 10 years; currently beyond normal age; and, currently less than normal age. The *Stand Scoring System* considered both normal pool acres and ERF acres (see Appendix K).

2. Normal Rotation Harvest Treatment Level Calculations: The pool of stands considered for normal rotation (see glossary) harvest treatment is all stands:
a. not reserved from harvest (e.g. old growth, EILC);
b. not designated to be managed as extended rotation forest (ERF);
c. and near normal harvest rotation age.

Harvest treatment level is the sum of normal rotation acres to be harvested from each age-class that will move the age-class distribution towards a more balanced structure. Once a balanced age-class distribution is achieved, stands can be scheduled for treatment upon reaching normal rotation age.

3. Extended Rotation Forest: Long-term DFFC goals are to retain 25 percent of the cover type acreage in effective ERF. This will provide a declining age-class structure out to the maximum harvest age. Rotation ages for ERF stands begin at age 150 and continue until age 170. Table 4.8d identifies ERF acres and maximum age for the red pine cover type.

Table 4.8d Red Pine ERF Acres (Plan Target Acres) and Maximum Age

	Prescribed ERF Acres	Effective ERF / DFFC Acres	Maximum Age
CP-PMOP	22,228	8,786	170

4. Extended Rotation Harvest Treatment Level Calculations: The pool of stands considered for extended rotation harvest treatment is all stands
a. not reserved from harvest (e.g. old growth, EILC);
b. designated to be managed as extended rotation forest (ERF);
c. and will be over normal harvest rotation age.

Extended rotation harvest treatment level is the sum of ERF acres to be harvested from each age-class that will move the age-class distribution towards a more balanced structure, while attempting to retain the a minimum level of effective ERF. A declining acreage of stands in each 10 year age-class is desired between normal rotation age and maximum rotation age. Emphasis is on treating the oldest age-classes

to minimize loss of fiber to tree mortality. Very few stands should be allowed to go untreated beyond the maximum rotation age (see *Glossary*).

5. Thinning: The following criteria will be used to determine a pool of stands to be field visited for evaluation for thinning:

All red pine plantations that are currently equal to, or greater than 15 years old will be field visited to assess whether thinning is appropriate during this 10-year plan implementation period. The forest inventory will be updated, as needed, based on the field examinations. The field-visit year will be scheduled based on the stand's current age or past thinning year. For example, 15-year-old stands should be scheduled for the last year of the plan, 16-year-old for next-to-the-last, etc. This will capture those stands that grow into the recommended DBH and density for thinning during the plan implementation period. Stands that meet the criteria for thinning will be treated through timber sales. Normal rotations stands older than 80 years will generally not be considered for thinning (140 years for ERF stands). Stand treatment criteria include:

a. As a general guide, pole stands (5 to 9 inches average diameter) should be thinned when basal area reaches 140 sq ft or more per acre, leaving about 90-110 ft2 per acre[2].
b. A higher basal area will be maintained in stands where the average tree diameter is greater than 15 inches.

4.8E Stand Treatment Summary

Table 4.8e identifies the treatment acres, conversion acres out of the cover type, old forest percent, effective ERF percent, and the average treatment ages for the next six decades for the red pine cover type. Based on the cover type management identified in this Plan, the average treatment age for red pine cover type increases over time reflecting the goal of providing more older, longer lived conifers on the landscape. Old Forest Percent means acres that are over normal rotation age, except stands designated as Old Growth. There is variation from decade to decade due to the current imbalance in the age-class distribution for this cover type.

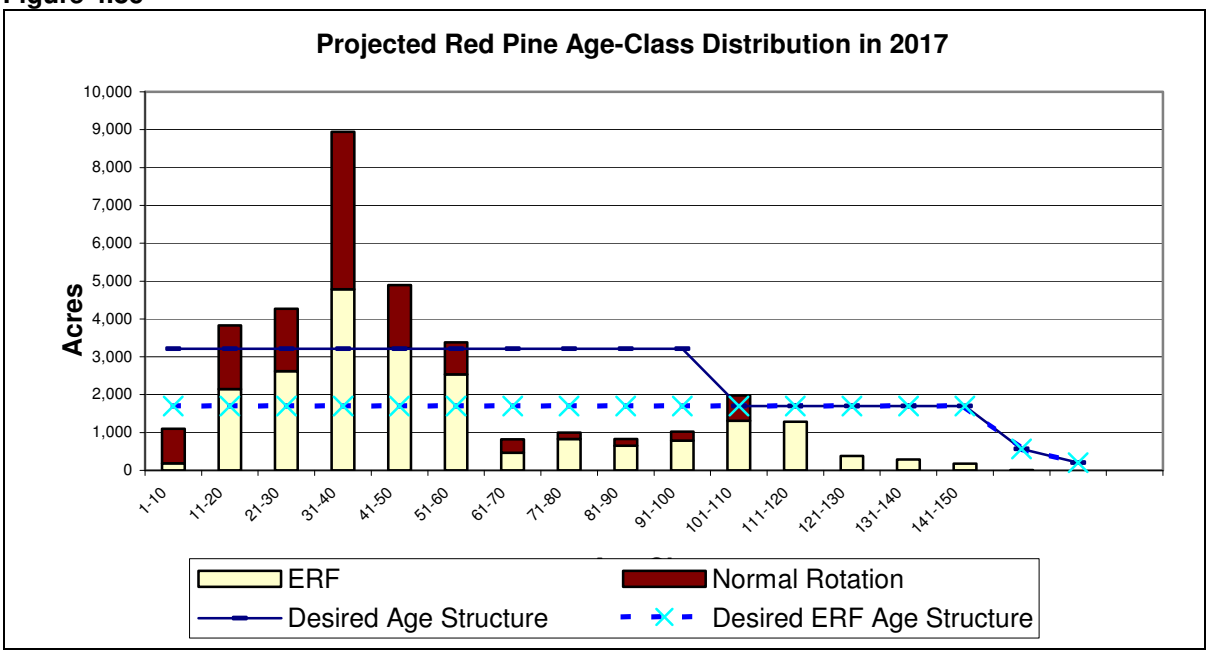
Table 4.8e Red Pine Treatment Summary by Decade

	Acres		Percent		Avg Treatment Age		Avg
Decades	**Total Treatment**	**Conversion**	**Old Forest %**	**Effective ERF**	**Normal**	**ERF**	**Age**
1	1,088	252	8.7%	6.3%	113	91	42
2	809	0	12.0%	10.1%	108	150	48
3	745	0	12.1%	11.3%	110	150	53
4	547	0	11.9%	11.9%	100	150	59
5	1,640	0	12.6%	12.6%	100	150	64
6	2,160	0	10.1%	10.0%	100	150	66
Total	6,989	252					
DFFC	**3,211**[1]	**6,017**[2]		**25%**	**100.0**[3]	**153.9**[3]	**64**[3]

[1] Total Treated Acres once a fully regulated forest is achieved.
[2] positive numbers are net acres into the cover type; negative numbers are net acres out of the cover type.
[3] anticipated age once a fully regulated forest is achieved.

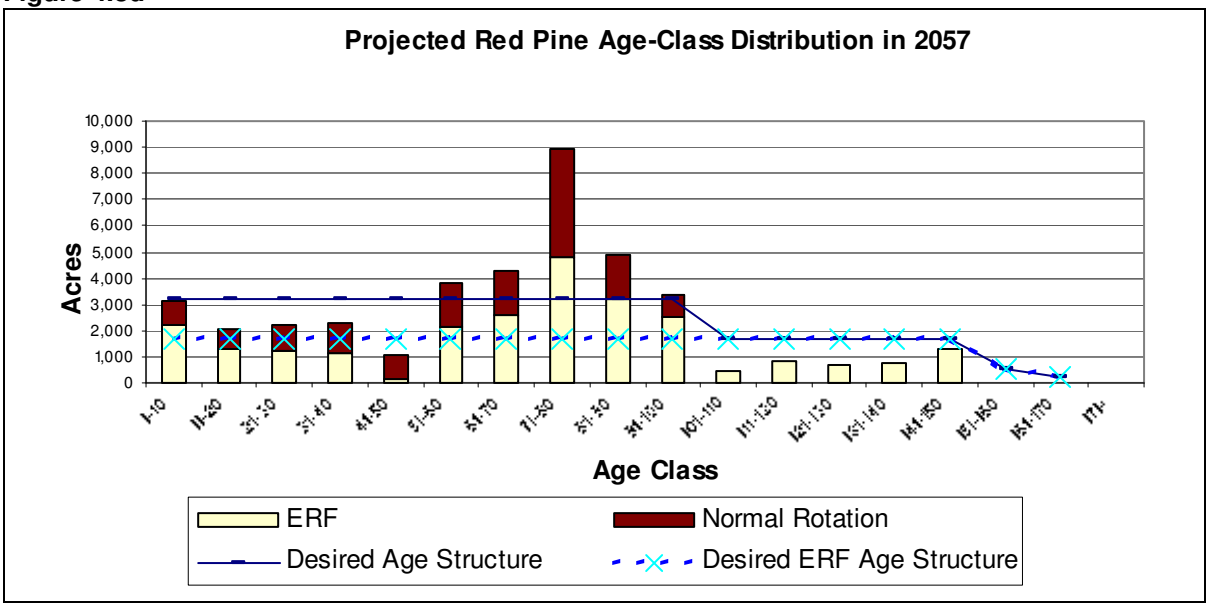
Based on the treatment levels by decade, Figure 4.8c identifies the projected age-class distribution in 2017 for the red pine cover type.

Figure 4.8c



Based on the treatment levels by decade, Figure 4.8d identifies the projected age-class distribution in 2057 for the red pine cover type.

Figure 4.8d



4.9 Jack Pine (JP)

4.9A Current Condition

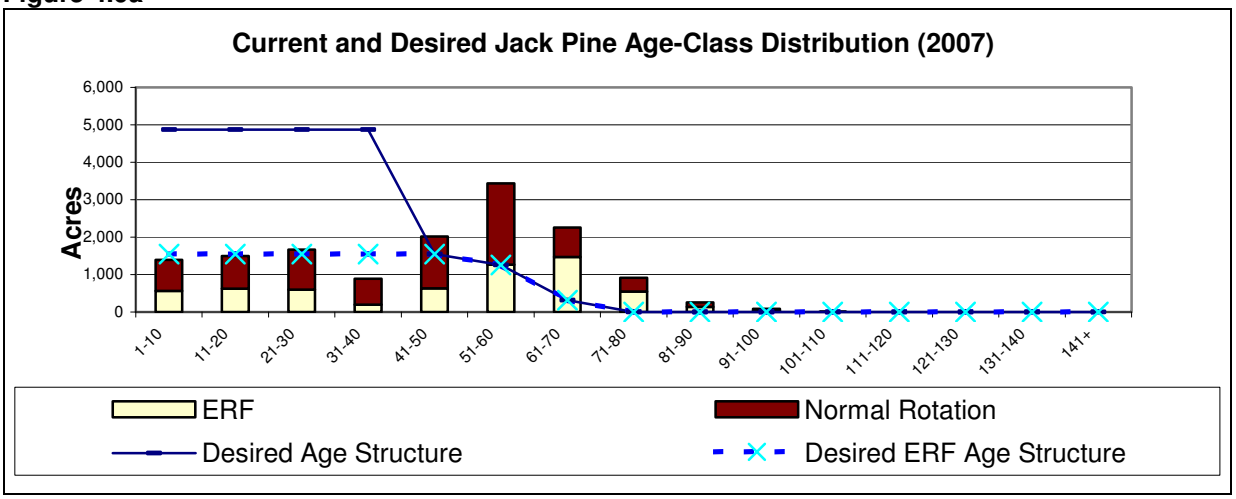
1. Cover Type Acres: In 2007, the jack pine cover type comprised 3.4 percent (14,419 acres) of state timberlands (429,229 acres) in the CP-PMOP subsections. Of the total jack pine cover type, approximately 68 percent (9,792 acres) is located in the PMOP, with 32 percent (4,627 acres) located in the CP (see Table 4.9a). A total of 80 acres of the jack pine cover type has been reserved from harvest in these two subsections. Due to several factors, including jack pine budworm and drought, the total acreage of the jack pine cover type has been declining in these two subsections.

Table 4.9a Jack Pine Cover Type Acres by Subsection

	CP	PMOP	Total
Acres	4,627	9,792	14,419
Percent	32	68	100

2. Age-Class Distribution: In these subsections, the current age-class distribution of the jack pine cover type does not reflect the balanced age-class structure desired for even-aged managed cover types. However, due to the occurrence of fire and disease outbreaks, historically jack pine may have never been a balanced age-class cover type. The current age-class distribution is skewed toward older age-classes (51+ years) with less acreage in the younger age-classes (see Figure 4.9a).

Figure 4.9a



3. Stand Composition: Natural origin stands comprise approximately 62 percent of the current jack pine cover type acreage. Associated species in jack pine stands may include red pine, aspen, bur oak, balsam fir, white spruce, paper birch, and/or white pine. Most CP-PMOP jack pine stands occur in Native Plant Community Classes that are woodlands (canopy cover ranging from 100 percent down to 25 percent). With recent fire suppression, many of these jack pine stands have developed more of a closed canopy condition.

Approximately 91 percent of the jack pine in the CP-PMOP forest inventory is currently within the central floristic region. The remainder of the CP-PMOP jack pine resource occurs in the northern floristic region. The following jack pine communities are identified as imperiled (very restricted range, very few populations, steep declines, or other factors) at the state (S2) and/or global (G2) level: FDc12a (S2), FDc23a (S2 and G2), FDc25a (S2), and FDn12a (S2) (Appendix J *Native Plant Communities*).

4.9B Future Direction

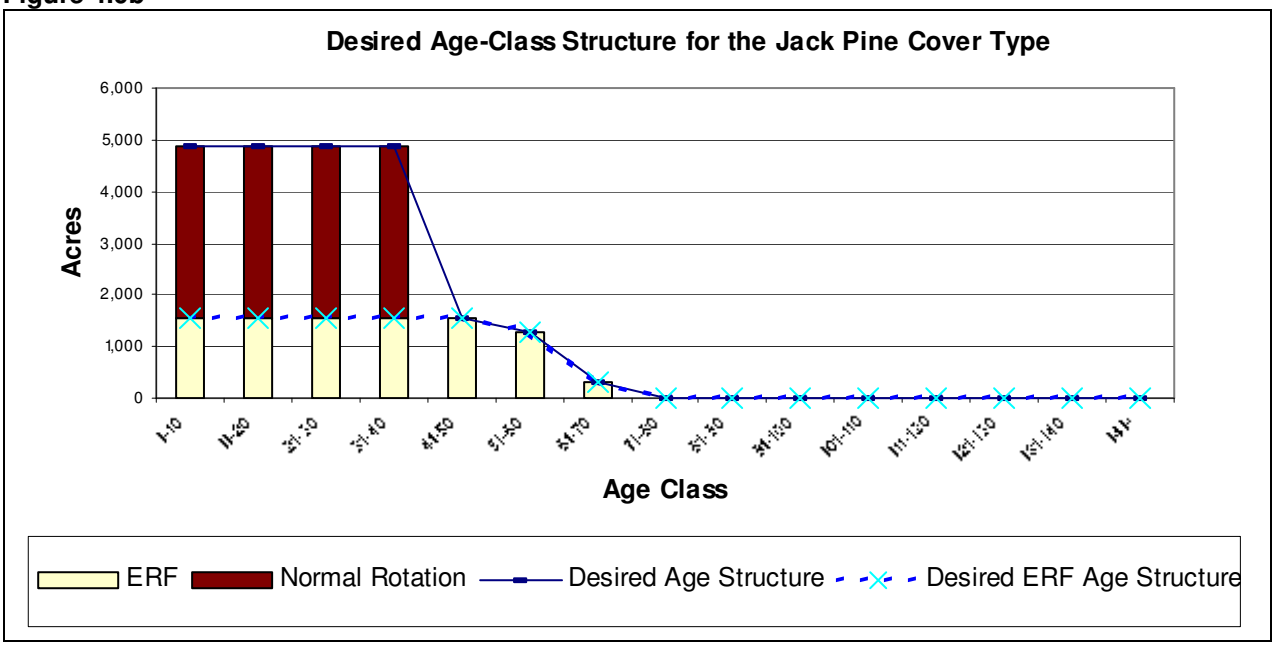
1. Cover Type Acres: Due to declines in the jack pine cover type in these subsections, the first priority is to maintain the existing acreage. The 10-year goal is to increase to 19,919 acres of jack pine cover type by 2017. The 50-year goal is to increase to 26,588 acres by 2057. Ideally, most of this cover type acreage will occur in Native Plant Communities (NPCs) where jack pine is an excellent competitor (see http://www.dnr.state.mn.us/forestry/ecs_silv/index.html). In the CP-PMOP subsections, these NPC classes include FDn12, FDc12, FDc23, FDc24, and FDc25. These communities are most likely to occur in higher scoring areas of the CP-PMOP *Potential Pine Woodland Areas* layer and thus would likely be the most appropriate areas for maintaining and increasing the jack pine cover type. See Section 4.9D for a description of this layer. Table 4.9b shows the desired changes by subsection.

Table 4.9b Recommended Jack Pine Cover Type Acres in the Subsections by Year

	2007	2017	2057
CP	4,627	6,239	NA
PMOP	9,792	13,680	NA
Total acres	**14,419**	**19,919**	**26,588**

2. Age-Class Distribution: The long-term goal is to move age-classes toward a more balanced structure. Accomplishing this goal will be delayed because jack pine stands selected for harvest in this plan implementation period exceeded targets designed to balance age-classes. Additional stands were selected because of the surplus of old jack pine cover type. Many stands across the subsections suffered severe mortality from recent jack pine budworm infestations. Young, healthy jack pine can withstand these infestations, but old weakened trees cannot. Without management, these old stands would likely not regenerate to jack pine. Jack pine stands that occur in FDc12 and FDn12 NPCs can generally be managed on a longer rotation. It is possible that balanced age-classes jack pine never occurred naturally in these subsections. Figure 4.9b shows the long-term desired age-class distribution for the jack pine cover type.

Figure 4.9b



The older age-classes will be managed so that enough older stands are deferred (ERF) beyond the normal rotation age to provide an adequate declining age-class distribution out to the maximum age of 65

years. The ERF goal for this cover type is to maintain 15 percent of the acres over the 40-year old normal rotation age (i.e., effective ERF) at any one time.

3. Stand Composition: The desired within-stand composition will be relatively pure jack pine in younger growth stages. Associated species may include red pine, aspen, bur oak, balsam fir, white spruce, paper birch, and/or white pine depending on the NPC. For detailed tree species composition descriptions, refer to the Vegetation Structure & Composition and the Natural History section for the pertinent NPC in the "*Field Guide to Native Plant Communities of Minnesota*." Most jack pine stands occur in NPC classes which are woodlands and should have canopy cover ranging from 100 percent down to 25 percent. Canopy cover generally increases as these stands age.

The jack pine dominated communities in the central floristic region evolved with frequent, mild surface fires in between catastrophic fires. Consequently, the jack pines in these subsections have adapted to this disturbance regime with a shorter life span and very few serotinous cones. These natural jack pine stands appear to have regenerated over a period of about 30 years with several age-classes of seedlings contributing to these classes. The remainder of the CP-PMOP jack pine resource occurs in the northern floristic region. In this floristic region, natural jack pine stands usually regenerate in a singe cohort after a catastrophic fire stimulates the serotinous cones to shed seed.

4. Patch Management: Catastrophic fires generally would have created larger patches, while mild surface fires would have created smaller patches. A number of large upland conifer patches identified for management in CP-PMOP subsections contain jack pine stands. In these managed patches, field foresters will consider incorporating patch, treatment, and conversion goals in management decisions. In other areas, they will practice whole stand management and try to group stands for harvest to maintain or enhance jack pine patch sizes.

5. Limiting Factors: Jack pine budworm is a perennial problem in these two subsections. Stands older than 50 years are at high risk for significant mortality due to budworm outbreaks. Outbreaks occur at 6-12 year intervals and usually last three to four years in any one location. Unlike other areas in the state, jack pine rotation age in these subsections is based on preventing adverse impact from jack pine budworm (rather than stem decay severity). The following are suggestions to address these limiting factors:

a. Maintain age-class diversity to minimize mortality losses.
b. Use a harvest age between 45 and 55 to manage jack pine stands.
c. Salvage budworm killed trees. Pre-salvage if intended products include dimensional lumber.
d. Minimize "edge" when designing timber sales as this also decreases the severity of budworm impact.
e. Regenerate jack pine from local seed sources to preserve the natural diversity of these drought-tolerant populations.
f. Recognize that natural regeneration on the central floristic sites can take many years to reach full stocking.

4.9C Stand Management

1. Even-aged Management Direction: The jack pine cover type will be managed primarily on an even-aged basis for pulpwood and bolts, and to support forest wildlife habitat and biodiversity. The goal is to move toward a balanced age-class structure while maintaining or improving site productivity and stand health.

2. Harvest Methods: The jack pine cover type will generally be treated through even-aged prescriptions using seed tree methods, clearcuts with reserves (e.g., jack pine, aspen, oak, red pine, white pine, white spruce, balsam fir, and/or birch), or clearcuts.

In the central floristic region, natural seeding may be accomplished by reserving ~30 sq. ft. of BA scattered seed trees, islands or clumps of mature seed trees, or advanced jack pine regeneration. Small gaps (~3 acre) could also be created in existing jack pine stands through a group selection harvest. These should be allowed to regenerate through natural seeding from remaining mature stands.

In the northern floristic region, natural seeding can be accomplished through summer harvest treatments and full tree skidding that distributes serotinous cones on mineral soil.

3. Harvest Prescriptions: The following are the most common prescriptions that will be used on jack pine timber sales:

a. Seed tree
b. Clearcut with reserves followed by natural seeding
c. Clearcut with reserves followed by artificial seeding or planting
d. Clearcut followed by natural seeding (from serotinous cones on exposed soil)
e. Clearcut followed by artificial seeding or planting
f. Group Selection

4. Intermediate Harvest Methods: Thinning is generally not recommended for CP-PMOP jack pine stands. Precommercial treatments may be considered to reduce extreme stand density or to manipulate stand composition to the desired species.

5. Intermediate Harvest Prescriptions: No thinning prescriptions are recommended for CP-PMOP jack pine stands.

6. Regeneration Methods: Natural seeding, artificial seeding, or planting will be used to regenerate jack pine. Consider that natural regeneration on the central floristic sites can take many years to reach full stocking. Regeneration recommendations are to:

a. Separate treatment/prescription types by northern and central floristic regions.
b. Promote natural regeneration through seed tree and small gap harvests in the central floristic region and use clearcuts with appropriate slash management in the northern floristic region.
c. Regenerate jack pine from local seed sources on these sites to preserve the natural diversity of these drought-tolerant populations.
d. Conduct brush and sod control when necessary, manage for prairie grasses and forbs (ground layer) in appropriate NPCs, use prescribed burning (understory and light slash burns) when possible, and discourage establishment of invasive or cool-season sod-forming grass species.
e. Consider mixing some other species that are appropriate to the site and NPC with jack pine when seeding or planting to regenerate some jack pine stands. Other species that may be included in smaller proportions are white pine and red pine.

4.9D Cover Type Conversion Management

Conversion Goals: The 10-year goal is to increase the jack pine cover type by 38 percent (5,500 acres). The 50-year goal is to increase the current acreage by 84 percent (12,169 acres). Table 4.9b shows the desired changes by subsection for year 2017 and for the subsections combined for 2057.

Conversion of other cover types to a stand dominated by jack pine will be accomplished by regenerating stands harvested in the FDn12, FDc12, FDc23, FDc24, and FDc25 NPC classes to jack pine. These stands will be primarily cutover areas, aspen, white spruce plantations on fire-dependant sites, dry oak sites in the PMOP, and red pine plantations. Priority LTAs for jack pine cover type increase include: Bemidji Sand Plain, Crow Wing Sand Plain, Park Rapids Sand Plain, Itasca Moraine Steep, and Two Inlets Moraine. Conversion to jack pine will likely be most successful in the higher scoring areas of the CP-PMOP *Potential Pine Woodland Areas* layer (see Appendix R). This layer was developed by overlaying woodland soil polygons with pre-settlement Jack Pine Barrens and Openings and GAP jack pine and red pine land cover data.

4.9E Stand Selection Criteria

1. Normal Rotation Forest: The normal rotation age of 40 will be used for calculating a regulated harvest level in the CP-PMOP. Historically an older rotation age was used (60 years) to manage jack pine. The rotation age used in this Plan (40 years) is lower than used in the past in an effort to capture volume before impacts from insect, disease and wind events.

Table 4.9c Jack Pine Normal Rotation Age and Maximum Age

Subsection	Normal Rotation Age	Maximum Age
CP	40	65
PMOP	40	65

The objective is to move the age-classes toward a more balanced structure. The priority during this 10-year management period is to select the oldest and highest scoring stands for treatment.

A *Stand Scoring System* was implemented which assigned scores to stands in the following priority: stands that were currently over maximum age; over maximum age within 10 years; currently beyond normal age; and, currently less than normal age. The *Stand Scoring System* considered both normal pool acres and ERF acres (see Appendix K).

2. Normal Rotation Harvest Treatment Level Calculations: The pool of stands considered for normal rotation (see glossary) harvest treatment is all stands:

a. not reserved from harvest (e.g. old growth, EILC);
b. not designated to be managed as extended rotation forest (ERF); and
c. near normal harvest rotation age.

Harvest treatment level is the sum of acres to be harvested from each age-class that will move the age-class distribution towards a more balanced structure. Once a balanced age-class structure is achieved stands can be scheduled for treatment upon reaching normal rotation age.

3. Extended Rotation Forest: The harvest level will be based on an ERF rotation age of 60 years. The long-term DFFC goals are to retain 15 percent of the cover type acreage over the normal rotation age to provide a declining age-class structure out to the maximum harvest age (see Figure 4.9b).

Table 4.9d Jack Pine ERF Acres (Plan Target Acres) and Maximum Age

Subsection	Prescribed ERF Acres	Effective ERF / DFFC Acres	Maximum Age
CP-PMOP	6056	2,163	65

4. Extended Rotation Harvest Treatment Level Calculations: The pool of stands considered for extended rotation harvest treatment is all stands

a. not reserved from harvest (e.g. old growth, EILC);
b. designated to be managed as extended rotation forest (ERF);
c. and will be over normal harvest rotation age.

Extended rotation harvest treatment level is the sum of ERF acres to be harvested from each age-class that will move the age-class distribution towards a more balanced structure, while attempting to retain the a minimum level of effective ERF. A declining acreage of stands in each 10-year age-class is desired between normal rotation age and maximum rotation age. Emphasis is on treating the oldest age-classes to minimize loss of fiber to tree mortality. Very few stands should be allowed to go untreated beyond the maximum rotation age (see Glossary).

4.9F Stand Treatment Summary

Table 4.9e shows the total treatment acres, recommended conversion acreage out of the jack pine cover type, old forest percent, effective ERF percent, and the average treatment ages for the next six decades. Based on the cover type management identified in this Plan, the average treatment age for jack pine cover type decreases during first two decades then increases reflecting the goal of maintaining more conifers on the landscape. Old Forest Percent means acres that are over normal rotation age, except

stands designated as Old Growth. There is variation from decade to decade because of the current age-class distribution of the cover type.

Table 4.9e Jack Pine Treatment Summary by Decade

Decades	Total Treatment	Conversion	Old Forest %	Effective ERF	Avg Treatment Age		Avg Age
					Normal	ERF	
1	3,076	0	62.1%	28.5%	68	79	43
2	4,528	0	33.8%	16.5%	64	78	29
3	2,460	0	17.9%	11.1%	52	77	22
4	2,361	0	12.4%	7.1%	51	69	23
5	3,206	0	11.7%	7.7%	45	59	26
6	5,643	0	27.5%	13.6%	49	54	28
Total	21,274	0					
DFFC	**5,318**[1]	**12,170**[2]		**13.8%**	**40.0**[3]	**60.2**[3]	**24**[3]

[1] Total Treated Acres once a fully regulated forest is achieved.
[2] positive numbers are net acres into the cover type; negative numbers are net acres out of the cover type.
[3] anticipated age once a fully regulated forest is achieved.

Figure 4.9c identifies the age-class structure of the jack pine cover type in 2017 at the end of the 10-year plan implementation period.

Figure 4.9c

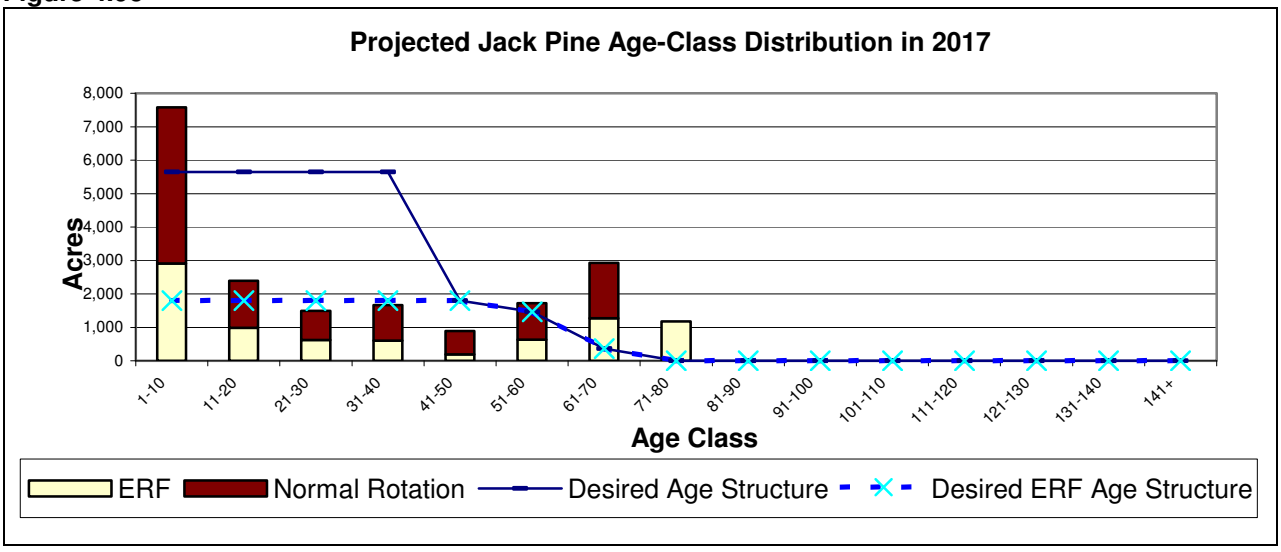
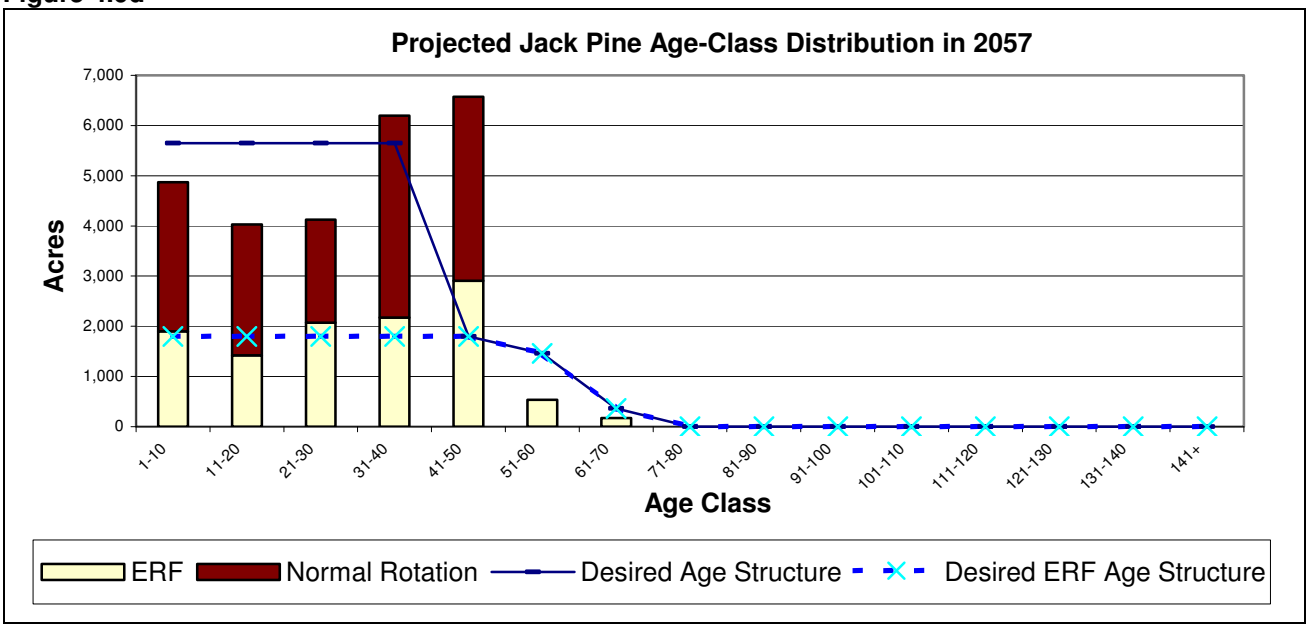


Figure 4.9d identifies the age-class structure of the jack pine cover type in 2057. Based on the modeling of these treatment levels, by the end of the fifth decade the cover type moves toward more consistency with the desired age-class distribution.

Figure 4.9d



As each new 10-year plan is developed, the treatment levels by decade and modeling will be re-evaluated.

4.10 Black Spruce Lowland (BSL)

4.10A Current Condition

1. Cover Type Characteristics: In 2007, the lowland black spruce cover type comprises 6.4 percent (27,677 acres) of the state timberlands (429,229 acres) managed in the CP-PMOP Subsections (see Table 4.10a). The black spruce cover type is mainly located in the Deer River and Blackduck Forestry Areas. Considering both site indexes for the CP and PMOP, approximately 2,657 acres have been designated as EILC and reserved from treatment for this plan implementation period.

Table 4.10a Lowland Black Spruce Cover Type Acres by Subsection

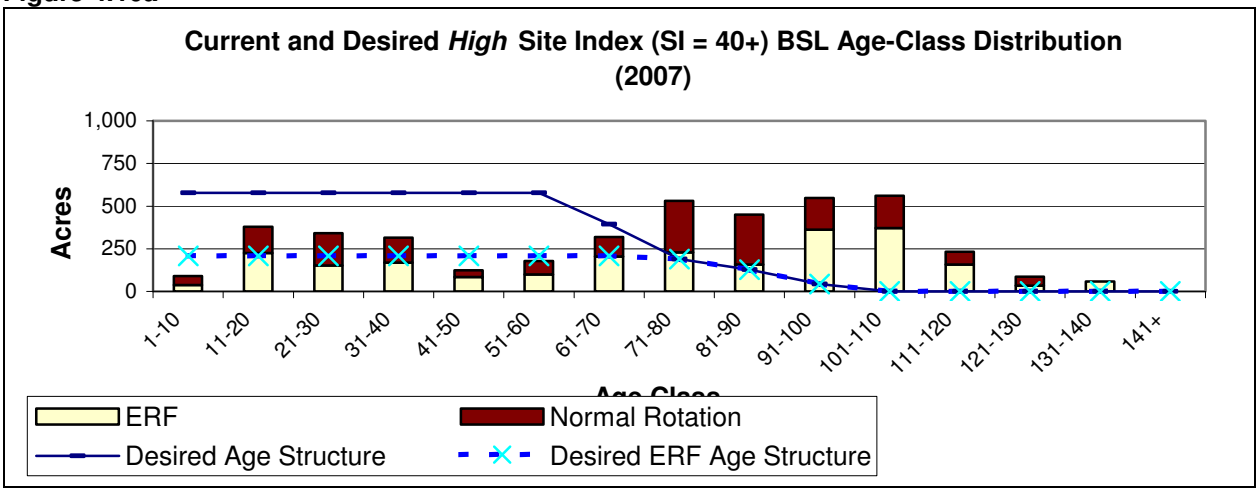
	CP	PMOP	Total
Acres	25,565	2,112	27,677
Percent	92	8	100

Black spruce is an excellent competitor in the FPn63, FPn82, FPs63, APn80, and APn81 wetland forest communities (i.e., NPCs).

2. Age-Class Distribution: The lowland black spruce cover type (BSL) has been divided into two site index groups (SI 40+, and SI 23-39) for determining harvest rotation ages and allowable treatment acres. Low site index BSL can be grown to a much longer rotation age than high site index. In both of the subsections, the current age-class distribution of the BSL cover type does not reflect the balanced age-class structure desired for even-aged managed cover types. The current age-class distribution is skewed toward older age-classes, with significant acreage being older than maximum rotation age.

Figure 4.10a shows the current and desired age-class distribution of BSL High Site Index for the combined two subsections.

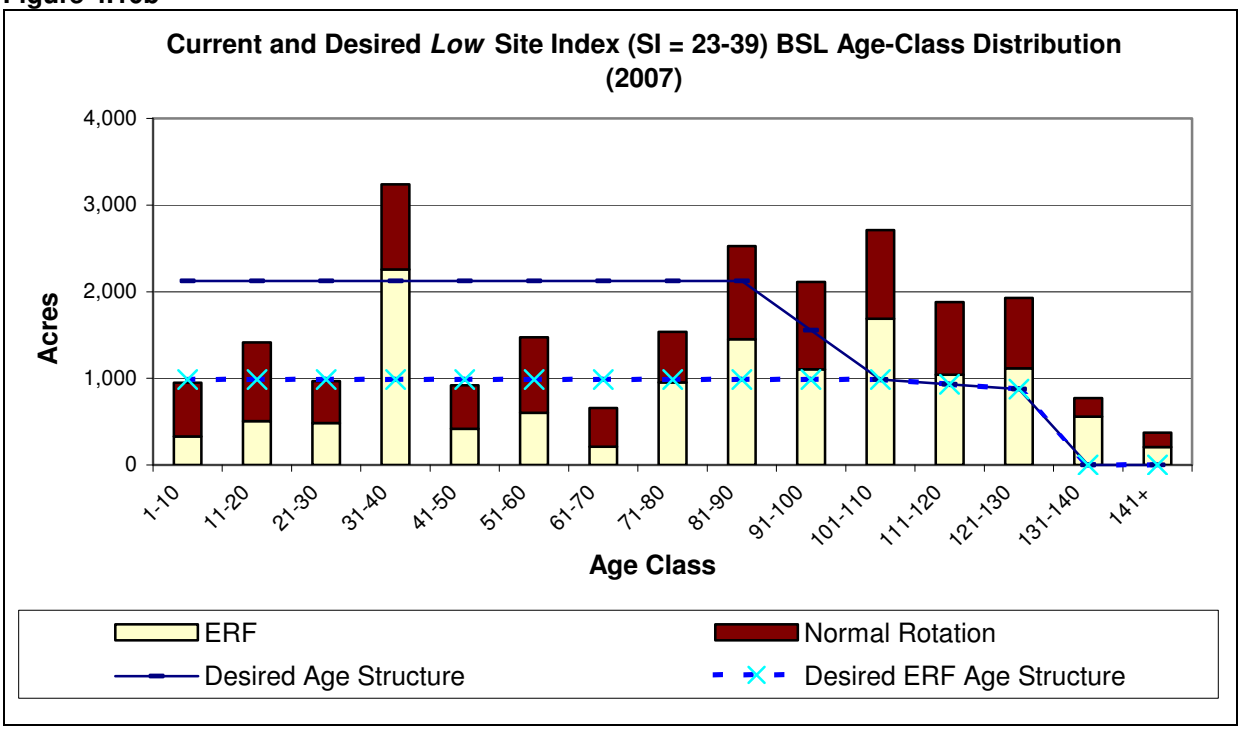
Figure 4.10a



3. Stand Composition: The BSL cover type is generally dominated by black spruce but there may be secondary species such as tamarack and white cedar present in stands.

Figure 4.10b shows the current and desired age-class distribution of BSL low site index for the combined two subsections.

Figure 4.10b



Within the two subsections, approximately 38 percent of non-ERF BSL acres are currently over the recommended normal rotation age.

4.10B Future Direction

1. Cover Type Acres: Both the 10-year DFFC and the 50-year DFFC for the BSL cover type acreage is to remain fairly consistent. No deliberate losses or gains are recommended, although minor changes may occur due to inventory updates.

2. Age-Class Distribution: A goal is to move the BSL age-classes toward a more balanced structure. Figures 4.10c and 4.10d show the desired age-class distribution of BSL by site index group.

Figure 4.10c

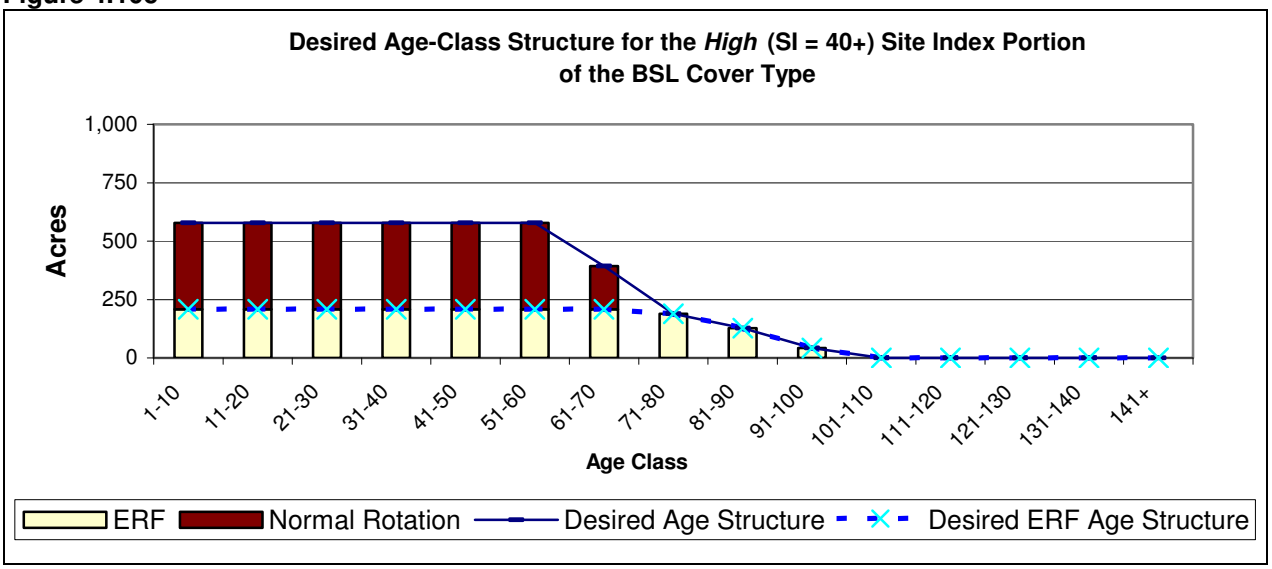
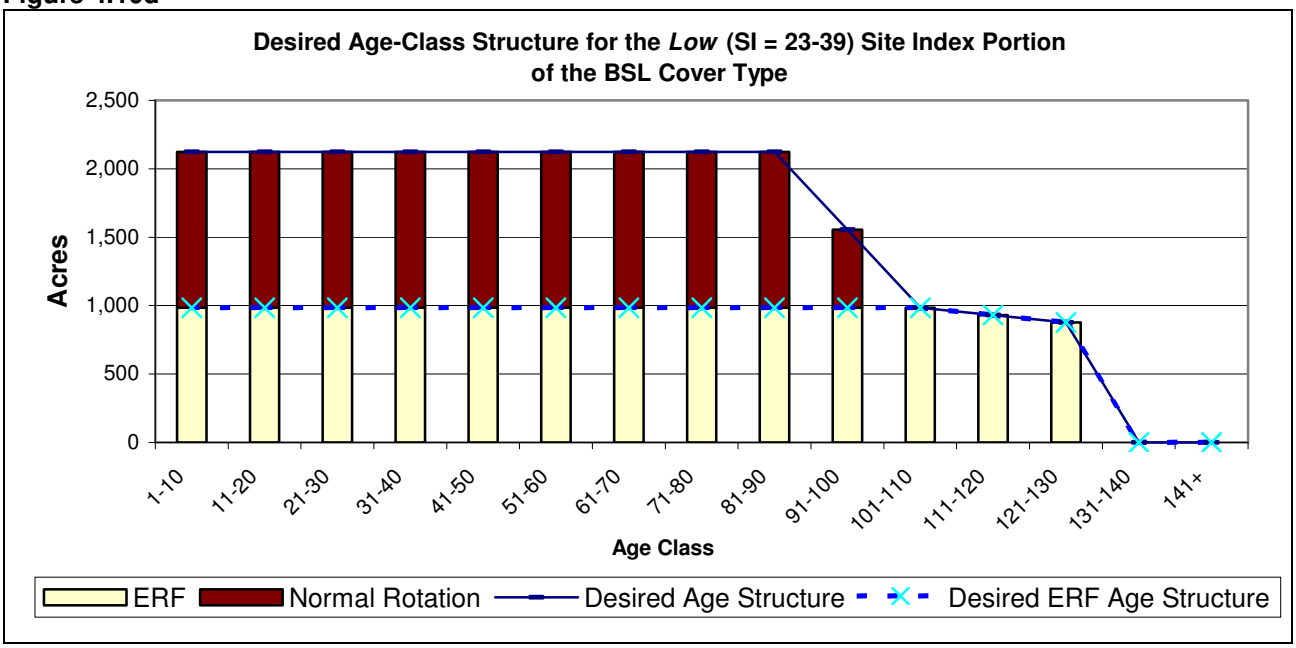


Figure 4.10d



The older age-classes will be managed with enough older stands deferred (i.e. ERF) to provide an adequate declining age-class distribution to the maximum age. The ERF goal for BSL Low Site Index is to maintain 14 percent of the acres over normal rotation age (i.e. effective ERF) at any one time. The ERF goal for BSL High Site Index is to maintain 11 percent of the acres over normal rotation age at any one time.

3. Stand Composition: The desired composition will range from pure black spruce to mixed coniferous stands, depending on the plant community appropriate to the site. Appropriate NPCs for this cover type include Apn80, Apn81, FPn63, FPn82, and FPs63.

As part of the *Silvicultural Prescription Worksheet*, field foresters will consider ECS and consult the appropriate Native Plant Community Fact Sheets in the *Field Guide to the Native Plant Communities of Minnesota: Laurentian Mixed Forest Province,* to determine most appropriate species composition as stand management decisions are made.

4. Patch Management Objectives: Patch management objectives include: creating more large patches; identifying both younger and older forest patches; and, in particular, increasing the patch size and age-class distribution of all lowland conifers.

5. Limiting Factors: Many stands in the BSL cover type are infected with dwarf mistletoe, a slow spreading disease that deforms and ultimately kills individual trees. A primary goal is to use harvesting techniques to regenerate infected stands while minimizing volume and sustainability losses. To the extent possible, infected stands will be selected for field visit and potential treatment during the 10-year plan implementation period.

4.10C Stand Management

1. Even-Aged Management Direction: The BSL cover type will be managed on an even-aged basis for pulpwood, while providing forest wildlife habitat and maintaining biodiversity.

2. Final Harvest: BSL will be treated through even-aged management using clear-cuts or clear-cuts with reserves (of secondary species). Where possible, larger blocks (100+ acres), will be harvested using natural stand boundaries.

Secondary component species in BSL stands such as tamarack, white cedar, balsam fir, and paper birch will be maintained.

The spread of eastern dwarf mistletoe to regenerating stands of black spruce is a primary concern in the management of this cover type. All sales should specify that the 5-foot cutting rule be applied unless another management method is specifically described in the stand's harvest prescription.

The following recommendations for harvest and post sale treatment are recommended to further limit the spread of dwarf mistletoe:

a. During the stand selection process, infected stands will be selected for field visit and potential harvest during this plan implementation period.
b. Black spruce reserve trees are not recommended due to the possibility of spreading dwarf mistletoe to the regenerating stand.
c. All clearcuts should kill all live black spruce greater than 5 feet in height. If the 5-foot recommendation is not used, follow-up inspections and treatments of harvested sites are suggested two years after harvest.
d. If the site is to be prescribed burned, slash should be distributed evenly.
e. Timber sales boundaries should be designed to include mistletoe pockets, plus a two-chain (102 feet) buffer of non-infected black spruce.
f. Follow-up inspection and treatment of harvested sites two years after harvest are suggested, with the intent of killing all remaining black spruce that are 5 feet and taller on the site.

3. Harvest Prescriptions: Following are the most common prescriptions that will be used on black spruce timber sale acres:

a. Clear-cut followed by natural seeding.
b. Clear-cut with reserves followed by natural seeding.
c. Clear-cut followed by artificial seeding.
d. Clear-cut with reserves followed by artificial seeding.

4. Regeneration Methods: Natural seeding or artificial seeding will be used to regenerate black spruce stands after harvest.

To reduce dwarf mistletoe infection in newly regenerating stands:

a. Use prescribed fire or winter shearing to remove all residual infected trees if they are not removed during timber harvest.
b. Regenerate densely-stocked stands of black spruce because mistletoe spreads more slowly and causes less damage in dense stands than in open ones.

4.10D Stand Selection Criteria

1. Normal Rotation Forest: Two site index groups were used with two corresponding normal rotation ages as shown on Table 4.10b.

Table 4.10b: Lowland Black Spruce Normal Rotation Age and Maximum Age

Site Index	Acres	Normal Rotation Age	Maximum Age
23-39	23,460	95	100
40+	4,217	65	95

The objective is to move the age-classes in each site index group toward a more balanced structure. The priority during this 10-year management period is to select the oldest and highest scoring stands for treatment. A *Stand Scoring System* was implemented which assigned scores to stands in the following priority: stands that were currently over maximum age; over maximum age within 10 years; currently beyond normal age; and, currently less than normal age. The *Stand Scoring System* considered both normal pool acres and ERF acres (see Appendix K). Not all stands above the normal harvest age will be selected because of the large acreage of stands currently over normal rotation age.

2. Normal Rotation Harvest Treatment Level Calculations (calculated for each of the two site index groups): The pool of stands considered for normal rotation (see *Glossary*) harvest treatment is all stands:

a. not reserved from harvest (e.g. old growth, EILC);

b. not designated to be managed as extended rotation forest (ERF); and
c. near normal harvest rotation age.

Harvest treatment level is the sum of normal rotation acres to be harvested from each age-class that will move the age-class distribution towards a more balanced structure. Once a balanced age-class structure is achieved stands can be scheduled for treatment upon reaching normal rotation age.

Adjustments to the normal harvest level were made to meet other goals, such as balancing the age-class distribution and providing relatively stable harvest levels. Lowland conifer stands that have been designated as ecologically important lowland conifers (EILC) will be reserved from harvest during this 10-year plan, but have been included in harvest level calculations.

3. Extended Rotation Forest: Two site-index classes are used for planning. Varying amounts of harvest are applied to age-classes beyond normal rotation age and out to maximum age. Table 4.10c identifies the Prescribed ERF and Effective ERF acres for both site indexes of BSL.

Table 4.10c Lowland Black Spruce ERF Acres (Plan Target Acres) and Maximum Age

Site Index	Prescribed ERF Acres	Effective ERF / DFFC Acres	Maximum Age
23-39	12,645	3,285	130
40+	1,820	464	95
Total	14,465	3,749	N/A

The selection of older-aged stands will be emphasized to help move this subset of ERF stands toward a desirable declining age-class structure. The ERF goal for BSL High Site Index is to maintain 11 percent of the acres over normal rotation age (i.e. Effective ERF) at any one time. The ERF goal for BSL Low Site Index is to maintain 14 percent of the acres over normal rotation age at any one time, and to provide a declining age-class structure out to maximum age (see Figures 4.10e through 4.10i).

4. Extended Rotation Harvest Treatment Level Calculations: The pool of stands considered for extended rotation harvest treatment is all stands:
a. not reserved from harvest (e.g., old growth, EILC);
b. designated to be managed as ERF; and
c. will be over normal harvest rotation age.

Extended rotation harvest treatment level is the sum of acres to be harvested from each age-class that will move the age-class distribution towards a more balanced structure, while attempting to retain the a minimum level of effective ERF. A declining acreage of stands in each 10-year age-class is desired between normal rotation age and maximum rotation age. Emphasis is on treating the oldest age-classes to minimize loss of fiber to tree mortality. Very few stands should be allowed to go untreated beyond the maximum rotation age (see *Glossary*).

4.10E Stand Treatment Summary

Tables 4.10d and 4.10e show the total treatment acres, old forest percent, effective ERF percent, and the average treatment ages for the next six decades by site index group. Old Forest Percent means acres that are over normal rotation age, except stands designated as Old Growth. Based on the cover type management identified in this Plan, the average treatment age for black spruce lowland cover type decreases during the plan implementation period (both site index classes). There is variation from decade to decade because of the current age-class distribution of the cover type.

Table 4.10d BSL (SI = 40+) Treatment Summary by Decade

Decades	Total Treatment	Conversion	Old Forest %	Effective ERF	Avg Treatment Age Normal	Avg Treatment Age ERF	Avg Age
1	619	0	62.3%	34.9%	114	126	70
2	657	0	53.6%	32.6%	105	120	63
3	705	0	41.6%	26.0%	104	120	55
4	582	0	30.0%	20.4%	101	115	46
5	580	0	24.0%	17.4%	78	110	42
6	574	0	18.8%	14.7%	72	101	38
Total	3,717	0					
DFFC	**577**1	**0**2		**11.0%**	**65.0**3	**87.2**3	**38**3

1 Total Treated Acres once a fully regulated forest is achieved.
2 positive numbers are net acres into the cover type; negative numbers are net acres out of the cover type.
3 anticipated age once a fully regulated forest is achieved.

Table 4.10e BSL (SI = 23-39) Treatment Summary by Decade

Decades	Total Treatment	Conversion	Old Forest %	Effective ERF	Avg Treatment Age Normal	Avg Treatment Age ERF	Avg Age
1	3,074	0	37.2%	22.0%	105	105	75
2	2,901	0	33.9%	19.4%	125	100	67
3	2,695	0	30.2%	20.1%	120	100	62
4	2,006	0	23.4%	15.4%	120	100	57
5	2,210	0	19.4%	12.4%	122	100	56
6	1,938	0	15.1%	8.4%	90	100	54
Total	14,824	0					
DFFC	**2,124**1	**0**2		**14.0%**	**95.0**3	**126.1**3	**57**3

1 Total Treated Acres once a fully regulated forest is achieved.
2 positive numbers are net acres into the cover type; negative numbers are net acres out of the cover type.
3 anticipated age once a fully regulated forest is achieved.

Figures 4.10e and 4.10f below illustrate the age-class structure of the BSL cover type in 2017 at the end of the 10-year plan implementation period for the two site indexes.

Figure 4.10e

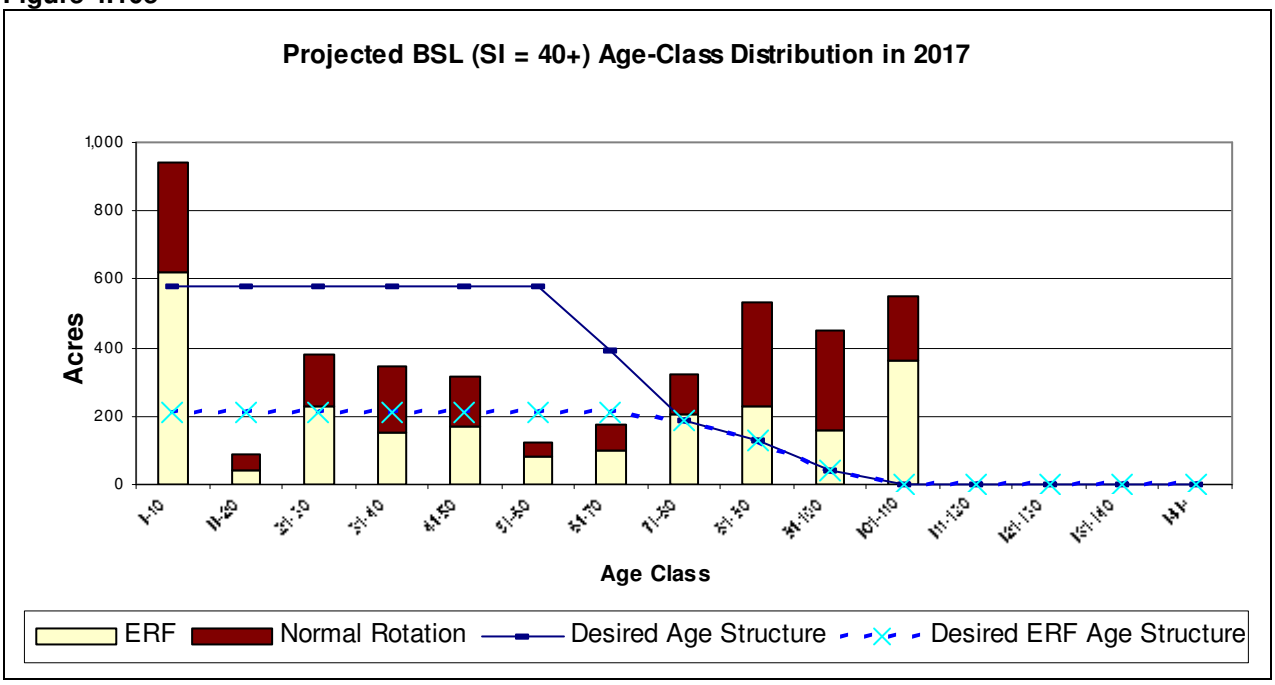
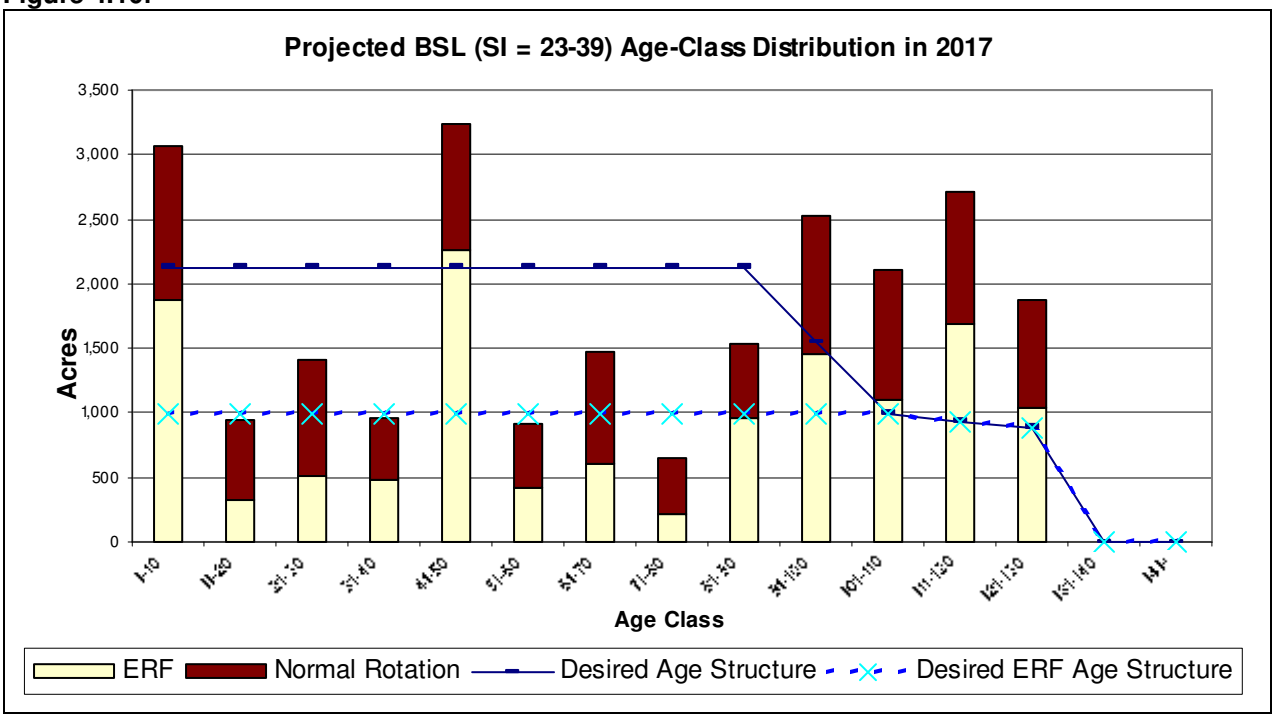


Figure 4.10f



Based on the modeling of the treatment levels by decade, Figures 4.10g and 4.10h show the projected age-class distributions in 2057 for the two site indexes in the BSL cover type.

Figure 4.10g

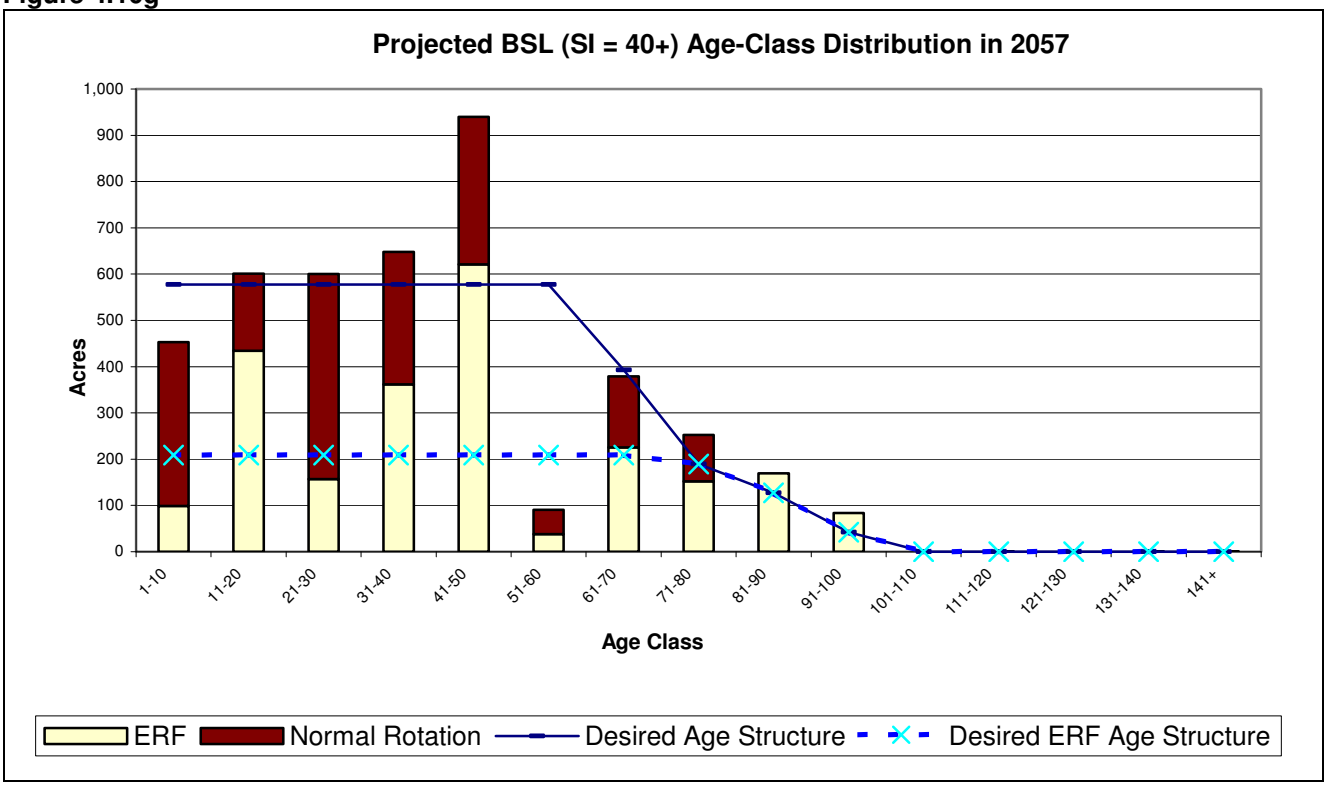
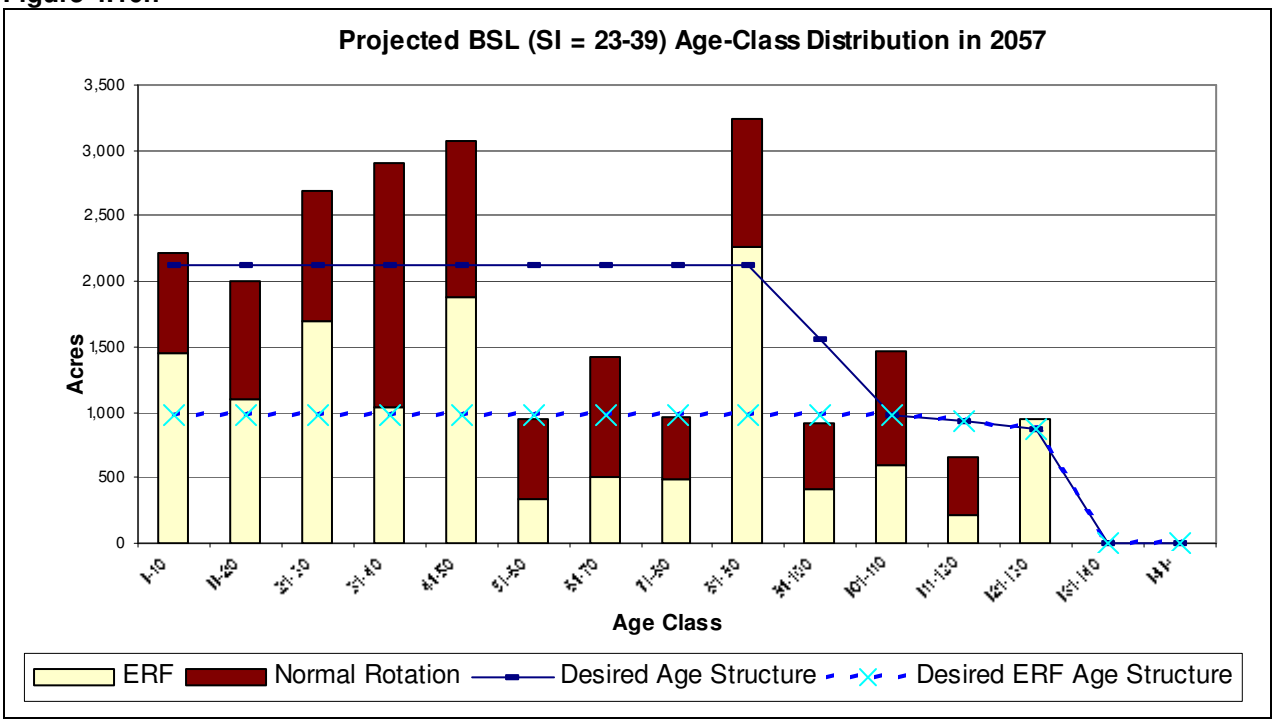


Figure 4.10h



As each new 10-year plan is developed, the treatment levels by decade and modeling will be re-evaluated.

4.11 White Spruce (WS)

4.11A Current Condition

1. Cover Type Characteristics: In 2007, the white spruce cover type comprises about 1.5 percent (7,089 acres) of state timberlands (429,229 acres) managed in the CP-PMOP subsections. Forty-three percent of this cover type is located in the CP subsection and 57 percent in the PMOP subsection (see Table 4.11a).

Table 4.11a White Spruce Cover Type Acres by Subsection

	CP	PMOP	Total
Acres	3,034	4,055	7,089
Percent	43	57	100%

The native plant communities (NPCs) identified where white spruce is an excellent competitor are FDn43 and MHn44.

2. Age-Class Distribution: The current age-class distribution of both natural and planted white spruce in the CP-PMOP subsections does not reflect the balanced age-class structure desired for even-aged managed cover types. In the two subsections combined, 91 percent of the white spruce cover type is under the recommended normal rotation age of 60 years for natural stands, and 50 years for planted. Figure 4.11a identifies the current age-class structure of natural white spruce and Figure 4.11b identifies the current age-class structure for planted white spruce.

Figure 4.11a

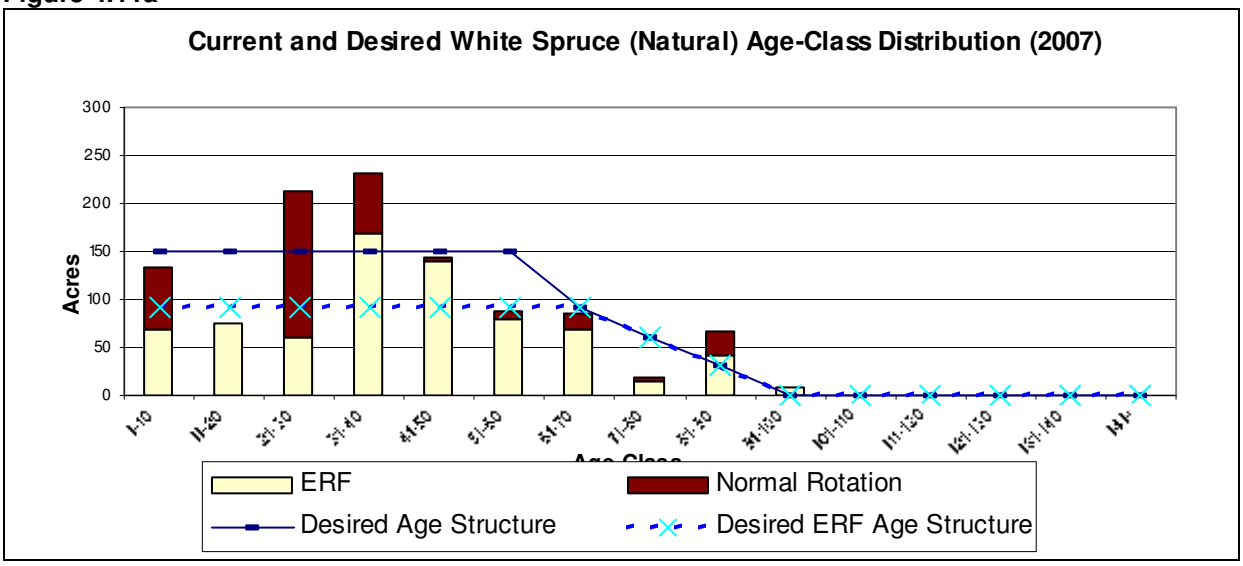
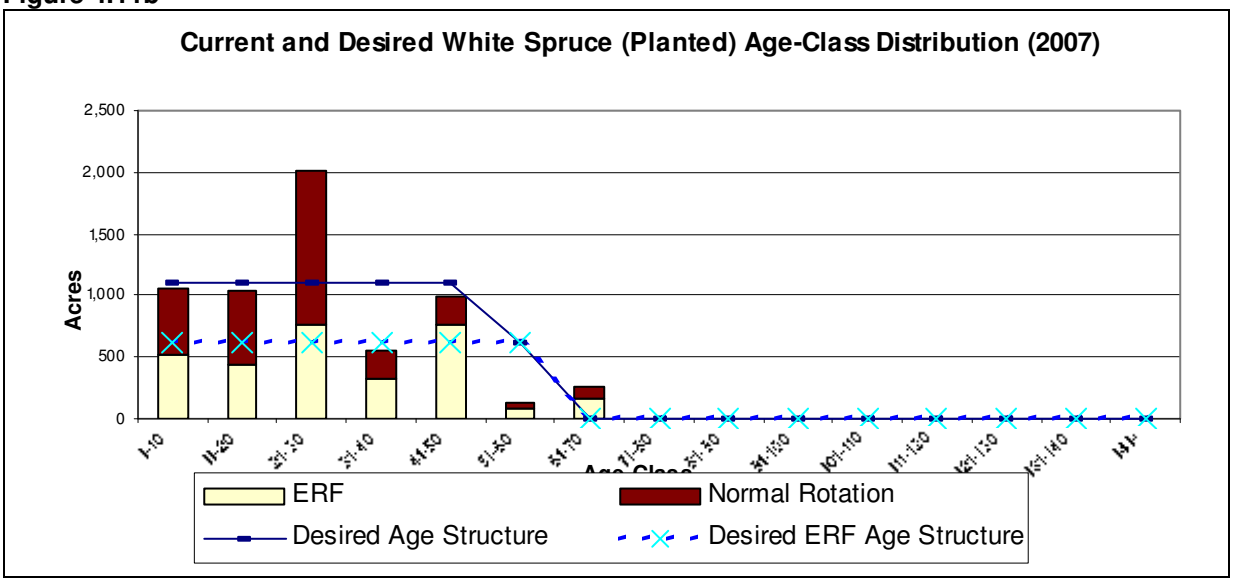


Figure 4.11b



3. Stand Composition: Most of the older, natural origin white spruce stands have a mixed coniferous-deciduous canopy with varying amounts of quaking aspen, paper birch and balsam fir. They also have smaller amounts of white pine, tamarack, or black spruce depending on landscape context, site conditions, and management history. Natural origin white spruce will be managed on a normal rotation age of 60 years. Approximately 85 percent of white spruce cover type less than 50 years old, originated as plantations and is being managed primarily as a single species on a normal rotation age of 50 years. As part of the *Stand Silvicultural Prescription Worksheet*, field foresters will consider ECS and consult the appropriate Native Plant Community Fact Sheets in the *Field Guide to the Native Plant Communities of Minnesota: Laurentian Mixed Forest Province,* to determine most appropriate species composition as stand management decisions are made.

4.11B Future Direction

1. Cover Type Acres: The 10-year DFFC is to decrease this cover type by 1 percent (net conversion of 50 acres). The 50-year DFFC is to increase the acreage in this cover type by two percent (net increase of 145 acres) across both subsections.

Table 4.11b Recommended White Spruce Cover Type Acres by Subsection by Year

Subsection	2007	2017	2057
CP	3,034	3,215	NA
PMOP	4,055	3,824	NA
Total acres	**7,089**	**7,039**	**7,233**

The 10-year net decrease will be accomplished by conversion of 1,000 acres to jack pine with an increase in white spruce acres from aspen (700 acres), balsam fir (150 acres) and northern hardwoods (100 acres).

The 50-year net increase will be accomplished through natural or artificial conversion by managing several cover types to result in a net increase of white spruce. This will be accomplished by conversion of 2,250 acres of white spruce plantation back to jack pine; 1,700 acres to aspen; 195 acres to balsam; and 500 acres to northern hardwoods.

It should be clarified that the white spruce cover type are net changes. The intent is to convert some white spruce stands to another cover type, while converting other cover types into white spruce stands.

2. Age-Class Distribution: The long-term goal is to move all white spruce cover types toward a more balanced age-class structure (See Figures 4.11c and 4.11d).

Figure 4.11c

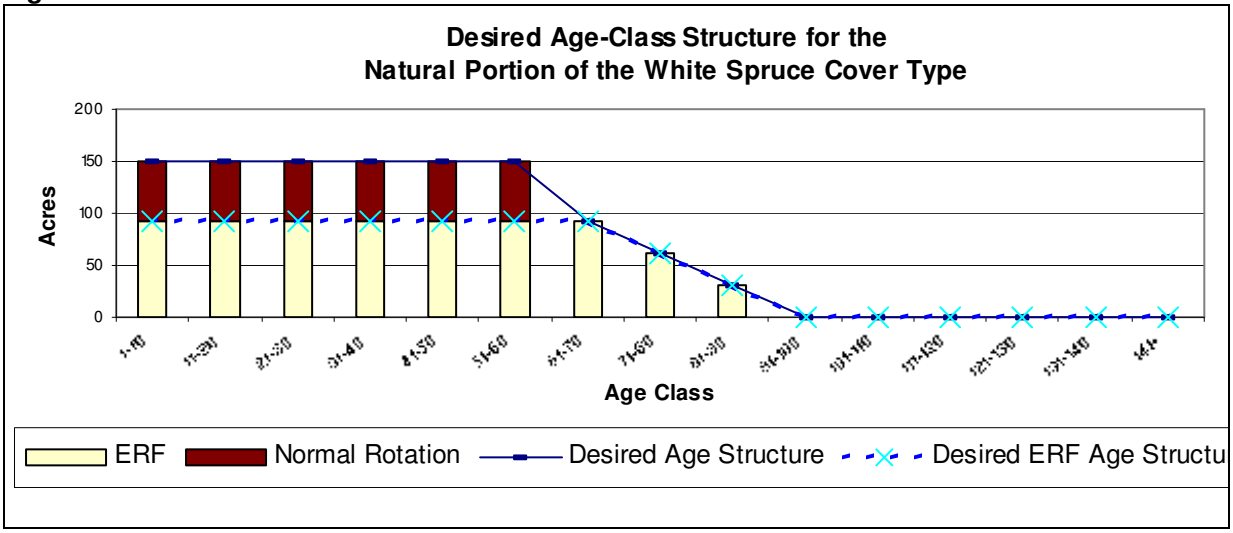
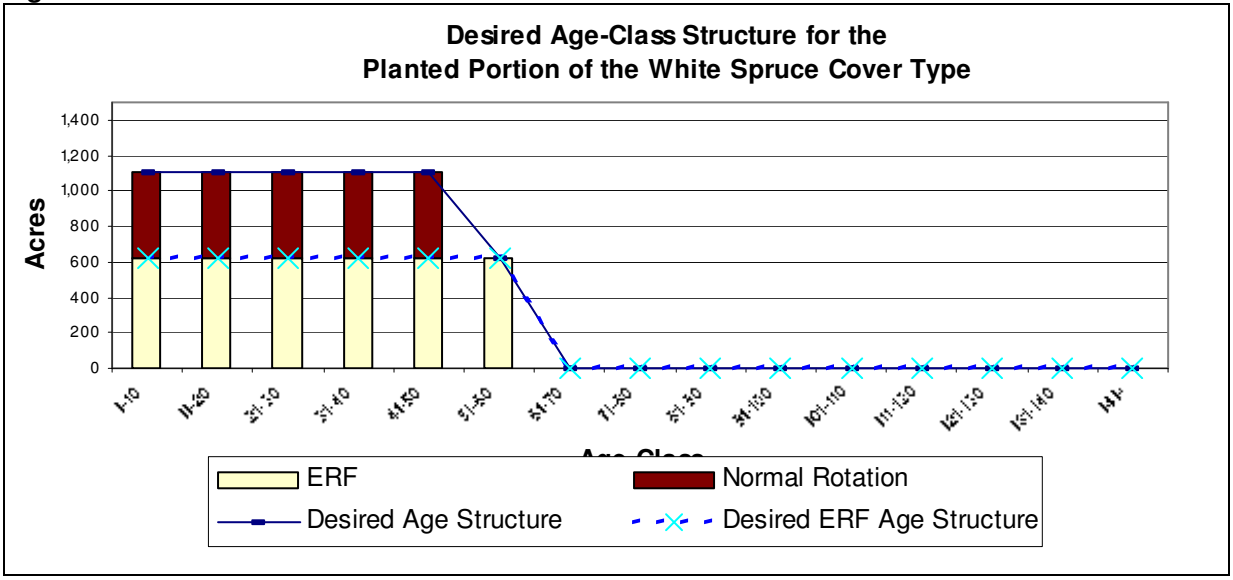


Figure 4.11d



Small portions of ERF and natural origin white spruce stands will be managed as multi-aged and mixed species stands. This type of management will be focused in specific areas such as riparian zones, and special management zones that are part of an Old Forest Management Complex.

3. Stand Composition: White spruce stands will vary from mostly pure white spruce to mixed species stands. A decreasing proportion of the white spruce plantations will be managed as single species, favoring a more diverse stand structure that includes varying amounts of conifers such as white pine, red pine, tamarack, black spruce, balsam fir, upland white cedar, and upland hardwoods such as aspen and birch depending on landscape context, site conditions, and management history. As part of the *Stand Silvicultural Prescription Worksheet*, field foresters will consider ECS and consult the appropriate Native Plant Community Fact Sheets in the *Field Guide to the Native Plant Communities of Minnesota: Laurentian Mixed Forest Province,* to determine most appropriate species composition.

4. Patch Management Objectives: Patch management objectives include: creating more large patches; identifying both younger and older forest patches; and in particular, increasing the patch size and age-class distribution of all lowland conifers.

4.11C Stand Management

1. Even-Aged Management

1.1. Even-aged Management Direction: Planted white spruce will be managed as normal rotation stands on an even-aged basis for pulpwood, bolts, and sawtimber products while moving toward a balanced age-class structure and maintaining or improving site productivity and wildlife habitat.

1.2. Even-Aged Harvest Methods: Harvest methods for normal rotation white spruce stands will include clearcut, shelterwood, or seed tree prescriptions. The use of natural stand boundaries or natural features such as topography and soil type to delineate timber sale boundaries is recommended.

Harvest regulations and techniques should be applied that will favor maintaining or increasing within-stand diversity by reserving from harvest a portion of the hardwoods and other long-lived conifers, and protecting desirable advanced regeneration. These reserve trees will maintain the within-stand species diversity, add structural diversity for the newly regenerating stand, and may also function as a seed source that could aid in increasing the density of these species in the new stand.

The two most common defoliators of white spruce are spruce budworm and yellow-headed spruce sawfly. Reserve trees may mitigate impacts from the sawfly by providing partial overstory shade. When regenerating white spruce stands, efforts should be made to reduce the amount of balsam fir in the stand, since balsam fir is the preferred host for spruce budworm.

1.3 Intermediate Harvest Methods:

a. Thinning will be used to reduce stand density to increase future tree growth, quality, and vigor, and to reduce the risk of spruce budworm outbreaks and damage. Recommendations are:
    - Thinning in normal rotation stands will occur in merchantable stands at approximately 10-year intervals, depending on site quality.
    - Older stands of ERF may have longer intervals (15 – 20 years) between thinnings to compensate for slower growth rates and to facilitate the growth of desirable understory species.
    - In multi-aged stands, residual basal area may be modified to meet ERF and other objectives. Examples are: 1) to encourage within stand diversity and 2) maintain higher residual basal areas because of the larger diameter of older trees.

b. Thinning in normal rotation and ERF stands will maintain (especially in natural origin stands) or increase within-stand diversity, while retaining white spruce as the main cover type by the following methods:
    - Reserve from harvest, or regenerate individual trees or patches of other tree species appropriate to the site, where possible. Efforts should be made to reduce the amount of balsam fir in the stand, since balsam fir is the preferred host for spruce budworm.
    - Protect advanced regeneration of desirable understory species, where possible.
    - Consider creating or maintaining variable densities within stands when thinning.
    - Higher stand densities (BA) are recommended along stand edges exposed to wind, and along high visual quality corridors such as major roads and lakes.
    - Attempt to retain shrub and forb species diversity appropriate to the site during management activities. An example to achieve this is to locate thinning rows or landings to avoid disturbance of some patches of shrubs or forbs.

c. If the stand is used as a thermal cover area by deer, consider applying one of the following options:
    - Maintain a higher stand basal area (e.g., wider reserve strips with canopy closure).
    - Thin only a portion of the stand.
    - Don't thin.

1.4 Thinning Prescriptions: Prescriptions for thinning include:

a. Row thin.
b. Strip thin
c. Selective thin.

d. Thin only when the ground is frozen and snow is present.
e. Conduct the first thinning before the plantation is 30 years old.

1.5. Even-Aged Management Prescriptions: The following are the most common prescriptions that will be used on normal rotation, white spruce timber sale acres:

a. Clearcut with Reserves.
b. Clearcut followed by artificial regeneration (planting or seeding).
c. Clearcut with Reserves followed by artificial regeneration (planting or seeding).
d. Seed Tree.
e. Shelterwood.

Some research shows that light shade will aid survival and promote healthier and more vigorous growth.

2. Uneven-Aged Management

2.1 Uneven-aged Management Direction: This is recommended specifically for riparian areas and other identified special management zones where even-aged management isn't appropriate. This management will only occur in natural white spruce cover types or ERF white spruce stands. Uneven-aged managed stands should result in multi-canopy, mixed species conditions that are desired on specific sites. Recommendations include:

a. Retain some supercanopy trees (e.g. white spruce, white pine, or other species) in patches or clumps at each treatment.
a. Encourage multi-layered understory development.
b. Emphasize regenerating white spruce in the understory.
c. Increase the amount of non-host tree species such as pines and hardwoods in the stand.

2.2 Uneven-Aged / Multi-Aged Management Prescriptions: Single-tree and group selection harvest methods should be used where multiple ages already exist in the stand. Where the stand is currently even-aged, shelterwood, seed tree with reserves, or group selection harvest methods may be needed to move the stand toward a multiple-aged stand. The following are the most common management prescriptions that will be used for white spruce ERF stands:

a. Group Selection
b. Single Tree Selection / Selective Tree Harvest
c. Seed Tree with Reserves
d. Shelterwood with Reserves

3. Limiting Factors

White spruce is usually a component of stands and is rarely found as a "pure" stand. Their root systems are shallow, so they are easily damaged during thinning. Declines observed in thinned white spruce plantations are likely due to thinning damage, attack by opportunistic insects (spruce weevil, spruce beetle, etc.), and to needlecast diseases. Spruce budworm is occasionally a defoliator in these subsections and can lead the white spruce stand into a decline.

a. Plant white spruce seedlings under a light overstory of aspen or aspen/birch as this discourages three insect pests that cause seedling mortality and impact height growth.
b. Thin only when the ground is frozen and snow is present.
c. Conduct the first thinning before the plantation is 30 years old.

Some observations indicate that white spruce stands may decline as a result of multiple stand entries to thin.

4. Regeneration

4.1 Regeneration Methods: After final or selective harvest, following are recommendations to consider when regenerating white spruce stands:

a. Use prescribed fire, mechanical scarification, or herbicides to site prep for natural or artificial seeding or planting.
b. During site preparation, discriminate against balsam fir and maintain non-host tree species such as pines and hardwoods in the stand to reduce the risk of spruce budworm infestation.

c. Consider within-stand diversity goals when determining the method, timing, and intensity of the site preparation or release so that species composition and structure within the stand is allowed to develop. For example, reduce the concentration of herbicide used or use a less intense method than rock raking.
d. Consider using techniques that make plantations look more like naturally regenerated stands.
    - Retain advanced regeneration of desired species from the previous stand.
    - Plant fewer trees per acre to allow other species to develop.
    - Plant trees at varied densities.
e. When regenerating spruce-fir stands, emphasis should be given to regenerating the white spruce and not the balsam fir, and also to increase the amount of non-host tree species such as pines and hardwoods in the stand.
f. After treatment of ERF stands, consider underplanting or artificial seeding of white spruce and other desired species to supplement natural seeding.

4.11 D Cover Type Conversion Management

1. Conversion Goals and Approach: The DFFC goal over the next 10-years is a net reduction of the white spruce cover type by 1 percent (50 acres). This net reduction will result from converting 1000 acres of the white spruce to jack pine on sites that were jack pine before being planted to white spruce. The 10-year DFFC goal also includes converting 950 acres to a white spruce cover type from 700 acres of aspen, 150 acres of balsam fir, and 100 acres of northern hardwoods. Locations for conversion of these cover types, to stands dominated by white spruce will be identified through conversion pool criteria queries and follow up site visits during the next 10-years. These sites will be assessed regarding their native plant community type and related capability for natural or artificial conversion.

Conversion of other forested cover types to a stand dominated by white spruce will be accomplished primarily by converting aspen, balsam fir, and northern hardwood stands. NPC classes where white spruce competes well with other vascular plants and ranks excellent for suitability include: FDn43 and MHn44. Most natural white spruce stands will be in the Mesic Northern Hardwoods and Boreal Hardwood-Conifer Ecosystem Types that were delineated by Shadis (2000). Many of the existing white spruce plantations on dry sites will be converted back to jack pine.

Priority LTAs for increasing the white spruce cover type include: Guthrie Till Plain, Bena Dunes and Peatlands, Rosey Lake Plain, Blackduck Till Plain, and Two Inlets Moraine. These LTAs currently contain 25-plus acres of white spruce cover type (natural stands) on state lands and have shown at least a two-fold decline (BT to FIA), or have shown a severe decline.

4.11E Stand Selection Criteria

1. Normal Rotation Forest: A rotation age of 50 years will be used for calculating a regulated harvest level for planted stands managed under normal rotation. A rotation age of 60 years will be used for calculating a regulated harvest level for natural stands under normal rotation. Table 4.11c identifies normal rotation and maximum rotation ages for planted and natural white spruce.

Table 4.11c White Spruce Normal Rotation Age and Maximum Age

Subsection	Site Index	Acres	Normal Rotation Age	Maximum Age
CP	Natural	461	60	90
CP	Planted	2573	50	60
PMOP	Natural	600	60	90
PMOP	Planted	3455	50	60

The objective is to move the age-classes toward a more balanced structure. The priority during the next 10-years will be to select the oldest and highest scoring stands for treatment. A *Stand Scoring System* was implemented which assigned scores to stands in the following priority: stands that were currently over maximum age; over maximum age within 10 years; currently beyond normal age; and, currently less than normal age. The *Stand Scoring System* considered both normal pool acres and ERF acres (see Appendix K).

2. Normal Rotation Harvest Treatment Level Calculations: The pool of stands considered for normal rotation (see glossary) harvest treatment is all stands:

a. not reserved from harvest (e.g. old growth, EILC);
b. not designated to be managed as extended rotation forest (ERF); and
c. and near normal harvest rotation age.

Harvest treatment level is the sum of normal rotation acres to be harvested from each age-class that will move the age-class distribution towards a more balanced structure. Once a balanced age-class structure is achieved stands can be scheduled for treatment upon reaching normal rotation age.

Applying the calculations, as stated above, results in a harvest level of 106 acres per year. Due to relatively small acreage in the older age-classes of normal rotation age stands, only 60 acres were selected for final harvest treatment during this 10-year plan.

3. Extended Rotation Forest: ERF stands (17 percent of the natural and 10 percent of planted white spruce cover type) will be managed as uneven-aged or multi-aged stands with a goal of increasing species and age-class diversity within the stand. Table 4.11d identifies ERF rotation and maximum age for the white spruce cover type. Seventeen percent of natural white spruce cover type was identified as extended-rotation forest in an effort to reflect the typical forest composition associated with OFMCs, special management zones and riparian areas.

4. Extended Rotation Harvest Treatment Level Calculations: The pool of stands considered for extended rotation harvest treatment is all stands:

a. not reserved from harvest (e.g. old growth, EILC);
b. designated to be managed as extended rotation forest (ERF); and,
c. will be over normal harvest rotation age.

Extended rotation harvest treatment level is the sum of ERF acres to be harvested from each age-class that will move the age-class distribution towards a more balanced structure, while attempting to retain the minimum level of effective ERF. A declining acreage of stands in each 10-year age-class is desired between normal rotation age and maximum rotation age. Emphasis is on treating the oldest age-classes to minimize loss of fiber to tree mortality. Very few stands should be allowed to go untreated beyond the maximum rotation age (see Appendix V *Glossary*).

Table 4.11d White Spruce ERF Acres (Plan Target Acres) and Maximum Age

Origin	Prescribed ERF Acres	Effective ERF / DFFC Acres	Maximum Age
Natural*	721	180	90
Planted	3616	603	60

* No ERF percentage was offered by the Statewide ERF Workgroup, reflects CP-PMOP Team-developed target

Due to the current age of ERF stands, no stands were selected for final harvest treatment during this 10-year plan implementation period. ERF stands were selected for treatment under the thinning criteria.

5. Thinning: Stands will be identified to be field visited and evaluated for thinning. Stands identified will be:

a. equal to or greater than 15 years old;
b. in a normal timber status; and,
c. of artificial (planted) origin.

The forest inventory will be updated, as needed, based on the field examinations. The field-visit year will be scheduled based on the stand's current age or past thinning year. For example, 15-year-old stands should be scheduled for the last year of the plan, 21-year-old for next to last, etc. This will capture those stands that grow into the recommended DBH and density for thinning during the plan implementation period. Stands that meet the criteria for thinning will be treated through timber sales.

6. Stand treatment criteria include:

a. Natural white spruce stands normal rotation age 30-60 years old.
b. Natural white spruce ERF stands 60-90 years old.
c. Plantation white spruce stands 30-50 years old.
d. Plantation white spruce ERF stands 50-60 years old.

See Sections 4.11B and C for more details on uneven-aged management and intermediate stand treatments.

4.11F Stand Treatment Summary

Tables 4.11e and 4.11f show the total treatment acres, recommended conversion acreage out of the white spruce cover type, and average treatment age over the next six decades for natural and planted white spruce cover types. Based on the cover type management identified in this Plan, the average treatment age for white spruce cover type generally increases over time reflecting the goal of providing more conifers on the landscape. Old Forest percent means acres that are over normal rotation age, except stands designated as Old Growth. There is variation from decade to decade because of the current age-class distribution.

Table 4.11e Treatment Summary by Decade for the Natural Portion of White Spruce

	Acres		Percent		Average Treatment Age		Average Age
Decade	**Total Treatment**	**Conversion**	**Old Forest**	**Avg**	**Normal**	**ERF**	
1	128	0	16.7%	12.6%	82	83	37
2	122	0	12.9%	12.2%	66	74	37
3	123	0	15.0%	15.0%	60	77	39
4	155	0	25.2%	25.2%	60	76	41
5	196	0	30.5%	21.5%	70	82	41
6	138	0	19.1%	19.1%	60	88	37
Total	862	0					
DFFC	**147**[1]	**0**[2]		**17.0%**	**60.0**[3]	**80.0**[3]	**37**[3]

[1] Total treated acres once a fully regulated forest is achieved.
[2] positive numbers are net acres into the cover type; negative numbers are net acres out of the cover type.
[3] anticipated age once a fully regulated forest is achieved.

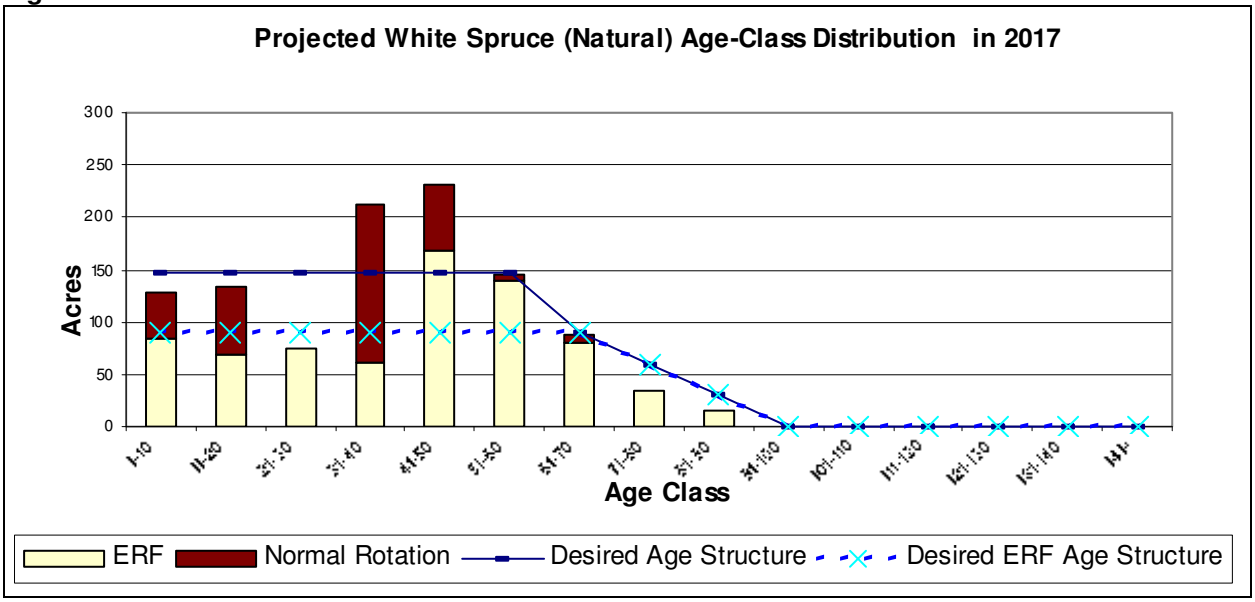
Table 4.11f Treatment Summary by Decade for the Planted Portion of White Spruce

	Acres		Percent		Average Treatment Age		Average Age
Decade	**Total Treatment**	**Conversion**	**Old Forest**	**Avg**	**Normal**	**ERF**	
1	1,000	1,000	6.3%	4.1%	55	57	26
2	842	313	6.7%	6.7%	44	60	28
3	1,050	312	5.5%	5.5%	50	53	30
4	1,132	313	17.3%	10.7%	57	63	31
5	1,150	312	15.5%	8.3%	57	61	30
6	1,254	0	17.9%	10.8%	57	60	29
Total	6,428	2,250					
DFFC	**1,111**[1]	**145**[2]		**10.0%**	**50.0**[3]	**60.0**[3]	**28**[3]

[1] Total treated acres once a fully regulated forest is achieved.
[2] positive numbers are net acres into the cover type; negative numbers are net acres out of the cover type.
[3] anticipated age once a fully regulated forest is achieved

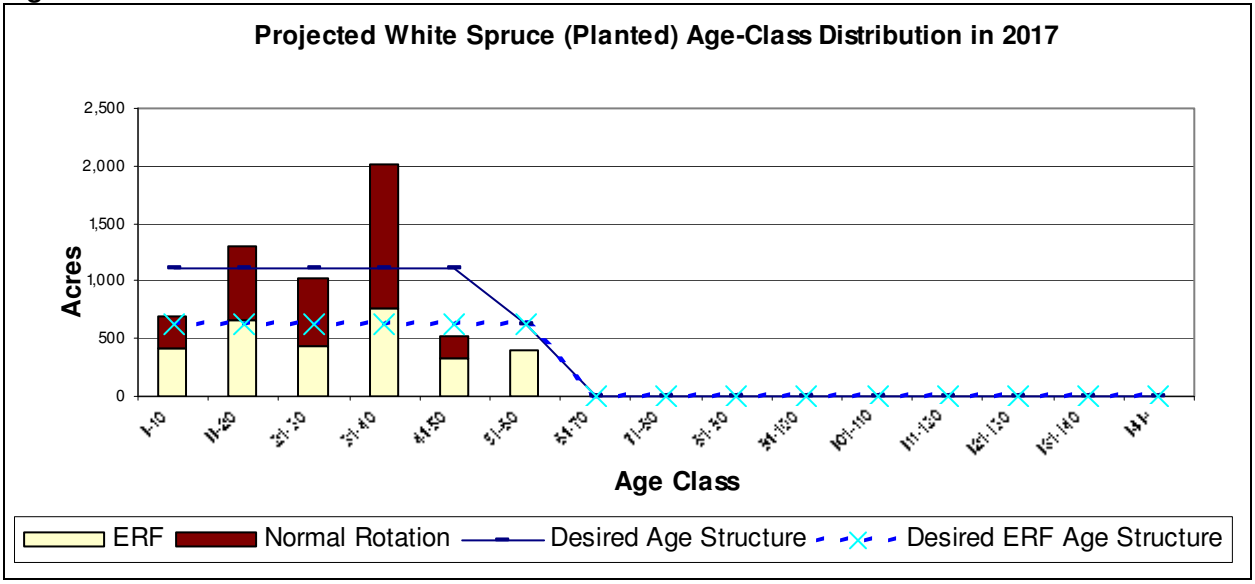
Based on the modeling of the treatment and conversion levels by decade, Figure 4.11e shows the projected age-class distribution in 2017 of the natural white spruce cover type.

Figure 4.11e



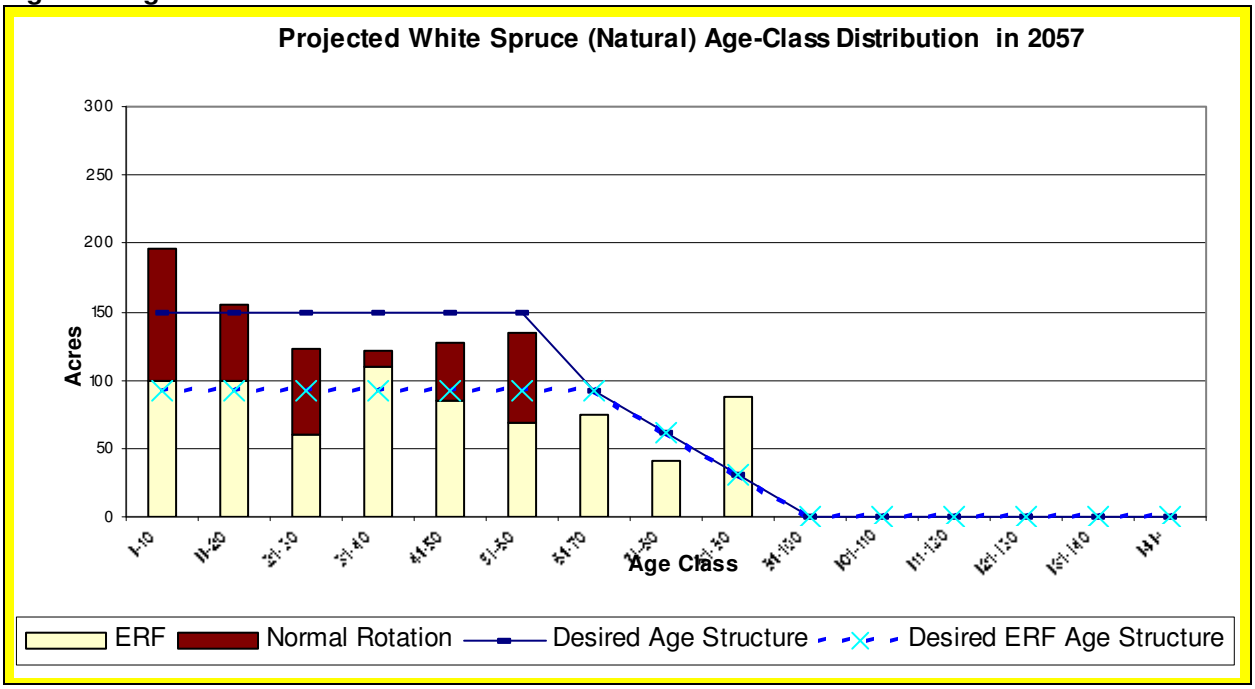
Based on the modeling of the treatment and conversion levels by decade, Figure 4.11f shows the projected age-class distribution in 2017 of the planted white spruce cover type.

Figure 4.11f



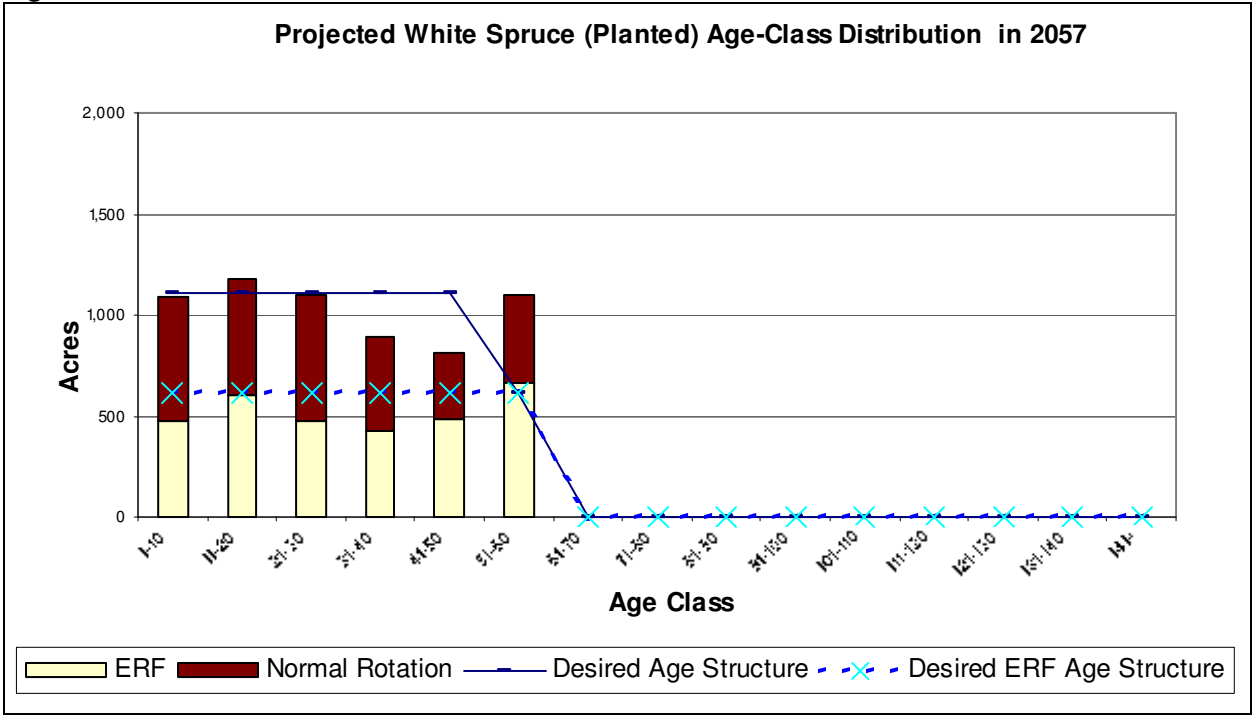
Based on the modeling of the treatment and conversion levels by decade, Figure 4.11g shows the projected age-class distribution in 2057 of the natural white spruce cover type.

Figure 4.11g



Based on the modeling of the treatment levels by decade, Figure 4.11h shows the projected age-class distribution in 2057 of the planted white spruce cover type.

Figure 4.11h



As each new 10-year plan is developed, the treatment levels by decade and modeling will be re-evaluated.

4.12 Balsam Fir (BF)

4.12A Current Condition

1. Cover Type Characteristics: In 2007, the balsam fir (BF) cover type comprised 1.8 percent (7,749 acres) of state timberlands (429,229 acres) managed in the CP-PMOP subsections. Of the total BF acres in the two subsections, 64 percent (4,971 acres) occurs in the CP and 36 percent (2,778 occurs in the PMOP (see Table 4.12a). A total of 60 acres of the balsam fir cover type has been reserved from harvest in these two subsections.

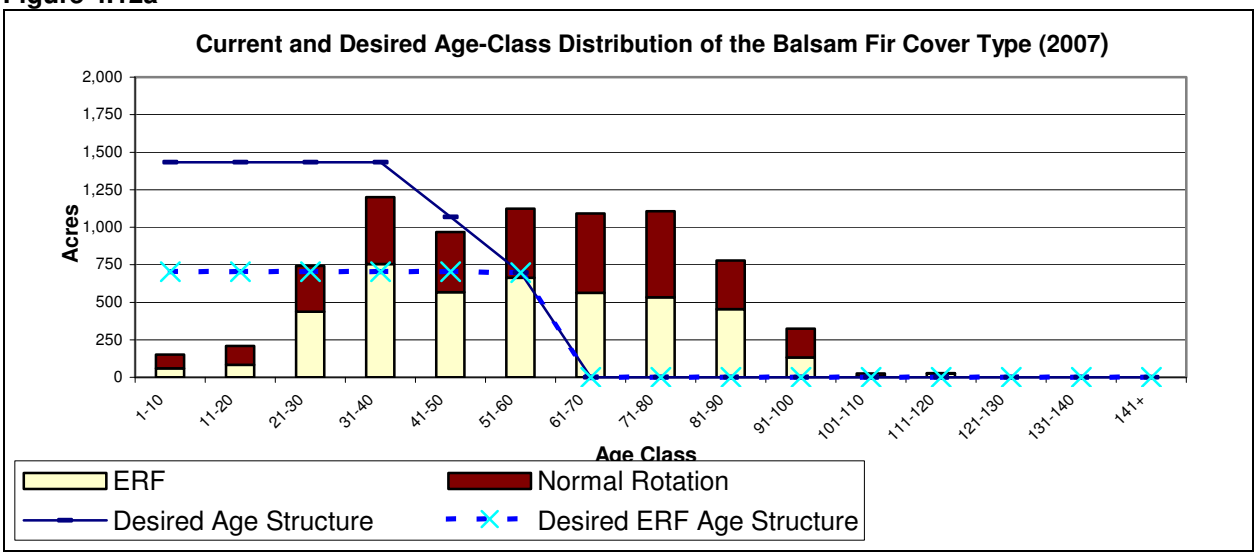
Table 4.12a Balsam Fir Cover Type Acres by Subsection

	CP	PMOP	Total
Acres	4,971	2,778	7,749
Percent	64	36	100

Balsam fir is an excellent competitor in Native Plant Communities (NPCs): FDn33, FDn43, MHn44, WFn53, and FPn63.

2. Age-Class Distribution: As shown on Figure 4.12a, the current balsam fir age-class distribution does not reflect the balanced age-class structure desired for even-age managed cover types.

Figure 4.12a



This figure shows that there are only 151 acres in the 1-10 age-class; that is less than in any other age-class. This is because balsam fir typically develops as a stand component following harvest of older balsam. Sometimes after 10-years, it often shows up in the inventory again as a balsam fir cover type.

Within the two subsections, approximately 64 percent of balsam fir acreage (4,965 acres plus 60 acres of old growth) is currently over the recommended normal rotation age of 45.

4.12B Future Direction

1. Cover type Acres: The DFFC over the next 50 years is to decrease the balsam fir cover type by 3 percent (256 acres), with balsam fir occurring primarily as the main component of mixed stands. These acres will be converted to white spruce (61 acres) and white cedar (195 acres) cover types.

Native plant communities favorable for balsam fir cover type maintenance are FDn33, FDn43, and MHn44. Balsam fir is best suited to wet-mesic sites where adequate soil moisture is available throughout

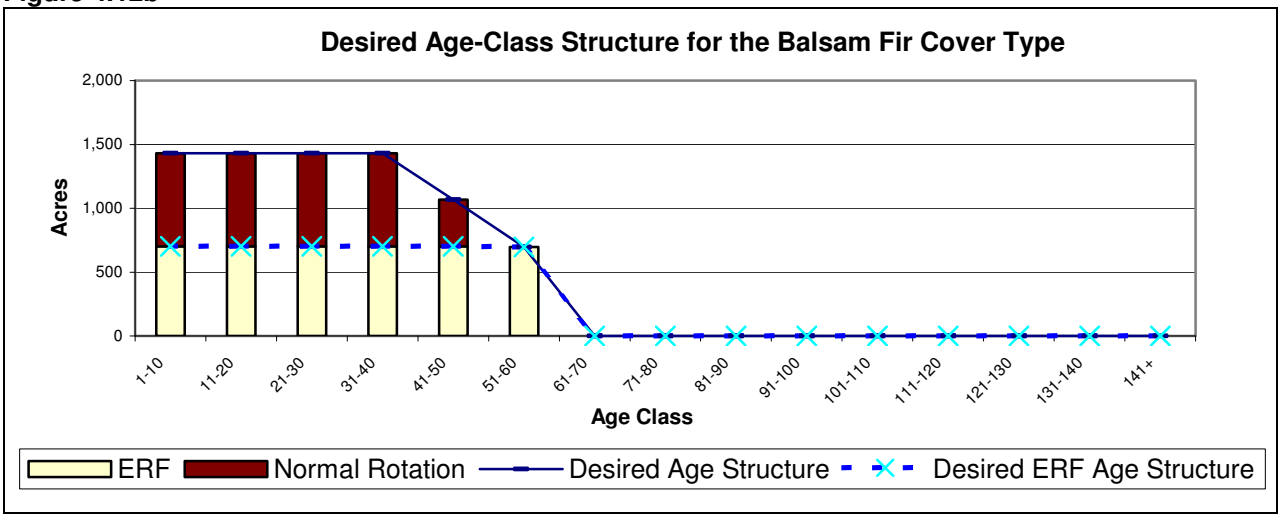
the growing season. After harvest, some balsam stands will naturally regenerate to aspen or birch cover types with balsam as a component.

Table 4.12b Recommended Balsam Fir Cover Type Acres in the Subsections by Year

	2007	2017	2057
CP	4,971	4,893	NA
PMOP	2,778	2,657	NA
Total acres	7,749	7,550	7,494

2. Age-Class Distribution: A goal is to move the current balsam age-class distribution toward a more balanced structure. Figure 4.12b shows the long-term desired age-class distribution for balsam fir. It is expected that the 0 – 10-year age-class will always be smaller than desired for a balanced structure because other pioneer species tend to dominate a balsam site after treatment. Gradually, however, the balsam component tends to increase in relative volume becoming the dominant species once again.

Figure 4.12b



The ERF goal for this cover type is to maintain 14 percent of the acres above normal rotation age at all times (i.e., effective ERF), with a declining age-class distribution from normal rotation (45 years) to maximum age (60 years).

3. Stand Composition: The desired future within stand composition for the balsam fir cover type has been identified as mixed forests that include upland hardwoods and long-lived conifers appropriate to the site. It will also be managed as a component of other mixed species cover types. As part of the *Stand Silvicultural Prescription Worksheet*, field foresters will consider ECS and consult the appropriate Native Plant Community Fact Sheets in the *Field Guide to the Native Plant Communities of Minnesota: Laurentian Mixed Forest Province,* to determine most appropriate species composition as stand management decisions are made.

4. Patch Management: Patch management objectives include: creating more large patches; identifying both younger and older forest patches; and, in particular, increasing the patch size and age-class distribution of lowland conifers.

5. Limiting Factors: Balsam fir trees and stands in these subsections are rarely defoliated and killed by spruce budworms. However, management strategies that increase the balsam fir component or its age will lead to more frequent incursions and mortality by spruce budworms. Recommendations to address these limiting factors include:

a. Keep the rotation age of balsam fir as low as possible as older trees are more vulnerable to spruce budworm-caused mortality.
b. When regenerating stands with spruce and fir in them, favor the spruce.

Occasionally, stands may be harvested below normal rotation age (45 years) if necessary to reduce rot, wind throw, and spruce budworm losses. (Note: To date, spruce budworm has not been a significant problem in these subsections, but it will be monitored and dealt with when detected.)

4.12C Stand Management

1. Even-aged Management Direction: The balsam fir cover type will be managed primarily on an even-aged basis for pulpwood and small saw logs. This will be accomplished while moving toward a balanced age-class structure and maintaining or improving forest wildlife habitat and biodiversity. Balsam is important for wildlife benefits, both as a cover type and as individual trees in other cover types.

Balsam fir is shade tolerant but grows best in about 50 percent or more full sunlight. Intermediate treatments offer an excellent opportunity to control species composition and speed up development of dense balsam fir stands. Mixed stands with 50-80 percent balsam fir component are likely the best candidates for enhancing wildlife habitat and esthetics. Balsam fir responds well to release. The best results occur when this is done while stands are young, vigorous and approximately 6-10 feet tall.

2. Uneven-aged Management Direction: Uneven-aged management may be appropriate where aesthetics is a priority. (See *Manager's Handbook for Balsam Fir in the North Central States*.)

3. Final Harvest: It is recommended that balsam fir final harvest be accomplished by overstory removal. Advanced balsam fir regeneration islands should be protected as a seed source where the goal is to maintain the stand as a balsam fir cover type, or to maintain balsam fir as a stand component.

4. Final Harvest Prescriptions: The following are the most common prescriptions that will be used on balsam fir timber sales:

a. Clearcut with reserves followed by natural seeding on exposed mineral soil.
b. Uneven-aged harvest with removal of older individuals creating space for new regeneration.
c. Artificial regeneration is not recommended.
d. Natural regeneration relying on advance regeneration and natural seeding.

5. Regeneration Methods after Final Harvest: Natural regeneration to mixed species stands is recommended. Natural regeneration of mixed stands relies on recent seed fall or advanced balsam fir reproduction present at the time of harvesting, seeding from surrounding stands, and sprouting or suckering of other tree species. Intermediate treatments may be used to increase balsam fir as a stand component.

6. Intermediate Harvest Methods: Thinning may be used to promote balsam as a stand component, or to increase future tree growth, quality, and vigor. Pre-commercial thinning may be used on some densely-stocked young stands. Thinning may be implemented on a small fraction of the cover type to enhance composition, but will not typically be applied for increasing volume production. (See *Manager's Handbook for Balsam Fir in the North Central States*.)

Following are recommendations for thinning balsam fir stands:

a. Pre-commercial thinning may be needed to alter species composition favoring balsam fir on desired sites. (See *Manager's Handbook for Balsam Fir in the North Central States*.)
b. Commercial thinning is acceptable in merchantable stands between 25 and 35 years old with a basal area greater than 120 square feet on the more productive sites (SI $\geq$ 50).
c. Do not remove more than one-third of the stand BA during a thinning. Protect advanced regeneration of desirable understory species.
d. Higher stand densities (BA) are recommended along stand edges exposed to wind and along high visual quality corridors, such as major roads and lakes.
e. If the stand is used as thermal cover by wildlife, consider applying one of the following options:
    - Maintain a higher stand basal area (e.g., wider reserve strips with canopy closure).
    - Thin only a portion of the stand.
    - Don't thin.

4.12D Cover type Conversion Management

1. Conversion Goals: Over the next 10-years, the DFFC is to convert 3 percent (200 acres) of the balsam fir cover type to white spruce (150 acres) and to white cedar (50 acres). The 50- year DFFC, which includes the 10-year DFFC, is to convert 256 acres to white spruce and white cedar. Balsam stands treated by timber harvest should result in a mixed conifer-hardwood composition. A management objective will be to maintain 98 percent of the balsam cover type with balsam fir as a significant component of the stand throughout the rotation.

Conversion of balsam fir to white spruce should occur in native plant community (NPC) FDn43 and MHn 44. Conversion of balsam fir to white cedar should occur on, MHn46, FPn63, FDn43 and WFn53, WFn55 sites.

Cover type conversions will be accomplished using a range of management options, including:

a. Allowing natural succession to occur on sites where the within-stand composition contains a high percentage of the desired species, or there is adequate advanced regeneration of these species in the understory.
b. Planting white spruce or white cedar on suitable sites.
c. Applying treatments such as mechanical site preparation, prescribed burning, or herbicide application followed by hand planting or artificial seeding, where required to establish the desired species.

4.12E Stand Selection Criteria

1. Normal Rotation Forest: A normal rotation age of 45 years old will be used for calculating a regulated harvest level (see Table 4.12.c).

Table 4.12c Balsam Fir Normal Rotation Age and Maximum Age

Subsection	Acres	Normal Rotation Age	Maximum Age
CP	4,971	45	60
PMOP	2,778	45	60

The objective is to move the age-classes toward a more balanced structure. The priority during the next 10-years is to select the oldest and highest scoring stands for treatment. A *Stand Scoring System* was implemented which assigned scores to stands in the following priority: stands that were currently over maximum age; over maximum age within 10 years; currently beyond normal age; and, currently less than normal age. The *Stand Scoring System* considered both normal pool acres and ERF acres (see Appendix K).

2. Normal Rotation Harvest Treatment Level Calculations: The pool of stands considered for normal rotation (see glossary) harvest treatment is all stands:

a. not reserved from harvest (e.g. old growth, EILC);
b. not designated to be managed as extended rotation forest (ERF); and
c. near normal harvest rotation age.

Harvest treatment level is the sum of normal rotation acres to be harvested from each age-class that will move the age-class distribution towards a more balanced structure. Once a balanced age-class structure is achieved stands can be scheduled for treatment upon reaching normal rotation age.

Adjustments to the normal harvest level may be made to meet other goals such as balancing the age-class distribution and providing relatively stable harvest levels.

3. Extended Rotation Forest: The harvest level will be based on an ERF rotation age of 60 years. Selection of older stands for examination will be emphasized to help move this subset of ERF stands toward the desirable declining age-class structure. The long-term goal is to retain 14 percent of the cover type as effective ERF to the maximum harvest age of 60. (see Table 4.12d.)

Table 4.12d Balsam Fir ERF Acres (Plan Target Acres) and Maximum Age

Subsection	Prescribed ERF Acres	Effective ERF /DFFC Acres	Maximum Age
CP-PMOP	4,356	1,085	60

4. Extended Rotation Harvest Treatment Level Calculations: The pool of stands considered for extended rotation harvest treatment is all stands:

a. not reserved from harvest (e.g. old growth, EILC);
b. designated to be managed as extended rotation forest (ERF); and
c. will be over normal harvest rotation age.

Extended rotation harvest treatment level is the sum of ERF acres to be harvested from each age-class that will move the age-class distribution towards a more balanced structure, while attempting to retain the a minimum level of effective ERF (see Appendix W *Glossary)*. A declining acreage of stands in each 10-year age-class is desired between normal rotation age and maximum rotation age. Emphasis is on treating the oldest age-classes first to minimize loss of fiber to tree mortality.

5. Thinned Stands: Normally, thinning will only be used to enhance composition goals as an occasional treatment, or with uneven-aged management.

4.12F Stand Treatment Summary

Table 4.12e shows the total treatment acres recommended conversion acreage out of the balsam fir cover type, effective ERF percent, and the average treatment ages for the next six decades. Based on the cover type management identified in this Plan, the average treatment age for balsam fir cover type decreases over time with a slight increase in the last decade. Old Forest Percent means acres that are over normal rotation age, except stands designated as Old Growth. There is variation from decade to decade due to the current age-class distribution for this cover type. This table does not include acreage treated through intermediate treatments or thinning.

Table 4.12e Balsam Fir Treatment Summary by Decade for the CP-PMOP

					Avg Treatment Age		Avg
Decades	**Total Treatment**	**Conversion**	**Old Forest %**	**Effective ERF**	**Normal**	**ERF**	**Age**
1	2,622	201	63.8%	34.6%	78	85	55
2	2,193	56	44.9%	27.8%	71	72	38
3	1,354	0	28.8%	21.3%	60	73	27
4	770	0	17.0%	14.7%	57	70	25
5	961	0	9.1%	7.4%	44	72	28
6	1,386	0	16.8%	11.4%	50	58	31
Total	9,286	257					
DFFC	**1,427**[1]	**-256**[2]		**14.0%**	**45.0**[3]	**57.5**[3]	**27**[3]

[1] Total treated acres once a fully regulated forest is achieved.
[2] positive numbers are net acres into the cover type; negative numbers are net acres out of the cover type.
[3] anticipated age once a fully regulated forest is achieved.

Figure 4.12c below illustrates the age-class structure of the balsam fir cover type in 2017 at the end of the 10-year plan implementation period.

Figure 4.12c

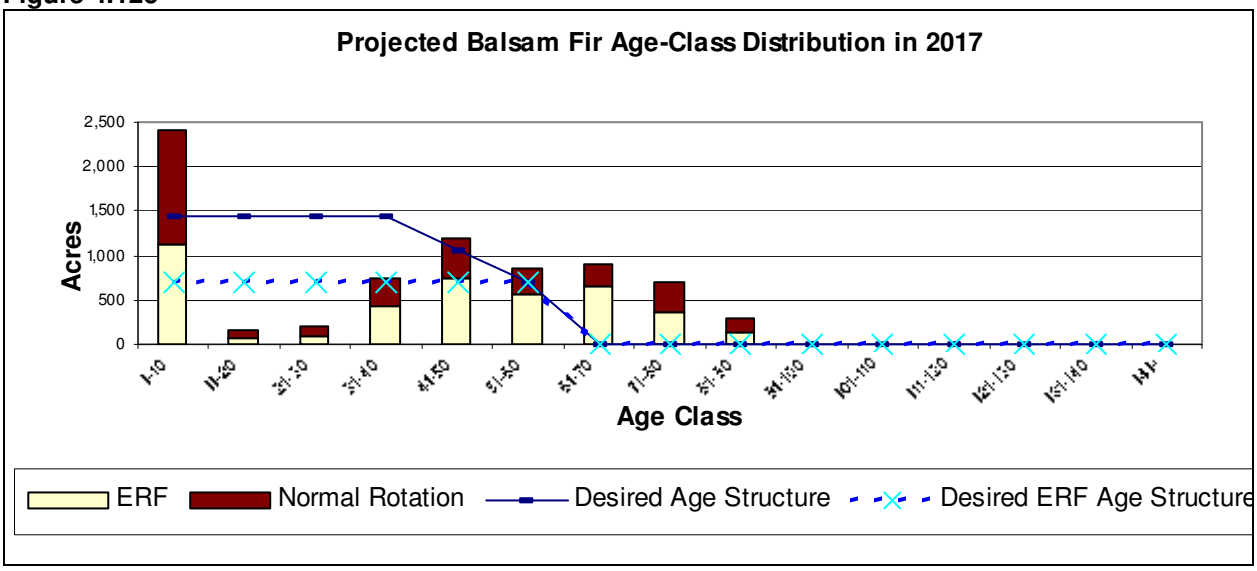
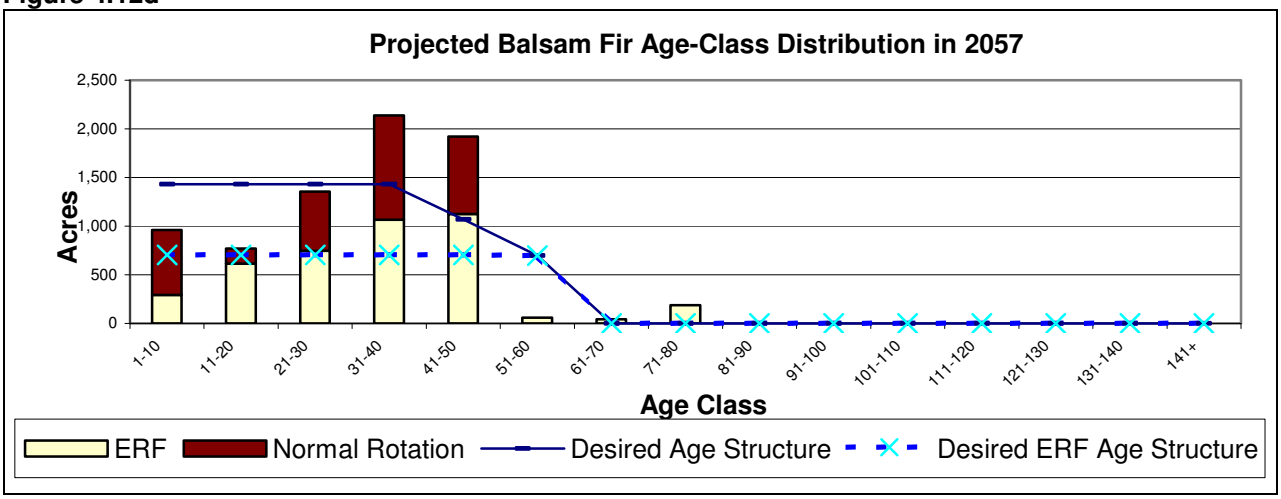


Figure 4.12d shows the projected age-class distribution of the even-aged portion of the balsam fir cover type in 2057 based on modeling of the treatment and conversion levels by decade.

Figure 4.12d



As each new 10-year plan is developed, the treatment levels by decade and modeling will be re-evaluated.

4.13 Tamarack (T) – on lowland sites

4.13A Current Condition

1. Cover Type Acres: In 2007, the tamarack cover type comprises 10.3 percent (44,269 acres) of the state timberlands (429,229 acres) managed in the CP-PMOP subsections. Approximately 88 percent (38,764 acres) of the tamarack cover type occurs in the CP and 12 percent (5,506 acres) occurs within the PMOP (see Table 4.13a). A total of 2,760 acres of the stagnant tamarack cover type has been designated EILC and reserved from treatment for this plan implementation period.

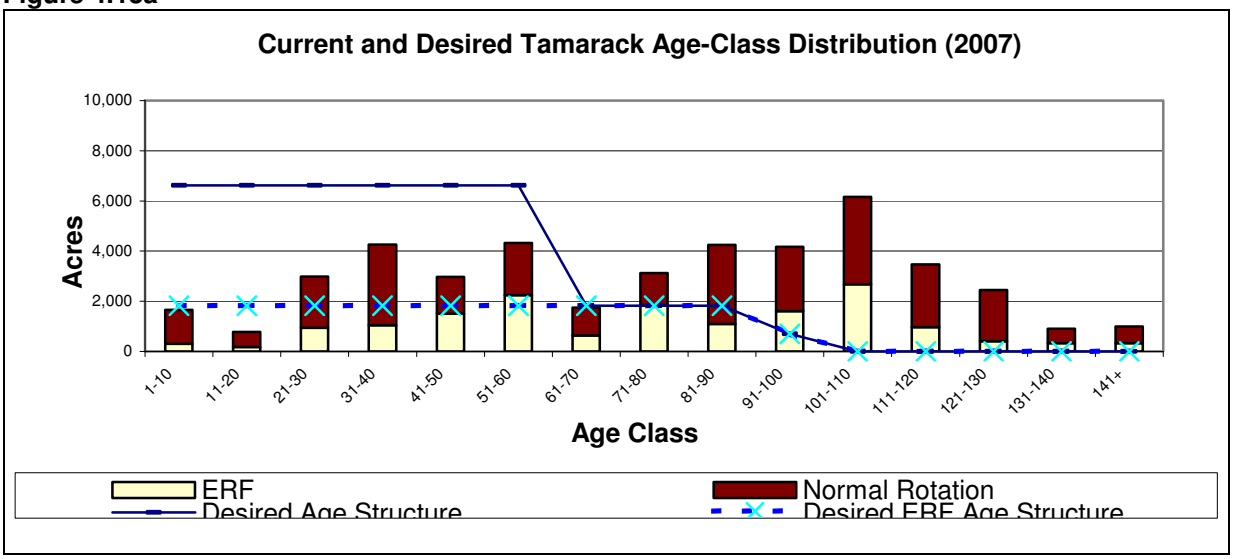
Table 4.13a Tamarack Cover Type Acres by Subsection

	CP	PMOP	Total
Acres	38,764	5,506	44,269
Percent	88	12	100%

Tamarack is often dominant in the following native plant community (NPC) types: WFn64 (N. Very Wet Ash Swamp), FPn82 (N. Rich Tamarack Swamp), and APn81 (N. Poor Conifer Swamp), FPn72 and FPs 63 NPC classes.

2. Age-Class Distribution: The current age-class distribution of the tamarack cover type does not reflect the desired balanced age-class structure for even-aged managed cover types. This age-class imbalance is consistent across both subsections (see Figure 4.13a).

Figure 4.13a



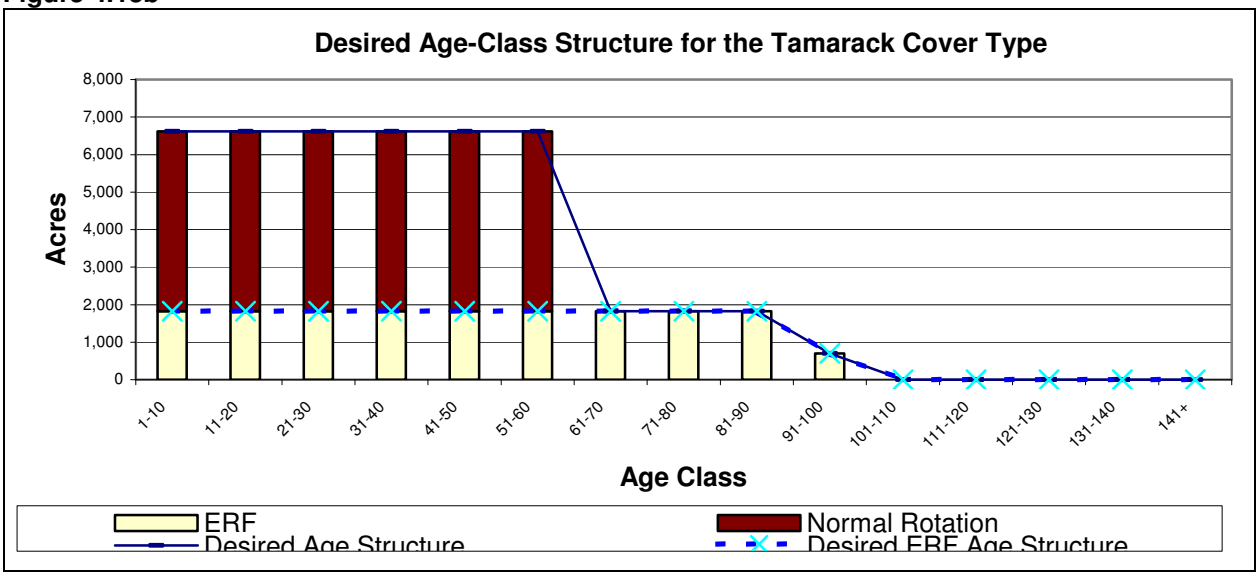
3. Species composition of mature stands: Mature stands of tamarack are often dominated by the single species, but there may be inclusions of other types such as balsam fir, black spruce, cedar or lowland hardwood.

4.13B Future Direction

1. Cover Type Acres: For the CP-PMOP subsections the 10-year DFFC is to increase this cover type approximately 2 percent or 800 acres. The 50-year goal is that the tamarack cover type acreage will increase about 5 percent or 2,400 acres. A goal is to increase tamarack within other cover types (e.g., aspen and birch) on upland sites.

2. Age-Class Distribution: A goal is to move the tamarack cover type age-classes toward a more balanced structure out to normal rotation age (60 years in the CP and 70 years in the PMOP) with a declining age-class distribution out to the maximum rotation age (105 years for both subsections). The older age-classes will be managed with enough older stands (ERF) deferred from treatment to provide an adequate declining age-class distribution out to the maximum age. The ERF goal for this cover type is to have 14 percent of the acres over normal rotation age (effective ERF) at any one time. Figure 4.13b shows the desired age-class structure for the tamarack cover type.

Figure 4.13b



3. Stand Composition: The desired composition of the tamarack cover type will range from pure tamarack to mixed stands, depending on the plant community appropriate to the site. As part of the *Stand Silvicultural Prescription Worksheet*, field foresters will consider ECS and consult the appropriate Native Plant Community Fact Sheets in the *Field Guide to the Native Plant Communities of Minnesota: Laurentian Mixed Forest Province,* to determine most appropriate species composition as stand management decisions are made.

4. Patch Management Objectives: Patch management objectives are to maintain existing large patches and increase the size of patches where possible as identified in the CP-PMOP subsection plan.

5. Limiting Factors: Since 2000, a statewide insect outbreak of eastern larch beetle has caused widespread mortality, ranging from 10-90 percent in individual stands. Consider pre-salvage or salvage harvest when stands are currently infested or are dying due to the infestation. Consider retaining a minimum of 5 to10 live tamarack per acre to serve as seed trees.

4.13C Stand Management

1. Even-Aged Management Direction: The tamarack cover type will be managed primarily by even-aged management methods for pulpwood, while providing forest wildlife habitat and maintaining biodiversity.

2. Harvest Method: Even-aged management using seed tree with reserves is the preferred method of harvest treatment for tamarack stands. Leaving about 10 tamarack per acre is recommended for successful seeding.

Where possible, maintain secondary component species of tamarack stands such as white cedar, paper birch, black spruce, and balsam fir. This can be accomplished by reserving seed trees, reserve islands, or clumps of mature trees or advanced regeneration.

Where possible, large treatment sites (100+ acres) are recommended using natural stand boundaries.

3. Harvest Prescriptions: Seed tree with reserves is the most common prescription that will be used on tamarack timber sales.

4. Regeneration Methods: Natural seeding from seed trees or artificial seeding are the methods used to regenerate tamarack stands. Where within-stand diversity is desired, artificial seeding may be an option for maintaining secondary species such as black spruce and cedar.

4.13D Cover Type Conversion Management

1. Conversion Goals: Over the next 10-years, the DFFC is to increase by 2 percent (800 acres) the tamarack cover type. The 50-year DFFC is to increase by 5 percent (2,400 acres) this cover type. These additional cover type acres will mostly be the result of reinventory, with older trees regenerating to becoming more dominant in what had previously been classed as lowland brush, or as ash/lowland hardwoods. To document these changes, a pro-active effort will be made to examine non-timber sites that may have tamarack regenerating on them.

Conversion of other cover types to a stand dominated by tamarack will be accomplished in WFn64, FPn72, FPn82, FPs63, and APn81 NPC classes. Priority LTAs for tamarack cover type increases include: Bemidji Sand Plain, Rosey Lake Plain, Blackduck Till Plain, and Blackduck Moraine. These LTAs currently contain 500+ acres of tamarack cover type on state lands and have shown a severe decline since the original land survey.

4.13E Stand Selection Criteria

1. Normal Rotation Forest: The normal rotation age recommended in the CP is 60 years, and 70 years in the PMOP (see Table 4.13b). The objective is to move the age-classes toward a more balanced age-class structure. The priority during this 10-year plan implementation period is to select the oldest and highest scoring stands for treatment. A *Stand Scoring System* was implemented which assigned scores to stands in the following priority: stands that were currently over maximum age; over maximum age within 10 years; currently beyond normal age; and, currently less than normal age. The *Stand Scoring System* considered both normal pool acres and ERF acres (see Appendix K). Not all stands above the normal harvest age will be treated because of the significant acreage of stands over normal rotation age.

Table 4.13b Tamarack Normal Rotation Age and Maximum Age

Subsection	Normal Rotation Age	Maximum Age
CP	60	105
PMOP	70	105

2. Normal Rotation Harvest Treatment Level Calculations: The pool of stands considered for normal rotation (see Glossary) harvest treatment is all stands:

a. not reserved from harvest (e.g. old growth, EILC);
b. not designated to be managed as extended rotation forest (ERF); and
c. near normal harvest rotation age.

Harvest treatment level is the sum of normal rotation acres to be harvested from each age-class that will move the age-class distribution towards a more balanced structure. Once a balanced age-class structure is achieved stands can be scheduled for treatment upon reaching normal rotation age.

Adjustments to the normal harvest level were made to meet other goals, such as balancing the age-class distribution and providing relatively stable harvest levels.

3. Extended Rotation Forest: The long-term DFFC goal is to retain 13 percent of the tamarack cover type over normal rotation age (60 years CP and 70 years in the PMOP) as effective ERF and provide a declining age-class structure out to maximum harvest age of 105 years in both subsections. The selection of older-aged stands for treatment will be emphasized to help move this subset of ERF stands toward the desirable declining age-class structure (see Table 4.13c).

Table 4.13c Tamarack ERF Acres (Plan Target Acres) and Maximum Age

Subsection	Prescribed ERF Acres	Effective ERF /DFFC Acres	Maximum Age
CP-PMOP	16,487	6,198	105

4. Extended Rotation Harvest Treatment Level Calculations: The pool of stands considered for extended rotation harvest treatment is all stands:

a. not reserved from harvest (e.g. old growth, EILC);
b. designated to be managed as extended rotation forest (ERF); and
c. will be over normal harvest rotation age.

Extended rotation harvest treatment level is the sum of ERF acres to be harvested from each age-class that will move the age-class distribution towards a more balanced structure, while attempting to retain the a minimum level of effective ERF (see *Glossary)*. A declining acreage of stands in each 10-year age-class is desired between normal rotation age and maximum rotation age. Emphasis is on treating the oldest age-classes first to minimize loss of fiber to tree mortality.

4.13F Stand Treatment Summary

Table 4.13d shows the total treatment acres, conversion acres out of the cover type, old forest percent, effective ERF percent, and the average treatment ages for the next six decades by site index group. Based on the cover type management identified in this Plan, the average treatment age for tamarack cover type decreases over time with a slight increase in the last decade. Old Forest Percent means acres that are over normal rotation age, except stands designated as Old Growth. There is variation from decade to decade because of the current age-class distribution of the cover type and how these age-classes are utilized over the 50-year period.

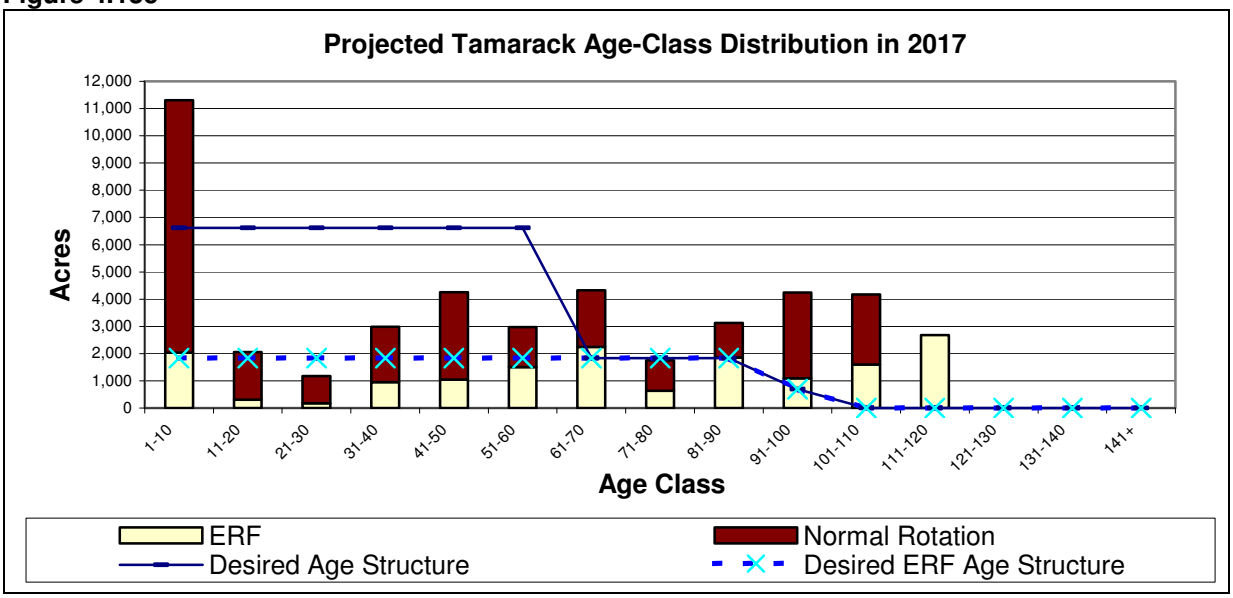
Table 4.13d Tamarack Treatment Summary by Decade

Decades	Total Treatment	Conversion	Old Forest %	Effective ERF	Avg Treatment Age Normal	Avg Treatment Age ERF	Avg Age
1	11,312	0	61.2%	22.2%	122	130	75
2	8,856	0	43.9%	21.8%	106	115	53
3	4,348	0	30.9%	13.6%	106	104	41
4	4,861	0	30.1%	13.8%	93	106	41
5	3,715	0	26.2%	12.2%	90	100	41
6	6,001	0	20.9%	7.8%	63	100	43
Total	39,093	0					
DFFC	**6,615**[1]	**2,399**[2]		**13.0%**	**61.2**[3]	**95.0**[3]	**36**[3]

[1] Total Treated Acres once a fully regulated forest is achieved.
[2] positive numbers are net acres into the cover type; negative numbers are net acres out of the cover type.
[3] anticipated age once a fully regulated forest is achieved.

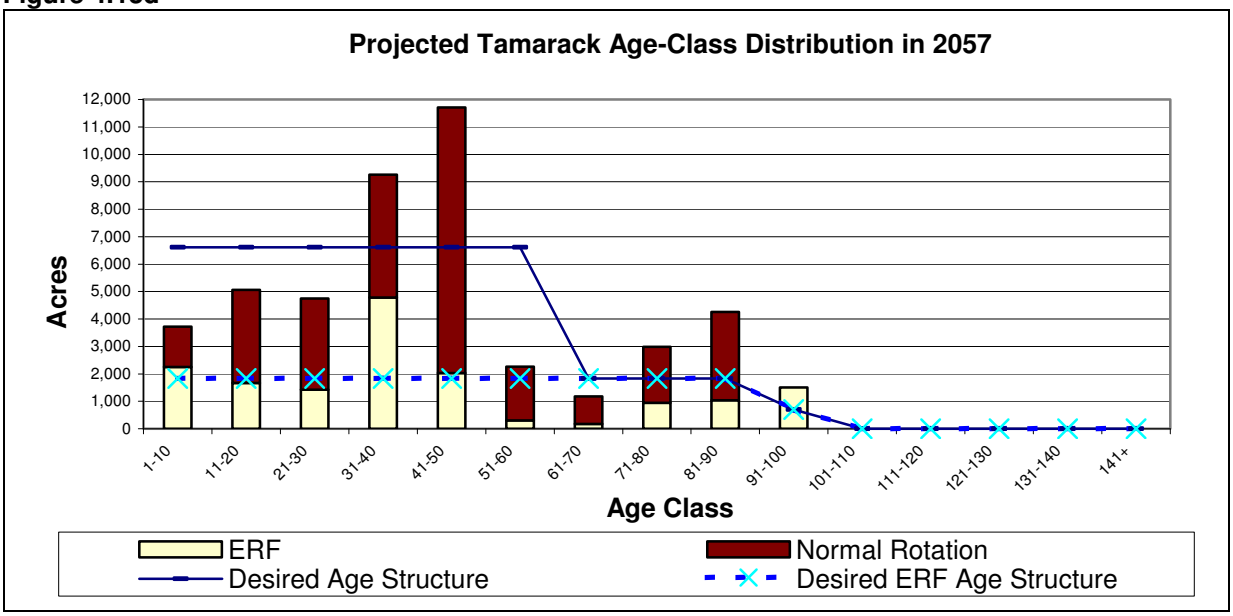
Based on the modeling of the treatment levels by decade, Figure 4.13c shows the age-class structure of the tamarack cover type in 2017, the end of this plan implementation period.

Figure 4.13c



Based on the modeling of the treatment levels by decade, Figure 4.13d shows the projected age-class distribution of the tamarack cover type in 2057.

Figure 4.13d



4.14 White Cedar (C)

4.14A Current Condition

1. Cover Type Characteristics: In 2007, the white cedar cover type comprises 2.9 percent (12,579 acres) of the state timberland acres (429,229 acres) found in the two subsections. White cedar totals 10,894 acres in the Chippewa Plains, and 1,685 acres of cedar in the Pine Moraine-Outwash Plains (see Table 4.14a). A total of 327 acres of the white cedar cover type and seven acres of stagnant cedar are reserved from harvest in these two subsections. In addition, a total of 2,023 acres of the white cedar and 1,397 acres of the stagnant cedar cover type has been designated as EILC and reserved from harvest during this plan implementation period.

Table 4.14a Cedar Cover Type Acres by Subsection

	CP	PMOP	Total
Acres	10,894	1,685	12,579
Percent	87	13	100

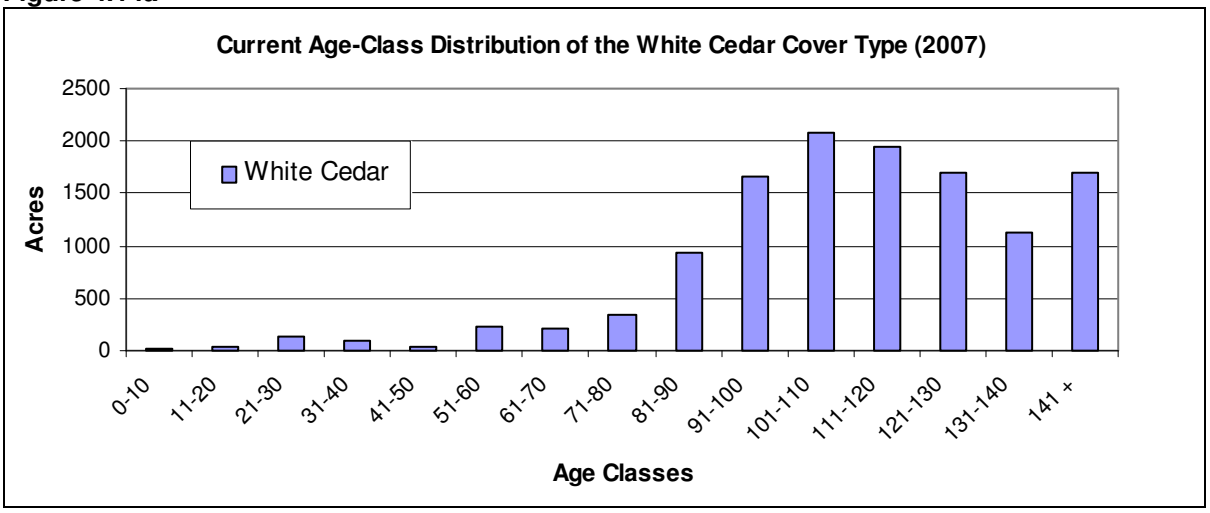
White cedar is an excellent competitor on lowland Native Plant Communities (NPCs) including: FPn63; FPn82; WFn53 and WFn55.

The DNR's forest inventory system does not separate cedar into upland and lowland cedar cover types. In the two sub-sections, 93 percent of cedar occurs on wet sites with a physiographic class of four or five.

2. Age-class Distribution: In both of the subsections, the current age-class distribution of the white cedar cover type, on both lowland and upland sites, does not reflect the desired balanced age-class structure. Cedar stands aged 100 years or older comprise 71 percent (8,972 acres) of the total cedar cover type acres. Only 4 percent (553 acres) of this cover type are less than 60 years old. This is a result of the very limited harvest that has occurred in this cover type over the past 30 years.

Figure 4.14a shows the current age-class distribution of white cedar cover type of the combined subsections for 2007.

Figure 4.14a



3. Stand Composition: On MHn46 sites, white cedar will be found with quaking aspen, black ash, and basswood. On lowland sites, white cedar occurs with black ash, balsam fir, or black spruce. White cedar grows on clay loams on upland sites and a variety of peat soils and mucks on lowland sites.
As part of the *Stand Silvicultural Prescription Worksheet*, field foresters will consider ECS and consult the appropriate Native Plant Community Fact Sheets in the *Field Guide to the Native Plant Communities of*

Minnesota: Laurentian Mixed Forest Province, to determine most appropriate species composition as stand management decisions are made.

4.14B Future Direction

1. **Cover Type Acres:** In the CP-PMOP subsections, the 10-year DFFC for white cedar cover type is to increase this cover type by 2 percent or 300 acres primarily from ash /lowland hardwoods, balsam fir, and aspen (from CP only). The 50-year DFFC is to increase the cedar cover type by 5 percent or 661 acres primarily from ash/lowland hardwoods and balsam fir (see Table 4.14b).

Typical cover type management strategies for white cedar include:

a. Maintain or increase the acreage of cedar stands that are traditionally used as thermal cover areas by deer.
b. Maintain or increase cedar as a component of other forest cover types.

Table 4.14b Recommended White Cedar Cover Type Acres in the Subsections by Year

	2007	2017	2057
CP	10,894	11,112	11,439
PMOP	1,685	1,179	1,769
Total acres	**12,579**	**12,291**	**13,208**

Additional cover type acres may result from reinventory of sites where developing regeneration has become more dominant on what had previously been classed as lowland brush (LB) or as black spruce lowland (BSL). To document these natural changes, a proactive effort will be made to examine nontimber sites that may have white cedar regeneration on them.

2. Age-Class Distribution: It is recommended that the age-class imbalance of the white cedar cover type be addressed by increasing the number of acres in the 0-50 year age-classes (even-aged), and increasing young cedar as a component within cedar stands (uneven-aged). Addressing this age-class imbalance must consider how to regenerate white cedar reliably in the presence of a high deer population. Achieving the desired even-age-class distribution may not be possible based on the limited harvest and difficulty in regenerating cedar.

3. Patch Management: Patch management objectives include: creating more large patches; identifying both younger and older forest patches; and in particular, increasing the patch size and age-class distribution of lowland conifers.

4.14C Stand Management

1. Management Direction: The white cedar cover type in the CP-PMOP subsections will be allowed to succeed naturally. No planned harvests are recommended in the subsections during this 10-year plan implementation period, with the exception of research plots where cedar regeneration is being targeted. All white cedar stands are designated ERF by department policy. White cedar provides significant value as wintering cover for deer, however regeneration is challenged due to browsing

Further, desired sites for conversion to the white cedar cover type are upland sites that support a plant community where aspen or balm-of-Gilead predominates with slight amounts of basswood and black ash. Otherwise, in these subsections the lowland plant communities that are likely to be associated with the white cedar cover type are the WFn53, WFn55, and FPn63.

2. Intermediate Harvest Methods: Some harvest of associated secondary species in cedar stands may be attempted in an effort to encourage natural regeneration of white cedar following a disturbance.

3. Final Harvest Methods: Final harvest in the white cedar is not planned until knowledge regarding its successful regeneration can be obtained.

4. Even-Aged Management Prescriptions: No even-aged management prescriptions for this cover type are recommended.

5. Regeneration Methods: The following recommendations should be considered when regenerating white cedar:

a. Plant using stock from local seed source.
b. Site preparation and herbicide use should consider maintaining within-stand diversity.
c. Protection from browsing is critical to a successful project.
d. Provide for six cavity trees, potential cavity trees, or snags per acre.[4]

4.14 D. Cover Type Conversion Management

Conversion of other cover types to a stand dominated by white cedar will be accomplished in MHn46 (primarily along the southern edge of the Agassiz basin, where white cedar may reach 90 feet in height and 30 inches in diameter,[1, 2)] WFn53, WFn55, FDn43 and FPn63 NPC classes. Priority LTAs for white cedar cover type increase include: Guthrie Till Plain, Rosey Lake Plain, Blackduck Till Plain, and Itasca Moraine. These LTAs currently contain 250+ acres of northern white cedar cover type on state lands and have shown some decline (BT to FIA). White cedar may be established after an initial shelterwood harvest of aspen and/or balm-of-Gilead.

4.14E Stand Selection Criteria

1. Stand Selection Criteria Pool: There is no pool for this cover type**.** The white cedar cover type in the CP-PMOP subsections will be allowed to succeed naturally. No planned harvests are recommended in the subsections during this 10-year plan implementation period. Other cover types will be selected for conversion to white cedar including aspen, ash/lowland hardwoods, and balsam fir. See these other cover type recommendations for stand selection criteria for conversion to white cedar.

2. Stand Treatment Criteria: There are no specific stand treatment strategies identified.

3. Extended Rotation Forest: All white cedar stands are designated ERF by department policy.

4. Harvest Calculation: No planned harvest is recommended during this plan implementation period.

[1]J.C. Ryan. 2006. *Minnesota Cedar.* Timber Bulletin. Sept/Oct 2006.
[2]John Almendinger. 2006 personal correspondence. Nov. 8, 2006.

[3] Minn. DNR. 2003. *Field Guide to the Native Plant Communities of Minnesota: The Laurentian Mixed Forest Province*. Ecological Land Classification Program, Minnesota County Biological Survey, Natural Heritage and Nongame Research Program. Minnesota Department of Natural Resources St. Paul, MN.
[4] Minnesota Forest Resources Council. 2005. *Sustaining Minnesota Forest Resources: Voluntary Site-Level Forest Management Guidelines for Landowners, Loggers, and Resource Managers.* www.frc.state.mn.us. Minnesota Forest Resources Council, 2003 Upper Buford Circle, St. Paul, MN 55108-6146.

4.15 Stagnant Spruce (Sx)

4.15A Current Condition

1. Cover Type Characteristics: In 2007, the stagnant spruce cover type comprises 4.0 percent (15,675 acres) of the state-administered timberlands (429,229 acres) managed in these two subsections. There are 9,551 acres of the stagnant spruce cover type identified as EILC and reserved from harvest during this plan implementation period. The stagnant spruce (Sx) cover type is lowland black spruce with a site index of less than 23. This means that trees on these sites are likely to be 22 feet or less in height, when trees are 50 years old. Because of their small size, black spruce, in the Sx cover type, are not typically harvested for traditional timber products.

Table 4.15a Stagnant Spruce Cover Type Acres by Subsection

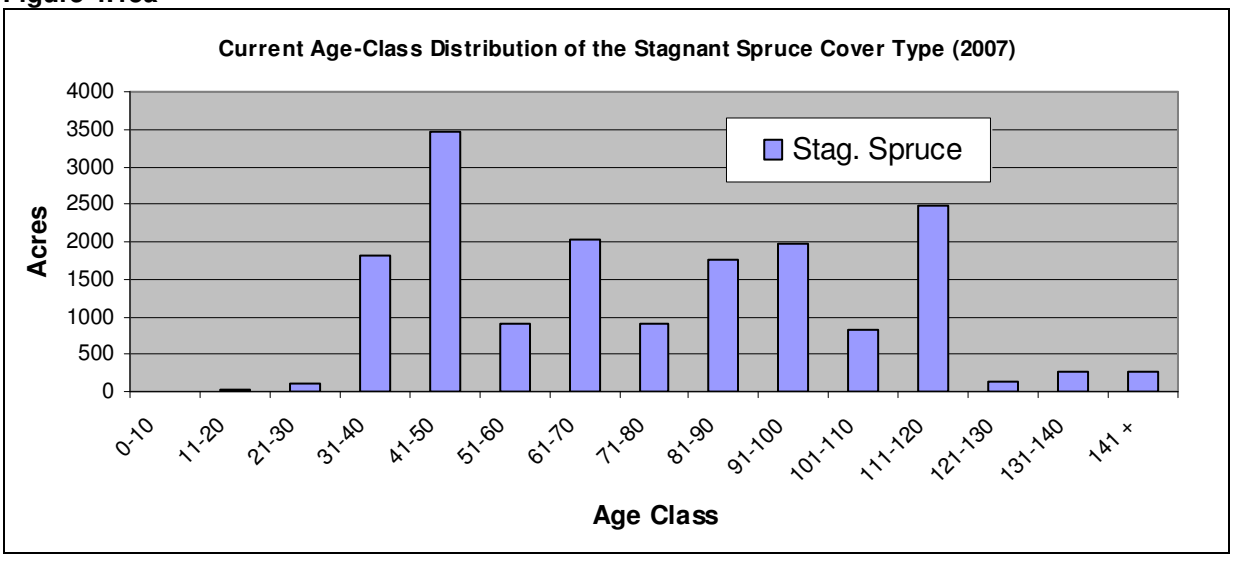
	CP	PMOP	Total
Acres	15,675	305	15,980
Percent	98	2	100

This cover type is composed of predominantly lowland black spruce, or a mix of black spruce and other lowland conifers (e.g., tamarack or white cedar), growing on very poor sites. These sites are composed of organic soils that are saturated year-round and have low nutrient levels. Plants that are commonly associated with Sx are Labrador tea, leather-leaf, alder, and bog birch with either sphagnum or feather mosses as a ground cover.

Sx is the predominant cover type where decorative spruce tops are harvested. Tree tops that are cut range from l½ feet to 6 feet in length. They are cut from selected trees and, over time, lateral branches grow a new top. The level of harvest within the stand varies with the quality of the trees, the size of the trees present, and the product specification used by the industry. For most stands, the selective harvest ranges from 5 -10 percent to as high as 20 percent of the trees. Harvesting in some higher quality stands has occurred periodically on a 10-15 year cycle.

2. Age-Class Distribution: Figure 4.15a shows the current age-class distribution of the stagnant spruce cover type.

Figure 4.15a



4.15B Future Direction

1. Cover type Acres and Age-Class Distribution: The Sx cover type acres should remain relatively constant. Since no, or very little clearcut harvest will occur in this cover type, the average age should increase over time.

4.15C Stand Management

1. Management Direction: The primary goal is to protect the hydrological and ecological integrity of Sx sites.

2. Management Prescriptions: The primary management prescription for this cover type is *decorative tree harvest* where tree tops are harvested for Christmas trees or winter greenery. Harvest operations will be directed to sites with a stocking of at least 1250 stems/acre and adequate numbers of trees from 3 to 20 feet tall. Trees over 20 feet are generally too tall for harvesting decorative tops.

Stagnant spruce stands found to be of merchantable size for pulpwood may be harvested using clear-cut methods. Occasionally, stagnant spruce stands that are infected with dwarf mistletoe disease and located adjacent to more productive black spruce are clear-cut harvested or sheared off and/or prescribed burned for disease control.

3. Harvesting Guidelines: The following recommendations will be used to guide decorative tree harvesting in this cover type:

a. Identify stands that are suitable for potential harvest of decorative tops.
b. Establish a sustainable harvest level (acres) for decorative tops.
c. Determine the percentage of stems that may be harvested.
d. Determine a re-entry period for repeat harvest.
e. Follow statewide guidelines and regulations for decorative tree site selection, harvest, operations, and sale supervision.
f. Promote alternative methods for transporting tops from the site, that reduce or eliminate impacts (e.g., helicopter slings).
g. Harvest on frozen ground whenever possible.
h. Leave at least 50 percent of the foliage on the tree. This will allow the tree to survive, continue to grow, and produce new top(s) from lateral branches.

Ideally, all harvest in stagnant spruce sites should be done in frozen conditions. Caution must be used to prevent site damage, however, since most harvest operations take place during the fall prior to freeze-up. Producers need to be limited to the use of small tracked vehicles or machines with high flotation tires to move the cut products to the landing area or pick-up location.

4. Regeneration Methods: Regeneration will occur through lateral branch growth after tops are harvested or through natural seeding from mature trees.

4.15D Stand Selection Criteria

1. Stand Selection Pool: The following criteria should be observed when selecting a pool of stands for possible tree top harvest:

a. Stands should have at least a density of 1250 trees per acre and a diameter less than 5 inches (DBH).
b. Include only stands that have not been harvested for 15 years.
c. Do not select stands that have been designated as ecologically important lowland conifers (EILC) stands.
d. Do not select stands in watershed protection areas of peatland SNAs.
e. Avoid stands with rare features or significant cultural resources.

The pool of stands created using the above criteria will be examined by photo interpretation or site visit. The pool will be further reduced by the following criteria:

a. Avoid stands where the only access route is across lags, and flowage areas that can't be crossed easily. These areas are excessively wet and often lack adequate root structure to support motorized traffic.
b. Avoid stands with poor access during the late fall period when decorative tree harvest typically occurs.

Allowable harvest levels will be developed annually based on DNR evaluations of local market demands.

The CP-PMOP SFRMP, maps, and Appendices can be viewed online at:
http://www.dnr.state.mn.us/forestry/subsection/cp_pmop/plan.html

Chapter 5. Monitoring

As this subsection plan is implemented, monitoring of forest management activities is critical to achieve the goals of the CP-PMOP Plan. Many DNR forest management activities are currently tracked, such as cover type acres treated; treatment methods and acres; timber volumes sold and harvested; and regeneration methods, species, and success. However, some management activities and objectives are not readily tracked, such as stand composition changes. Monitoring of forest activities includes both site-level monitoring (*MFRC Voluntary Site Level Forest Management Guidelines*) and landscape-level monitoring (forest management consistent with the goals of the CP-PMOP Plan). Discussed below are the annual reviews and tracking of stand treatments and the landscape-level monitoring that will be used to monitor the implementation of CP-PMOP Plan.

5.1 Annual Stand Examination Plan Review among Divisions of DNR

Each year as Annual Stand Exam Plans are developed from the subsection plan, the Divisions of Fish and Wildlife and Ecological Resources will provide input to forestry staff regarding selection of stands and stand treatments. The Annual Stand Exam Plans developed by each Forestry Area are based on the state's fiscal year, July 1 – June 30. These annual harvest plans are typically prepared and cruised during the fall and winter months leading up to the start of the fiscal year. During development of the CP-PMOP Stand Exam List and also during each Forestry Area's identification of their Annual Stand Exam Lists other divisions are provided an opportunity to identify stands where they would like to participate in a joint field visit/stand evaluation. These joint visits allow all divisions to affect the stand prescriptions applied and stand management objectives. These review opportunities are also provided for annual plan additions (i.e., stands added during the year due to windthrow salvage, new information about a stand, etc.). A public review process is included for both the annual plans and additions.

5.2 Stand Treatments and Site level Monitoring

Approximately one-tenth of the stands selected for treatment, as identified in the CP-PMOP, will be field visited each year during the 10-year plan period. Final stand treatment prescriptions will be determined after the field visit/stand examinations are completed. Prescriptions and objectives assigned to stands during the SFRMP planning process are preliminary and may be adjusted based on current stand conditions and other information and input at the time of the stand examination.

Following timber sales or after forest development projects are contracted, forestry staff administers timber harvest permits, forest development projects (e.g., site preparation and tree planting), and road projects as the work is completed. Forestry staff regularly monitors these activities to ensure that permit regulations and contract specifications are being met. In addition, standardized timber sales inspections are completed on at least 10 percent of active timber sales each year. The application of site-level forest management guidelines (e.g., riparian management zone guidelines) is monitored during permit and contract supervision and inspections.

In addition to Division of Forestry monitoring, the MFRC site-level monitoring program will also periodically sample sites in these subsections as part of its overall statewide monitoring program. The objective of this statewide monitoring program is to evaluate the implementation of the MFRC's *Voluntary Site-Level Forest Management Guidelines* through field visits to randomly selected, recently harvested sites across the various forest land ownerships (state, county, national forest, tribal, forest industry, non-industrial private lands, etc.). The monitoring results from sites on state lands in these subsections will be used to determine implementation of the MFRC's site-level guidelines.

5.3 Landscape level monitoring

To monitor landscape-level forest management by DNR against the goals of the CP-PMOP Plan, two types of monitoring questions will be addressed:

1. Implementation Monitoring, which determines whether the management actions are being implemented as written in the CP-PMOP Plan, meaning:

Are management actions being carried out in a manner that is consistent with the plan?
and,

2. Effectiveness Monitoring, which determines the appropriateness or effectiveness of specific management actions designed and implemented to accomplish specific objectives identified in the CP-PMOP Plan, meaning:

   Are management actions having the desired on-the-ground effect?

It is often not possible to see the results of prescriptions and objectives assigned to stands, for many years. Many of the treatments assigned to stands in this plan may not be accomplished until after the 10-year plan is over. Some reasons are: 1) a portion of the stands identified for treatment won't be field - examined (and for many, offered for sale) until late in the 10-year plan implementation period, 2) the harvest of timber sales occurs up to five years after the sale date, 3) forest development activities may be needed to regenerate the site to the desired species after the timber sale harvest is completed, 4) desired structural changes in stands may take many years or decades to occur, and 5) forest inventory data may not capture the forest stand composition components or changes for many years or capture it at all. Because of this, preliminary stand-management objectives (see Appendix I *Standard Codes in SFRMP*) have been developed to record the intent or objectives of stand treatments. Preliminary objectives may be assigned to some stands during the SFRMP process to provide preliminary guidance for the appraiser to consider during the on-site stand evaluation. Final objectives will be assigned after the stand examination/appraisal for a timber sale or other treatment is completed. The assignment of objectives to stands allows recording of the various stand treatments on an annual basis to assist in monitoring the implementation of the CP-PMOP Plan. This will help determine if strategies are being applied and if management objectives and goals are being met.

A significant portion of the data needed to monitor plan implementation and effectiveness will be collected from existing databases. Other data, especially those relating to effectiveness of management actions, are more difficult to obtain.

The following data sources and existing forestry management tools will be used to implement CP-PMOP monitoring:

1. Forest Inventory Module (FIM)
   The primary source of information about the current condition of DNR forest lands is the Forest Inventory Module (FIM). FIM is a stand-level forest inventory. A stand is a contiguous group of trees similar in age, species composition, and structure; and growing on a site of similar quality, to be declared a distinguishable forest unit. A forest is comprised of many stands. FIM captures essential information about every forest stand on more than four million acres of DNR forest land. It is the basic data set from which decisions are made about if, when, where, and in what manner DNR forest stands will be treated. Information gathered includes overstory and understory tree species, stand age, timber volumes, site productivity, shrub and ground species, insects and diseases, and other specific site conditions. Native plant community (NPC) classification will be captured on stands for which evaluations have been completed.

2. Silvicultural and Roads Module (SRM)
   The Silviculture and Roads Module (SRM) enables foresters to plan and record management objectives and actions on state lands. An SRM site is the piece of land for which the manager has developed a prescription (i.e., a series of actions). The site may be a FIM stand, part of a stand, or more than one stand. SRM allows for multi-year prescriptions for sites to manage the site for a specified objective. The site prescription consists of all the actions prescribed for a site to obtain a desired future condition. Actions include all the timber harvesting, site prep, planting, and seeding, TSI, and regeneration survey work needed to manage a stand for a specified objective. This long-range schedule and record of completed work helps track management activities, obligations, and management objectives. It is the foundation for budget requests and work plans.

3. Timber Sales Module (TSM)

The Timber Sales Module (TSM) includes the following functions: timber sales reporting, supports the appraisal and sale of timber harvest permits, tracking security provided by permit holders, accounting for harvested timber, and collecting revenue.

4. CP-PMOP Stand Exam List Shapefile
   The SFRMP shapefile includes FIM stand data for all state-administered forest lands in the subsection plans. Subsection boundaries may have been slightly adjusted to avoid splitting of stands for consideration of access, etc. Therefore, the SFRMP subsection shapefile boundaries may be somewhat different than the original ECS subsection shapefile.

   In addition to the standard FIM data fields, the SFRMP shapefile includes fields added during the planning process to identify stands for specific purposes (e.g., ERF, EILC, patches, preliminary objectives, new access data, and stand-selection fields). This will make it possible to create a statewide shapefile and provide a uniform set of fields for importing into SRM, posting on the DRS, reporting, and monitoring purposes

5. Annual Harvest List and Annual Plan Additions Shapefiles
   Annual Harvest Lists and Plan Additions are drawn from SFRMP shapefiles and include additional information (including prescription, treatment acres, etc.). Adjustments can be made to add or remove stands, revise comment fields, or change joint visits (etc.).

6. DNR Data Resource Site (DRS)
   The Data Resource Site (DRS) is a standardized collection of GIS data, metadata and programs. A DRS is a place where GIS resources are stored and made available to the users. The layers available on the DRS are designed such that use by DNR staff is intuitive and efficient. Many layers have been converted to shapefiles that are statewide in extent and targeted to a specific piece of information.

7. Internal Assessments and Inventories
   Data from existing and pending assessments and inventories conducted by the Divisions of Ecological Resources, Fish and Wildlife, and Waters will be used. Examples of possible data sources include: wildlife population surveys (ruffed grouse, deer, goshawk, red-shouldered hawk, etc.); harvest reports; and water sampling results (impaired waters).

8. External Assessments and Inventories including resource management information, studies, and surveys conducted by other stakeholders.

9. Imagery available through the Forestry Resource Assessment Center.

Sampling of Sites

Because so much of the monitoring data comes from the SRM database, it is important to attempt to validate the accuracy of SRM data entry and consistency between the site objective and vegetation conditions (incorporating both implementation and effectiveness monitoring). The SFRMP Process Work Group will develop a method of site sampling (number of sites, site selection, techniques, etc.), emphasizing the application of existing survey tools/efforts such as timber sale inspections and regeneration surveys to gather validation data.

Baseline Data

Every effort will be made to identify baseline data for each indicator. The subsection assessments done at the beginning of the planning process contain all or most of the necessary data. Some indicators are tracked as a frequency or occurrence, for which there was not prior record keeping (e.g., the number of treatment deferrals). Although most pre-plan implementation data is lacking, data will be recorded annually so trend information during the plan's time frame will be available.

Data Collection, Analysis and Interpretation

Data from the SRM and FIM databases, and GIS shape files (primarily for implementation monitoring) will be collected periodically during the life of the plan. Effectiveness monitoring data will be collected and compiled at a mid point and at the end of a plan's time frame (2017). This information will be provided to the subsection team for interpretation and analysis as the basis for preparing the landscape level monitoring of implementation of the CP-PMOP Plan.

Data is entered into the FIM, SRM, and TSM continually. Fiscal year entries must be completed by September 1 of the following year. Data for the previous fiscal year can be extracted anytime after September. Plan shape files and DRS files are continually available.

5.4 Monitoring Roles and Responsibilities

Monitoring implementation of the CP-PMOP SFRMP will be the responsibility of the following individuals:

Forestry Field Staff has responsibility to:

Accurately record data and clearly document decisions regarding site objectives and associated actions for entry into appropriate databases.

Timber Sales, Silviculture and Inventory Program Foresters have responsibility to:

Accurately record data into the appropriate database (FIM, SRM, TSM) in a timely manner. Screens field data/decisions for consistency between actions and objectives, and with SFRMP plan directions.

CP-PMOP Team Core 4 has the responsibility to:

Review the monitoring results and is responsible for follow up on issues that arise. Follow up may include convening the full team, conducting additional training, re-emphasizing certain plan goals, initiating the plan amendment process, etc. The existing SFRMP decision-making process will be followed to guide the Core 4 process as monitoring issues are addressed. The CP-PMOP Core 4 consists of a regional wildlife member, regional forestry member; an ecological resources member, and the forest planner.

CP-PMOP Team

The CP-PMOP Team meets at the request of the Teams' Core 4 to discuss and interpret monitoring results and determine appropriate course of action.

CP-PMOP Forest Planner

The forest planner has the responsibility to: incorporate monitoring in SFRMP training for field staff, communicate the nature and importance of SFRMP monitoring to field staff, work with SFRMP Teams to incorporate monitoring considerations in formulating goals (i.e., measurable DFFCs) during plan development, convene the Core 4 to review monitoring reports, provide brief summaries of monitoring reports for review by FRIT, and assist with preparation of monitoring reports.

Central Office Forest Planner

The Central Office Forest Planner works with the subsection Teams' forest planner and the Core 4 to compile baseline data; facilitates annual extraction of data from databases and other sources, and assists the subsection Teams' Core 4 in obtaining and analyzing monitoring data; coordinates the preparation of monitoring reports; and maintains a central data and report storage system.

Monitoring questions and indicators have been identified for both implementation and effectiveness monitoring (Table 5.1). Indicators are a particular unit of information that, when measured over time, document changes in a specific condition referenced in the monitoring question.

5.5 Communicating Results

Each subsection team's Core 4 will analyze and summarize monitoring results following collection of the data. A written report, summarizing results of the annual efforts, will be prepared mid-term and at the end of the plan's time frame. These reports will be distributed internally and be accessible via the DNR Web site. Monitoring will guide future actions for CP-PMOP Plan amendments or plan adjustments.

The CP-PMOP SFRMP, maps, and Appendices can be viewed online at:
http://www.dnr.state.mn.us/forestry/subsection/cp_pmop/plan.html

Table 5.1 SFRMP Monitoring questions, indicators, outcomes, data sources, frequency, and priority.

*1 - measurements we can do fairly easily and will start immediately; 2 - measurements we are currently working on and hope to do soon; 3 - measurements we want to do and will continue to investigate, but are currently not able to undertake.

Monitoring Question	Indicator	Report by	Desired Outcome	Data Source	Initial Freq.	Priority* Rating
Implementation Monitoring: are management actions being carried out in a manner that is consistent with the plan? (numbers 1 – 27)						
1. Are the numbers of acres treated (by cover type) consistent with the plan?	Acres treated	Acres by cover type by type of treatment	*This column will be filled in with the measurable outcomes specified in the subsection plans.*	SRM Location Detail Properties and Actual Actions	Annual	1
2. Which management actions (prescriptions) were carried out or scheduled (by cover type)?	Management actions (prescriptions) carried out	Actions by cover type and acres		SRM Location Detail Properties and Actual Actions	Annual	1
3. Are the numbers of acres reforested and the species used consistent with the plan (by cover type)?	Acres reforested and the species used	Acres and species by reforestation method		SRM Objectives and Actual Actions	Annual	1
4. Are the acres and age of ERF stands treated in a way that is consistent with the plan (by cover type)?	Acres and age of ERF stands treated	Acres and age by cover type		FIM SFRMP Shape File	Annual?	1
5. Are the numbers of "normal rotation" acres treated consistent with the plan (by cover type)?	"Normal Acres" treated	Acres by cover type	*This column will be filled in with the measurable outcomes specified in the subsection plans.*	FIM SFRMP Shape File	Annual?	1
6. Were all selected stands field visited?	Stands field visited	Number of stands (percent)		SRM Actual Actions	Annual	1
7. What is the frequency of stand treatment being a deferral (by cover type)?	Stand treatment = deferral	Number of stands by cover type and acres		SRM Location Detail Properties Actual Actions	Annual	1
8. What is the frequency of stand treatment being a FIM alteration (by cover type)?	Stand treatment = alteration	Number of stands by cover type and acres		SRM Actual Actions	Annual	1

Monitoring Question	Indicator	Report by	Desired Outcome	Data Source	Initial Freq.	Priority* Rating
9. Is the number of stands managed to maintain cover type consistent with the plan (by cover type)?	Stands managed to maintain cover type	Number of stands by cover type and acres		SRM Objectives and Actual Actions	Annual	1
10. Is the number of stands managed to maintain cover type but increase stand species composition consistent with the plan (by species)?	Stands managed to maintain cover type but increase stand species composition	Number of stands by cover type and acres		SRM Objectives and Actual Actions	Annual	1
11. Is the number of stands managed to maintain cover type but change structural composition consistent with the plan (by type of change)?	Stands managed to maintain cover type but change structural composition	Number of stands by cover type and acres	*This column will be filled in with the measurable outcomes specified in the subsection plans.*	SRM Objectives and Actual Actions	Annual	1
12. Is the number of stands managed to convert to another cover type consistent with the plan (by cover type)?	Stands managed to convert to another cover type	Number of stands by desired cover type and acres		SRM Objectives and Actual Actions	Annual	1
13. Is the frequency and location of stand management to maintain a large patch consistent with the plan?	Stand management to maintain a large patch	Number of stands and acres		SRM Objectives and Actual Actions	Annual	1
14. Is the frequency of stand management to increase patch size consistent with the plan?	Stand management to increase patch size	Number of instances and acres		SRM Objectives and Actual Actions	Annual	1
15. Is the frequency and location of stand management to enhance smaller patches consistent with the plan?	Stand management to enhance smaller patches	Number of instances and acres	*This column will be filled in with the measurable outcomes specified in the subsection plans.*	SRM Objectives and Actual Actions	Annual	1
16. Are the numbers of RMZ acres managed for long-	RMZ acres managed for	Acres		SRM Objectives and Actual	Annual	1

Monitoring Question	Indicator	Report by	Desired Outcome	Data Source	Initial Freq.	Priority* Rating
lived conifers consistent with the plan?	long-lived conifers			Actions, GIS		
17. Are the numbers of RMZ acres managed to maintain shade to trout streams consistent with the plan?	RMZ acres managed to maintain shade to trout streams	Acres		SRM Objectives and Actual Actions, GIS	Annual	1
18. Is the frequency of stand management to maintain existing NPC and structure (by NPC) consistent with the plan?	Stand management to maintain existing NPC and structure	Number of stands by NPC and acres		SRM Objectives and Actual Actions	Annual	1
19. Is the frequency of stand management to retain NPC older growth stage components consistent with the plan?	Stand management to retain NPC older growth stage components	Number of stands by NPC and acres	*This column will be filled in with the measurable outcomes specified in the subsection plans.*	SRM Objectives and Actual Actions	Annual	1
20. Is the number of stands managed to protect rare plant and animal locations consistent with the plan (by species)?	Stands managed to protect rare plant and animal locations	Number of stands and acres (note whether a portion of stand)		SRM Objectives and Actual Actions	Annual	1
21. Is the frequency of stands under special management for species or habitat consistent with the plan?	Stands under special management for species or habitat	Number of stands and acres		SRM Objectives and Actual Actions	Annual	1
22. Is the frequency of stand management to maintain adequate residual BA within an identified corridor consistent with the plan?	Stand management to maintain adequate residual BA within an identified corridor	Number of stands and acres		SRM Objectives and Actual Actions	Annual	1
23. Are the known locations of rare native plant considered and protected (by species)?	Stands managed to protect a rare native plant	Number of stands and acres	*This column will be filled in with the measurable outcomes specified in the subsection plans.*	SRM Objectives and Actual Actions	Annual	1
24. Is the frequency of use	Use of prescribed	Number of		SRM Objectives	Annual	1

Monitoring Question	Indicator	Report by	Desired Outcome	Data Source	Initial Freq.	Priority* Rating
of prescribed burning as a management tool consistent with the plan?	burning as a management tool	instances and acres		and Actual Actions		
25. Is the frequency of use of less intensive TSI or site preparation techniques consistent with the plan?	Use of less intensive TSI or site preparation techniques	Number of instances and acres		SRM Objectives and Actual Actions	Annual	1
26. Are the known locations of cultural resource considered and protected (by species)?	Stands managed to protect a known cultural resource	Number of stands and acres (note whether a portion of stand)		SRM Objectives and Actual Actions	Annual	1
27. Is the number of new access miles built and closure methods used consistent with the plan?	New roads built and road closure methods used	Miles and methods		SRM	Annual	1
Effectiveness Monitoring: are management actions having the desired on-the-ground effect? (numbers 28 – 41)						
28. Change in the amount of forest land and timberland?	Amount of forest land and timber	Acres of forest land and timberland	Increase	FIM Satellite Imagery GIS/DRS	Plan Mid Point & Renewal	1
29. Change in representation of forest cover types?	Cover type representation	Total forest acres in each cover type and percent change	To be specified based on subsection plan	FIM Satellite Imagery	Plan Mid Point & Renewal	1
30. Change in forest size and age-class distribution?	Forest size and age-class distribution	Total forest acres in each size and age-class and percent change	Desired outcome varies; to be specified based on subsection plans	FIM	Plan Mid Point & Renewal	1
31. Change in percent of young forest?	Young forest	Acres and percent of total forest	Increase	FIM	Plan Mid-Point & Renewal	1
32. Change in percent of old forest?	Old forest	Acres and percent of total forest	Increase as stated in plan	FIM	Plan Mid-Point & Renewal	1
33. Change in the percent of effective ERF?	Effective ERF	Acres and percent of total forest	Increase as stated in plan	FIM	Plan Mid-Point & Renewal	1

Monitoring Question	Indicator	Report by	Desired Outcome	Data Source	Initial Freq.	Priority* Rating
34. Change in the number of stands with long-lived conifers?	Stands with long-lived conifers	Total acres and percent change	Increase	FIM Possibly Satellite Imagery	Plan Mid-Point & Renewal	2
35. Change in area of forest affected by potentially damaging agents (tree mortality and damage, wildfire, flooding, invasive/exotic species, insects and diseases, animals, and utility/road construction)?	Area of forest affected by potentially damaging agents	Acres affected by agent and percent change	Decrease affected acres	FIM (look into surveys by Forest Health staff)	Plan Renewal	2
36. Change in forest spatial patterns (patch and connectivity)?	Forest spatial patterns	Number of and size (acres) of patch and index of connectivity	Larger patches with greater connectivity	FIM GIS/modeling	Plan Renewal	2
37. Change in miles of impaired streams within forests?	Miles of impaired streams within forests	Miles of impaired streams and change	Decrease in miles of impaired streams	Work with Waters GIS/DRS	Plan Renewal, when data is available	2
38. Change in forest-associated species of concern by taxonomic group?	Forest-associated species of concern	Indicator of population size and change	Healthier populations	Work with Wildlife & Eco Services, etc.	Plan Renewal, when data is available	2
39. Change in forest game populations?	Forest game populations	Population estimates	Healthier populations			
40. Change in forest bird populations?	Forest bird populations	Indicator of population size and change; possibly red-shouldered hawk, goshawk	Healthier populations	Collaborate, possibly with university study, Eco Services	Plan Renewal, when data is available	3
41. Change in known rare plant communities (number of sites, area, and composition)?	Known rare plant communities	Number of and size (acres) of sites, and measure (indices) of health	Maintain or enhance	Work with Eco Services	Plan Renewal, when data is available	3

*1 - measurements we can do fairly easily and will start immediately; 2 - measurements we are currently working on and hope to do soon; 3 - measurements we want to do and will continue to investigate, but are currently not able to undertake.

Chapter 6. Response to Public Comments from *Preliminary Issues and Assessment document*

6.1 Background

A public comment period on the *Preliminary Issues and Assessment Document* was initiated in late September 2006 and ended October 14, 2006. Comments were accepted via letter, e-mail, or fax (a list of individuals and organizations that submitted comments is found at the end of this chapter). The comments submitted were grouped into common topics and issues with responses provided. The DNR response prepared by the SFRMP Team in this chapter provides a reference to the General Direction Statement (GDS), Strategies; Cover Type Management Recommendations, or other sections where the comments relating to the topic or issue were considered in the CP-PMOP Plan.

6.2 Issue Specific Comments

Issue from the *Preliminary Issues and Assessment document:*
How should the age-classes of forest types be represented across the landscape?

Comments Received:
1. *Age-class distributions should focus on balancing age-classes to improve forest productivity and health and reduce mortality*
2. *Recognize the ecological importance of the Lake States region for providing early successional deciduous forests within the larger landscapes.*

Response:
It is a goal of the CP-PMOP plan to work toward balancing the age-class distribution of all stands managed on an even-age basis. The plan considers the importance of early successional forests by establishing rotation ages that will lower the average harvest age and by designating young patches where harvests will be coordinated to maintain areas of young forest.

Representative GDS:

A3a. Forests managed for young, early-successional stages will be distributed across the landscape.

Representative Strategies:

14. Consider ECS characteristics when locating sites capable of supporting young early-successional forests.

15. Move aspen, balm of Gilead, paper birch, and jack pine cover types toward a balanced age-class structure.

18. Include areas of young, early-successional forest, adjacent to areas of extensive or expansive old forest (i.e. ERF, old growth, or OFMC).

19. Maintain young, early-successional forest, in a variety of patch sizes to provide habitat for associated species.

122. Move even-age managed cover types toward a balanced age-class structure.

Issue from the *Preliminary Issues and Assessment document*:
In your opinion, what are appropriate mixes of vegetation composition, structure, spatial arrangement, growth stages, and plant community distribution on state lands across the landscape?

Comments Received:

1. *Need to clarify the significance of the relative tree species abundance as depicted in Chapter 3 (of the Preliminary Issues and Assessment Document). Is this based on acres?*

Response:

The species abundance information in Chapter 3 is not based on acreage. It is a reflection of historical tree frequency based on notes made by original land surveyors from 1846-1908 as they selected bearing trees. From 1977-2002, a bearing tree selection method, developed by Dr. John Almendinger, has been applied to forest inventory plot information. The impact of agricultural and residential development is not measured. The relative occurrence of certain tree species in forested areas is the focus. Historical information, such as through bearing tree notes is a primary factor used to help determine the historical landscape. Several goals of this plan are to consider and move forest composition to more closely reflect the vegetation that developed under natural disturbance regimes.

Representative GDS:

B1a: Forest composition will be managed according to ecological classifications to more closely reflect vegetation that developed under natural disturbance regimes.

Representative Strategies:

20. Consider the MFRC North Central Landscape Plan forest composition goals and objectives**.**

21. Increase mixed forest conditions in most stands in selected cover types.

22. Decrease the acres of aspen, northern hardwoods, oak, ash, and lowland hardwoods to favor conifer cover types.

23. Increase the acres of the white pine, jack pine, tamarack and northern white cedar cover types.

24. Increase the acres of the cedar and tamarack cover types on both upland and lowland sites.

Issue from the *Preliminary Issues and Assessment document*:

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

Comments Received:

1. *DNR should follow MFRC site level guidelines, not exceed them*.

Response:

It is DNR policy to adhere to the *MFRC Site-Level Guidelines* when implementing all forest management practices. Specific MFRC Guidelines will be implemented, appropriate to the field circumstances, on a site-by-site basis.

Representative GDS:

C2a. Management activities will protect or enhance riparian areas.

Representative Strategies:

43. Implement the MFRC *Voluntary Site-level Forest Management Guidelines*.

48. Establish widths of RMZs consistent with MFRC *Voluntary Site-level Forest Management Guidelines*.

49. Field identify the boundaries of RMZs prior to applying treatments.

50. Maintain a filter strip between aquatic resources and treatment areas consistent with MFRC *Voluntary Site-level Forest Management Guidelines*.

51. Implement treatments within identified RMZs consistent with MFRC *Voluntary Site-level Forest Management Guidelines.*

Issue from the *Preliminary Issues and Assessment document*:
How can DNR develop new forest management access routes that minimize damage to other forest resources?

Comments Received:
1. *Provide access to private lands as well as other public lands for timber management purposes.*
2. *Identify and maintain forest roads that are needed for resource management and protection.*
3. *Road closures should be carefully reviewed*.
4. *Do not obliterate roads*.

Response:
One task of the SFRMP planning process is to identify the amount and type of access needed to treat the stands identified on the 10-year stand exam lists. The SFRMP planning process is primarily intended to identify new access needs and is not intended to develop a management plan for these accesses. Management of forest access is planned for through other programs within DNR including the DNR road management program and off-highway vehicle (OHV) planning process. Coordination in establishing, using and maintaining forest management access with other landowners, both public and private, is a goal and strategy of this plan. The DNR has no ability to manage or provide access to private lands. It is DNR policy to allow access across DNR lands when appropriate. DNR makes every effort to plan for and coordinate forest access routes. The new access needs lists component of this plan identifies needed access over the next 10-year plan implementation period. This new access needs list identifies, when practical, the type and recommended disposition of new access needed to manage isolated state lands.

Pressures exist to not expand the amount of maintained access on state forest land due to maintenance costs to reasonably safe standards. Isolated routes or routes that are not regularly maintained are frequently abused, resulting in erosion and reduced suitability for the intended purpose. Consequently, as needed, access restriction is appropriate to protect natural resources and the viability of the access route for future management. Frequently, gating or berming to restrict unwarranted vehicle use is the preferred option. In rare cases, access routes may be blocked with slash or debris to reduce further damage and then reopened in the future for timber management purposes.

Representative GDS:

D1a. Forest access routes will be well planned, with an increased level of collaboration among federal, county, private, and local units of government to share access, minimize new construction and close routes no longer needed for forest management purposes**.**

Representative Strategies:

68. Complete a timber access plan.

69. As Annual Stand Exam Lists are prepared continue to cooperate with other forest landowners to retain existing access to state land and to coordinate development and maintenance of new access routes across mixed ownerships.

71. Gate, barricade or obliterate all roads constructed during the life of this plan that are not needed for future stand management.

Issue from the *Preliminary Issues and Assessment document*:
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?

1. *Only use the Range of Natural Variation as a tool and not as a goal.*

   Response:
   This Plan recommends that the range of natural variation (RNV) be used as a tool. This is evidenced by the strategy stated below which states that RNV should be "considered" when stand treatments are implemented. RNV information on forest composition and age-structure developed for the CP and PMOP subsections were used as a tool for identifying potential composition change goals. The goal is not to recreate a specific historic condition. Analysis of RNV, including many other considerations, was used to determine the magnitude and location of forest cover type composition change goals in the subsections.

   Representative Strategy:
   12. Consider ECS and range of natural variation (RNV) when identifying sites capable of growing older stands and/or providing winter cover and food sources for wildlife.

2. *It is important that social and economic values are considered and balanced with ecological values.*

   Response:
   This plan attempts to balance social and economic values with ecological values. One primary objective of the SFRMP process is to maintain the DNR's certification as sustainable forests. To maintain sustainable economic conditions, a sustainable resource is necessary. Social and economic values are furthered by maintaining forest certification on DNR managed lands.

   Representative GDSs:
   H1a. Forests will be managed to provide a sustainable supply of forest products for human use, while minimizing negative impacts to wildlife habitat and forest biodiversity.

   I1a. Forests will be managed to increase overall timber productivity.

   L1a. Forest management activities will protect cultural resources on state administered lands.

   Representative Strategies:
   122. Move even-age managed cover types toward a balanced age-class structure.

   124. Improve the distribution of ages and quality of timber in uneven-aged managed cover types.

   136. Support research that maximizes timber productivity (e.g., optimal stocking levels, mixed species management, treatment timing) without impacting wildlife and plant species.

   137. Apply management techniques to improve stocking and stand composition on general forestry lands

Issue from the *Preliminary Issues and Assessment document*:
How might we provide habitat for all wildlife and plant species and maintain opportunities for hunting, trapping, and nature observation?

Comments Received:
1. *Provide specific measures of public interest in individual species*.

2. *Population goals for species of economic importance such as ruffed grouse or whitetail deer should be developed*.

   Response:
   Establishing specific measures of interest in wildlife species and identification of desirable or undesirable wildlife species and population levels is beyond the scope of this plan. The Management Section of Wildlife is responsible for providing goals and policy relative to wildlife populations.

   The primary objective of this plan is to manage vegetation while accommodating the multiple use-challenge of the DNR. This includes managing vegetation while considering impacts to wildlife habitat and populations. In this regard, vegetation management, as it affects wildlife populations is one of many primary considerations used to guide vegetation management as recommended in this plan. Wildlife management and establishing population goals for specific species are prepared by the Management Section of Wildlife. For example in 2008, the section anticipates adopting a *Ruffed Grouse Long-Range Plan* that will, among other recommendations, identify desired annual average harvest goals. As those plans/guidelines and management directions are prepared and adopted, they become the section's input and recommendations relating to vegetation management as implemented on state forest lands.

Issue from the *Preliminary Issues and Assessment document*:
How might we address the impacts on forest ecosystems from forest insects and disease, invasive species, animal damage, global climate change, and natural disturbances such as fires and blow down?

Comments Received:

1. *Age-class distributions should focus on balancing age-classes to improve forest productivity and health and reduce mortality.*

   Response:
   It is a goal of this plan to work toward balancing the age-class distribution of all stands managed on an even-aged basis. Based on the existing age-class balance of the commercial species, as they currently exist, this can be achieved in some species, but cannot be achieve in other species during the 50-year planning horizon of this plan. As harvest levels and cover type management recommendations were prepared (see Chapter 4) a primary goal was to balance the age-class distribution of even-aged cover types within the 50-year planning horizon. In addition, the plan takes a pro-active approach by establishing rotation and maximum ages that consider forest health and productivity.

   Representative GDSs:

   A1a. Forest resources will continue to represent multiple age-classes, distributed across the landscape**.**

   N1a. Forest management will minimize damage to forests from native insects and diseases.

   Representative Strategies:

   2. Provide representations of desired age-classes through forest composition goals.

   3. Develop and apply criteria to identify stands that are over rotation age but can be carried into subsequent 10-year planning periods to reduce age-class imbalances.

   97. Provide a balanced age-class structure in cover types managed with even-aged silvicultural systems.

   150. Manage identified forest insect and disease occurrences to contain and reduce impacts, using techniques appropriate for the species involved.

152. Manage the vegetative content and structure of stands to reduce the potential impact of insects and disease.

Issue from the *Preliminary Issues and Assessment document*:
What are sustainable levels of harvest for timber and non-timber forest products?

Comments Received:

1. *Need to demonstrate that we are managing in a sustainable manner.*

Response:

A primary goal of the SFRMP process is to implement forest management while considering broad ecological characteristics, which affect vegetative management. Vegetative management characteristics include ecological, wildlife and cultural factors as well as characteristics, that directly affect and determine timber production levels. As these broad characteristics are factored into vegetation management actions, sustainable forests will result. An equally important result of maintaining sustainable forests is that certification by national independent forest certifiers is achieved. DNR's forest lands are presently certified as sustainable forests, but continued planning and completion of the CP-PMOP Plan, and other SFRMPs is necessary to maintain this certification.

Representative GDSs: **H1a**. Forests will be managed to provide a sustainable supply of forest products for human use while minimizing negative impacts to wildlife habitat and forest biodiversity.

M1a. Forest management will continue to implement measures to sustain or enhance existing biodiversity.

Representative Strategies:

142. Ensure that DNR forest managers have access to and consider appropriate related resource management policy, guidelines and plans of other divisions when vegetative management is prescribed.

147. Complete the Minnesota County Biological Survey (MCBS) for all counties within the subsections.

148. Maintain the ecological integrity of Native Plant Communities (NPCs) by documenting and managing known locations with a statewide rank of Critically Imperiled (S1) or Imperiled (S2), and those with S-ranks of S3 to S5 that are rare or otherwise unique in these subsections.

149. Consult the Natural Heritage database (including the rare features database) prior to prescribing or implementing forest management activities.

Issue from the *Preliminary Issues and Assessment document*:
How can we increase the quantity and quality of timber products on state lands?

Comments Received:

1. *ERF ages should not exceed 1.5 times the normal rotation age. Exceeding these ages would significantly reduce timber outputs.*

Response:

The amount of old forest and ERF on state lands is determined based on department policy found in the DNR *Extended Rotation Forest (ERF) Guidelines, July 1994* (See *CP-PMOP Preliminary Issues and Assessment Document).* This ERF policy evaluated and identified the optimum normal and extended rotation ages for all commercial cover types that allowed the multiple use challenge to be accommodated on state forestlands. The *ERF Guidelines* identify that selective harvest or deferring the ultimate harvest of the trees or stand can provide for larger products such as sawlogs or enable an understory to become merchantable (e.g., balsam fir in an aspen stand) by allowing it to grow past the traditional rotation ages of the overstory species. In applying the

ERF policy, several CP-PMOP Plan Strategies identify that ERF should be prescribed in areas where old forest attributes can address multiple goals. In most cover types in the CP-PMOP subsections, the ERF ages do not exceed 1.5 times the normal rotation age.

Representative GDS

A2a: Forest managed for old forest characteristics will be distributed across the landscape.

Representative Strategies:

11. Prescribe ERF stands in steep areas, inaccessible terrain, riparian areas, habitat areas, travel corridors, and visual corridors to achieve desired old forest attributes consistent with DNR OFMC policy.

2. *Short-term harvest rates should be increased to capture mortality*.

Response:

Normal rotation ages have been developed for all commercial species and serves as a primary factor in establishing harvest levels. When species do not attain their normal rotation age due to insects, disease or disturbance events, efforts will be made to salvage timber from damaged stands as appropriate.

Representative GDS

N3a: Natural disturbance events will be evaluated to determine the appropriate forest management response to address the effects on the landscape.

Representative Strategies:

152. Manage the vegetative content and structure of stands to reduce the potential impact of insects and disease.

156. Accept a higher level of disturbance in ERF stands, provided the level of impact does not jeopardize the ability to regenerate the stand to the desired cover type or jeopardize the management goals of surrounding stands.

157. Evaluate large-scale (i.e., hundreds to thousands of acres) and small-scale (i.e., tens of acres) disturbance events to determine appropriate action

158: Implement efforts to salvage usable timber stumpage from damaged stands in a timely manner to minimize losses due to decay and staining.

3. *Implement a proactive approach to improve forest health and productivity*.

Response:

The SFRMP process is designed as a proactive approach to forest vegetative management. The CP-PMOP Plan contains 31GDSs and 168 strategies, all of which state a proactive approach to improving forest health and maintaining forest productivity while reflecting the broad multiply use mandate for DNR forest lands.

Representative GDSs:

A1a. Forest resources will continue to represent multiple age-classes, distributed across the landscape.

A3a. Forests managed for young, early-successional stages will be distributed across the landscape.

H1a. Forests will be managed to provide a sustainable supply of forest products for human use while minimizing negative impacts to wildlife habitat and forest biodiversity.

I1a. Forests will be managed to increase overall timber productivity.

N1a. Forest management will minimize damage to forests from native insects and diseases.

Representative Strategies:

72. Maintain the highest soil productivity possible by favoring regeneration and growth of native vegetation and trees using the *MFRC Voluntary Site-level Forest Management Guidelines.*

73. Utilize harvest systems, methods and sale regulations (e.g., process at stump) that protect advanced regeneration and maintain or improve the patterns, diversity and composition of forest vegetation present in the stand prior to harvest.

122. Move even-age managed cover types toward a balanced age-class structure.

124. Improve the distribution of ages and quality of timber in uneven-age managed cover types.

136. Support research that maximizes timber productivity (e.g., optimal stocking levels, mixed species management, treatment timing) without impacting wildlife and plant species.

137. Apply management techniques to improve stocking and stand composition on general forestry lands.

152. Manage the vegetative content and structure of stands to reduce the potential impact of insects and disease.

4. *Consider stands of aspen, paper birch, and white spruce greater than 70 for harvest over the next five years.*
5. *Aspen, paper birch, and white spruce beyond the age of 50 should be harvested and regenerated prior to experiencing additional volume losses.*

Response:

The SFRMP process requires many factors to be considered in establishing cover type treatment levels. These factors include: providing for a balanced age-class distribution for even-aged managed cover types; providing for old forest characteristics; providing extended rotation forests; and considering the impacts of natural disturbances and disease. These factors are accommodated and considered as harvest levels are established. Further guidance is provided by establishing normal rotation ages and maximum rotation ages for all commercial species and is one of the primary management factors in establishing harvest levels by cover type. Across the two subsections, normal rotation ages for aspen are 45 and 40 years; rotation ages for birch are 50 years and rotation age for white spruce is 50 and 60 years. Except those stands identified as ERF, old growth or EILC, all stands greater than these normal rotations ages have been considered for stand site visit and possible treatment.

In addition, see Chapter 4, Cover Type Management Recommendations for more detailed information concerning management of aspen, paper birch and white spruce in the CP and PMOP subsections.

Representative GDSs:

H1a. Forests will be managed to provide a sustainable supply of forest products for human use while minimizing negative impacts to wildlife habitat and forest biodiversity.

N3a. Natural disturbance events will be evaluated to determine the appropriate forest management response to address the effects on the landscape.

Representative Strategies:

122. Move even-age managed cover types toward a balanced age-class structure.

137. Apply management techniques to improve stocking and stand composition on general forestry lands.

158. Implement efforts to salvage usable timber stumpage from damaged stands in a timely manner to minimize losses due to decay and staining.

6. *Balsam fir and jack pine should be managed on a 50-year rotation and all stands greater than 60 years old harvested during the next 10-years. Stands older than 60 are highly susceptible to budworm and red rot*.
7. *Depart from sustainable flow to capture mortality and volume losses that are presently occurring on state lands.*

Response:

Normal rotation ages and merchantable ages have been developed for all commercial species and serve as one primary management factor in establishing harvest levels. Normal rotation ages consider the mean annual increment and other available data related to forest productivity considering wood quality and local knowledge. Normal rotation ages have been established specifically for the CP and PMOP landscapes to consider a range of factors that affect vegetation growth. When disturbance events occur before normal rotation ages are achieved, the CP-PMOP Plan recommends that efforts be made to salvage this timber.

Considering balsam fir and jack pine, the normal rotation age is 45 and 40 years respectively (younger than recommended by the commentator) and the maximum rotation age for these two cover types is 60 and 65 years (consistent with the recommendations of the commentator).

In addition, see Chapter 4, Cover Type Management Recommendations for more detailed information concerning management of, balsam fir and jack pine in the CP and PMOP subsections.

Representative GDSs:

H1a. Forests will be managed to provide a sustainable supply of forest products for human use while minimizing negative impacts to wildlife habitat and forest biodiversity.

N3a. Natural disturbance events will be evaluated to determine the appropriate forest management response to address the effects on the landscape.

Representative Strategies:

156. Accept a higher level of disturbance in ERF stands, provided the level of impact does not jeopardize the ability to regenerate the stand to the desired cover type or jeopardize the management goals of surrounding stands.

157. Evaluate large-scale (i.e., hundreds to thousands of acres) and small-scale (i.e., tens of acres) disturbance events to determine appropriate action.

158. Implement efforts to salvage usable timber stumpage from damaged stands in a timely manner to minimize losses due to decay and staining.

8. *Strive to increase productivity of commercial timberlands.*
9. *Identify site productivity classes across the forests and prioritize the most productive sites for management.*

Response:

Within the broad multiple use challenge embraced by DNR, increased productivity of commercial timberlands is a primary objective.

Representative GDS:

I1a. Forests will be managed to increase overall timber productivity.

Representative Strategies:

110. Use harvest systems, and sale regulations that protect advanced regeneration and maintain or improve patterns, diversity and composition of forest vegetation representative of the stand prior to harvest.

136. Support research that maximizes timber productivity (e.g., optimal stocking levels, mixed species management, treatment timing) without impacting wildlife and plant species.

137. Apply management techniques to improve stocking and stand composition on general forestry lands

159. Expand the knowledge of field staff related to preventing or reducing damage caused by wildlife through training and/or field level information sharing.

10. *Recognize and assess forest growth potential and propose intensive forest management programs to increase the productivity on timberlands*.
11. *Assess stocking levels, current growth, and the capacity of these lands to increase growth per acre*.
12. *Matching site to species and regeneration to full stocking levels should be encouraged, post harvest, to increase productivity.*

Response:

The capacity of lands to increase growth per acre can be achieved, in part, by ensuring that tree species suitable to the site are identified and managed as the priority species. A primary component of the CP-PMOP Plan is to identify forest vegetative management practices that consider the ecological characteristics of the site. Forest stand characteristics such as site index, topography, hydrologic considerations and soils capabilities are all factors that determine forest growth potentials. Matching vegetative management practices consistent with the site's ecological characteristics is a recurring theme is the plan's strategies. Increasing and improving forest growth potentials or timber productivity is stated in many strategies throughout this plan. See Chapter 4, *Cover Type Management Recommendations* for specific references to tree species and the native plant communities where the species is identified as good competitors and where cover type changes are recommended based on NPC. In addition see Appendix E, *Silviculture Prescription Worksheet* that outlines the role that NPCs will play as site level management objectives and prescriptions are implemented by foresters.

Representative GDSs:

A1a. Forest resources will continue to represent multiple age-classes, distributed across the landscape.

H1a. Forests will be managed to provide a sustainable supply of forest products for human use while minimizing negative impacts to wildlife habitat and forest biodiversity.

I1a. Forests will be managed to increase overall timber productivity.

Representative Strategies:

1. Consider ECS characteristics and other indicators when deciding where old forest and younger age-classes are best suited.

12. Consider ECS and range of natural variation (RNV) when identifying sites capable of growing older stands and/or providing winter cover and food sources for wildlife.

14. Consider ECS characteristics when locating sites capable of supporting young early-successional forests.

37. Utilize ECS information to assist in determining management direction for stands on state lands.

85. Ensure that regenerating tree species are suitable as indicated in the DNR's ECS *Suitability of Tree Species by Native Plant Community* tables

97. Provide a balanced age-class structure in cover types managed with even-aged silvicultural systems.

98. Increase the productivity and maintain the health of even-aged cover types.

102. Maintain the productivity of forest soils to favor regeneration and growth of native vegetation and trees.

136. Support research that maximizes timber productivity (e.g., optimal stocking levels, mixed species management, treatment timing) without impacting wildlife and plant species.

137. Apply management techniques to improve stocking and stand composition on general forestry lands.

13. *Identify off-site aspen (site indices < 50) for conversion. Conversion of these stands should be through active not passive management*.

Response:
The DFFC for the aspen cover type identifies that over the next 50 years a total of 14,369 acres are to be actively identified and converted to white cedar, jack pine, white spruce, white pine, or red pine. The stands of aspen cover type determined to be most suitable for conversion have been identified and included in the conversion pool. From this conversion management pool the Forestry Area Stand Exam Lists have identified specific aspen stands for cover type changes and or site visits over the 10-year plan implementation period.

Representative GDS:
B1a. Forest composition will be managed according to ecological classifications to more closely reflect vegetation that developed under natural disturbance regimes.

Representative Strategy:
22. Decrease the acres of aspen, northern hardwoods, oak, ash, and lowland hardwoods to favor conifer cover types.

14. *Develop high-risk-low-volume (HRLV) stand criteria to be implemented over the next five years.* (MFI)

Response: The CP and PMOP subsections do not contain significant HRLV stands, as may be found in other subsections of the state. Factors that tend to lead to HRLV stands (limited access and significant topography) are generally not found in the CP-PMOP. Relatively comprehensive access, reasonable topography and reasonably stable markets have combined to reduce possible HRLV stands to relatively minor acreages. In the CP-PMOP the majority of what could be considered high-risk stands is due to advanced age and as such have been included in the management pool from which the 10-year Stand Exam Lists were developed. For these reasons special management or identification of HRLV was not considered a significant factor in the CP-PMOP planning process.

15. *School Fund Trust Lands should be managed to increase timber growth and productivity and to maximize the return to the trust. These lands should not be reserved from timber management.*

Response:

The management goal for school trust lands is to secure the maximum long-term economic return consistent with sound natural resource and management principles. Sound natural resource management principles have been interpreted as managing trust lands to preserve unique characteristics or values, and to provide recreation opportunities. The DNR has been charged with managing school trust lands. The Forest Resources Management Act of 1995 requires, as policy, that the DNR pursue the sustainable management, use, and protection of the state's forest resources. In implementing these two broad directives, the DNR manages school trust lands through a balance of long-term economic return, providing wildlife habitat, recreational opportunities, protection of unique characteristics, and other environmental and social goals.

16. *Do not remove timberland from production via high biodiversity areas, ecologically important lowland conifers, misapplication of ERF or allowing stands to succeed naturally*.

Response:

A primary challenge of the DNR and intent of the SFRMP process is to provide for vegetative management while reflecting the needs of all forest users including those with interests in high biodiversity areas, EILC and ERF. It is not the intent to remove timberland from production, but rather to accommodate all users and forest goals while enhancing timber productivity where possible. Identification of biodiversity areas is a function of the Minnesota County Biological Survey. The intent is to identify areas of outstanding, rare and unique resources that should be considered as vegetative management is implemented. EILCs have been identified as a result of a comprehensive effort to identify those stands that met specific designation criteria. Identification of ERF is governed by statewide policy and standards applied to the specific characteristics of the CP and PMOP subsections. The DNR is challenged to accommodate all of these interests as forestry management is practiced.

The direction presented for forest resource management in these subsections is consistent with strategic direction previously developed by the Department, e.g., *Directions 2000, The Strategic Plan*, *September 2000*, and more recently, *A Strategic Conservation Agenda 2003-2007*. These documents and policy directions can be viewed on the DNR Web site at: http://www.dnr.state.mn.us/aboutdnr/reports/index.html**.**

Representative GDSs:

H1a. Forests will be managed to provide a sustainable supply of forest products for human use, while minimizing negative impacts to wildlife habitat and forest biodiversity.

I1a. Forests will be managed to increase overall timber productivity.

Representative Strategies:

4. Designate ERF stands in the amounts and percentages prescribed by the Statewide ERF Work Group.

11. Prescribe ERF stands in steep areas, inaccessible terrain, riparian areas, habitat areas, travel corridors, and visual corridors to achieve desired old forest attributes consistent with DNR OFMC policy.

125. Designate lowland conifer old growth from EILC stands and return undesignated stands to the harvest pool.

137. Apply management techniques to improve stocking and stand composition on general forestry lands

Issue from the *Preliminary Issues and Assessment document*:

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

-No comments received.

Issue from the *Preliminary Issues and Assessment document*:
How will foresters and wildlife managers achieve desired results and maintain the integrity of state and federal statutes?

Comments Received:

1. *Need to foster more cooperation between land managers on projects*.
2. *Continue to solicit comments from and support of other forest owners and managers*.

Response:

Fostering cooperation and soliciting comments from other forest managers has been implemented in the past and will be maintained and improved through the SFRMP process. Cooperation is being addressed through multi-divisional planning within the department and local contacts with federal, county and industrial land managers. In particular, CP-PMOP Preliminary Issues and Assessment Document, the CP-PMOP Plan, the 10-year Stand Exam Lists, and the New Access Needs Lists will be made available to other agencies managing forest lands in these subsections, stakeholders and the public. Currently, the DNR notifies other agencies when the annual harvest plans and annual plan additions are posted on the DNR Web site for review. In addition DNR staff participants in the MFRC North Central Regional Landscape planning process. The MFRC Plan produced landscape level direction for agencies and other landowners and recommended strategies that implement the MFRC landscape direction.

Representative GDS:

K1a. Forest management activities will continue to adhere to state and federal statutes.

Representative Strategies:

20. Consider the MFRC *North Central Landscape Region Plan* forest composition goals and objectives.

30. Coordinate plan implementation with large land managers including the U.S. Forest Service, county land departments, local governments, industrial forest land managers and nonprofit organizations to identify causes and mitigate impacts of fragmentation.

119. Develop cooperative procedures with other land management agencies to coordinate wildlife management efforts.

140. Invite comment from, and coordinate with adjacent landowners.

141. Ensure that forest resource managers maintain a working knowledge of all applicable state and federal statutes, rules, guidelines and policies.

142. Ensure that DNR forest managers have access to and consider appropriate related resource management policy, guidelines and plans of other divisions when vegetative management is prescribed.

144. Share data on known cultural sites and consider impacts to these sites as silvicultural treatments are applied.

Issue from the *Preliminary Issues and Assessment document*:
How will cultural resources be protected during forest management activities on state administered lands?

-No comments received.

Issue from the *Preliminary Issues and Assessment document*:
How can we ensure that rare plants and animals, their habitats, and other rare features are protected in these subsections?

-No comments received

6.3 General Comments on the *Preliminary Issues and Assessment* document

Identified below are comments received, which were not considered directly related to any particular Issue as contained in the *Preliminary Issues and Assessment document*.

Comment Received:

1. *Need to demonstrate that our land managers are using the best science available*.
2. *Incorporate the forest modeling software from this point forward regarding the Chippewa Plains SFRMP*.

   Response:

   DNR is adopting new tools, techniques and procedures on a regular basis aimed at remaining current with state-of-the-art resource management strategies. The divisions are charged with keeping abreast of changing forest conditions, markets, ecological and wildlife trends and challenges. Information sharing and cooperative planning among divisions and with other resource / scientific institutions is encouraged and practiced. Examples of changing forestry management techniques include: revisions to the basic forest stand database, efforts to incorporate new data bases into forestry management such as the County Biological Survey; considering the Native Plant Community classification on sites that are potential forest development projects; cooperative agreements with research institutions, and efforts to incorporate state-of-the-art forest modeling software to predict affects of various forest management actions.

   Representative GDS:

   N5a. Forest management practices will consider the impacts of climate change on forest lands and will attempt to mitigate these impacts using current knowledge and future research findings.

   Representative Strategies:

   12. Consider ECS and range of natural variation (RNV) when identifying sites capable of growing older stands and/or providing winter cover and food sources for wildlife.

   55. Collect baseline ecological data on surface water quality across the subsection.

   81. Design and implement training that allows field staff to identify native plant communities, growth stages, natural disturbance intervals, suitable tree species, and soil operability ratings.

3. *The Assessment does a good job of presenting the important elements relating to forest vegetation management on state-administered forest lands*.
4. *Need to focus less effort on planning and more on implementation*.

   Response:

   Forests are complex systems that require significant information for accurate description. The SFRMP planning process requires an extensive range of information as depicted in the CP-PMOP *Preliminary Issues and Assessment* document to accurately establish background information and forest management challenges reflecting the broadest interests. It also commits to public review and comment at two key stages in the process, issue identification and plan review.

The DNR has committed to completing subsection-based management planning as soon as possible to maintain forest certification on state forest lands. The DNR maintains that comprehensive forest land management is best achieved when practices are integrated and coordinated among common subsections. Considering that the CP-PMOP SDD includes 50 year DFFCs meaning that forest management policy and practices are being developed which have a 50-year implementation horizon, a thoughtful planning process is appropriate.

In addition, the Division of Forestry has been upgrading electronic inventory and silvicultural tracking systems to help coordinate and speed up implementation of plan strategies. Also, new processes for evaluating forest sites (i.e., Ecological Classification, Land Type Associations, etc.) as well as methods for projecting impacts of decisions (i.e. modeling) are being used to make the strategies developed during this planning process the most integrated and coordinated to date. Future forest management efforts will include continued improvements in data management, inventory, site characteristic recording and forest modeling.

6.4 Comments considered beyond the scope of this plan:

Comment Received:

1. *Need an effective education program*

   Response:

   Many strategies are identified that stress the importance of training and education to allow DNR professionals to stay current with changing and improved forestry management techniques. Public education is an important issue but outside the scope of this planning process. In an effort to produce plans in a timely manner, consideration has been narrowed to vegetative management on forested lands administered by the DNR Division of Forestry and Division of Wildlife.

6.5 List of organizations and individuals that submitted Comments

The following individuals / organizations have submitted comments on *Preliminary Issues and Assessment document:*

1. Bill Haugen
2. Tim J. O'Hara, Minnesota Forest Industries
3. Jim Mohler
4. Anne Oldakowski

Chapter 7. 10-Year Stand Exam List and New Access Needs Lists

This chapter of the CP-PMOP SFRMP summarizes the results of the 10-Year Stand Exam List and New Access Needs List selection processes.

7.1 Managed Cover Type Treatment Summary

The CP-PMOP subsection landscape is approximately 4.6 million acres. State timberlands comprise approximately 9 percent (429,229 acres) of the land in the subsections.

Considering both even and uneven-aged managed cover types, of the 429,229 acres of state timberlands, 374,202 acres (87 percent) were considered management pool acres. Management pool acres are defined as timberland acres that are available for potential timber harvest after reserves (e.g., designated old-growth stands) are removed from the forest inventory.

Of the 374,202 management pool acres, 143,616 acres (38 percent) were identified as stand selection pool acres. For even-aged managed cover types the stand selection pool Acres are defined as acres from the management pool that met age criteria based on normal and maximum rotation ages and also met the stand selection criteria specific to each even-aged managed cover type (see Chapter 4 Cover Type Management Recommendations, Stand Selection Criteria). For uneven-aged managed cover types the stand selection pool Acres are defined as acres that met the stand selection criteria specific to each uneven-aged managed cover type (see Chapter 4 Cover Type Management Recommendations, Stand Selection Criteria and Appendix T, *Stand Exam List and New Access Needs List Instructions, Attachment D-3: Management Pool Selective and Thinning Harvest Acres).*

To assist Forestry Areas in selecting the 10-Year Stand Exam List from the stand selection pool acres, a *Stand Scoring System* was developed and used during stand selection (see Appendix K, *Stand Scoring System).* The scoring system assigned scores to stands as priorities that furthered the DFFCs, strategies and Stand Selection Criteria identified in the CP-PMOP Plan. Scoring factors included: cover type conversion opportunities; treatment model priorities; designated patch management; and priority open landscapes.

Of the stand selection pool acres, a total of 96,991 acres (68 percent) were identified for treatment during this 10-year planning period as shown on Table 7.7a. This 96,991 total acres differs from the total acres on Table 7.1a (94,894). This difference is because Table 7.7a includes several cover type designations (e.g., stagnant tamarack, agriculture, upland brush, marsh) that are not included on Table 7.1a. The database does not record actual timbered stands on these cover type designations. However, based on field staff knowledge of these areas, some of these stands were known to exhibit potential for treatment and therefore were included on the 10-Year Stand Exam List.

Table 7.1a Managed Cover Type Treatment Summary

Cover Type	Rotation[1] Class	Planned Rotation Age	Management Pool Acres (all ages)[2]	Stand Selection Pool Acres)[3]	CP-PMOP Planned Treatment Level[4]			Total Plan Stand Exam Acres
					Even	Intermediate Treatment*	Visit	
Ash/Lowland Hardwoods	Un-even-aged	No set rotation age	16,858	3,026	47	1,524	747	**2,318**
Aspen/Balm of Gilead	N	45/40	128,337	36,960	21,117	539	3,235	**31,965**
	ERF	80/75/60	54,932	18,247	5,538	553	983	
Birch	N	50	3,754	2,790	748	10	456	**3,911**
	ERF	65/50	5,711	4,918	1,761	155	781	
Northern Hardwoods	Un-even-aged	No set rotation age	16,163	8,213	296	5,041	831	**6,168**
Jack Pine	N	40	8,307	4,722	1,881	50	272	**4,495**
	ERF	65	6,071	3,554	1,653	292	347	
White Spruce	N	60/50	3,298	452	118	1,430	113	**3,971**
	ERF	90/60	3,782	1,202	258	1,902	150	
Balsam Fir	N	45	3,414	2,217	721	139	312	**2,203**
	ERF	60	4,278	2,855	432	174	425	
Tamarack	N	60/70	26,095	14,692	4,747	37	914	**7,741**
	ERF	105	15,559	11,449	1,771	31	241	
Black Spruce Lowland – Low SI	N	95	9,842	3,925	759	0	360	**2,542**
	ERF	130	11,617	5,150	1,292	0	131	
Black Spruce Lowland - High SI	N	65	1,768	1,018	142	31	158	**542**
	ERF	95	2,236	2,128	166	0	45	
Red Pine	N	100	12,535	1,433	366	7,016	346	**19,531**
	ERF	170	21,646	48	145	11,127	531	
Oak – High SI	N	80	3,650	2,401	1,022	165	108	**1,760**
	ERF	120	2,828	1,875	86	379	0	
Oak - Low SI	N	50	3,541	3,303	1,483	165	343	**4,780**
	ERF	80	5,952	5,553	1,932	121	736	
White Pine	ERF	No set rotation age	2,027	1,485	104	731	121	**956**
Total Acres			**374,204**	**143,616**	**48,636**	**33,150**	**13,108**	**94,894**

* Includes prescriptions such as thinning, selective harvest, uneven-aged management.

[1] Rotation Class: N -managed under normal rotation; ERF –managed as extended rotation forest

[2] Management pool acres are timberland acres that are available for potential timber harvest after reserves (e.g., designated old-growth stands) are subtracted at the beginning of this planning process.

[3] The Management Pool Acres that met the stand selection criteria for treatment and age criteria based on normal and maximum rotation ages. Also refer to Appendix T (*Stand Exam List and New Access Needs List Instructions, Attachment D-3*) for additional acres that were identified as an uneven-aged management pool.

[4] 10-year planned treatment level (acres) for this planning period (includes site visit acres).

7.2 Stand Selection Results

Stands were selected for field examinations and possible treatment based on the: general direction statements, DFFCs and strategies identified in Chapter 3; Cover Type Management Recommendations and Stand Selection Criteria identified in Chapter 4. Appendix T (*Stand Exam List and New Access Needs List Instructions and Attachments*) outlines the stand selection process implemented by each Forestry Area in the CP-PMOP.

Appendix U, *10-Year Stand Examination List and New Access Needs List* identifies the list of stands by subsection, location, cover type, treatment acres, and preliminary prescription selected as a result of the CP-PMOP SFRMP stand selection process.

7.3 Stand Examinations (Field Visits)

Over the 10-year planning period it is anticipated that every stand on the 10-Year Stand Examination List will be field visited to determine the actual management to be implemented. A total of 5,985 stands are identified on the 10-Year Stand Exam List. As stands were selected and placed on the 10-Year Stand Exam List, preliminary prescriptions were assigned. Final management objectives and final prescriptions will be determined as each stand is field visited.

At the time of field visit a *Silvicultural Prescription Worksheet* (Appendix E) will be prepared. As the *Worksheet* is prepared the range of decisions about each stand's management include:

1. Appraise the stand for a timber sale.
2. Defer treatment of the stand to a future year.
3. Update the stand's forest inventory data to reflect current conditions without prescribing a management action at this time.
4. Manage for the understory regeneration without harvesting at this time.
5. Prescribe silviculture treatment (e.g., site preparation and tree planting).
6. Prescribe timber stand improvement (tsi) to enhance stand vigor, diversity, or productivity.

7.4 Maps of 10-Year Stand Exam List and New Access Needs List

The following maps identify the locations of stands placed on the 10-Year Stand Exam List. The maps are included at the end of this chapter.

The following maps identify all lands administered by DNR and shown by generalized cover type and provided here for background:

Map 7.4.1a DNR-Administered Lands by Generalized Cover Types
Chippewa Plains ECS Subsection

Map 7.4.1b DNR-Administered Lands by Generalized Cover Types
Pine Moraines and Outwash Plains ECS Subsection

The following maps identify designated Old Growth, EILC and stands designated as ERF and is provided here for background:

Map 7.4.2a Old Growth, EILC, and ERF Stands
Chippewa Plains

Map 7.4.2b Old Growth, EILC, and ERF Stands
Pine Moraines and Outwash Plains

The following maps display the locations of stands selected for field examinations and possible treatment by generalized cover type:

Map 7.4.3a Stands Identified for Treatment by Generalized Cover Type
Chippewa Plains (West)

Map 7.4.3b Stands Identified for Treatment by Generalized Cover Type
Chippewa Plains (East)

Map 7.4.3c Stands Identified for Treatment by Generalized Cover Type
Pine Moraines and Outwash Plains (West)

Map 7.4.3d Stands Identified for Treatment by Generalized Cover Type
Pine Moraines and Outwash Plains (East)

The following maps display the locations of stands selected for field examinations and possible treatment by preliminary prescription:

Map 7.4.4a Stands Identified for Treatment by Preliminary Prescriptions Chippewa Plains (West)
Map 7.4.4b Stands Identified for Treatment by Preliminary Prescriptions Chippewa Plains (East)
Map 7.4.4c Stands Identified for Treatment by Preliminary Prescriptions Pine Moraines and Outwash Plains (West)
Map 7.4.4d Stands Identified for Treatment by Preliminary Prescriptions Pine Moraines and Outwash Plains (East)

The following maps display the locations of designated patches greater than 101 acres within the subsections and the stands selected for treatment by location and preliminary prescription. Stands which furthered patch management objectives were scored and received priority consideration during the stand selection process:

Map 7.4.5a Patches Greater Than 101 Acres and Stand Prescription in Patch Chippewa Plains
Map 7.4.5b Patches Greater Than 101 Acres and Stand Prescription in Patch Pine Moraines and Outwash Plains

The following maps identify all stands selected that require new access construction as either a temporary access or permanent resource management route:

Map 7.11.1a Stands Requiring New Access Chippewa Plains
Map 7.11.1b Stands Requiring New Access Pine Moraines and Outwash Plains

Note: The maps have been reduced and printed in grayscale in this document. It is recommended that these maps be viewed at a larger scale and in color. The colored maps and this report can be viewed at http://www.dnr.state.mn.us/forestry/subsection/cp_pmop/index.html, and are available in CD format.

7.5 Stand Evaluations

As the stand field visit examinations are completed, all information from the CP-PMOP Plan (e.g., DFFCs, strategies, cover type management recommendations, and all department policy, guidelines and directives, and FIM dataset) will be considered in evaluating the stands and making final prescriptions. The field process will include completion of the *Silvicultural Prescription Worksheet*. For many stands, the SFRMP FIM database includes: preliminary management objectives; comments concerning stand management; identification of special management areas; and, requests for a joint visit among DNR divisions (See Appendix I *Standard Codes in SFRMP*).

During the development of the CP-PMOP 10-Year Stand Exam List, some stands have been identified for joint site visits by staff from the Divisions of Fish and Wildlife or Ecological Resources. Joint site visits allow DNR field staff to achieve consensus concerning stand management that considers the characteristics unique to individual stands and issues of concern in the field based on the goals and objectives for the stand and the surrounding landscape as recommended in the plan. Stands identified for joint site visits are indicated as such on Annual Stand Exam Lists and appraiser stand reports. Results of joint site visits are documented and filed in the timber sale permit file.

7.6 Public Review of Stand Examination Lists

The entire 10-Year Stand Exam List is available for public review at: http//www.dnr.state.mn.us/forestry/subsection/cp_pmop/index.html. Stands will be available for public review again as they are included in Annual Stand Exam Lists prepared by each Forestry Area (i.e., by stand examination year). If stands are added to the Annual Stand Exam list they will receive public review as part of an Annual Plan Addition. For details on these public review processes, see http://www.dnr.state.mn.us/forestry/harvesting/plans.html.

7.7 Treatment Acres Summary

Table 7.7a summarizes the 10-Year Stand Exam acres by cover type and subsection. The total acres on Table 7.7a (96,991) differs from total acres on Table 7.1a (94,894) because several cover type

designations (e.g. stagnant tamarack, agriculture, upland brush, marsh) are not included in the management pool acres due to their non-forested cover type designation. However, based on field staff knowledge of these areas, some of these stands were known to exhibit potential for treatment and therefore were included on the 10-Year Stand Exam List.

Table 7.7a 10-Year Summary: Cover Type Stand Examination Acres by Subsection

Cover type	Chippewa Plains	Pine Moraines & Outwash Plains	Total
Ash	1,198	608	1,806
Lowland Hardwoods	355	69	425
Aspen	8,308	23,011	31,319
Birch	1,429	2,480	3,909
Bam	577	69	646
Northern Hardwoods	3,342	2,845	6,186
Oak	307	6,232	6,539
White Pine	301	684	985
Norway Pine	5,505	15,665	21,170
Jack Pine	1,148	3,346	4,494
White Spruce	1,305	2,664	3,969
Balsam Fir	1,143	1,061	2,204
Lowland Black Spruce	3,038	45	3,083
Tamarack	6,474	1,266	7,740
White Cedar	162	0	162
Stagnant Tamarack*	8	0	8
Stagnant Cedar*	14	0	14
Offsite Oak*	16	124	140
Cut Over Area*	500	452	952
Lowland Grass*	28	11	40
Upland Grass	28	277	304
Lowland Brush*	639	18	657
Upland Brush*	13	82	96
Agriculture*	0	21	21
Industrial Development*	12	8	20
Recreation Development*	0	6	6
Roads*	12	0	12
Marsh*	71	0	71
Total	35,931	61,060	96,991

***** During selection of the 10-Year Stand Exam List, stands were selected and prescriptions recorded under these cover type designations based on field knowledge, experience and air photo interpretation. Final prescriptions will be determined following site visits.

7.8 Preliminary Prescriptions Summary

Based on the stand selection criteria developed in the CP-PMOP Plan, preliminary prescriptions were assigned to stands selected for treatment as the 10-Year Stand Exam Lists were developed. Table 7.8a provides a summary of the preliminary prescriptions by subsection.

Table 7.8a 10-Year Summary: Preliminary Prescription Acres by Subsection

General Prescription	Detailed Prescription[1]	Chippewa Plains	Pine Moraines & Outwash Plains	Total
Even-aged	Clearcut with Reserves	11,245	31,348	42,593
	Clearcut with Reserves - sprouting	0	62	62
	Salvage - Clearcut	0	11	11
	Salvage-w/Rsrv-Clearcut-I&D	0	42	42
Seed Tree	Seed Tree w/Rsrv	179	0	179
	Seed tree	4,437	224	4,661
Shelterwood	Shelterwood	234	866	1,100
Uneven-aged	Uneven-aged Harvest	3,407	2,296	5,703
	Group Selection	0	32	32
	Salvage Cut-Selective Harvest	86	51	137
	Sanitation Cut-Selective Harvest	0	60	60
	Intermediate Harvest	249	0	249
Thinning	Commercial Thinning	6,375	18,996	25,371
	Selective Thinning-Commercial	3	279	283
Manage for Understory	Manage for Understory	527	658	1,185
On-site Visit	On-site Visit	4,951	3,546	8,497
Re-inventory	Re-inventory	4,238	2,589	6,827
	Total	**35,931**	**61,060**	**96,991**

[1] Refer to Appendix I (*Standard Codes in SFRMP*) for prescription definitions

Table 7.8b provides a more detailed summary of the 10-Year Stand Exam List by cover type, prescription, and subsection. Appendix U, *10-Year Stand Examination List and New Access Needs List*, includes the preliminary prescription for each of the stands selected for treatment during the 10-year period.

Table 7.8b 10-Year Summary: Preliminary Prescription Acres by Cover Type and Subsection

Covertype	Prescription	Chippewa Plains	Pine Moraines and Outwash Plains	Total
Ash	Shelterwood	9	0	9
	Uneven-aged Harvest	576	173	749
	Commercial Thinning	0	149	149
	Selective Thinning-Commercial	0	15	15
	Manage for Understory	26	120	146
	On-site Visit	461	135	595
	Re-inventory	127	17	144
	Total	**1,198**	**608**	**1,806**
Lowland Hardwoods				
	Clearcut-with Reserves	0	12	12
	Seed Tree	0	8	8
	Uneven-aged Harvest	163	35	198
	Manage for Understory	6	0	6
	On-site Visit	109	0	109
	Re-inventory	77	14	91
	Total	**355**	**69**	**425**
Aspen	Clearcut-with Reserves	6,103	20,078	26,181
	Clearcut-w/Rsrv-Sprouting	0	62	62
	Seed Tree	12	0	12
	Shelterwood	5	0	5
	Salvage-w/Rsvr-Clearcut-I&D	0	6	6
	Uneven-aged Harvest	41	71	113
	Intermediate Harvest	133	0	133
	Commercial Thinning	225	108	333
	Selective Thinning-Commercial	0	43	43
	Manage for Understory	44	412	456
	On-site Visit	595	1,005	1,601
	Re-inventory	1,149	1,226	2,375
	Total	**8,308**	**23,011**	**31,319**
Birch	Clearcut-with Reserves	385	2,106	2,491
	Shelterwood	18	0	18
	Uneven-aged Harvest	31	102	134
	Commercial Thinning	3	0	3
	Manage for Understory	28	0	28
	On-site Visit	436	147	583
	Re-inventory	528	125	652
	Total	**1,429**	**2,480**	**3,909**
Balm of Gilead	Clearcut-with Reserves	344	45	389
	Manage for Understory	5	9	15
	On-site Visit	75	0	75
	Re-inventory	153	15	168
	Total	**577**	**69**	**646**
Northern Hardwoods	Clearcut-with Reserves	0	157	157
	Shelterwood	15	104	119
	Uneven-aged Harvest	2,328	1,634	3,962
	Group Selection	0	32	32
	Commercial Thinning	262	709	970
	Selective Thinning-Commercial	0	13	13
	Manage for Understory	102	0	102
	On-site Visit	477	66	544
	Re-inventory	158	130	288
	Total	**3,342**	**2,845**	**6,186**

Covertype	Prescription	Chippewa Plains	Pine Moraines and Outwash Plains	Total
Oak	Clearcut-with Reserves	25	3,821	3,846
	Shelterwood	18	659	677
	Uneven-aged Harvest	123	32	155
	Commercial Thinning	10	618	628
	Selective Thinning-Commercial	0	30	30
	Manage for Understory	17	0	17
	On-site Visit	48	1,019	1,067
	Re-inventory	67	53	120
	Total	**307**	**6,232**	**6,539**
White Pine	Clearcut-with Reserves	0	28	28
	Shelterwood	33	43	76
	Uneven-aged Harvest	0	101	101
	Commercial Thinning	152	441	593
	Salvage Cut - Selective Harvest	70	0	70
	Manage for Understory	13	0	13
	On-site Visit	14	60	74
	Re-inventory	19	12	31
	Total	**301**	**684**	**985**
Norway Pine	Clearcut-with Reserves	165	243	407
	Shelterwood	61	40	101
	Uneven-aged Harvest	0	10	10
	Intermediate Harvest	116	0	116
	Commercial Thinning	4,567	14,600	19,167
	Selective Thinning-Commercial	3	179	182
	Salvage Cut - Selective Harvest	0	51	51
	Manage for Understory	46	0	46
	On-site Visit	304	395	699
	Re-inventory	244	148	392
	Total	**5,505**	**15,665**	**21,170**
Jack Pine	Clearcut-with Reserves	527	2,892	3,419
	Seed Tree	20	0	20
	Shelterwood	76	0	76
	Slavage-Clearcut	0	11	11
	Salvage-w/Rsvr-Clearcut-I&D	0	8	8
	Uneven-aged Harvest	4	82	86
	Commercial Thinning	139	15	154
	Sanitation Cut - Selective Harvest	0	60	60
	Manage for Understory	12	30	42
	On-site Visit	184	134	319
	Re-inventory	186	115	301
	Total	**1,148**	**3,346**	**4,494**

Covertype	Prescription	Chippewa Plains	Pine Moraines and Outwash Plains	Total
White Spruce	Clearcut-with Reserves	166	136	302
	Seed Tree	0	74	74
	Uneven-aged Harvest	0	25	25
	Commercial Thinning	963	2,334	3,297
	Manage for Understory	9	0	9
	On-site Visit	142	84	226
	Re-inventory	25	12	37
	Total	**1,305**	**2,664**	**3,969**
Balsam Fir	Clearcut-with Reserves	394	727	1,120
	Seed Tree	5	0	5
	Salvage-w/Rsvr-Clearcut-I&D	0	28	28
	Uneven-aged Harvest	122	32	155
	Commercial Thinning	0	2	2
	Manage for Understory	89	67	156
	On-site Visit	256	149	405
	Re-inventory	277	56	333
	Total	**1,143**	**1,061**	**2,204**
Lowland Black Spruce	Clearcut-with Reserves	2,145	0	2,145
	Seed Tree	144	11	155
	Salvage Cut - Selective Harvest	16	0	16
	Manage for Understory	74	0	74
	On-site Visit	491	4	495
	Re-inventory	167	31	198
	Total	**3,038**	**45**	**3,083**
Tamarack	Clearcut-with Reserves	953	998	1,951
	Seed Tree	4,255	132	4,387
	Seed Tree-with Reserves	179	0	179
	Commercial Thinning	32	0	32
	Manage for Understory	30	6	36
	On-site Visit	638	60	697
	Re-inventory	388	70	457
	Total	**6,474**	**1,266**	**7,740**
White Cedar	Manage for Understory	12	0	12
	On-site Visit	92	0	92
	Re-inventory	58	0	58
	Total	**162**	**0**	**162**
Stagnant Tamarack*	Re-inventory	8	0	8
	Total	**8**	**0**	**8**
Stagnant Cedar*	On-site Visit	14	0	14
	Total	**14**	**0**	**14**
Offsite Oak*	Clearcut-with Reserves	0	91	91
	Shelterwood	0	20	20
	Manage for Understory	0	13	13
	On-site Visit	16	0	16
	Total	**16**	**124**	**140**

Covertype	Prescription	Chippewa Plains	Pine Moraines and Outwash Plains	Total
Cutover Area*	On-site Visit	110	31	141
	Re-inventory	391	421	812
	Total	**500**	**452**	**952**
Lowland Grass*	Uneven-aged Harvest	18	0	18
	On-site Visit	6	0	6
	Re-inventory	4	11	16
	Total	**28**	**11**	**40**
Upland Grass*	Clearcut-with Reserves	0	4	4
	On-site Visit	22	203	225
	Re-inventory	6	70	76
	Total	**28**	**277**	**304**
Lowland Brush*	Clearcut-with Reserves	39	0	39
	Commercial Thinning	22	18	40
	Manage for Understory	15	0	15
	On-site Visit	438	0	438
	Re-inventory	125	0	125
	Total	**639**	**18**	**657**
Upland Brush*	On-site Visit	13	33	46
	Re-inventory	0	50	50
	Total	**13**	**82**	**96**
Agriculture *	On-site Visit	0	21	21
	Total	**0**	**21**	**21**
Industrial Dev*	On-site Visit	12	0	12
	Re-inventory	0	8	8
	Total	**12**	**8**	**20**
Recreation Dev*	Re-inventory	0	6	6
	Total	**0**	**6**	**6**
Roads*	Re-inventory	12	0	12
	Total	**12**	**0**	**12**
Marsh*	Re-inventory	71	0	71
	Total	**71**	**0**	**71**
	Total	**35,931**	**61,060**	**96,991**

***** During selection of the 10-Year Stand Exam List, stands were selected and prescriptions recorded under these cover type designations based on field knowledge, experience and air photo interpretation. Final prescriptions will be determined following site visits.

7.9 Stand Age Summary

Tables 7.9a and 7.9b show the average stand age by cover type at the time of stand selection (2007) for stands selected for treatment during the 10-year plan period.

Table 7.9a 10-Year Summary: Average Age of Stands Selected for Treatment for Cover Types Managed Primarily by Even-Aged Harvest Methods

Cover Type	Rotation Age Type[1]	SFRMP Rotation Ages[1]		Chippewa Plains	Pine Moraines & Outwash Plains	Target (DFFC) Ave. Treatment Age (Both Subsections)	Average for Both Subsections
		CP	PMOP				
Ash	N/A	N/A	N/A	101		N/A	101
Lowland Hardwoods	N/A	N/A	N/A		71	N/A	71
Aspen	Normal	45	40	59	65	42	63
	ERF	80	75	65	71	73	70
Birch	Normal	50	50	79	76	50	77
	ERF	65	60	71	76	62	75
Bam	Normal	40	40	72		42	72
	ERF	60	60	71	80	73	74
Northern Hardwoods	N/A	N/A	N/A	62	85	N/A	81
Oak	Normal	80/50[2]	80/50[2]	101	80	80/50	80
	ERF	120/80[2]	120/80[2]	86	83	113/70	83
White Pine	N/A	N/A	N/A	124	40	N/A	61
Norway Pine	Normal	100	100	114	89	100	105
	ERF	170	170	106	97	154	99
Jack Pine	Normal	40	40	63	60	40	61
	ERF	65	65	68	66	60	66
White Spruce	Normal	60	50	65	68	60/50[3]	66
	ERF	90	60	63	59	80/60[3]	61
Balsam Fir	Normal	45	45	68	68	45	68
	ERF	60	60	75	72	57	73
Lowland Black Spruce	Normal	65/95[2]	65/95[2]	113		95/65[4]	113
	ERF	95/130[2]	95/130[2]	123	122	126/87[4]	123
Tamarack	Normal	60	70	114	112	61	114
	ERF	105	105	113	127	95	117
Stagnant Cedar	N/A	N/A	N/A		58	N/A	58

[1]Rotation ages as determined by Division of Forestry. Rotation ages were only determined for cover types to be managed as even-aged.
[2]Rotation ages are different based on site index for these species. See Table 3.1e , Chapter 3.
[3]First target average treatment age is for natural stands. Second average is for plantations.
[4]Target average treatment age is split between two site index ranges. See Table 3.1e, Chapter 3.

Table 7.9b 10-Year Summary: Average Age of Stands Selected for Treatment for Cover Types Managed Primarily by Selective and Thinning Harvest Methods

Cover Type	Rotation Age Type[1]	SFRMP Rotation Ages[1]		Chippewa Plains	Pine Moraines & Outwash Plains	Average for Both Subsections
Ash	N/A	**CP**	**PMOP**	96	89	94
Lowland Hardwoods	N/A	N/A	N/A	96	87	96
Aspen	Normal	45	40	52	65	60
	ERF	80	75	61	67	64
Birch	Normal	50	50	77	71	76
	ERF	65	60	76	75	76
Bam	Normal	40	40	76	56	75
	ERF	60	60	76	71	74
Northern Hardwoods	N/A	N/A	N/A	81	81	81
Oak	Normal	80/50[2]	80/50[2]	84	79	81
	ERF	120/80[2]	120/80[2]	88	90	89
White Pine	ERF	N/A	N/A	95	63	70
Norway Pine	Normal	100	100	52	39	43
	ERF	170	170	58	45	49
Jack Pine	Normal	40	40	60	60	60
	ERF	65	65	58	63	60
White Spruce	Normal	60	50	31	28	29
	ERF	90	60	42	34	36
Balsam Fir	Normal	45	45	71	79	73
	ERF	60	60	72	71	72
Lowland Black Spruce	Normal	65/95[2]	65/95[2]	97	49	93
	ERF	95/130[2]	95/130[2]	104		104
Tamarack	Normal	60	70	113	92	111
	ERF	105	105	115	119	116
White Cedar	ERF	N/A	N/A	100		100
Stagnant Tamarack	N/A	N/A	N/A	80		80
Stagnant Cedar	N/A	N/A	N/A	140		140
Offsite Oak	Normal	N/A	N/A	96	110	103
	ERF	N/A	N/A	75		75

[1]Rotation ages as determined by Division of Forestry Rotation ages were only determined for cover types to be managed as even-aged.
[2]Rotation ages are different based on site index for these species. See Table 3.1e, Chapter 3.

7.10 Stand Selection Summary by Subsection, Forestry Area, and Cover type

Table 7.10a summarizes by subsection the planned stand examination acres by Forestry Area.

Table 7.10a CP- PMOP: 10-Year Planned Stand Examination Acres by Forestry Area

Covertype	Bemidji	Blackduck	Brainerd	Park Rapids	Detroit Lakes	Deer River	Little Falls	Total
Ash	265	260	273	276	42	689	0	1,806
Lowland Hardwoods	121	121	37	12	8	125	0	425
Aspen	5,145	2,932	7,764	12,520	1,045	1,611	301	31,319
Birch	712	434	1,970	258	44	491	0	3,909
Balm of Gilead	154	146	54	15	0	277	0	646
Northern Hardwoods	2,022	1,317	1,122	739	587	357	42	6,186
Oak	532	30	4,428	998	255	32	265	6,539
White Pine	148	99	422	117	94	60	47	985
Norway Pine	3,675	824	5,284	9,799	254	1,336	0	21,170
Jack Pine	1,107	52	486	2,840	0	9	0	4,494
Scotch Pine	0	0	7	7	0	0	0	14
White Spruce	1,014	251	768	1,501	165	271	0	3,969
Balsam Fir	632	342	323	605	33	269	0	2,204
Lowland Black Spruce	543	1,188	31	0	0	1,322	0	3,083
Tamarack	1,876	1,082	142	792	98	3,594	157	7,740
White Cedar	81	58	0	0	0	23	0	162
Stagnant Tamarack*	8	0	0	0	0	0	0	8
Stagnant Cedar*	0	0	0	0	0	14	0	14
Offsite Oak*	11	0	0	104	0	5	20	140
Cutover Area*	544	0	43	338	6	21	0	952
Lowland Grass*	28	0	0	11	0	0	0	40
Upland Grass*	28	0	0	273	4	0	0	304
Lowland Brush*	106	197	0	18	0	336	0	657
Upland Brush*	13	0	0	82	0	0	0	96
Agriculture*	0	0	0	18	4	0	0	21
Industrial Dev*	0	0	0	8	0	12	0	20
Recreation Dev*	0	0	6	0	0	0	0	6
Roads*	0	0	0	0	0	12	0	12
Marsh*	71	0	0	0	0	0	0	71
Total	**18,837**	**9,333**	**23,157**	**31,330**	**2,639**	**10,864**	**831**	**96,991**

* During selection of the 10-Year Stand Exam List, stands were selected and prescriptions recorded under these cover-type designations based on field knowledge, experience and air photo interpretation. Final prescriptions will be determined following site visits.

7.11 New Access Needs

7.11A Purpose

The primary purpose of identifying new access needs in SFRMP planning is to provide an estimate of general location, miles, and type of new access needed to implement the 10-year plan. The preliminary access needs information also:

- provides a general assessment of new state forest road construction needs for budget development;
- identifies access that will require a USFS (or other public or private) road use permit or special use permit; and

- addresses access, habitat fragmentation, and road density concerns via post-sale access management intentions.

7.11B Scope

The scope of identifying new access needs in the CP-PMOP Plan is limited to:

- estimating the miles of new state forest road and new temporary access needed to access stands identified for treatment in the 10-Year Stand Exam List; and,
- identifying (tagging) stands for which new access is needed.

Developing a comprehensive access plan for all land ownerships within the subsections is beyond the scope of CP-PMOP SFRMP planning. Establishing a guideline for maximum road/trail density in these subsections is also beyond the scope of this plan. The DNR cooperates and coordinates with other landowners on road and trail use and development. This cooperation and coordination will be used to minimize new road/access development, forest fragmentation, and disturbance to wildlife.

Map 7.11.1a and Map 7.11.1b displays those stands identified for treatment during the plan period (FY2009-2018) that require some type of new access construction. See Appendix T (*10-Year Stand Exam List and New Access Needs List Instructions and Attachments)* for definitions and descriptions of types of access.

As part of the *Interdisciplinary Forest Management Coordination Framework,* staff from the Management Section of Wildlife, Forestry and Ecological Resources have an opportunity to review the New Access Needs Lists and advise on the type of access needed and post-use disposition. In addition, as part of annual coordination meetings, prior to completion of the Forestry Area Annual Stand Exam Lists, consultation with the appropriate staff on the location of new access routes will occur where endangered, threatened, or special concern species, rare native plant communities, or other significant non-timber forest resources may be affected.

7.11C DNR Road Classifications

The following DNR forest road classifications were used in identifying new access needs:

System Roads
These roads are the major roads in the forest that provide forest management and recreational access. These roads are open to all motorized vehicles but can be closed temporarily to address seasonal road or fire conditions.

Minimum Maintenance Roads
These roads are used for forest management access on an intermittent, as-needed basis. Recreational users may use them, but the roads are not promoted or maintained for recreation. The roads are open to all motorized vehicles but can be temporarily closed to address road deterioration or fire conditions.

Resource Management Access Routes
These routes are used only during management activity. They are not immediately needed after management activity ends but the corridor is preserved for future management activity. Specific closure methods (e.g., gate, berm, rocks, or felled timber) are determined at the time the route is established. These routes are closed to all motorized recreation use (for hunting, trapping, etc. exceptions, see Minnesota Statutes 84.926).

Temporary Access Routes
If the access route does not fit into one of the first three options, it must be abandoned and the site reclaimed so evidence of a travel route is minimized. Temporary access routes are used only during management activity. They are closed to all motorized recreation use (for hunting, trapping, etc. exceptions, see Minnesota Statutes 84.926).

7.11D Interdisciplinary Review of Access Planning

New access needs were identified by field staff (with interdisciplinary input and/or review) after stands were identified for inclusion on the 10-Year Stand Exam List. Details on the directions provided to field staff for identifying new access needs are included in Appendix T, *Stand Exam List and New Access Needs List Instructions and Attachments.*

The new access needs maps included in this chapter show the stand locations where new access routes are needed. The SFRMP process does not identify, map, or digitize detailed routes for the identified new access needs. Actual route layout will occur on the ground at the time of project implementation.

Note: The maps have been reduced and printed in grayscale in this document. It is recommended that these maps be viewed at a larger scale and in color. The colored maps and this report can be viewed at http://www.dnr.state.mn.us/forestry/subsection/cp_pmop/index.html, and are available in CD format.

7.11E New Access Needs Results

Of the 5,985 total stands on the 10-Year Stand Exam List, 360 stands, or 6 percent required some type of new access designation, permit or construction. The New Access Needs List process identified a need for 139.2 miles of new access in the CP-PMOP subsections. These access routes have been classified as 18.4 miles of Resource Management Access Routes and 120.8 miles of Temporary Access Routes. The road classification, mileage, and closure method will be finalized when field staff completes the actual on-the-ground road layout. Interdisciplinary review will be followed if significant changes or alterations are made following the stand site visits.

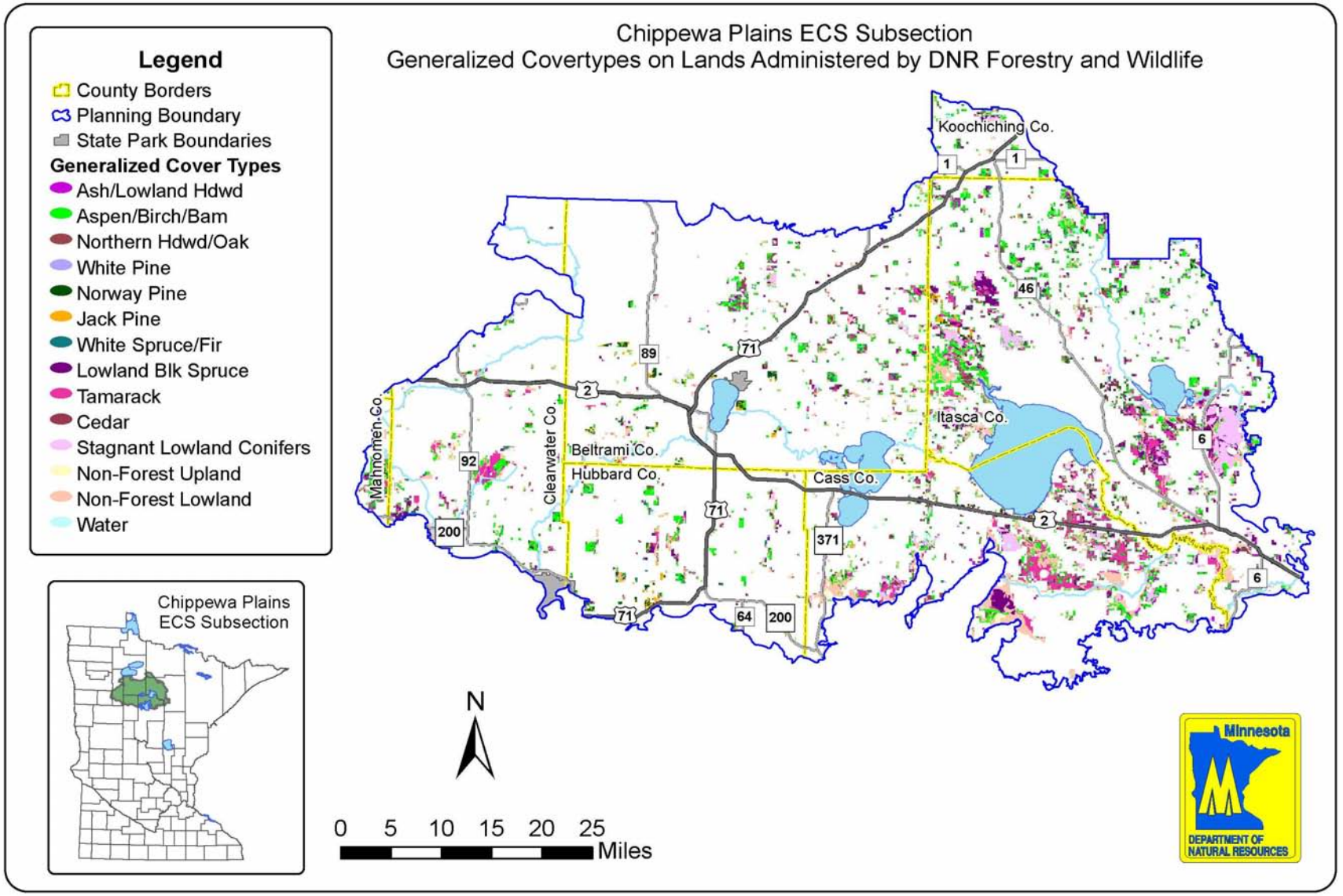
Table 7.11a summarizes the number of miles by new access route type needed to access the stands in the 10-year Stand Exam List for the CP-PMOP subsections.

Map 7.11.1a and Map 7.11b, *Stands Requiring New Access* construction, identifies those stands from the 10-Year Stand Exam List that required new construction as either a Temporary Access Route or a Resource Management Access Route.

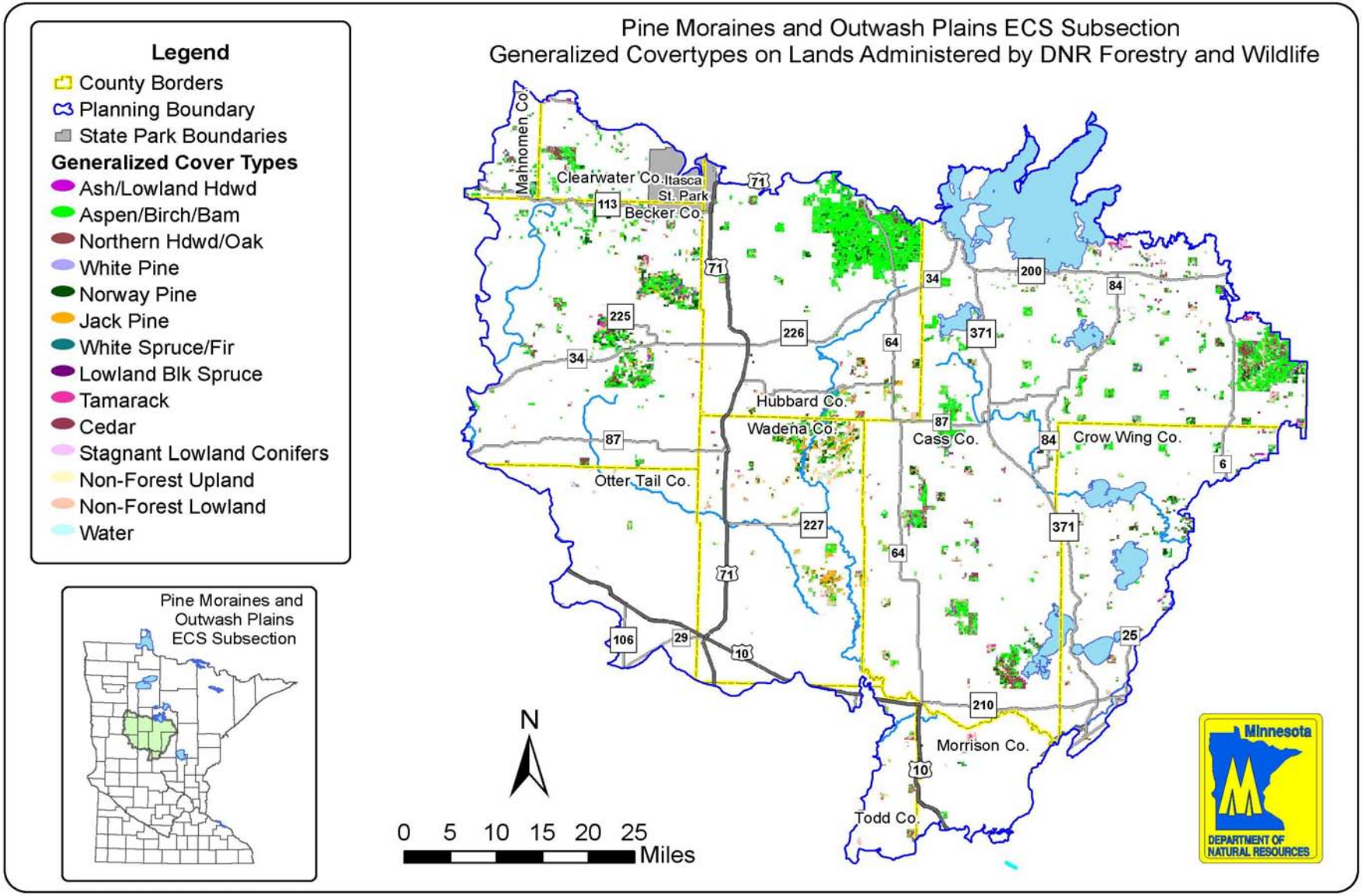
Table 7. 11a New Access Needs Miles by Subsection, Season of Use, and Access Type

Subsection	Season of Use	Miles of Resource Management Access Route	Miles of Temporary Access Route	Total Miles
CP	Summer	0.2	2.2	2.4
	Winter	14.0	49.3	63.3
CP Total		**14.2**	**51.5**	**65.7**
PMOP	Summer	1.6	34.5	36.1
	Winter	2.6	34.8	37.4
PMOP Total		**4.2**	**69.3**	**73.5**
CP-PMOP Total		**18.4**	**120.8**	**139.2**

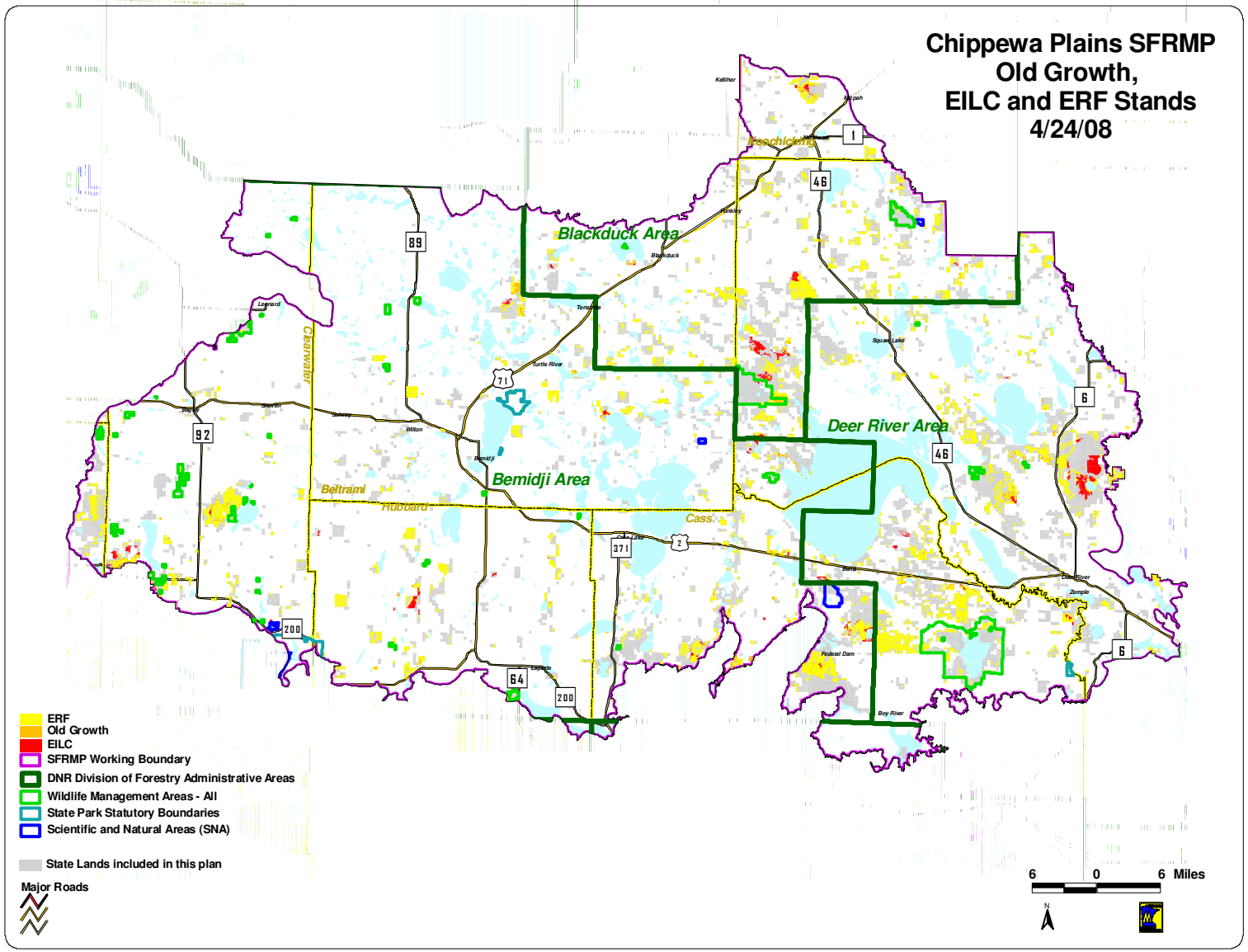
Map 7.4.1a DNR-Administered Lands by Generalized Cover Types - Chippewa Plains ECS Subsection



Map 7.4.1b DNR-Administered Lands by Generalized Cover Types – Pine Moraines and Outwash Plains ECS Subsection

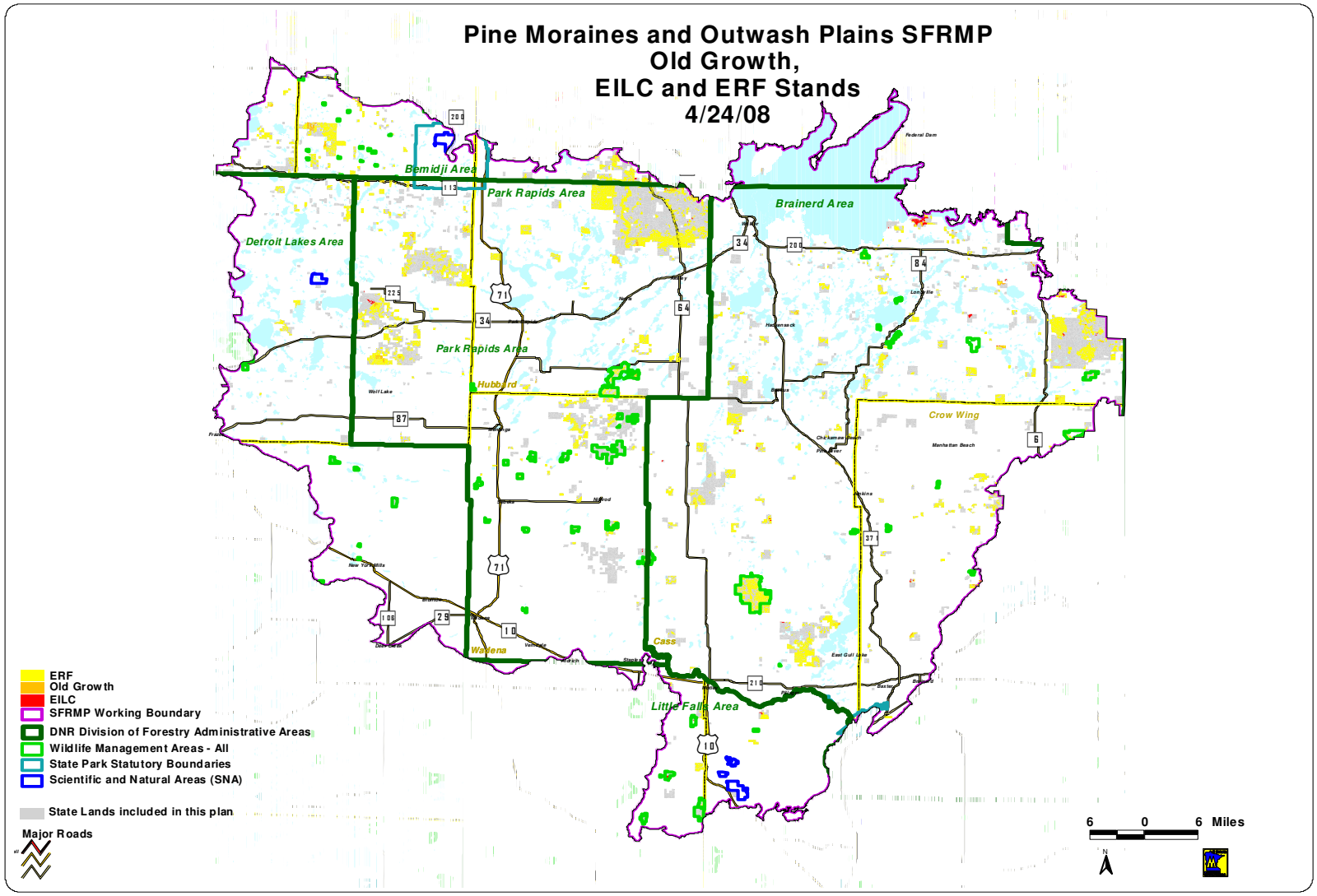


Map 7.4.2a Old Growth, EILC, and ERF Stands - Chippewa Plains

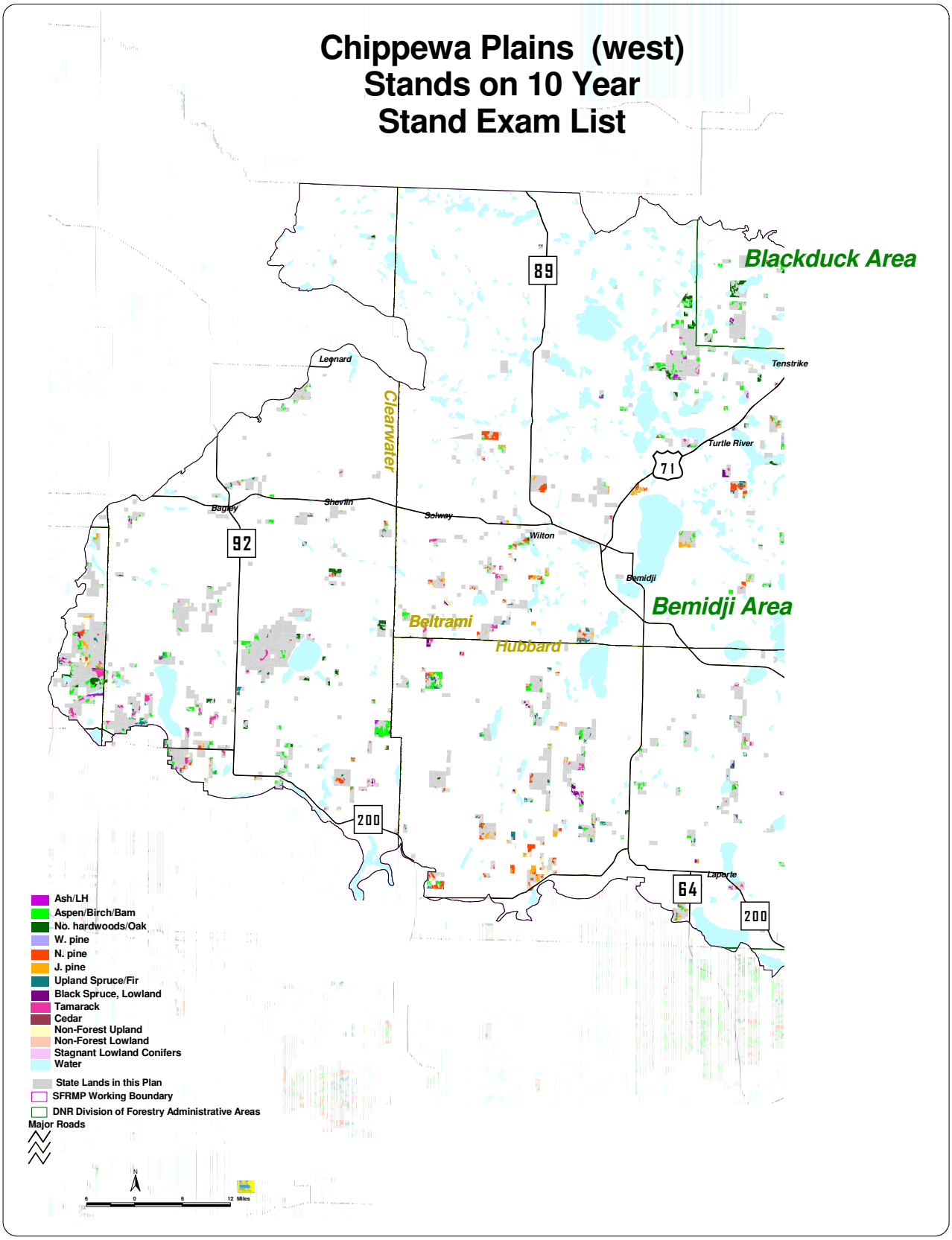


Note: The maps have been reduced and printed in grayscale in this document. It is recommended that these maps be viewed at a larger scale and in color. The colored maps and this report can be viewed at :
http://www.dnr.state.mn.us/forestry/subsection/cp_pmop/index.html

Map 7.4.2b Old Growth, EILC, and ERF Stands - Pine Moraines and Outwash Plains



Map 7.4.3a Stands Identified for Treatment by Generalized Cover Type
Chippewa Plains (West)



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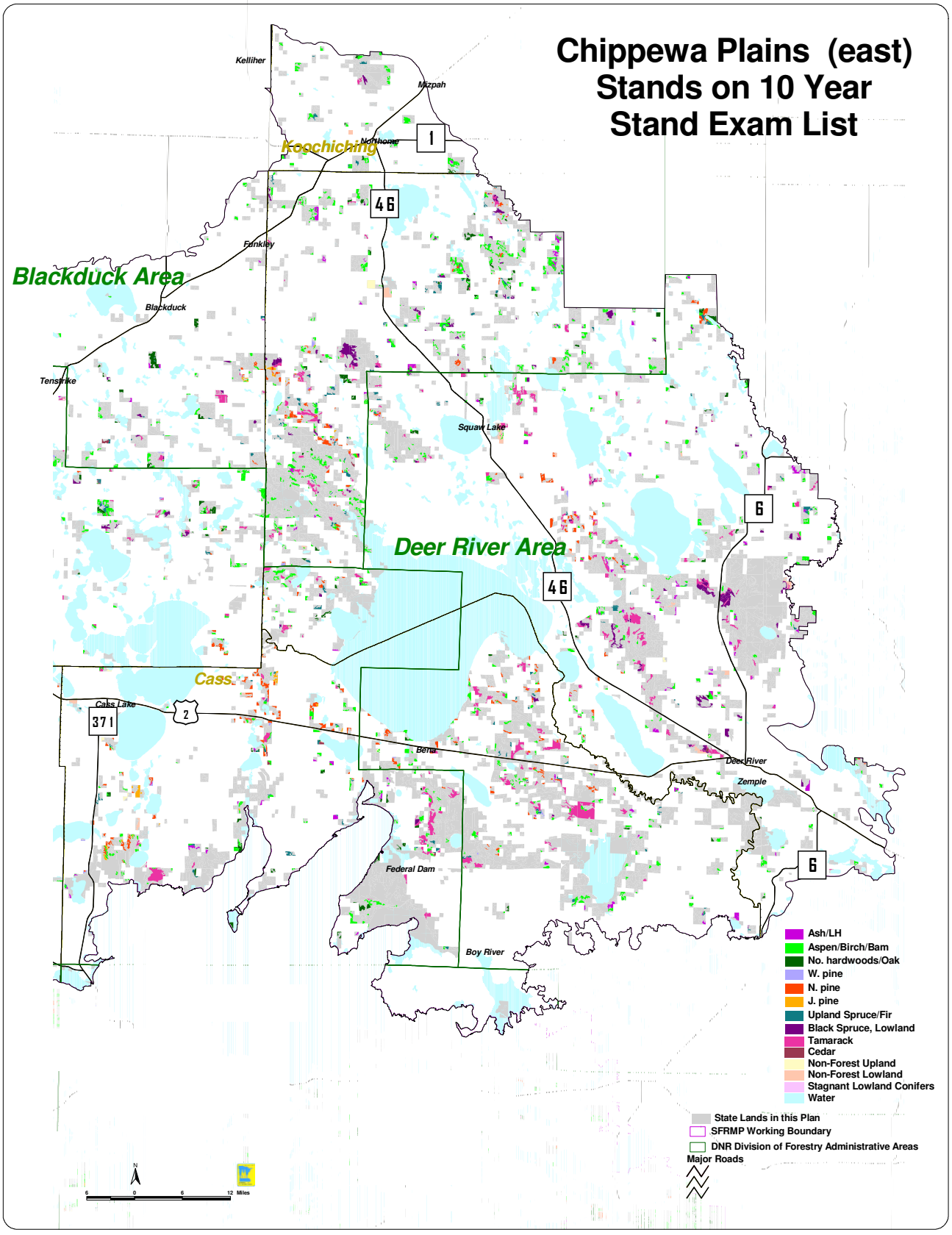
Map 7.4.3b Stands Identified for Treatment by Generalized Cover Type
Chippewa Plains (East)



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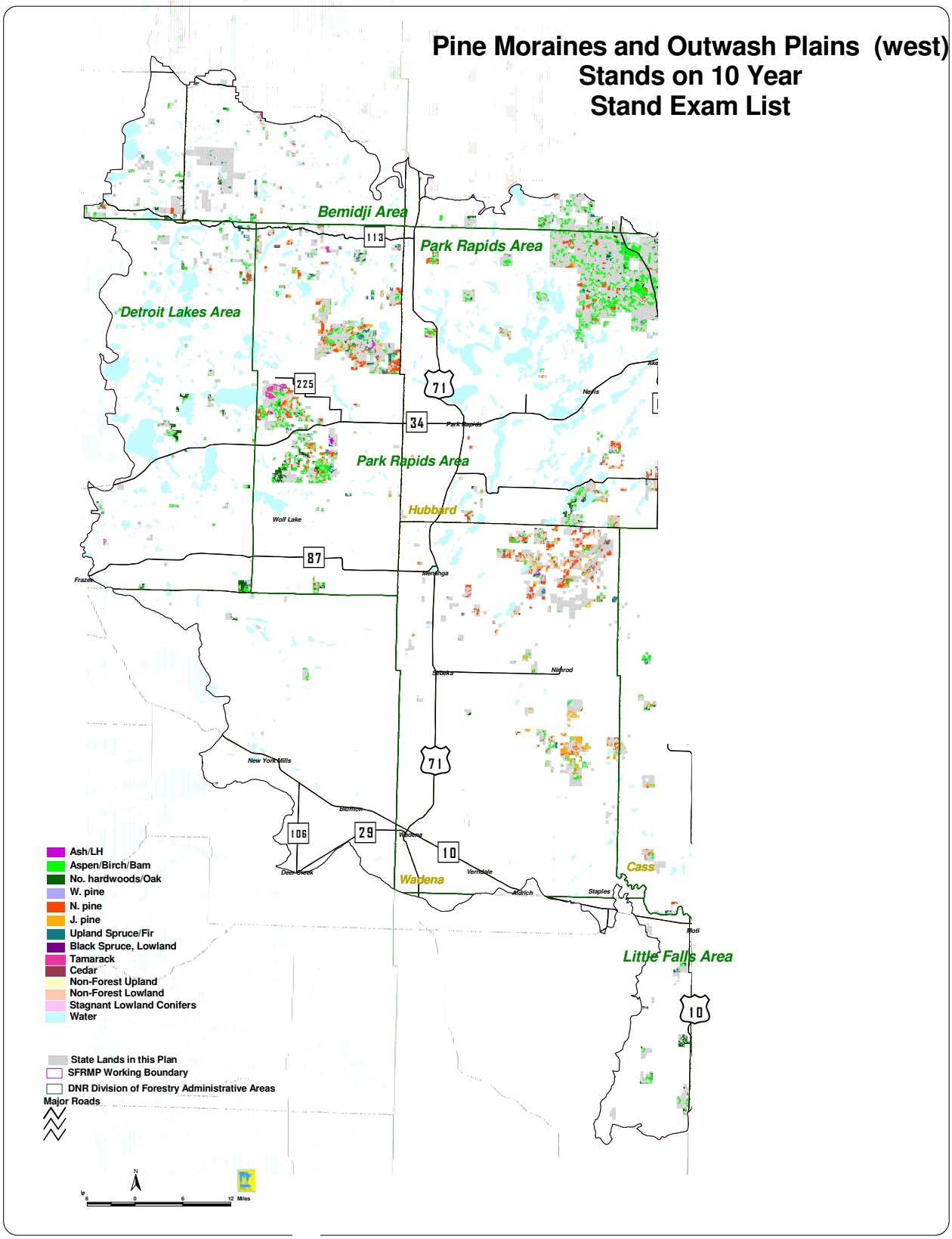
Map 7.4.3c Stands Identified for Treatment by Generalized Cover Type
Pine Moraines and Outwash Plains (West)



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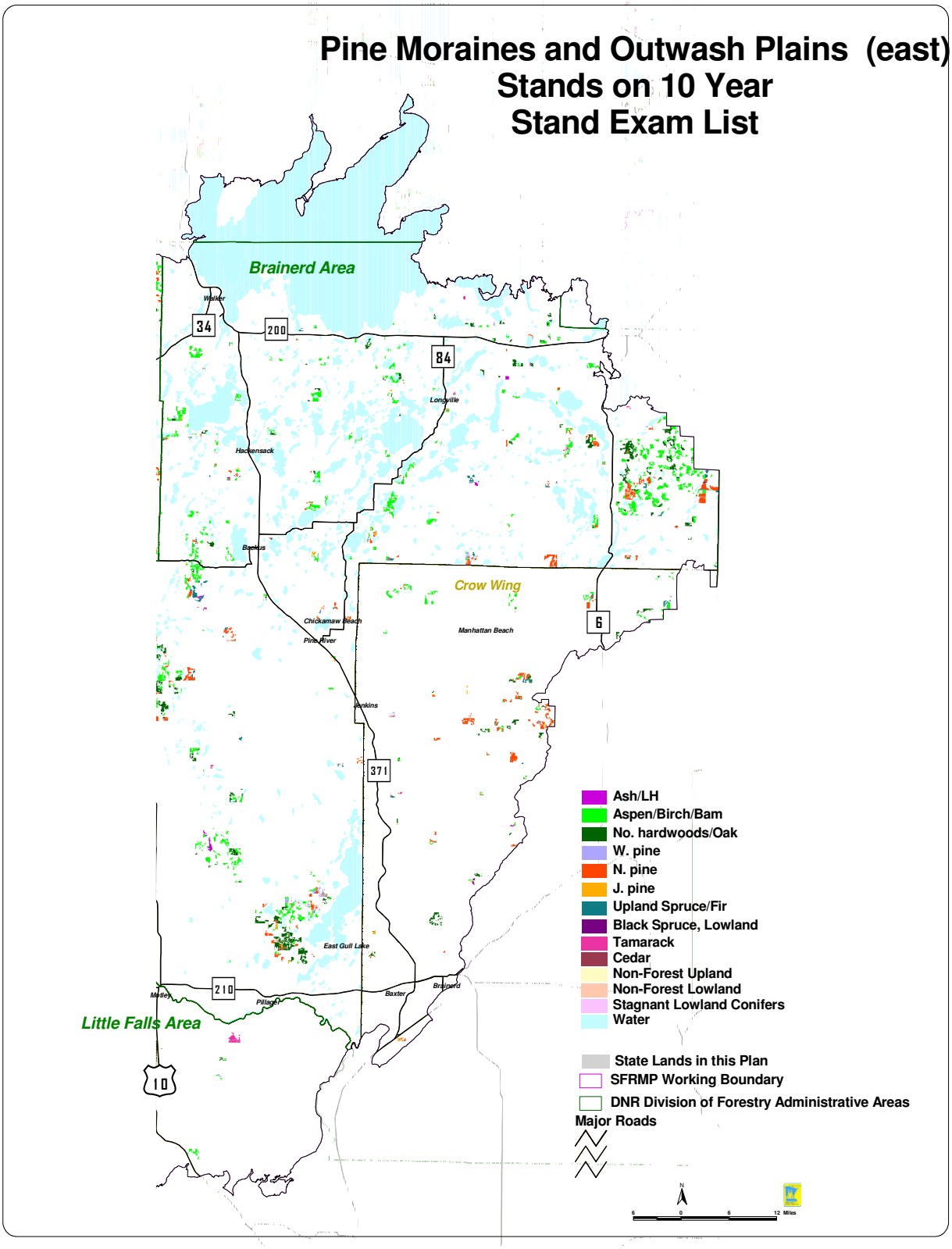
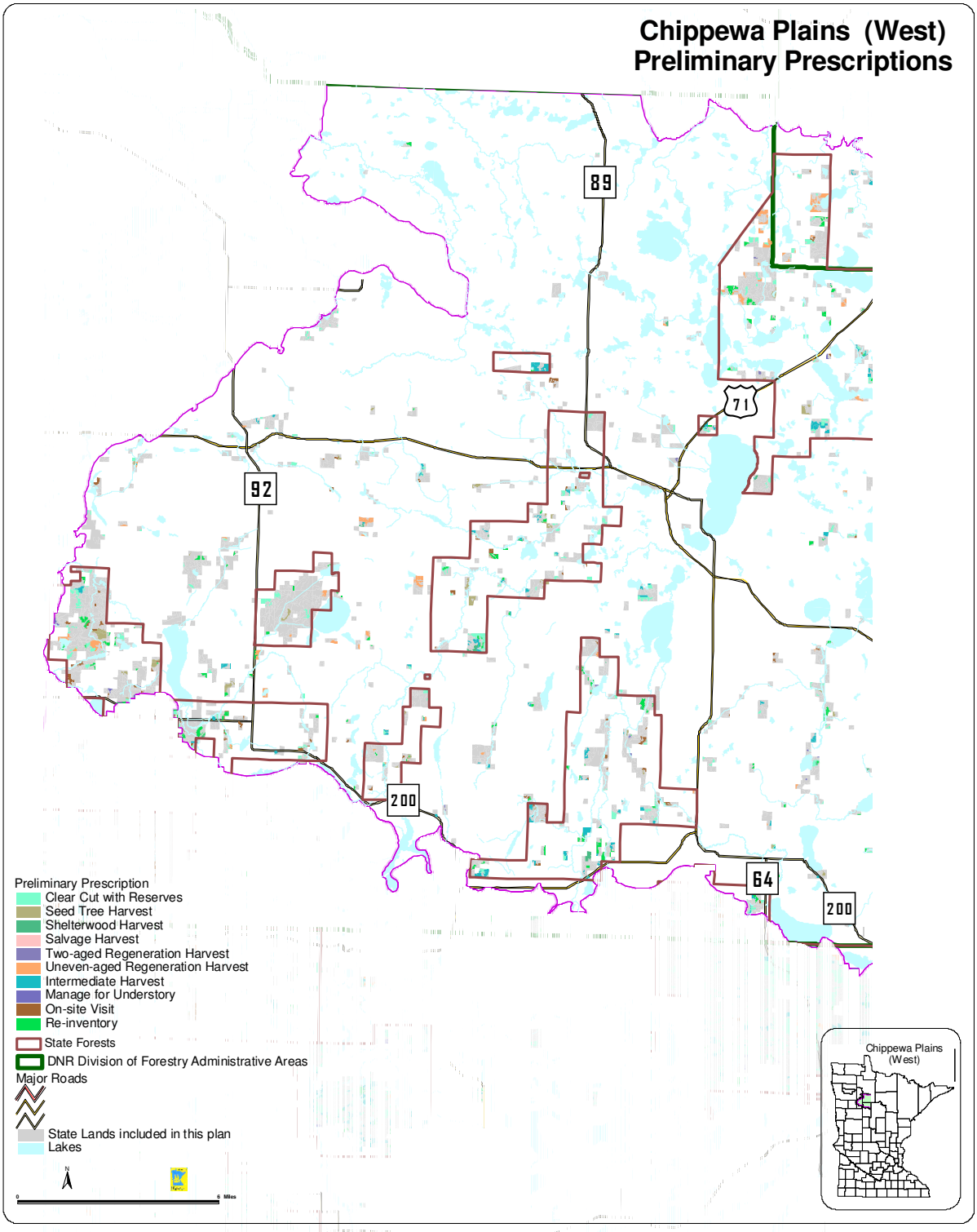
http://www.dnr.state.mn.us/forestry/subsection/cp_pmop/index.html

Map 7.4.3d Stands Identified for Treatment by Generalized Cover Type
Pine Moraines and Outwash Plains (East)



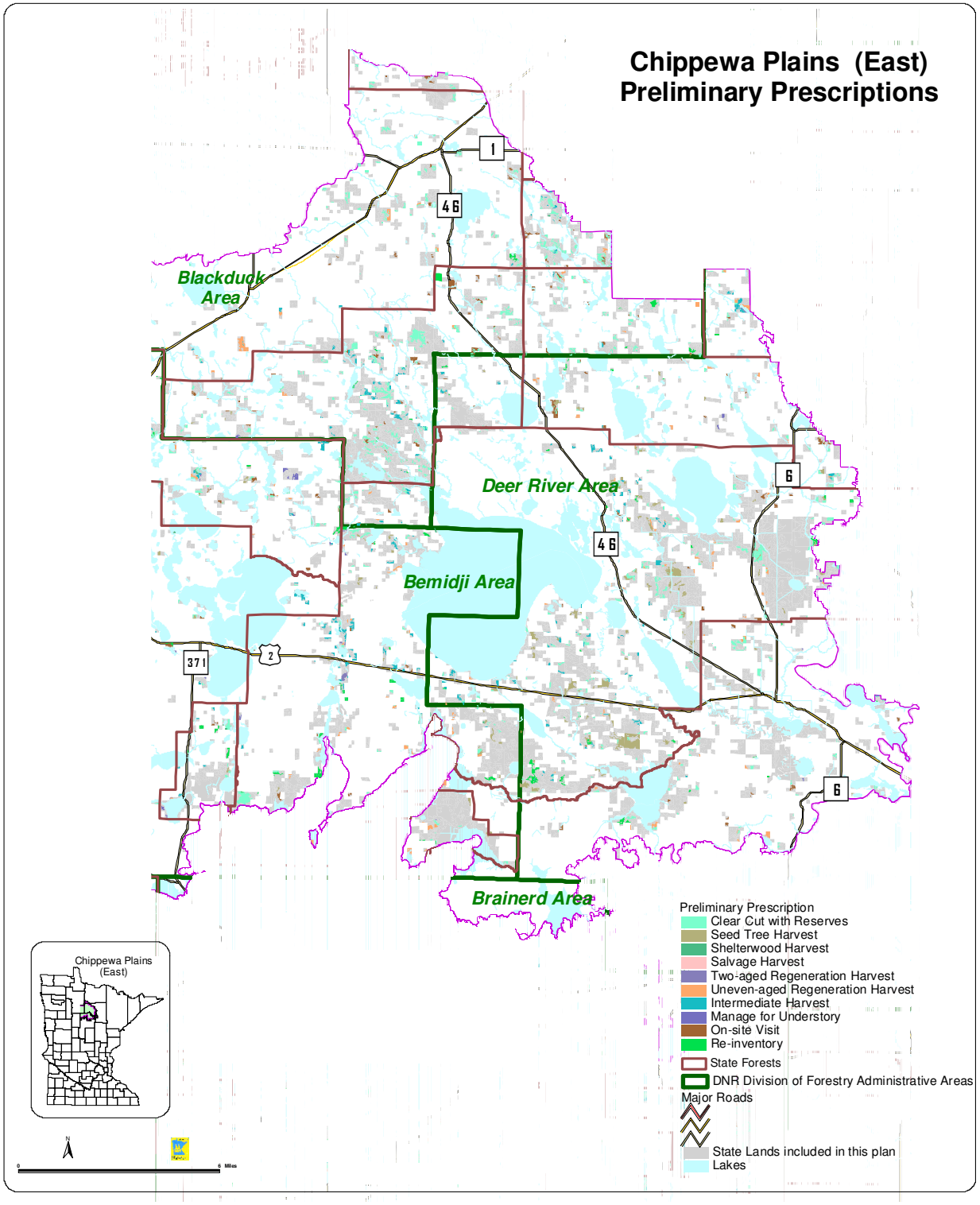
Note: The maps have been reduced and printed in grayscale in this document. It is recommended that these maps be viewed at a larger scale and in color. The colored maps can be viewed at:
http://www.dnr.state.mn.us/forestry/subsection/cp_pmop/index.html

Map 7.4.4a Stands Identified for Treatment by Preliminary Prescriptions Chippewa Plains (West)



Note: The maps have been reduced and printed in grayscale in this document. It is recommended that these maps be viewed at a larger scale and in color. The colored maps can be viewed at: *http://www.dnr.state.mn.us/forestry/subsection/cp_pmop/index.html*

Map 7.4.4b Stands Identified for Treatment by Preliminary Prescriptions
Chippewa Plains (East)



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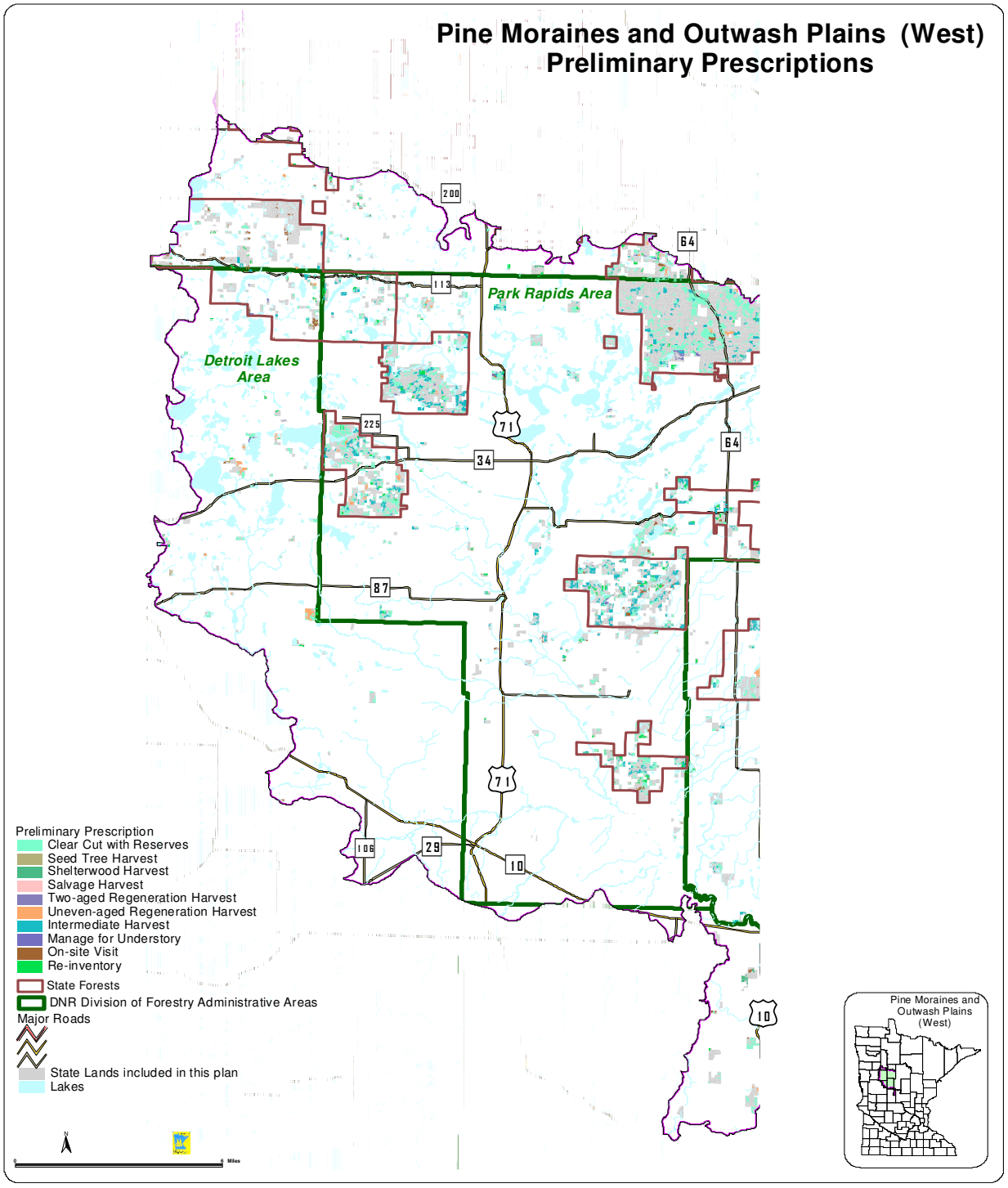
http://www.dnr.state.mn.us/forestry/subsection/cp_pmop/index.html

Map 7.4.4c Stands Identified for Treatment by Preliminary Prescriptions
Pine Moraines and Outwash Plains (West)



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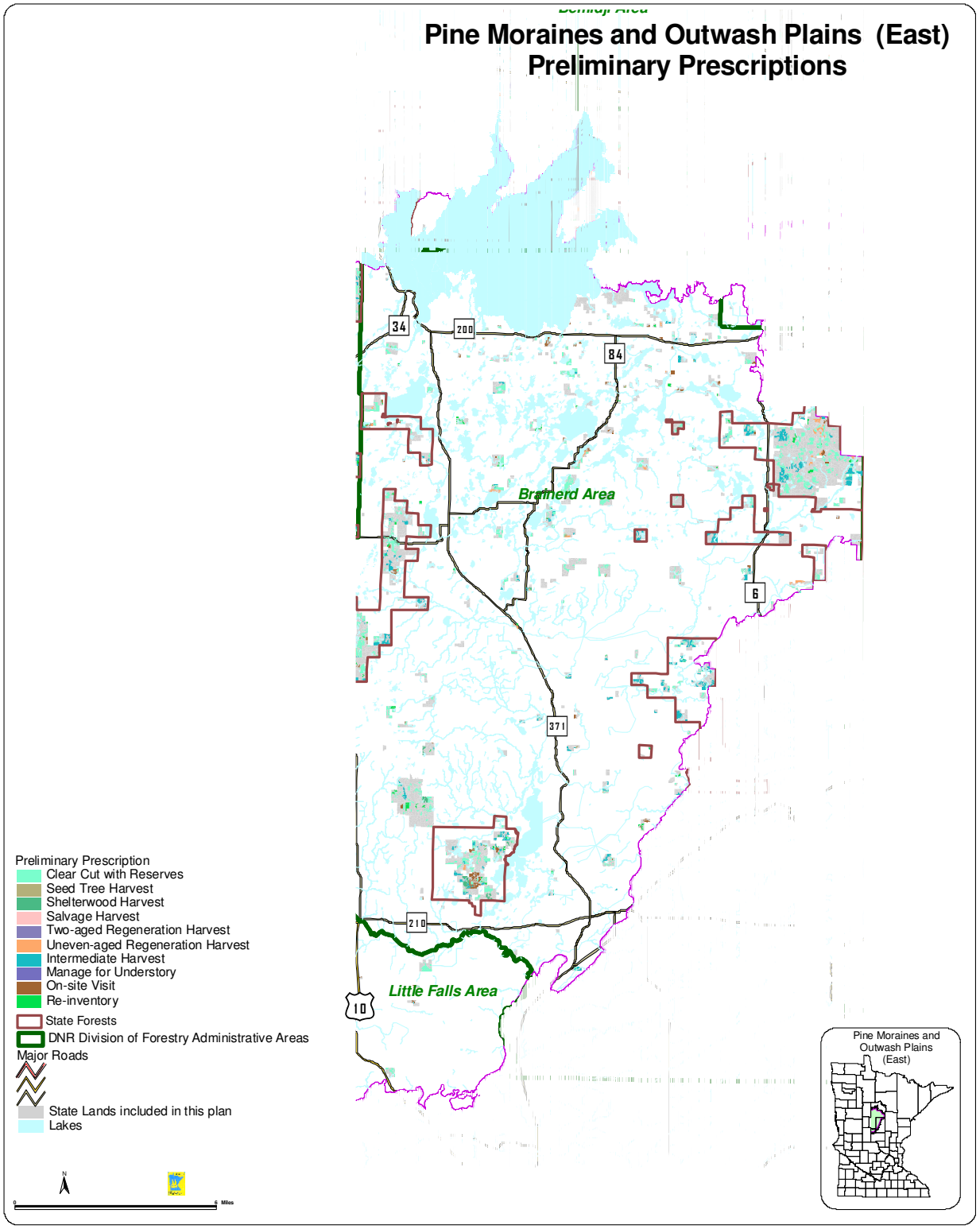
Map 7.4.4d Stands Identified for Treatment by Preliminary Prescriptions
Pine Moraines and Outwash Plains (East)



Note: The maps have been reduced and printed in grayscale in this document. It is recommended that these maps be viewed at a larger scale and in color. The colored maps can be viewed at:
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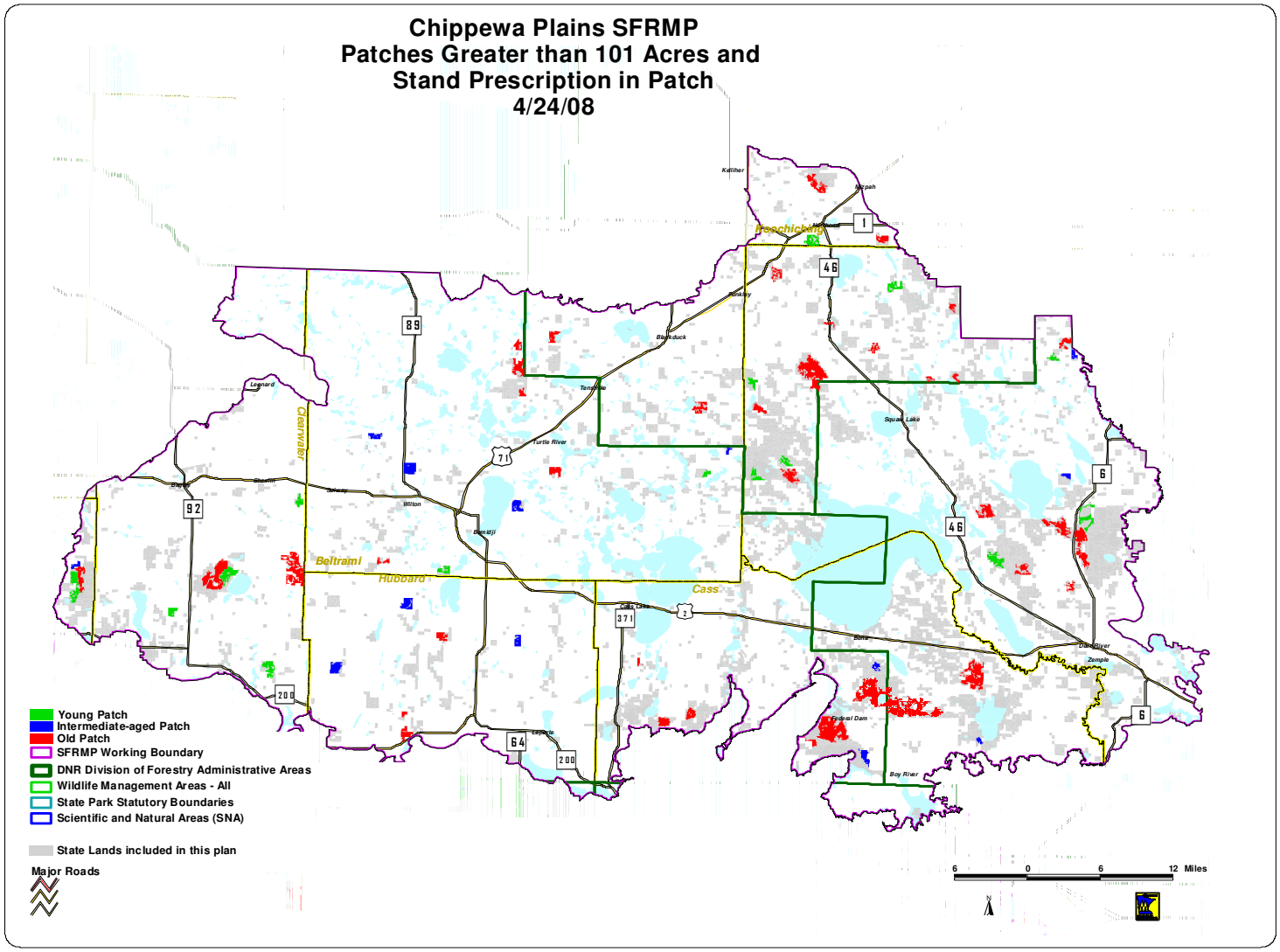
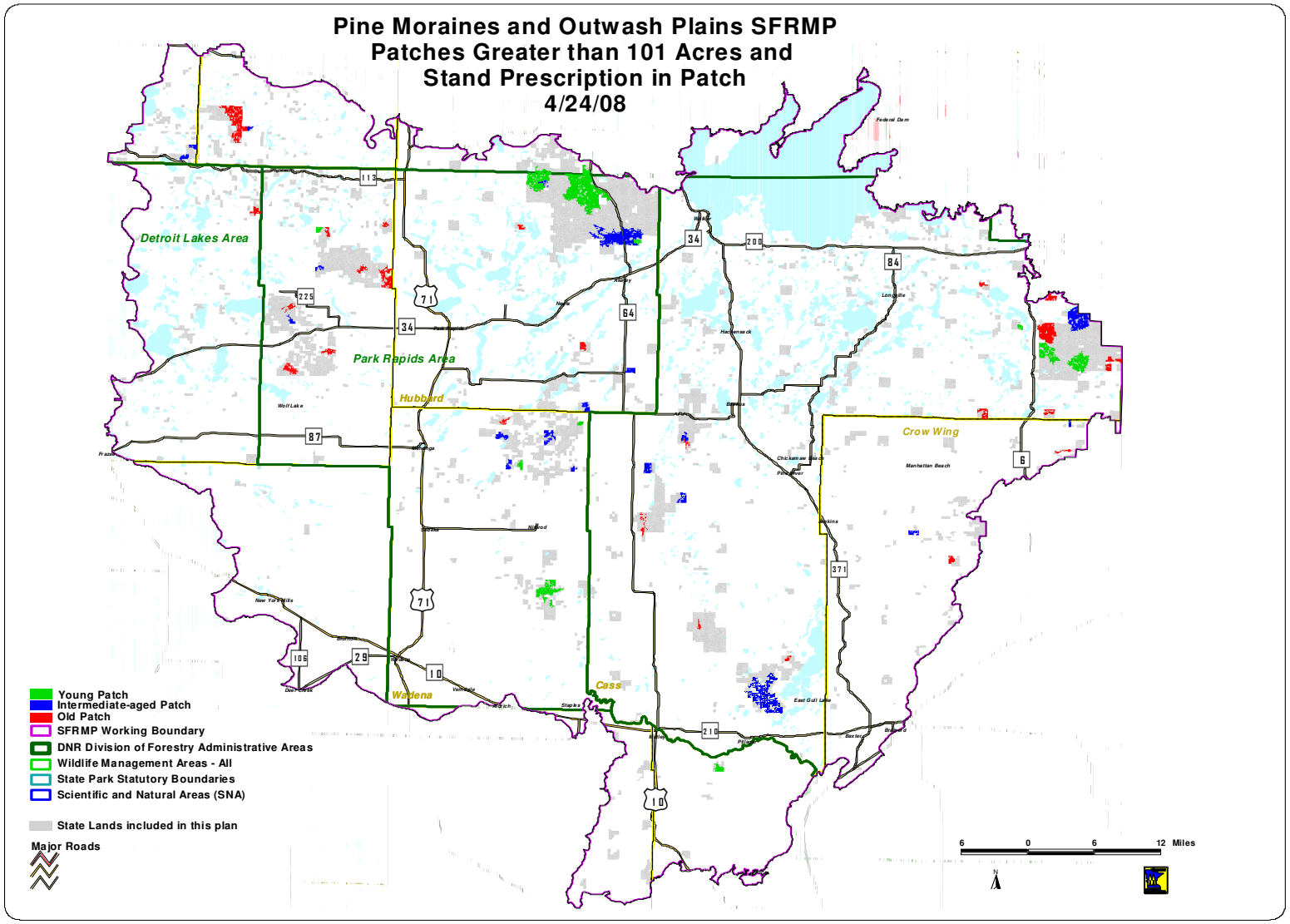
Map 7.4.5a Patches Greater than 101 Acres and Stand Prescription in Patch
Chippewa Plains

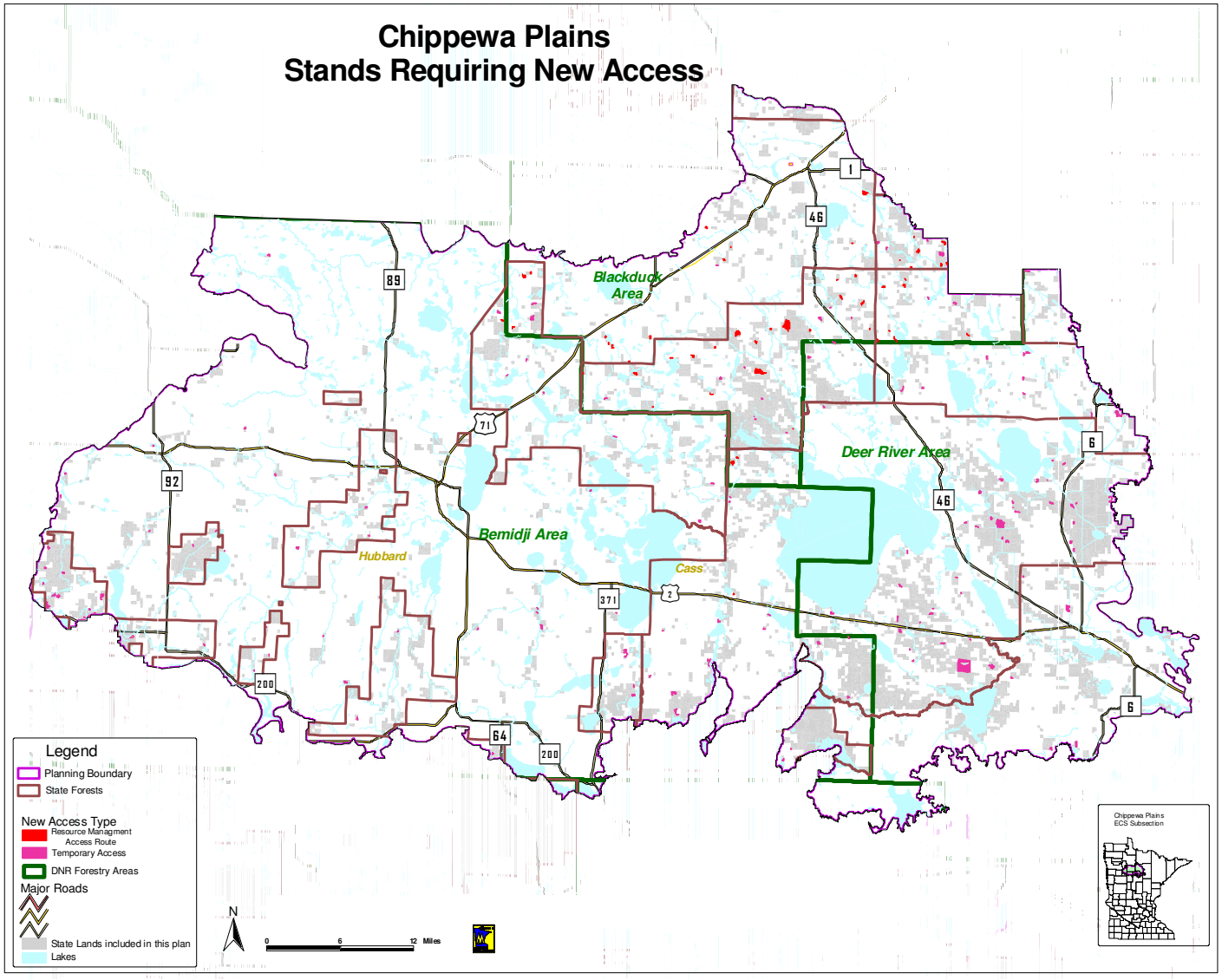


Map 7.4.5b Patches Greater than 101 Acres and Stand Prescription in Patch
Pine Moraines and Outwash Plains



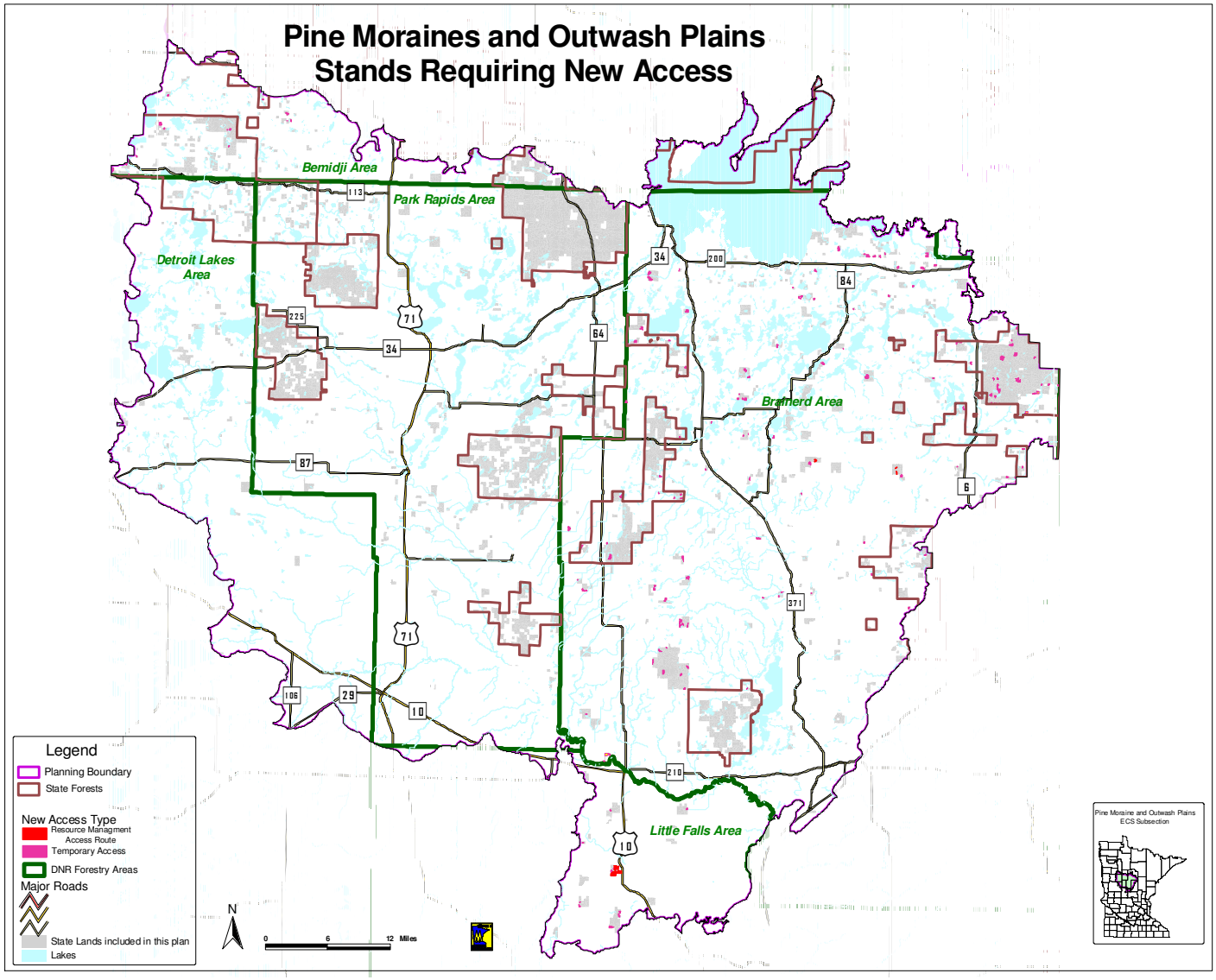
Note: The maps have been reduced and printed in grayscale in this document. It is recommended that these maps be viewed at a larger scale and in color. The colored maps and this report can be viewed at :
http://www.dnr.state.mn.us/forestry/subsection/cp_pmop/index.html

Map 7.11.1a Stands Requiring New Access, Chippewa Plains



Note: The maps have been reduced and printed in grayscale in this document. It is recommended that these maps be viewed at a larger scale and in color. The colored maps and this report can be viewed at:
http://www.dnr.state.mn.us/forestry/subsection/cp_pmop/index.html

Map 7.11.1b Stands Requiring New Access, Pine Moraines and Outwash Plains



Note: The maps have been reduced and printed in grayscale in this document. It is recommended that these maps be viewed at a larger scale and in color. The colored maps and this report can be viewed at:
http://www.dnr.state.mn.us/forestry/subsection/cp_pmop/index.html

APPENDIX A

Ecological Classification System (ECS)

Contents

I. Definition

The ECS is part of a nationwide mapping initiative developed to improve our ability to manage all natural resources on a sustainable basis.

Ecological Classification System is a method to identify, describe, and map units of land with different capabilities to support natural resources. This is done by integrating climatic, geologic, hydrologic, topographic, soil, and vegetation data.

In Minnesota, the classification and mapping is divided into six levels of detail. These levels are:

Province: Largest units representing the major climate zones in North America, each covering several states. Minnesota has three provinces: eastern broadleaf forest, northern boreal forest and prairie.

Section: Divisions within provinces that often cross state lines. Sections are defined by the origin of glacial deposits, regional elevation, distribution of plants and regional climate. Minnesota has 10 sections (e.g.: Red River Valley).

Subsection: County-sized areas within sections that are defined by glacial land-forming processes, bedrock formations, local climate, topographic relief, and the distribution of plants. Minnesota has 24 subsections (e.g.: Mille Lacs Uplands).

Land type association: Landscapes within subsections, characterized by glacial formations, bedrock types, topographic roughness, lake and stream patterns, depth to ground water table, and soil material. Example: Alexandria Moraine.

Land type: The individual elements of land type associations, defined by recurring patterns of uplands and wetlands, soil types, plant communities, and fire history. Example: fire-dependent xeric pine-hardwood association.

Community: Unique combinations of plants and soils within land types, defined by characteristic trees, shrubs and forbs, elevation, and soil moisture.

Example: sugar maple-basswood forest

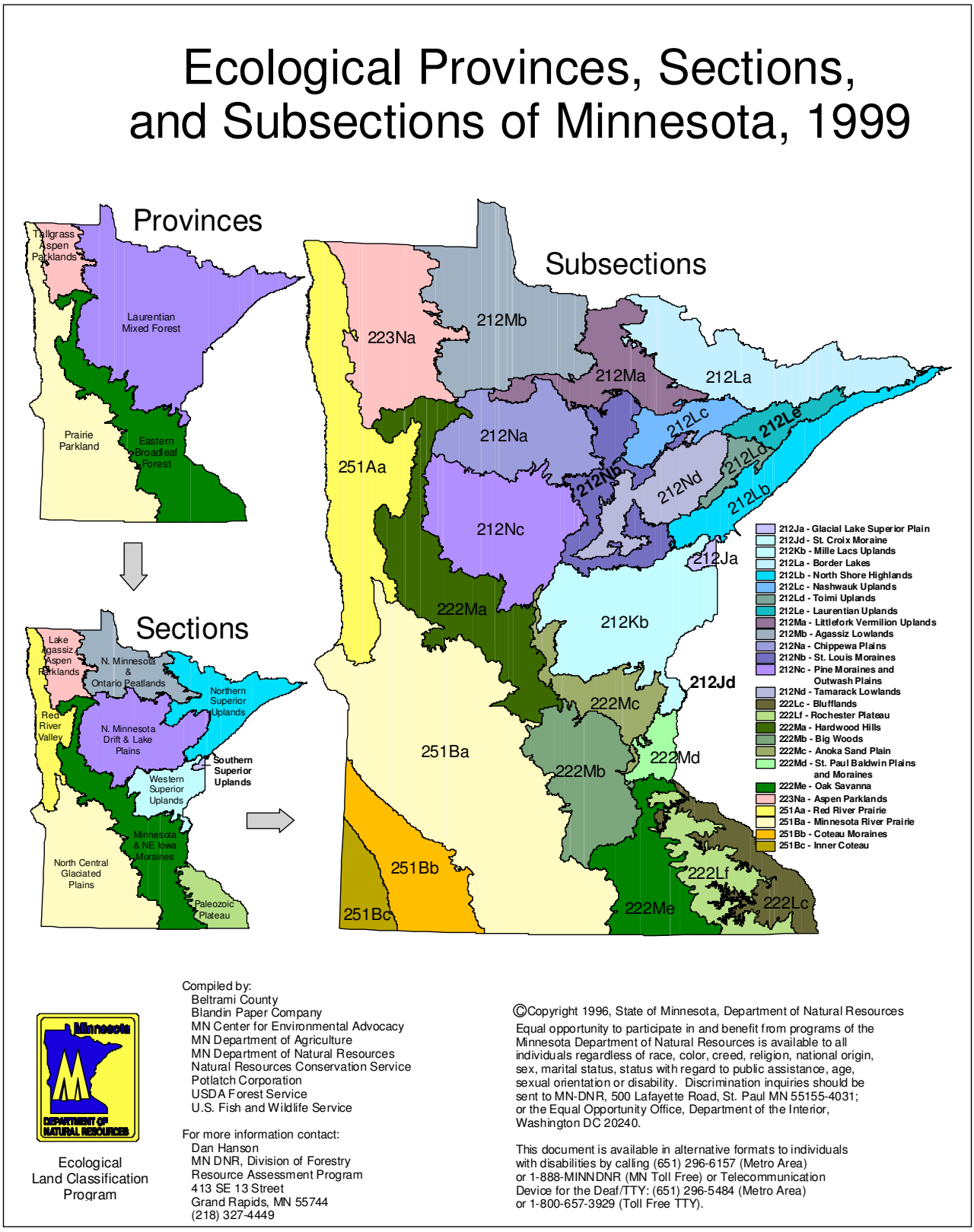
II. Purpose of an Ecological Classification System

- Define the units of Minnesota's landscape using a consistent methodology.
- Provide a common means for communication among a variety of resource managers and with the public.
- Provide a framework to organize natural resource information.
- Improve predictions about how vegetation will change over time in response to various influences.
- Improve our understanding of the interrelationships between plant communities, wildlife habitat, timber production, and water quality.

III. End Products

- Maps and descriptions of ecological units for provinces through land types.
- Field keys and descriptions to determine which communities are present on a parcel of land.
- Applications for management for provinces through communities.
- Mapping of province, section, subsection, and land type association boundaries is complete throughout Minnesota.

Figure A.1: Ecological Provinces, Sections, and Subsections of Minnesota, 1999



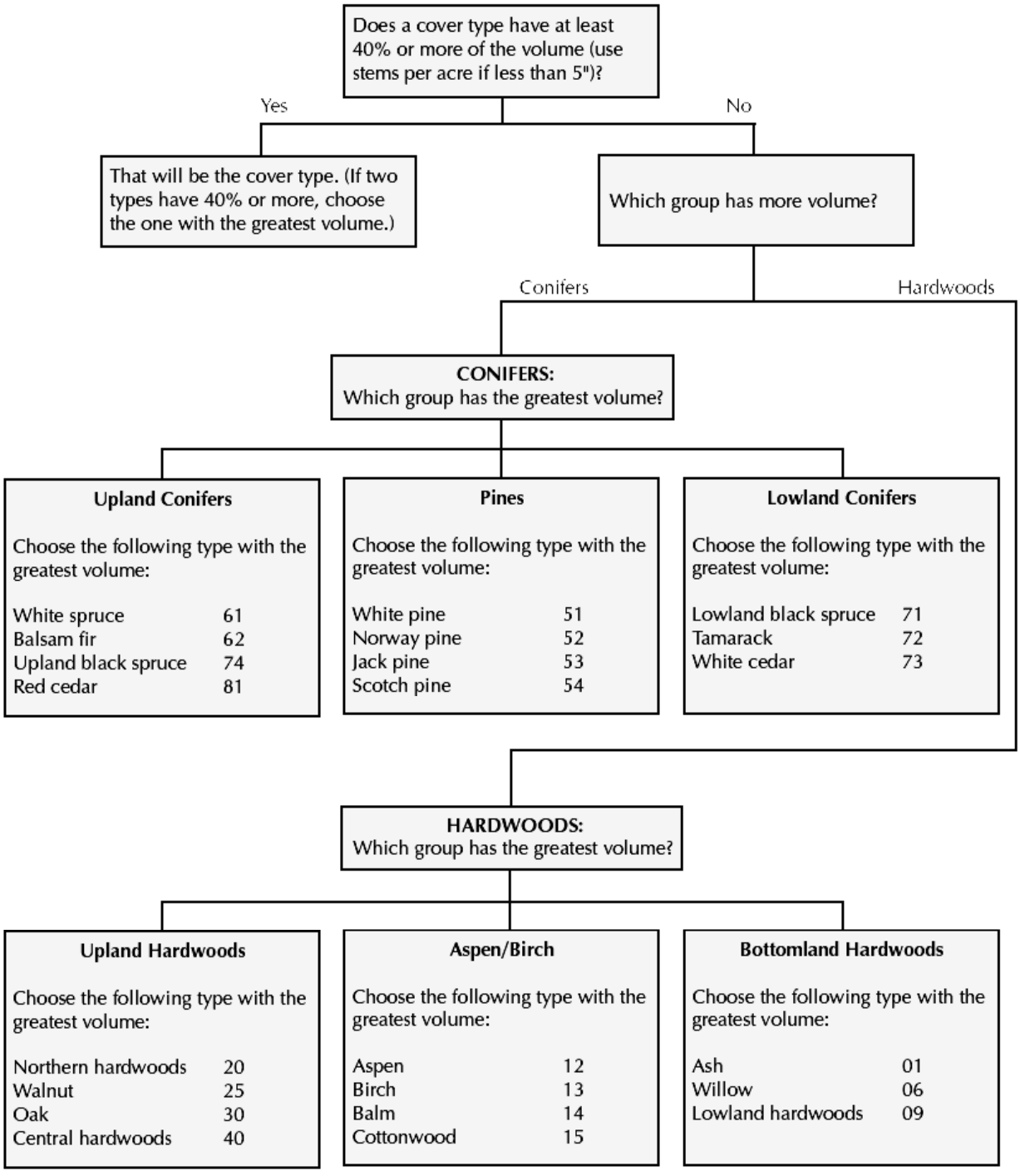
APPENDIX B

Tree Species in the Chippewa Plains-Pine Moraines and Outwash Plains Subsections

Common name	Latin name	Cover Type Code
Aspen		A
Quaking Aspen	*Populus tremuloides*	
Bigtooth Aspen	*Populus grandidentata*	
Balm of Gilead (Balsam Poplar)	*Populus balsamifera*	BG
Balsam Fir	*Abies balsamea*	BF
Paper Birch	*Betula papyrifera*	Bi
Black Spruce	*Picea mariana*	BSL (lowland) BSU (upland)
Jack Pine	*Pinus banksiana*	JP
Lowland Hardwoods		LH
Black Ash	*Fraxinus nigra*	Ash
Green Ash	*Fraxinus pennsylvanica*	Ash
American Elm	*Ulmus americana*	
Silver Maple	*Acer saccharinum*	
Box Elder	*Acer negundo*	
Northern Hardwoods		NH
Sugar Maple	*Acer saccharum*	
Red Maple	*Acer rubrum*	
Basswood	*Tilia americana*	
Yellow Birch	*Betula alleghaniensis*	
Ironwood	*Ostrya virginiana*	
Oak	(often included with NH)	O
Northern Red Oak	*Quercus rubra*	
Bur Oak	*Quercus macrocarpa*	
Red Pine (Norway Pine)	*Pinus resinosa*	NP
Stagnant Spruce		Sx
Tamarack	*Larix laricina*	T
White Cedar	*Thuja occidentalis*	C
White Pine	*Pinus strobes*	WP
White Spruce	*Picea glauca*	WS

APPENDIX C

Key for Main Cover Type Determination



Some of the types may switch between groups depending on the physiographic class.

Number after cover type name is the cover type code.

From: Cooperative Stand Assessment (CSA) Users' Manual, DNR Division of Forestry, 2001.

APPENDIX D

Process Used to Determine Old Forest Management Complexes

DEPARTMENT: Natural Resources – Forestry STATE OF MINNESOTA

Office Memorandum

DATE:

TO: CP-PMOP Area Forestry Supervisors
CPPMOP Wildlife Supervisors.
Kurt Rusterholz

FROM: Mark Carlstrom, CP-PMOP Team Leader PHONE: 218-732-3309

SUBJECT: CP-PMOP Old Forest Management Complexes (OFMC) Plans

The Chippewa Plains/Pine Moraines and Outwash Plains SFRMP Team is asking for your help and participation in the mapping and completion of all Old Forest Management Complex Plans (OFMC) for the CP-PMOP SFRMP. This needs to be done in order to finish the Old Growth designation process and is also the first step in the selection of ERF for the CP-PMOP SFRMP.

You were given a heads up to this assignment a while back. Before these plans could be written, however, errors in the old growth designations in FIM needed to be corrected. We are now at that point in the planning process where we need your involvement in completing these Plans.

Interdisciplinary (Forestry, Wildlife, Eco) teams will develop the OFMC Plans. These individual plans will identify each Old Growth stand; decide which stands will be in the Special Management Zone (SMZ) and if there are additional stands around the SMZ that should be added to the OFMC.

For consistency and to expedite this process, Mike Locke, Thom Soule and Paul Lundgren will be assisting you with these plans. They will spend one day each in the Deer River, Bemidji (w/Blackduck), Backus and Park Rapids (w/Detroit Lakes) Areas to complete these Plans.

A packet of Planning materials consisting of this memo and the following materials is being provided to you ahead of time.

1. SMZ Designation Instructions.
2. Record keeping form.
3. Old Forest Guideline Addendum No. 5.
4. Prescription Definitions & codes.
5. Maps of each Areas designated OG Stands (hand delivered)

Before coming to your Area we request that you read these materials and review each of the map sets. The more preliminary planning that is done, the less time we will need to complete this project. It is also important that you make sure we have accounted for all Old Growth stands in your area.

At this time it is **NOT** necessary to make any changes in FIM, including any type lines changes. We will do this with you, including filling out the form the day we come to your Area. Any type line changes you feel you want to make should be done by hand on these map sets. Also, any required information that you obtain as you review these complexes may be recorded on the attached form. Make copies as needed.

If you have any questions, please contact Paul Lundgren (218-947-3232), or Thom Soule (218-755-4030). We will be in contact with you within the next two weeks to set up these meetings. The Team members assisting you intend to finish each Area in one day and to have the CP-PMOP Old Forest Complex planning process completed before Christmas, so please plan accordingly.

cc: NW, NE and Central Regional Supervisors
CP-PMOP Team.
J. Nelson, S. Merchant , J. Boe, H. Cozzetto

CP-PMOP Old Forest Complex SMZ Designation Instructions

The purpose of these instructions is to assure that clear consistent decisions are made regarding the inclusion entire of stands or parts of stands in the **Special Management Zone**s that surround designated old growth stands in the CP-PMOP Subsections.

As old-growth stands were designated, there was a need to define management for the SMZ. Field managers felt that the conservation value of designated old growth stands or groups of stands could be increased by managing additional stands around the SMZ on extended rotations (ERF).

SMZ- The **Special Management Zone (SMZ)** is a group of stands or portions of stands immediately around designated old-growth stands. The SMZ is intended to provide ecological protection, minimize edge effects and wind throw damage to old-growth stands.

The1994 Old-Growth Forest Guidelines specified that SMZs be managed as all-aged Extended Rotation or as limited clear cuts where, at any given time, no more than 25% of the SMZ has regeneration less than 1/3 potential height.

The minimum SMZ width is 330 feet, but may be expanded to existing stand boundaries, to connect with the SMZ of nearby old-growth stands, to achieve another management objective, or in response to new information (i.e. County Biological Survey data).

1. Evaluate each stand for inclusion in the SMZ as shown by green line (330 feet width)

   A. Select the 330' portion[1] of the stand as shown on map to be part of the SMZ if the stand is not an old growth type and partitioning will not result in an unmanageable stand remaining outside the SMZ. **Due to FIM, other planning issues and Department direction, partitioning stands should be the exception.*
      1. ***A preferable option is to use a natural or man made feature that is at least 330 ft. from the designated OG stand(s) as the SMZ boundary.***
      - The remainder of a forest cover type outside the SMZ should be managed under the same prescription as that part of the type within the SMZ when it would provide significant additional protection.
      - Assign ERF prescription and preliminary treatment prescription.
      - Document reasons for not assigning ERF Prescription.
      - Record stand and SMZ acres.

   B. Select entire stand to be part of the SMZ if the stand is an old growth type and partitioning would result in less protection of the old growth stand(s) and/or result in unmanageable stands inside or outside the SMZ.
      - Assign ERF prescription and preliminary treatment prescription.
      - Document reasons for not assigning ERF Prescription.
      - Record stand and SMZ acres.
      -

2. Evaluate additional stands for inclusion in OFMC as per Addendum.
   A. If selected for inclusion in OFMC.

Assign ERF prescription and appropriate preliminary treatment prescription.

Old-Forest Management Complex Plan B Worksheet

Date (mm/day/yr):_____ Plan Preparer'(s):_____

Subsection: _____ Forestry Area: _____ RAN: _____

Old Growth IDs: _____

Legal Description: Section_____ Twp._____ Range_____ UTM for center of OFMC._____

FIM Stand ID	FIM Label	Final Timber Status Code	Mgt. Code	Current Planned Cut Number	Total Stand Acres	Acres Within SMZ	Prelim Presc. Code	ERF Purpose (From ERF Guidelines)	Management Objective	Comments

Notes on back.

Page 1 of ___

APPENDIX E
Stand Silvicultural Prescription Worksheet

STAND SILVICULTURAL PRESCRIPTION WORKSHEET - NW Region

(Ctrl and ; enters today's date) Forestry Area

Field Inspection by: **Date:**

1. **SRM Stand IDs:**

<----- Acres

Main stand [---------- Additional adjacent stands with this prescription ----------]

2. **ECS:**
   - ☐ LTA –
   - ☐ Native Plant Community –
   - ☐ Growth Stage -
3. **Soils:** Soil type or enter Soil Name:
4. **Relevant General Goals from Mgmt. Plan:**
5. **Past Management Practices:**
6. **Present Conditions:**
   - ☐ General Composition & Structure
   - ☐ Age (Main Species)
   - ☐ Site Index
   - ☐ Volumes
   - ☐ Basal Area
   - ☐ Understory/Advance Regeneration
   - ☐ Landscape Context
7. **Forest Health:**
8. **Desired Future Stand Condition:**
9. **Prescription:**

	SRM Action	Appoximate Year of Action	Acres	
(required)	Next site visit			

10. **SRM Objective Codes:** View Mgmt Objective Definitions
11. **Remarks/prescription rationale:**

Review :

Prescription Writer: Date:
Area Silviculture Program Forester Date:
Area Timber Program Forester Date:

APPENDIX F

Ecologically Important Lowland Conifers (EILC):
Stand Designation Process

EILC Background:

As directed by Forestry policy each SFRMP process is required to identify EILC. The objective of this designation is to reserve from treatment, adequate amounts of EILC across the subsections, so that the best representations can be evaluated and eventually selected.

Subsection Planning Teams are directed to prepare criteria to define EILC, identify cover types in their subsections which reflect EILC characteristics and determine an adequate acreage for each EILC cover type sufficient to conserve the characteristics of the EILC.

Ecologically important lowland conifers are defined as stands of black spruce, tamarack, and cedar, including stagnant lowland conifer stands, that are examples of high quality native plant communities (NPCs) that are representative of lowland conifer NPCs found in the subsections. The designated EILC stands will be reserved from treatment during the 10-year planning period. Future management of designated EILC stands is specifically, by policy, not determined in current CP-PMOP planning period.

EILC are reserved from treatment, for the period of time covered by the subsection plan, based on the ecologically important habitat or natural community type they represent. These reserved stands should be reviewed for continued protection at the beginning of the next cycle of subsection planning based on the Old Growth Guidelines or other guidelines in place at that future date.

EILC Designation Process

An EILC SFRMP work group convened to prepare a draft of the EILC designation. The EILC work group prepared background information, datasets, designation criteria and applied the EILC designation criteria to the appropriate cover types to identify specific EILC stands as policy directed. The draft EILC designation was presented and approved by the CP-PMOP SFRMP Planning Team. CP-PMOP SFRMP Planning Team adopted the following as presented by the EILC Work Group.

The total acreage of stands designated EILC is a function of:

- EILC percentage goal for the subsections and
- EILC Stand Designation Criteria

The EILC percentage goal to be designated was determined to be 5.0% based on the total acres of old growth goal within each subsection, divided by the total acres of all old growth types within the subsection within its respective working boundary. The derived percentage is then doubled to produce the actual EILC percentage goal. This percentage was then applied to each cover type acreage to identify specific stands (using the EILC Stand Designation Criteria identified below). Tthe designated acreage for the EILC cover types was derived from all the stagnant stands that are located within MCBS Sites ranked as having a biodiversity significance of High. The Work Group recommended and CP-PMOP Planning Team agreed that this EILC acreage goal should not be used in the future as a basis for acreage goal setting for lowland conifer old-growth forest. The principle reason being that selecting EILC goals by this method would likely include far more than the 2X goal (as stated in the Rare Features Section, SFRMP Guidebook) for the potential old-growth pool.

Using the MCBS staff's preliminary assessment ranking of stands as a pool, The CP-PMOP EILC Work Group applied the following criteria to select out stands according to the above rationale. The Work Group then tallied the acreage totals and used this as our acreage goals. It is important to note that these goals do not include acreage in SNAs.
From the potentially qualifying acres, attempts were made to select contiguous acres, and also place acres adjacent to SNA's and other unique resource areas.

EILC Stand Designation Criteria: CHIPPEWA PLAINS

Black spruce:

- Newage≥ 80 (=2251 stands)

Tamarack:

- Newage≥ 80 (Work Group evaluated the number of stands included in various newages and determined that ≥ 80 gave 902 stands and 20708 acres, or 48% of the stands and 49% of the acres.

Cedar:

- Phys Class 0-3 = "upland cedar"; *keep all*; 73 stands, including Morph Meadows deer yards
- Phys Class 4 and above = "lowland cedar"; 681 stands; 10,064 acres
    - newage ≥ 70 (591 stands; 9442 acres)

Stagnant spruce, tamarack, and cedar:

- Selection criteria:
    - Follow Agassiz Lowlands example for each LTA; 5% of each cover type (B,T,C,sB,sT,sC)
    - Adjacent to other lowland types in EILC or other "protection" (SNA, WPA, WMA, cRNA, etc.)

EILC Stand Designation Criteria: PINE MORAINES and OUTWASH PLAINS

Black Spruce:

- Newage≥ 65. 123y=oldest.

Tamarack:

- Newage≥ 65; 272 stands; 4364 stands.

Cedar:

- all ages (due to few stands and little acreage); phys class 3+ (stands in phys class 3; class 4; class 5); 72 stands, 1499 acres.

Stagnant Black Spruce, Stagnant Tamarack, Stagnant Cedar:

- same as CP; use to fill in or complete complexes (unless >100 ac stands or complexes themselves)

Table F. 1 below identifies the CP-PMOP EILC Stand Designations by cover type and LTA.

Table F.1 EILC Acres Selected by Cover Type and Land Type Association

LTA	71, BSL	72, T	73, C	75, SX	76, TX	77, CX	Acres by LTA
212Ma18	0	0	0	0		0	0
212Na03	0	505.03	108.63	24.45	5.5	34.41	678.02
212Na04	28.98	6.71				0	35.69
212Na07	803.45	716.03	98.52	0	47	56.87	1721.87
212Na08	0	765.47	84.43	0	0	0	849.9
212Na09	803.91	716.1	33.73	586.81	709.84	265.85	3116.24
212Na10	199.04	948.6	402.7	8361.32	192.61	358.49	10462.76
212Na11	0					0	0
212Na16	194.61	73.49	147.6	537.3	64.02	125.06	1142.08
212Na18	29.77	151.49	365.78	34.33	149.51	21.33	752.21
212Na21	16.91	619.14	0	0	65.01		701.06
212Na22	25.42	19.11	16.72			0	61.25
212Nb02	0	0	11.83	0			11.83
212Nb07	0	0	0	0		0	0
212Nb12			0				0
212Nc01	14.56	60.18		0			74.74
212Nc02	0	0	6.03				6.03
212Nc03	16.21	84.67			0		100.88
212Nc04		266.25					266.25
212Nc05		35.21					35.21
212Nc06		37.24					37.24
212Nc08	0	5.45					5.45
212Nc09		14.42					14.42
212Nc10	0	39.76					39.76
212Nc11	12.02	81.89		0	0		93.91
212Nc12	46.39	58.95					105.34
212Nc13	8.21	10.1	128.5	0		71.51	218.32
212Nc14	88.24	153.04	77.51		17.28		336.07
212Nc16	128.66	194.33	322.92	6.49	77.62	441.88	1171.9
212Nc28	48.07	178.24		0			226.31
212Nc30	12.68	24.78	189.68	0	0	21.67	248.81
212Nc31	139.61	151.49	28.55		0		319.65
212Nc32		14.29					14.29
212Nc33	0	0					0
212Nc34	40.02	19.21					59.23
222Ma16		0					0
Acres by Ctype	2656.8	5950.7	2023.1	9550.7	1328.4	1397.1	22906.72

APPENDIX G

Process used to develop Cover Type DFFCs for CP-PMOP SFRMP

Background

The cover type DFFCs identified in the CP-PMOP Plan reflects the SFRMP Planning Team's effort to develop 10 and 50-year Cover Type DFFC's acreage goals that establish appropriate forest composition goals at the landscape level and also ensure restoration of important component tree species that have declined. The Plan's goals are viewed as aggressive but achievable and appropriate to the landscape.

Process

The SFRMP Planning Team tasked a workgroup with preparing a draft report that established cover type DFFCs for the CP-PMOP. First the work group summarized information on certain cover type/tree species at the subsection, combined subsection, and section scale for the CP-PMOP planning area. This information included: current status, recent trends, historical information, MFRC analysis, NPC Classes, CWCS Plan Key Habitats, and Desired Future Forest Conditions from the MFRC Regional Landscape Plan.

Other information was summarized and reported spatially, primarily at the LTA scale. This information included land descriptions, current vegetation, Pre-settlement Vegetation, original bearing trees with comparisons to FIA data, PLS survey notes, and NPC occurrence. Much of this information can be found in the LTA Assessment and Analysis documents (see Appendix N LTA Analysis and Assessment Documents).

All of this information and DNR staff knowledge and experience was used to develop and test various cover type change scenarios with 2004 data at the subsection scale. From these scenarios, the workgroup developed recommendations on appropriate cover type acreage goals with increases and decreases by cover type. Ten-year conversion pool criteria were developed to identify potential conversion sites. The workgroup also identified priority LTAs for cover type increases and summarized cover type DFFC related information by forested cover type. Initially the 10 and 50-year goals were developed for each subsection and the two subsections were then combined based on 2004 data (See Appendix U Stand Exam List and New Access Needs List Instructions, Attachment C-3).

The SFRMP Planning team and the Cover Type Recommendations workgroups then reviewed, updated, and approved the cover type DFFCs based on 2007 data. A scoring system was then developed to help identify potential conversion sites that could contribute to multiple plan goals (See Appendix K Stand Scoring System). These potential conversion sites were scored based on whether they were in priority LTAs for cover type increases and their proximity to a designated patch of the same general type (See Appendix K Stand Scoring System). The conversion scoring system and acreage information was then used to allocate cover type DFFC acreage goals to each Forestry Areas targets to be applied during implementation of the plan.

APPENDIX H

10-Year and 50-Year Cover Type Conversion DFFC

Cover Type Names (some combined)

Cover Type Data on Forestry & Wildlife Land	Ash/ Lowland Hardwoods	Aspen/ Balm	Balsam Fir	Birch	Black Spruce Upland	Black Spruce Lowland	Central Hardwoods	Cutover Area	Jack Pine	Northern White Cedar	Northern Hardwoods	Red Pine	Oak	Scotch Pine	Tamarack	White Pine	White Spruce	Total Acres
Chippewa Plains																		
1989 Cover Type Acres	10,152	66,753	9,534	8,594	107	29,305		3,299	7,450	10,373	6,682	8,657	1,426		36,382	174	1,856	**200,744**
2004 Cover Type Acres	10,648	66,562	5,422	5,136	28	25,578		3,000	5,689	10,800	7,108	11,084	1,045		38,324	565	3,171	**194,160**
Change in Acres from 89 to 04	496	-191	-4,112	-3,458	-79	-3,727		-299	-1,761	427	426	2,427	-381		1,942	391	1,315	
10-year DFFC Change	-387	-992	-128	0		0			629	216	127	0	0		699	0	95	
50-year DFFC Change	-1,160	-4,093	-638	0		0			2,202	692	846	1,840	0		2,096	0	475	
10-year DFFC Acreage	10,261	65,570	5,294	5,136		25,578			6,318	11,016	7,235	11,084	1,045		39,023	565	3,266	**191,392**
% Change from 2004	-3.6%	-1.5%	-2.4%	0.0%		0.0%			11.1%	2.0%	1.8%	0.0%	0.0%		1.8%	0.0%	3.0%	
50-year DFFC Acreage	9,488	62,469	4,784	5,136		25,578			7,891	11,492	7,954	12,924	1,045		40,420	565	3,646	**193,390**
% Change from 2004	-10.9%	-6.1%	-11.8%	0.0%		0.0%			38.7%	6.4%	11.9%	16.6%	0.0%		5.5%	0.0%	15.0%	
Pine Moraines & Outwash Plains																		
1989 Cover Type Acres	4,860	111,155	3,171	10,043	399	2,859	0	2,479	18,290	2,071	7,780	19,381	12,862	7	7,142	942	2,421	**205,862**
2004 Cover Type Acres	5,872	114,669	3,072	6,966	78	2,143	6	1,025	12,399	1,687	9,701	23,642	14,553	13	5,565	2,118	3,510	**207,019**
Change in Acres from 89 to 04	1,012	3,514	-99	-3,077	-321	-716	6	-1,454	-5,891	-384	1,921	4,261	1,691	6	-1,577	1,176	1,089	
10-year DFFC Change	-213	-1,708	-72	0		0			1,871	34	173	0	-500		101	0	105	
50-year DFFC Change	-640	-7,607	-362	-500		0			6,298	108	1,154	4,160	-1,500		304	0	525	
10-year DFFC Acreage	5,659	112,961	3,000	6,966		2,143			14,270	1,721	9,874	23,642	14,053		5,666	2,118	3,615	**205,687**
% Change from 2004	-3.6%	-1.5%	-2.4%	0.0%		0.0%			15.1%	2.0%	1.8%	0.0%	-3.4%		1.8%	0.0%	3.0%	
50-year DFFC Acreage	5,232	107,062	2,710	6,466		2,143			18,697	1,795	10,855	27,802	13,053		5,869	2,118	4,035	**207,839**
% Change from 2004	-10.9%	-6.6%	-11.8%	-7.2%		0.0%			50.8%	6.4%	11.9%	17.6%	-10.3%		5.5%	0.0%	15.0%	

Cover Type Data on Forestry & Wildlife Land	Ash/ Lowland Hardwoods	Aspen/ Balm	Balsam Fir	Birch	Black Spruce Upland	Black Spruce Lowland	Central Hardwoods	Cutover Area	Jack Pine	Northern White Cedar	Northern Hardwoods	Red Pine	Oak	Scotch Pine	Tamarack	White Pine	White Spruce	Total Acres
CP and PMOP																		
1989 Cover Type Acres	15,012	177,908	12,705	18,637	506	32,164	0	5,778	25,740	12,444	14,462	28,038	14,288	7	43,524	1,116	4,277	**406,606**
2004 Cover Type Acres	16,520	181,231	8,494	12,102	106	27,721	6	4,025	18,088	12,487	16,809	34,726	15,598	13	43,889	2,683	6,681	**401,179**
Change in Acres from 89 to 04	1,508	3,323	-4,211	-6,535	-400	-4,443	6	-1,753	-7,652	43	2,347	6,688	1,310	6	365	1,567	2,404	
10-year DFFC Change	-600	-2,700	-200	0		0			2,500	250	300	0	-500		800	0	200	
50-year DFFC Change	-1,800	-11,700	-1,000	-500		0			8,500	800	2,000	6,000	-1,500		2,400	0	1,000	
10-year DFFC Acreage	15,920	178,531	8,294	12,102		27,721			20,588	12,737	17,109	34,726	15,098		44,689	2,683	6,881	**397,079**
% Change from 2004	-3.6%	-1.5%	-2.4%	0.0%		0.0%			13.8%	2.0%	1.8%	0.0%	-3.2%		1.8%	0.0%	3.0%	
50-year DFFC Acreage	14,720	169,531	7,494	11,602		27,721			26,588	13,287	18,809	40,726	14,098		46,289	2,683	7,681	**401,229**
% Change from 2004	-10.9%	-6.5%	-11.8%	-4.1%		0.0%			47.0%	6.4%	11.9%	17.3%	-9.6%		5.5%	0.0%	15.0%	

Appendix I: Standard Codes in SFRMP

Field Name	Valid Values	Description
AD		Land Administrator
	1	Division of Forestry
	2	Division of Fish and Wildlife
	3	Division of Parks
	4	Other State administrator (most in this plan are Division of Trails & Waterways)
ECS_NAME		ECS Subsection Name
	Agassiz Lowlands	Agassiz Lowlands subsection
	Anoka Sand Plains	Anoka Sand Plains subsection
	Aspen Parklands	Aspen Parklands subsection
	Blufflands	Blufflands subsection
	Border Lakes	Border Lakes subsection
	Chippewa Plains	Chippewa Plains subsection
	Glacial Lake Superior Plain	Glacial Lake Superior Plain subsection
	Laurentian Highlands	Laurentian Highlands subsection
	Littlefork-Vermilion Uplands	Littlefork-Vermilion Uplands subsection
	Mille Lacs Uplands	Mille Lacs Uplands subsection
	Nashwauk Uplands	Nashwauk Uplands subsection
	Northshore Highlands	Northshore Highlands subsection
	Pine Moraines-Outwash Plains	Pine Moraines-Outwash Plains subsection
	Rochester Plateau	Rochester Plateau subsection
	St. Louis Moraines	St. Louis Moraines subsection
	Tamarack Lowlands	Tamarack Lowlands subsection
	Toimi Uplands	Toimi Uplands subsection
NEW_AGE_"CY"		Current age as of "CYXXXX"
NAGE_CLASS		New age class to current year
	1 - 10	
	11 - 21	

Field Name	Valid Values	Description
NAGE_CLASS (cont.)		New age class to current year
	21 - 30	
	31 - 40	
	41 - 50	
	51 - 60	
	61 - 70	
	71 - 80	
	81 - 90	
	91 - 100	
	101 - 110	
	111 - 120	
	121 - 130	
	131 - 140	
	141 - 150	
	151 - 160	
	161 - 170	
	171 - 180	
	181 - 190	
	191 - 200	
	201 - 210	
	211 plus	
INOPERABLE		Inoperable stands identified by field staff
	0	Normal operability
	1	Stand is inoperable due to steep slope, inaccessible, etc.
MAN_ACRES		Management acres - available for treatment

Field Name	Valid Values	Description
SMA		Special Management Area
	GMAR	Ruffed Grouse Management Area. Identifies areas where the management emphasis is to maintain or increase ruffed grouse habitat. Not limited to officially designated ruffed grouse management areas.
	GMAS	Sharp-tail Grouse Management Area
	RHMA	Red-shouldered Hawk Management Area
	MSMA	Miscellaneous Special Management Area
	OLMA	Open landscape management area (includes openlands SMAs and Priority Open Landscape Areas).
PAT_NOM		Patch nomenclature (codes). Patch nomenclature is a multiple combination of these codes.
	M	Mixed ownership patch
	FP	Future patch
	P	Patch
	O	Old
	I	Intermediate aged
	Y	Young
	V	Uneven-aged
	1	Large (>640 acres)
	2	Medium large (251-640 acres)
	3	Medium (101-250 acres)
	U	Upland
	L	Lowland
	D	Decidious
	C	Conifer
	M	Mixed conifer/deciduous
PAT_NAME		Patch name (assigned to all stands in patch)
PATCH_DFC	See values for PAT_NOM	See descriptions for PAT_NOM

Field Name	Valid Values	Description
ERF		Extended Rotation Forest (ERF)
	0	Stand not designated as ERF
	1	ERF designated stand
ERF_LOC		Extended Rotation Forest Location Codes. Multiple codes may be assigned.
	O	Within an OFMC or otherwise adjacent to designated old growth stands
	R	Within or adjacent to riparian area
	S	Within an area with soil erosion/compaction concerns and/or within or adjacent to a riparian area
	T	Within an area selected for timber management (selective harvest, deferring harvest, providing for larger products, and/or enabling an understory to become merchantable)
	V	Within a visually sensitive travel corridor or view shed and/or within or adjacent to a recreation area (e.g., campground, day-use area)
	W	Part of a large patch and/or within an area containing rare and distinctive species or native plant communities and/or part of a corridor linking other old forest areas
EILC		Ecologically important lowland conifers – Reserve during this 10-year plan.
	0	Stand not designated as EILC
	1	EILC designated stand
CRITERIA		Identifies the stands that meet the stand selection criteria. It provides the pool of stands to choose from for stand treatments in the 10-year plan.
	HIGH RISK LOW VOLUME	Stand meets the criteria established for HRLV stands.
	HARVEST	Stand that meets the harvest criteria
	UNEVEN AGED HARVEST	Stand that meets the uneven-aged harvest criteria
	THIN	Stand that meets the thinning criteria
	FIELD VISIT	Stand that requires a field visit to determine a prescription.
	UNDER MGMT,TBR=9	Stand is currently a timber sale or on a FY harvest plan.
PRESCRIP		Preliminary Prescription Code for Stand Treatment.
	1100	Even-Aged Regeneration Harvest
	1111	Clearcut with Reserves
	1113	Clearcut with Reserves – Sprouting
	1116	Clearcut – Natural seeding

Field Name	Valid Values	Description
PRESCRIP (cont.)		Preliminary Prescription Code for Stand Treatment.
	1118	Clearcut – Artificial Regeneration
	1119	Clearcut with Reserves – Artificial Regeneration
	1120	Seed Tree
	1121	Seed tree with Reserves
	1130	Shelterwood
	1131	Shelterwood with Reserves
	1140	Salvage – Clearcut
	1147	Salvage with Reserves-Clearcut – Insects or Disease
	1200	Two-Age Regeneration Harvest
	1212	Clearcut with Reserves-Sprouting
	1216	Clearcut with Reserves-Natural Seeding
	1220	Seed Tree with Reserves
	1300	Uneven-aged Harvest
	1310	Group Selection
	1800	Intermediate Harvest
	1810	Thinning
	1820	Selective Thinning-Commercial
	1840	Salvage Cut – Selective Harvest
	1850	Sanitation Cut – Selective Harvest
	1940	Manage for understory
	9100	On-site Evaluation
	9110	Re-inventory.
T_ACRES		Treatment acres (e.g., harvest, etc.)
SE_YEAR		Planned year (FY) to complete the stand examination/appraisal.
MGMT_CT		Cover type to manage for in the future (Cover type code) – *Preliminary estimate*. Same as current stand cover type unless edited during the stand selection process.

Field Name	Valid Values	Description
OBJECTIVE		Coding used to assign preliminary objectives to stands. Multiple codes may be assigned.
	MA1	Maintain similar species mix and stand structure
	INC??	Maintain current cover type but increase species "##" (from FIM cover type codes)
	CHG1	Maintain current cover type but change to multi-aged stand structure
	CHG2	Maintain current cover type but change to uneven-aged stand structure.
	CHG3	Maintain current cover type but change to even-aged stand structure.
	CHG4	Maintain current cover type but \vary basal area distribution.
	CHG5	Maintain current cover type but increase coarse woody debris (> 6 inches diameter)
	CHG6	Maintain current cover type but retain legacy patches.
	COV??	Convert stand to cover type "##" (from FIM cover type codes)
	PAT1	Maintain large patch.
	PAT2	Increase patch size.
	PAT3	Manage for smaller patches.
	RIP1	Increase long-lived conifers within riparian management zones.
	RIP2	Maintain shade to a trout stream
	CON1	Conserve biodiversity - maintain existing NPC composition and structure
	CON2	Conserve biodiversity - protect rare plant or animal location.
	CON3	Conserve biodiversity - special management consideration for species or habitat.
	CON4	Conserve biodiversity - protect a known rare native plant community.
	CON5	Conserve biodiversity - use prescribed fire.
	CON6	Conserve biodiversity - use less intensive TSI or site preparation.
	CON7	Conserve biodiversity - Retain NPC older growth stage components.
	CULT1	Apply strategies to protect a known cultural resource.
	MNT1	Maintain corridors - retain adequate residual basal area within a corridor.
FOR_COM		Forestry staff comments regarding the stand management.
WLD_COM		Wildlife staff comments regarding the stand management.
ECO_COM		Ecological Services staff comments regarding the stand management.
FSH_COM		Fisheries staff comments regarding the stand management.

Field Name	Valid Values	Description
COMMENT		General comments assigned to a stand during the planning process.
JT_VISIT		Joint field visit desired by staff from other divisions. Multiple codes may be assigned.
	FSH	Contact Area Fisheries staff prior to the field visit.
	WLD	Contact Area Wildlife staff prior to the field visit.
	ECO	Contact Ecological Services representative prior to the field visit.
NA_TYPE		Type of new access. Only assigned to stands where new access is needed.
	System Road	System Roads are the major roads in the forest that provide forest management access, recreational access and may be connected to the state, county, or township public road systems.
	Min. Maintenance Road	Minimum Maintenance Roads are used for forest management access on an intermittent, as-need basis. These roads are not promoted or maintained for recreation. The roads will be open to all motorized vehicles but not maintained to the level where low clearance licensed highway vehicles can travel routinely on them.
	Res. Mgmt. Access Route	Resource Management Access Routes are not immediately needed after the cessation of the management activity, but may be needed in the future for management activity and the corridor needs to be preserved. These routes will be closed to all motorized recreation users.
	Temporary Access Route	If the access route does not fit into one of the first three options, the temporary access route will be abandoned and the site reclaimed so that evidence of a travel route is minimized.
NA_MILE		New access miles only (estimate to nearest 0.1 mile)
NA_SW		New access season of use.
	S	Summer access
	W	Winter access
NA_POST		Post management activity road treatment.
	M	Maintain open.
	L	Leave open/minimal maintenance.
	C	Close with barrier; open only for management.

Field Name	Valid Values	Description
NA_POST (cont.)		Post management activity road treatment.
	A	Abandon (applies to all new temporary access routes).
RD_PERMIT		New access requires a USFS permit or crosses a peatland SNA.
	F	USFS Road Use Permit (i.e., use of NF System Road)
	G	USFS Special Use Permit (i.e., crossing USFS land via a NF non-system road or new access route)
	S	SNA Winter Road (notification)
	Z	Access information assigned to another near-by stand
APPRAISER		Person (last name) assigned to do the stand exam.

APPENDIX J

Native Plant Communities

Statewide Heritage Conservation Ranks (S-Ranks) for Native Plant Community Types

NPC Type S-Rank	Definition
S1	Critically imperiled.
S2	Imperiled.
S3	Rare or uncommon.
S4	Widespread, abundant, and apparently secure, but with cause for long-term concern.
S5	Demonstrably widespread, abundant and secure.

Native Plant Communities of the Chippewa Plains-Pine Moraines and Outwash Plains subsections (Natural Heritage 2008)

Class Code	Plant Community Classification	S rank	CP	PMOP
APn80	Northern Spruce Bog	5	X	X
APn81	Northern Poor Conifer Swamp	4	X	X
APn90	Northern Open Bog	5/4	X	X
APn91	Northern Poor Fen	3/4/5	X	X
FDc12	**Central Poor Dry Pine Woodland**	**2**	**X**	**X**
FDc23	**Central Dry Pine Woodland**	**2**	**X**	**X**
FDc24	Central Rich Dry Pine Woodland	3/4	X	X
FDc25	**Central Dry Oak-Aspen (Pine) Woodland**	**2**		**X**
FDc34	**Central Dry Mesic Pine Hardwood Forest**	**2/3**	**X**	**X**
FDn12	**Northern Dry-Sand Pine Woodland**	**2**	**X**	
FDn33	Northern Dry Mesic Mixed Woodland	3	X	X
FFn57	Northern Terrace Forest	3		X
FFn67	Northern Flood Plain Forest	3		X
FPn63	Cedar Swamp	3	X	X
FPn73	Northern Alder Swamp	5	X	X
FPn82	Northern Rich Tamarack Swamp	5	X	X
FPs63	Northern Rich Tamarack Swamp	3		X
MHc26	Central Dry-mesic Oak -Aspen forest	4	X	X
MHc36	Central Mesic Hardwood Forest	3/4	X	X
MHc37	Central Mesic hardwood Forest (W)	4	X	X
MHn35	Northern Mesic Hardwood Forest	4	X	X
Class Code	**Plant Community Classification**	**S rank**	**CP**	**PMOP**
MHn44	**Northern Wet-Mesic Hardwood Forest**	**2/3/4**	**X**	**X**
MHn46	Northern Wet-Mesic Hardwood Forest	4	X	X
MHn47	Northern Rich Mesic Hardwood Forest	3	X	X

MHs39	**Southern Mesic Maple-Basswood Forest**	**2/3**	**X**	**X**
MRn83	Northern Mixed Cattail Marsh	4/5	X	X
OPn81	Northern Shrub Shore Fen	5	X	X
OPn91	Northern Rich Fen	3/4/5	X	
OPn92	Northern Rich Fen (Basin)	4	X	X
WFn53	Northern Wed Cedar Forest	3	X	X
WFn55	Northern Wet Ash Swamp	4/3	X	X
WFn64	Northern Very Wet Ash Swamp	4	X	X
WFs57	**Southern Wet Ash Swamp**	**2**		**X**
WMn82	Northern Wet Meadow/Carr	4/5	X	X

S1 (critically imperiled) and S2 (imperiled) Native Plant Communities are noted in bold print.

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APPENDIX K

Stand Scoring System

Conversion Scoring System

Individual stands have been scored (range 1-3) for conversion to another cover type. A stand can have a conversion score for more than one cover type. For example, the aspen stand (134 A55) has a conversion score for red pine (RP 1) and white pine (WP 2). Below is the Stand Scoring System description, which applies to all the cover types the draft CP-PMOP plan recommends to increase acreage in over the next 10 years.

> A stand receives 1 point if it meets the cover type's 10-year conversion pool criteria and an additional 1 point if it is within a priority LTA for that cover type and another point if it is within a 330' buffer of a managed patch of the same general category.

These Stand Scores have been applied to the SFRMP FIM dataset and are shown as a conversion label such as WP 2 in the dataset. As an example for the stand mentioned above, a conversion score and label of WP 2 has been assigned. This means that this aspen stand met the white pine 10-year conversion pool criteria (one point) and that the 2nd point came from being in either a priority LTA for white pine or in a buffer of an Upland Conifer patch. Refer to the stand selection FIM dataset attribute table to determine the source of the 2nd point. In this case, the table shows the 2nd point came from this stand being in a priority LTA.

Even-age Scoring System

The total even-age score (range 1-7) for a stand is calculated by summing the three component scores: treatment model (range 1-4), managed patch (1 or 2), and openlands areas (1). For example, a particular white spruce stand (150 WS45) received a score of 5 points. This score resulted from summing the stand's three component scores: 4 points from the treatment model, 1 point from a managed patch, and 0 points from openlands areas. Refer to the stand selection FIM dataset attribute table for the details of the component scores by stand.

Total even-age score = (treatment model score + managed patch score + openlands score)

Treatment Model Score Description (range 1-4 points)

Within an individual treatment model, points were assigned to each age-class and pool (normal or ERF) combination in the first decade (2007-2017) according the definitions below.

Score	Pool	Definition
4	Normal	currently over max and all acres selected
4	ERF	currently over max and all acres selected
3	Normal	will be over max within 10 years and some acres selected
3	ERF	currently over max and some acres selected
2	Normal	beyond normal but won't be max in 10 years and some acres selected
2	ERF	will be over max within 10 years and some acres selected
1	Normal	currently less than normal and some acres selected
1	ERF	beyond normal and some acres selected

Managed Patch Score Description (1 or 2 points)

Stands or groups of stands within the 146 managed patches in the CP and PMOP subsections were assigned 1 or 2 points, if the CP-PMOP planning Team believed treatment in the next 10 years would contribute to the goals of the individual patches. Stands with a 2 point managed patch score should receive more consideration for treatment than the 1 point stands during stand selection.

Openlands Areas (1 point)

All stands that intersected the Blackduck Openlands Area or the Prairie Chicken Area received 1 point. By giving these stands a higher score, the CP-PMOP planning Team believed these stands would be more likely to be selected for treatment in the next 10 years, which will create younger forests in these areas.

APPENDIX L

Terrestrial, Vertebrate Species List

Chippewa Plains / Pine Moraines and Outwash Plains ECS Subsections

[a] **Species Common Name:** Are standardized nomenclature for GAP protocol uses through NatureServe and its related searchable plant, animal and ecological communities database called NatureServe Explorer (2002) located at: http://www.natureserveexplorer.org.

[b] **Resident Status: R**=Regular resident as Breeding, Nesting, or Migratory (acceptable record exists in at least eight of the past 10 years); **PR=**Permanent Resident (exists year-round).

[c] **State Legal Status: E**=State Endangered; **T**=State Threatened; **SC**=State Species of Special Concern; **BG=**Big Game; **SG=**Small Game; **F**=Furbearer; **MW**=Migratory Waterfowl; **UB**=Unprotected Bird; **PB=**Protected Bird; **PWA**=Protected Wild Animal; **UWA**=Unprotected Wild Animal.

[d] **Federal Legal Status: T**=Federal Threatened; **E**=Federal Endangered; **P**=Federal Protection by Migratory Bird Treaty Act and/or Bald Eagle Protection Act and/or CITES.

[e] **ECS Subsection Resident Status: B**=Minnesota breeding record exists for the species; **P**=Presence known or predicted, as year around resident; **M=**Spring or fall migrant, non-breeder; **SV**= Summer visitor, non-breeder; **WV**=Winter visitor, non-breeder; **A**=Absent; **(L)**=Limited distribution within ECS Subsection.

*** Species of Greatest Conservation Need**

Terrestrial Vertebrate Species List
Minnesota DNR-Division of Fish and Wildlife - Wildlife Resources Assessment Project[A]

Common Name[a]	Scientific Name	Resident Status[b]	State Legal Status[c]	Federal Legal Status[d]	ECS Subsection[e]	
					Pine Moraines/ Outwash Plains	Chippewa Plains
Wood Duck	*Aix sponsa*	R	PB, MW	P	B	B
American Wigeon	*Anas americana*	R	PB, MW	P	M	B
Green-winged Teal	*Anas crecca*	R	PB, MW	P	M	B
Blue-winged Teal	*Anas discors*	R	PB, MW	P	B	B
Mallard	*Anas platyrhynchos*	R	PB, MW	P	B	B
*American Black Duck	*Anas rubripes*	R	PB, MW	P	M	B
Ring-necked Duck	*Aythya collaris*	R	PB, MW	P	B	B
Canada Goose	*Branta canadensis*	R	PB, MW	P	B	B
Common Goldeneye	*Bucephala clangula*	R	PB, MW	P	B	B
*Trumpeter Swan	*Cygnus buccinator*	R	PB, MW, T	P	B	B
Hooded Merganser	*Lophodytes cucullatus*	R	PB, MW	P	B	B
Common Merganser	*Mergus merganser*	R	PB, MW	P	B	B
Ruffed Grouse	*Bonasa umbellus*	PR	PB, SG		P	P
*Spruce Grouse	*Falcipennis canadensis*	PR	PB, SG		A	P
Wild Turkey	*Meleagris gallopavo*	PR	PB, SG		P	A
*Greater Prairie Chicken	*Tympanuchus cupido*	PR	PB, SG,		P	A

			SC			
*Sharp-tailed Grouse	*Tympanuchus phasianellus*	PR	PB, SG		P	P
*Common Loon	*Gavia immer*	R	PB	P	B	B
*Red-necked Grebe	*Podiceps grisegena*	R	PB	P	B	B
Pied-billed Grebe	*Podilymbus podiceps*	R	PB	P	B	B
*American White Pelican	*Pelecanus erythrorhynchos*	R	PB, SC	P	B	M/SV
Double-crested Cormorant	*Phalacrocorax auritus*	R	UB	P	B	B
Great Blue Heron	*Ardea herodias*	R	PB	P	B	B
*American Bittern	*Botaurus lentiginosus*	R	PB	P	B	B
Green Heron	*Butorides virescens*	R	PB	P	B	B
*Least Bittern	*Ixobrychus exilis*	R	PB	P	B	B
Turkey Vulture	*Cathartes aura*	R	PB	P	B	B
Cooper's Hawk	*Accipiter cooperii*	R	PB	P	B	B
*Northern Goshawk	*Accipiter gentilis*	R	PB	P	B	B
Sharp-shinned Hawk	*Accipiter striatus*	R	PB	P	B	B
Red-tailed Hawk	*Buteo jamaicensis*	R	PB	P	B	B
*Red-shouldered Hawk	*Buteo lineatus*	R	PB, SC	P	B	B
Broad-winged Hawk	*Buteo platypterus*	R	PB	P	B	B
*Northern Harrier	*Circus cyaneus*	R	PB	P	B	B
*Bald Eagle	*Haliaeetus leucocephalus*	R	PB, SC	P/T	B	B
Osprey	*Pandion haliaetus*	R	PB	P	B	B
Merlin	*Falco columbarius*	R	PB	P	B	B
American Kestrel	*Falco sparverius*	R	PB	P	B	B
*Yellow Rail	*Coturnicops noveboracensis*	R	PB, SC	P	B	B
American Coot	*Fulica americana*	R	PB, SG	P	B	B
Sora	*Porzana carolina*	R	PB, SG	P	B	B
*Virginia Rail	*Rallus limicola*	R	PB, SG	P	B	B
Sandhill Crane	*Grus canadensis*	R	PB	P	B	B
Killdeer	*Charadrius vociferus*	R	PB	P	B	B
Spotted Sandpiper	*Actitis macularia*	R	PB	P	B	B
*Upland Sandpiper	*Bartramia longicauda*	R	PB	P	B	B
Wilson’s Snipe	*Capella delicate*	R	PB, SG	P	B	B
*Wilson's Phalarope	*Phalaropus tricolor*	R	PB, T	P	B	B
*American Woodcock	*Scolopax minor*	R	PB, SG	P	B	B
*Black Tern	*Chlidonias niger*	R	PB	P	B	B
Capian Tern	*Hydroprognecaspia*	R	PB	P	B	
Herring Gull	*Larus argentatus*	R	PB	P	B	B
Ring-billed Gull	*Larus delawarensis*	R	PB	P	B	B
*Forster's Tern	*Sterna forsteri*	R	PB, SC	P	M	B
*Common Tern	*Sterna hirundo*	R	PB, T	P	B	M
Rock Pigeon	*Columba livia*	R	PB	P	P	P
Mourning Dove	*Zenaida macroura*	R	PB	P	B	B
Yellow-billed Cuckoo	*Coccyzus americanus*	R	PB	P	B	M
N Saw-Whet Owl	*Aegolius acadicus*	PR	PB		PR	PR
*Black-billed Cuckoo	*Coccyzus erythropthalmus*	R	PB	P	B	B
*Short-eared Owl	*Asio flammeus*	R	PB, SC	P	B	B
Long-eared Owl	*Asio otus*	PR	PB	P	B	B
Great Horned Owl	*Bubo virginianus*	PR	UB	P	P	P
Great Gray Owl	*Strix nebulosa*	PR	PB	P	P	P

Barred Owl	*Strix varia*	PR	PB	P	P	P
*Whip-poor-will	*Caprimulgus vociferus*	R	PB	P	B	B
*Common Nighthawk	*Chordeiles minor*	R	PB	P	B	B
Chimney Swift	*Chaetura pelagica*	R	PB	P	B	B
Ruby-throated Hummingbird	*Archilochus colubris*	R	PB	P	B	B
Belted Kingfisher	*Ceryle alcyon*	R	PB	P	B	B
Northern Flicker	*Colaptes auratus*	R	PB	P	B	B
Pileated Woodpecker	*Dryocopus pileatus*	PR	PB	P	P	P
Red-bellied Woodpecker	*Melanerpes carolinus*	PR	PB	P	P	WV
*Red-headed Woodpecker	*Melanerpes erythrocephalus*	R	PB	P	B	B
*Black-backed Woodpecker	*Picoides arcticus*	PR	PB	P	WV	P
American Three-toed Woodpecker	*Picoides dorsalis*	PR	PB		PR	PR
Downy Woodpecker	*Picoides pubescens*	PR	PB	P	P	P
Hairy Woodpecker	*Picoides villosus*	PR	PB	P	P	P
*Yellow-bellied Sapsucker	*Sphyrapicus varius*	R	PB	P	B	B
*Olive-sided Flycatcher	*Contopus cooperi*	R	PB	P	B	B
*Eastern Wood-Pewee	*Contopus virens*	R	PB	P	B	B
Alder Flycatcher	*Empidonax alnorum*	R	PB	P	B	B
Yellow-bellied Flycatcher	*Empidonax flaviventris*	R	PB	P	B	B
*Least Flycatcher	*Empidonax minimus*	R	PB	P	B	B
Great Crested Flycatcher	*Myiarchus crinitus*	R	PB	P	B	B
Eastern Phoebe	*Sayornis phoebe*	R	PB	P	B	B
Eastern Kingbird	*Tyrannus tyrannus*	R	PB	P	B	B
Western Kingbird	*Tyrannus verticalis*	R	PB	P	B	A
Yellow-throated Vireo	*Vireo flavifrons*	R	PB	P	B	B
Warbling Vireo	*Vireo gilvus*	R	PB	P	B	B
Red-eyed Vireo	*Vireo olivaceus*	R	PB	P	B	B
Blue-headed Vireo	*Vireo solitarius*	R	PB	P	B	B
*Cerulean Warbler	*Dendroica cerulea*	R	PB, SC	P	B	A
American Crow	*Corvus brachyrhynchos*	PR	PB	P	P	P
Yellow-rumped Warbler	*Dendroica coronata*	R	PB	P	B	B
Common Raven	*Corvus corax*	PR	PB	P	P	P
Blackburnian Warbler	*Dendroica fusca*	R	PB	P	B	B
Blue Jay	*Cyanocitta cristata*	PR	PB	P	P	P
Magnolia Warbler	*Dendroica magnolia*	R	PB	P	B	B
Gray Jay	*Perisoreus canadensis*	PR	PB	P	P	P
Chestnut-sided Warbler	*Dendroica pensylvanica*	R	PB	P	B	B
Palm Warbler	*Dendroica palmarum*	R	PB	P	B	B
Black-billed Magpie	*Pica pica*	PR	UB	P	A	P
Yellow Warbler	*Dendroica petechia*	R	PB	P	B	B
Horned Lark	*Eremophila alpestris*	R	PB	P	B	B
Pine Warbler	*Dendroica pinus*	R	PB	P	B	B
Barn Swallow	*Hirundo rustica*	R	PB	P	B	B
*Cape May Warbler	*Dendroica tigrina*	R	PB	P	M	B
Cliff Swallow	*Petrochelidon pyrrhonota*	R	PB	P	B	B
Black-throated Green Warbler	*Dendroica virens*	R	PB	P	B	B
Purple Martin	*Progne subis*	R	PB	P	B	B
Common Yellowthroat	*Geothlypis trichas*	R	PB	P	B	B

*Canada Warbler	*Wilsonia canadensis*	R	PB	P	B	B
Bank Swallow	*Riparia riparia*	R	PB	P	B	B
Black-and-white Warbler	*Mniotilta varia*	R	PB	P	B	B
*N Rough-winged Swallow	*Stelgidopteryx serripennis*	R	PB	P	B	B
*Connecticut Warbler	*Oporornis agilis*	R	PB	P	B	B
Tree Swallow	*Tachycineta bicolor*	R	PB	P	B	B
Mourning Warbler	*Oporornis philadelphia*	R	PB	P	B	B
*Black-capped Chickadee	*Poecile atricapillus*	PR	PB	P	P	P
Northern Parula	*Parula americana*	R	PB	P	B	B
Boreal Chickadee	*Poecile hudsonicus*	PR	PB	P	A	P
*Ovenbird	*Seiurus aurocapillus*	R	PB	P	B	B
Red-breasted Nuthatch	*Sitta canadensis*	PR	PB	P	P	P
Northern Waterthrush	*Seiurus noveboracensis*	R	PB	P	B	B
White-breasted Nuthatch	*Sitta carolinensis*	PR	PB	P	P	P
American Redstart	*Setophaga ruticilla*	R	PB	P	B	B
Brown Creeper	*Certhia americana*	R	PB	P	B	B
*Golden-winged Warbler	*Vermivora chrysoptera*	R	PB	P	B	B
*Marsh Wren	*Cistothorus palustris*	R	PB	P	B	B
Tennessee Warbler	*Vermivora peregrina*	R	PB	P	M	B
*Sedge Wren	*Cistothorus platensis*	R	PB	P	B	B
Nashville Warbler	*Vermivora ruficapilla*	R	PB	P	B	B
House Wren	*Troglodytes aedon*	R	PB	P	B	B
Scarlet Tanager	*Piranga olivacea*	R	PB	P	B	B
*Winter Wren	*Troglodytestroglodytes*	R	PB			
Northern Cardinal	*Cardinalis cardinalis*	PR	PB	P	P	WV
Golden-crowned Kinglet	*Regulus satrapa*	R	PB	P	B	B
*Le Conte's Sparrow	*Ammodramus leconteii*	R	PB	P	B	B
Ruby-crowned Kinglet	*Regulus calendula*	R	PB	P	M	B
*Nelson's Sharp-tailed Sparrow	*Ammodramus nelsoni*	R	PB, SC	P	B	B
Blue-gray Gnatcatcher	*Polioptila caerulea*	R	PB	P	B	A
Grasshopper Sparrow	*Ammodramus savannarum*	R	PB	P	B	M
*Veery	*Catharus fuscescens*	R	PB	P	B	B
Lark Sparrow	*Chondestes grammacus*	R	PB	P	B	A
Hermit Thrush	*Catharus guttatus*	R	PB	P	B	B
Dark-eyed Junco	*Junco hyemalis*	R	PB	P	M	B
Swainson's Thrush	*Catharus ustulatus*	R	PB	P	M	B
*Swamp Sparrow	*Melospiza georgiana*	R	PB	P	B	B
*Wood Thrush	*Hylocichla mustelina*	R	PB	P	B	B
Song Sparrow	*Melospiza melodia*	R	PB	P	B	B
Eastern Bluebird	*Sialia sialis*	R	PB	P	B	B
*Savannah Sparrow	*Passerculus sandwichensis*	R	PB	P	B	B
American Robin	*Turdus migratorius*	R	PB	P	B	B
Eastern Towhee	*Pipilo erythrophthalmus*	R	PB	P	B	B
Gray Catbird	*Dumetella carolinensis*	R	PB	P	B	B
Vesper Sparrow	*Pooecetes gramineus*	R	PB	P	B	B
*Brown Thrasher	*Toxostoma rufum*	R	PB	P	B	B
Clay-colored Sparrow	*Spizella pallida*	R	PB	P	B	B
European Starling	*Sturnus vulgaris*	PR	UB	P	P	P
Chipping Sparrow	*Spizella passerina*	R	PB	P	B	B

Cedar Waxwing	*Bombycilla cedrorum*	R	PB	P	B	B
*Field Sparrow	*Spizella pusilla*	R	PB	P	B	A
*White-throated Sparrow	*Zonotrichia albicollis*	R	PB	P	B	B
Indigo Bunting	*Passerina cyanea*	R	PB	P	B	B
*Rose-breasted Grosbeak	*Pheucticus ludovicianus*	R	PB	P	B	B
Red-winged Blackbird	*Agelaius phoeniceus*	R	UB	P	B	B
*Bobolink	*Dolichonyx oryzivorus*	R	PB	P	B	B
Brewer's Blackbird	*Euphagus cyanocephalus*	R	UB	P	B	B
Baltimore Oriole	*Icterus galbula*	R	PB	P	B	B
Brown-headed Cowbird	*Molothrus ater*	R	PB	P	B	B
Common Grackle	*Quiscalus quiscula*	R	UB	P	B	B
*Eastern Meadowlark	*Sturnella magna*	R	PB	P	B	B
Western Meadowlark	*Sturnella neglecta*	R	PB	P	B	B
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	R	UB	P	B	B
Pine Siskin	*Carduelis pinus*	R	PB	P	P	P
American Goldfinch	*Carduelis tristis*	R	PB	P	B	B
House Finch	*Carpodacus mexicanus*	PR	PB	P	P	P
Purple Finch	*Carpodacus purpureus*	R	PB	P	B	B
Evening Grosbeak	*Coccothraustes vespertinus*	R	PB	P	P	P
House Sparrow	*Passer domesticus*	PR	UB	P	P	P
MAMMALS						
Southern Flying Squirrel	*Glaucomys volans*	PR			P	A
Woodchuck	*Marmota monax*	PR			P	P
Least Chipmunk	*Tamias minimus*	PR			P	P
Eastern Gray Squirrel	*Sciurus carolinensis*	PR	PWA, SG		P	P
Eastern Fox Squirrel	*Sciurus niger*	PR	PWA, SG		P	P
*Franklin's Ground Squirrel	*Spermophilus franklinii*	PR			P	P
Thirteen-lined Ground Squirrel	*Spermophilus tridecemlineatus*	PR			P	P
Eastern Chipmunk	*Tamias striatus*	PR			P	P
Red Squirrel	*Tamiasciurus hudsonicus*	PR			P	P
American Beaver	Castor canadensis	PR	PWA, SG, F		P	P
Plains Pocket Gopher	*Geomys bursarius*	PR	UWA		P	P
Woodland Jumping Mouse	*Napaeozapus insignis*	PR			P	P
Meadow Jumping Mouse	*Zapus hudsonius*	PR			P	P
*Prairie Vole	*Microtus ochrogaster*	PR	SC		P	A
Meadow Vole	*Microtus pennsylvanicus*	PR			P	P
Southern Red-backed Vole	*Clethrionomys gapperi*	PR			P	P
Common Muskrat	*Ondatra zibethicus*	PR	PWA,SG,F		P	P
White-footed Deer Mouse	*Peromyscus leucopus*	PR			P	P
N American Deer Mouse	*Peromyscus maniculatus bairdii*	PR			P	P
Southern Bog Lemming	*Synaptomys cooperi*	PR			P	P
North American Porcupine	*Erethizon dorsatum*	PR	UWA		P	P
Snowshoe Hare	*Lepus americanus*	PR	PWA, SG		P	P
White-tailed Jackrabbit	*Lepus townsendii*	PR	PWA, SG		P	A
Eastern Cottontail	*Sylvilagus floridanus*	PR	PWA, SG		P	P
Northern Short-tailed Shrew	*Blarina brevicauda*	PR			P	P
Arctic Shrew	*Sorex arcticus*	PR			P	P

Cinereus Shrew	*Sorex cinereus*	PR			P	P
Pygmy Shrew	*Sorex hoyi*	PR			P	P
American Water Shrew	*Sorex palustris*	PR			P	P
Star-nosed Mole	*Condylura cristata*	PR			P	P
Big Brown Bat	*Eptesicus fuscus*	PR			B	B
Silver-haired Bat	*Lasionycteris noctivagans*	R			B	B
Eastern Red Bat	*Lasiurus borealis*	R			B	B
Hoary Bat	*Lasiurus cinereus*	R			B	B
Little Brown Myotis	*Myotis lucifugus*	PR			B	B
*Northern Myotis	*Myotis septentrionalis*	PR	SC		B	B
Coyote	*Canis latrans*	PR	UWA		P	P
*Gray Wolf	*Canis lupus*	PR	SC	T, P	P	P
Gray Fox	*Urocyon cinereoargenteus*	PR	PWA, SG, F		P	P
Red Fox	*Vulpes vulpes*	PR	PWA, SG, F		P	P
*Canadian Lynx		PR	SC	E		P
Bobcat	*Lynx rufus*	PR	PWA, SG, F	P	P	P
American Marten	Martes americana	PR	PWA, SG, F		P	P
Fisher	*Martes pennanti*	PR	PWA, SG, F		P	P
Northern River Otter	*Lontra canadensis*	PR	PWA, SG, F		P	P
Ermine	*Mustela erminea*	PR	UWA		P	P
Long-tailed Weasel	*Mustela frenata*	PR	UWA		P	A
American Mink	*Mustela vison*	PR	PWA, SG, F		P	P
*American Badger	*Taxidea taxus*	PR	PWA, SG, F		P	P
Striped Skunk	*Mephitis mephitis*	PR	UWA		P	P
*E Spotted Skunk	*Spilogale putorius*	PR			P	P
Raccoon	*Procyon lotor*	PR	PWA, SG, F		P	P
American Black Bear	*Ursus americanus*	PR	PWA, BG	P	P	P
White-tailed Deer	*Odocoileus virginianus*	PR	PWA, BG		P	P
Northern Flying Squirrel	*Glaucomys sabrinus*	PR			P	P
AMPHIBIANS AND REPTILES						
American Toad	*Bufo americanus*	PR	PWA		P	P
Canadian Toad	*Bufohemiophyrus*	PR			P	P
Cope's Gray Treefrog	*Hyla chrysoscelis*	PR	PWA		P	A
Gray Treefrog	*Hyla versicolor*	PR	PWA		P	P
Spring Peeper	*Pseudacris crucifer*	PR	PWA		P	P
Boreal Chorus Frog	*Pseudacris triseriata*	PR	PWA		P	P
Green Frog	*Rana clamitans*	PR	PWA		P	A
Northern Leopard Frog	*Rana pipiens*	PR	PWA		P	P
Mink Frog	*Rana septentrionalis*	PR	PWA		P	P
Wood Frog	*Rana sylvatica*	PR	PWA		P	P
Blue-spotted Salamander	*Ambystoma laterale*	PR			P	P
Tiger Salamander	*Ambystoma tigrinum*	PR			P	P
*Four-toed Salamander	*Hemidactylium scutatum*	PR	SC		P	P

*Redback Salamander	*Plethodon cinereus*	PR			P	P
*Mudpuppy	*Necturusmacalosus*					
Eastern Newt	*Notophthalmus viridescens*	PR			P	P
*Common Snapping Turtle	*Chelydra serpentina*	PR	PWA, SC		P	P
Northern Painted Turtle	*Chrysemys picta*	PR	PWA		P	P
*Blanding's Turtle	*Emydoidea blandingii*	PR	PWA, T		P	A
Prairie Skink	*Eumeces septentrionalis*	PR			P	P
*Eastern Hognose Snake	*Heterodon platyrhinos*	PR			P	A
*Smooth Green Snake	*Liochlorophis vernalis*	PR			P	P
Red-bellied Snake	*Storeria occipitomaculata*	PR			P	A
Plains Garter Snake	*Thamnophis radix*	PR			P	P
Common Garter Snake	*Thamnophis sirtalis*	PR			P	P

[A] **MNWRAP Disclaimer**: This species list is a representation of the current occurrence of these species based upon Minnesota Ecological Classification System Subsections. The species may not occur everywhere within the Subsection. Animal distributions are dynamic and occurrence revisions may be made as new information becomes available.

APPENDIX M
Wildlife Habitat Relationships

7.2 Wildife Habitat Relationships- Amphibiasn and Reptiles

Amphibian habitat relationships by Minnesota Gap Analysis Project (MN-GAP) land cover type

Non-Forest land cover types>>> Forest land cover types>>>

				Urban/ Dev.			Ag./Grass			Shrub			Aquatic				Upland Coniferous Fores									Lowland Coniferous Forest							Upland Deciduous Forest					Lowland Deciduous Forest						Forest type size class				
SPECIES GROUP Species Common Name	Habitat feature		Barren	High intensity urban	Low intensity urban	Transportation	Cropland	Grassland	Prairie	Upland shrub	Lowland deciduous sh	Lowland evergreen sh	Water	Floating aquatic	Sedge Meadow	Broadleaf sedge/Catta	Jack Pine	Red Pine	White Pine mix	Balsam Fir mix	White Spruce	Upland Black Spruce	Up. N. White Cedar	Upland Conifer	Up. coniferous/deciduous mix	Lowland Black Spruc	Stagnant black spruce	Tamarack	Stagnant tamarack	Low. N. White Cedar	Stagnant N. White Ce	Stagnant conifer	Aspen/White Birch	Bur/White Oak	Red Oak	Maple/Basswood	Upland deciduous m	Black Ash	Silver Maple	Cottonwood	Lowland deciduous m	Low. deciduous/coniferous m		Seedling	Sapling	Pole timber	Saw timber	Uneven
AMPHIBIANS																																																
TOADS AND FROGS																																																
American Toad	RV			Y	Y			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y
Gray Treefrog	DRV										Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y								Y	Y	Y	Y	Y	Y	Y	Y	Y	Y					Y	Y
Spring Peeper	DRV				Y						Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y
Western Chorus Frog	RV			Y	Y			Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y								Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y	Y
Green Frog	R										Y	Y	Y	Y	Y	Y										Y	Y	Y	Y	Y	Y	Y						Y	Y	Y	Y	Y						
Northern Leopard Frog	R								Y	Y	Y		Y	Y	Y	Y											Y		Y		Y	Y						Y	Y	Y	Y	Y						
Mink Frog	R											Y	Y	Y		Y										Y	Y	Y	Y	Y	Y	Y										Y						
Wood Frog	DV										Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y					Y	Y
SALAMANDERS																																																
Blue-spotted Salamander	DV										Y		Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y									Y	Y	Y	Y	Y	Y	Y	Y	Y	Y					Y	Y
Tiger Salamander	V			Y	Y		Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y								Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y	Y	Y
Four-toed Salamander	DV																									Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y					Y	
Redback Salamander	D																Y	Y	Y					Y	Y								Y	Y	Y	Y	Y	Y	Y	Y	Y	Y					Y	Y
Eastern Newt	DR												Y				Y	Y	Y					Y	Y								Y	Y	Y	Y	Y	Y	Y	Y	Y	Y					Y	Y
REPTILES																																																
LIZARDS																																																
Prairie Skink								Y	Y																									Y														
SNAKES																																																
Eastern Hognose Snake	D							Y	Y								Y	Y							Y								Y	Y	Y	Y	Y	Y	Y	Y	Y							
Smooth Green Snake					Y			Y	Y	Y	Y	Y			Y	Y	Y	Y	Y							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											
Redbelly Snake	D							Y							Y		Y	Y	Y						Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y						
Plains Garter Snake					Y			Y	Y						Y	Y																																
Common Garter Snake	D			Y	Y			Y	Y	Y	Y	Y			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y						
TURTLES																																																
Snapping Turtle	R												Y	Y		Y																																
Painted Turtle	DR											Y	Y	Y		Y																																
Blanding's Turtle								Y	Y				Y	Y	Y	Y																																

7.2 Wildlife Habitat Relationships- Bird Habitats

Bird habitat relationships by Minnesota Gap Analysis Project (MN-GAP) land cover type>>

Non-Forested types>>> | Forest land cover types>>>

SPECIES GROUP Species Common Name	Habitat feature	Barren	Urban/ Dev.			Ag./Grass			Shrub			Aquatic			Upland Coniferous Forest								Up. coniferous/deciduous mi	Lowland Coniferous Forest							Upland Deciduous Forest					Lowland Deciduous Forest				Low. deciduous/coniferous n	Forest size class				
			High intensity urban	Low intensity urban	Transportation	Cropland	Grassland	Prairie	Upland shrub	Lowland deciduous s	Lowland evergreen s	Water	Floating aquatic	Sedge Meadow	Broadleaf sedge/Catt	Jack Pine	Red Pine	White Pine mix	Balsam Fir mix	White Spruce	Upland Black Spruce	Up. N. White Cedar	Upland Conifer		Lowland Black Spruc	Stagnant black spruc	Tamarack	Stagnant tamarack	Low. N. White Ceda	Stagnant N. White C	Stagnant conifer	Aspen/White Birch	Bur/White Oak	Red Oak	Maple/Basswood	Upland deciduous n	Black Ash	Silver Maple	Cottonwood	Lowland deciduous n		Seedling	Sapling	Pole timber	Saw timber	Uneven
LOONS AND GREBES																																											
Common Loon												Y	Y																															
Pied-billed Grebe												Y	Y	Y	Y																													
Red-necked Grebe												Y	Y		Y																													
PELICANS AND CORMORANTS																																											
American White Pelican												Y	Y	Y																														
Double-crested Cormorant	RS											Y	Y	Y	Y																Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y
HERONS AND BITTERNS																																											
American Bittern	R						Y	Y		Y		Y	Y	Y	Y																													
Least Bittern	R									Y		Y	Y	Y	Y																													
Great Blue Heron	RS											Y	Y	Y	Y																Y	Y	Y		Y	Y	Y	Y	Y	Y				Y	Y
Green Heron	R								Y	Y		Y	Y	Y	Y													Y	Y							Y	Y	Y	Y	Y				Y	Y
VULTURES																																											
Turkey Vulture	S						Y	Y	Y							Y	Y	Y	Y	Y	Y	Y	Y								Y	Y	Y	Y	Y							Y	Y	
SWANS AND GEESE																																											
Canada Goose	R			Y		Y	Y	Y	Y	Y		Y	Y	Y	Y																													
Trumpeter Swan										Y		Y	Y	Y	Y																													
DUCKS AND																																											
Wood Duck	CMRS									Y		Y	Y		Y																Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y
American Wigeon	R						Y	Y	Y	Y		Y	Y	Y	Y																													
American Black Duck	R						Y	Y	Y	Y		Y	Y	Y	Y																						Y	Y	Y	Y	Y		Y	Y	Y	Y	Y
Mallard	RM			Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y																						Y	Y	Y	Y	Y				Y	Y

7.2 Wildlife Habitat Relationships- Bird Habitats

Bird habitat relationships by Minnesota Gap Analysis Project (MN-GAP) land cover type>>

Non-Forested types>>> | Forest land cover types>>>

SPECIES GROUP Species Common Name	Habitat feature	Barren	Urban/ Dev.			Ag./Grass			Shrub			Aquatic				Upland Coniferous Forest								Up. coniferous/deciduous mix	Lowland Coniferous Forest								Upland Deciduous Forest					Lowland Deciduous Forest				Low. deciduous/coniferous mix	Forest size class				
			High intensity urban	Low intensity urban	Transportation	Cropland	Grassland	Prairie	Upland shrub	Lowland deciduous shru	Lowland evergreen shrul	Water	Floating aquatic	Sedge Meadow	Broadleaf sedge/Cattail	Jack Pine	Red Pine	White Pine mix	Balsam Fir mix	White Spruce	Upland Black Spruce	Up. N. White Cedar	Upland Conifer		Lowland Black Spruce	Stagnant black spruce	Tamarack	Stagnant tamarack	Low. N. White Cedar	Stagnant N. White Cedar	Stagnant conifer	Aspen/White Birch	Bur/White Oak	Red Oak	Maple/Basswood	Upland deciduous mix	Black Ash	Silver Maple	Cottonwood	Lowland deciduous mix		Seedling	Sapling	Pole timber	Saw timber	Uneven
Blue-winged Teal	R					Y	Y	Y	Y	Y		Y	Y	Y	Y																														
Northern Pintail	R					Y	Y	Y				Y	Y	Y	Y																														
Green-winged Teal	R						Y	Y	Y	Y		Y	Y	Y	Y																														
Ring-necked Duck										Y		Y	Y	Y	Y																														
Common Goldeneye	CRS											Y	Y		Y																Y	Y	Y	Y		Y	Y	Y	Y					Y	Y
Hooded Merganser	CRS									Y		Y	Y	Y	Y																Y	Y	Y	Y		Y	Y	Y	Y					Y	Y
Common Merganser	CRS											Y																			Y	Y	Y	Y		Y	Y	Y	Y					Y	Y
OSPREYS																																													
Osprey	RS											Y																																Y	Y	
HAWKS AND EAGLES																																													
Bald Eagle	R											Y					Y	Y					Y	Y							Y	Y	Y	Y	Y	Y			Y	Y				Y	Y
Northern Harrier						Y	Y	Y	Y		Y															Y		Y								Y	Y	Y	Y	Y						
Sharp-shinned Hawk																Y	Y	Y	Y	Y	Y		Y	Y	Y																			Y	Y
Cooper's Hawk							Y		Y							Y	Y	Y													Y	Y	Y	Y	Y	Y	Y	Y	Y					Y	Y
Northern Goshawk																Y	Y	Y	Y	Y	Y		Y	Y							Y	Y	Y	Y	Y									Y	Y
Red-shouldered Hawk	R																														Y	Y	Y	Y	Y	Y	Y	Y	Y					Y	Y
Broad-winged Hawk							Y		Y							Y	Y	Y	Y	Y			Y	Y							Y	Y	Y	Y	Y									Y	Y
Red-tailed Hawk							Y	Y						Y		Y	Y	Y						Y							Y	Y	Y	Y	Y							Y	Y	Y	Y	
FALCONS																																													
American Kestrel	CS					Y	Y	Y																																					
Merlin							Y	Y	Y		Y			Y		Y	Y	Y	Y	Y	Y	Y	Y	Y							Y	Y	Y	Y	Y	Y	Y	Y	Y					Y	Y

7.2 Wildlife Habitat Relationships- Bird Habitats

Bird habitat relationships by Minnesota Gap Analysis Project (MN-GAP) land cover type>>

Non-Forested types>>> | Forest land cover types>>>

SPECIES GROUP Species Common Name	Habitat feature	Barren	Urban/ Dev.			Ag./Grass			Shrub			Aquatic				Upland Coniferous Forest								Up. coniferous/deciduous mix	Lowland Coniferous Forest								Upland Deciduous Forest					Lowland Deciduous Forest				Low. deciduous/coniferous mix	Forest size class				
			High intensity urban	Low intensity urban	Transportation	Cropland	Grassland	Prairie	Upland shrub	Lowland deciduous shru	Lowland evergreen shru	Water	Floating aquatic	Sedge Meadow	Broadleaf sedge/Cattail	Jack Pine	Red Pine	White Pine mix	Balsam Fir mix	White Spruce	Upland Black Spruce	Up. N. White Cedar	Upland Conifer		Lowland Black Spruce	Stagnant black spruce	Tamarack	Stagnant tamarack	Low. N. White Cedar	Stagnant N. White Cedar	Stagnant conifer	Aspen/White Birch	Bur/White Oak	Red Oak	Maple/Basswood	Upland deciduous mix	Black Ash	Silver Maple	Cottonwood	Lowland deciduous mix		Seedling	Sapling	Pole timber	Saw timber	Uneven
GROUSE AND TURKEYS																																												
Ruffed Grouse									Y	Y														Y							Y	Y	Y	Y	Y						Y	Y	Y	Y	
Spruce Grouse	D										Y					Y			Y	Y	Y		Y		Y	Y	Y	Y	Y	Y	Y												Y	Y	Y
Sharp-tailed Grouse						Y	Y	Y	Y	Y	Y			Y																															
Greater Prairie Chicken						Y	Y	Y																																				
Wild Turkey	M					Y	Y																									Y	Y		Y								Y	
RAILS AND COOTS																																												
Yellow Rail										Y		Y	Y	Y	Y																													
Virginia Rail	R									Y		Y	Y	Y	Y																													
Sora	R									Y		Y	Y	Y	Y																													
Common Moorhen	R									Y		Y	Y		Y																													
American Coot	R											Y	Y	Y	Y																													
CRANES																																												
Sandhill Crane						Y	Y	Y		Y	Y		Y	Y	Y																														
PLOVERS																																												
Killdeer	R	Y		Y		Y	Y	Y	Y																																			
SANDPIPERS																																												
Spotted Sandpiper	R	Y		Y			Y	Y	Y		Y	Y		Y	Y																													
Upland Sandpiper						Y	Y	Y	Y	Y				Y	Y																														
Common Snipe										Y	Y	Y		Y	Y											Y		Y		Y	Y														
American Woodcock							Y		Y	Y																						Y	Y	Y	Y	Y						Y				
Wilson's Phalarope							Y	Y				Y	Y	Y	Y																													

7.2 Wildlife Habitat Relationships- Bird Habitats

Bird habitat relationships by Minnesota Gap Analysis Project (MN-GAP) land cover type>>

Non-Forested types>>> | Forest land cover types>>>

SPECIES GROUP Species Common Name	Habitat feature	Barren	Urban/ Dev.			Ag./Grass			Shrub			Aquatic				Upland Coniferous Forest								Up. coniferous/deciduous mix	Lowland Coniferous Forest							Upland Deciduous Forest					Lowland Deciduous Forest				Low. deciduous/coniferous mix	Forest size class				
			High intensity urban	Low intensity urban	Transportation	Cropland	Grassland	Prairie	Upland shrub	Lowland deciduous shru	Lowland evergreen shrul	Water	Floating aquatic	Sedge Meadow	Broadleaf sedge/Cattail	Jack Pine	Red Pine	White Pine mix	Balsam Fir mix	White Spruce	Upland Black Spruce	Up. N. White Cedar	Upland Conifer		Lowland Black Spruce	Stagnant black spruce	Tamarack	Stagnant tamarack	Low. N. White Cedar	Stagnant N. White Cedar	Stagnant conifer	Aspen/White Birch	Bur/White Oak	Red Oak	Maple/Basswood	Upland deciduous mix	Black Ash	Silver Maple	Cottonwood	Lowland deciduous mix		Seedling	Sapling	Pole timber	Saw timber	Uneven
JAEGERS, GULLS AND TERNS																																												
Ring-billed Gull	R	Y		Y		Y	Y					Y		Y	Y																														
Herring Gull	R	Y		Y			Y					Y																																
Forster's Tern												Y	Y	Y	Y																														
Black Tern												Y	Y	Y	Y																														
PIGEONS AND DOVES																																												
Rock Dove							Y																																					
Mourning Dove				Y		Y	Y									Y	Y	Y	Y	Y	Y		Y																		Y		Y	Y	Y
CUCKOOS																																												
Black-billed Cuckoo									Y	Y																																		
Yellow-billed Cuckoo									Y	Y																										Y	Y	Y	Y	Y		Y				Y
OWLS																																												
Great Horned Owl	CS			Y			Y		Y							Y	Y	Y	Y	Y	Y		Y	Y							Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y
Barred Owl	C															Y	Y	Y	Y	Y	Y	Y	Y								Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y
Great Gray Owl	S								Y	Y	Y			Y											Y	Y	Y	Y	Y	Y	Y					Y				Y			Y	Y
Long-eared Owl							Y							Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y		Y			Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y
Short-eared Owl						Y	Y	Y		Y	Y			Y	Y																														
Northern Saw-whet Owl	C								Y							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y								Y				Y	
NIGHTJARS																																												
Common Nighthawk		Y	Y	Y		Y	Y	Y																																			
Whip-poor-will	FD						Y		Y							Y								Y							Y	Y	Y	Y	Y						Y	Y	Y	Y	
SWIFTS																																												
Chimney Swift	CS	Y	Y	Y																											Y	Y	Y	Y	Y						Y	Y	Y	Y	
HIMMINGBIRDS																																												
Ruby-throated Hummingbird	R			Y			Y		Y																					Y				Y		Y	Y	Y		Y			Y	Y

7.2 Wildlife Habitat Relationships- Bird Habitats

Bird habitat relationships by Minnesota Gap Analysis Project (MN-GAP) land cover type>>

Non-Forested types>>> | Forest land cover types>>>

SPECIES GROUP Species Common Name	Habitat feature	Barren	Urban/			Ag./Gra			Shrub			Aquatic				Upland Coniferous Fores								Up. coniferous/deciduous	Lowland Coniferous							Upland					Lowland				Low. deciduous/coniferous	Forest size				
			High intensity urban	Low intensity urban	Transportation	Cropland	Grassland	Prairie	Upland shrub	Lowland deciduous shru	Lowland evergreen shru	Water	Floating aquatic	Sedge Meadow	Broadleaf sedge/Cattail	Jack Pine	Red Pine	White Pine mix	Balsam Fir mix	White Spruce	Upland Black Spruce	Up. N. White Cedar	Upland Conifer		Lowland Black Spruce	Stagnant black spruce	Tamarack	Stagnant tamarack	Low. N. White Cedar	Stagnant N. White Cedar	Stagnant conifer	Aspen/White Birch	Bur/White Oak	Red Oak	Maple/Basswood	Upland deciduous mix	Black Ash	Silver Maple	Cottonwood	Lowland deciduous mix		Seedling	Sapling	Pole timber	Saw timber	Uneven
KINGFISHERS																																												
Belted Kingfisher	B	Y										Y	Y		Y																														
WOODPECKERS																																												
Red-headed Woodpecker	CMS																														Y	Y	Y	Y								Y	Y	
Red-bellied Woodpecker	CMS																																Y		Y	Y		Y					Y	Y
Yellow-bellied Sapsucker	CMS																							Y							Y	Y	Y	Y	Y								Y	
Downy Woodpecker	CDS																							Y							Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y
Hairy Woodpecker	CDS															Y	Y	Y						Y	Y		Y		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y
Black-backed Woodpecker	CDS															Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y									Y			Y	Y	Y
Northern Flicker	CS								Y	Y						Y	Y	Y	Y	Y	Y		Y	Y							Y	Y	Y	Y	Y						Y			Y	Y
Pileated Woodpecker	CDMS																							Y							Y	Y	Y	Y	Y	Y	Y		Y				Y	Y	Y
FLYCATCHERS																																												
Western Kingbird					Y		Y	Y	Y	Y						Y	Y	Y						Y							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y					
Eastern Kingbird	MRS				Y			Y	Y	Y				Y	Y	Y	Y	Y						Y							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y					
Olive-sided Flycatcher	RS									Y	Y					Y			Y	Y	Y		Y		Y	Y	Y	Y	Y	Y	Y											Y	Y	Y
Eastern Wood-Pewee					Y												Y	Y						Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y							Y	
Yellow-bellied Flycatcher	D										Y					Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											Y	Y	
Alder Flycatcher	R									Y																																		
Least Flycatcher									Y	Y														Y							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y
Eastern Phoebe	R				Y	Y			Y	Y		Y																			Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	
Great Crested Flycatcher	CS				Y					Y	Y													Y							Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	
SHRIKES																																												
Northern Shrike							Y		Y																						Y	Y	Y	Y	Y						Y	Y			
Loggerhead Shrike						Y	Y	Y	Y																						Y	Y	Y	Y	Y										

7.2 Wildlife Habitat Relationships- Bird Habitats

Bird habitat relationships by Minnesota Gap Analysis Project (MN-GAP) land cover type>>

Non-Forested types>>> | Forest land cover types>>>

SPECIES GROUP Species Common Name	Habitat feature	Barren	Urban/ Dev.			Ag./Grass			Shrub			Aquatic				Upland Coniferous Forest								Up. coniferous/deciduous mix	Lowland Coniferous Forest							Upland Deciduous Forest					Lowland Deciduous Forest				Low. deciduous/coniferous mix	Forest size class				
			High intensity urban	Low intensity urban	Transportation	Cropland	Grassland	Prairie	Upland shrub	Lowland deciduous shrub	Lowland evergreen shrub	Water	Floating aquatic	Sedge Meadow	Broadleaf sedge/Cattail	Jack Pine	Red Pine	White Pine mix	Balsam Fir mix	White Spruce	Upland Black Spruce	Up. N. White Cedar	Upland Conifer		Lowland Black Spruce	Stagnant black spruce	Tamarack	Stagnant tamarack	Low. N. White Cedar	Stagnant N. White Cedar	Stagnant conifer	Aspen/White Birch	Bur/White Oak	Red Oak	Maple/Basswood	Upland deciduous mix	Black Ash	Silver Maple	Cottonwood	Lowland deciduous mix		Seedling	Sapling	Pole timber	Saw timber	Uneven
VIREOS																																												
Yellow-throated Vireo	R			Y					Y	Y														Y								Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y
Blue-headed Vireo																Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y												Y	Y	
Warbling Vireo	R			Y					Y																						Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y
Red-eyed Vireo																	Y	Y		Y	Y		Y								Y	Y	Y	Y	Y									Y	Y	
JAYS, CROWS AND RAVENS																																												
Gray Jay	M															Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y												Y	Y	
Blue Jay	M															Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y
Black-billed Magpie						Y	Y	Y	Y	Y	Y					Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	
American Crow	M			Y		Y	Y	Y	Y	Y	Y					Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y
Common Raven	M															Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	
LARKS																																												
Horned Lark		Y		Y		Y	Y	Y	Y	Y																																		
SWALLOWS																																												
Purple Martin	RS		Y	Y			Y					Y			Y																													
Tree Swallow	CS						Y	Y		Y	Y	Y	Y	Y	Y																Y	Y	Y	Y	Y	Y	Y	Y						
Northern Rough-winged	BR	Y		Y								Y																																
Bank Swallow	BR	Y		Y			Y	Y				Y	Y																																
Cliff Swallow	R			Y	Y	Y	Y					Y																																
Barn Swallow				Y	Y	Y	Y					Y	Y	Y	Y																														
CHICKADEES																																												
Black-capped Chickadee	CS			Y					Y	Y	Y					Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Boreal Chickadee	CS								Y	Y	Y					Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y										Y			Y	Y	Y

7.2 Wildlife Habitat Relationships- Bird Habitats

Bird habitat relationships by Minnesota Gap Analysis Project (MN-GAP) land cover type>>

Non-Forested types>>> | Forest land cover types>>>

SPECIES GROUP / Species Common Name	Habitat feature	Barren	Urban/ Dev.			Ag./Grass			Shrub			Aquatic				Upland Coniferous Forest								Up. coniferous/deciduous mix	Lowland Coniferous Forest								Upland Deciduous Forest					Lowland Deciduous Forest				Low. deciduous/coniferous mix	Forest size class				
			High intensity urban	Low intensity urban	Transportation	Cropland	Grassland	Prairie	Upland shrub	Lowland deciduous shrub	Lowland evergreen shrub	Water	Floating aquatic	Sedge Meadow	Broadleaf sedge/Cattail	Jack Pine	Red Pine	White Pine mix	Balsam Fir mix	White Spruce	Upland Black Spruce	Up. N. White Cedar	Upland Conifer		Lowland Black Spruce	Stagnant black spruce	Tamarack	Stagnant tamarack	Low. N. White Cedar	Stagnant N. White Cedar	Stagnant conifer	Aspen/White Birch	Bur/White Oak	Red Oak	Maple/Basswood	Upland deciduous mix	Black Ash	Silver Maple	Cottonwood	Lowland deciduous mix		Seedling	Sapling	Pole timber	Saw timber	Uneven
NUTHATCHES																																												
Red-breasted Nuthatch	CS															Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y									Y			Y	Y	Y
White-breasted Nuthatch	CS																														Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y
CREEPERS																																												
Brown Creeper	CS																																				Y	Y		Y	Y			Y	Y	Y
WRENS																																												
House Wren	CS				Y				Y	Y																					Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y			
Sedge Wren							Y	Y		Y				Y	Y											Y		Y		Y	Y													
Marsh Wren	R									Y		Y		Y	Y																													
KINGLETS																																												
Golden-crowned Kinglet																Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y									Y			Y	Y	Y
Ruby-crowned Kinglet																Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y									Y			Y	Y	Y
Blue-gray Gnatcatcher																															Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y
THRUSHES																																												
Eastern Bluebird	CS				Y			Y	Y	Y																					Y	Y	Y	Y	Y						Y					
Veery	M															Y								Y							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Swainson's Thrush	M															Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y		Y		Y									Y				Y	Y	
Hermit Thrush	M															Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y													Y	Y	Y
Wood Thrush	M				Y																			Y							Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y	Y
American Robin	M				Y			Y		Y						Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y	Y	Y
MIMICS AND THRASHERS																																												
Gray Catbird	MR				Y				Y	Y	Y															Y		Y		Y	Y											Y	Y				
Brown Thrasher	M				Y				Y																						Y	Y	Y	Y	Y						Y	Y				

7.2 Wildlife Habitat Relationships- Bird Habitats

Bird habitat relationships by Minnesota Gap Analysis Project (MN-GAP) land cover type>>

SPECIES GROUP / Species Common Name	Habitat feature		Barren	Urban/Dev.: High intensity urban	Urban/Dev.: Low intensity urban	Urban/Dev.: Transportation	Ag./Grass: Cropland	Ag./Grass: Grassland	Ag./Grass: Prairie	Shrub: Upland shrub	Shrub: Lowland deciduous shrub	Shrub: Lowland evergreen shrub	Aquatic: Water	Aquatic: Floating aquatic	Aquatic: Sedge Meadow	Aquatic: Broadleaf sedge/Cattail	Upland Coniferous Forest: Jack Pine	Upland Coniferous Forest: Red Pine	Upland Coniferous Forest: White Pine mix	Upland Coniferous Forest: Balsam Fir mix	Upland Coniferous Forest: White Spruce	Upland Coniferous Forest: Upland Black Spruce	Upland Coniferous Forest: Up. N. White Cedar	Upland Coniferous Forest: Upland Conifer	Up. coniferous/deciduous mix	Lowland Coniferous Forest: Lowland Black Spruce	Lowland Coniferous Forest: Stagnant black spruce	Lowland Coniferous Forest: Tamarack	Lowland Coniferous Forest: Stagnant tamarack	Lowland Coniferous Forest: Low. N. White Cedar	Lowland Coniferous Forest: Stagnant N. White Cedar	Lowland Coniferous Forest: Stagnant conifer	Upland Deciduous Forest: Aspen/White Birch	Upland Deciduous Forest: Bur/White Oak	Upland Deciduous Forest: Red Oak	Upland Deciduous Forest: Maple/Basswood	Upland Deciduous Forest: Upland deciduous mix	Lowland Deciduous Forest: Black Ash	Lowland Deciduous Forest: Silver Maple	Lowland Deciduous Forest: Cottonwood	Lowland Deciduous Forest: Lowland deciduous mix	Low. deciduous/coniferous mix		Forest size class: Seedling	Forest size class: Sapling	Forest size class: Pole timber	Forest size class: Saw timber	Forest size class: Uneven
			Non-Forested types>>>														Forest land cover types>>>																															
WAXWINGS																																																
Cedar Waxwing	MR				Y					Y							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y										Y		Y	Y	Y	Y	Y
WARBLERS																																																
Golden-winged Warbler	R									Y	Y						Y	Y	Y	Y					Y								Y	Y	Y			Y	Y		Y			Y	Y	Y	Y	
Tennessee Warbler																											Y		Y		Y	Y														Y	Y	
Nashville Warbler										Y	Y						Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	
Northern Parula																	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y														Y	Y	
Yellow Warbler	R				Y					Y	Y																											Y	Y		Y			Y	Y			
Chestnut-sided Warbler					Y					Y																							Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y			
Magnolia Warbler																	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y													Y	Y		
Cape May Warbler																				Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y												Y	Y	Y	Y	
Yellow-rumped Warbler																	Y	Y		Y	Y	Y		Y		Y	Y	Y	Y			Y										Y				Y	Y	Y
Black-throated Green																	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y									Y	Y	Y
Blackburnian Warbler																	Y	Y	Y	Y	Y	Y		Y	Y																					Y	Y	Y
Pine Warbler																	Y	Y	Y					Y	Y																						Y	
Palm Warbler												Y															Y		Y		Y	Y												Y	Y	Y	Y	
Cerulean Warbler																																				Y			Y							Y	Y	Y
Black-and-white Warbler	D									Y	Y						Y	Y	Y					Y	Y		Y						Y	Y	Y	Y	Y	Y	Y		Y	Y		Y	Y	Y		
American Redstart										Y	Y						Y																Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y	
Ovenbird																	Y	Y	Y	Y	Y			Y	Y								Y	Y	Y	Y	Y									Y	Y	
Northern Waterthrush	DR										Y															Y	Y	Y	Y	Y	Y	Y						Y	Y		Y	Y				Y	Y	Y
Connecticut Warbler												Y					Y									Y	Y	Y	Y	Y	Y	Y												Y	Y	Y	Y	
Mourning Warbler										Y	Y						Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y		Y	Y			
Common Yellowthroat	R									Y	Y				Y	Y	Y	Y								Y	Y	Y	Y	Y	Y	Y												Y	Y			
Canada Warbler	D									Y		Y							Y	Y	Y	Y	Y	Y	Y	Y		Y		Y			Y			Y	Y									Y	Y	

7.2 Wildlife Habitat Relationships- Bird Habitats

Bird habitat relationships by Minnesota Gap Analysis Project (MN-GAP) land cover type>>

Non-Forested types>>> | Forest land cover types>>>

SPECIES GROUP / Species Common Name	Habitat feature	Barren	Urban/ Dev.: High intensity urban	Urban/ Dev.: Low intensity urban	Urban/ Dev.: Transportation	Ag./Grass: Cropland	Ag./Grass: Grassland	Ag./Grass: Prairie	Shrub: Upland shrub	Shrub: Lowland deciduous shrub	Shrub: Lowland evergreen shrub	Aquatic: Water	Aquatic: Floating aquatic	Aquatic: Sedge Meadow	Aquatic: Broadleaf sedge/Cattail	Upland Coniferous Forest: Jack Pine	Upland Coniferous Forest: Red Pine	Upland Coniferous Forest: White Pine mix	Upland Coniferous Forest: Balsam Fir mix	Upland Coniferous Forest: White Spruce	Upland Coniferous Forest: Upland Black Spruce	Upland Coniferous Forest: Up. N. White Cedar	Upland Coniferous Forest: Upland Conifer	Up. coniferous/deciduous mix	Lowland Coniferous Forest: Lowland Black Spruce	Lowland Coniferous Forest: Stagnant black spruce	Lowland Coniferous Forest: Tamarack	Lowland Coniferous Forest: Stagnant tamarack	Lowland Coniferous Forest: Low. N. White Cedar	Lowland Coniferous Forest: Stagnant N. White Cedar	Lowland Coniferous Forest: Stagnant conifer	Upland Deciduous Forest: Aspen/White Birch	Upland Deciduous Forest: Bur/White Oak	Upland Deciduous Forest: Red Oak	Upland Deciduous Forest: Maple/Basswood	Upland Deciduous Forest: Upland deciduous mix	Lowland Deciduous Forest: Black Ash	Lowland Deciduous Forest: Silver Maple	Lowland Deciduous Forest: Cottonwood	Lowland Deciduous Forest: Lowland deciduous mix	Low. deciduous/coniferous mix	Forest size class: Seedling	Forest size class: Sapling	Forest size class: Pole timber	Forest size class: Saw timber	Forest size class: Uneven
TANAGERS																																														
Scarlet Tanager																Y								Y								Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	
TOWHEES AND SPARROWS																																														
Eastern Towhee	M								Y	Y						Y							Y										Y	Y		Y						Y	Y	Y	Y	
Chipping Sparrow				Y					Y							Y	Y	Y	Y	Y	Y	Y	Y	Y																	Y			Y	Y	
Clay-colored Sparrow							Y	Y	Y	Y	Y					Y	Y	Y	Y	Y	Y	Y	Y		Y		Y		Y			Y	Y			Y	Y	Y	Y	Y	Y	Y	Y			
Field Sparrow							Y	Y	Y							Y	Y	Y						Y								Y	Y	Y	Y	Y				Y		Y				
Vesper Sparrow						Y	Y	Y	Y					Y																		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y					
Lark Sparrow				Y		Y	Y	Y	Y					Y																		Y	Y	Y	Y	Y	Y									
Savannah Sparrow						Y	Y	Y	Y	Y	Y			Y	Y													Y		Y	Y		Y													
Grasshopper Sparrow				Y		Y	Y	Y	Y					Y																																
Le Conte's Sparrow						Y	Y	Y		Y	Y			Y	Y																															
Nelson's Sharp-tailed							Y	Y		Y				Y	Y													Y		Y	Y															
Song Sparrow									Y	Y				Y		Y																Y					Y	Y	Y	Y		Y	Y	Y		
Swamp Sparrow							Y			Y	Y			Y	Y																															
White-throated Sparrow									Y	Y						Y			Y	Y	Y		Y	Y	Y		Y		Y												Y	Y	Y	Y		
Dark-eyed Junco									Y							Y			Y	Y	Y		Y	Y												Y						Y	Y	Y	Y	Y
GROSBEAKS																																														
Northern Cardinal	M			Y					Y	Y													Y									Y	Y	Y	Y	Y	Y	Y		Y		Y	Y			
Rose-breasted Grosbeak	M			Y																												Y	Y	Y	Y	Y								Y	Y	
Indigo Bunting									Y	Y																						Y	Y	Y	Y	Y	Y	Y		Y		Y	Y			

7.2 Wildlife Habitat Relationships- Bird Habitats

Bird habitat relationships by Minnesota Gap Analysis Project (MN-GAP) land cover type>>

Non-Forested types>>> | Forest land cover types>>>

SPECIES GROUP / Species Common Name	Habitat feature	Barren	Urban/ Dev.			Ag./Grass			Shrub			Aquatic				Upland Coniferous Forest								Up. coniferous/deciduous mix	Lowland Coniferous Forest							Upland Deciduous Forest					Lowland Deciduous Forest				Low. deciduous/coniferous mix	Forest size class				
		Barren	High intensity urban	Low intensity urban	Transportation	Cropland	Grassland	Prairie	Upland shrub	Lowland deciduous shrub	Lowland evergreen shrub	Water	Floating aquatic	Sedge Meadow	Broadleaf sedge/Cattail	Jack Pine	Red Pine	White Pine mix	Balsam Fir mix	White Spruce	Upland Black Spruce	Up. N. White Cedar	Upland Conifer	Up. coniferous/deciduous mix	Lowland Black Spruce	Stagnant black spruce	Tamarack	Stagnant tamarack	Low. N. White Cedar	Stagnant N. White Cedar	Stagnant conifer	Aspen/White Birch	Bur/White Oak	Red Oak	Maple/Basswood	Upland deciduous mix	Black Ash	Silver Maple	Cottonwood	Lowland deciduous mix	Low. deciduous/coniferous mix	Seedling	Sapling	Pole timber	Saw timber	Uneven
BLACKBIRDS AND ORIOLES																																														
Bobolink						Y	Y	Y	Y	Y	Y			Y																																
Red-winged Blackbird	R					Y	Y		Y	Y		Y	Y	Y	Y																															
Eastern Meadowlark						Y	Y	Y		Y				Y	Y																		Y													
Western Meadowlark						Y	Y	Y	Y	Y				Y	Y																															
Yellow-headed Blackbird	R											Y		Y	Y																															
Brewer's Blackbird	R			Y		Y	Y	Y	Y	Y	Y			Y	Y											Y		Y		Y	Y	Y	Y						Y							
Common Grackle				Y		Y	Y	Y		Y	Y			Y	Y																															
Brown-headed Cowbird						Y	Y	Y	Y							Y	Y	Y	Y	Y	Y	Y	Y	Y								Y	Y	Y	Y	Y						Y				
Baltimore Oriole	MR			Y																				Y								Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y
FINCHES																																														
Purple Finch	M			Y														Y	Y	Y	Y		Y			Y		Y	Y	Y	Y										Y			Y	Y	Y
House Finch	M		Y	Y																																										
Pine Siskin	M			Y												Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y										Y			Y	Y	
American Goldfinch				Y			Y		Y	Y																						Y	Y	Y	Y	Y						Y				
Evening Grosbeak	M															Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y		Y													Y	Y	Y	Y	

7.2 Wildlife Habitat Relationships- Mammal Habitats.

Mammal habitat relationships by Minnesota Gap Analysis Project (MN-GAP) land cover type

Non-Forest land cover types>>> | Forest land cover types>>>

SPECIES GROUP Species common name	habitat Feature	Barren	Urban/ Dev.				Ag./Grass			Shrub			Aquatic				Upland Coniferous Forest								Up. coniferous/deciduous mix	Lowland Coniferous Forest							Upland Deciduous Forest					Lowland Deciduous Forest				Low. deciduous/coniferous mi	Forest size class				
			High intensity urban	Low intensity urban	Transportation		Cropland	Grassland	Prairie	Upland shrub	Lowland deciduous sh	Lowland evergreen sh	Water	Floating aquatic	Sedge Meadow	Broadleaf sedge/Catta	Jack Pine	Red Pine	White Pine mix	Balsam Fir mix	White Spruce	Upland Black Spruce	Up. N. White Cedar	Upland Conifer		Lowland Black Spruce	Stagnant black spruce	Tamarack	Stagnant tamarack	Low. N. White Cedar	Stagnant N. White Ce	Stagnant conifer	Aspen/White Birch	Bur/White Oak	Red Oak	Maple/Basswood	Upland deciduous m	Black Ash	Silver Maple	Cottonwood	Lowland deciduous m		Seedling	Sapling	Pole timber	Saw timber	Uneven
INSECTIVORES																																												
Northern Short-tailed	D			Y			Y	Y		Y	Y				Y	Y	Y	Y		Y				Y	Y		Y		Y			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Arctic Shrew	R										Y	Y			Y	Y									Y	Y	Y	Y	Y	Y	Y								Y		Y	Y	Y	Y	Y
Cinereus Shrew	D						Y	Y		Y	Y	Y			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Pygmy Shrew	D						Y	Y		Y	Y	Y			Y	Y			Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y				Y		Y			Y	Y	Y	Y	Y	Y
Water Shrew	DR										Y	Y	Y		Y	Y									Y	Y	Y	Y	Y	Y	Y												Y	Y	Y
Star-nosed Mole	DR										Y	Y			Y	Y									Y	Y	Y	Y	Y	Y	Y						Y	Y		Y	Y			Y	Y	Y
BATS																																												
Big Brown Bat	CRS			Y			Y	Y					Y				Y	Y	Y		Y	Y			Y								Y	Y	Y		Y			Y	Y	Y			
Silver-haired Bat	CRS												Y					Y	Y		Y			Y	Y	Y		Y		Y			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y
Eastern Red Bat	CR		Y	Y			Y			Y	Y		Y			Y					Y	Y											Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y
Hoary Bat	R			Y			Y			Y			Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y		Y			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y
Little Brown Bat	CRS						Y	Y		Y	Y		Y		Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y		Y		Y			Y	Y	Y	Y	Y	Y	Y	Y	Y		Y				
Northern Myotis	CRS		Y	Y													Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y		Y			Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y
CARNIVORES																																												
Coyote	M		Y		Y		Y	Y	Y	Y	Y	Y			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Gray Wolf	M						Y	Y		Y	Y	Y					Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Gray Fox	CDM						Y	Y	Y	Y	Y																							Y	Y	Y	Y	Y	Y	Y	Y				Y	Y
Red Fox			Y		Y		Y	Y	Y	Y	Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y								Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Bobcat	CD									Y	Y						Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y	Y	Y	Y
Northern River Otter													Y	Y	Y	Y																														
American Marten	CDS																Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y										Y			Y	Y	Y
Fisher	CDRS										Y									Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y
Ermine	DR									Y	Y						Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Long-tailed Weasel	DR									Y	Y							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
American Mink	DR										Y		Y	Y	Y	Y																														

7.2 Wildlife Habitat Relationships -Mammal Habitat

Mammal habitat relationships by Minnesota Gap Analysis Project (MN-GAP) land cover type

Non-Forest land cover types>>> | Forest land cover types>>>

SPECIES GROUP Species common name	habitat Feature	Barren	Urban/ Dev.			Ag./Grass			Shrub			Aquatic				Upland Coniferous Fores								Up. coniferous/deciduous mix	Lowland Coniferous Forest							Upland Deciduous Forest					Lowland Deciduous Forest				Low. deciduous/coniferous mix	Forest size class				
			High intensity urban	Low intensity urban	Transportation	Cropland	Grassland	Prairie	Upland shrub	Lowland deciduous shru	Lowland evergreen shrul	Water	Floating aquatic	Sedge Meadow	Broadleaf sedge/Cattail	Jack Pine	Red Pine	White Pine mix	Balsam Fir mix	White Spruce	Upland Black Spruce	Up. N. White Cedar	Upland Conifer		Lowland Black Spruce	Stagnant black spruce	Tamarack	Stagnant tamarack	Low. N. White Cedar	Stagnant N. White Cedar	Stagnant conifer	Aspen/White Birch	Bur/White Oak	Red Oak	Maple/Basswood	Upland deciduous mix	Black Ash	Silver Maple	Cottonwood	Lowland deciduous mix		Seedling	Sapling	Pole timber	Saw timber	Uneven
American Badger						Y	Y	Y	Y																							Y													
Striped Skunk	DM			Y		Y	Y	Y	Y							Y	Y	Y	Y	Y	Y	Y	Y	Y							Y	Y	Y	Y	Y						Y	Y	Y	Y	Y
Northern Raccoon	CMRS	Y		Y		Y	Y		Y	Y		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y
Black Bear	CDMR								Y								Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
EVEN-TOED UNGULATES																																													
White-tailed Deer						Y	Y	Y	Y							Y	Y	Y	Y	Y	Y	Y	Y	Y							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
RODENTS																																													
Northern Flying Squirrel	CDMS															Y	Y	Y	Y	Y	Y	Y	Y	Y									Y					Y				Y	Y
Southern Flying Squirrel	CDMS																															Y	Y	Y	Y	Y	Y						Y	Y	Y
Woodchuck				Y		Y	Y		Y	Y																						Y	Y								Y				
Eastern Gray Squirrel	CDM			Y		Y																	Y									Y	Y	Y	Y	Y							Y	
Eastern Fox Squirrel	CDM			Y			Y																									Y	Y	Y	Y		Y					Y	Y	Y
Franklin's Ground Squirrel				Y			Y	Y	Y																																		Y	Y	
Thirteen-lined Ground				Y		Y	Y	Y	Y																																				
Least Chipmunk	DM							Y	Y	Y						Y	Y	Y	Y	Y	Y	Y	Y	Y					Y			Y				Y						Y	Y	Y	Y	Y
Eastern Chipmunk	DM			Y			Y		Y	Y							Y	Y		Y	Y	Y	Y	Y								Y	Y	Y	Y	Y				Y			Y	Y	Y	Y
Red Squirrel	CDMS															Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y										Y			Y	Y	Y
American Beaver	R								Y	Y		Y																			Y				Y						Y	Y	Y	Y	Y
Plains Pocket Gopher						Y	Y	Y	Y																						Y	Y	Y	Y	Y						Y	Y			
Woodland Jumping Mouse	DM																		Y	Y	Y		Y											Y	Y	Y			Y			Y	Y	Y	Y
Meadow Jumping Mouse							Y	Y	Y	Y	Y			Y	Y	Y	Y	Y	Y	Y	Y		Y																			Y				
Woodland Deer Mouse							Y		Y							Y	Y	Y	Y	Y	Y	Y	Y									Y	Y	Y	Y	Y	Y	Y		Y		Y	Y	Y	Y	
Prairie Deer Mouse																																														
White-footed Mouse	CDMS								Y							Y	Y	Y	Y	Y	Y		Y	Y								Y	Y	Y	Y	Y	Y	Y	Y	Y			Y	Y	Y	Y
Southern Red-backed Vole	DM								Y	Y	Y					Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y
Meadow Vole							Y		Y					Y	Y	Y	Y	Y													Y	Y	Y	Y	Y										

APPENDIX N

Land Type Association (LTA)
Assessment and Analysis Documents

Land Type Association (LTA) Assessment and Analysis Documents were prepared to provide forest management information at a smaller landscape scale within the CP and PMOP subsections. They contain reference information organized in overview, description, land management, and vegetation sections for individual LTAs. One purpose of these LTA documents is to provide additional information to DNR field staff as stand management decisions are made during the life of CP-PMOP Plan.

A LTA document template with section descriptions is included in this Appendix. All LTA documents are available on the CP-PMOP website at:
http://www.dnr.state.mn.us/forestry/subsection/cp_pmop/plan.html

LTA Assessment and Analysis documents have been prepared for the following LTAs found within the Chippewa Plains and Pine Moraines and Outwash Plains subsections:

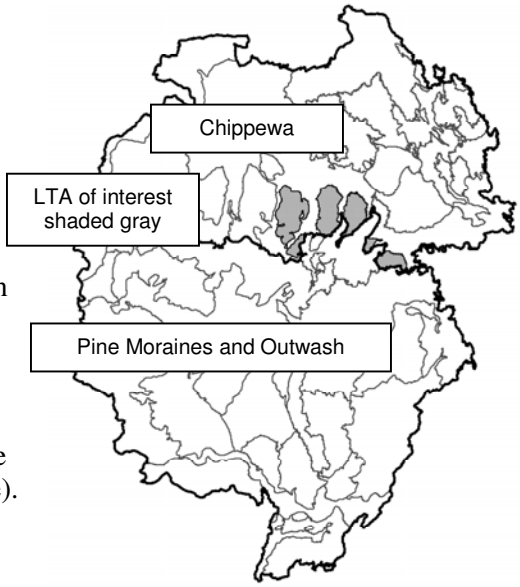
Chippewa Plains

1.	Guthrie Till Plain	212Na03
2.	Bemidji Sand Plain	212Na07
3.	Bena Dunes and Peatlands	212Na08
4.	Rosey Lake Plain	212Na09
5.	Deer River Peatlands	212Na10
6.	Bowstring Till Plain	212Na11
7.	Blackduck Till Plain	212Na16
8.	Blackduck Moraine	212Na18
9.	Alida Till Plain	212Na21
10.	Becida Till Plain	212Na22

Pine Moraines & Outwash Plains

1.	Crow Wing Sand Plain	212Nc01
2.	St. Croix Moraine	212Nc02
3.	Swan Creek Sand Plain	212Nc08
4.	Nimrod Drumlin Plain	212Nc10
5.	Park Rapids Sand Plain	212Nc11
6.	Spring Brook Till Plain	212Nc13
7.	Outing Moraine	212Nc14
8.	Itasca Moraine	212Nc16
9.	Shell Lake Moraine	212Nc28
10.	Itasca Moraine Steep	212Nc30
11.	Two Inlets Moraine	212Nc31
12.	Bass Lake Moraine	212Nc32
13.	Naytahwaush Moraine	212Nc34

LTA Name (LTA code)



OVERVIEW

This LTA Assessment and Analysis Guide contains section explanations, data descriptions, acronyms, and references for the 23 LTA Assessment and Analysis documents that were written for the Chippewa Plains and Pine Moraines and Outwash Plains subsections. Of the 36 total LTAs in these two subsections, these 23 LTAs were chosen because they contain $\geq$ 5% state land (Forestry, Parks, and Wildlife).

Acronyms in this document include: LTA (Land Type Associations), GAP (Gap Analysis Program), CSA (Cooperative Sand Assessment), FIA (Forest Inventory and Analysis), CP-PMOP (Chippewa Plains and Pine Moraines and Outwash Plains subsections), SFRMP (Subsection Forest Resource Management Planning), MFRC (Minnesota Forest Resources Council), OFMC (Old Forest Management Complex), EILC (Ecologically Important Lowland Conifers), and ERF (Extended Rotation Forests).

DESCRIPTION

LTA descriptions are from the Preliminary Issues and Assessment document - Chapter 5 (section 5.2) for the Chippewa Plains/Pine Moraines and Outwash Plains (August 2006). This document also contains the citations referenced in these descriptions.

LAND MANAGEMENT

Land Stewardship

Written description of land stewardship and ownership for each LTA. Begins with a summary statement of percentages which is based on the table in this section developed from 2008 GAP stewardship. GAP assigned all open water acreage to an agency (see table note for total acreage). The remaining narrative includes references to counties, major lakes and rivers, protected waters acreage, larger natural resource management units, ownership patterns, significant landowners, and municipalities in or near each LTA or its units.

Natural Resource Management Units

Lists contain known federal, state, county, and other natural resource management units within each LTA with descriptions of portion within the LTA boundaries.

VEGETATION

Pre-settlement Vegetation and Tree Species

Pre-settlement Vegetation (Marshner's Map) summary with percentages in each LTA.

Type and number of generalized vegetation/landscape characteristics from original Public Land Survey notes in this LTA.

Type and number of bearing tree species (some grouped) by LTA from Minnesota's Bearing Tree Database.

Current Land Cover

As referenced from table at end of document:

- Summary of top five GAP land cover classes with percentages on all ownerships (total acres).
- Summary of top five CSA main cover types with percentages on DNR Forestry and Wildlife land in 2007 (total acres).
- List of significant (generally >2 times more or less) percentage differences in land cover between DNR Forestry and Wildlife land (2007 CSA data) and all ownerships (GAP land cover).

Changes in Tree Species Composition

As referenced from table at end of document, the following list of tree species were or are a significant component (>5%) of the forest and their abundance has changed significantly (generally >2 times more or less) since the original land survey. Magnitude of change was calculated by comparing FIA data to original bearing trees. For additional data descriptions and methodology, see the Preliminary Issues and Assessment document - Chapter 3 (section 3.7) for the Chippewa Plains/Pine Moraines and Outwash Plains (August 2006).

50-year Main Cover Type Goals

See main cover type 50-year goals from CP-PMOP SFRMP plan in table at end of document. If applicable, cover types where this is a priority LTA for cover type increase are listed.

Potential Forest Ecosystem Types and Native Plant Communities

Forest (landscape) ecosystem types present in this LTA are listed (Shadis 2000). These ecosystem types were used in MFRC's North Central Landscape planning process. Native Plant Communities Classes that were known to occur in this LTA **(bold text)** or occurred in similar LTAs in 2006 are listed as codes under general community categories (upland forests, wetland forests, and non-forested communities).

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

List includes number of old growth stands with associated OFMCs, acres of EILC, and acres of ERF on DNR Forestry and Wildlife land in the LTA.

Age Classes

Figure with age-class distribution of all forested cover types in this LTA (total acres).

Patch Dynamics

Number of designated forest patches on state forestry and wildlife lands in general categories (lowland conifers, upland conifers, lowland hardwoods, and upland hardwoods) with patch names.

Guthrie Till Plain (212Na03)

OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

Level to rolling till plains formed by the Koochiching Lobe Glacier. The LTA consists of several islands of till separated by narrow sand plains from a different LTA. Uplands occupy 81 percent, wetlands occupy 16 percent, and lakes occupy 3 percent of the LTA (MN DNR, 1998). The majority (85 percent) of the soils have loam and clay loam textures (NRCS, 1994). Minor amounts of sand over loam are present on the edges next to sand plains.

The upland pre-settlement vegetation was mesic northern hardwoods, mixed white pine-red pine, dry-mesic pine-hardwoods, and wet-mesic hardwood-conifer (white pine) (Shadis,1999 and Marschner, 1974). Lowland pre-settlement vegetation was commonly conifer bog and swamp (Marschner, 1974).

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is federal (45.1%), followed by private (38.1%), state (8.1%), and county (8.0%). See table below. This LTA exists as six separate units along and adjacent to Leech Lake in Cass and Hubbard counties. All but the northwestern-most entity borders Leech Lake's east, north, and west shores. The four eastern-most units are entirely within Chippewa National Forest. Nearly all of the LTA is inside Leech Lake Indian Reservation. Over 17,740 acres of protected waters exist in the LTA.

Federal, state, county, and private industrial lands are spread throughout the LTA. No state lands exist in the southeastern unit. The two north-central units contain the largest contiguous blocks of USFS lands. Potlatch Corporation holdings are located in the LTA's northern three units. No municipalities exist inside the LTA, but surrounding communities include Laporte, Cass Lake, Federal Dam, Boy River, and Walker.

Agency (%)	Acres	Percent
State (8.1%)		
DNR Other	40	0.0%
DNR, Fish and Wildlife	25	0.0%
DNR, Forestry	9,184	8.0%
State (Undifferentiated)	47	0.0%
County (8.0%)		
Cass	4,572	4.0%
Hubbard	4,652	4.0%
Federal (45.1%)		
Bureau of Indian Affairs	3,060	2.7%
Leech Lake Reservation	1,540	1.3%
Other	78	0.1%
U.S. Forest Service	47,124	41.0%
Other Public (0.3%)		
City of Cass Lake	302	0.3%
School District	40	0.0%
Private (38.1%)		
Private	42,390	36.9%
Private Industrial	1,412	1.2%
Tribal (0.4%)		
Leech Lake Reservation	86	0.1%
Minnesota Chippewa Indians	381	0.3%
Grand Total	**114,933 acres**	

* note - 3,498 acres of open water are included in the table above

Natural Resource Management Units

Federal

United States Forest Service

- National Forests: Chippewa (west central, southwest, and south central)

State

Minnesota Department of Natural Resources

- State Forests: Paul Bunyan (extreme northeast corner), Welsh Lake (west one third), Bowstring (southwest corner), Battleground (central and southwest)
- Aquatic Management Areas: Henry Kartarik Island, Five Mile Point

County

None known

Other

Leech Lake Indian Reservation

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (12%), Big Woods - Hardwoods (oak, maple, basswood, hickory) (23%), Conifer Bogs and Swamps (17%), Mixed Hardwood and Pine (Maple, White Pine, Basswood, etc) (13%), Mixed White Pine and Red Pine (20%), and White Pine (5%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-405, scattering oak, scattering timber-16, thicket, brush, underbrush or only tree around-10, dry land, dry ridge, or island-2, lake, slough, pond-15, river, creek, bottom, or valley, ravine-2, marsh or swamp-83, meadow-1, windthrow, windfall-11, and burned area-35.

Bearing trees include: Ash-22, Black Ash-10, Aspen-238, Balm-of-Gilead-5, Balsam Fir-67, Basswood-38, Birch-88, Yellow Birch-18, Cedar-65, Elm-42, Ironwood-25, Maple-68, Sugar Maple-70, Oak-57, Bur Oak-17, Red Oak-46, Pine-3, Jack Pine-35, Red Pine-99, White Pine-189, Spruce-39, Tamarack-118, and Willow-5.

Current Land Cover

As referenced from table on page 6:

- Top five GAP land cover classes on all ownerships (120,562 total acres):
  Aspen/White Birch (32.1%), Upland Deciduous (19.2%), Cropland (10.7%), Maple/Basswood (7.4%), and Lowland Deciduous Shrub (4.8%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (9,748 total acres):
  Aspen (20.1%), Stagnant Cedar (15.2%), Northern Hardwoods (9.7%), Tamarack (9.7%), and Marsh (8.3%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 25.0 times more Tamarack, 11.6 times more Ash, 10.6 times more White Spruce, 4.3 times more Northern White Cedar, 3.4 times more Marsh, 2.5 times more Muskeg, 2.3 times more Lowland Grass, 2.2 times less Jack Pine, 3.1 times less Upland Grass, 3.3 times less Upland Brush, 5.7 times less Lowland Hardwood, 7.5 times less Agricultural, and 11.1 times less in the Oak group.

Changes in Tree Species Composition

As referenced from table on page 6, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 2.6 times more Red Maple, 2.6 times more Basswood, 2.6 times less White Spruce, 3.2 times less Red Pine, 4.8 times less Tamarack, and 8.2 times less White Pine in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 6. This is a priority LTA for White Spruce and Northern White Cedar cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry-Mesic Pine, Dry-Mesic Pine/Oak, and Mesic Northern Hardwood. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

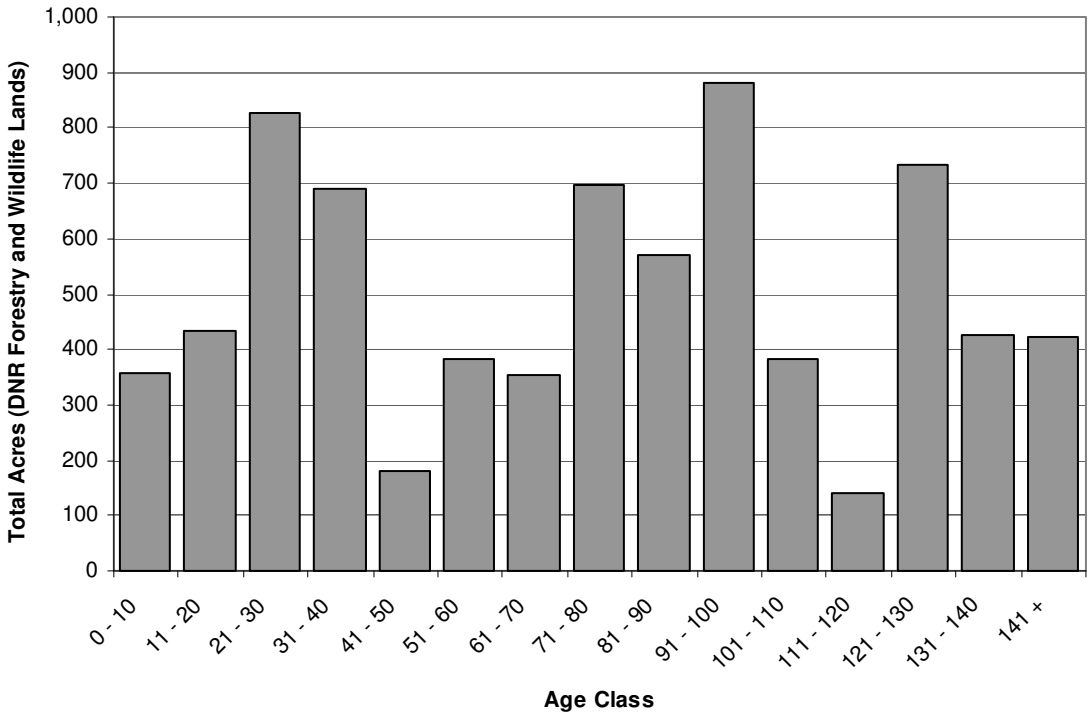
Upland Forests
FDc34, MHn35, MHn44, MHn46, MHn47, MHc26, MHc36, MHs39
Wetland Forests
FFn67, WFn53, **WFn55**, **WFn64, FPn63, FPn82, APn80, APn81**
Non-Forested Communities
OPn81, OPn92, WMn73, WMn82, FPn73

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains 21 old growth stands with associated OFMCs, 214 acres of EILC, and 2,068 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (7,478 total acres).



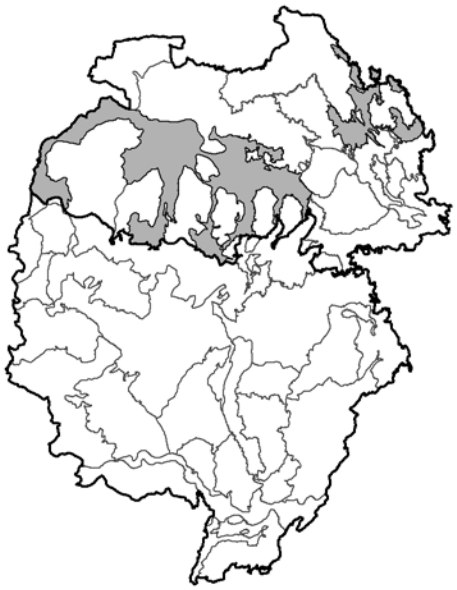
Patch Dynamics

This LTA contains 6 designated forest patches on state forestry and wildlife lands. They include 2 lowland conifer patches (Sucker Bay Conifers West and Sucker Bay Conifers East) and 4 upland hardwood patches (Wilkinson Hardwoods, Sucker Creek Hardwoods, Gould Hardwoods, and Ottertail Point).

Guthrie Till Plain (212Na03)										
	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	38,705	32.1	Aspen	1,957	20.1	-1.3	Aspen	1.73	-7.9%
				Balm of Gilead	60	0.6		Balm of Gilead	-1.67	
				Birch	409	4.2		Paper Birch	1.44	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	8,893	7.4	Northern Hardwoods[4]	942	9.7	1.3	Sugar Maple	1.17	-10.8%
								Red Maple	2.58	
								Basswood	2.64	
								Yellow Birch	-1.08	
	Bur/White Oak	1	0.0	Oak	26	0.3	-11.1	Bur Oak	1.98	PMOP -10.9%
	Red Oak	3,590	3.0					Red Oak	1.58	
	Upland Deciduous	23,135	19.2	Offsite Oak	10	0.1				
	Group Sum	74,324	**61.6**	Group Sum	3,404	**34.9**	-1.8			
LOWLAND DECIDUOUS	Black Ash	471	0.4	Ash	441	4.5	11.6	Ash	1.33	-10.7%
	Lowland Deciduous	2,803	2.3	Lowland Hardwood	40	0.4	-5.7	Elm	-1.65	
	Group Sum	3,275	**2.7**	Group Sum	481	**4.9**	1.8			
UPLAND CONIFERS	White Pine mix	0	0.0	White Pine	34	0.3		White Pine	-8.18	112.4%
	Red Pine	2	0.0	Norway Pine[5]	29	0.3	148.4	Red Pine	-3.18	17.1%
	Red/White Pine	3,939	3.3							
	Red/White Pine-Deciduous mix	147	0.1							
	Jack Pine	695	0.6	Jack Pine	25	0.3	-2.2	Jack Pine	1.13	84.4%
	Jack Pine-Deciduous mix	97	0.1							
	White Spruce	53	0.0	White Spruce	45	0.5	10.6	White Spruce	-2.57	2.0%
	Balsam Fir mix	1,430	1.2	Balsam Fir	178	1.8	1.5	Balsam Fir	-1.30	-3.3%
	Spruce/Fir-Deciduous mix	8	0.0							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	0	0.0				0.0%
	Upland Northern White-Cedar	1,410	1.2							
	Upland Conifer	178	0.1							
	Group Sum	7,957	**6.6**	Group Sum	311	**3.2**	-2.1			
LOWLAND CONIFERS	Lowland Black Spruce	1,911	1.6	Black Spruce, Lowland	179	1.8	1.2	Black Spruce	1.00	0.0%
	Tamarack	469	0.4	Tamarack	949	9.7	25.0	Tamarack	-4.76	5.4%
	Lowland Northern White-Cedar	1,831	1.5	Northern White Cedar	640	6.6	4.3	Cedar	-1.48	5.3%
	Group Sum	4,211	**3.5**	Group Sum	1,768	**18.1**	5.2			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	24	0.3				
	Stagnant Tamarack	0	0.0	Stagnant Tamarack	6	0.1				
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	1,484	15.2				
	Stagnant Conifer	0	0.0							
	Group Sum	0	**0.0**	Group Sum	1,514	**15.5**				
SHRUBLAND	Upland Shrub	2,620	2.2	Upland Brush	0	0.0	-3.3			
				Cutover Area	64	0.7				
	Lowland Deciduous Shrub	5,742	4.8	Lowland Brush	570	5.8	1.2			
	Lowland Evergreen Shrub	272	0.2	Muskeg	56	0.6	2.5			
	Group Sum	8,633	**7.2**	Group Sum	690	**7.1**	-1.0			
AQUATIC	Water	3,353	2.8	Permanent Water	0	0.0				
	Floating Aquatic	0	0.0	Non-Permanent Water	413	4.2				
	Broadleaf Sedge/Cattail	2,890	2.4	Marsh	806	8.3	3.4			
	Sedge Meadow	591	0.5	Lowland Grass	112	1.1	2.3			
	Group Sum	6,834	**5.7**	Group Sum	1,330	**13.6**	2.4			
CROP/GRASS	Cropland	12,932	10.7	Agricultural	140	1.4	-7.5			
	Grassland	443	0.4	Upland Grass	11	0.1	-3.1			
	Prairie	0	0.0							
	Group Sum	13,375	**11.1**	Group Sum	151	**1.6**	-7.1			
DEVELOPED	Low Intensity Urban	0	0.0	Development[6]	17	0.2				
	High Intensity Urban	0	0.0							
	Mixed Developed	0	0.0							
	Transportation	320	0.3	Roads	62	0.6	2.4			
	Group Sum	320	**0.3**	Group Sum	79	**0.8**	3.0			
	Other[7]	1,633	1.4	Other[8]	20	0.2				
	LTA TOTAL	120,562	100.0	LTA TOTAL	9,748	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Bemidji Sand Plain (212Na07)



OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A nearly level to gently rolling outwash plain formed by meltwater from the Des Moines Lobe Glacier. Uplands occupy 62 percent, wetlands occupy 23 percent, and lakes occupy 15 percent of the LTA (MN DNR, 1998). There are 0.5 miles of streams per square mile. The majority of upland soils are dry sand. Calcium carbonate has been leached out of the upper six feet or more. Minor amounts of sandy loam or loam soils also occur (NRCS,1994).

The majority of the upland pre-settlement vegetation was dry pine (jack pine) and dry mesic pine-hardwood forests (Shadis, 1999). Lowland pre-settlement vegetation was commonly conifer bog and swamp (Marschner, 1974). Historic fire regimes for the dominant upland types were: a) 30- to 75-year forest replacement and b) 150- to 350-year forest replacement with five- to 50-year forest maintenance, respectively (Shadis, 1999).

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is private (45.6%), followed by federal (21.4%), county (17.5%), and state (14.9%). See table below. This LTA exists as seven separate units within eight different counties: Polk, Mahnomen, Clearwater, Beltrami, Hubbard, Cass, Itasca, and Koochiching. The Mississippi River meanders through the LTA. Over 184,133 acres of protected waters exist inside the LTA. Lakes within or adjacent to the LTA include Lower Rice, Bemidji, Plantagenet, Cass, Winnibigoshish, Leech, and Bowstring.

Parts of the LTA are inside Leech Lake and White Earth Indian Reservations and Chippewa National Forest. Federal, state, county, and private industrial lands are scattered throughout the LTA. Large tracts of contiguous USFS lands are adjacent to Lake Winnibigoshish. The majority of state, county, and Potlatch Corporation lands are located in the LTA's west unit. Municipalities include Cass Lake, Laporte, Leonard, Wilton, Bagley, Squaw Lake, and Bemidji.

Agency (%)	Acres	Percent
State (14.9%)		
DNR, Ecological Resources	194	0.0%
DNR, Fish and Wildlife	2,140	0.5%
DNR, Forestry	60,705	13.9%
DNR, Parks	1,368	0.3%
DNR, Trails and Waterways	46	0.0%
Other	275	0.1%
State (Undifferentiated)	376	0.1%
County (17.5%)		
Beltrami	33,802	7.7%
Cass	1,216	0.3%
Clearwater	6,901	1.6%
Hubbard	33,690	7.7%
Itasca	101	0.0%
Mahnomen	1,048	0.2%
Federal (21.4%)		
Bureau of Indian Affairs	3,997	0.9%
Leech Lake Reservation	1,069	0.2%
Minnesota Chippewa Indians	85	0.0%
Other	511	0.1%
U.S. Forest Service	87,331	19.9%
White Earth Reservation	630	0.1%
Other Public (0.3%)		
City of Bagley	123	0.0%
City of Bemidji	752	0.2%
City of Cass Lake	20	0.0%
City of Solway	40	0.0%
School District	270	0.1%
Private (45.6%)		
Private	187,043	42.7%
Private Industrial	12,694	2.9%
Tribal (0.3%)		
Leech Lake Reservation	251	0.1%
Minnesota Chippewa Indians	519	0.1%
White Earth Reservation	549	0.1%
Grand Total	**437,746 acres**	

* note – 80,965 acres of open water are included in the table above

Natural Resource Management Units

Federal

United States Forest Service

- National Forests: Chippewa (west central and north central)

State

Minnesota Department of Natural Resources

- State Forests: Paul Bunyan (north half and southeast), Blackduck (southeast corner), Bowstring (north central and southwest), Mississippi Headwaters (north two thirds), Welsh Lake (east two thirds), Big Fork (west half and south central), Buena Vista (south one third), Pine Island (extreme southwest corner), White Earth (north central)
- Wildlife Management Areas: Kabekona, Birch Creek, Rockwood, Wolf Lake, Henry O. Bjoring, Old Red Lake Trail, Island Lake Fmha, Roy Lake, Minnow Lake, West Four Legged Lake, Perch Lake, Lower Rice Lake
- Aquatic Management Areas: Kabekona, Henry Kartarik Island
- Fish Management Areas: Williams, Andrusia Lake, Trees, Clearwater River, Bemidji Lake, Grace Lake, Necktie River
- Scientific and Natural Areas: Lost Forty, Pennington Bog
- State Parks: Lake Bemidji

County

None known

Other

Leech Lake Indian Reservation
White Earth Indian Reservation

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (19%), Conifer Bogs and Swamps (18%), Jack Pine Barrens and Openings (31%), Lakes (open water) (13%), and Mixed White Pine and Red Pine (8%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-1,245, pine grove or grove-1, pine openings, pine barrens, scattered pine-104, scattering oak, scattering timber-72, thicket, brush, underbrush or only tree around-53, dry land, dry ridge, or island-6, lake, slough, pond-286, river, creek, bottom, or valley, ravine-34, marsh or swamp-540, meadow-4, wet prairie or prairie-3, windthrow, windfall-20, and burned area-70.

Bearing trees include: Ash-30, Black Ash-2, Aspen-493, Balm-of-Gilead-44, Balsam Fir-68, Basswood-29, Birch-204, Yellow Birch-2, Cedar-135, Cottonwood-4, Elm-60, Ironwood-2, Maple-27, Sugar Maple-12, Oak-83, Bur Oak-19, Northern Pin Oak-1, Red Oak-3, Pine-59, Jack Pine-1779, Red Pine-901, White Pine-199, Spruce-235, White Spruce-1, Tamarack-945, and Willow-10.

Current Land Cover

As referenced from table on page 7:

- Top five GAP land cover classes on all ownerships (535,802 total acres):
  Aspen/White Birch (20.9%), Water (14.7%), Cropland (12.9%), Lowland Deciduous Shrub (8.9%), and Jack Pine (7.9%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (68,029 total acres):
  Aspen (17.8 %), Lowland Brush (13.7%), Marsh (13.1%), Norway Pine (9.8%), and Tamarack (8.6%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 32.9 times more White Spruce, 22.8 times more White Pine, 9.7 times more Tamarack, 3.5 times more Northern White Cedar, 2.5 times more Balsam Fir, 2.5 times more Lowland Black Spruce, 2.2 times more Marsh, 2.4 times less Lowland Hardwood, and 38.6 times less in the Agricultural group.

Changes in Tree Species Composition

As referenced from table on page 7, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 10.5 times more Red Oak, 5.0 times more Balsam Fir, 4.9 times more Balm of Gilead, 3.5 times more Ash, 2.6 times more Aspen, 2.3 times more Basswood, 2.1 times more Paper Birch, 2.5 times less Sugar Maple, and 5.0 times less Tamarack in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 7. This is a priority LTA for Jack Pine and Tamarack cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry Pine, Dry-Mesic Pine, Dry-Mesic Pine/Oak, and Mesic Northern Hardwood. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

Upland Forests

FDn12, FDn33, MHn35, **MHn46**, MHn47, **FDc12, FDc23, FDc24, FDc34, MHn44,** MHc26, MHc36, MHc37

Wetland Forests

FFn57, FFn67, WFn53, WFn55, **WFn64**, **FPn63, FPn82**, APn80, APn81

Non-Forested Communities

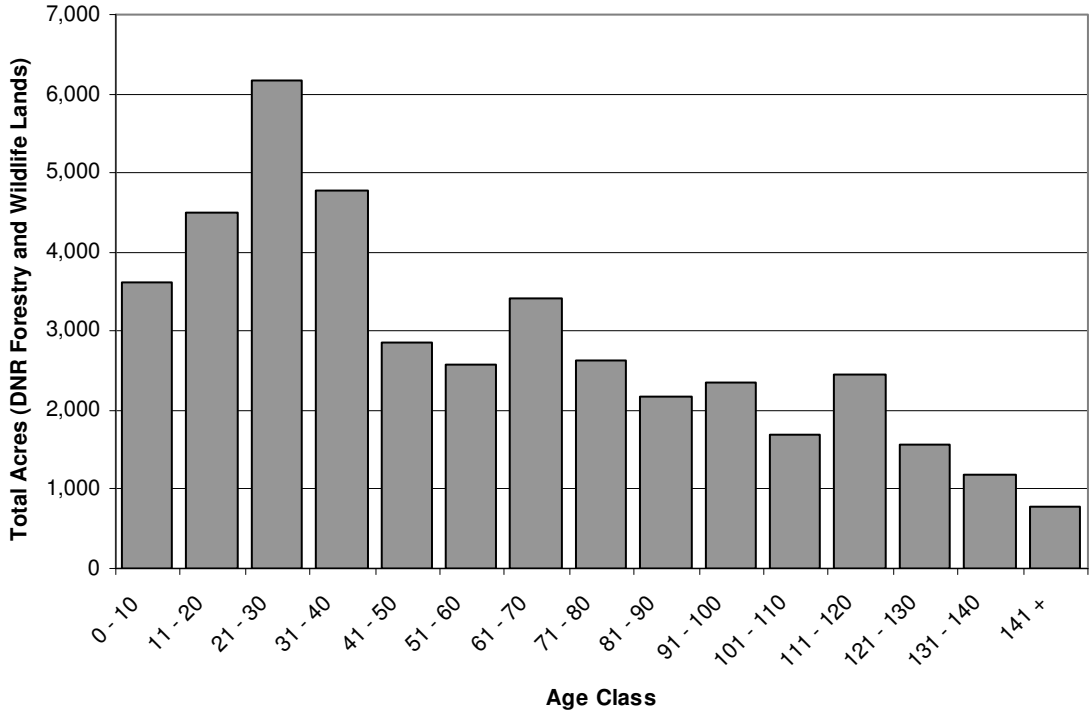
APn91, **OPn81, OPn91**, OPn92, **WMn73, WMn82, FPn73**

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains 31 old growth stands with associated OFMCs, 1,310 acres of EILC, and 16,298 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (42,731 total acres).



Patch Dynamics

This LTA contains 20 designated forest patches on state forestry and wildlife lands. They include 2 lowland conifer patches (Schoolcraft Conifers and Leech Lake Conifers), 9 upland conifer patches (Buzzle Conifers, Eckles Conifers, Northern Conifers, Grant Valley Conifers East, South Lake George Conifers, North Lake George Conifers, Trestle, Clover Conifers, and Turtle River Conifers), and 9 upland hardwood patches (Arrowhead, Rockwood Hardwoods South, Bigfork River, Little Jesse, Island Lake

Hardwoods, Rice Lake, Old Grade, Clover Hardwoods North, and Clover Hardwoods South).

Bemidji Sand Plain (212Na07)										
	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	111,989	20.9	Aspen	12,116	17.8		Aspen	2.58	-7.9%
				Balm of Gilead	244	0.4	-1.1	Balm of Gilead	4.86	
				Birch	828	1.2		Paper Birch	2.11	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	4,075	0.8	Northern Hardwoods[4]	773	1.1	1.5	Sugar Maple	-2.50	-10.8%
								Red Maple	0.00	
								Basswood	2.25	
								Yellow Birch	0.00	
	Bur/White Oak	441	0.1	Oak	269	0.4	1.1	Bur Oak	1.73	PMOP -10.9%
	Red Oak	1,422	0.3					Red Oak	10.50	
	Upland Deciduous	24,795	4.6	Offsite Oak	23	0.0				
	Group Sum	142,723	**26.6**	Group Sum	14,253	**21.0**	-1.3			
LOWLAND DECIDUOUS	Black Ash	818	0.2	Ash	1,117	1.6	10.8	Ash	3.50	-10.7%
	Lowland Deciduous	8,630	1.6	Lowland Hardwood	456	0.7	-2.4	Elm	1.64	
	Group Sum	9,448	**1.8**	Group Sum	1,573	**2.3**	1.3			
UPLAND CONIFERS	White Pine mix	59	0.0	White Pine	172	0.3	22.8	White Pine	-1.89	112.4%
	Red Pine	158	0.0	Norway Pine[5]	6,675	9.8	332.5	Red Pine	-1.22	17.1%
	Red/White Pine	30,128	5.6							
	Red/White Pine-Deciduous mix	2,224	0.4							
	Jack Pine	42,176	7.9	Jack Pine	3,166	4.7	-1.7	Jack Pine	-1.34	84.4%
	Jack Pine-Deciduous mix	3,542	0.7							
	White Spruce	268	0.1	White Spruce	1,118	1.6	32.9	White Spruce	-1.64	2.0%
	Balsam Fir mix	5,125	1.0	Balsam Fir	1,631	2.4	2.5	Balsam Fir	5.00	-3.3%
	Spruce/Fir-Deciduous mix	659	0.1							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	0	0.0				0.0%
	Upland Northern White-Cedar	1,510	0.3							
	Upland Conifer	6,024	1.1							
	Group Sum	91,872	**17.1**	Group Sum	12,762	**18.8**	1.1			
LOWLAND CONIFERS	Lowland Black Spruce	12,454	2.3	Black Spruce, Lowland	3,953	5.8	2.5	Black Spruce	1.13	0.0%
	Tamarack	4,760	0.9	Tamarack	5,845	8.6	9.7	Tamarack	-5.03	5.4%
	Lowland Northern White-Cedar	5,092	1.0	Northern White Cedar	2,247	3.3	3.5	Cedar	1.50	5.3%
	Group Sum	22,305	**4.2**	Group Sum	12,046	**17.7**	4.3			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	19	0.0	Stagnant Spruce	353	0.5	145.3			
	Stagnant Tamarack	27	0.0	Stagnant Tamarack	284	0.4	81.7			
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	1,436	2.1				
	Stagnant Conifer	92	0.0							
	Group Sum	139	**0.0**	Group Sum	2,073	**3.0**	117.8			
SHRUBLAND	Upland Shrub	18,911	3.5	Upland Brush	140	0.2	-1.3			
				Cutover Area	1,770	2.6				
	Lowland Deciduous Shrub	47,568	8.9	Lowland Brush	9,345	13.7	1.5			
	Lowland Evergreen Shrub	907	0.2	Muskeg	220	0.3	1.9			
	Group Sum	67,386	**12.6**	Group Sum	11,474	**16.9**	1.3			
AQUATIC	Water	78,780	14.7	Permanent Water	1,039	1.5				
	Floating Aquatic	0	0.0	Non-Permanent Water	1,573	2.3				
	Broadleaf Sedge/Cattail	31,621	5.9	Marsh	8,924	13.1	2.2			
	Sedge Meadow	6,813	1.3	Lowland Grass	1,056	1.6	1.2			
	Group Sum	117,214	**21.9**	Group Sum	12,592	**18.5**	-1.2			
CROP/GRASS	Cropland	68,863	12.9	Agricultural	226	0.3	-38.6			
	Grassland	1,821	0.3	Upland Grass	303	0.4	1.3			
	Prairie	0	0.0							
	Group Sum	70,684	**13.2**	Group Sum	530	**0.8**	-16.9			
DEVELOPED	Low Intensity Urban	3,676	0.7	Development[6]	379	0.6	-2.2			
	High Intensity Urban	2,775	0.5							
	Mixed Developed	59	0.0							
	Transportation	2,488	0.5	Roads	206	0.3	-1.5			
	Group Sum	8,998	**1.7**	Group Sum	584	**0.9**	-2.0			
	Other[7]	5,033	0.9	Other[8]	141	0.2				
	LTA TOTAL	535,802	100.0	LTA TOTAL	68,029	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Bena Dunes and Peatlands (212Na08)

OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A nearly level outwash plain formed by melt waters from the Des Moines Lobe Glacier that was extensively reshaped by wind action. Uplands occupy 47 percent, wetlands occupy 51 percent, and lakes occupy 2 percent of the LTA (MN DNR, 1998). Extensive swamps and bogs occur, especially in the southern portions of the LTA. Soil parent material is predominantly fine sand. Calcium carbonate has been leached out of the upper six feet or more.

The dominant upland pre-settlement vegetation was dry (jack and red) pine forest and dry mesic (red and white) pine/hardwood. The majority of lowland pre-settlement vegetation was conifer swamp. Historic fire regimes for the dominant upland types were 150- to 350- year forest replacement with five- to 50-year forest maintenance for both communities.

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is state (47.6%), followed by federal (46.7%), and private (3.9%). See table below. This LTA is located in Cass and Itasca counties and is bisected by the Mississippi River. Over 44,604 acres of protected waters exist inside the LTA. Lakes within or adjacent to the LTA include Winnibigoshish, Ball Club, and Six Mile.

The entire LTA is inside Leech Lake Indian Reservation and Chippewa National Forest. Federal, state, county, and private industrial lands are distributed throughout the LTA. The majority of the LTA is in public ownership, with federal and state lands predominating. Municipalities include Bena and Federal Dam.

Agency (%)	Acres	Percent
State (47.6%)		
DNR, Ecological Resources	11	0.0%
DNR, Fish and Wildlife	5,470	6.2%
DNR, Forestry	35,841	40.5%
Other	797	0.9%
County (0.8%)		
Cass	691	0.8%
Federal (46.7%)		
Bureau of Indian Affairs	1,147	1.3%
Leech Lake Reservation	115	0.1%
Other	100	0.1%
U.S. Forest Service	39,916	45.2%
Private (3.9%)		
Private	2,779	3.1%
Private Industrial	675	0.8%
Tribal (1.0%)		
Leech Lake Reservation	853	1.0%
Grand Total	**88,395 acres**	

* note - 2,622 acres of open water are included in the table above

Natural Resource Management Units

Federal

United States Forest Service

- National Forests: Chippewa (east central)

State

Minnesota Department of Natural Resources

- State Forests: Bowstring (south central)
- Wildlife Management Areas: Mud Goose
- Scientific and Natural Areas: Hole-in-the-Bog Peatland

County

None known

Other

Leech Lake Indian Reservation

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (29%), Conifer Bogs and Swamps (44%), Jack Pine Barrens and Openings (17%), and Wet Prairie (7%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-145, pine openings, pine barrens, scattered pine-13, scattering oak, scattering timber-2, dry land, dry ridge, or island-31, lake, slough, pond-13, river, creek, bottom, or valley, ravine-6, marsh or swamp-207, windthrow, windfall-17, and burned area-4.

Bearing trees include: Ash-8, Black Ash-9, Aspen-109, Balsam Fir-10, Basswood-2, Birch-44, Cedar-63, Elm-5, Oak-4, Bur Oak-3, Red Oak-1, Pine-13, Jack Pine-132, Red Pine-161, White Pine-17, Spruce-29, Tamarack-344, and Willow-1.

Current Land Cover

As referenced from table on page 6:

- Top five GAP land cover classes on all ownerships (93,011 total acres):
  Aspen/White Birch (22.7%), Lowland Deciduous Shrub (15.2%), Red/White Pine (9.5%), Tamarack (5.5%), Lowland Deciduous (5.5%), Broadleaf Sedge/Cattail (5.5%), and Upland Deciduous (4.7%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (39,186 total acres):
  Tamarack (32.2 %), Lowland Brush (13.0%), Marsh (12.4%), Aspen (11.2%), and Norway Pine (5.8%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 5.8 times more Tamarack, 3.9 times more Ash, 2.3 times more Marsh, 3.0 times less Balsam Fir, 4.8 times less Agricultural, 5.0 times less Jack Pine, and 29.7 times less in the Lowland Hardwood group.

Changes in Tree Species Composition

As referenced from table on page 6, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 8.9 times more Balsam Fir, 2.4 times more Cedar, 2.2 times more Paper Birch, 2.1 times more Black Spruce, 2.0 times more Ash, 2.3 times less Bur Oak, 3.0 times less Jack Pine, and 3.3 times less White Spruce in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 6. This is a priority LTA for White Spruce cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry Pine and Dry-Mesic Pine/Oak. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

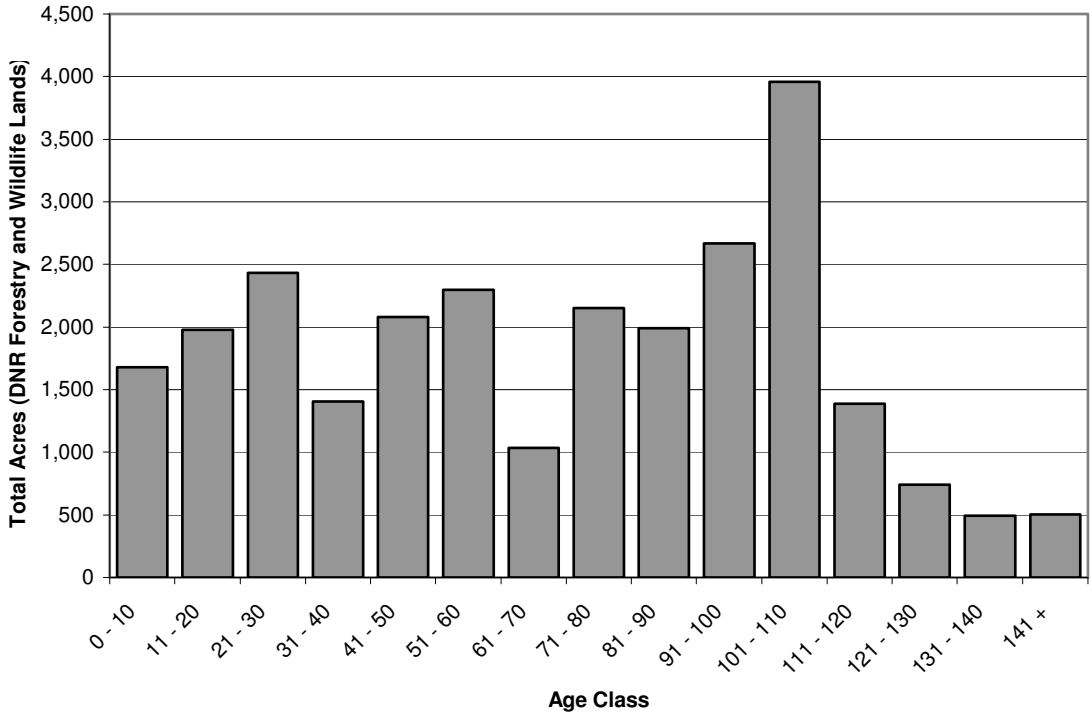
Upland Forests
FDn12, FDn33, FDc12, FDc23, FDc24, FDc34, **MHn35, MHn44, MHn46,** MHn47**, MHc26**, MHc36
Wetland Forests
FFn57, FFn67, **WFn53**, WFn55, **WFn64, FPn63, FPn82, APn80**, APn81
Non-Forested Communities
APn91, OPn81, OPn91, OPn92, WMn73, WMn82, FPn73

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains 10 old growth stands with associated OFMCs, 826 acres of EILC, and 11,920 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (26,815 total acres).



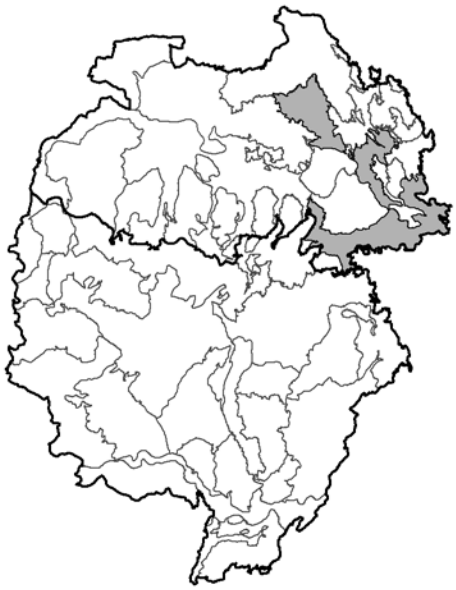
Patch Dynamics

This LTA contains 5 designated forest patches on state forestry and wildlife lands. They include 3 lowland conifer patches (Drumbeater, North Mud, and West Drumbeater Conifers) and 2 upland hardwood patches (Blacksmith Hardwoods and South Sixmile).

Bena Dunes and Peatlands (212Na08)										
	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	21,153	22.7	Aspen	4,372	11.2	-1.7	Aspen	1.04	-7.9%
				Balm of Gilead	13	0.0		Balm of Gilead	0.00	
				Birch	894	2.3		Paper Birch	2.16	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	166	0.2	Northern Hardwoods[4]	100	0.3	1.4	Sugar Maple	0.00	-10.8%
								Red Maple	0.00	
								Basswood	1.50	
								Yellow Birch	0.00	
	Bur/White Oak	0	0.0	Oak	58	0.1	38.5	Bur Oak	-2.25	PMOP -10.9%
	Red Oak	4	0.0					Red Oak	0.00	
	Upland Deciduous	4,372	4.7	Offsite Oak	10	0.0				
	Group Sum	25,695	**27.6**	Group Sum	5,447	**13.9**	-2.0			
LOWLAND DECIDUOUS	Black Ash	146	0.2	Ash	238	0.6	3.9	Ash	2.00	-10.7%
	Lowland Deciduous	5,079	5.5	Lowland Hardwood	72	0.2	-29.7	Elm	1.40	
	Group Sum	5,224	**5.6**	Group Sum	310	**0.8**	-7.1			
UPLAND CONIFERS	White Pine mix	0	0.0	White Pine	80	0.2		White Pine	1.94	112.4%
	Red Pine	0	0.0	Norway Pine[5]	2,286	5.8		Red Pine	-1.03	17.1%
	Red/White Pine	8,878	9.5							
	Red/White Pine-Deciduous mix	208	0.2							
	Jack Pine	1,246	1.3	Jack Pine	106	0.3	-5.0	Jack Pine	-2.95	84.4%
	Jack Pine-Deciduous mix	77	0.1							
	White Spruce	18	0.0	White Spruce	135	0.3	18.2	White Spruce	-3.33	2.0%
	Balsam Fir mix	3,007	3.2	Balsam Fir	428	1.1	-3.0	Balsam Fir	8.91	-3.3%
	Spruce/Fir-Deciduous mix	27	0.0							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	12	0.0				0.0%
	Upland Northern White-Cedar	1,336	1.4							
	Upland Conifer	528	0.6							
	Group Sum	15,325	**16.5**	Group Sum	3,047	**7.8**	-2.1			
LOWLAND CONIFERS	Lowland Black Spruce	3,869	4.2	Black Spruce, Lowland	1,398	3.6	-1.2	Black Spruce	2.11	0.0%
	Tamarack	5,154	5.5	Tamarack	12,637	32.2	5.8	Tamarack	-1.90	5.4%
	Lowland Northern White-Cedar	3,170	3.4	Northern White Cedar	925	2.4	-1.4	Cedar	2.38	5.3%
	Group Sum	12,193	**13.1**	Group Sum	14,960	**38.2**	2.9			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	1,035	2.6				
	Stagnant Tamarack	0	0.0	Stagnant Tamarack	1,400	3.6				
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	602	1.5				
	Stagnant Conifer	0	0.0							
	Group Sum	0	**0.0**	Group Sum	3,037	**7.8**				
SHRUBLAND	Upland Shrub	748	0.8	Upland Brush	18	0.0	-17.6			
				Cutover Area	0	0.0				
	Lowland Deciduous Shrub	14,114	15.2	Lowland Brush	5,091	13.0	-1.2			
	Lowland Evergreen Shrub	1,741	1.9	Muskeg	760	1.9	1.0			
	Group Sum	16,603	**17.9**	Group Sum	5,869	**15.0**	-1.2			
AQUATIC	Water	2,321	2.5	Permanent Water	201	0.5				
	Floating Aquatic	0	0.0	Non-Permanent Water	207	0.5				
	Broadleaf Sedge/Cattail	5,078	5.5	Marsh	4,845	12.4	2.3			
	Sedge Meadow	1,190	1.3	Lowland Grass	586	1.5	1.2			
	Group Sum	8,589	**9.2**	Group Sum	5,839	**14.9**	1.6			
CROP/GRASS	Cropland	807	0.9	Agricultural	71	0.2	-4.8			
	Grassland	91	0.1	Upland Grass	0	0.0				
	Prairie	0	0.0							
	Group Sum	898	**1.0**	Group Sum	71	**0.2**	-5.4			
DEVELOPED	Low Intensity Urban	101	0.1	Development[6]	83	0.2	1.9			
	High Intensity Urban	3	0.0							
	Mixed Developed	0	0.0							
	Transportation	29	0.0	Roads	189	0.5	15.4			
	Group Sum	133	**0.1**	Group Sum	272	**0.7**	4.9			
	Other[7]	8,352	9.0	Other[8]	334	0.9				
	LTA TOTAL	93,011	100.0	LTA TOTAL	39,186	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Rosey Lake Plain (212Na09)



OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A nearly level glacial lake basin (Aitkin) formed by melt waters of the Des Moines Lobe Glacier. Uplands occupy 51 percent, wetlands occupy 41 percent, and lakes occupy 8 percent of the LTA (MN DNR, 1998). There are 0.5 miles of streams per square mile. Mineral soils with silt and clay textures occupy 36 percent and fine sand textures occupy 25 percent of the LTA.

The pre-settlement vegetation was wet-mesic hardwood-conifer (pine) with minor amounts of dry pine and mesic northern hardwoods in the northern two polygons and wet-mesic hardwood-conifer (spruce-fir) in the southern polygon (Marschner, 1974). Lowland presettlement vegetation was wet sedge meadows and conifer bog and swamp (Marschner, 1974). Historic fire regimes for the dominant upland types were a) 150- to 350-year forest replacement, b) 150- to 350-year forest replacement with five- to 50-year forest maintenance, c) 250- to 1,000-year forest replacement, and d) 70- to 150-year forest replacement.

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is private (35.1%), followed by federal (33.7%), state (24.0%), and county (6.4%). See table below. Water bodies segregate the essentially contiguous four units of this LTA. The LTA is located in Beltrami, Cass, and Itasca counties. Over 124,144 acres of protected waters exist inside the LTA. Lakes within or adjacent to the LTA include Winnibigoshish, Leech, Bowstring, and Round. The Mississippi River flows through the LTA.

Nearly all of the LTA is inside Leech Lake Indian Reservation and Chippewa National Forest. Federal, state, county, and private industrial lands are dispersed throughout the LTA. Most USFS land is located in the LTA's north unit. Significant blocks of state forestlands are located in three of the LTA's four units. Abundant parcels owned by Potlatch Corporation and Blandin Paper Company exists in the LTA, as well as a large tract of Minnesota Power and Light Company land in the south unit of the LTA. Municipalities include Federal Dam, Boy River, Zemple, Deer River, and Cohasset.

Agency (%)	Acres	Percent
State (24.0%)		
DNR, Ecological Resources	2,461	1.0%
DNR, Fish and Wildlife	11,774	5.0%
DNR, Forestry	41,536	17.5%
DNR, Parks	406	0.2%
Other	670	0.3%
State (Undifferentiated)	83	0.0%
County (6.4%)		
Beltrami	128	0.1%
Cass	9,782	4.1%
Itasca	5,271	2.2%
Federal (33.7%)		
Bureau of Indian Affairs	1,089	0.5%
Bureau of Land Management	164	0.1%
Leech Lake Reservation	132	0.1%
Other	1,354	0.6%
U.S. Forest Service	77,151	32.6%
Other Public (0.3%)		
City of Deer River	683	0.3%
Private (35.1%)		
Private	72,593	30.6%
Private Industrial	9,905	4.2%
Private Other	673	0.3%
Tribal (0.5%)		
Leech Lake Reservation	1,094	0.5%
Grand Total	**236,949 acres**	

* note - 24,613 acres of open water are included in the table above

Natural Resource Management Units

Federal

United States Forest Service

- National Forests: Chippewa (east central)

State

Minnesota Department of Natural Resources

- State Forests: Blackduck (east half), Bowstring (north central, east central, and southwest), Battleground (east half)

- Wildlife Management Areas: Bowstring Deer Yard, Bass Brook, Mud Goose
- Aquatic Management Areas: Crawford Island, Five Mile Point
- Fish Management Areas: Mostoller, Steven's Lake
- Scientific and Natural Areas: Hole-in-the-Bog Peatland
- State Parks: Schoolcraft

County

None known

Other

Leech Lake Indian Reservation

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (34%), Conifer Bogs and Swamps (38%), Lakes (open water) (8%), and Wet Prairie (8%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-605, pine openings, pine barrens, scattered pine-4, scattering oak, scattering timber-10, thicket, brush, underbrush or only tree around-13, dry land, dry ridge, or island-8, lake, slough, pond-32, river, creek, bottom, or valley, ravine-24, marsh or swamp-505, meadow-3, windthrow, windfall-40, and burned area-7.

Bearing trees include: Ash-8, Aspen-28, Balm-of-Gilead-7, Balsam Fir-13, Basswood-2, Birch-15, Cedar-65, Elm-8, Oak-1, Pine-7, Jack Pine-3, Red Pine-3, White Pine-8, Spruce-117, Tamarack-322, and Willow-1.

Current Land Cover

As referenced from table on page 6:

- Top five GAP land cover classes on all ownerships (283,826 total acres):
  Aspen/White Birch (25.9%), Lowland Deciduous Shrub (11.8%), Water (8.8%), Cropland (7.5%), and Upland Deciduous (6.7%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (56,565 total acres):
  Aspen (15.4%), Lowland Black Spruce (14.7%), Lowland Brush (10.7%), Tamarack (9.1%), and Marsh (8.8%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:

DNR land has 4.7 times more Tamarack, 4.3 times more Muskeg, 4.1 times more Ash, 2.6 times more Lowland Black Spruce, 2.3 times more Jack Pine, 5.8 times less Agricultural, and 6.7 times less in the Lowland Hardwood group.

Changes in Tree Species Composition

As referenced from table on page 6, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 8.6 times more Balm of Gilead, 5.7 times more Ash, 2.5 times more Ash, 2.4 times more Basswood, 2.5 times less White Pine, 5.4 times less Tamarack, and 6.6 times less White Spruce in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 6. This is a priority LTA for White Pine, White Spruce, Tamarack, and Northern White Cedar cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry Pine, Dry-Mesic Pine/Oak, Mesic Northern Hardwood, Boreal Hardwood Conifer, White Cedar Swamp, and Open Meadows. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

Upland Forests

FDn12, FDn33, FDn43, **FDc34, MHn35, MHn44, MHn46, MHn47, MHc26, MHc36**

Wetland Forests

FFn57, FFn67, **WFn53, WFn55, WFn64,** FPn63, **FPn82, APn80, APn81**

Non-Forested Communities

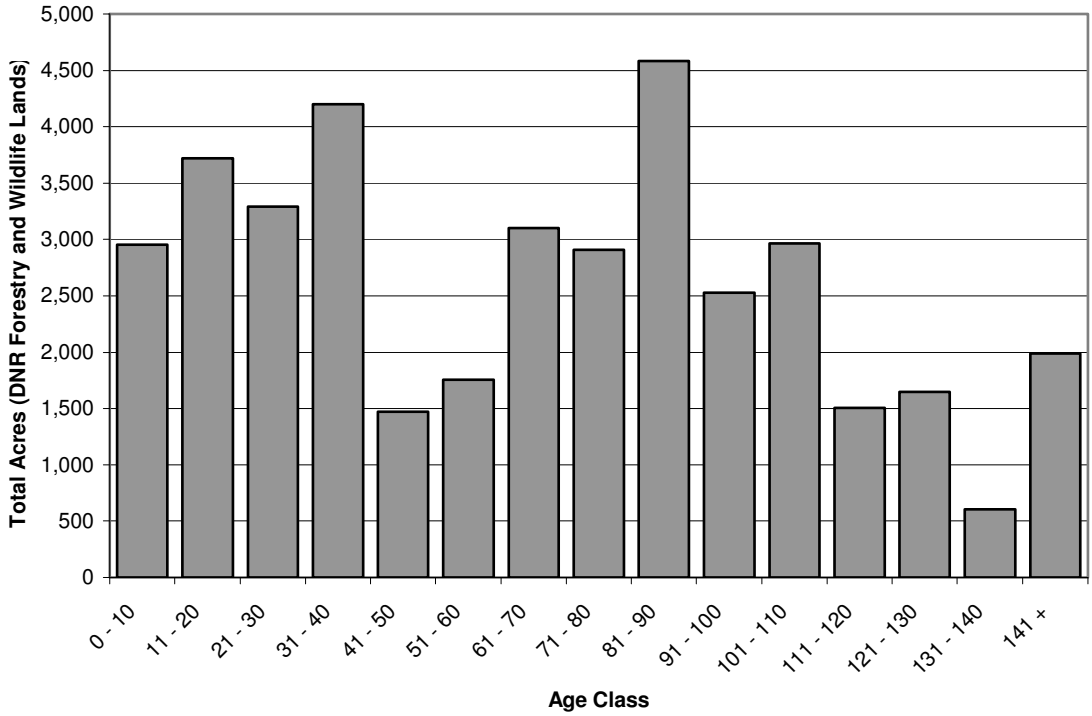
APn90, APn91, MRn83, **OPn81,** OPn91, OPn92, **WMn73, WMn82, FPn73**

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains 6 old growth stands with associated OFMCs, 1,752 acres of EILC, and 10,602 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (39,239 total acres).



Patch Dynamics

This LTA contains 9 designated forest patches on state forestry and wildlife lands. They include 2 upland conifer patches (Skimmerhorn Creek and Decker Lake), 2 upland hardwood patches (South Goose and Olivet), 4 lowland conifer patches (South Gould Conifers, North Gould Conifers, Skimmerhorn Lake, and Little Cut Foot), and a lowland hardwoods patch (Shallow Pond).

Rosey Lake Plain (212Na09)

	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	73,490	25.9	Aspen	8,738	15.4	-1.5	Aspen	1.77	-7.9%
				Balm of Gilead	843	1.5		Balm of Gilead	8.56	
				Birch	336	0.6		Paper Birch	1.06	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	1,990	0.7	Northern Hardwoods[4]	619	1.1	1.6	Sugar Maple	-1.30	-10.8%
								Red Maple	0.00	
								Basswood	2.40	
								Yellow Birch	0.00	
	Bur/White Oak	5	0.0	Oak	75	0.1	2.0	Bur Oak	1.00	PMOP -10.9%
	Red Oak	188	0.1					Red Oak	1.50	
	Upland Deciduous	19,118	6.7	Offsite Oak	5	0.0				
	Group Sum	94,791	**33.4**	Group Sum	10,616	**18.8**	-1.8			
LOWLAND DECIDUOUS	Black Ash	3,269	1.2	Ash	2,645	4.7	4.1	Ash	5.65	-10.7%
	Lowland Deciduous	13,236	4.7	Lowland Hardwood	395	0.7	-6.7	Elm	2.50	
	Group Sum	16,506	**5.8**	Group Sum	3,040	**5.4**	-1.1			
UPLAND CONIFERS	White Pine mix	21	0.0	White Pine	76	0.1	17.9	White Pine	-2.47	112.4%
	Red Pine	34	0.0	Norway Pine[5]	1,243	2.2	182.1	Red Pine	1.53	17.1%
	Red/White Pine	8,413	3.0							
	Red/White Pine-Deciduous mix	406	0.1							
	Jack Pine	2,165	0.8	Jack Pine	1,010	1.8	2.3	Jack Pine	-1.18	84.4%
	Jack Pine-Deciduous mix	330	0.1							
	White Spruce	124	0.0	White Spruce	298	0.5	12.1	White Spruce	-6.56	2.0%
	Balsam Fir mix	5,655	2.0	Balsam Fir	709	1.3	-1.6	Balsam Fir	1.78	-3.3%
	Spruce/Fir-Deciduous mix	29	0.0							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	0	0.0				0.0%
	Upland Northern White-Cedar	3,089	1.1							
	Upland Conifer	873	0.3							
	Group Sum	21,139	**7.4**	Group Sum	3,335	**5.9**	-1.3			
LOWLAND CONIFERS	Lowland Black Spruce	16,096	5.7	Black Spruce, Lowland	8,338	14.7	2.6	Black Spruce	-1.40	0.0%
	Tamarack	5,531	1.9	Tamarack	5,130	9.1	4.7	Tamarack	-5.36	5.4%
	Lowland Northern White-Cedar	7,737	2.7	Northern White Cedar	911	1.6	-1.7	Cedar	-1.35	5.3%
	Group Sum	29,364	**10.3**	Group Sum	14,380	**25.4**	2.5			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	4,202	7.4				
	Stagnant Tamarack	1	0.0	Stagnant Tamarack	1,204	2.1	5441.4			
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	2,462	4.4				
	Stagnant Conifer	10	0.0							
	Group Sum	12	**0.0**	Group Sum	7,868	**13.9**	3415.0			
SHRUBLAND	Upland Shrub	5,657	2.0	Upland Brush	18	0.0	-9.8			
				Cutover Area	96	0.2				
	Lowland Deciduous Shrub	33,385	11.8	Lowland Brush	6,071	10.7	-1.1			
	Lowland Evergreen Shrub	2,034	0.7	Muskeg	1,743	3.1	4.3			
	Group Sum	41,076	**14.5**	Group Sum	7,928	**14.0**	-1.0			
AQUATIC	Water	25,002	8.8	Permanent Water	630	1.1				
	Floating Aquatic	177	0.1	Non-Permanent Water	585	1.0				
	Broadleaf Sedge/Cattail	17,875	6.3	Marsh	4,984	8.8	1.4			
	Sedge Meadow	5,496	1.9	Lowland Grass	2,122	3.8	1.9			
	Group Sum	48,550	**17.1**	Group Sum	8,320	**14.7**	-1.2			
CROP/GRASS	Cropland	21,183	7.5	Agricultural	733	1.3	-5.8			
	Grassland	1,009	0.4	Upland Grass	155	0.3	-1.3			
	Prairie	0	0.0							
	Group Sum	22,192	**7.8**	Group Sum	888	**1.6**	-5.0			
DEVELOPED	Low Intensity Urban	463	0.2	Development[6]	96	0.2	-1.7			
	High Intensity Urban	358	0.1							
	Mixed Developed	0	0.0							
	Transportation	375	0.1	Roads	84	0.1	1.1			
	Group Sum	1,196	**0.4**	Group Sum	180	**0.3**	-1.3			
	Other[7]	9,001	3.2	Other[8]	12	0.0				
	LTA TOTAL	283,826	100.0	LTA TOTAL	56,565	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Deer River Peatlands (212Na10)

OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A level glacial lake basin that was formed by melt waters from the Des Moines Lobe Glacier. Uplands occupy 20 percent, wetlands occupy 77 percent, and lakes occupy 3 percent of the LTA (MN DNR, 1998). The mineral soils have fine sand (25 percent), clay (16 percent), and silt (6 percent) textures.

The upland pre-settlement vegetation was wet-mesic hardwood-conifer (spruce-fir) with minor amounts of dry pine (Marschner, 1974). Lowland pre-settlement vegetation was wet sedge meadows and conifer bog and swamp (Marschner, 1974). Historic fire regimes for the dominant upland type were 70- to 150-year forest replacement.

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is state (60.9%), followed by federal (20.0%), private (17.7%), and county (1.1%). See table below. This LTA exists as two separate units within Cass and Itasca counties. The Mississippi River meanders through the LTA. Over 48,809 acres of protected waters exist inside the LTA. Lakes within or adjacent to the LTA include Bowstring, White Oak, and Little White Oak lakes.

Most of the LTA is inside Leech Lake Indian Reservation and Chippewa National Forest. The majority of forestland in the LTA is state owned. Federal, county, and private industrial lands are spread throughout. The largest block of USFS land is located in the LTA's north unit. Several tracts of Potlatch Corporation and Blandin Paper Company lands exist in the north unit of the LTA. Over 23,000 contiguous acres of Leech Lake

Indian Reservation tribal land is within the LTA's south unit. Municipalities include the town of Deer River.

Agency (%)	Acres	Percent
State (60.9%)		
DNR, Fish and Wildlife	141	0.3%
DNR, Forestry	32,353	60.4%
Other	92	0.2%
County (1.1%)		
Cass	191	0.4%
Itasca	402	0.8%
Federal (20.0%)		
Bureau of Indian Affairs	94	0.2%
Leech Lake Reservation	568	1.1%
Other	78	0.1%
U.S. Forest Service	9,956	18.6%
Private (17.7%)		
Private	7,024	13.1%
Private Industrial	2,445	4.6%
Tribal (0.4%)		
Leech Lake Reservation	205	0.4%
Grand Total	**53,549 acres**	

* note - 2,690 acres of open water are included in the table above

Natural Resource Management Units

Federal

United States Forest Service

- National Forests: Chippewa (east central)

State

Minnesota Department of Natural Resources

- State Forests: Bowstring (northeast corner)
- Wildlife Management Areas: Bowstring Deer Yard

County

None known

Other

Leech Lake Indian Reservation

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (9%), Conifer Bogs and Swamps (67%), and Wet Prairie (14%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-19, pine openings, pine barrens, scattered pine-1, thicket, brush, underbrush or only tree around-6, dry land, dry ridge, or island-1, lake, slough, pond-5, river, creek, bottom, or valley, ravine-12, marsh or swamp-200, windthrow, windfall-35, and burned area-3.

Bearing trees include: Ash-8, Aspen-28, Balm-of-Gilead-7, Balsam Fir-13, Basswood-2, Birch-15, Cedar-65, Elm-8, Oak-1, Pine-7, Jack Pine-3, Red Pine-3, White Pine-8, Spruce-117, Tamarack-322, and Willow-1.

Current Land Cover

As referenced from table on page 6:

- Top five GAP land cover classes on all ownerships (62,268 total acres):
  Lowland Black Spruce (21.1%), Lowland Deciduous Shrub (16.4%), Broadleaf Sedge/Cattail (11.2%), Aspen/White Birch (10.6%), Lowland Northern White Cedar (8.3%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (35,572 total acres):
  Stagnant Spruce (23.2%), Lowland Black Spruce (14.5%), Lowland Brush (13.4%), Tamarack (13.0%), and Marsh (7.9%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 3.8 times more Tamarack and 95.1 times less in the Lowland Hardwood group.

Changes in Tree Species Composition

As referenced from table on page 6, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 7.8 times more Ash, 7.3 times more Balsam Fir, 4.4 times more Aspen, 3.7 times more Balm of Gilead, 2.2 times more Cedar, and 3.9 times less Tamarack in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 6. This LTA was not identified as a priority LTA for cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Forested Bog and Open Meadows. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

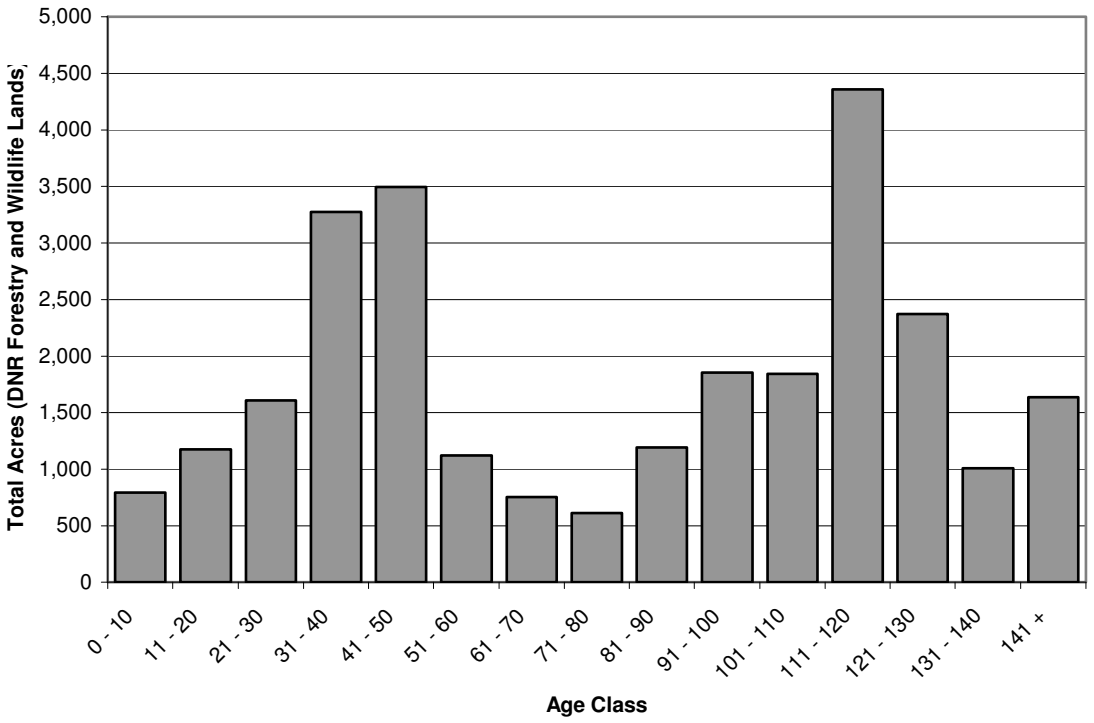
Upland Forests
MHn35
Wetland Forests
FFn57, FFn67, **WFn53, WFn55**, WFn64, FPn63, FPn82, APn80, APn81
Non-Forested Communities
APn91, OPn92, WMn82

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains 3 old growth stands with associated OFMCs, 2,873 acres of EILC, and 6,831 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (27,103 total acres).



Patch Dynamics

This LTA contains 8 designated forest patches on state forestry and wildlife lands. They include 7 lowland conifer patches (Little Ball Club, North Grouse Creek, Section 29,

South Bowstring, South Grouse Creek, West Rice, and White Oak) and a lowland hardwoods patch (South Chapel).

Deer River Peatlands (212Na10)

	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	6,579	10.6	Aspen	2,248	6.0	-1.6	Aspen	4.44	-7.9%
				Balm of Gilead	121	0.3		Balm of Gilead	3.73	
				Birch	123	0.3		Paper Birch	1.35	PMOP -5.2%
				Offsite Aspen	20	0.1				
	Maple/Basswood	83	0.1	Northern Hardwoods[4]	33	0.1	-1.5	Sugar Maple	0.00	-10.8%
								Red Maple	0.00	
								Basswood	0.00	
								Yellow Birch	0.00	
	Bur/White Oak	0	0.0	Oak	9	0.0	8.5	Bur Oak	0.00	PMOP -10.9%
	Red Oak	2	0.0					Red Oak	0.00	
	Upland Deciduous	970	1.6	Offsite Oak	0	0.0				
	Group Sum	7,634	**12.3**	Group Sum	2,554	**6.8**	-1.8			
LOWLAND DECIDUOUS	Black Ash	1,195	1.9	Ash	900	2.4	1.2	Ash	7.80	-10.7%
	Lowland Deciduous	3,712	6.0	Lowland Hardwood	24	0.1	-95.1	Elm	0.00	
	Group Sum	4,908	**7.9**	Group Sum	924	**2.5**	-3.2			
UPLAND CONIFERS	White Pine mix	0	0.0	White Pine	0	0.0		White Pine	0.00	112.4%
	Red Pine	0	0.0	Norway Pine[5]	20	0.1		Red Pine	0.00	17.1%
	Red/White Pine	270	0.4							
	Red/White Pine-Deciduous mix	22	0.0							
	Jack Pine	73	0.1	Jack Pine	0	0.0		Jack Pine	0.00	84.4%
	Jack Pine-Deciduous mix	35	0.1							
	White Spruce	6	0.0	White Spruce	22	0.1	6.4	White Spruce	0.00	2.0%
	Balsam Fir mix	711	1.1	Balsam Fir	47	0.1	-9.0	Balsam Fir	7.33	-3.3%
	Spruce/Fir-Deciduous mix	16	0.0							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	0	0.0				0.0%
	Upland Northern White-Cedar	689	1.1							
	Upland Conifer	134	0.2							
	Group Sum	1,955	**3.1**	Group Sum	90	**0.2**	-13.1			
LOWLAND CONIFERS	Lowland Black Spruce	13,141	21.1	Black Spruce, Lowland	5,449	14.5	-1.5	Black Spruce	1.37	0.0%
	Tamarack	2,117	3.4	Tamarack	4,895	13.0	3.8	Tamarack	-3.87	5.4%
	Lowland Northern White-Cedar	5,159	8.3	Northern White Cedar	1,908	5.1	-1.6	Cedar	2.16	5.3%
	Group Sum	20,417	**32.8**	Group Sum	12,252	**32.6**	-1.0			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	8,716	23.2				
	Stagnant Tamarack	0	0.0	Stagnant Tamarack	349	0.9				
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	2,219	5.9				
	Stagnant Conifer	0	0.0							
	Group Sum	0	**0.0**	Group Sum	11,284	**30.0**				
SHRUBLAND	Upland Shrub	384	0.6	Upland Brush	17	0.0	-1.8			
				Cutover Area	109	0.3				
	Lowland Deciduous Shrub	10,204	16.4	Lowland Brush	5,039	13.4	-1.2			
	Lowland Evergreen Shrub	382	0.6	Muskeg	278	0.7	1.2			
	Group Sum	10,970	**17.6**	Group Sum	5,443	**14.5**	-1.2			
AQUATIC	Water	2,085	3.3	Permanent Water	419	1.1				
	Floating Aquatic	5	0.0	Non-Permanent Water	143	0.4				
	Broadleaf Sedge/Cattail	6,948	11.2	Marsh	2,975	7.9	-1.4			
	Sedge Meadow	1,440	2.3	Lowland Grass	1,363	3.6	1.6			
	Group Sum	10,477	**16.8**	Group Sum	4,900	**13.0**	-1.3			
CROP/GRASS	Cropland	919	1.5	Agricultural	0	0.0				
	Grassland	114	0.2	Upland Grass	12	0.0	-5.6			
	Prairie	0	0.0							
	Group Sum	1,033	**1.7**	Group Sum	12	**0.0**	-50.6			
DEVELOPED	Low Intensity Urban	0	0.0	Development[6]	17	0.0				
	High Intensity Urban	0	0.0							
	Mixed Developed	0	0.0							
	Transportation	9	0.0	Roads	66	0.2	12.3			
	Group Sum	9	**0.0**	Group Sum	83	**0.2**	15.4			
	Other[7]	4,866	7.8	Other[8]	31	0.1				
	LTA TOTAL	62,268	100.0	LTA TOTAL	37,572	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Bowstring Till Plain (212Na11)

OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A nearly level to rolling landscape formed in till and sand-capped till. Uplands occupy 90 percent, wetlands occupy 10 percent, and lakes occupy less than 1 percent of the LTA (MN DNR, 1998). Soil parent materials have loam and clay loam textures in the northwestern half and along the lake. The southeast half has 20 to 40 inches of sand over the loamy till (Itasca County Soil Survey).

The majority of the upland pre-settlement vegetation was wet-mesic hardwood-conifer (pine) and mesic northern hardwoods (Shadis, 1999 and Marschner, 1974). The dominant lowland pre-settlement vegetation was wet meadows or conifer bog and swamp (Marschner, 1974). Historic fire regimes for the dominant upland types were a) 150- to 350-year forest replacement and b) 250- to 1,000-year forest replacement, respectively.

The majority of the upland pre-settlement vegetation was aspen-birch (trending to conifers) and Big Woods—Hardwoods (Marschner, 1974). The dominant lowland pre-settlement vegetation was wet meadows or conifer bog and swamp (Marschner, 1974).

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is federal (45.3%), followed by private (41.8%), state (10.7%), and county (2.2%). See table below. This LTA is located in west central Itasca County. Over 57 acres of protected waters exist within the LTA. Bowstring Lake borders the LTA's southeast and southwest side.

Parts of the LTA are inside Leech Lake Indian Reservation and Chippewa National Forest. Federal, state, and county lands are spread throughout the LTA. Large tracts of contiguous USFS land are present from end to end. The majority of state lands are located in the LTA's southeast portion. No municipalities are located within the LTA.

Agency (%)	Acres	Percent
State (10.7%)		
DNR, Forestry	198	10.7%
County (2.2%)		
Itasca	41	2.2%
Federal (45.3%)		
Bureau of Indian Affairs	52	2.8%
Other	42	2.2%
U.S. Forest Service	744	40.2%
Private (41.8%)		
Private	738	39.9%
Private Industrial	36	2.0%
Grand Total	**1,851 acres**	

* note – 5 acres of open water are included in the table above

Natural Resource Management Units

Federal

United States Forest Service

- National Forests: Chippewa (northeast corner)

State

Minnesota Department of Natural Resources

- State Forests: Bowstring (northeast corner)

County

None known

Other

Leech Lake Indian Reservation

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (44%), Big Woods - Hardwoods (oak, maple, basswood, hickory) (31%), and Wet Prairie (25%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-3, scattering oak, scattering timber-1, and marsh or swamp-2.

Bearing trees include: Balsam Fir-1, Birch-3, Cedar-1, Sugar Maple-4, White Pine-1, Spruce-1, and Tamarack-3.

Current Land Cover

As referenced from table on page 5:

- Top five GAP land cover classes on all ownerships (1,854 total acres):
  Aspen/White Birch (69.9%), Upland Deciduous (8.3%), Cropland (5.2%), Lowland Deciduous (3.3%), and Upland Shrub (3.2%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (210 total acres):
  Aspen (69.6%), Northern Hardwoods (9.7%), Lowland Brush (7.5%), Stagnant Cedar (5.0%), and Lowland Black Spruce (5.0%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 12.3 times more Lowland Black Spruce, 6.7 times more Northern Hardwoods, and 2.4 times more in the Lowland Brush group.

Changes in Tree Species Composition

As referenced from table on page 5, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 2.8 times less Paper Birch in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 5. This LTA was not identified as a priority LTA for cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry-Mesic Pine/Oak. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

Upland Forests

FDn12, FDn33, FDn43, FDc34**, MHn35, MHn44, MHn46, MHn47,** MHc26

Wetland Forests

FFn57, FFn67, WFn53**, WFn55,WFn64, FPn63,** FPn82, **APn80,** APn81

Non-Forested Communities

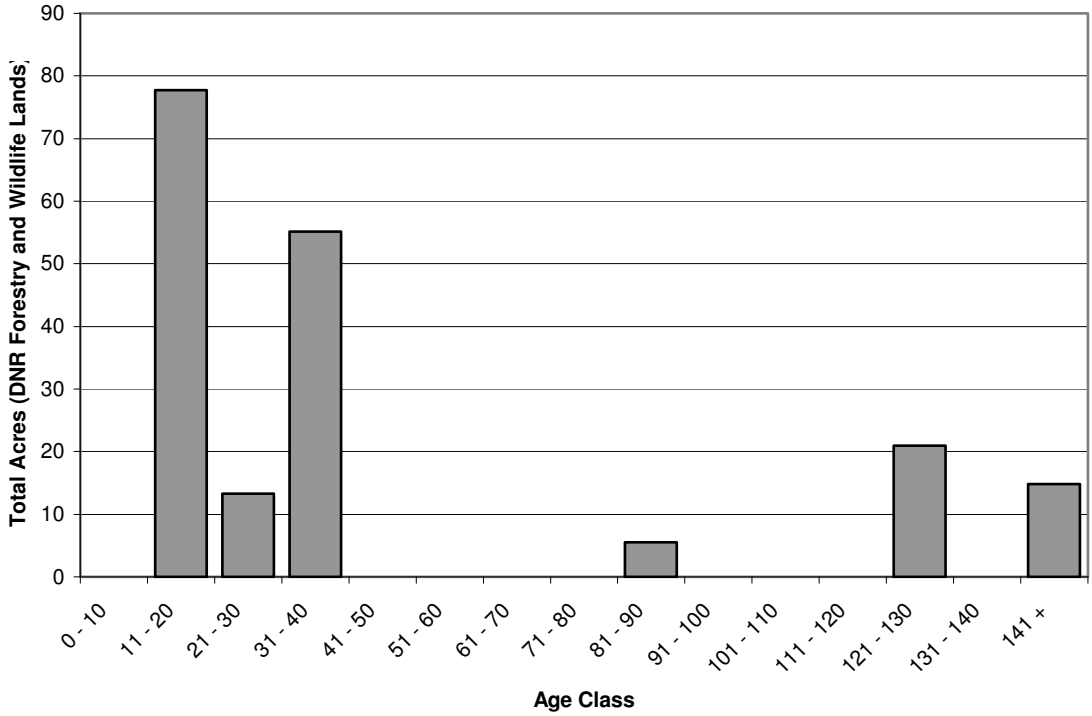
APn90, APn91, MRn83, OPn81, OPn91, OPn92, WMn73, WMn82, FPn73

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains no old growth stands or associated OFMCs, 11 acres of EILC, and 11 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (188 total acres).



Patch Dynamics

This LTA contains no designated forest patches on state forestry and wildlife lands.

Bowstring Till Plain (212Na11)										
	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	1,296	69.9	Aspen	146	69.6	-1.0	Aspen	0.00	-7.9%
				Balm of Gilead	0	0.0		Balm of Gilead	0.00	
				Birch	0	0.0		Paper Birch	-2.78	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	27	1.4	Northern Hardwoods[4]	20	9.7	6.7	Sugar Maple	1.08	-10.8%
								Red Maple	0.00	
								Basswood	0.00	
								Yellow Birch	0.00	
	Bur/White Oak	0	0.0	Oak	0	0.0		Bur Oak	0.00	PMOP -10.9%
	Red Oak	0	0.0					Red Oak	0.00	
	Upland Deciduous	153	8.3	Offsite Oak	0	0.0				
	Group Sum	1,476	**79.6**	Group Sum	167	**79.3**	-1.0			
LOWLAND DECIDUOUS	Black Ash	3	0.2	Ash	0	0.0		Ash	0.00	-10.7%
	Lowland Deciduous	62	3.3	Lowland Hardwood	0	0.0		Elm	0.00	
	Group Sum	65	**3.5**	Group Sum	0	**0.0**				
UPLAND CONIFERS	White Pine mix	0	0.0	White Pine	0	0.0		White Pine	0.00	112.4%
	Red Pine	0	0.0	Norway Pine[5]	0	0.0		Red Pine	0.00	17.1%
	Red/White Pine	23	1.2							
	Red/White Pine-Deciduous mix	4	0.2							
	Jack Pine	0	0.0	Jack Pine	0	0.0		Jack Pine	0.00	84.4%
	Jack Pine-Deciduous mix	1	0.0							
	White Spruce	0	0.0	White Spruce	0	0.0		White Spruce	0.00	2.0%
	Balsam Fir mix	24	1.3	Balsam Fir	0	0.0		Balsam Fir	0.00	-3.3%
	Spruce/Fir-Deciduous mix	0	0.0							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	0	0.0				0.0%
	Upland Northern White-Cedar	13	0.7							
	Upland Conifer	2	0.1							
	Group Sum	66	**3.6**	Group Sum	0	**0.0**				
LOWLAND CONIFERS	Lowland Black Spruce	8	0.4	Black Spruce, Lowland	11	5.0	12.3	Black Spruce	0.00	0.0%
	Tamarack	0	0.0	Tamarack	0	0.0		Tamarack	0.00	5.4%
	Lowland Northern White-Cedar	4	0.2	Northern White Cedar	0	0.0		Cedar	0.00	5.3%
	Group Sum	11	**0.6**	Group Sum	11	**5.0**	8.2			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	0	0.0				
	Stagnant Tamarack	0	0.0	Stagnant Tamarack	0	0.0				
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	10	5.0				
	Stagnant Conifer	0	0.0							
	Group Sum	0	**0.0**	Group Sum	10	**5.0**				
SHRUBLAND	Upland Shrub	59	3.2	Upland Brush	0	0.0				
				Cutover Area	0	0.0				
	Lowland Deciduous Shrub	57	3.1	Lowland Brush	16	7.5	2.4			
	Lowland Evergreen Shrub	4	0.2	Muskeg	0	0.0				
	Group Sum	120	**6.5**	Group Sum	16	**7.5**	1.2			
AQUATIC	Water	5	0.3	Permanent Water	0	0.0				
	Floating Aquatic	0	0.0	Non-Permanent Water	4	1.9				
	Broadleaf Sedge/Cattail	6	0.3	Marsh	0	0.0				
	Sedge Meadow	0	0.0	Lowland Grass	0	0.0				
	Group Sum	11	**0.6**	Group Sum	4	**1.9**	3.2			
CROP/GRASS	Cropland	96	5.2	Agricultural	0	0.0				
	Grassland	3	0.1	Upland Grass	0	0.0				
	Prairie	0	0.0							
	Group Sum	99	**5.3**	Group Sum	0	**0.0**				
DEVELOPED	Low Intensity Urban	0	0.0	Development[6]	0	0.0				
	High Intensity Urban	0	0.0							
	Mixed Developed	0	0.0							
	Transportation	1	0.1	Roads	3	1.3	22.3			
	Group Sum	1	**0.1**	Group Sum	3	**1.3**	22.3			
	Other[7]	4	0.2	Other[8]	0	0.0				
	LTA TOTAL	1,854	100.0	LTA TOTAL	210	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Blackduck Till Plain (212Na16)

OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A nearly level to rolling till plain formed by the Koochiching Lobe Glacier. Uplands occupy 66 percent, wetlands occupy 30 percent, and lakes occupy 4 percent of the LTA (MN DNR, 1998). Small wet depressions that are dry in the summer are common. Intermittent streams are commonly present in areas where the loamy till is near or at the surface. There are 0.5 miles of streams per square mile. The majority of upland soils have loam to clay loam textures. A cap of sandy material is commonly found on the surface.

The dominant upland pre-settlement vegetation was wet-mesic hardwood-conifer (spruce-fir) (Shadis, 1999 and Marschner, 1974). Lowland pre-settlement vegetation was conifer bog and swamp (Marschner, 1974). Historic fire regime for the dominant upland type was 70- to 150-year forest replacement (Shadis, 1999).

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is private (51.5%), followed by federal (25.8%), state (12.6%), and county (10.0%). See table below. This LTA exists as four separate units within Beltrami, Itasca, and Koochiching counties. Over 72,353 acres of protected waters are present inside the LTA. Lakes within or adjacent to the LTA include Blackduck, Island, Sand, and Jessie.

Parts of the LTA are in Leech Lake Indian Reservation and Chippewa National Forest. Federal, state, county, and private industrial lands are scattered throughout the LTA. Large contiguous tracts of USFS lands are evident in all four LTA units. The majority of

private industrial forestlands, which includes Boise Cascade Corporation, Potlatch Corporation, Blandin Paper Company, and Boundary Company, Inc. parcels, are located in the LTA's north unit. Municipalities include Blackduck, Kelliher, Tenstrike, Funkley, Squaw Lake, Northome, and Mizpah.

Agency (%)	Acres	Percent
State (12.6%)		
DNR, Ecological Resources	224	0.1%
DNR, Fish and Wildlife	1,432	0.5%
DNR, Forestry	32,531	12.0%
Other	66	0.0%
State (Undifferentiated)	25	0.0%
County (10.0%)		
Beltrami	13,103	4.8%
Itasca	825	0.3%
Koochiching	13,072	4.8%
Federal (25.8%)		
Bureau of Indian Affairs	496	0.2%
Farmers Home Administration	1,142	0.4%
Leech Lake Reservation	68	0.0%
Other	443	0.2%
U.S. Forest Service	67,644	25.0%
Other Public (0.0%)		
School District	79	0.0%
Private (51.5%)		
Private	112,328	41.4%
Private Industrial	23,238	8.6%
Private Other	3,949	1.5%
Tribal (0.1%)		
Leech Lake Reservation	346	0.1%
Grand Total	**271,011 acres**	

* note - 12,966 acres of open water are included in the table above

Natural Resource Management Units

Federal

United States Forest Service

- National Forests: Chippewa (northwest, north central, northeast, east central)

State

Minnesota Department of Natural Resources

- State Forests: Blackduck (west/northwest, north/north central, east/northeast), Bowstring (north/northeast), Big Fork (west/southwest, south/southeast), Buena Vista (north/northeast), Red Lake (southeast corner), Pine Island (southwest corner)
- Wildlife Management Areas: Carmen Borgerding, Dishpan, Bowstring Deer Yard, Squaw Lake Deer Yard
- Aquatic Management Areas: Blackduck Lake

- Fish Management Areas: Island Lake, Bender
- Scientific and Natural Areas: Lost Forty

County

None known

Other

Leech Lake Indian Reservation

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (70%), and Conifer Bogs and Swamps (19%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-875, scattering oak, scattering timber-3, thicket, brush, underbrush or only tree around-6, dry land, dry ridge, or island-5, lake, slough, pond-34, river, creek, bottom, or valley, ravine-9, marsh or swamp-375, meadow-3, wet prairie or prairie-1, windthrow, windfall-18, and burned area-8.

Bearing trees include: Ash-51, Black Ash-15, Aspen-392, Balm-of-Gilead-30, Balsam Fir-361, Basswood-57, Birch-448, Yellow Birch-1, Cedar-360, Cottonwood-4, Elm-69, Ironwood-6, Maple-38, Sugar Maple-27, Oak-8, Bur Oak-1, Northern Pin Oak-3, Pine-6, Jack Pine-25, Red Pine-67, White Pine-172, Spruce-523, Black Spruce –5, Tamarack-647, and Willow-7.

Current Land Cover

As referenced from table on page 6:

- Top five GAP land cover classes on all ownerships (290,519 total acres):
  Aspen/White Birch (33.3%), Cropland (12.8%), Lowland Deciduous Shrub (12.4%), Upland Deciduous (11.7%), and Lowland Deciduous (6.0%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (9,748 total acres):
  Aspen (34.0%), Lowland Brush (14.3%), Lowland Black Spruce (7.7%), Ash (5.7%), and Tamarack (5.3%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 10.6 times more Ash, 5.3 times more Tamarack, 4.4 times more Northern White Cedar, 3.5 times more Lowland Black Spruce, and 51.7 times less in the Lowland Hardwood group.

Changes in Tree Species Composition

As referenced from table on page 6, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 10.5 times more Balm of Gilead, 3.4 times more Ash, 2.8 times more Aspen, 2.5 times more Bur Oak, 2.1 times more Elm, 2.0 times more Sugar Maple, 2.0 times more Basswood, 2.2 times less Black Spruce, 2.4 times less Red Pine, 5.9 times less Tamarack, and 6.3 times less White Spruce in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 6. This is a priority LTA for White Spruce, Tamarack, and Northern White Cedar cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry-Mesic Pine/Oak, Mesic Northern Hardwood, Boreal Hardwood Conifer, and White Cedar Swamp. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

Upland Forests
FDn12, FDn33, FDn43, **MHn35, MHn44, MHn46, MHn47**

Wetland Forests
FFn57, FFn67, WFn53, **WFn55, WFn64, FPn63**, FPn82, **APn80**

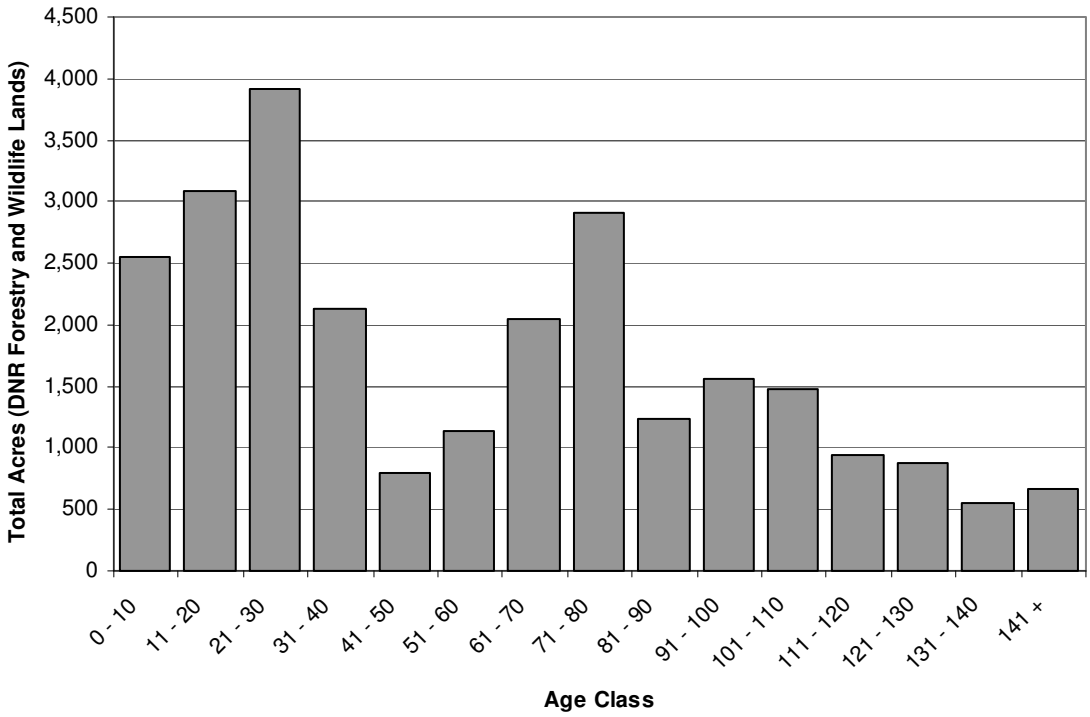
Non-Forested Communities
APn90, APn91, MRn83, OPn81, OPn91, **OPn92, WMn73, WMn82, FPn73**

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains 4 old growth stands with associated OFMCs, 552 acres of EILC, and 8,130 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (25,881 total acres).



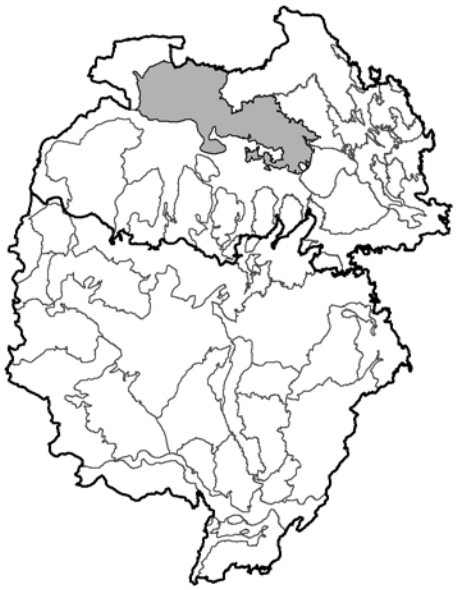
Patch Dynamics

This LTA contains 10 designated forest patches on state forestry and wildlife lands. They include 5 upland hardwood patches (Little Constance, Squaw Lake, County 29, Blue Ox, and Cloverleaf), a lowland conifers patch (County 36), and 4 lowland hardwood patches (South Chapel, Cormant River Headwaters, Popple River, and West Six).

Blackduck Till Plain (212Na16)										
	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	96,783	33.3	Aspen	12,086	34.0	1.1	Aspen	2.79	-7.9%
				Balm of Gilead	642	1.8		Balm of Gilead	10.50	
				Birch	500	1.4		Paper Birch	-1.60	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	8,290	2.9	Northern Hardwoods[4]	1,567	4.4	1.5	Sugar Maple	2.00	-10.8%
								Red Maple	0.00	
								Basswood	2.00	
								Yellow Birch	0.00	
	Bur/White Oak	0	0.0	Oak	24	0.1	-2.4	Bur Oak	2.50	PMOP -10.9%
	Red Oak	483	0.2					Red Oak	0.00	
	Upland Deciduous	33,864	11.7	Offsite Oak	0	0.0				
	Group Sum	139,421	**48.0**	Group Sum	14,819	**41.7**	-1.1			
LOWLAND DECIDUOUS	Black Ash	1,558	0.5	Ash	2,012	5.7	10.6	Ash	3.42	-10.7%
	Lowland Deciduous	17,491	6.0	Lowland Hardwood	41	0.1	-51.7	Elm	2.10	
	Group Sum	19,050	**6.6**	Group Sum	2,053	**5.8**	-1.1			
UPLAND CONIFERS	White Pine mix	6	0.0	White Pine	12	0.0	17.7	White Pine	0.00	112.4%
	Red Pine	0	0.0	Norway Pine[5]	152	0.4		Red Pine	-2.38	17.1%
	Red/White Pine	3,878	1.3							
	Red/White Pine-Deciduous mix	400	0.1							
	Jack Pine	1,092	0.4	Jack Pine	4	0.0	-36.9	Jack Pine	0.00	84.4%
	Jack Pine-Deciduous mix	282	0.1							
	White Spruce	124	0.0	White Spruce	224	0.6	14.8	White Spruce	-6.25	2.0%
	Balsam Fir mix	3,605	1.2	Balsam Fir	621	1.7	1.4	Balsam Fir	1.33	-3.3%
	Spruce/Fir-Deciduous mix	31	0.0							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	0	0.0				0.0%
	Upland Northern White-Cedar	1,992	0.7							
	Upland Conifer	414	0.1							
	Group Sum	11,825	**4.1**	Group Sum	1,014	**2.9**	-1.4			
LOWLAND CONIFERS	Lowland Black Spruce	6,437	2.2	Black Spruce, Lowland	2,719	7.7	3.5	Black Spruce	-2.19	0.0%
	Tamarack	2,873	1.0	Tamarack	1,867	5.3	5.3	Tamarack	-5.88	5.4%
	Lowland Northern White-Cedar	2,583	0.9	Northern White Cedar	1,392	3.9	4.4	Cedar	-1.96	5.3%
	Group Sum	11,892	**4.1**	Group Sum	5,978	**16.8**	4.1			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	1,088	3.1				
	Stagnant Tamarack	0	0.0	Stagnant Tamarack	252	0.7				
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	677	1.9				
	Stagnant Conifer	0	0.0							
	Group Sum	0	**0.0**	Group Sum	2,017	**5.7**				
SHRUBLAND	Upland Shrub	4,383	1.5	Upland Brush	11	0.0	-2.8			
				Cutover Area	182	0.5				
	Lowland Deciduous Shrub	36,166	12.4	Lowland Brush	5,078	14.3	1.1			
	Lowland Evergreen Shrub	433	0.1	Muskeg	401	1.1	7.6			
	Group Sum	40,981	**14.1**	Group Sum	5,672	**16.0**	1.1			
AQUATIC	Water	13,850	4.8	Permanent Water	581	1.6				
	Floating Aquatic	13	0.0	Non-Permanent Water	1,601	4.5				
	Broadleaf Sedge/Cattail	6,681	2.3	Marsh	1,135	3.2	1.4			
	Sedge Meadow	2,514	0.9	Lowland Grass	438	1.2	1.4			
	Group Sum	23,059	**7.9**	Group Sum	3,755	**10.6**	1.3			
CROP/GRASS	Cropland	37,077	12.8	Agricultural	43	0.1	-105.9			
	Grassland	665	0.2	Upland Grass	53	0.2	-1.5			
	Prairie	0	0.0							
	Group Sum	37,742	**13.0**	Group Sum	96	**0.3**	-48.0			
DEVELOPED	Low Intensity Urban	408	0.1	Development[6]	34	0.1	-2.8			
	High Intensity Urban	371	0.1							
	Mixed Developed	0	0.0							
	Transportation	1,113	0.4	Roads	48	0.1	-2.8			
	Group Sum	1,891	**0.7**	Group Sum	82	**0.2**	-2.8			
	Other[7]	4,659	1.6	Other[8]	14	0.0				
	LTA TOTAL	290,519	100.0	LTA TOTAL	35,500	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Blackduck Moraine (212Na18)



OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A rolling to steep end moraine formed by the Koochiching Lobe Glacier. Uplands occupy 63 percent, wetlands occupy 28 percent, and lakes occupy 9 percent of the LTA (MN DNR, 1998). Soil parent material is loam to clay loam till.

The dominant upland pre-settlement vegetation was dry-mesic (red and white) pine forest, wet-mesic hardwood-conifer (spruce-fir) forest, and wet-mesic hardwood/conifer (white pine) forest, (Shadis, 1999 and Marschner, 1974). The majority of lowland pre-settlement vegetation was conifer bog and swamp (Marschner, 1974). Historic fire regimes for the dominant upland types were a) 150- to 350-year forest replacement with five- to 50-year forest maintenance, b) 70- to 150-year forest replacement, and c) 250- to 1,000-year forest replacement, respectively (Shadis, 1999).

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is private (42.3%), followed by federal (22.4%), county (21.5%), and state (13.7%). See table below. This LTA exists as six separate units within Beltrami and Itasca counties. Three of the LTA's six units are less than 25 acres each in size. The Mississippi River flows through the LTA. Over 88,763 acres of protected waters exist inside the LTA. Lakes within or adjacent to the LTA include Puposky, Big, Cass, and Winnibigoshish.

Parts of the LTA are inside Leech Lake and Chippewa National Forest. Federal, state, county, and private industrial lands are distributed throughout the LTA. Large tracts of

contiguous USFS lands occur primarily in the LTA's central and east portions. The majority of state lands are located in the LTA's east half, while most county lands occur in the west half. Very little private industrial forestlands exist. Municipalities include Tenstrike and Turtle River.

Agency (%)	Acres	Percent
State (13.7%)		
DNR, Fish and Wildlife	3,018	1.2%
DNR, Forestry	32,567	12.5%
DNR, Parks	198	0.1%
County (21.5%)		
Beltrami	55,129	21.1%
Itasca	795	0.3%
Lakes and Rivers	261	0.1%
Federal (22.4%)		
Bureau of Indian Affairs	820	0.3%
Bureau of Land Management	16	0.0%
Leech Lake Reservation	85	0.0%
Other	1,173	0.4%
U.S. Forest Service	56,320	21.6%
Private (42.3%)		
Private	110,237	42.3%
Private Industrial	211	0.1%
Tribal (0.0%)		
Leech Lake Reservation	43	0.0%
Grand Total	**260,873 acres**	

* note - 27,084 acres of open water are included in the table above

Natural Resource Management Units

Federal

United States Forest Service

- National Forests: Chippewa (northwest corner)

State

Minnesota Department of Natural Resources

- State Forests: Blackduck (west half), Bowstring (northwest corner), Mississippi Headwaters (extreme north portion), Buena Vista (nearly all)
- Wildlife Management Areas: James B. Fern, Sugar Lake, Long Lake, Morph Meadows
- Scientific and Natural Areas: Pennington Bog
- State Parks: Lake Bemidji

County

None known

Other

Leech Lake Indian Reservation

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (21%), Conifer Bogs and Swamps (25%), Lakes (open water) (6%), Mixed Hardwood and Pine (Maple, White Pine, Basswood, etc) (10%), and Mixed White Pine and Red Pine (26%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-749, pine openings, pine barrens, scattered pine-12, scattering oak, scattering timber-19, thicket, brush, underbrush or only tree around-21, dry land, dry ridge, or island-16, lake, slough, pond-132, river, creek, bottom, or valley, ravine-8, marsh or swamp-358, meadow-2, windthrow, windfall-48, and burned area-74.

Bearing trees include: Ash-45, Black Ash-4, Aspen-418, Balm-of-Gilead-23, Balsam Fir-157, Basswood-52, Birch-378, Cedar-229, Elm-95, Ironwood-13, Maple-69, Sugar Maple-22, Oak-61, Bur Oak-17, Red Oak-6, Pine-51, Jack Pine-120, Red Pine-259, White Pine-309, Spruce-163, Black Spruce –4, Tamarack-729, and Willow-2.

Current Land Cover

As referenced from table on page 6:

- Top five GAP land cover classes on all ownerships (304,462 total acres):
  Aspen/White Birch (25.4%), Upland Deciduous (12.8%), Cropland (12.5%), Lowland Deciduous Shrub (10.3%), and Water (8.1%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (44,610 total acres):
  Aspen (29.8 %), Marsh (13.5%), Lowland Brush (10.1%), Tamarack (8.9%), and Northern Hardwoods (5.5%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 12.6 times more Tamarack, 3.9 times more Northern White Cedar, 2.9 times more Marsh, 1.4 times more Lowland Black Spruce, and 1.0 times less in the Lowland Brush group.

Changes in Tree Species Composition

As referenced from table on page 6, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 6.5 times more Basswood, 6.3 times more Balm of Gilead, 4.2 times more Ash, 2.5 times more Black Spruce, 2.4 times more Sugar Maple, 2.2 times more Red Oak, 2.1 times more Aspen, 2.0 times more Elm, 2.4 times less White Spruce, 5.9 times less Tamarack, 6.3 times less Red Pine, 10.7 times less White Pine, and 20.0 times less Jack Pine in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 6. This is a priority LTA for White Pine, White Spruce, and Tamarack cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry Pine, Dry-Mesic Pine, Dry-Mesic Pine/Oak, Mesic Northern Hardwood, and Boreal Hardwood Conifer. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

Upland Forests

FDn12, FDn33, FDc12**, FDc34, MHn35, MHn44**, MHn46, **MHn47, MHc26,** MHc37

Wetland Forests

FFn57, FFn67, **WFn53,** WFn55**, WFn64, FPn63, FPn82, APn80,** APn81

Non-Forested Communities

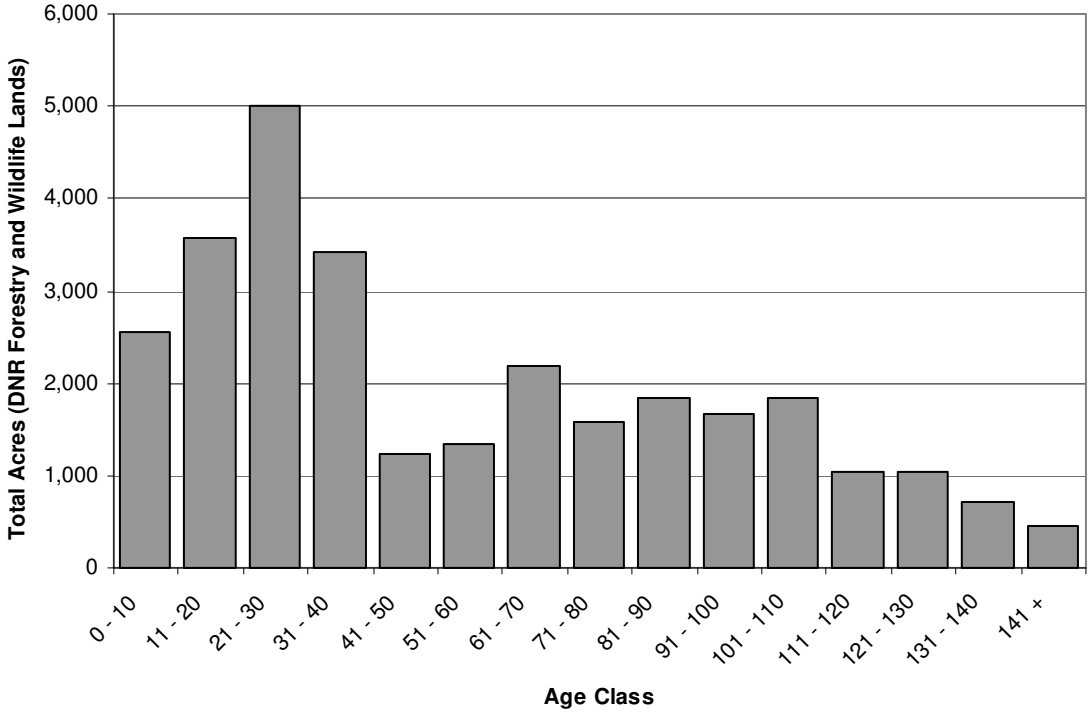
APn91, OPn92, WMn73, WMn82, FPn73

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains 30 old growth stands with associated OFMCs, 972 acres of EILC, and 8,181 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (29,518 total acres).



Patch Dynamics

This LTA contains 12 designated forest patches on state forestry and wildlife lands. They include 10 upland hardwood patches (Little Moose Lake, No Name Lake, Medicine Lake, Durand Hardwoods North, Rabideau, Durand Hardwoods South, Range Line Lake, Moose Lake Hardwoods, Castle Creek, and Morff) and 2 lowland conifer patches (Third River and Bog Lake).

Blackduck Moraine (212Na18)

	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	77,183	25.4	Aspen	13,282	29.8	1.2	Aspen	2.06	-7.9%
				Balm of Gilead	151	0.3		Balm of Gilead	6.29	
				Birch	662	1.5		Paper Birch	-1.15	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	15,309	5.0	Northern Hardwoods[4]	2,473	5.5	1.1	Sugar Maple	2.41	-10.8%
								Red Maple	0.00	
								Basswood	6.53	
								Yellow Birch	0.00	
	Bur/White Oak	0	0.0	Oak	20	0.0	-13.1	Bur Oak	1.85	PMOP -10.9%
	Red Oak	1,774	0.6					Red Oak	2.20	
	Upland Deciduous	39,078	12.8	Offsite Oak	0	0.0				
	Group Sum	133,343	**43.8**	Group Sum	16,588	**37.2**	-1.2			
LOWLAND DECIDUOUS	Black Ash	270	0.1	Ash	707	1.6	17.9	Ash	4.21	-10.7%
	Lowland Deciduous	8,886	2.9	Lowland Hardwood	323	0.7	-4.0	Elm	2.04	
	Group Sum	9,157	**3.0**	Group Sum	1,030	**2.3**	-1.3			
UPLAND CONIFERS	White Pine mix	0	0.0	White Pine	141	0.3		White Pine	-10.67	112.4%
	Red Pine	0	0.0	Norway Pine[5]	402	0.9		Red Pine	-6.31	17.1%
	Red/White Pine	6,450	2.1							
	Red/White Pine-Deciduous mix	137	0.0							
	Jack Pine	2,453	0.8	Jack Pine	80	0.2	-4.5	Jack Pine	-20.00	84.4%
	Jack Pine-Deciduous mix	780	0.3							
	White Spruce	240	0.1	White Spruce	494	1.1	14.0	White Spruce	-2.38	2.0%
	Balsam Fir mix	3,424	1.1	Balsam Fir	452	1.0	-1.1	Balsam Fir	1.60	-3.3%
	Spruce/Fir-Deciduous mix	14	0.0							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	0	0.0				0.0%
	Upland Northern White-Cedar	2,376	0.8							
	Upland Conifer	863	0.3							
	Group Sum	16,737	**5.5**	Group Sum	1,569	**3.5**	-1.6			
LOWLAND CONIFERS	Lowland Black Spruce	11,077	3.6	Black Spruce, Lowland	2,194	4.9	1.4	Black Spruce	2.50	0.0%
	Tamarack	2,141	0.7	Tamarack	3,963	8.9	12.6	Tamarack	-5.86	5.4%
	Lowland Northern White-Cedar	4,229	1.4	Northern White Cedar	2,410	5.4	3.9	Cedar	-1.03	5.3%
	Group Sum	17,446	**5.7**	Group Sum	8,567	**19.2**	3.4			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	1,187	2.7				
	Stagnant Tamarack	0	0.0	Stagnant Tamarack	355	0.8				
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	222	0.5				
	Stagnant Conifer	0	0.0							
	Group Sum	0	**0.0**	Group Sum	1,764	**4.0**				
SHRUBLAND	Upland Shrub	6,810	2.2	Upland Brush	34	0.1	-7.0			
				Cutover Area	109	0.2				
	Lowland Deciduous Shrub	31,228	10.3	Lowland Brush	4,506	10.1	-1.0			
	Lowland Evergreen Shrub	1,100	0.4	Muskeg	318	0.7	2.0			
	Group Sum	39,138	**12.9**	Group Sum	4,968	**11.1**	-1.2			
AQUATIC	Water	24,638	8.1	Permanent Water	958	2.1				
	Floating Aquatic	4	0.0	Non-Permanent Water	2,176	4.9				
	Broadleaf Sedge/Cattail	14,212	4.7	Marsh	6,016	13.5	2.9			
	Sedge Meadow	4,060	1.3	Lowland Grass	818	1.8	1.4			
	Group Sum	42,914	**14.1**	Group Sum	9,969	**22.3**	1.6			
CROP/GRASS	Cropland	37,993	12.5	Agricultural	20	0.0	-279.6			
	Grassland	694	0.2	Upland Grass	75	0.2	-1.4			
	Prairie	0	0.0							
	Group Sum	38,687	**12.7**	Group Sum	95	**0.2**	-59.7			
DEVELOPED	Low Intensity Urban	25	0.0	Development[6]	2	0.0	-8.0			
	High Intensity Urban	78	0.0							
	Mixed Developed	0	0.0							
	Transportation	988	0.3	Roads	59	0.1	-2.5			
	Group Sum	1,091	**0.4**	Group Sum	61	**0.1**	-2.6			
	Other[7]	5,948	2.0	Other[8]	0	0.0				
	LTA TOTAL	304,462	100.0	LTA TOTAL	44,610	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Alida Till Plain (212Na21)

OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A complex of rolling till plains and moraines separated by outwash channels all formed by the Koochiching Lobe Glacier. Uplands occupy 83 percent, wetlands occupy 15 percent, and lakes occupy 2 percent of the LTA (MN DNR, 1998). The most mineral soils in the till plains and moraines have loam to clay loam textures. Sandy loam or sand textures are also present primarily in the outwash channels.

The majority of the upland pre-settlement vegetation was aspen-birch (trending to conifers), mixed white pine and red pine, Big Woods—hardwoods, and jack pine barrens and openings (Marschner, 1974). The dominant lowland pre-settlement vegetation was wet meadows or conifer bog and swamp (Marschner, 1974).

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is private (76.9%), followed by county (13.4%), and state (8.8%). See table below. This LTA is located in Mahnomen, Clearwater, Beltrami, and Hubbard counties. The Mississippi River meanders through the southeastern portion of the LTA. Over 26,363 acres of protected waters exist inside the LTA. Lakes within or adjacent to the LTA include Upper Rice, Minerva, and Itasca.

Parts of the LTA's west side are inside White Earth Indian Reservation. State and county lands are scattered throughout the LTA. The largest block of contiguous state forestland occurs in the central portion of the LTA. Most county lands are concentrated in the

southeast and east segments. No USFS and very little private industrial lands are found in the LTA. Municipalities include Bagley, Shevlin, and Solway.

Agency (%)	Acres	Percent
State (8.8%)		
DNR, Ecological Resources	210	0.1%
DNR, Fish and Wildlife	1,191	0.6%
DNR, Forestry	14,643	7.7%
DNR, Parks	843	0.4%
County (13.4%)		
Beltrami	883	0.5%
Clearwater	22,790	11.9%
Hubbard	1,929	1.0%
Mahnomen	37	0.0%
Federal (0.4%)		
Bureau of Indian Affairs	721	0.4%
Other Public (0.2%)		
City of Bagley	368	0.2%
Private (76.9%)		
Private	145,913	76.4%
Private Industrial	962	0.5%
Tribal (0.3%)		
White Earth Reservation	570	0.3%
Grand Total	**191,060 acres**	

* note - 3,753 acres of open water are included in the table above

Natural Resource Management Units

Federal

None known

State

Minnesota Department of Natural Resources

- State Forests: Mississippi Headwaters (central and south portions), White Earth (north portions)
- Wildlife Management Areas: Mud Lake, Sucker Lake, Mallard Lake, Gill Lake, Robinson Lake, Upper Rice Lake, Daniel Lake, Island Lake Fmha, Lower Rice, Mosquito Creek
- Scientific and Natural Areas: Iron Springs Bog, Itasca Wilderness Sanctuary
- State Parks: Itasca

County

None known

Other

White Earth Indian Reservation

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (45%), Big Woods - Hardwoods (oak, maple, basswood, hickory) (6%), Conifer Bogs and Swamps (17%), Jack Pine Barrens and Openings (5%), and Mixed White Pine and Red Pine (21%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-449, pine openings, pine barrens, scattered pine-39, scattering oak, scattering timber-32, thicket, brush, underbrush or only tree around-64, lake, slough, pond-8, river, creek, bottom, or valley, ravine-3, marsh or swamp-183, windthrow, windfall-10, and burned area-159.

Bearing trees include: Ash-21, Aspen-556, Balm-of-Gilead-65, Balsam Fir-56, Basswood-21, Birch-112, Cedar-1, Cottonwood-12, Elm-101, Ironwood-12, Maple-42, Sugar Maple-16, Oak-36, Bur Oak-21, Red Oak-6, Pine-37, Jack Pine-107, Red Pine-199, White Pine-437, Spruce-98, Tamarack-335, and Willow-2.

Current Land Cover

As referenced from table on page 6:

- Top five GAP land cover classes on all ownerships (196,599 total acres):
  Cropland (36.8%), Aspen/White Birch (20.7%), Upland Deciduous (14.1%), Lowland Deciduous Shrub (6.0%), and Upland Shrub (3.7%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (16,279 total acres):
  Aspen (26.4 %), Tamarack (19.1%), Lowland Brush (17.8%), Lowland Grass (4.3%), and Marsh (3.6%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 18.1 times more Tamarack, 7.6 times more Balsam Fir, 6.8 times more Upland Grass, 3.0 times more Lowland Brush, 2.4 times more Lowland Black Spruce, 2.0 times more Lowland Grass, and 2.1 times less in the Upland Grass group.

Changes in Tree Species Composition

As referenced from table on page 6, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 8.2 times more Basswood, 3.0 times more Bur Oak, 3.0 times more Ash, 2.8 times more Balsam Fir, 2.4 times more Red Oak, 2.3 times more Elm, 2.1 times more Balm of Gilead, 2.0 times less Red Pine, 2.9 times less Tamarack, and 24.8 times less White Pine in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 6. This is a priority LTA for White Pine cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry-Mesic Pine and Dry-Mesic Pine/Oak. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

Upland Forests

FDn12, **FDn33, FDc12, FDc34, MHn35, MHn44, MHn46,** MHn47**, MHc26, MHc37**

Wetland Forests

FFn57, FFn67, WFn53, WFn55, WFn64, FPn63, FPn82, APn80, APn81

Non-Forested Communities

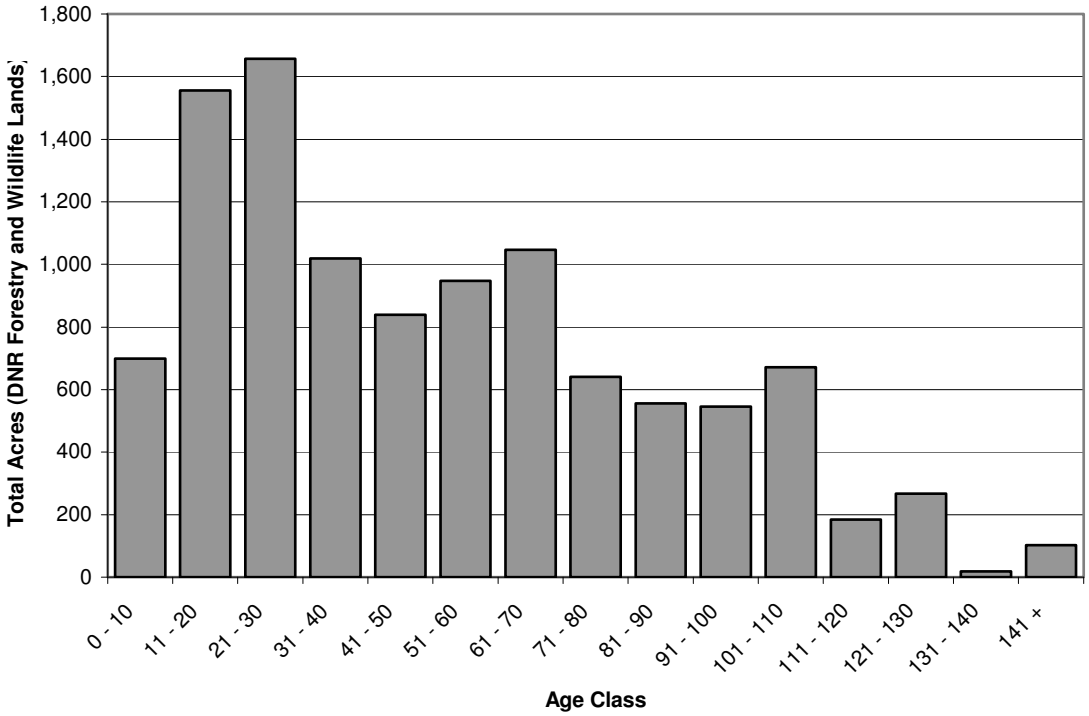
APn91, OPn92, WMn73, **WMn82**, FPn73

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains 4 old growth stands with associated OFMCs, 401 acres of EILC, and 4,900 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (10,748 total acres).



Patch Dynamics

This LTA contains 8 designated forest patches on state forestry and wildlife lands. They include an upland conifers patch (Itasca Conifers), 6 upland hardwood patches (Bear Moose Creek Hardwoods, Rice Hardwoods, Minerva Hardwoods North, Shevlin Hardwoods, Minerva Hardwoods South, and Itasca Hardwoods), and a lowland conifers patch (Nora/Minerva Conifers).

Alida Till Plain (212Na21)

	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	40,704	20.7	Aspen	4,296	26.4	1.4	Aspen	1.28	-7.9%
				Balm of Gilead	232	1.4		Balm of Gilead	2.11	
				Birch	44	0.3		Paper Birch	1.38	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	5,413	2.8	Northern Hardwoods[4]	503	3.1	1.1	Sugar Maple	-1.62	-10.8%
								Red Maple	-1.67	
								Basswood	8.22	
								Yellow Birch	0.00	
	Bur/White Oak	3	0.0	Oak	208	1.3	5.8	Bur Oak	2.95	PMOP -10.9%
	Red Oak	426	0.2					Red Oak	2.43	
	Upland Deciduous	27,672	14.1	Offsite Oak	0	0.0				
	Group Sum	74,218	**37.8**	Group Sum	5,282	**32.4**	-1.2			
LOWLAND DECIDUOUS	Black Ash	41	0.0	Ash	402	2.5	119.3	Ash	3.00	-10.7%
	Lowland Deciduous	1,138	0.6	Lowland Hardwood	306	1.9	3.2	Elm	2.30	
	Group Sum	1,179	**0.6**	Group Sum	708	**4.3**	7.3			
UPLAND CONIFERS	White Pine mix	0	0.0	White Pine	84	0.5		White Pine	-24.75	112.4%
	Red Pine	0	0.0	Norway Pine[5]	410	2.5		Red Pine	-1.98	17.1%
	Red/White Pine	2,167	1.1							
	Red/White Pine-Deciduous mix	1,327	0.7							
	Jack Pine	2,015	1.0	Jack Pine	79	0.5	-2.1	Jack Pine	1.22	84.4%
	Jack Pine-Deciduous mix	955	0.5							
	White Spruce	185	0.1	White Spruce	90	0.6	5.9	White Spruce	-1.71	2.0%
	Balsam Fir mix	754	0.4	Balsam Fir	476	2.9	7.6	Balsam Fir	2.83	-3.3%
	Spruce/Fir-Deciduous mix	202	0.1							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	12	0.1				0.0%
	Upland Northern White-Cedar	51	0.0							
	Upland Conifer	1,571	0.8							
	Group Sum	9,227	**4.7**	Group Sum	1,151	**7.1**	1.5			
LOWLAND CONIFERS	Lowland Black Spruce	1,984	1.0	Black Spruce, Lowland	397	2.4	2.4	Black Spruce	1.36	0.0%
	Tamarack	2,083	1.1	Tamarack	3,113	19.1	18.1	Tamarack	-2.94	5.4%
	Lowland Northern White-Cedar	27	0.0	Northern White Cedar	11	0.1	4.9	Cedar	0.00	5.3%
	Group Sum	4,094	**2.1**	Group Sum	3,521	**21.6**	10.4			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	21	0.1				
	Stagnant Tamarack	0	0.0	Stagnant Tamarack	65	0.4				
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	0	0.0				
	Stagnant Conifer	8	0.0							
	Group Sum	8	**0.0**	Group Sum	86	**0.5**	129.5			
SHRUBLAND	Upland Shrub	7,344	3.7	Upland Brush	35	0.2	-2.1			
				Cutover Area	252	1.5				
	Lowland Deciduous Shrub	11,806	6.0	Lowland Brush	2,890	17.8	3.0			
	Lowland Evergreen Shrub	294	0.1	Muskeg	23	0.1	-1.0			
	Group Sum	19,443	**9.9**	Group Sum	3,200	**19.7**	2.0			
AQUATIC	Water	3,525	1.8	Permanent Water	328	2.0				
	Floating Aquatic	0	0.0	Non-Permanent Water	37	0.2				
	Broadleaf Sedge/Cattail	5,746	2.9	Marsh	588	3.6	1.2			
	Sedge Meadow	4,161	2.1	Lowland Grass	692	4.3	2.0			
	Group Sum	13,432	**6.8**	Group Sum	1,645	**10.1**	1.5			
CROP/GRASS	Cropland	72,294	36.8	Agricultural	48	0.3	-125.6			
	Grassland	1,023	0.5	Upland Grass	572	3.5	6.8			
	Prairie	0	0.0							
	Group Sum	73,317	**37.3**	Group Sum	620	**3.8**	-9.8			
DEVELOPED	Low Intensity Urban	2	0.0	Development[6]	62	0.4	4.4			
	High Intensity Urban	159	0.1							
	Mixed Developed	11	0.0							
	Transportation	1,134	0.6	Roads	4	0.0	-21.9			
	Group Sum	1,306	**0.7**	Group Sum	67	**0.4**	-1.6			
	Other[7]	375	0.2	Other[8]	0	0.0				
	LTA TOTAL	196,599	100.0	LTA TOTAL	16,279	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Becida Till Plain (212Na22)

OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A complex of Koochiching and Wadena Lobe glacier till plains separated by Koochiching Lobe glacier outwash channels. Topography is level (outwash channels) to rolling (till plains). Uplands occupy 87 percent, wetlands occupy 8 percent, and lakes occupy 5 percent of the LTA (MN DNR, 1998). The majority of the mineral soils have loam to clay loam textures. Small areas with sandy loam or sand textures are also present.

The majority of the upland pre-settlement vegetation was jack pine barrens and openings, mixed white pine and red pine, aspen-birch (trending to conifers), and Big Woods—hardwoods (Marschner, 1974). The dominant lowland pre-settlement vegetation was wet meadows or conifer bog and swamp (Marschner, 1974).

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is private (51.2%), followed by county (38.4%), and state (10.4%). See table below. This LTA is located in Clearwater, Beltrami, and Hubbard counties. The Headwaters of the Mississippi River is located in the LTA's southwest portion. Over 6,569 acres of protected waters exist inside the LTA. Lakes within or adjacent to the LTA include Itasca, Big LaSalle, LaSalle, Hennepin, Evergreen, and Lake Hattie.

State, county, and private industrial lands are spread throughout the LTA. An island on Hennepin Lake is federally owned. Large tracts of contiguous county lands are located in

LTA's east, west, and central portions. Potlatch Corporation forestlands are located in the LTA's north half. Communities include Lake Itasca and Becida.

Agency (%)	Acres	Percent
State (10.4%)		
DNR, Forestry	4,150	6.8%
DNR, Parks	2,207	3.6%
County (38.4%)		
Beltrami	35	0.1%
Clearwater	1,654	2.7%
Hubbard	21,772	35.6%
Private (51.2%)		
Private	30,954	50.7%
Private Industrial	296	0.5%
Grand Total	**61,068 acres**	

* note - 3,175 acres of open water are included in the table above

Natural Resource Management Units

Federal

None known

State

Minnesota Department of Natural Resources

- State Forests: Paul Bunyan (northwest and west), Mississippi Headwaters (eastern portions)
- Scientific and Natural Areas: Itasca Wilderness Sanctuary
- State Parks: Itasca

County

None known

Other

None known

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Conifer Bogs and Swamps (10%), Jack Pine Barrens and Openings (30%), and Mixed White Pine and Red Pine (26%),

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-249, pine openings, pine barrens, scattered pine-2, scattering oak, scattering timber-5, thicket, brush, underbrush or only tree around-19, lake, slough, pond-12, river, creek, bottom, or

valley, ravine-3, marsh or swamp-30, meadow-1, windthrow, windfall-4, and burned area-8.

Bearing trees include: Ash-8, Black Ash-4, Aspen-195, Balm-of-Gilead-4, Balsam Fir-8, Basswood-3, Birch-34, Elm-6, Ironwood-4, Maple-7, Sugar Maple-7, Oak-27, Bur Oak-4, Red Oak-5, Pine-1, Jack Pine-198, Red Pine-117, White Pine-59, Spruce-30, and Tamarack-54.

Current Land Cover

As referenced from table on page 6:

- Top five GAP land cover classes on all ownerships (304,462 total acres):
  Aspen/White Birch (25.4%), Upland Deciduous (12.8%), Cropland (12.5%), Lowland Deciduous Shrub (10.3%), and Water (8.1%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (4,151 total acres):
  Aspen (54.8 %), White Spruce (6.7%), Balsam Fir (5.5%), Lowland Brush (5.1%), and Oak (4.1%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 10.2 times more Balsam Fir, 1.3 times more Lowland Black Spruce, 1.6 times less Jack Pine, and 3.3 times less in the Northern Hardwoods group.

Changes in Tree Species Composition

As referenced from table on page 6, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 10.4 times more Balm of Gilead, 6.6 times more Balsam Fir, 4.5 times more Basswood, 3.4 times more Paper Birch, 3.2 times more Red Oak, 3.1 times more Bur Oak, 2.3 times more Elm, 3.0 times less Black Spruce, 3.4 times less Sugar Maple, 10.0 times less Red Pine, 20.3 times less Tamarack, and 25.3 times less White Pine in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 6. This is a priority LTA for White Pine cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry-Mesic Pine/Oak. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

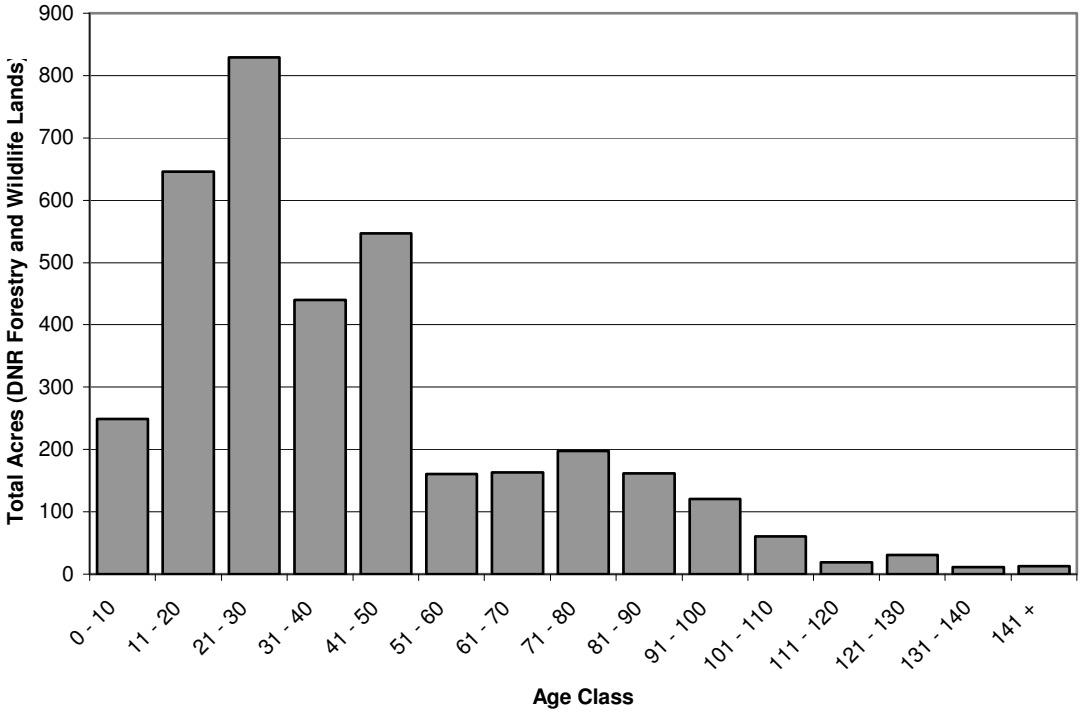
Upland Forests
FDn33, **FDc12,** FDc23, FDc24**, FDc34**, FDs37, MHn35, MHn44, MHn46, **MHc26, MHc37**
Wetland Forests
FFn57, FFn67, WFn53, WFn55, WFn64, WFs57, **FPn63**, FPn72, FPn82, APn80, APn81
Non-Forested Communities
APn90, APn91, **MRn83**, OPn81, **OPn92**, WMn73, **WMn82**, FPn73

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains 38 old growth stands with associated OFMCs, 47 acres of EILC, and 1,538 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (3,648 total acres).



Patch Dynamics

This LTA contains 3 designated forest patches on state forestry and wildlife lands. They include an upland conifers patch (Grant Valley Conifers West) and 2 upland hardwood patches (Lake Hattie Hardwoods and Rockwood Hardwoods North).

Becida Till Plain (212Na22)

	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	25,126	36.7	Aspen	2,275	54.8	1.6	Aspen	1.44	-7.9%
				Balm of Gilead	15	0.4		Balm of Gilead	10.40	
				Birch	81	1.9		Paper Birch	3.38	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	3,409	5.0	Northern Hardwoods[4]	62	1.5	-3.3	Sugar Maple	-3.50	-10.8%
								Red Maple	1.00	
								Basswood	4.50	
								Yellow Birch	0.00	
	Bur/White Oak	23	0.0	Oak	172	4.1	1.6	Bur Oak	3.14	PMOP -10.9%
	Red Oak	1,762	2.6					Red Oak	3.17	
	Upland Deciduous	8,592	12.6	Offsite Oak	0	0.0				
	Group Sum	38,911	**56.9**	Group Sum	2,605	**62.8**	1.1			
LOWLAND DECIDUOUS	Black Ash	10	0.0	Ash	68	1.6	117.1	Ash	1.00	-10.7%
	Lowland Deciduous	120	0.2	Lowland Hardwood	9	0.2	1.2	Elm	2.25	
	Group Sum	129	**0.2**	Group Sum	77	**1.9**	9.8			
UPLAND CONIFERS	White Pine mix	8	0.0	White Pine	0	0.0		White Pine	-25.33	112.4%
	Red Pine	18	0.0	Norway Pine[5]	132	3.2	122.4	Red Pine	-10.00	17.1%
	Red/White Pine	860	1.3							
	Red/White Pine-Deciduous mix	148	0.2							
	Jack Pine	2,645	3.9	Jack Pine	98	2.4	-1.6	Jack Pine	-1.88	84.4%
	Jack Pine-Deciduous mix	501	0.7							
	White Spruce	49	0.1	White Spruce	277	6.7	93.4	White Spruce	-1.33	2.0%
	Balsam Fir mix	372	0.5	Balsam Fir	230	5.5	10.2	Balsam Fir	6.60	-3.3%
	Spruce/Fir-Deciduous mix	57	0.1							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	0	0.0				0.0%
	Upland Northern White-Cedar	18	0.0							
	Upland Conifer	484	0.7							
	Group Sum	5,160	**7.5**	Group Sum	737	**17.8**	2.4			
LOWLAND CONIFERS	Lowland Black Spruce	1,911	2.8	Black Spruce, Lowland	148	3.6	1.3	Black Spruce	-3.00	0.0%
	Tamarack	469	0.7	Tamarack	51	1.2	1.8	Tamarack	-20.33	5.4%
	Lowland Northern White-Cedar	1,831	2.7	Northern White Cedar	17	0.4	-6.6	Cedar	0.00	5.3%
	Group Sum	4,211	**6.2**	Group Sum	216	**5.2**	-1.2			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	0	0.0				
	Stagnant Tamarack	3	0.0	Stagnant Tamarack	0	0.0				
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	13	0.3				
	Stagnant Conifer	0	0.0							
	Group Sum	3	**0.0**	Group Sum	13	**0.3**	77.9			
SHRUBLAND	Upland Shrub	2,734	4.0	Upland Brush	3	0.1	-1.7			
				Cutover Area	97	2.3				
	Lowland Deciduous Shrub	2,368	3.5	Lowland Brush	212	5.1	1.5			
	Lowland Evergreen Shrub	49	0.1	Muskeg	0	0.0				
	Group Sum	5,151	**7.5**	Group Sum	312	**7.5**	-1.0			
AQUATIC	Water	2,908	4.2	Permanent Water	31	0.7				
	Floating Aquatic	0	0.0	Non-Permanent Water	3	0.1				
	Broadleaf Sedge/Cattail	1,449	2.1	Marsh	126	3.0	1.4			
	Sedge Meadow	412	0.6	Lowland Grass	0	0.0				
	Group Sum	4,769	**7.0**	Group Sum	159	**3.8**	-1.8			
CROP/GRASS	Cropland	9,677	14.1	Agricultural	0	0.0				
	Grassland	201	0.3	Upland Grass	19	0.5	1.5			
	Prairie	0	0.0							
	Group Sum	9,878	**14.4**	Group Sum	19	**0.5**	-31.9			
DEVELOPED	Low Intensity Urban	0	0.0	Development[6]	4	0.1				
	High Intensity Urban	0	0.0							
	Mixed Developed	0	0.0							
	Transportation	149	0.2	Roads	0	0.0				
	Group Sum	149	**0.2**	Group Sum	4	**0.1**	-2.6			
	Other[7]	60	0.1	Other[8]	10	0.2				
	LTA TOTAL	68,421	100.0	LTA TOTAL	4,151	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Crow Wing Sand Plain (212Nc01)

OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A gently rolling pitted outwash plain with islands of till, all formed by the Rainy Lobe Glacier. Uplands occupy 64 percent, wetlands occupy 10 percent, and lakes occupy 26 percent of the LTA (MN DNR, 1998). Soil parent material is sandy loam or sand. Soils were formed under forest vegetation.

The dominant upland pre-settlement vegetation was dry pine-oak woodlands, dry-mesic (jack, red, and white) pine-hardwood forest, and dry-mesic (white and red) pine forest (Shadis, 1999 and Marschner, 1974). Lowland pre-settlement vegetation was commonly conifer bog and swamp (Marschner, 1974).

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is private (88.9%), followed by county (5.6%), and state (5.1%). See table below. This LTA is located in Cass and Crow Wing counties. The Mississippi River flows through the LTA's east and southeast portions. Over 73,766 acres of protected waters exist inside the LTA. Lakes within or adjacent to the LTA include Whitefish, Gull, Pelican, North Long, and Edward.

Federal, state, county, and private industrial lands are scattered throughout the LTA. The largest contiguous tracts of state, county, and Potlatch Corporation lands occur in the LTA's northeast and east central portions. Municipalities include Crosslake, East Gull Lake, Emily, Fifty Lakes, Manhattan Beach, Baxter, Lake Shore, Nisswa, Breezy Point, Pequot Lake, Jenkins, and Brainerd.

Agency (%)	Acres	Percent
State (5.1%)		
DNR, Fish and Wildlife	1,355	0.9%
DNR, Forestry	6,352	4.0%
DNR, Trails and Waterways	23	0.0%
Other	239	0.2%
State (Undifferentiated)	34	0.0%
County (5.6%)		
Cass	1,486	0.9%
Crow Wing	7,371	4.7%
Federal (0.1%)		
Army Corps of Engineers	177	0.1%
Other	28	0.0%
Other Public (0.2%)		
City of Breezy Point	224	0.1%
City of Cross Lake	41	0.0%
City of Nisswa	82	0.1%
Private (88.9%)		
Private	129,596	82.1%
Private Conservancy	94	0.1%
Private Industrial	10,621	6.7%
Tribal (0.1%)		
Mille Lacs Reservation	106	0.1%
Grand Total	**157,829 acres**	

* note - 58,078 acres of open water are included in the table above

Natural Resource Management Units

Federal

None known

State

Minnesota Department of Natural Resources

- State Forests: Land O'Lakes (south central), Crow Wing (southwest and north central)
- Wildlife Management Areas: Upgaard, Twin Heron, Lowell, Mission Lake
- Aquatic Management Areas: Grassy Point, Upper Whitefish Lake, Dassett Island, Ivy Island, Pleasant Lake, Big Pine Lake, Bertha Moody, North Long Lake, Love Lake, Gilbert Lake
- Fish Management Areas: Stony Brook, Arrowhead Lake, Pine River, West Lower Hay Lake, Nelson Lake, Lower Hay Lake, Hay Creek, East Twin Lake, Loungee/Markee Lake, Hubert Lake, Whiskey Creek, White Sand Lake
- State Recreation Areas: Cuyuna Country

County

None known

Other

The Nature Conservancy
- Paul Bunyan Savanna

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (20%), Jack Pine Barrens and Openings (35%), Lakes (open water) (23%), Mixed White Pine and Red Pine (8%), and Wet Prairie (5%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-544, pine openings, pine barrens, scattered pine-19, scattering oak, scattering timber-58, thicket, brush, underbrush or only tree around-44, dry land, dry ridge, or island-1, lake, slough, pond-145, river, creek, bottom, or valley, ravine-17, marsh or swamp-84, meadow-8, and burned area-10.

Bearing trees include: Ash-9, Black Ash-2, Aspen-87, Balm-of-Gilead-1, Balsam Fir-4, Basswood-7, Birch-29, Elm-17, Ironwood-1, Maple-1, Sugar Maple-7, Oak-42, Bur Oak-3, Red Oak-11, Pine-237, Jack Pine-685, Red Pine-540, White Pine-123, Spruce-13, Tamarack-69, and Willow-1.

Current Land Cover

As referenced from table on page 6:

- Top five GAP land cover classes on all ownerships (219,914 total acres):
  Aspen/White Birch (28.5%), Water (25.3%), Red Oak (9.9%), Grassland (7.3%), and Jack Pine (5.7%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (7,741 total acres):
  Norway Pine (19.7 %), Aspen (16.7%), Oak (12.5%), Marsh (10.6%), and Permanent Water (8.7%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 6.8 times more Norway Pine, 5.0 times more Ash, 4.4 times more Marsh, 3.9 times more Lowland Brush, 2.8 times more Tamarack, 2.5 times more Lowland Brush, and 8.9 times less in the Upland Brush group.

Changes in Tree Species Composition

As referenced from table on page 6, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original

land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 9.7 times more Red Oak, 9.4 times more Paper Birch, 7.2 times more Aspen, 5.3 times more Bur Oak, 2.7 times more Basswood, 2.5 times more Ash, 3.0 times less Elm, 5.3 times less White Pine, 5.3 times less Tamarack, and 6.0 times less Red Pine in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 6. This is a priority LTA for Jack Pine, Norway Pine, and White Pine cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry-Mesic Pine/Oak. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

Upland Forests

FDn33, FDc12, **FDc23, FDc24, FDc25, FDc34,** FDs37, **MHc26, MHc36**

Wetland Forests

FFn57, FFn67, WFn53, WFn55, WFn64, WFs57, FPn72, FPn82, APn81

Non-Forested Communities

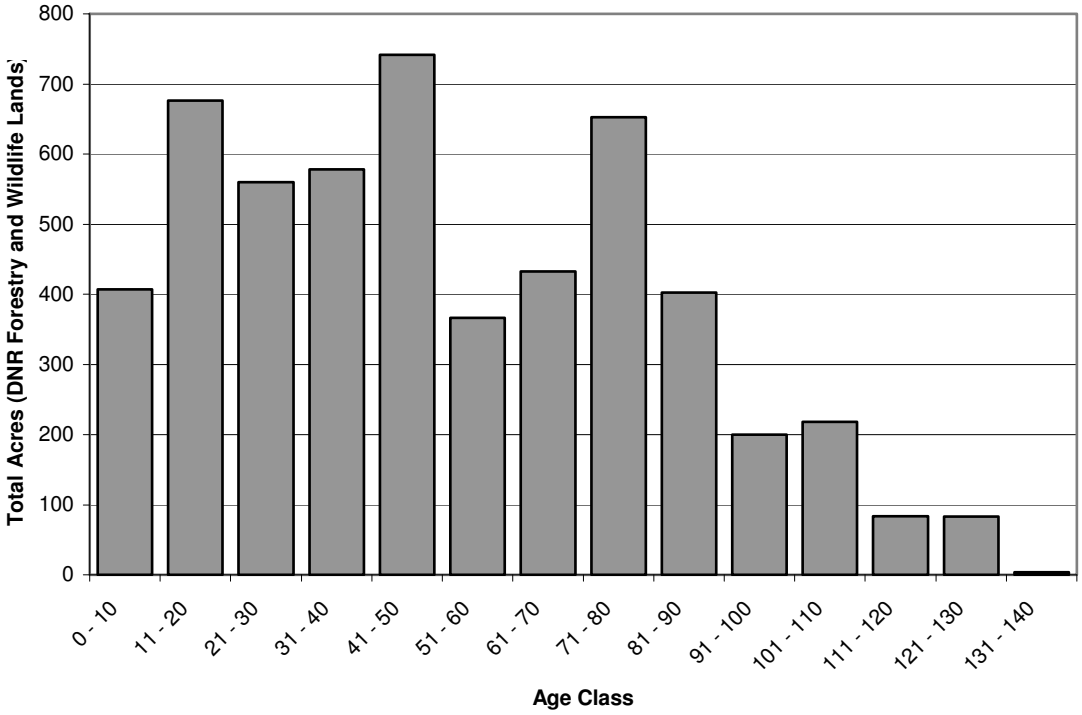
APn90, **APn91**, MRn83, **OPn81**, OPn92, WMn73, **WMn82,** FPn73

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains 7 old growth stands with associated OFMCs, 25 acres of EILC, and 2,743 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (5,404 total acres).



Patch Dynamics

This LTA contains 2 designated forest patches on state forestry and wildlife lands. They are upland conifer patches (Ideal and Mission).

Crow Wing Sand Plain (212Nc01)										
	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	62,606	28.5	Aspen	1,289	16.7	-1.4	Aspen	7.23	-7.9%
				Balm of Gilead	0	0.0		Balm of Gilead	0.00	
				Birch	264	3.4		Paper Birch	9.36	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	135	0.1	Northern Hardwoods[4]	131	1.7	27.5	Sugar Maple	-1.33	-10.8%
								Red Maple	0.00	
								Basswood	2.67	
								Yellow Birch	0.00	
	Bur/White Oak	1,760	0.8	Oak	967	12.5	1.2	Bur Oak	5.33	PMOP -10.9%
	Red Oak	21,760	9.9					Red Oak	9.73	
	Upland Deciduous	0	0.0	Offsite Oak	41	0.5				
	Group Sum	86,261	**39.2**	Group Sum	2,692	**34.8**	-1.1			
LOWLAND DECIDUOUS	Black Ash	1,323	0.6	Ash	232	3.0	5.0	Ash	2.50	-10.7%
	Lowland Deciduous	0	0.0	Lowland Hardwood	80	1.0		Elm	-3.00	
	Group Sum	1,323	**0.6**	Group Sum	312	**4.0**	6.7			
UPLAND CONIFERS	White Pine mix	903	0.4	White Pine	55	0.7	1.7	White Pine	-5.31	112.4%
	Red Pine	6,396	2.9	Norway Pine[5]	1,522	19.7	6.8	Red Pine	-5.98	17.1%
	Red/White Pine	0	0.0							
	Red/White Pine-Deciduous mix	0	0.0							
	Jack Pine	12,573	5.7	Jack Pine	327	4.2	-1.4	Jack Pine	-2.28	84.4%
	Jack Pine-Deciduous mix	0	0.0							
	White Spruce	111	0.1	White Spruce	249	3.2	63.8	White Spruce	0.00	2.0%
	Balsam Fir mix	114	0.1	Balsam Fir	0	0.0		Balsam Fir	0.00	-3.3%
	Spruce/Fir-Deciduous mix	0	0.0							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	3	0.0				0.0%
	Upland Northern White-Cedar	0	0.0							
	Upland Conifer	0	0.0							
	Group Sum	20,096	**9.1**	Group Sum	2,156	**27.8**	3.0			
LOWLAND CONIFERS	Lowland Black Spruce	1,081	0.5	Black Spruce, Lowland	94	1.2	2.5	Black Spruce	0.00	0.0%
	Tamarack	1,138	0.5	Tamarack	111	1.4	2.8	Tamarack	-5.33	5.4%
	Lowland Northern White-Cedar	63	0.0	Northern White Cedar	0	0.0		Cedar	0.00	5.3%
	Group Sum	2,282	**1.0**	Group Sum	205	**2.6**	2.5			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	40	0.5				
	Stagnant Tamarack	189	0.1	Stagnant Tamarack	0	0.0				
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	0	0.0				
	Stagnant Conifer	0	0.0							
	Group Sum	189	**0.1**	Group Sum	40	**0.5**	6.0			
SHRUBLAND	Upland Shrub	6,805	3.1	Upland Brush	12	0.1	-8.9			
				Cutover Area	15	0.2				
	Lowland Deciduous Shrub	3,435	1.6	Lowland Brush	477	6.2	3.9			
	Lowland Evergreen Shrub	0	0.0	Muskeg	0	0.0				
	Group Sum	10,240	**4.7**	Group Sum	504	**6.5**	1.4			
AQUATIC	Water	55,703	25.3	Permanent Water	676	8.7				
	Floating Aquatic	3,110	1.4	Non-Permanent Water	88	1.1				
	Broadleaf Sedge/Cattail	5,246	2.4	Marsh	820	10.6	4.4			
	Sedge Meadow	7,031	3.2	Lowland Grass	149	1.9	-1.7			
	Group Sum	71,088	**32.3**	Group Sum	1,734	**22.4**	-1.4			
CROP/GRASS	Cropland	10,496	4.8	Agricultural	0	0.0				
	Grassland	16,043	7.3	Upland Grass	5	0.1	-118.4			
	Prairie	0	0.0							
	Group Sum	26,539	**12.1**	Group Sum	5	**0.1**	-195.8			
DEVELOPED	Low Intensity Urban	1,067	0.5	Development[6]	59	0.8	-1.1			
	High Intensity Urban	828	0.4							
	Mixed Developed	0	0.0							
	Transportation	0	0.0	Roads	34	0.4				
	Group Sum	1,895	**0.9**	Group Sum	93	**1.2**	1.4			
	Other[7]	0	0.0	Other[8]	1	0.0				
	LTA TOTAL	219,914	100.0	LTA TOTAL	7,741	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

St. Croix Moraine (212Nc02)

OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A steep end moraine formed by the Rainy Lobe Glacier. Uplands occupy 76 percent, wetlands occupy 11 percent, and lakes occupy 13 percent of the LTA (MN DNR, 1998). Soil parent material is coarse loamy (sandy loam) and sandy till. Soils formed under forest vegetation.

The dominant upland pre-settlement vegetation was dry-mesic (white and red) pine, dry-mesic (white) pine/hardwood, wet-mesic hardwood-conifer, (Marschner, 1974). Lowland pre-settlement vegetation was conifer bog and swamp (Marschner, 1974).

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is private (45.7%), followed by state (34.4%), and county (19.9%). See table below. This LTA exists as two separate units within Cass, Crow Wing, Todd, and Morrison counties. The Crow Wing River bisects the LTA's north and south units and flows into the Mississippi River, which meanders south along the east side of the LTA's south unit. Over 41,400 acres of protected waters exist inside the LTA. Lakes within or adjacent to the LTA include Pine Mountain, Spider, Gull, Alexander, and Shamineau.

Federal, state, county, and private industrial lands are distributed throughout the LTA. The largest contiguous tracts of state and county lands occur in the LTA's north unit. Potlatch Corporation holdings are located in both the north and south units of the LTA. Municipalities include East Gull Lake, Lake Shore, and Nisswa.

Agency (%)	Acres	Percent
State (34.4%)		
Department of Military Affairs	31,623	17.7%
DNR, Ecological Resources	1,898	1.1%
DNR, Fish and Wildlife	4,579	2.6%
DNR, Forestry	22,635	12.7%
Other	258	0.1%
State (Undifferentiated)	498	0.3%
County (19.9%)		
Cass	35,463	19.8%
Todd	35	0.0%
Federal (0.0%)		
Other	44	0.0%
Private (45.7%)		
Private	75,965	42.5%
Private Conservancy	1,831	1.0%
Private Industrial	2,552	1.4%
Private Other	1,356	0.8%
Grand Total	**178,737 acres**	

* note - 28,291 acres of open water are included in the table above

Natural Resource Management Units

Federal

None known

State

Minnesota Department of Natural Resources

- State Forests: Pillsbury (nearly all), Foothills (south half)
- Wildlife Management Areas: Stanchfield Lake, Phillbrook, Meadow Brook, Kobliska, Ruff-Nik
- Aquatic Management Areas: Grassy Point
- Fish Management Areas: Pine Mountain Lake, Agate Lake, Stump Lake, Shamineau Lake
- Scientific and Natural Areas: Lake Alexander Woods
- State Parks: Crow Wing

County

None known

Other

The Nature Conservancy

- Lake Alexander Preserve

Minnesota National Guard

- Camp Ripley

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (31%), Conifer Bogs and Swamps (5%), Lakes (open water) (8%), Mixed Hardwood and Pine (Maple, White Pine, Basswood, etc) (15%), Mixed White Pine and Red Pine (24%), and Oak openings and barrens (5%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-555, pine openings, pine barrens, scattered pine-16, scattering oak, scattering timber-32, oak barrens or oak openings-4, thicket, brush, underbrush or only tree around-92, lake, slough, pond-115, river, creek, bottom, or valley, ravine-5, marsh or swamp-105, meadow-2, wet prairie or prairie-3, and burned area-24.

Bearing trees include: Ash-19, Black Ash-8, Aspen-301, Balsam Fir-23, Basswood-20, Birch-276, Yellow Birch-4, Elm-24, Ironwood-19, Maple-83, Sugar Maple-26, Oak-127, Bur Oak-10, Northern Pin Oak-4, Red Oak-155, Pine-278, Jack Pine-48, Red Pine-233, White Pine-228, Spruce-33, Tamarack-207, and Willow-2.

Current Land Cover

As referenced from table on page 6:

- Top five GAP land cover classes on all ownerships (209,260 total acres):
  Aspen/White Birch (49.1%), Water (11.1%), Red Oak (9.3%), Grassland (6.7%), and Upland Shrub (6.6%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (29,112 total acres):
  Aspen (40.6 %), Oak (21.5%), Marsh (6.6%), Norway Pine (6.1%), and Birch (4.9%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 5.3 times more Norway Pine, 3.0 times more Marsh, 2.2 times more Oak, 2.6 times less Lowland Grass, and 10.7 times less in the Upland Grass group.

Changes in Tree Species Composition

As referenced from table on page 6, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 15.7 times more Red Maple, 2.6 times more Aspen, 2.5 times more Bur Oak, 2.0 times more Red Oak, 2.0 times more Basswood, 2.5 times less Balsam Fir, 4.1 times less Red Pine, 7.7 times less Sugar Maple, 10.7 times less White Pine, and 10.8 times less Tamarack in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 6. This is a priority LTA for Norway Pine and White Pine cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry-Mesic Pine and Dry-Mesic Pine/Oak. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

Upland Forests

FDn33, FDc12, FDc23, FDc24, FDc25, **FDc34, FDs37, MHn35,** MHn44, **MHc26, MHc36**

Wetland Forests

FFn57, FFn67, WFn53, **WFn55, WFn64**, WFs57, FPn72, **FPn82**, FPs63, **APn81**

Non-Forested Communities

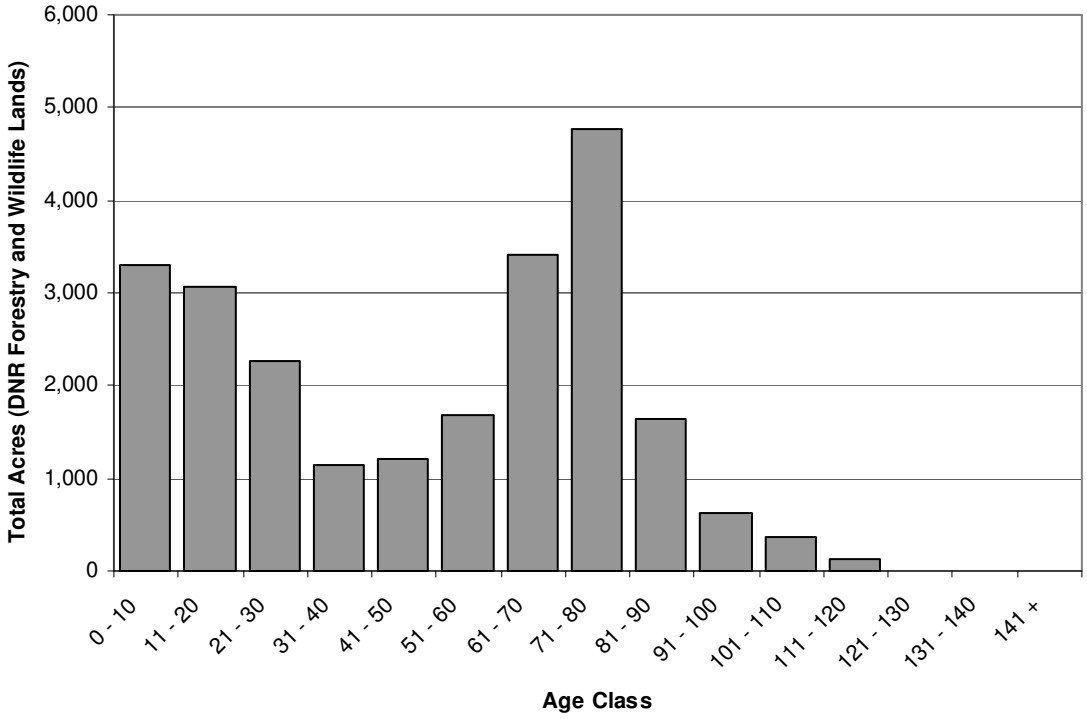
APn90, **APn91**, MRn83, **OPn81**, OPn92, WMn73, **WMn82**, FPn73

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains 6 old growth stands with associated OFMCs, 17 acres of EILC, and 9,907 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (23,619 total acres).



Patch Dynamics

This LTA contains 5 designated forest patches on state forestry and wildlife lands. They include 3 upland conifer patches (Rode, Hunter Lake, and Fairview), an upland hardwoods patch (Pillsbury), and a lowland hardwoods patch (Bull Moose Ash).

St. Croix Moraine (212Nc02)

	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	102,676	49.1	Aspen	11,815	40.6	-1.1	Aspen	2.58	-7.9%
				Balm of Gilead	0	0.0		Balm of Gilead	0.00	
				Birch	1,441	4.9		Paper Birch	1.38	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	262	0.1	Northern Hardwoods[4]	628	2.2	17.2	Sugar Maple	-7.67	-10.8%
								Red Maple	15.67	
								Basswood	2.00	
								Yellow Birch	0.00	
	Bur/White Oak	655	0.3	Oak	6,256	21.5	2.2	Bur Oak	2.50	PMOP -10.9%
	Red Oak	19,507	9.3					Red Oak	2.04	
	Upland Deciduous	0	0.0	Offsite Oak	136	0.5				
	Group Sum	123,099	**58.8**	Group Sum	20,275	**69.6**	1.2			
LOWLAND DECIDUOUS	Black Ash	1,999	1.0	Ash	406	1.4	1.5	Ash	1.08	-10.7%
	Lowland Deciduous	0	0.0	Lowland Hardwood	111	0.4		Elm	1.90	
	Group Sum	1,999	**1.0**	Group Sum	517	**1.8**	1.9			
UPLAND CONIFERS	White Pine mix	547	0.3	White Pine	324	1.1	4.3	White Pine	-10.67	112.4%
	Red Pine	2,387	1.1	Norway Pine[5]	1,764	6.1	5.3	Red Pine	-4.05	17.1%
	Red/White Pine	0	0.0							
	Red/White Pine-Deciduous mix	0	0.0							
	Jack Pine	1,724	0.8	Jack Pine	196	0.7	-1.2	Jack Pine	-1.35	84.4%
	Jack Pine-Deciduous mix	0	0.0							
	White Spruce	24	0.0	White Spruce	427	1.5	125.4	White Spruce	0.00	2.0%
	Balsam Fir mix	161	0.1	Balsam Fir	68	0.2	3.0	Balsam Fir	-2.50	-3.3%
	Spruce/Fir-Deciduous mix	0	0.0							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	0	0.0				0.0%
	Upland Northern White-Cedar	0	0.0							
	Upland Conifer	0	0.0							
	Group Sum	4,844	**2.3**	Group Sum	2,778	**9.5**	4.1			
LOWLAND CONIFERS	Lowland Black Spruce	461	0.2	Black Spruce, Lowland	6	0.0	-10.0	Black Spruce	0.00	0.0%
	Tamarack	711	0.3	Tamarack	37	0.1	-2.7	Tamarack	-10.75	5.4%
	Lowland Northern White-Cedar	95	0.0	Northern White Cedar	6	0.0	-2.2	Cedar	0.00	5.3%
	Group Sum	1,266	**0.6**	Group Sum	50	**0.2**	-3.6			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	0	0.0				
	Stagnant Tamarack	66	0.0	Stagnant Tamarack	0	0.0				
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	0	0.0				
	Stagnant Conifer	0	0.0							
	Group Sum	66	**0.0**	Group Sum	0	**0.0**				
SHRUBLAND	Upland Shrub	13,742	6.6	Upland Brush	14	0.0	-17.9			
				Cutover Area	93	0.3				
	Lowland Deciduous Shrub	4,279	2.0	Lowland Brush	591	2.0	-1.0			
	Lowland Evergreen Shrub	0	0.0	Muskeg	52	0.2				
	Group Sum	18,020	**8.6**	Group Sum	750	**2.6**	-3.3			
AQUATIC	Water	23,263	11.1	Permanent Water	1,089	3.7				
	Floating Aquatic	2,965	1.4	Non-Permanent Water	1,005	3.5				
	Broadleaf Sedge/Cattail	4,610	2.2	Marsh	1,921	6.6	3.0			
	Sedge Meadow	6,666	3.2	Lowland Grass	360	1.2	-2.6			
	Group Sum	37,503	**17.9**	Group Sum	4,375	**15.0**	-1.2			
CROP/GRASS	Cropland	8,366	4.0	Agricultural	36	0.1	-32.0			
	Grassland	13,967	6.7	Upland Grass	181	0.6	-10.7			
	Prairie	0	0.0							
	Group Sum	22,333	**10.7**	Group Sum	217	**0.7**	-14.3			
DEVELOPED	Low Intensity Urban	105	0.1	Development[6]	67	0.2	3.7			
	High Intensity Urban	24	0.0							
	Mixed Developed	0	0.0							
	Transportation	0	0.0	Roads	26	0.1				
	Group Sum	129	**0.1**	Group Sum	93	**0.3**	5.2			
	Other[7]	0	0.0	Other[8]	58	0.2				
	LTA TOTAL	209,260	100.0	LTA TOTAL	29,112	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Swan Creek Sand Plain (212Nc08)

OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A landscape dominated by level Rainy and Wadena Lobe outwash plains. Soil parent material is sand. The sand has been reworked by wind; dune features are common. Uplands occupy 64 percent, wetlands occupy 35 percent, and lakes occupy 1 percent of the LTA (MN DNR, 1998).

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is private (68.5%), followed by county (19.5%), and state (12.1%). See table below. This LTA is located in Cass and Wadena counties. The Crow Wing River courses through the LTA. Over 12,927 acres of protected waters exist inside the LTA. Lakes within or adjacent to the LTA include Dry, Sand, Farnham, and Radabaugh.

Federal, state, county, and private industrial lands are dispersed throughout the LTA. The majority of these forestlands occur in the LTA's northern two-thirds, including a large contiguous block of Potlatch Corporation land holdings. No municipalities occur inside the LTA, but the cities of Staples and Motley are the nearest communities.

Agency (%)	Acres	Percent
State (12.1%)		
DNR, Fish and Wildlife	449	1.2%
DNR, Forestry	4,210	10.9%
State (Undifferentiated)	19	0.0%
County (19.5%)		

Cass	6,347	16.4%
Wadena	1,209	3.1%
Private (68.5%)		
Private	20,813	53.7%
Private Industrial	5,738	14.8%
Grand Total	**38,785 acres**	

* note - 620 acres of open water are included in the table above

Natural Resource Management Units

Federal
None known

State
Minnesota Department of Natural Resources
- State Forests: Lyons (southeast/east portions)
- Wildlife Management Areas: Dry Sand

County
None known

Other
None known

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (14%), Conifer Bogs and Swamps (14%), Jack Pine Barrens and Openings (53%), River Bottom Forest (5%), Wet Prairie (15%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-71, scattering oak, scattering timber-7, thicket, brush, underbrush or only tree around-10, dry land, dry ridge, or island-1, lake, slough, pond-7, river, creek, bottom, or valley, ravine-13, marsh or swamp-70, meadow-5, and burned area-5.

Bearing trees include: Ash-3, Black Ash-1, Aspen-13, Basswood-1, Birch-2, Cottonwood-1, Elm-5, Maple-1, Oak-4, Red Oak-1, Pine-9, Jack Pine-208, Red Pine-55, White Pine-3, Spruce-5, Tamarack-77.

Current Land Cover

As referenced from table on page 5:

- Top five GAP land cover classes on all ownerships (39,929 total acres):
  Jack Pine (20.6%), Aspen/White Birch (16.5%), Grassland (12.5%), Lowland Deciduous Shrub (10.1%), and Sedge Meadow (9.7%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (4,854 total acres):
  Lowland Brush (30.7%), Aspen (18.3%), Jack Pine (15.8 %), Norway Pine (10.2%), and Lowland Grass (7.0%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 6.8 times more Norway Pine, 3.0 times more Upland Brush, 2.6 times more Ash, 1.3 times less Jack Pine, and 15.0 times less in the Upland Grass group.

Changes in Tree Species Composition

As referenced from table on page 5, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 7.0 times more Bur Oak, 6.0 times more Red Oak, 5.7 times more Aspen, 4.8 times more Paper Birch, and 2.4 times more Ash in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 5. This LTA was not identified as a priority LTA for cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry Pine. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

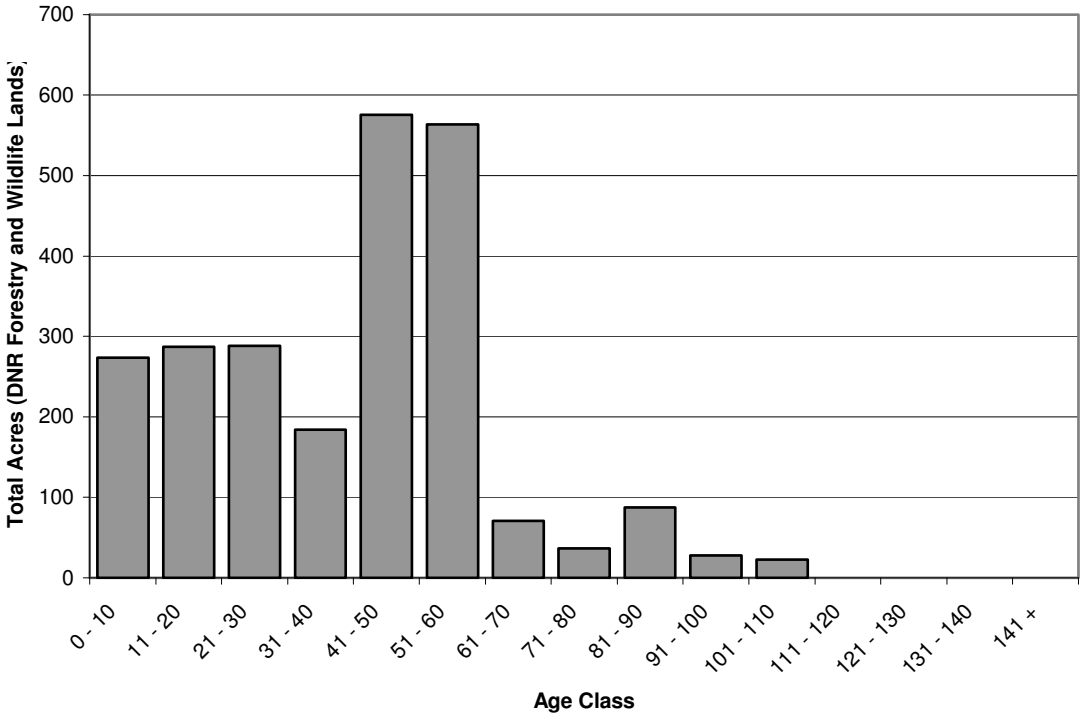
Upland Forests
FDc23, FDc24, FDc25, FDs37, MHc26
Wetland Forests
FFn57, FFn67, WFn55, FPn82, APn81
Non-Forested Communities
OPn81, WMn82

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains no old growth stands or associated OFMCs, 5 acres of EILC, and 557 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (2,417 total acres).



Patch Dynamics

This LTA contains 1 designated forest patches on state forestry and wildlife lands. It is an upland conifers patch (Cottrell).

Swan Creek Sand Plain (212Nc08)

	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	6,580	16.5	Aspen	887	18.3	1.1	Aspen	5.73	-7.9%
				Balm of Gilead	0	0.0		Balm of Gilead	0.00	
				Birch	0	0.0		Paper Birch	4.80	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	0	0.0	Northern Hardwoods[4]	0	0.0		Sugar Maple	0.00	-10.8%
								Red Maple	0.00	
								Basswood	0.00	
								Yellow Birch	0.00	
	Bur/White Oak	224	0.6	Oak	8	0.2	-11.3	Bur Oak	7.09	PMOP -10.9%
	Red Oak	542	1.4					Red Oak	6.00	
	Upland Deciduous	0	0.0	Offsite Oak	44	0.9				
	Group Sum	7,345	**18.4**	Group Sum	939	**19.4**	1.1			
LOWLAND DECIDUOUS	Black Ash	345	0.9	Ash	109	2.2	2.6	Ash	2.40	-10.7%
	Lowland Deciduous	0	0.0	Lowland Hardwood	33	0.7		Elm	1.46	
	Group Sum	345	**0.9**	Group Sum	142	**2.9**	3.4			
UPLAND CONIFERS	White Pine mix	83	0.2	White Pine	0	0.0		White Pine	0.00	112.4%
	Red Pine	593	1.5	Norway Pine[5]	493	10.2	6.8	Red Pine	1.16	17.1%
	Red/White Pine	0	0.0							
	Red/White Pine-Deciduous mix	0	0.0							
	Jack Pine	8,214	20.6	Jack Pine	765	15.8	-1.3	Jack Pine	-1.11	84.4%
	Jack Pine-Deciduous mix	0	0.0							
	White Spruce	6	0.0	White Spruce	0	0.0		White Spruce	0.00	2.0%
	Balsam Fir mix	101	0.3	Balsam Fir	0	0.0		Balsam Fir	0.00	-3.3%
	Spruce/Fir-Deciduous mix	0	0.0							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	0	0.0				0.0%
	Upland Northern White-Cedar	0	0.0							
	Upland Conifer	0	0.0							
	Group Sum	8,997	**22.5**	Group Sum	1,258	**25.9**	1.2			
LOWLAND CONIFERS	Lowland Black Spruce	217	0.5	Black Spruce, Lowland	9	0.2	-2.9	Black Spruce	0.00	0.0%
	Tamarack	518	1.3	Tamarack	69	1.4	1.1	Tamarack	0.00	5.4%
	Lowland Northern White-Cedar	32	0.1	Northern White Cedar	0	0.0		Cedar	0.00	5.3%
	Group Sum	766	**1.9**	Group Sum	78	**1.6**	-1.2			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	0	0.0				
	Stagnant Tamarack	24	0.1	Stagnant Tamarack	0	0.0				
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	0	0.0				
	Stagnant Conifer	0	0.0							
	Group Sum	24	**0.1**	Group Sum	0	**0.0**				
SHRUBLAND	Upland Shrub	2,444	6.1	Upland Brush	2	0.0	-1.7			
				Cutover Area	176	3.6				
	Lowland Deciduous Shrub	4,033	10.1	Lowland Brush	1,489	30.7	3.0			
	Lowland Evergreen Shrub	0	0.0	Muskeg	0	0.0				
	Group Sum	6,478	**16.2**	Group Sum	1,668	**34.4**	2.1			
AQUATIC	Water	217	0.5	Permanent Water	76	1.6				
	Floating Aquatic	225	0.6	Non-Permanent Water	41	0.8				
	Broadleaf Sedge/Cattail	3,084	7.7	Marsh	273	5.6	-1.4			
	Sedge Meadow	3,891	9.7	Lowland Grass	339	7.0	-1.4			
	Group Sum	7,417	**18.6**	Group Sum	729	**15.0**	-1.2			
CROP/GRASS	Cropland	3,581	9.0	Agricultural	0	0.0				
	Grassland	4,976	12.5	Upland Grass	40	0.8	-15.0			
	Prairie	0	0.0							
	Group Sum	8,557	**21.4**	Group Sum	40	**0.8**	-25.8			
DEVELOPED	Low Intensity Urban	0	0.0	Development[6]	0	0.0				
	High Intensity Urban	0	0.0							
	Mixed Developed	0	0.0							
	Transportation	0	0.0	Roads	0	0.0				
	Group Sum	0	**0.0**	Group Sum	0	**0.0**				
	Other[7]	0	0.0	Other[8]	0	0.0				
	LTA TOTAL	39,929	100.0	LTA TOTAL	4,854	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Nimrod Drumlin Plain (212Nc10)

OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A landscape dominated by level Rainy and Wadena Lobe outwash plains. Long narrow ridges (drumlins) of till material are very common. Uplands occupy 64 percent, wetlands occupy 36 percent, and lakes occupy less than 1 percent of the LTA (MN DNR, 1998).

The majority of the mineral soils has sand over sandy loam textures and sandy loam over sand or gravel textures. They formed under forest vegetation. Hardpans are common in the subsoil. Uplands in the western third of the LTA have sandy soils with features formed under prairie and forest vegetation. Long narrow peatlands are very common. The majority of the upland pre-settlement vegetation was dry pine with minor amounts of lowland (boreal) hardwood-conifer (Shadis, 1999 and Marschner, 1974). The lowland presettlement vegetation was conifer bog and swamp (26 percent) and wet prairie (25 percent) (Marschner, 1974).

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is private (74.5%), followed by county (13.4%), and state (12.1%). See table below. This LTA is located in Cass, Hubbard, and Wadena counties. The Crow Wing River flows through the LTA. Over 46,790 acres of protected waters exist inside the LTA.

Federal, state, county, and private industrial lands are scattered throughout the LTA. The majority of state lands are concentrated in the LTA's west half, whereas most county lands are distributed throughout the east half. Numerous holdings of Potlatch

Corporation lands are evenly distributed in the LTA. Nimrod is the LTA's only municipality.

Agency (%)	Acres	Percent
State (12.1%)		
DNR, Fish and Wildlife	2,732	2.0%
DNR, Forestry	13,775	9.9%
Other	13	0.0%
State (Undifferentiated)	227	0.2%
County (13.4%)		
Cass	12,581	9.1%
Hubbard	5,247	3.8%
Wadena	797	0.6%
Private (74.5%)		
Private	94,186	67.8%
Private Industrial	7,079	5.1%
Private Other	2,206	1.6%
Grand Total	**138,843 acres**	

* note - 1,034 acres of open water are included in the table above

Natural Resource Management Units

Federal

None known

State

Minnesota Department of Natural Resources

- State Forests: Huntersville (east/southeast portions), Badoura (south portion), Lyons (north two-thirds), Foothills (southwest corner)
- Wildlife Management Areas: North Germany, Strike, Huntersville, Burgen Lake Prairie

County

None known

Other

None known

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (23%), Conifer Bogs and Swamps (35 %), Jack Pine Barrens and Openings (22%), Mixed White Pine and Red Pine (5%), and Wet Prairie (10%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-289,

pine openings, pine barrens, scattered pine-3, scattering oak, scattering timber-15, thicket, brush, underbrush or only tree around-9, dry land, dry ridge, or island-1, lake, slough, pond-4, river, creek, bottom, or valley, ravine-22, marsh or swamp-285, meadow-9, wet prairie or prairie-3, windthrow, windfall-13, and burned area-40.

Bearing trees include: Ash-8, Black Ash-14, Aspen-103, Balm-of-Gilead-2, Balsam Fir-25, Basswood-12, Birch-38, Yellow Birch-1, Cottonwood-1, Elm-14, Ironwood-1, Maple-2, Oak-39 Pine-70, Jack Pine-372, Red Pine-192, White Pine-47, Spruce-51, Tamarack-477, and Willow-2.

Current Land Cover

As referenced from table on page 6:

- Top five GAP land cover classes on all ownerships (140,704 total acres):
  Aspen/White Birch (17.6%), Cropland (17.0%), Sedge Meadow (16.7%), Grassland (12.8%), and Lowland Deciduous Shrub (11.6%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (16,737 total acres):
  Aspen (19.1 %), Marsh (18.0%), Jack Pine (17.1%), Lowland Brush (15.5%), and Lowland Grass (8.7%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 6.7 times more Marsh, 4.9 times more Norway Pine, 1.7 times more Jack Pine, 1.9 times less Lowland Grass, and 3.3 times less in the Upland Grass group.

Changes in Tree Species Composition

As referenced from table on page 6, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 18.0 times more Balm of Gilead, 4.8 times more Aspen, 3.4 times more Elm, 1.9 times more Paper Birch, 2.0 times less Red Pine, and 39.3 times less Tamarack in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 6. This is a priority LTA for Norway Pine cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry Pine. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

Upland Forests

FDn12, FDn33, FDc12, FDc23, FDc24, FDc34, MHn44, MHn47, MHc26, MHc36.

Wetland Forests

FFn57, FFn67, WFn53, WFn55, WFn64, FPn63, FPn82, APn81.

Non-Forested Communities

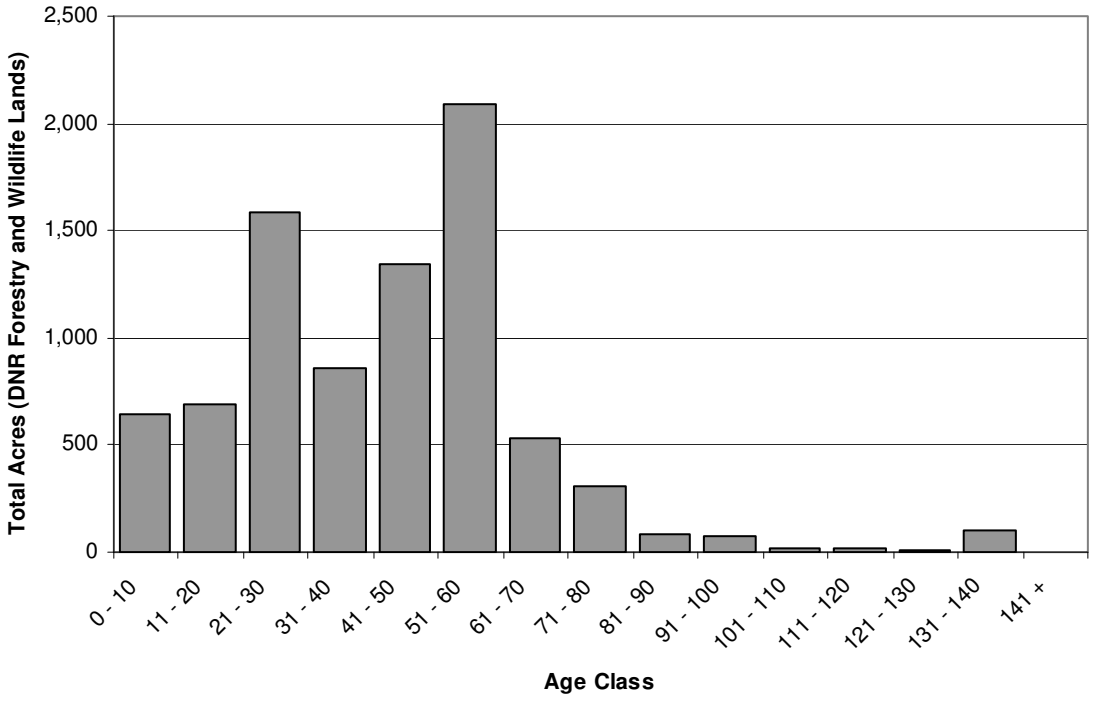
APn91, OPn81, OPn91, OPn92, WMn73, WMn82, FPn73.

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains 1 old growth stands with associated OFMC, 26 acres of EILC, and 1,836 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (8,348 total acres).



Patch Dynamics

This LTA contains 6 designated forest patches on state forestry and wildlife lands. They include 4 upland conifer patches (Bunny Hill, Howser's Corner, Mud Lake Duck Camp, and Lyons Shelter) and 2 lowland hardwood patches (Ansel Old Growth and Long Ash Corridor).

Nimrod Drumlin Plain (212Nc10)										
	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	24,726	17.6	Aspen	3,204	19.1	1.1	Aspen	4.76	-7.9%
				Balm of Gilead	107	0.6		Balm of Gilead	18.00	
				Birch	37	0.2		Paper Birch	1.88	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	37	0.0	Northern Hardwoods[4]	0	0.0		Sugar Maple	0.00	-10.8%
								Red Maple	0.00	
								Basswood	0.00	
								Yellow Birch	0.00	
	Bur/White Oak	1,172	0.8	Oak	146	0.9	-2.6	Bur Oak	1.04	PMOP -10.9%
	Red Oak	1,971	1.4					Red Oak	0.00	
	Upland Deciduous	0	0.0	Offsite Oak	8	0.0				
	Group Sum	27,907	**19.8**	Group Sum	3,502	**20.9**	1.1			
LOWLAND DECIDUOUS	Black Ash	1,565	1.1	Ash	313	1.9	1.7	Ash	1.14	-10.7%
	Lowland Deciduous	0	0.0	Lowland Hardwood	12	0.1		Elm	3.38	
	Group Sum	1,565	**1.1**	Group Sum	325	**1.9**	1.7			
UPLAND CONIFERS	White Pine mix	192	0.1	White Pine	10	0.1	-2.2	White Pine	0.00	112.4%
	Red Pine	1,724	1.2	Norway Pine[5]	1,010	6.0	4.9	Red Pine	-2.03	17.1%
	Red/White Pine	0	0.0							
	Red/White Pine-Deciduous mix	0	0.0							
	Jack Pine	13,805	9.8	Jack Pine	2,866	17.1	1.7	Jack Pine	1.82	84.4%
	Jack Pine-Deciduous mix	0	0.0							
	White Spruce	16	0.0	White Spruce	485	2.9	247.8	White Spruce	0.00	2.0%
	Balsam Fir mix	90	0.1	Balsam Fir	8	0.1	-1.3	Balsam Fir	0.00	-3.3%
	Spruce/Fir-Deciduous mix	0	0.0							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	3	0.0				0.0%
	Upland Northern White-Cedar	0	0.0							
	Upland Conifer	0	0.0							
	Group Sum	15,828	**11.2**	Group Sum	4,383	**26.2**	2.3			
LOWLAND CONIFERS	Lowland Black Spruce	48	0.0	Black Spruce, Lowland	45	0.3	7.9	Black Spruce	0.00	0.0%
	Tamarack	1,196	0.9	Tamarack	92	0.6	-1.5	Tamarack	-39.25	5.4%
	Lowland Northern White-Cedar	14	0.0	Northern White Cedar	0	0.0		Cedar	0.00	5.3%
	Group Sum	1,258	**0.9**	Group Sum	137	**0.8**	-1.1			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	0	0.0				
	Stagnant Tamarack	88	0.1	Stagnant Tamarack	0	0.0				
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	0	0.0				
	Stagnant Conifer	0	0.0							
	Group Sum	88	**0.1**	Group Sum	0	**0.0**				
SHRUBLAND	Upland Shrub	7,629	5.4	Upland Brush	271	1.6	-2.0			
				Cutover Area	192	1.1				
	Lowland Deciduous Shrub	16,348	11.6	Lowland Brush	2,589	15.5	1.3			
	Lowland Evergreen Shrub	0	0.0	Muskeg	0	0.0				
	Group Sum	23,977	**17.0**	Group Sum	3,053	**18.2**	1.1			
AQUATIC	Water	798	0.6	Permanent Water	185	1.1				
	Floating Aquatic	38	0.0	Non-Permanent Water	9	0.1				
	Broadleaf Sedge/Cattail	3,794	2.7	Marsh	3,016	18.0	6.7			
	Sedge Meadow	23,463	16.7	Lowland Grass	1,457	8.7	-1.9			
	Group Sum	28,094	**20.0**	Group Sum	4,667	**27.9**	1.4			
CROP/GRASS	Cropland	23,981	17.0	Agricultural	6	0.0	-495.3			
	Grassland	17,999	12.8	Upland Grass	658	3.9	-3.3			
	Prairie	0	0.0							
	Group Sum	41,980	**29.8**	Group Sum	664	**4.0**	-7.5			
DEVELOPED	Low Intensity Urban	7	0.0	Development[6]	0	0.0				
	High Intensity Urban	1	0.0							
	Mixed Developed	0	0.0							
	Transportation	0	0.0	Roads	6	0.0				
	Group Sum	8	**0.0**	Group Sum	6	**0.0**	6.6			
	Other[7]	0	0.0	Other[8]	0	0.0				
	LTA TOTAL	140,704	100.0	LTA TOTAL	16,737	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Park Rapids Sand Plain (212Nc11)

OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A landscape dominated by level to rolling outwash plains formed by the Wadena Lobe Glacier. Channels formed by post-glacial melt water are common. Uplands occupy 82 percent, wetlands occupy 11 percent, and lakes occupy 7 percent of the LTA (MN DNR,1998). The majority of the mineral soils have sandy loam (52 percent) or sand (40 percent) textures. Fifty-five percent of the upland soils formed under a combination of prairie and forest vegetation while 43 percent formed under forest vegetation.

The majority of the upland pre-settlement vegetation was dry pine forest (53 percent) and lowland (boreal) hardwood-conifer (22 percent) (Shadis, 1999 and Marschner, 1974). The majority of lowland pre-settlement vegetation was conifer bog and swamp (Marschner, 1974).

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is private (87.5%), followed by state (6.9%), and county (4.9%). See table below. This LTA is located in Hubbard, Cass, Becker, and Wadena counties. Over 59,587 acres of protected waters exist inside the LTA. Lakes within or adjacent to the LTA include Fish Hook, Crow Wing chain of lakes, Belle Taine, Big Sand, Shell, and Straight.

Small portions of the LTA are inside White Earth Indian Reservation and Chippewa National Forest. Federal, state, county, and private industrial lands are widely scattered throughout the LTA. The majority of public lands include both state-owned and county

administered lands. Large blocks of state land exist in the southeast portion of the LTA, while the largest contiguous blocks of county lands occur in the east central and northwest portions. Most Potlatch Corporation lands are distributed within the south two-thirds of the LTA. Municipalities include Akeley, Menahga, Park Rapids, and Nevis.

Agency (%)	Acres	Percent
State (6.9%)		
DNR, Ecological Resources	200	0.1%
DNR, Fish and Wildlife	4,396	1.3%
DNR, Forestry	19,161	5.6%
County (4.9%)		
Becker	4,230	1.2%
Cass	2,137	0.6%
Hubbard	10,271	3.0%
Wadena	274	0.1%
Federal (0.3%)		
Bureau of Indian Affairs	429	0.1%
Other	405	0.1%
U.S. Forest Service	162	0.0%
White Earth Reservation	86	0.0%
Other Public (0.3%)		
City of Nevis	42	0.0%
City of Park Rapids	1,026	0.3%
School District	123	0.0%
Private (87.5%)		
Private	260,497	75.6%
Private Industrial	41,129	11.9%
Private Other	183	0.1%
Grand Total	**344,751 acres**	

* note - 26,939 acres of open water are included in the table above

Natural Resource Management Units

Federal

United States Forest Service

- National Forests: Chippewa (southwest corner)

State

Minnesota Department of Natural Resources

- State Forests: Paul Bunyan (southwest and southeast portions), Huntersville (southeast portion), Two Inlets (northwest, west central, and southwest) Badoura (south portion), Smokey Hills (north boundary), White Earth (extreme south), Foothills (southwest portion)
- Wildlife Management Areas: Kitten Creek, Yeager Lake, Lowe, Red Eye, Menahga, Huntersville, Burgen Lake Prairie, Crow Wing Chain
- Aquatic Management Areas: Sixth Crow Wing Lake, Straight River/Fish River, Shell Lake, Bog Lake

- Fish Management Areas: Park Rapids Hatchery, Fifth Crow Wing Lake, Fourth Crow Wing Lake, Straight River, Big Stony Lake, First Crow Wing Lake, Straight Lake, Cat Creek, Rogers Lake
- Scientific and Natural Areas: Greenwater Lake

County

None known

Other

White Earth Indian Reservation

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (24%), Conifer Bogs and Swamps (7 %), Jack Pine Barrens and Openings (54%), Lakes (open water) (5%), and Wet Prairie (6 %).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber- 903, pine grove or grove-1, pine openings, pine barrens, scattered pine-51, scattering oak, scattering timber-200, oak barrens or oak openings-4, thicket, brush, underbrush or only tree around-44, lake, slough, pond-136, river, creek, bottom, or valley, ravine-24, marsh or swamp-161, meadow-3, wet prairie or prairie-50, windthrow, windfall-9, and burned area-126.

Bearing trees include: Ash-9, Black Ash-6, Aspen-208, Balm-of-Gilead-1, Balsam Fir-11, Basswood-2, Birch-58, Elm-14, Maple-1, Oak-67, Bur Oak-40, Red Oak-16, Pine-60, Jack Pine-2371, Red Pine-796, White Pine-46, Spruce-50, and Tamarack-205.

Current Land Cover

As referenced from table on page 6:

- Top five GAP land cover classes on all ownerships (377,018 total acres):
  Cropland (32.1%), Aspen/White Birch (18.9%), Jack Pine (14.1%), Water (7.2%), and Grassland (7.1%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (24,056 total acres):
  Norway Pine (24.5 %), Aspen (20.5%), Jack Pine (13.6%), Lowland Brush (7.2%), and Marsh (6.9%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:

DNR land has 6.6 times more Norway Pine, 5.7 times more Marsh, 3.3 times more Tamarack, 2.1 times more Lowland Brush, 1.0 times less Jack Pine, and 3.2 times less in the Upland Grass group.

Changes in Tree Species Composition

As referenced from table on page 6, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 10.0 times more Red Oak, 6.3 times more Balsam Fir, 5.7 times more Ash, 5.5 times more Aspen, 3.8 times more Paper Birch, 2.7 times more Bur Oak, 2.0 times less White Spruce, 2.7 times less Tamarack, and 3.3 times less White Pine in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 6. This is a priority LTA for Jack Pine cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry Pine. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

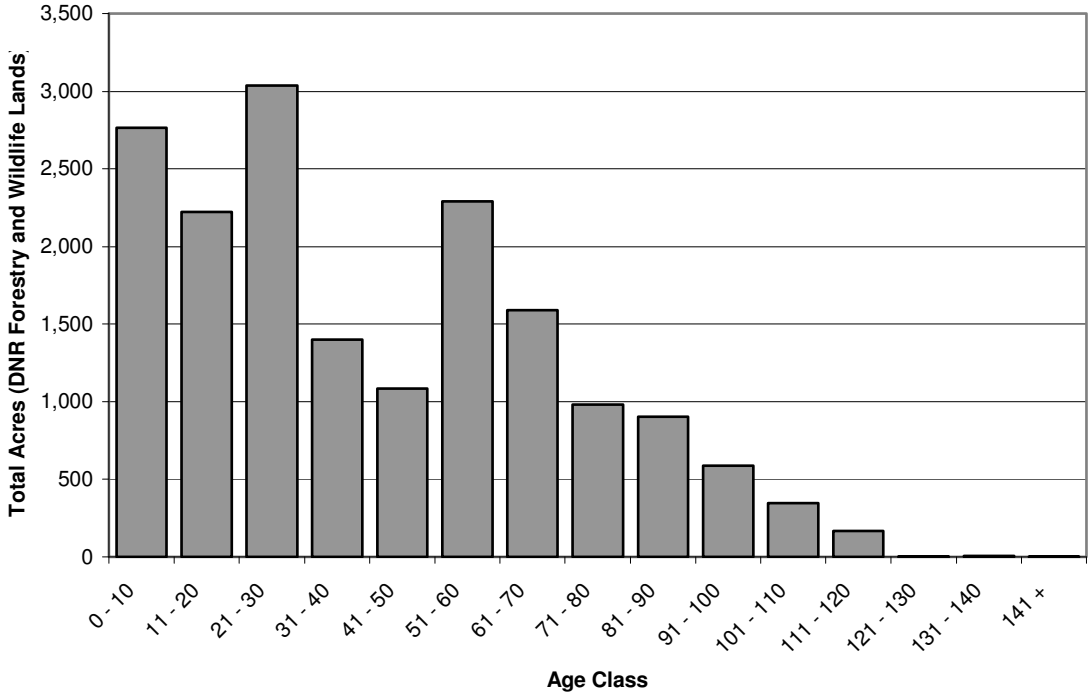
Upland Forests
FDn12, FDn33, **FDc12, FDc23, FDc24, FDc34**, MHn44, MHn47, MHc26, MHc36, MHc37
Wetland Forests
FFn57, FFn67, WFn53, WFn55, WFn64, FPn63, FPn82, APn81
Non-Forested Communities
APn91, OPn81, OPn91, OPn92, WMn73, WMn82, FPn73

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains 5 old growth stands with associated OFMCs, 40 acres of EILC, and 8,242 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (17,403 total acres).



Patch Dynamics

This LTA contains 13 designated forest patches on state forestry and wildlife lands. They include 11 upland conifer patches (Finn Lake, Mary Brown West, Howser's Corner, McKinley, Badoura Patch, Boot Lake, Mary Brown East, Shell City, Mantrap Lake, Crow Wing Pine, and Wallingford Creek Pine) and 2 lowland conifer patches (Crow Wing Tamarack and Wallingford Creek Tamarack).

Park Rapids Sand Plain (212Nc11)										
	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	71,122	18.9	Aspen	4,938	20.5	1.2	Aspen	5.52	-7.9%
				Balm of Gilead	0	0.0		Balm of Gilead	0.00	
				Birch	355	1.5		Paper Birch	3.79	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	371	0.1	Northern Hardwoods[4]	98	0.4	4.1	Sugar Maple	0.00	-10.8%
								Red Maple	0.00	
								Basswood	0.00	
								Yellow Birch	0.00	
	Bur/White Oak	4,094	1.1	Oak	605	2.5	-1.1	Bur Oak	2.70	PMOP -10.9%
	Red Oak	6,128	1.6					Red Oak	10.00	
	Upland Deciduous	0	0.0	Offsite Oak	131	0.5				
	Group Sum	81,715	**21.7**	Group Sum	6,127	**25.5**	1.2			
LOWLAND DECIDUOUS	Black Ash	1,957	0.5	Ash	357	1.5	2.9	Ash	5.67	-10.7%
	Lowland Deciduous	0	0.0	Lowland Hardwood	38	0.2		Elm	1.67	
	Group Sum	1,957	**0.5**	Group Sum	395	**1.6**	3.2			
UPLAND CONIFERS	White Pine mix	1,456	0.4	White Pine	65	0.3	-1.4	White Pine	-3.33	112.4%
	Red Pine	13,883	3.7	Norway Pine[5]	5,884	24.5	6.6	Red Pine	-1.61	17.1%
	Red/White Pine	0	0.0							
	Red/White Pine-Deciduous mix	0	0.0							
	Jack Pine	53,266	14.1	Jack Pine	3,280	13.6	-1.0	Jack Pine	-1.63	84.4%
	Jack Pine-Deciduous mix	0	0.0							
	White Spruce	228	0.1	White Spruce	407	1.7	28.0	White Spruce	-2.00	2.0%
	Balsam Fir mix	646	0.2	Balsam Fir	198	0.8	4.8	Balsam Fir	6.33	-3.3%
	Spruce/Fir-Deciduous mix	0	0.0							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	33	0.1				0.0%
	Upland Northern White-Cedar	0	0.0							
	Upland Conifer	0	0.0							
	Group Sum	69,478	**18.4**	Group Sum	9,867	**41.0**	2.2			
LOWLAND CONIFERS	Lowland Black Spruce	817	0.2	Black Spruce, Lowland	256	1.1	4.9	Black Spruce	1.00	0.0%
	Tamarack	3,380	0.9	Tamarack	720	3.0	3.3	Tamarack	-2.65	5.4%
	Lowland Northern White-Cedar	90	0.0	Northern White Cedar	0	0.0		Cedar	0.00	5.3%
	Group Sum	4,287	**1.1**	Group Sum	977	**4.1**	3.6			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	10	0.0				
	Stagnant Tamarack	359	0.1	Stagnant Tamarack	23	0.1	-1.0			
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	0	0.0				
	Stagnant Conifer	0	0.0							
	Group Sum	359	**0.1**	Group Sum	33	**0.1**	1.4			
SHRUBLAND	Upland Shrub	10,353	2.7	Upland Brush	72	0.3	1.4			
				Cutover Area	873	3.6				
	Lowland Deciduous Shrub	12,820	3.4	Lowland Brush	1,742	7.2	2.1			
	Lowland Evergreen Shrub	0	0.0	Muskeg	0	0.0				
	Group Sum	23,173	**6.1**	Group Sum	2,687	**11.2**	1.8			
AQUATIC	Water	27,188	7.2	Permanent Water	540	2.2				
	Floating Aquatic	25	0.0	Non-Permanent Water	113	0.5				
	Broadleaf Sedge/Cattail	4,511	1.2	Marsh	1,654	6.9	5.7			
	Sedge Meadow	15,428	4.1	Lowland Grass	393	1.6	-2.5			
	Group Sum	47,152	**12.5**	Group Sum	2,700	**11.2**	-1.1			
CROP/GRASS	Cropland	121,076	32.1	Agricultural	423	1.8	-18.3			
	Grassland	26,902	7.1	Upland Grass	530	2.2	-3.2			
	Prairie	0	0.0							
	Group Sum	147,978	**39.2**	Group Sum	953	**4.0**	-9.9			
DEVELOPED	Low Intensity Urban	715	0.2	Development[6]	252	1.0	4.5			
	High Intensity Urban	164	0.0							
	Mixed Developed	0	0.0							
	Transportation	0	0.0	Roads	47	0.2				
	Group Sum	878	**0.2**	Group Sum	299	**1.2**	5.3			
	Other[7]	41	0.0	Other[8]	18	0.1				
	LTA TOTAL	377,018	100.0	LTA TOTAL	24,056	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Spring Brook Till Plain (212Nc13)

OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A landscape dominated by a rolling till plains with small areas of hilly-pitted outwash, eskers, and melt water channels. The Rainy Lobe Glacier formed all landforms. Uplands occupy 68 percent, wetlands occupy 21 percent, and lakes occupy 11 percent of the LTA (MN DNR, 1998). The majority (63 percent) of the LTA has mineral soils with sandy loam texture. Twenty-four percent of the LTA has mineral soils with loam or clay-loam textures, while 11 percent are sandy. All upland soils formed under forest vegetation (NRCS, 1994). Lakes occupy 6 percent of the area.

The majority of the upland presettlement vegetation was mixed white pine-red pine (36 percent) and lowland (boreal) hardwood-conifer (13 percent) (Shadis, 1999 and Marschner, 1974). The majority of lowland pre-settlement vegetation was conifer bog and swamp (Marschner, 1974).

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is county (58.9%), followed by private (30.6%), state (7.3%), and federal (2.0%). See table below. This LTA is located in Crow Wing and Cass counties. Over 29,116 acres of protected waters exist inside the LTA. Lakes within or adjacent to the LTA include Little Boy, Laura, Lower Trelipe, Inguadona, West Fox, and East Fox.

The majority of land within the LTA is publicly owned. Parts of the LTA are inside Leech Lake Indian Reservation and Chippewa National Forest. USFS lands are found in

the LTA's northern-most portion. Scattered blocks of state lands occur throughout the LTA, while county lands make up the bulk of the LTA's ownership. Potlatch Corporation land holdings are located in the south two-thirds of the LTA. Municipalities include Emily, Fifty Lakes, and Manhattan Beach.

Agency (%)	Acres	Percent
State (7.3%)		
DNR, Fish and Wildlife	834	0.8%
DNR, Forestry	6,740	6.4%
DNR, Trails and Waterways	32	0.0%
County (58.9%)		
Cass	40,006	38.2%
Crow Wing	19,970	19.1%
Hubbard	1,737	1.7%
Federal (2.0%)		
Other	98	0.1%
U.S. Forest Service	1,985	1.9%
Other Public (1.2%)		
Private	52	0.0%
University of Minnesota	1,198	1.1%
Private (30.6%)		
Private	28,811	27.5%
Private Industrial	3,231	3.1%
Grand Total	**104,694 acres**	

* note - 10,875 acres of open water are included in the table above

Natural Resource Management Units

Federal

United States Forest Service

- National Forests: Chippewa (southeastern fringe)

State

Minnesota Department of Natural Resources

- State Forests: Land O'Lakes (west portions)
- Wildlife Management Areas: Draggett Brook
- Aquatic Management Areas: Snowshoe Lake

County

None known

Other

Leech Lake Indian Reservation

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (13%), Conifer Bogs and Swamps (16%), Lakes (open water) (6%), Mixed Hardwood and Pine (Maple, White Pine, Basswood, etc) (19%), and Mixed White Pine and Red Pine (36%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-426, pine grove or grove-1, pine openings, pine barrens, scattered pine-1, scattering oak, scattering timber-4, thicket, brush, underbrush or only tree around-6, dry land, dry ridge, or island-2, lake, slough, pond-44, river, creek, bottom, or valley, ravine-1, marsh or swamp-81, windthrow, windfall-11, and burned area-13.

Bearing trees include: Ash-25, Black Ash-6, Aspen-240, Balsam Fir-28, Basswood-18, Birch-203, Yellow Birch-7, Cedar-49, Elm-11, Ironwood-7, Maple-69, Sugar Maple-15, Oak-32, Bur Oak-13, Red Oak-23, Pine-10, Jack Pine-41, Red Pine-121, White Pine-198, Spruce-57, Tamarack-175, and Willow-1.

Current Land Cover

As referenced from table on page 6:

- Top five GAP land cover classes on all ownerships (120,699 total acres):
  Aspen/White Birch (46.3%), Red Oak (8.9%), Sedge Meadow (7.6%), Water (7.0%), and Upland Shrub (6.4%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (7,389 total acres):
  Aspen (49.9 %), Marsh (12.1%), Norway Pine (8.0%), Lowland Brush (4.6%), and Northern White Cedar (4.2%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 14.1 times more Balsam Fir, 4.9 times more Marsh, 4.6 times more Norway Pine, 3.3 times less Oak, and 5.5 times less in the Lowland Grass group.

Changes in Tree Species Composition

As referenced from table on page 6, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 3.0 times more Elm, 2.7 times more Bur Oak, 2.5 times more Aspen, 2.1 times more Red Oak, 2.3 times less Black Spruce, 2.4 times less Sugar Maple, 2.8 times less Red Pine, 2.9 times less Jack Pine, 5.8 times less White Spruce, 7.2 times less Tamarack, and 24.3 times less White Pine in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 6. This is a priority LTA for Norway Pine and White Pine cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry-Mesic Pine. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

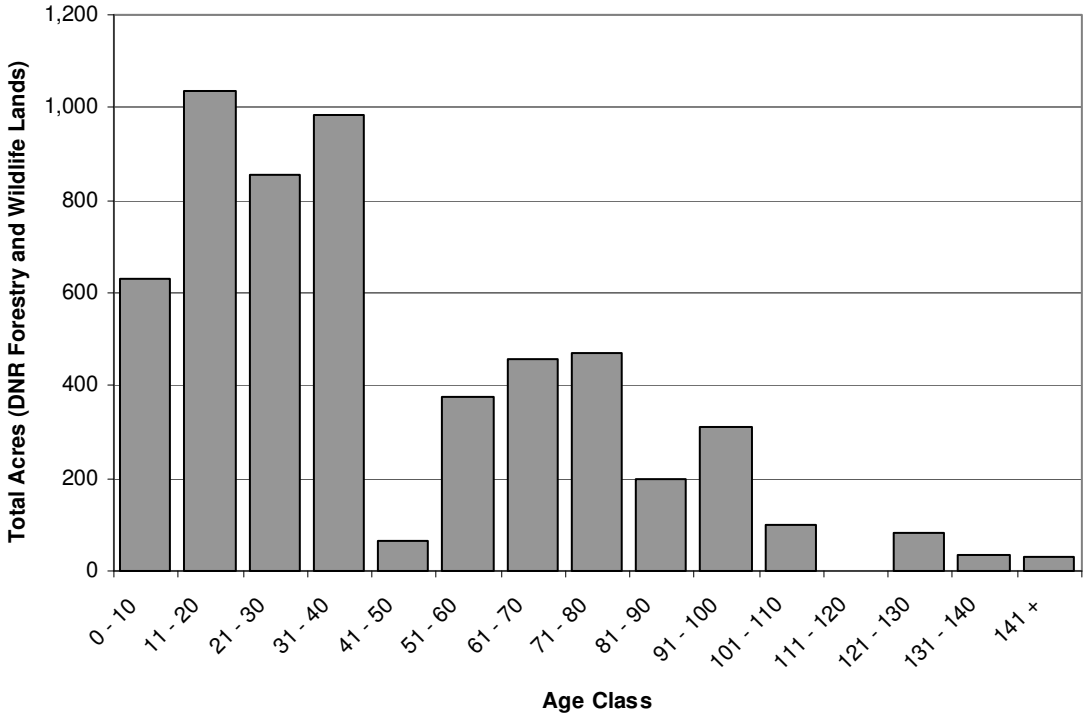
Upland Forests
FDn33, FDc24, FDc25**, FDc34, MHn35, MHn46**, MHn47, **MHc26,** MHc36, MHc47
Wetland Forests
FFn67, **WFn53,** WFn55, **WFn64**, FPn63, **FPn82**, APn80, **APn81**
Non-Forested Communities
APn91, MRn83**, OPn92, WMn82**

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains 2 old growth stands with associated OFMCs, 211 acres of EILC, and 1,525 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (5,631 total acres).



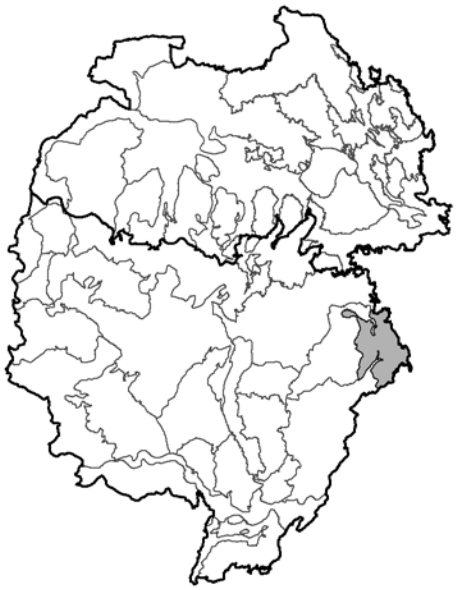
Patch Dynamics

This LTA contains 2 designated forest patches on state forestry and wildlife lands. They include an upland conifers patch (Dagget Brook) and a lowland conifers patch (Trelipe Creek).

Spring Brook Till Plain (212Nc13)										
	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	55,907	46.3	Aspen	3,685	49.9	1.1	Aspen	2.45	-7.9%
				Balm of Gilead	13	0.2		Balm of Gilead	0.00	
				Birch	114	1.5		Paper Birch	1.15	PMOP -5.2%
				Offsite Aspen	11	0.1				
	Maple/Basswood	842	0.7	Northern Hardwoods[4]	6	0.1	-8.6	Sugar Maple	-2.44	-10.8%
								Red Maple	1.25	
								Basswood	1.00	
								Yellow Birch	0.00	
	Bur/White Oak	325	0.3	Oak	204	2.8	-3.3	Bur Oak	2.67	PMOP -10.9%
	Red Oak	10,697	8.9					Red Oak	2.06	
	Upland Deciduous	0	0.0	Offsite Oak	0	0.0				
	Group Sum	67,770	**56.1**	Group Sum	4,033	**54.6**	-1.0			
LOWLAND DECIDUOUS	Black Ash	3,931	3.3	Ash	250	3.4	1.0	Ash	1.68	-10.7%
	Lowland Deciduous	0	0.0	Lowland Hardwood	37	0.5		Elm	3.00	
	Group Sum	3,931	**3.3**	Group Sum	287	**3.9**	1.2			
UPLAND CONIFERS	White Pine mix	248	0.2	White Pine	84	1.1	5.5	White Pine	-24.33	112.4%
	Red Pine	2,087	1.7	Norway Pine[5]	590	8.0	4.6	Red Pine	-2.75	17.1%
	Red/White Pine	0	0.0							
	Red/White Pine-Deciduous mix	0	0.0							
	Jack Pine	1,524	1.3	Jack Pine	8	0.1	-11.6	Jack Pine	-2.90	84.4%
	Jack Pine-Deciduous mix	0	0.0							
	White Spruce	72	0.1	White Spruce	57	0.8	13.0	White Spruce	-5.75	2.0%
	Balsam Fir mix	164	0.1	Balsam Fir	142	1.9	14.1	Balsam Fir	1.76	-3.3%
	Spruce/Fir-Deciduous mix	0	0.0							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	0	0.0				0.0%
	Upland Northern White-Cedar	0	0.0							
	Upland Conifer	0	0.0							
	Group Sum	4,094	**3.4**	Group Sum	881	**11.9**	3.5			
LOWLAND CONIFERS	Lowland Black Spruce	1,697	1.4	Black Spruce, Lowland	37	0.5	-2.8	Black Spruce	-2.33	0.0%
	Tamarack	2,062	1.7	Tamarack	10	0.1	-12.5	Tamarack	-7.24	5.4%
	Lowland Northern White-Cedar	1,001	0.8	Northern White Cedar	311	4.2	5.1	Cedar	1.37	5.3%
	Group Sum	4,760	**3.9**	Group Sum	358	**4.8**	1.2			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	0	0.0				
	Stagnant Tamarack	226	0.2	Stagnant Tamarack	0	0.0				
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	72	1.0				
	Stagnant Conifer	0	0.0							
	Group Sum	226	**0.2**	Group Sum	72	**1.0**	5.2			
SHRUBLAND	Upland Shrub	7,721	6.4	Upland Brush	3	0.0	-159.2			
				Cutover Area	0	0.0				
	Lowland Deciduous Shrub	3,668	3.0	Lowland Brush	340	4.6	1.5			
	Lowland Evergreen Shrub	0	0.0	Muskeg	23	0.3				
	Group Sum	11,390	**9.4**	Group Sum	366	**5.0**	-1.9			
AQUATIC	Water	8,490	7.0	Permanent Water	120	1.6				
	Floating Aquatic	1,479	1.2	Non-Permanent Water	239	3.2				
	Broadleaf Sedge/Cattail	2,953	2.4	Marsh	895	12.1	4.9			
	Sedge Meadow	9,175	7.6	Lowland Grass	103	1.4	-5.5			
	Group Sum	22,098	**18.3**	Group Sum	1,357	**18.4**	1.0			
CROP/GRASS	Cropland	1,599	1.3	Agricultural	0	0.0				
	Grassland	4,817	4.0	Upland Grass	6	0.1	-46.4			
	Prairie	0	0.0							
	Group Sum	6,415	**5.3**	Group Sum	6	**0.1**	-61.8			
DEVELOPED	Low Intensity Urban	15	0.0	Development[6]	22	0.3	24.1			
	High Intensity Urban	0	0.0							
	Mixed Developed	0	0.0							
	Transportation	0	0.0	Roads	7	0.1				
	Group Sum	15	**0.0**	Group Sum	29	**0.4**	32.1			
	Other[7]	0	0.0	Other[8]	0	0.0				
	LTA TOTAL	120,699	100.0	LTA TOTAL	7,389	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Outing Moraine (212Nc14)



OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A landscape dominated by rolling till plains and steep end moraines dissected by outwash channels. The Rainy Lobe Glacier formed all features. Uplands occupy 71 percent, wetlands occupy 23 percent, and lakes occupy 6 percent of the LTA (MN DNR, 1998). Soil parent material is sandy-loam till, with many stones, in the till plains and moraines and sandy in the outwash channels. Soils were formed under forest vegetation.

The dominant upland pre-settlement vegetation was dry-mesic (white and red) pine/hardwood forest, wet-mesic hardwood-conifer (white pine) forest, and mesic northern hardwood forest (Marschner, 1974). The majority of lowland pre-settlement vegetation was conifer bog and swamp (Marschner, 1974). Historic fire regimes for the upland types were: a) 150- to 350-year forest replacement with five- to 50-year forest maintenance, b) 150- to 350-year forest replacement, and c) 250- to 1,000-year stand replacement, respectively.

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is county (45.8%), followed by private (28.0%), state (24.6%), and federal (1.6%). See table below. This LTA is located in Cass, Aitkin, and Crow Wing counties. Over 19,518 acres of protected waters exist inside the LTA. Lakes within or adjacent to the LTA include Thunder, Big Rice, Washburn, Roosevelt, and Emily.

The majority of land within the LTA is publicly owned. The northern fringe of the LTA is inside Chippewa National Forest. USFS lands are found at the LTA's northern border. Scattered parcels of state land occur throughout the LTA, including a large contiguous block in the northeast segment. Significant amounts of county land appear in the remaining parts of the LTA. Some Potlatch Corporation land holdings are located in the LTA's southern portion. Municipalities include Emily and Fifty Lakes.

Agency (%)	Acres	Percent
State (24.6%)		
DNR, Fish and Wildlife	1,384	1.8%
DNR, Forestry	17,580	22.5%
Other	243	0.3%
State (Undifferentiated)	36	0.0%
County (45.8%)		
Aitkin	13	0.0%
Cass	28,489	36.4%
Crow Wing	7,267	9.3%
Federal (1.6%)		
U.S. Forest Service	1,242	1.6%
Private (28.0%)		
Private	21,817	27.9%
Private Industrial	111	0.1%
Grand Total	**78,182 acres**	

* note - 5,573 acres of open water are included in the table above

Natural Resource Management Units

Federal

United States Forest Service

- National Forests: Chippewa (extreme southeast portion)

State

Minnesota Department of Natural Resources

- State Forests: Land O'Lakes (nearly all), Hill River (extreme southwest fringe)
- Wildlife Management Areas: Moose Wallow, Duck Lake
- Aquatic Management Areas: Snowshoe Lake
- Fish Management Areas: Spire Valley Hatchery, Morrison Lake, Allen Lake

County

None known

Other

Leech Lake Indian Reservation

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (21%), Conifer Bogs and Swamps (17%), Mixed Hardwood and Pine (Maple, White Pine, Basswood, etc) (7%), and Mixed White Pine and Red Pine (49%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-285, scattering oak, scattering timber-1, dry land, dry ridge, or island-1, lake, slough, pond-27, marsh or swamp-75, windthrow, windfall-5, and burned area-10.

Bearing trees include: Ash-7, Black Ash-9, Aspen-114, Balsam Fir-25, Basswood-10, Birch-130, Yellow Birch-7, Cedar-13, Cottonwood-2, Elm-8, Ironwood-4, Maple-26, Sugar Maple-6, Oak-38, Bur Oak-10, Red Oak-16, Pine-27, Jack Pine-19, Red Pine-122, White Pine-179, Spruce-38, Tamarack-135, and Willow-1.

Current Land Cover

As referenced from table on page 6:

- Top five GAP land cover classes on all ownerships (84,822 total acres):
  Aspen/White Birch (51.9%), Red Oak (8.0%), Sedge Meadow (6.1%), Water (5.9%), and Black Ash (4.4%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (18,915 total acres):
  Aspen (44.4 %), Oak (11.6%), Marsh (6.9%), Lowland Grass (5.5%), and Norway Pine (5.3%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 3.8 times more Marsh, 2.1 times more Northern Hardwoods, 1.8 times more Norway Pine, 1.6 times more Lowland Brush, and 1.3 times less in the Lowland Black Spruce group.

Changes in Tree Species Composition

As referenced from table on page 6, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 10.5 times more Red Maple, 3.9 times more Elm, 2.9 times more Red Oak, 2.7 times more Ash, 2.5 times more Balsam Fir, 2.4 times more Aspen, 2.0 times more Bur Oak, 5.3 times less Red Pine, 10.1 times less White Pine, and 13.4 times less Tamarack in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 6. This is a priority LTA for Norway Pine cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry-Mesic Pine/Oak. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

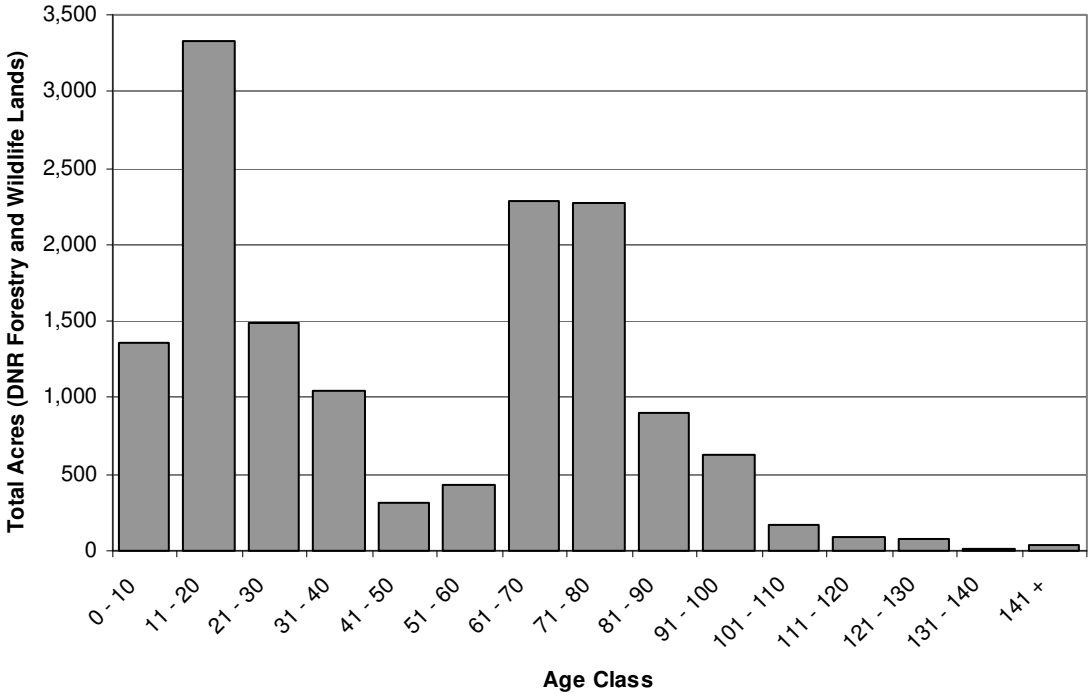
Upland Forests
FDn33, FDc24, FDc25, FDc34, **MHn35,** MHn46, MHn47, MHc26, MHc36, MHc47
Wetland Forests
FFn67, WFn53, **WFn55,** WFn64, FPn63, **FPn82, APn80**, APn81
Non-Forested Communities
APn91, **MRn83,** OPn92, WMn82

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains 3 old growth stands with associated OFMCs, 144 acres of EILC, and 5,448 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (14,444 total acres).



Patch Dynamics

This LTA contains 8 designated forest patches on state forestry and wildlife lands. They include 2 upland conifer patches (Thunder Hills and Dickerson Hill), 3 upland hardwood patches (Draper Tower, Coxie Lake, and Lower Lake), 2 lowland conifer patches (Goose Lake Bog and Rice Lake Bog), and a lowland hardwoods patch (Duck Lake).

Outing Moraine (212Nc14)

	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	44,002	51.9	Aspen	8,399	44.4	-1.1	Aspen	2.49	-7.9%
				Balm of Gilead	0	0.0		Balm of Gilead	0.00	
				Birch	301	1.6		Paper Birch	1.26	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	1,549	1.8	Northern Hardwoods[4]	718	3.8	2.1	Sugar Maple	1.15	-10.8%
								Red Maple	10.50	
								Basswood	1.70	
								Yellow Birch	0.00	
	Bur/White Oak	88	0.1	Oak	2,196	11.6	1.4	Bur Oak	2.00	PMOP -10.9%
	Red Oak	6,781	8.0					Red Oak	2.85	
	Upland Deciduous	0	0.0	Offsite Oak	0	0.0				
	Group Sum	52,420	**61.8**	Group Sum	11,613	**61.4**	-1.0			
LOWLAND DECIDUOUS	Black Ash	3,716	4.4	Ash	511	2.7	-1.6	Ash	2.65	-10.7%
	Lowland Deciduous	0	0.0	Lowland Hardwood	32	0.2		Elm	3.88	
	Group Sum	3,716	**4.4**	Group Sum	542	**2.9**	-1.5			
UPLAND CONIFERS	White Pine mix	158	0.2	White Pine	17	0.1	-2.1	White Pine	-10.05	112.4%
	Red Pine	2,546	3.0	Norway Pine[5]	1,005	5.3	1.8	Red Pine	-5.31	17.1%
	Red/White Pine	0	0.0							
	Red/White Pine-Deciduous mix	0	0.0							
	Jack Pine	1,058	1.2	Jack Pine	10	0.1	-24.0	Jack Pine	-1.25	84.4%
	Jack Pine-Deciduous mix	0	0.0							
	White Spruce	64	0.1	White Spruce	112	0.6	7.8	White Spruce	1.57	2.0%
	Balsam Fir mix	105	0.1	Balsam Fir	41	0.2	1.8	Balsam Fir	2.48	-3.3%
	Spruce/Fir-Deciduous mix	0	0.0							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	0	0.0				0.0%
	Upland Northern White-Cedar	0	0.0							
	Upland Conifer	0	0.0							
	Group Sum	3,931	**4.6**	Group Sum	1,185	**6.3**	1.4			
LOWLAND CONIFERS	Lowland Black Spruce	2,434	2.9	Black Spruce, Lowland	416	2.2	-1.3	Black Spruce	-1.43	0.0%
	Tamarack	1,992	2.3	Tamarack	451	2.4	1.0	Tamarack	-13.40	5.4%
	Lowland Northern White-Cedar	445	0.5	Northern White Cedar	151	0.8	1.5	Cedar	1.33	5.3%
	Group Sum	4,871	**5.7**	Group Sum	1,018	**5.4**	-1.1			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	56	0.1	Stagnant Spruce	0	0.0				
	Stagnant Tamarack	43	0.1	Stagnant Tamarack	85	0.4	8.9			
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	0	0.0				
	Stagnant Conifer	0	0.0							
	Group Sum	98	**0.1**	Group Sum	85	**0.4**	3.9			
SHRUBLAND	Upland Shrub	2,310	2.7	Upland Brush	21	0.1	-11.9			
				Cutover Area	23	0.1				
	Lowland Deciduous Shrub	2,670	3.1	Lowland Brush	962	5.1	1.6			
	Lowland Evergreen Shrub	0	0.0	Muskeg	110	0.6				
	Group Sum	4,980	**5.9**	Group Sum	1,115	**5.9**	1.0			
AQUATIC	Water	4,978	5.9	Permanent Water	449	2.4				
	Floating Aquatic	1,017	1.2	Non-Permanent Water	427	2.3				
	Broadleaf Sedge/Cattail	1,559	1.8	Marsh	1,307	6.9	3.8			
	Sedge Meadow	5,165	6.1	Lowland Grass	1,031	5.5	-1.1			
	Group Sum	12,719	**15.0**	Group Sum	3,213	**17.0**	1.1			
CROP/GRASS	Cropland	393	0.5	Agricultural	0	0.0				
	Grassland	1,669	2.0	Upland Grass	17	0.1	-22.3			
	Prairie	0	0.0							
	Group Sum	2,062	**2.4**	Group Sum	17	**0.1**	-27.5			
DEVELOPED	Low Intensity Urban	18	0.0	Development[6]	118	0.6	22.0			
	High Intensity Urban	6	0.0							
	Mixed Developed	0	0.0							
	Transportation	0	0.0	Roads	8	0.0				
	Group Sum	24	**0.0**	Group Sum	126	**0.7**	23.5			
	Other[7]	0	0.0	Other[8]	0	0.0				
	LTA TOTAL	84,822	100.0	LTA TOTAL	18,915	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Itasca Moraine (212Nc16)

OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A landscape characterized by steep, irregularly shaped slopes with many closed depressions. This end moraine formed by the Wadena Lobe Glacier. Uplands occupy 66 percent, wetlands occupy 16 percent, and lakes occupy 18 percent of the LTA (MN DNR,1998). Stream density is 0.2 miles per square mile (total of 66 miles). Soil parent material is a complex of sandy to loamy and clay loam till with a high content of granitic stones. Soils have formed under forest vegetation.

Pre-settlement vegetation was primarily drymesic (white) –pine-hardwoods with smaller amounts of dry pine (jack and red pine) in the southwest quarter and lowland –hardwood-conifer (spruce-fir) in the northeast quarter. The historic disturbance regimes were primarily high-intensity forest replacement fires every 70 to 350 years, with low- to moderate-intensity forest maintenance fires occurring every five to 50 years in southwest quarter and low- to moderate-intensity forest maintenance fires occurring every 25 to100 years in the northeast quarter.

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is private (44.8%), followed by federal (27.4%), county (20.6%), and state (7.0%). See table below. This LTA exists as two separate units within Hubbard, Cass, and Crow Wing counties. Over 79,053 acres of protected waters exist inside the LTA. Lakes within or adjacent to the LTA include Leech, Ten Mile, Woman, Pine Mountain, Little Boy, and Big Rice.

Parts of the LTA are inside Leech Lake Indian Reservation and Chippewa National Forest. Federal, state, county, and private industrial lands are distributed throughout the LTA. Nearly the LTA's entire north unit is USFS land. Large contiguous tracts of additional USFS lands are located in the north one-third of the south unit. State and county lands occur throughout the LTA, with most county lands found in the southwestern portions of the south unit. The LTA contains only a few scattered Potlatch Corporation land holdings. Municipalities include Akeley, Backus, Longville, and Hackensack.

Agency (%)	Acres	Percent
State (7.0%)		
DNR, Fish and Wildlife	872	0.4%
DNR, Forestry	14,476	6.6%
Other	42	0.0%
County (20.6%)		
Cass	44,353	20.3%
Crow Wing	253	0.1%
Hubbard	474	0.2%
Federal (27.4%)		
Bureau of Indian Affairs	1,511	0.7%
Leech Lake Reservation	226	0.1%
Other	57	0.0%
U.S. Forest Service	57,986	26.5%
Private (44.8%)		
Private	96,113	44.0%
Private Industrial	1,747	0.8%
Tribal (0.2%)		
Leech Lake Reservation	313	0.1%
Minnesota Chippewa Indians	81	0.0%
Grand Total	**218,504 acres**	

* note – 49,283 acres of open water are included in the table above

Natural Resource Management Units

Federal

United States Forest Service

- National Forests: Chippewa (south portions)

State

Minnesota Department of Natural Resources

- State Forests: Badoura (extreme northeast corner), Bowstring (southwest corner), Foothills (north portions)
- Wildlife Management Areas: Woman Lake, Mule Lake, Ah-gwah-ching, George Cook
- Aquatic Management Areas: Kid/Lost Lakes, Boy River, Woman Lake, Louise Lake
- Fish Management Areas: Larson Lake, Webb Lake

County

None known

Other

Leech Lake Indian Reservation

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (19%), Conifer Bogs and Swamps (11%), Jack Pine Barrens and Openings (7%), Lakes (open water) (14%), Mixed Hardwood and Pine (Maple, White Pine, Basswood, etc) (11%), and Mixed White Pine and Red Pine (33%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-623, pine grove or grove-1, pine openings, pine barrens, scattered pine-9, scattering oak, scattering timber-49, oak barrens or oak openings-3, thicket, brush, underbrush or only tree around-71, dry land, dry ridge, or island-21, lake, slough, pond-174, river, creek, bottom, or valley, ravine-4, marsh or swamp-179, meadow-2, windthrow, windfall-11, and burned area-21.

Bearing trees include: Ash-23, Black Ash-5, Aspen-363, Balm-of-Gilead-4, Balsam Fir-51, Basswood-32, Birch-223, Yellow Birch-2, Cedar-69, Elm-25, Ironwood-19, Maple-87, Sugar Maple-14, Oak-113, Bur Oak-12, Red Oak-42, Pine-68, Jack Pine-190, Red Pine-461, White Pine 322, Spruce-89, Tamarack-267, and Willow-2.

Current Land Cover

As referenced from table on page 6:

- Top five GAP land cover classes on all ownerships (274,827 total acres):
  Aspen/White Birch (44.4%), Water (16.2%), Red Oak (4.8%), Upland Shrub (4.8%), and Grassland (4.0%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (17,777 total acres):
  Aspen (30.4 %), Marsh (12.3%), Birch (6.6%), Lowland Brush (6.3%), and Permanent Water (6.1%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 5.8 times more Northern White Cedar, 5.3 times more Northern Hardwoods, 4.8 times more Marsh, 2.1 times more Lowland Deciduous Shrub, and 1.9 times less in the Jack Pine group.

Changes in Tree Species Composition

As referenced from table on page 6, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 4.0 times more Balm of Gilead, 3.3 times more Basswood, 2.7 times more Aspen, 2.5 times more Sugar Maple, 2.3 times more Red Oak, 2.7 times less Cedar, 3.6 times less Red Pine, 5.7 times less White Pine, 5.8 times less Tamarack, and 8.5 times less White Spruce in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 6. This is a priority LTA for Norway Pine, White Pine, and Northern White Cedar cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry Pine, Dry-Mesic Pine, Dry-Mesic Pine/Oak, and Boreal Hardwood Conifer. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

Upland Forests

FDn33, **FDc24, FDc34**, FDs37, **MHn35, MHn44, MHn46, MHc26,** MHc36, MHc37, MHs39

Wetland Forests

FFn57, FFn67**, WFn53**, WFn55, WFn64, WFs57, **FPn63,** FPn72, **FPn82, APn80, APn81**

Non-Forested Communities

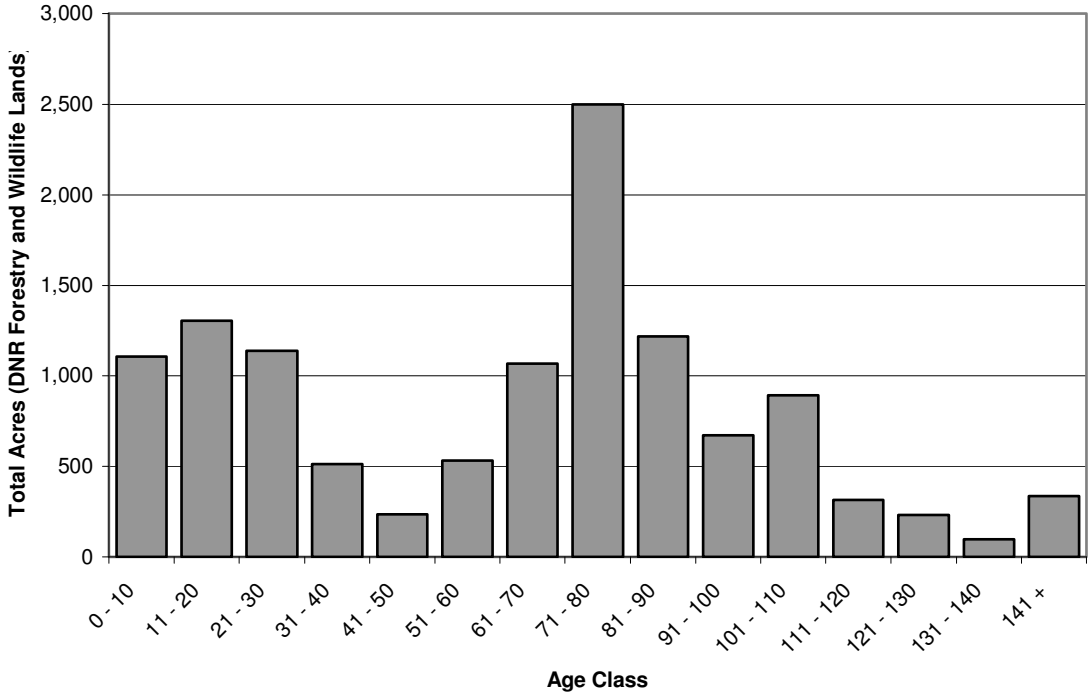
APn90, APn91, MRn83, OPn81, **OPn92, WMn73, WMn82, FPn73**

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains 14 old growth stands with associated OFMCs, 503 acres of EILC, and 4,526 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (12,161 total acres).



Patch Dynamics

This LTA contains 2 designated forest patches on state forestry and wildlife lands. They include a lowland conifers patch (Current Lake) and a lowland hardwoods patch (George Cook).

Itasca Moraine (212Nc16)

	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	122,116	44.4	Aspen	5,403	30.4		Aspen	2.74	-7.9%
				Balm of Gilead	25	0.1	-1.2	Balm of Gilead	4.00	
				Birch	1,174	6.6		Paper Birch	1.86	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	2,952	1.1	Northern Hardwoods[4]	1,020	5.7	5.3	Sugar Maple	2.50	-10.8%
								Red Maple	1.04	
								Basswood	3.33	
								Yellow Birch	0.00	
	Bur/White Oak	888	0.3	Oak	575	3.2	-1.6	Bur Oak	1.84	PMOP -10.9%
	Red Oak	13,282	4.8					Red Oak	2.34	
	Upland Deciduous	1,379	0.5	Offsite Oak	0	0.0				
	Group Sum	140,617	**51.2**	Group Sum	8,196	**46.1**	-1.1			
LOWLAND DECIDUOUS	Black Ash	3,671	1.3	Ash	344	1.9	1.4	Ash	-1.22	-10.7%
	Lowland Deciduous	293	0.1	Lowland Hardwood	138	0.8	7.3	Elm	1.40	
	Group Sum	3,964	**1.4**	Group Sum	482	**2.7**	1.9			
UPLAND CONIFERS	White Pine mix	963	0.4	White Pine	71	0.4	1.1	White Pine	-5.65	112.4%
	Red Pine	7,506	2.7	Norway Pine[5]	863	4.9	1.8	Red Pine	-3.61	17.1%
	Red/White Pine	366	0.1							
	Red/White Pine-Deciduous mix	17	0.0							
	Jack Pine	3,953	1.4	Jack Pine	132	0.7	-1.9	Jack Pine	-1.15	84.4%
	Jack Pine-Deciduous mix	7	0.0							
	White Spruce	42	0.0	White Spruce	60	0.3	22.2	White Spruce	-8.50	2.0%
	Balsam Fir mix	459	0.2	Balsam Fir	173	1.0	5.8	Balsam Fir	1.61	-3.3%
	Spruce/Fir-Deciduous mix	0	0.0							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	0	0.0				0.0%
	Upland Northern White-Cedar	164	0.1							
	Upland Conifer	36	0.0							
	Group Sum	13,513	**4.9**	Group Sum	1,299	**7.3**	1.5			
LOWLAND CONIFERS	Lowland Black Spruce	2,875	1.0	Black Spruce, Lowland	277	1.6	1.5	Black Spruce	-1.75	0.0%
	Tamarack	4,350	1.6	Tamarack	448	2.5	1.6	Tamarack	-5.82	5.4%
	Lowland Northern White-Cedar	2,030	0.7	Northern White Cedar	764	4.3	5.8	Cedar	-2.67	5.3%
	Group Sum	9,255	**3.4**	Group Sum	1,488	**8.4**	2.5			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	21	0.1				
	Stagnant Tamarack	633	0.2	Stagnant Tamarack	90	0.5	2.2			
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	578	3.3				
	Stagnant Conifer	107	0.0							
	Group Sum	740	**0.3**	Group Sum	688	**3.9**	14.4			
SHRUBLAND	Upland Shrub	13,207	4.8	Upland Brush	18	0.1	-22.8			
				Cutover Area	19	0.1				
	Lowland Deciduous Shrub	8,311	3.0	Lowland Brush	1,126	6.3	2.1			
	Lowland Evergreen Shrub	9	0.0	Muskeg	434	2.4	754.6			
	Group Sum	21,527	**7.8**	Group Sum	1,598	**9.0**	1.1			
AQUATIC	Water	44,399	16.2	Permanent Water	1,085	6.1				
	Floating Aquatic	4,591	1.7	Non-Permanent Water	162	0.9				
	Broadleaf Sedge/Cattail	7,102	2.6	Marsh	2,184	12.3	4.8			
	Sedge Meadow	9,379	3.4	Lowland Grass	334	1.9	-1.8			
	Group Sum	65,471	**23.8**	Group Sum	3,765	**21.2**	-1.1			
CROP/GRASS	Cropland	8,190	3.0	Agricultural	0	0.0				
	Grassland	11,125	4.0	Upland Grass	78	0.4	-9.2			
	Prairie	0	0.0							
	Group Sum	19,315	**7.0**	Group Sum	78	**0.4**	-16.0			
DEVELOPED	Low Intensity Urban	183	0.1	Development[6]	96	0.5	4.0			
	High Intensity Urban	185	0.1							
	Mixed Developed	0	0.0							
	Transportation	23	0.0	Roads	69	0.4	46.0			
	Group Sum	391	**0.1**	Group Sum	164	**0.9**	6.5			
	Other[7]	35	0.0	Other[8]	19	0.1				
	LTA TOTAL	274,827	100.0	LTA TOTAL	17,777	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Shell Lake Moraine (212Nc28)

OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A landscape dominated by hummocky end moraines formed by the Wadena and Des Moines lobes. Soil parent material is coarse loamy (sandy loam) till. Hardpans and stones are common. Soils have formed under forest vegetation. Lakes are common.

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is private (66.6%), followed by state (17.0%), federal (12.0%), and county (4.2%). See table below. This LTA is located in Becker County. Over 30,980 acres of protected waters exist inside the LTA. Lakes within or adjacent to the LTA include Flat, Tamarac, Height of Land, Pine, Shell, Toad, Wolf, and Island.

Part of the LTA is inside White Earth Indian Reservation. Federal, state, county, and private industrial lands are dispersed throughout the LTA. The majority of the LTA's public lands are state forestlands, which are located primarily in the eastern portion within the boundaries of Smokey Hills State Forest. The LTA's only municipality is Wolf Lake.

Agency (%)	Acres	Percent
State (17.0%)		
DNR, Ecological Resources	183	0.2%
DNR, Fish and Wildlife	255	0.2%
DNR, Forestry	17,164	16.6%
County (4.2%)		

Becker	4,353	4.2%
Federal (12.0%)		
U.S. Fish and Wildlife Service	12,399	12.0%
Other Public (0.1%)		
School District	127	0.1%
Private (66.6%)		
Private	68,514	66.2%
Private Industrial	416	0.4%
Grand Total	**103,411 acres**	

* note - 16,176 acres of open water are included in the table above

Natural Resource Management Units

Federal

United States Fish and Wildlife Service

- National Wildlife Refuges: Tamarac
- Waterfowl Production Areas: Lyman Lakes

State

Minnesota Department of Natural Resources

- State Forests: Smokey Hills (nearly all)
- Wildlife Management Areas: Hubbel Pond
- Aquatic Management Areas: Shell Lake, Twin Lake
- Fish Management Areas: Bass Lake, Toad Lake, Little Toad Lake
- Scientific and Natural Areas: Greenwater Lake

County

None known

Other

White Earth Indian Reservation

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (37%), Aspen-Birch (trending to hardwoods) (10%), Conifer Bogs and Swamps (12%), Lakes (open water) (11%), and Mixed White Pine and Red Pine (24%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-271, pine openings, pine barrens, scattered pine-2, scattering oak, scattering timber-25, thicket, brush, underbrush or only tree around-40, lake, slough, pond-80, river, creek, bottom, or valley, ravine-5, marsh or swamp-129, meadow-1, wet prairie or prairie-2, windthrow, windfall-6, and burned area-11.

Bearing trees include: Ash-10, Black Ash-2, Aspen-251, Balm-of-Gilead-19, Balsam Fir-19, Basswood-12, Birch-62, Yellow Birch-1, Cottonwood-6, Elm-28, Ironwood-4, Maple-14, Sugar Maple-10, Oak-114, Bur Oak-12, Northern Pin Oak-1, Red Oak-11, Pine-44, Jack Pine-55, Red Pine-149, White Pine-94, Spruce-42, and Tamarack-192.

Current Land Cover

As referenced from table on page 5:

- Top five GAP land cover classes on all ownerships (122,755 total acres):
  Aspen/White Birch (30.4%), Water (14.5%), Cropland (10.5%), Grassland (6.3%), and Bur/White Oak (5.5%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (17,808 total acres):
  Aspen (40.1 %), Norway Pine (11.5%), Northern Hardwoods (9.5%), Tamarack (6.5%), and Lowland Brush (4.7%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 4.4 times more Norway Pine, 2.7 times more Tamarack, 2.5 times more Ash, 2.0 times more Northern Hardwoods, 2.0 times more Marsh, 2.4 times less Oak, and 15.3 times less in the Upland Grass group.

Changes in Tree Species Composition

As referenced from table on page 5, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 6.6 times more Basswood, 4.7 times more Ash, 3.1 times more Paper Birch, 3.0 times more Balsam Fir, 2.0 times more Elm, 2.2 times less Black Spruce, 4.2 times less Tamarack, 5.6 times less White Pine, and 14.9 times less Red Pine in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 5. This is a priority LTA for Norway Pine cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry Pine and Dry-Mesic Pine. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

Upland Forests

FDn12, FDn33, FDc12, FDc23, **FDc24,** FDc34, **MHn44**, MHn47, **MHc26**, MHc36, **MHc37**

Wetland Forests

FFn57, FFn67, WFn53, WFn55, WFn64, FPn63, FPn82, APn81

Non-Forested Communities

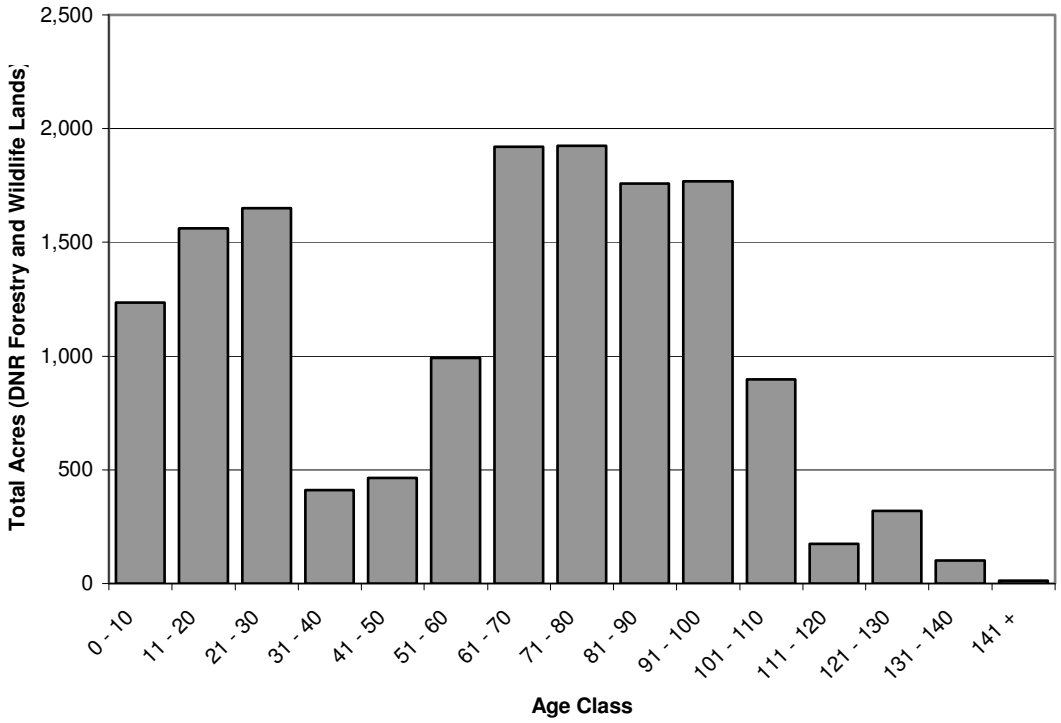
APn91, OPn81, OPn91, OPn92, WMn73, WMn82, FPn73

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains 9 old growth stands with associated OFMCs, 96 acres of EILC, and 5,476 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (15,194 total acres).



Patch Dynamics

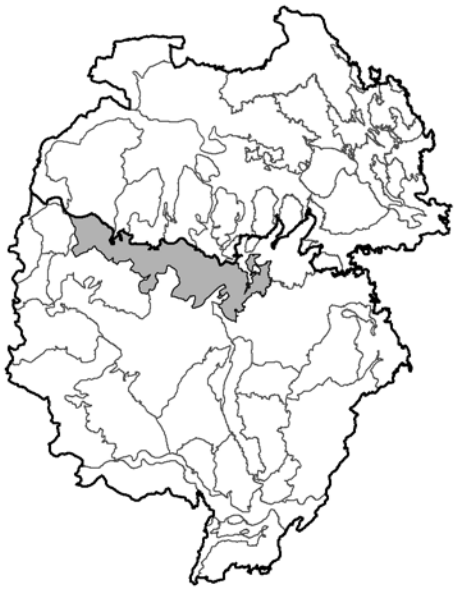
This LTA contains 5 designated forest patches on state forestry and wildlife lands. They include 3 upland conifer patches (Wolf Lake, Elbow Lake, and Osage), an upland hardwoods patch (Wolf Lake Hardwoods), and a lowland hardwoods patch (North Elbow Lake).

Shell Lake Moraine (212Nc28)

	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	37,355	30.4	Aspen	7,135	40.1	1.4	Aspen	1.41	-7.9%
				Balm of Gilead	46	0.3		Balm of Gilead	1.40	
				Birch	407	2.3		Paper Birch	3.12	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	5,754	4.7	Northern Hardwoods[4]	1,686	9.5	2.0	Sugar Maple	1.58	-10.8%
								Red Maple	0.00	
								Basswood	6.63	
								Yellow Birch	0.00	
	Bur/White Oak	6,802	5.5	Oak	793	4.5	-2.4	Bur Oak	1.41	PMOP -10.9%
	Red Oak	6,398	5.2					Red Oak	1.69	
	Upland Deciduous	0	0.0	Offsite Oak	0	0.0				
	Group Sum	56,309	**45.9**	Group Sum	10,066	**56.5**	1.2			
LOWLAND DECIDUOUS	Black Ash	1,752	1.4	Ash	629	3.5	2.5	Ash	4.70	-10.7%
	Lowland Deciduous	0	0.0	Lowland Hardwood	39	0.2		Elm	2.00	
	Group Sum	1,752	**1.4**	Group Sum	667	**3.7**	2.6			
UPLAND CONIFERS	White Pine mix	87	0.1	White Pine	38	0.2	3.0	White Pine	-5.60	112.4%
	Red Pine	3,246	2.6	Norway Pine[5]	2,051	11.5	4.4	Red Pine	-14.89	17.1%
	Red/White Pine	0	0.0							
	Red/White Pine-Deciduous mix	0	0.0							
	Jack Pine	1,181	1.0	Jack Pine	510	2.9	3.0	Jack Pine	1.04	84.4%
	Jack Pine-Deciduous mix	0	0.0							
	White Spruce	173	0.1	White Spruce	82	0.5	3.3	White Spruce	-1.31	2.0%
	Balsam Fir mix	285	0.2	Balsam Fir	478	2.7	11.6	Balsam Fir	3.00	-3.3%
	Spruce/Fir-Deciduous mix	0	0.0							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	0	0.0				0.0%
	Upland Northern White-Cedar	0	0.0							
	Upland Conifer	0	0.0							
	Group Sum	4,971	**4.0**	Group Sum	3,159	**17.7**	4.4			
LOWLAND CONIFERS	Lowland Black Spruce	354	0.3	Black Spruce, Lowland	122	0.7	2.4	Black Spruce	-2.20	0.0%
	Tamarack	2,995	2.4	Tamarack	1,154	6.5	2.7	Tamarack	-4.16	5.4%
	Lowland Northern White-Cedar	5	0.0	Northern White Cedar	0	0.0		Cedar	0.00	5.3%
	Group Sum	3,354	**2.7**	Group Sum	1,276	**7.2**	2.6			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	10	0.1				
	Stagnant Tamarack	444	0.4	Stagnant Tamarack	0	0.0				
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	0	0.0				
	Stagnant Conifer	0	0.0							
	Group Sum	444	**0.4**	Group Sum	10	**0.1**	-6.2			
SHRUBLAND	Upland Shrub	2,044	1.7	Upland Brush	22	0.1	-1.5			
				Cutover Area	171	1.0				
	Lowland Deciduous Shrub	6,313	5.1	Lowland Brush	836	4.7	-1.1			
	Lowland Evergreen Shrub	0	0.0	Muskeg	2	0.0				
	Group Sum	8,356	**6.8**	Group Sum	1,031	**5.8**	-1.2			
AQUATIC	Water	17,809	14.5	Permanent Water	379	2.1				
	Floating Aquatic	14	0.0	Non-Permanent Water	103	0.6				
	Broadleaf Sedge/Cattail	2,595	2.1	Marsh	742	4.2	2.0			
	Sedge Meadow	6,348	5.2	Lowland Grass	151	0.8	-6.1			
	Group Sum	26,766	**21.8**	Group Sum	1,375	**7.7**	-2.8			
CROP/GRASS	Cropland	12,941	10.5	Agricultural	96	0.5	-19.5			
	Grassland	7,691	6.3	Upland Grass	73	0.4	-15.3			
	Prairie	0	0.0							
	Group Sum	20,632	**16.8**	Group Sum	169	**0.9**	-17.7			
DEVELOPED	Low Intensity Urban	9	0.0	Development[6]	14	0.1	10.4			
	High Intensity Urban	0	0.0							
	Mixed Developed	0	0.0							
	Transportation	0	0.0	Roads	40	0.2				
	Group Sum	9	**0.0**	Group Sum	54	**0.3**	40.7			
	Other[7]	160	0.1	Other[8]	0	0.0				
	LTA TOTAL	122,755	100.0	LTA TOTAL	17,808	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Itasca Moraine Steep (212Nc30)



OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

An end moraine characterized by steep rugged terrain. Uplands occupy 84 percent, wetlands occupy 10 percent, and lakes occupy 6 percent of the LTA (MN DNR, 1998). The soils are a complex of sandy, loamy, and sand over loamy textures. The majority is well-drained.

The majority of the upland pre-settlement vegetation was dry-mesic pine-oak and dry-mesic pine with minor amounts of dry pine (Shadis, 1999 and Marschner, 1974). The majority of lowland pre-settlement vegetation was conifer bog and swamp (Marschner,1974).

Native forest communities that have historically persisted on this LTA include: dry jack pine-red pine forest on areas that tend to be sandy and/or have historically had severe (crown) fires at 50- to 80-year intervals. Dry-mesic pine (white)/oak forest on areas with loamy subsoils present within the rooting zone. Historically low-intensity ground fires occurred every five to 40 years. Dry-mesic pine (white and red) on areas with loamy subsoils present within the rooting zone. Historically, low-intensity ground fires occurred every 10 to 40 years and severe (crown) fires occurred every 100 to 200 years.

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is state (36.0%), followed by county (28.2%), private (26.2%), and federal (8.8%). See table below. This LTA is located in Clearwater, Cass, Hubbard, and Becker counties. The Headwaters of the

Mississippi River is located in the LTA's northwest portion. Over 26,073 acres of protected waters exist inside the LTA. Lakes within or adjacent to the LTA include Itasca, Elk, George, Kabekona, Leech, Ten Mile, and Mantrap.

Parts of the LTA are inside White Earth and Leech Lake Indian Reservations and Chippewa National Forest. Federal, state, county, and private industrial lands are scattered throughout the LTA. Large tracts of contiguous USFS lands are located in the LTA's east segment. The majority of state lands occur in the east central portion of the LTA within Paul Bunyan State Forest. Most county lands are found in the LTA's west and central parts. Potlatch Corporation lands are found primarily in the south half of the LTA, including a 2,400-acre block. The only municipality is the city of Walker.

Agency (%)	**Acres**	**Percent**
State (36.0%)		
DNR, Ecological Resources	39	0.0%
DNR, Fish and Wildlife	266	0.1%
DNR, Forestry	55,662	25.4%
DNR, Parks	22,919	10.5%
DNR, Trails and Waterways	20	0.0%
County (28.2%)		
Becker	255	0.1%
Cass	4,794	2.2%
Clearwater	18,601	8.5%
Hubbard	38,088	17.4%
Federal (8.8%)		
Bureau of Indian Affairs	621	0.3%
U.S. Forest Service	18,661	8.5%
Other Public (0.0%)		
School District	41	0.0%
Private (26.2%)		
Private	52,677	24.0%
Private Industrial	4,663	2.1%
Tribal (0.9%)		
Leech Lake Reservation	40	0.0%
Minnesota Chippewa Indians	156	0.1%
White Earth Reservation	1,739	0.8%
Grand Total	**219,242 acres**	

* note - 14,578 acres of open water are included in the table above

Natural Resource Management Units

Federal

United States Forest Service

- National Forests: Chippewa (southwest corner)

State

Minnesota Department of Natural Resources

- State Forests: Paul Bunyan (south half), White Earth (east and southeast portions), Foothills (northwest portion)

- Wildlife Management Areas: Stassen Lake, Sucker Lake, Kabekona, Frellsen Lake, Sugar Bush Lake
- Aquatic Management Areas: Long Lake
- Fish Management Areas: Sucker Brook, Gould Lake, Leech Lake, Ah-gwah-ching, Howard Lake
- Scientific and Natural Areas: Itasca Wilderness Sanctuary
- State Parks: Itasca

County

None known

Other

Leech Lake Indian Reservation
White Earth Indian Reservation

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (34%), Jack Pine Barrens and Openings (27%), and Mixed White Pine and Red Pine (30%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-732, pine openings, pine barrens, scattered pine-1, scattering oak, scattering timber-74, thicket, brush, underbrush or only tree around-70, dry land, dry ridge, or island-12, lake, slough, pond-64, marsh or swamp-74, windthrow, windfall-12, and burned area-3.

Bearing trees include: Ash-11, Black Ash-1, Aspen-610, Balm-of-Gilead-13, Balsam Fir-12, Basswood-13, Birch-221, Cedar-17, Elm-16, Ironwood-4, Maple-21, Sugar Maple-12, Oak-86, Bur Oak-4, Red Oak-37, Pine-14, Jack Pine-608, Red Pine-576, White Pine-281, Spruce-27, Tamarack-113, and Willow-1.

Current Land Cover

As referenced from table on page 6:

- Top five GAP land cover classes on all ownerships (239,074 total acres):
  Aspen/White Birch (60.5%), Red Oak (6.9%), Water (5.7%), Red Pine (3.3%), and Upland Shrub (3.1%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (56,957 total acres):
  Aspen (78.1 %), Norway Pine (5.1%), Permanent Water (2.3%), Oak (2.2%), and Birch (1.5%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 1.6 times more Norway Pine, and 3.9 times less in the Oak group.

Changes in Tree Species Composition

As referenced from table on page 6, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 11.0 times more Red Maple, 5.5 times more Balm of Gilead, 5.5 times more Black Spruce, 4.7 times more Bur Oak, 4.5 times more Ash, 4.3 times more Basswood, 3.4 times more Balsam Fir, 2.5 times more Cedar, 2.3 times more Aspen, 4.9 times less White Pine, 7.1 times less Red Pine, 7.7 times less Jack Pine, and 10.3 times less Tamarack in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 6. This is a priority LTA for Jack Pine, Norway Pine, and White Pine cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry-Mesic Pine and Dry-Mesic Pine/Oak. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

Upland Forests
FDn33, FDc12, FDc23, **FDc24, FDc34**, FDs37**, MHn35, MHn44, MHn46, MHc26**, MHc36, **MHc37**

Wetland Forests
FFn57, FFn67, **WFn53**,WFn55, WFn64, **WFs57, FPn63**, FPn72, **FPn82,** APn81

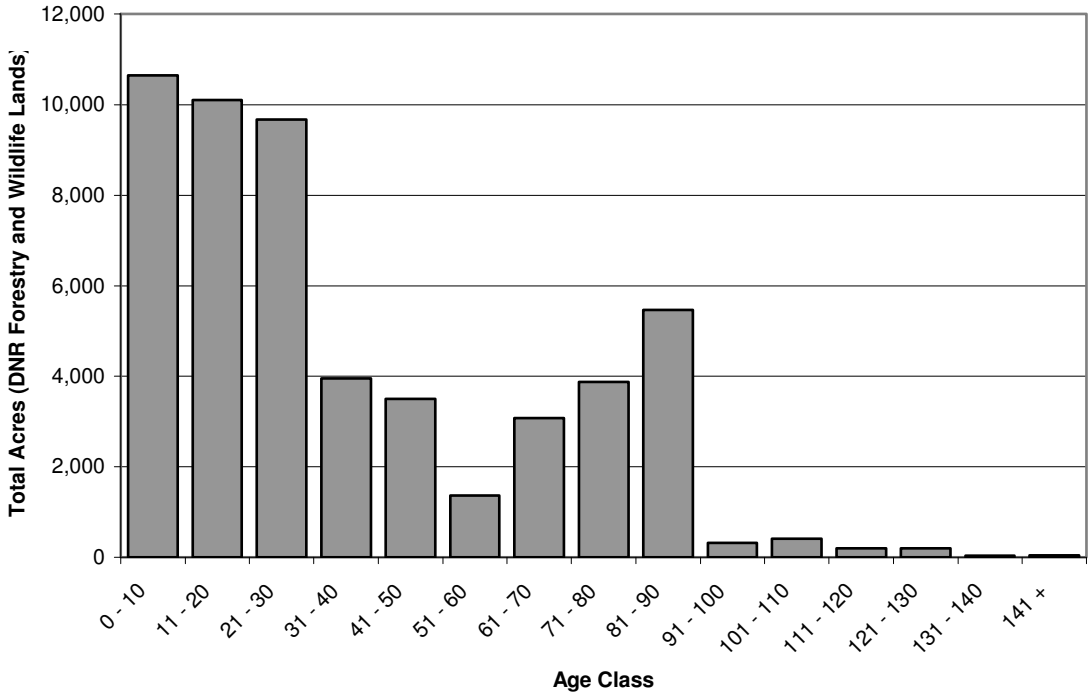
Non-Forested Communities
APn90, APn91, MRn83, **OPn81, OPn92**, WMn73, **WMn82**, FPn73

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains 19 old growth stands with associated OFMCs, 232 acres of EILC, and 18,522 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (52,854 total acres).



Patch Dynamics

This LTA contains 5 designated forest patches on state forestry and wildlife lands. They include an upland conifers patch (Teepee Lakes Pine) and 4 upland hardwood patches (Pineview, Teepee Lakes Hardwoods, Parkway, and Refuge).

Itasca Moraine Steep (212Nc30)

	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	144,718	60.5	Aspen	44,477	78.1	1.3	Aspen	2.29	-7.9%
				Balm of Gilead	31	0.1		Balm of Gilead	5.50	
				Birch	841	1.5		Paper Birch	1.90	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	4,853	2.0	Northern Hardwoods[4]	767	1.3	-1.5	Sugar Maple	1.55	-10.8%
								Red Maple	11.00	
								Basswood	4.25	
								Yellow Birch	0.00	
	Bur/White Oak	4,566	1.9	Oak	1,268	2.2	-3.9	Bur Oak	4.71	PMOP -10.9%
	Red Oak	16,381	6.9					Red Oak	1.95	
	Upland Deciduous	2,215	0.9	Offsite Oak	28	0.0				
	Group Sum	172,732	**72.3**	Group Sum	47,412	**83.2**	1.2			
LOWLAND DECIDUOUS	Black Ash	1,105	0.5	Ash	332	0.6	1.3	Ash	4.50	-10.7%
	Lowland Deciduous	396	0.2	Lowland Hardwood	12	0.0	-7.9	Elm	1.14	
	Group Sum	1,500	**0.6**	Group Sum	344	**0.6**	-1.0			
UPLAND CONIFERS	White Pine mix	1,255	0.5	White Pine	446	0.8	1.5	White Pine	-4.90	112.4%
	Red Pine	7,781	3.3	Norway Pine[5]	2,899	5.1	1.6	Red Pine	-7.07	17.1%
	Red/White Pine	887	0.4							
	Red/White Pine-Deciduous mix	228	0.1							
	Jack Pine	4,946	2.1	Jack Pine	263	0.5	-4.5	Jack Pine	-7.69	84.4%
	Jack Pine-Deciduous mix	200	0.1							
	White Spruce	113	0.0	White Spruce	740	1.3	27.4	White Spruce	-1.17	2.0%
	Balsam Fir mix	632	0.3	Balsam Fir	140	0.2	-1.1	Balsam Fir	3.40	-3.3%
	Spruce/Fir-Deciduous mix	15	0.0							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	0	0.0				0.0%
	Upland Northern White-Cedar	58	0.0							
	Upland Conifer	268	0.1							
	Group Sum	16,384	**6.9**	Group Sum	4,488	**7.9**	1.1			
LOWLAND CONIFERS	Lowland Black Spruce	891	0.4	Black Spruce, Lowland	121	0.2	-1.8	Black Spruce	5.50	0.0%
	Tamarack	1,007	0.4	Tamarack	158	0.3	-1.5	Tamarack	-10.25	5.4%
	Lowland Northern White-Cedar	659	0.3	Northern White Cedar	232	0.4	1.5	Cedar	2.50	5.3%
	Group Sum	2,558	**1.1**	Group Sum	510	**0.9**	-1.2			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	53	0.1				
	Stagnant Tamarack	63	0.0	Stagnant Tamarack	24	0.0	1.6			
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	22	0.0				
	Stagnant Conifer	32	0.0							
	Group Sum	95	**0.0**	Group Sum	99	**0.2**	4.4			
SHRUBLAND	Upland Shrub	7,330	3.1	Upland Brush	281	0.5	-3.7			
				Cutover Area	185	0.3				
	Lowland Deciduous Shrub	4,609	1.9	Lowland Brush	356	0.6	-3.1			
	Lowland Evergreen Shrub	49	0.0	Muskeg	120	0.2	10.2			
	Group Sum	11,988	**5.0**	Group Sum	941	**1.7**	-3.0			
AQUATIC	Water	13,518	5.7	Permanent Water	1,295	2.3				
	Floating Aquatic	132	0.1	Non-Permanent Water	352	0.6				
	Broadleaf Sedge/Cattail	3,603	1.5	Marsh	682	1.2	-1.3			
	Sedge Meadow	4,244	1.8	Lowland Grass	109	0.2	-9.3			
	Group Sum	21,497	**9.0**	Group Sum	2,439	**4.3**	-2.1			
CROP/GRASS	Cropland	6,854	2.9	Agricultural	0	0.0				
	Grassland	4,800	2.0	Upland Grass	57	0.1	-19.9			
	Prairie	0	0.0							
	Group Sum	11,655	**4.9**	Group Sum	57	**0.1**	-48.3			
DEVELOPED	Low Intensity Urban	286	0.1	Development[6]	141	0.2	1.3			
	High Intensity Urban	167	0.1							
	Mixed Developed	0	0.0							
	Transportation	134	0.1	Roads	191	0.3	6.0			
	Group Sum	587	**0.2**	Group Sum	332	**0.6**	2.4			
	Other[7]	78	0.0	Other[8]	334	0.6				
	LTA TOTAL	239,074	100.0	LTA TOTAL	56,957	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Two Inlets Moraine (212Nc31)

OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A rolling to hummocky landscape dominated by a complex of outwash plains and end moraines formed by the Wadena Lobe Glacier. Ice-walled lake features are common in the east half of township 142 to 37 and the west half of township 142 to 36. Uplands occupy 73 percent, wetlands occupy 18 percent, and lakes occupy 9 percent of the LTA (MN DNR, 1998). Soil parent material is loamy till with stones and hardpans on the moraines. Sandy soils are dominant on outwash plains and inclusions in the moraines. Ice-wall lake features have sandy or loamy soils on the hillsides and silts and/or clays on the flat tops. All soils formed under forest vegetation.

The majority of the upland pre-settlement vegetation was dry pine (41 percent) and dry-mesic pine (21 percent) (Shadis, 1999 and Marschner, 1974). The majority of lowland pre-settlement vegetation was conifer bog and swamp (Marschner, 1974).

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is private (47.0%), followed by county (34.2%), and state (18.2%). See table below. This LTA is located in Hubbard, Clearwater, and Becker counties. Over 26,176 acres of protected waters exist inside the LTA. Lakes within or adjacent to the LTA include Long Lost, Bad Medicine, Little Mantrap, Potato, Fish Hook, Many Point, and Round.

The west half of the LTA is inside White Earth Indian Reservation. Federal, state, county, and private industrial lands are scattered throughout the LTA. The majority of

the LTA's public lands are state and county forestlands. Most state lands occur within the south central portion of the LTA, while the bulk of county lands are situated in the west half. Potlatch Corporation land holdings are found primarily in the LTA's east half. There are no municipalities in the LTA, but Park Rapids is its nearest city.

Agency (%)	Acres	Percent
State (18.2%)		
DNR, Ecological Resources	66	0.1%
DNR, Fish and Wildlife	165	0.1%
DNR, Forestry	20,081	16.6%
DNR, Parks	1,721	1.4%
County (34.2%)		
Becker	33,272	27.5%
Clearwater	2,596	2.1%
Hubbard	5,523	4.6%
Federal (0.2%)		
Other	254	0.2%
Other Public (0.1%)		
School District	162	0.1%
Private (47.0%)		
Private	54,957	45.4%
Private Industrial	1,927	1.6%
Tribal (0.2%)		
White Earth Reservation	244	0.2%
Grand Total	**120,968 acres**	

* note - 12,269 acres of open water are included in the table above

Natural Resource Management Units

Federal

None known

State

Minnesota Department of Natural Resources

- State Forests: White Earth (southeast portion), Two Inlets (nearly all)
- Wildlife Management Areas: Gardner Lake, Long Lost Lake, Glanders Lake, Long Lost Lake South, Frellsen Lake
- Fish Management Areas: Lost Lake
- Scientific and Natural Areas: Greenwater Lake
- State Parks: Itasca

County

None known

Other

White Earth Indian Reservation

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (23%), Conifer Bogs and Swamps (6%), Jack Pine Barrens and Openings (42%), Lakes (open water) (7%), and Mixed White Pine and Red Pine (21%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-182, pine openings, pine barrens, scattered pine-14, scattering oak, scattering timber-3, thicket, brush, underbrush or only tree around-3, lake, slough, pond-63, river, creek, bottom, or valley, ravine-7, marsh or swamp-97, and burned area-1.

Bearing trees include: Ash-8, Aspen-239, Balm-of-Gilead-26, Balsam Fir-12, Basswood-6, Birch-46, Elm-12, Ironwood-2, Maple-3, Sugar Maple-6, Oak-19, Bur Oak-11, Red Oak-10, Jack Pine-468, Red Pine-248, White Pine-77, Spruce-33, Tamarack-192, and Willow-1.

Current Land Cover

As referenced from table on page 6:

- Top five GAP land cover classes on all ownerships (131,748 total acres):
  Aspen/White Birch (41.5%), Water (10.1%), Jack Pine (7.1%), Cropland (6.3%), and Lowland Deciduous Shrub (5.0%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (21,508 total acres):
  Aspen (37.5 %), Norway Pine (15.9%), Marsh (7.6%), Jack Pine (5.1%), and Tamarack (4.8%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 13.2 times more White Spruce, 5.7 times more Balsam Fir, 4.7 times more Norway Pine, 3.0 times more Marsh, 1.9 times more Tamarack, and 2.6 times less in the Lowland Grass group.

Changes in Tree Species Composition

As referenced from table on page 6, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 6.0 times more Red Oak, 4.6 times more Ash, 3.6 times more Balsam Fir, 3.1 times more Paper Birch, 3.0 times more Basswood, 3.0 times more Bur Oak, 2.5 times more Aspen, 2.3 times more Black Spruce, 2.0 times

more Elm, 2.2 times less Red Pine, 2.5 times less Jack Pine, 4.0 times less White Pine, 4.1 times less Tamarack, and 7.0 times less White Spruce in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 6. This is a priority LTA for Jack Pine, Norway Pine, White Pine, and White Spruce cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry Pine, Dry-Mesic Pine, and Dry-Mesic Pine/Oak. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

Upland Forests

FDn12, FDn33, **FDc12**, FDc23, **FDc24, FDc34, MHn35**, MHn44, **MHn47**, MHc26, **MHc36, MHc37**

Wetland Forests

FFn67, WFn53, WFn55, WFn64, **FPn63, FPn82,** APn81

Non-Forested Communities

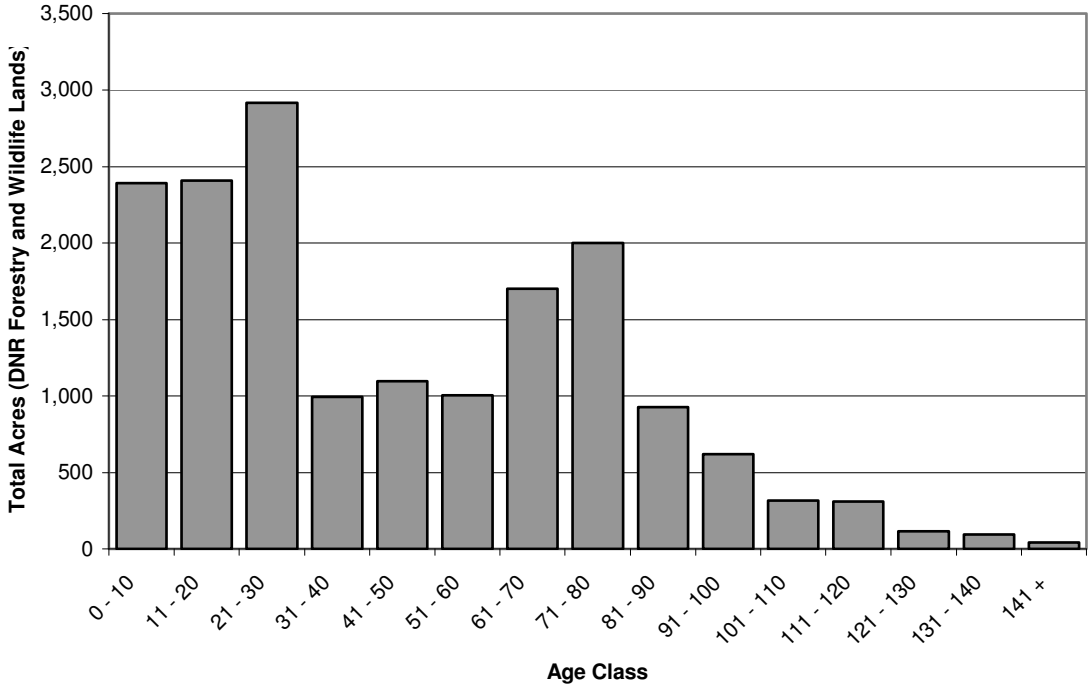
APn91, OPn81, OPn91, OPn92, WMn73, WMn82, FPn73

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains 5 old growth stands with associated OFMCs, 123 acres of EILC, and 7,386 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (16,942 total acres).



Patch Dynamics

This LTA contains 6 designated forest patches on state forestry and wildlife lands. They include 5 upland conifer patches (Indian Creek (Fir), Bad Medicine Lake, Hungry Man, Fool's Lake, and Small Lake) and a lowland conifers patch (Indian Creek).

Two Inlets Moraine (212Nc31)										
	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	54,696	41.5	Aspen	8,063	37.5	-1.1	Aspen	2.48	-7.9%
				Balm of Gilead	0	0.0		Balm of Gilead	-1.06	
				Birch	327	1.5		Paper Birch	3.13	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	1,243	0.9	Northern Hardwoods[4]	147	0.7	-1.4	Sugar Maple	1.50	-10.8%
								Red Maple	0.00	
								Basswood	3.00	
								Yellow Birch	0.00	
	Bur/White Oak	4,041	3.1	Oak	116	0.5	-7.9	Bur Oak	2.95	PMOP -10.9%
	Red Oak	1,536	1.2					Red Oak	6.00	
	Upland Deciduous	0	0.0	Offsite Oak	22	0.1				
	Group Sum	61,516	**46.7**	Group Sum	8,676	**40.3**	-1.2			
LOWLAND DECIDUOUS	Black Ash	2,140	1.6	Ash	384	1.8	1.1	Ash	4.60	-10.7%
	Lowland Deciduous	0	0.0	Lowland Hardwood	21	0.1		Elm	2.00	
	Group Sum	2,140	**1.6**	Group Sum	405	**1.9**	1.2			
UPLAND CONIFERS	White Pine mix	401	0.3	White Pine	60	0.3	-1.1	White Pine	-4.00	112.4%
	Red Pine	4,439	3.4	Norway Pine[5]	3,416	15.9	4.7	Red Pine	-2.23	17.1%
	Red/White Pine	0	0.0							
	Red/White Pine-Deciduous mix	0	0.0							
	Jack Pine	9,337	7.1	Jack Pine	1,086	5.1	-1.4	Jack Pine	-2.49	84.4%
	Jack Pine-Deciduous mix	0	0.0							
	White Spruce	436	0.3	White Spruce	940	4.4	13.2	White Spruce	-7.00	2.0%
	Balsam Fir mix	1,005	0.8	Balsam Fir	939	4.4	5.7	Balsam Fir	3.63	-3.3%
	Spruce/Fir-Deciduous mix	0	0.0							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	0	0.0				0.0%
	Upland Northern White-Cedar	0	0.0							
	Upland Conifer	0	0.0							
	Group Sum	15,618	**11.9**	Group Sum	6,441	**29.9**	2.5			
LOWLAND CONIFERS	Lowland Black Spruce	1,264	1.0	Black Spruce, Lowland	288	1.3	1.4	Black Spruce	2.25	0.0%
	Tamarack	3,316	2.5	Tamarack	1,034	4.8	1.9	Tamarack	-4.06	5.4%
	Lowland Northern White-Cedar	23	0.0	Northern White Cedar	29	0.1	7.5	Cedar	0.00	5.3%
	Group Sum	4,603	**3.5**	Group Sum	1,350	**6.3**	1.8			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	0	0.0				
	Stagnant Tamarack	351	0.3	Stagnant Tamarack	69	0.3	1.2			
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	0	0.0				
	Stagnant Conifer	0	0.0							
	Group Sum	351	**0.3**	Group Sum	69	**0.3**	1.2			
SHRUBLAND	Upland Shrub	5,938	4.5	Upland Brush	24	0.1	-2.9			
				Cutover Area	313	1.5				
	Lowland Deciduous Shrub	6,528	5.0	Lowland Brush	999	4.6	-1.1			
	Lowland Evergreen Shrub	0	0.0	Muskeg	3	0.0				
	Group Sum	12,467	**9.5**	Group Sum	1,339	**6.2**	-1.5			
AQUATIC	Water	13,276	10.1	Permanent Water	994	4.6				
	Floating Aquatic	35	0.0	Non-Permanent Water	135	0.6				
	Broadleaf Sedge/Cattail	3,296	2.5	Marsh	1,631	7.6	3.0			
	Sedge Meadow	4,552	3.5	Lowland Grass	289	1.3	-2.6			
	Group Sum	21,159	**16.1**	Group Sum	3,049	**14.2**	-1.1			
CROP/GRASS	Cropland	8,305	6.3	Agricultural	0	0.0				
	Grassland	5,574	4.2	Upland Grass	48	0.2	-19.1			
	Prairie	0	0.0							
	Group Sum	13,879	**10.5**	Group Sum	48	**0.2**	-47.5			
DEVELOPED	Low Intensity Urban	1	0.0	Development[6]	12	0.1	107.4			
	High Intensity Urban	0	0.0							
	Mixed Developed	0	0.0							
	Transportation	0	0.0	Roads	119	0.6				
	Group Sum	1	**0.0**	Group Sum	131	**0.6**	1196.7			
	Other[7]	14	0.0	Other[8]	0	0.0				
	LTA TOTAL	131,748	100.0	LTA TOTAL	21,508	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Bass Lake Moraine (212Nc32)

OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A rolling to hummocky landscape dominated by end moraines and pitted outwash plains formed by the Red River Lobe Glacier. A few outwash channels are present. Uplands occupy 85 percent, wetlands occupy 9 percent, and lakes occupy 6 percent of the LTA (MN DNR, 1998). Soil parent material is coarse loamy (sandy loam) till with hardpans and sandy outwash. Soils formed under forest vegetation.

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is county (58.2%), followed by federal (15.3%), state (14.4%), private (8.5), and tribal (3.5%). See table below. This LTA is located in Mahnomen, Clearwater, and Becker counties. Over 5,727 acres of protected waters exist inside the LTA. Lakes within or adjacent to the LTA include Bass, Upper and Lower Camp, Big Rock, Long Lost, and Elbow.

Most of the LTA is inside White Earth Indian Reservation. Federal, state, and county lands are distributed throughout the LTA. The majority of state land is situated in the LTA's central portion. County lands are primarily found in the east half of the LTA, of which most is contiguous. There are no USFS lands, private industrial forestlands, or municipalities in the LTA.

Agency (%)	Acres	Percent
State (14.4%)		
DNR, Fish and Wildlife	210	0.4%

DNR, Forestry	6,573	13.8%
State (Undifferentiated)	74	0.2%
County (58.2%)		
Becker	26	0.1%
Clearwater	27,285	57.5%
Mahnomen	324	0.7%
Federal (15.3%)		
Bureau of Indian Affairs	6,840	14.4%
Other	64	0.1%
White Earth Reservation	375	0.8%
Private (8.5%)		
Private	4,045	8.5%
Tribal (3.5%)		
White Earth Reservation	1,670	3.5%
Grand Total	**47,486 acres**	

* note - 2,978 acres of open water are included in the table above

Natural Resource Management Units

Federal

None known

State

Minnesota Department of Natural Resources

- State Forests: White Earth (central and south central portions)
- Wildlife Management Areas: Upper Camp Lake, Wapatus Lake, McKenzie lake, Little Rock Lake, Island Lake, Little Bass Lake, Pickerel Lake
- Aquatic Management Areas: Elbow Lake Creek

County

None known

Other

White Earth Indian Reservation

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (15%), Aspen-Birch (trending to hardwoods) (7%), and Mixed White Pine and Red Pine (68%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-174, pine openings, pine barrens, scattered pine-3, lake, slough, pond-12, marsh or swamp-17, windthrow, windfall-4, and burned area-27.

Bearing trees include: Ash-3, Aspen-151, Balm-of-Gilead-20, Balsam Fir-5, Basswood-14, Birch-27, Elm-15, Ironwood-8, Maple-5, Sugar Maple-30, Oak-25, Bur Oak-12, Red Oak-22, Pine-1, Jack Pine-27, Red Pine-66, White Pine-117, Spruce-23, and Tamarack-23.

Current Land Cover

As referenced from table on page 5:

- Top five GAP land cover classes on all ownerships (50,008 total acres):
  Aspen/White Birch (51.5%), Maple/Basswood (11.7%), Red Oak (8.7%), Bur/White Oak (7.7%), and Water (7.5%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (7,546 total acres):
  Aspen (52.1 %), Northern Hardwoods (22.0%), Permanent Water (8.0%), Norway Pine (4.4%), and Marsh (4.1%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 3.8 times more Norway Pine, 3.7 times more Marsh, 1.9 times more Northern Hardwoods, and 15.0 times less in the Oak group.

Changes in Tree Species Composition

As referenced from table on page 5, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 4.8 times more Basswood, 2.2 times more Paper Birch, 1.9 times more Sugar Maple, 2.0 times less Balsam Fir, 5.0 times less White Spruce, 6.6 times less Red Pine, 9.8 times less Tamarack, 11.5 times less Jack Pine, and 16.3 times less White Pine in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 5. This is a priority LTA for White Pine cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry-Mesic Pine and Dry-Mesic Pine/Oak. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

Upland Forests

FDc24, **FDc34, MHn35, MHc26**, MHc37

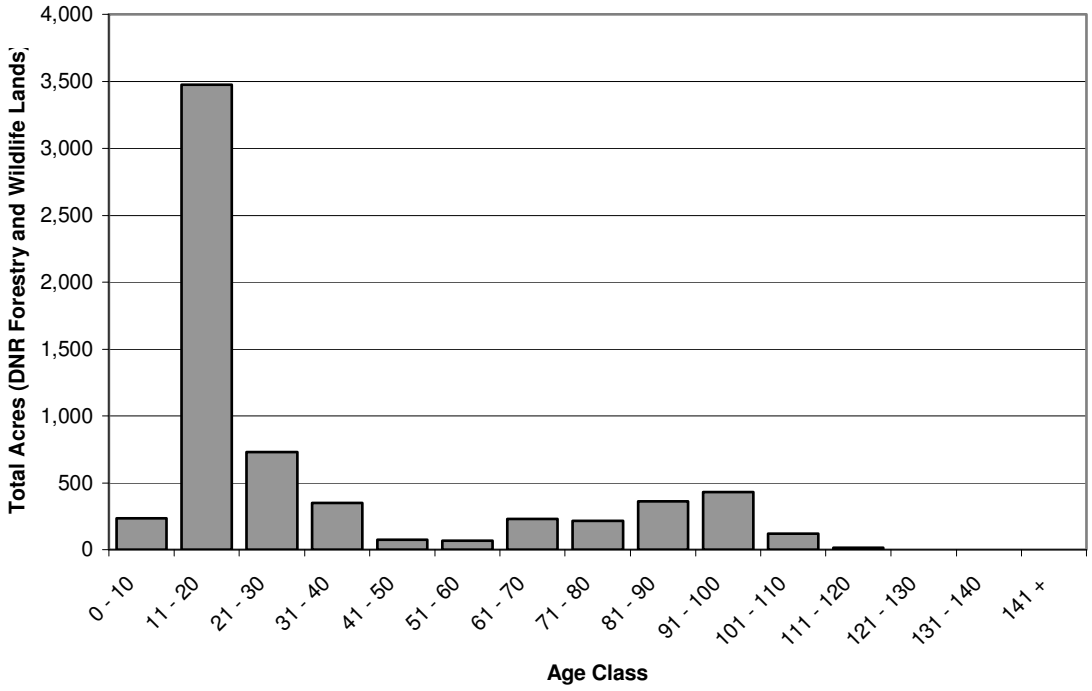
Wetland Forests
FFn67, WFn53, WFn55, WFn64, FPn82, **FPs63,** APn80, APn81
Non-Forested Communities
OPn81, WMn82

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains 21 old growth stands with associated OFMCs, 14 acres of EILC, and 3,135 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (6,310 total acres).



Patch Dynamics

This LTA contains 2 designated forest patches on state forestry and wildlife lands. They include an upland conifers patch (LaPrairie Conifers) and an upland hardwoods patch (LaPrairie Hardwoods).

Bass Lake Moraine (212Nc32)

	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	25,769	51.5	Aspen	3,931	52.1	1.0	Aspen	1.80	-7.9%
				Balm of Gilead	0	0.0		Balm of Gilead	-1.72	
				Birch	44	0.6		Paper Birch	2.23	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	5,846	11.7	Northern Hardwoods[4]	1,661	22.0	1.9	Sugar Maple	1.90	-10.8%
								Red Maple	0.00	
								Basswood	4.83	
								Yellow Birch	0.00	
	Bur/White Oak	3,841	7.7	Oak	83	1.1	-15.0	Bur Oak	-1.08	PMOP -10.9%
	Red Oak	4,371	8.7					Red Oak	1.55	
	Upland Deciduous	154	0.3	Offsite Oak	0	0.0				
	Group Sum	39,982	**80.0**	Group Sum	5,719	**75.8**	-1.1			
LOWLAND DECIDUOUS	Black Ash	457	0.9	Ash	7	0.1	-9.4	Ash	1.40	-10.7%
	Lowland Deciduous	12	0.0	Lowland Hardwood	0	0.0		Elm	1.30	
	Group Sum	470	**0.9**	Group Sum	7	**0.1**	-9.6			
UPLAND CONIFERS	White Pine mix	28	0.1	White Pine	33	0.4	8.0	White Pine	-16.25	112.4%
	Red Pine	576	1.2	Norway Pine[5]	330	4.4	3.8	Red Pine	-6.59	17.1%
	Red/White Pine	0	0.0							
	Red/White Pine-Deciduous mix	3	0.0							
	Jack Pine	166	0.3	Jack Pine	0	0.0		Jack Pine	-11.50	84.4%
	Jack Pine-Deciduous mix	0	0.0							
	White Spruce	57	0.1	White Spruce	119	1.6	13.8	White Spruce	-5.00	2.0%
	Balsam Fir mix	73	0.1	Balsam Fir	70	0.9	6.4	Balsam Fir	-2.00	-3.3%
	Spruce/Fir-Deciduous mix	0	0.0							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	0	0.0				0.0%
	Upland Northern White-Cedar	0	0.0							
	Upland Conifer	12	0.0							
	Group Sum	914	**1.8**	Group Sum	552	**7.3**	4.0			
LOWLAND CONIFERS	Lowland Black Spruce	14	0.0	Black Spruce, Lowland	0	0.0		Black Spruce	0.00	0.0%
	Tamarack	81	0.2	Tamarack	32	0.4	2.6	Tamarack	-9.75	5.4%
	Lowland Northern White-Cedar	0	0.0	Northern White Cedar	0	0.0		Cedar	0.00	5.3%
	Group Sum	95	**0.2**	Group Sum	32	**0.4**	2.2			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	0	0.0				
	Stagnant Tamarack	61	0.1	Stagnant Tamarack	0	0.0				
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	0	0.0				
	Stagnant Conifer	0	0.0							
	Group Sum	61	**0.1**	Group Sum	0	**0.0**				
SHRUBLAND	Upland Shrub	1,308	2.6	Upland Brush	48	0.6	-4.1			
				Cutover Area	0	0.0				
	Lowland Deciduous Shrub	980	2.0	Lowland Brush	94	1.3	-1.6			
	Lowland Evergreen Shrub	0	0.0	Muskeg	0	0.0				
	Group Sum	2,288	**4.6**	Group Sum	143	**1.9**	-2.4			
AQUATIC	Water	3,748	7.5	Permanent Water	607	8.0				
	Floating Aquatic	12	0.0	Non-Permanent Water	141	1.9				
	Broadleaf Sedge/Cattail	553	1.1	Marsh	310	4.1	3.7			
	Sedge Meadow	710	1.4	Lowland Grass	18	0.2	-5.9			
	Group Sum	5,022	**10.0**	Group Sum	1,077	**14.3**	1.4			
CROP/GRASS	Cropland	510	1.0	Agricultural	0	0.0				
	Grassland	660	1.3	Upland Grass	0	0.0				
	Prairie	0	0.0							
	Group Sum	1,170	**2.3**	Group Sum	0	**0.0**				
DEVELOPED	Low Intensity Urban	0	0.0	Development[6]	4	0.1				
	High Intensity Urban	0	0.0							
	Mixed Developed	0	0.0							
	Transportation	0	0.0	Roads	6	0.1				
	Group Sum	0	**0.0**	Group Sum	10	**0.1**				
	Other[7]	7	0.0	Other[8]	6	0.1				
	LTA TOTAL	50,008	100.0	LTA TOTAL	7,546	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

Naytahwaush Moraine (212Nc34)

OVERVIEW

Information presented in this document is specific to this LTA with some reference to the larger ECS subsection. This summary was written to provide additional forest management information in this landscape and includes the following main sections: overview, description, land management, and vegetation. See the LTA Assessment and Analysis Guide for section explanations, data descriptions, acronyms, and references.

DESCRIPTION

A landscape dominated by a rolling end moraine that is dissected by outwash channels. The Red River Lobe Glacier formed all features. Uplands occupy 81 percent, wetlands occupy 11 percent, and lakes occupy 8 percent of the LTA (MN DNR, 1998). Soil parent material is coarse loamy (sandy loam) outwash and till. Stones and hardpans are common. Soils have formed under forest vegetation.

LAND MANAGEMENT

Land Stewardship

Based on GAP stewardship data, the majority of this LTA is federal (47.1%), followed by county (21.2%), private (18.4%), state (12.1%), and tribal (1.2%). See table below. This LTA is located in Mahnomen, Clearwater, and Becker counties. Over 7,290 acres of protected waters exist inside the LTA. Lakes within or adjacent to the LTA include Roy, North and South Twin, Snider, Big Rat, Strawberry, and Tulaby.

The entire LTA is inside White Earth Indian Reservation. Federal, state, and county lands are spread throughout the LTA. Most state lands are located in the central portion of the LTA, while county forestlands are found primarily in the south one third. There are no USFS lands, private industrial forestlands, or municipalities in the LTA.

Agency (%)	Acres	Percent
State (12.1%)		
DNR, Fish and Wildlife	111	0.2%
DNR, Forestry	5,219	10.4%
DNR, Parks	96	0.2%

Mahnomen	11	0.0%
Other	196	0.4%
State (Undifferentiated)	422	0.8%
County (21.2%)		
Becker	8,497	16.9%
Clearwater	1,563	3.1%
Mahnomen	483	1.0%
Other	83	0.2%
Federal (47.1%)		
Bureau of Indian Affairs	18,813	37.5%
Other	2,310	4.6%
U.S. Fish and Wildlife Service	392	0.8%
White Earth Reservation	2,112	4.2%
Private (18.4%)		
Private	9,209	18.4%
Tribal (1.2%)		
White Earth Reservation	619	1.2%
Grand Total	**50,136 acres**	

* note - 4,360 acres of open water are included in the table above

Natural Resource Management Units

Federal

United States Fish and Wildlife Service

- National Wildlife Refuges: Tamarac

State

Minnesota Department of Natural Resources

- State Forests: White Earth (north central and southwest portions)
- Wildlife Management Areas: Roy Lake, Lower Rice
- Fish Management Areas: Strawberry Lake

County

None known

Other

White Earth Indian Reservation

VEGETATION

Pre-settlement Vegetation and Tree Species

The major Pre-settlement Vegetation types in this LTA include: Aspen-Birch (trending to Conifers) (12%), Aspen-Birch (trending to hardwoods) (6%), Conifer Bogs and Swamps (7%), Lakes (open water) (7%), and Mixed White Pine and Red Pine (61%).

The following list contains the number of section corner notes from the original Public Land Survey by vegetation/landscape characteristic within this LTA, forest, timber-92, pine openings, pine barrens, scattered pine-20, scattering oak, scattering timber-18, lake,

slough, pond-24, river, creek, bottom, or valley, ravine-1, marsh or swamp-21, wet prairie or prairie-2, windthrow, windfall-3, and burned area-66.

Bearing trees include: Ash-3, Aspen-100, Balm-of-Gilead-21, Balsam Fir-12, Basswood-19, Birch-17, Elm-39, Ironwood-1, Maple-3, Sugar Maple-25, Oak-30, Bur Oak-44, Red Oak-19, Pine-3, Jack Pine-12, Red Pine-28, White Pine-132, Spruce-15, and Tamarack-53.

Current Land Cover

As referenced from table on page 5:

- Top five GAP land cover classes on all ownerships (51,145 total acres):
  Aspen/White Birch (45.1%), Bur/White Oak (9.9%), Water (9.1%), Maple/Basswood (8.0%), and Red Oak (6.6%).

- Top five CSA main cover types on DNR Forestry and Wildlife land (5,167 total acres):
  Aspen (44.3 %), Northern Hardwoods (9.1%), Oak (6.9%), Norway Pine (6.3%), and Lowland Brush (4.4%).

- Significant percentage differences in land cover between DNR Forestry and Wildlife land and all ownerships:
  DNR land has 13.7 times more Balsam Fir, 11.6 times more Norway Pine, 1.1 times more Northern Hardwoods, and 2.4 times less in the Oak group.

Changes in Tree Species Composition

As referenced from table on page 5, the following tree species were or are a significant component of the forest and their abundance has changed significantly since the original land survey (magnitude of change calculated by comparing FIA data to original bearing trees):

There is currently 4.1 times more Ash, 2.5 times more Aspen, 1.9 times more Basswood, 3.1 times less Tamarack, 4.0 times less Red Pine, and 110.5 times less White Pine in this LTA.

50-year Main Cover Type Goals

See main cover type 50-year goals in table on page 5. This is a priority LTA for White Pine cover type increase.

Potential Forest Ecosystem Types and Native Plant Communities

This LTA contains the following forest ecosystem types: Dry-Mesic Pine. The following Native Plant Communities Classes are known to occur in this LTA **(bold text)** or occur in similar LTAs.

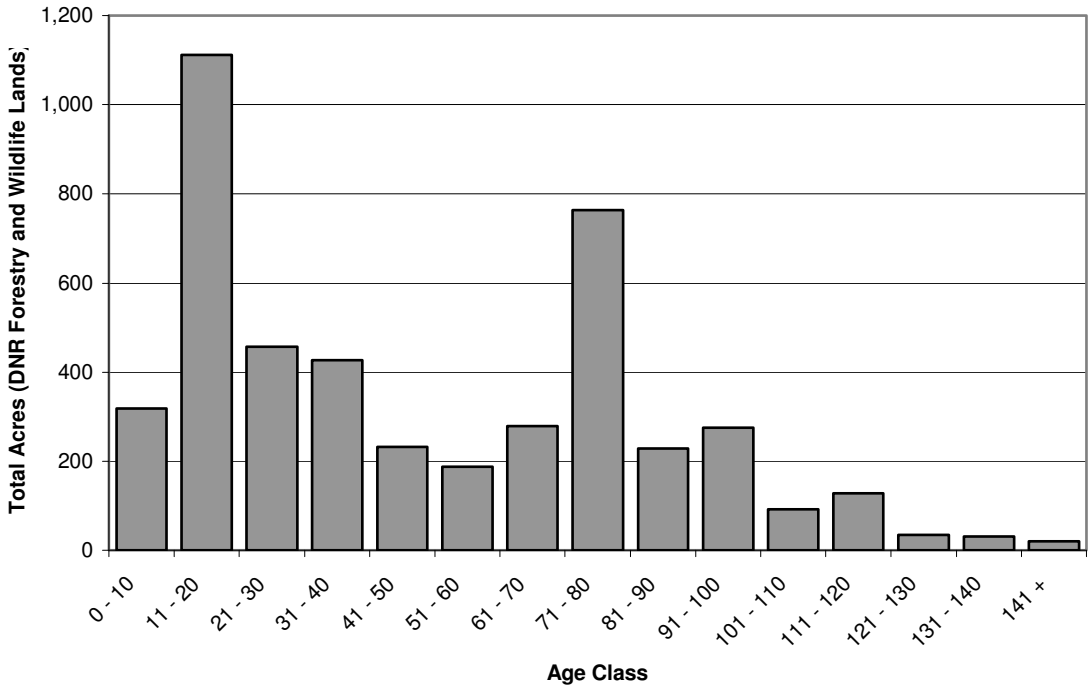
Upland Forests
FDc24, FDc34, MHn35, MHc26, MHc37
Wetland Forests
FFn67, **WFn53**, WFn55, **WFn64, FPn82,** FPs63, APn80, APn81
Non-Forested Communities
OPn81, WMn82

Old Growth, Ecologically Important Lowland Conifers, and Extended Rotation Forests

This LTA contains no old growth stands or associated OFMCs, 49 acres of EILC, and 1,356 acres of ERF on DNR Forestry and Wildlife land.

Age Classes

Figure below shows age-class distribution of all forested cover types in this LTA (4,589 total acres).



Patch Dynamics

This LTA contains 2 designated forest patches on state forestry and wildlife lands. They are upland conifer patches (South Little Elbow Conifers and North Little Elbow Conifers).

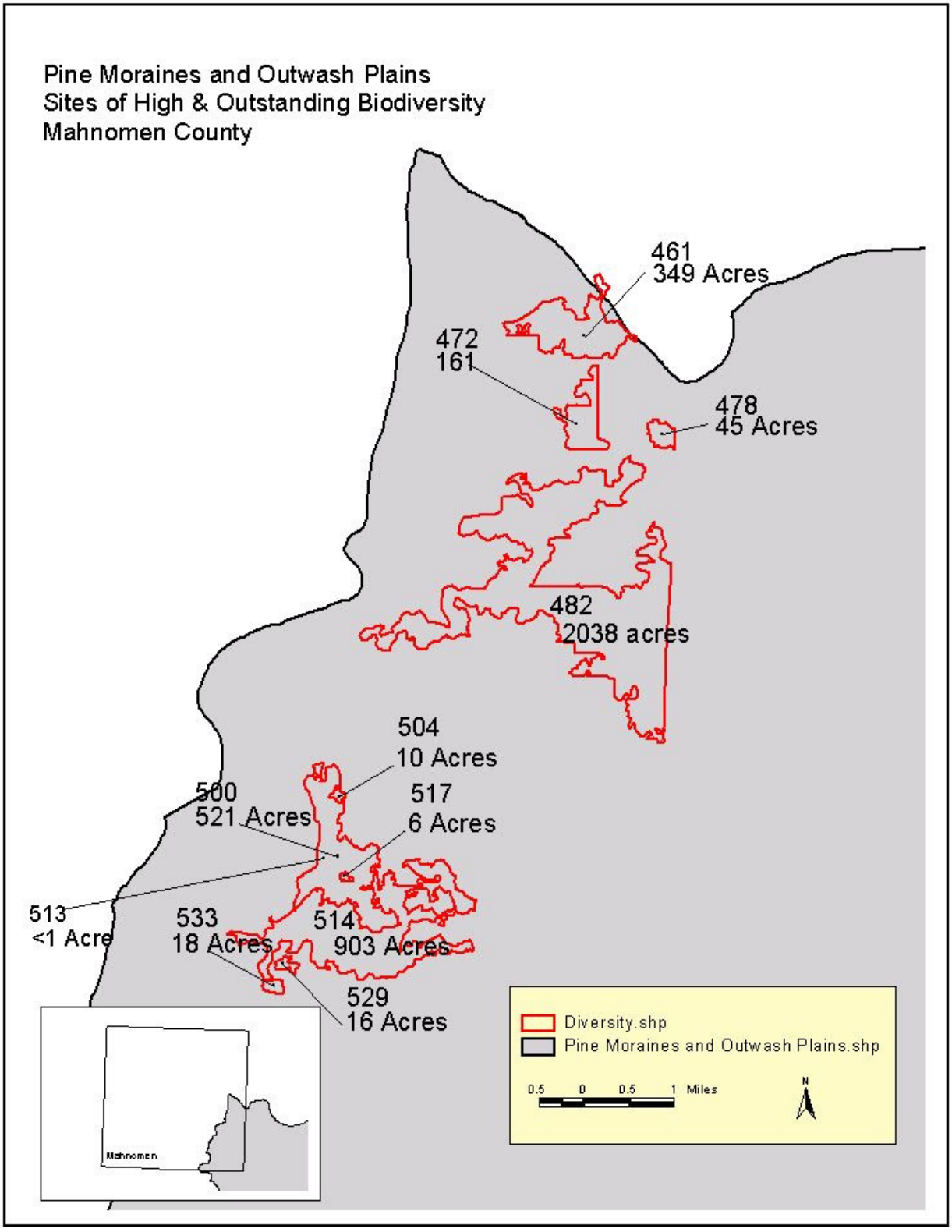
Naytahwaush Moraine (212Nc34)										
	Current GAP Land Cover[1] All Ownerships			Current CSA Land Cover[2] DNR Forestry and Wildlife			Comparison of DNR to All Ownerships[3]	Comparison of FIA data to Original Bearing Trees		CP-PMOP Cover Type 50-year Goal
GROUP	Land Cover Class	Acres	%	Main Cover Type	Acres	%		Tree Species	Change[3]	
UPLAND DECIDUOUS	Aspen/White Birch	23,041	45.1	Aspen	2,288	44.3	1.0	Aspen	2.49	-7.9%
				Balm of Gilead	0	0.0		Balm of Gilead	1.45	
				Birch	90	1.8		Paper Birch	1.69	PMOP -5.2%
				Offsite Aspen	0	0.0				
	Maple/Basswood	4,072	8.0	Northern Hardwoods[4]	470	9.1	1.1	Sugar Maple	1.07	-10.8%
								Red Maple	0.00	
								Basswood	1.94	
								Yellow Birch	0.00	
	Bur/White Oak	5,083	9.9	Oak	355	6.9	-2.4	Bur Oak	-1.80	PMOP -10.9%
	Red Oak	3,356	6.6					Red Oak	1.59	
	Upland Deciduous	529	1.0	Offsite Oak	0	0.0				
	Group Sum	36,082	**70.5**	Group Sum	3,203	**62.0**	-1.1			
LOWLAND DECIDUOUS	Black Ash	1,188	2.3	Ash	206	4.0	1.7	Ash	4.14	-10.7%
	Lowland Deciduous	95	0.2	Lowland Hardwood	196	3.8	20.5	Elm	1.66	
	Group Sum	1,283	**2.5**	Group Sum	402	**7.8**	3.1			
UPLAND CONIFERS	White Pine mix	4	0.0	White Pine	110	2.1	287.4	White Pine	-110.50	112.4%
	Red Pine	278	0.5	Norway Pine[5]	326	6.3	11.6	Red Pine	-4.00	17.1%
	Red/White Pine	5	0.0							
	Red/White Pine-Deciduous mix	46	0.1							
	Jack Pine	130	0.3	Jack Pine	6	0.1	-2.1	Jack Pine	1.19	84.4%
	Jack Pine-Deciduous mix	13	0.0							
	White Spruce	156	0.3	White Spruce	129	2.5	8.2	White Spruce	-1.25	2.0%
	Balsam Fir mix	140	0.3	Balsam Fir	194	3.7	13.7	Balsam Fir	1.21	-3.3%
	Spruce/Fir-Deciduous mix	3	0.0							
	Upland Black Spruce	0	0.0	Black Spruce, Upland	0	0.0				0.0%
	Upland Northern White-Cedar	1	0.0							
	Upland Conifer	46	0.1							
	Group Sum	822	**1.6**	Group Sum	764	**14.8**	9.2			
LOWLAND CONIFERS	Lowland Black Spruce	65	0.1	Black Spruce, Lowland	55	1.1	8.3	Black Spruce	-1.14	0.0%
	Tamarack	868	1.7	Tamarack	162	3.1	1.8	Tamarack	-3.07	5.4%
	Lowland Northern White-Cedar	2	0.0	Northern White Cedar	0	0.0		Cedar	0.00	5.3%
	Group Sum	935	**1.8**	Group Sum	216	**4.2**	2.3			
STAGNANT LOWLAND CONIFERS	Stagnant Black Spruce	0	0.0	Stagnant Spruce	0	0.0				
	Stagnant Tamarack	97	0.2	Stagnant Tamarack	0	0.0				
	Stagnant Northern White-Cedar	0	0.0	Stagnant Cedar	0	0.0				
	Stagnant Conifer	0	0.0							
	Group Sum	97	**0.2**	Group Sum	0	**0.0**				
SHRUBLAND	Upland Shrub	1,239	2.4	Upland Brush	7	0.1	-19.0			
				Cutover Area	0	0.0				
	Lowland Deciduous Shrub	1,287	2.5	Lowland Brush	226	4.4	1.7			
	Lowland Evergreen Shrub	0	0.0	Muskeg	0	0.0				
	Group Sum	2,525	**4.9**	Group Sum	232	**4.5**	-1.1			
AQUATIC	Water	4,644	9.1	Permanent Water	121	2.3				
	Floating Aquatic	0	0.0	Non-Permanent Water	58	1.1				
	Broadleaf Sedge/Cattail	479	0.9	Marsh	132	2.5	2.7			
	Sedge Meadow	839	1.6	Lowland Grass	5	0.1	-16.8			
	Group Sum	5,962	**11.7**	Group Sum	315	**6.1**	-1.9			
CROP/GRASS	Cropland	2,331	4.6	Agricultural	0	0.0				
	Grassland	1,019	2.0	Upland Grass	17	0.3	-6.2			
	Prairie	0	0.0							
	Group Sum	3,350	**6.6**	Group Sum	17	**0.3**	-20.3			
DEVELOPED	Low Intensity Urban	0	0.0	Development[6]	12	0.2				
	High Intensity Urban	0	0.0							
	Mixed Developed	0	0.0							
	Transportation	15	0.0	Roads	5	0.1	3.4			
	Group Sum	15	**0.0**	Group Sum	17	**0.3**	11.4			
	Other[7]	74	0.1	Other[8]	0	0.0				
	LTA TOTAL	51,145	100.0	LTA TOTAL	5,167	100.0				

Footnotes: 1. MN GAP data on all ownerships, 2. CSA data on DNR Forestry and Wildlife administered lands, 3. Magnitude of change (ex. -2.0 is a 2-fold decline and 4.5 is a 4.5-fold increase), 4. Includes Central Hardwoods, 5. Includes Scotch Pine, 6. Includes Industrial & Urban Development and Recreation Development, 7. Includes Barren and Lowland Conifer-Deciduous mix, 8. Includes Moss and Rock Outcrop

APPENDIX O

Areas of High or Outstanding Biodiversity
Within the Pine Moraines and Outwash Plains Subsection
(Morrison and Mahnomen Counties)

Name or Site Number	Rank in Diversity	MCBS Size Total Acres	Acres Administered by Forestry	Acres Within State Forest Boundaries
461	High	349	0	0
472	High	161	0	0
478	High	45	0	0
482	High	2038	243	0
500	High	521	90	426
504	High	10	0	0
513	High	1	1	1
514	High	903	355	903
517	High	6	6	6
529	High	16	0	16
533	High	18	12	18
942	High	3410	0	0
943	High	166	0	0
946	High	2675	0	0
949	High	223	0	0
953	High	2420	0	0
955	High	362	0	0
956	High	147	0	0
961	High	32	0	0
964	High	748	0	0
966	High	582	0	0
967	High	614	0	0
968	High	29	0	0
970	High	397	0	0
975	High	448	200	0
976	High	1979	0	0
989	High	208	0	0
994	High	2966	0	0
1002	High	1218	0	0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Sites of High & Outstanding Biodiversity
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478
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482
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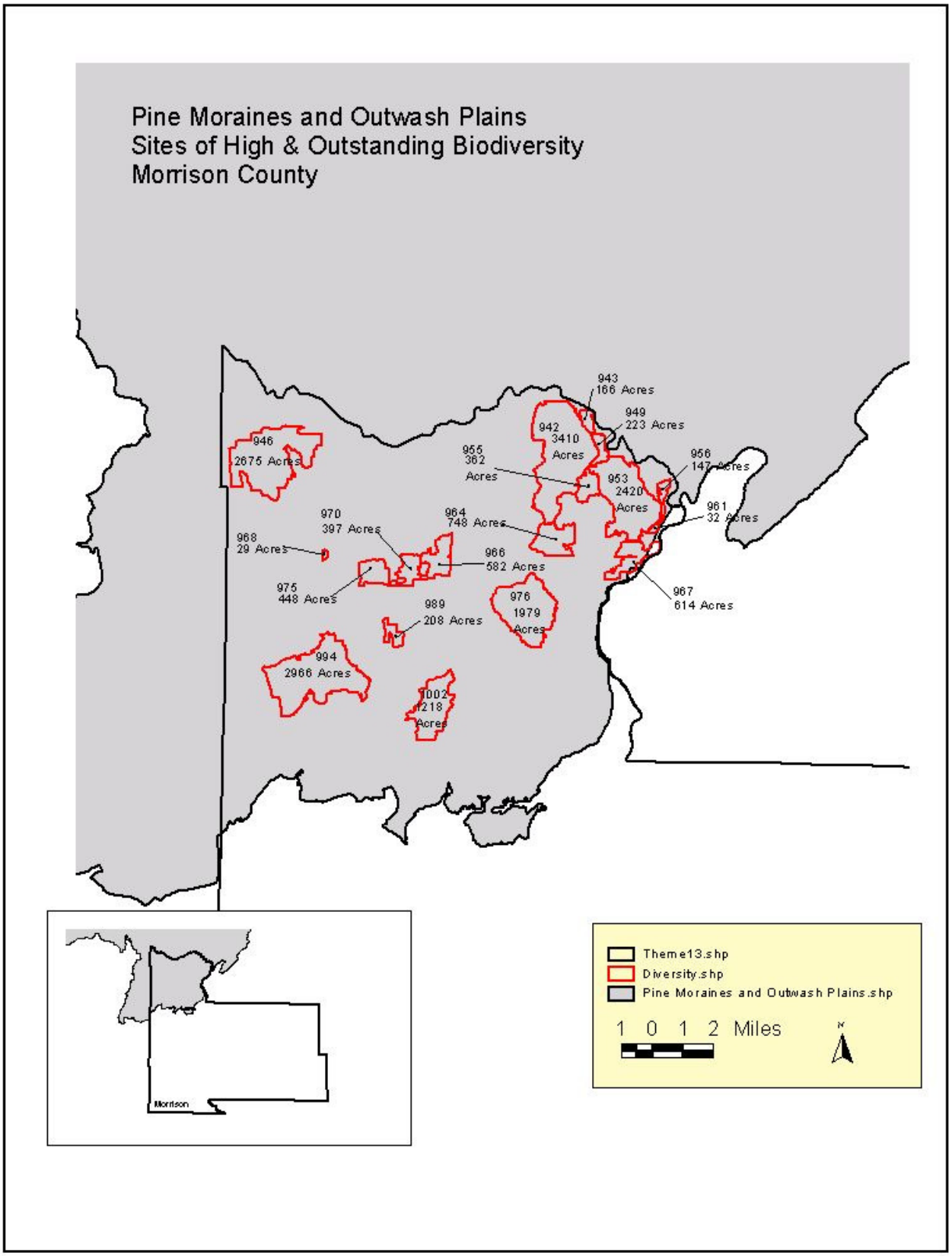
Pine Moraines and Outwash Plains
Sites of High & Outstanding Biodiversity
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942
3410
Acres
946
2675 Acres
955
362
Acres
956
147 Acres
953
2420
Acres
961
32 Acres
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397 Acres
964
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APPENDIX P

Special Management Areas and Priority Open Landscapes that were available or were considered during selection of the 10-Year Stand Exam Lists

Special Management Areas for specific wildlife species

Ruffed Grouse Management Areas
- Third River - 2 Sections T147 R29
- Sandstrom - 1 Section T149 R28
- Smoky Hills State Forest - 6 Sections T139 R37
- Two Inlets State Forest - 2 Sections T141 R36
- Paul Bunyan State Forest – 4 Sections T142 R33
- Buena Vista – 6 Sections T148 R33
- Port Hope – 4 Sections T148 R31&32

Prairie Chicken/Sandhill Crane Area 16 Sections T139 R32

Red-shouldered Hawk Management Area
- 3 Sections T140 R37/6 Sections T139 R37

Red-shouldered Hawk Priority LTAs
- A-ranked (highest priority) – 2 center units of Guthrie Till Plain (212Na03) and both units of St. Croix Moraine (212Nc02)
- B-ranked – none in these two subsections
- C-ranked (lower priority) – largest unit of Blackduck Moraine (212Na18), Bass Lake Moraine (212Nc32), Shell Lake Moraine (212Nc28), south unit of Itasca Moraine (212Nc16), and Crow Wing Sand Plain (212Nc01).

Northern Goshawk Territories
- 500 meter, 1 mile, and 3 mile buffers of nest sites

Special Management Areas for openlands

Mud-Goose WMA
White Oak
Mississippi River
Bowstring River
First River- Egg Lake
Laura Lake
Boy River
Rabbit/Raven
Third River
Morph Meadows
Leech Lake Sedge Meadows – Battleground, Boy Bay/River, Headquarters Bay/Bear Island, Swamp Lake/Steamboat Bay, and The Narrows

Priority Open Landscape Areas

Sharp-tailed Grouse-Openlands Complex – Special Management Unit (SMU) designation containing portions of Blackduck Till Plain (212Na16), Blackduck Moraine (212Na18), and Debs Till Plain (212Na19) LTAs.

Ponsford/Shell/Hubbard Prairie – LTA designation of portion of Park Rapids Sand Plain (212Nc11) LTA.

Prairie Chicken Openlands Area - LTA designation containing portions of Nimrod Drumlin Plain (212Nc10) and Park Rapids Sand Plain (212Nc11) LTAs.

Verndale Sand Plain (212Nc07) – entire LTA designation.

APPENDIX Q

Patch Management in CP-PMOP

Patch Name	Patch Code	Acres	Size Class	Forestry Area
North Gould Conifers	PO1LC	2301.68	Class 1	Bemidji
Pillsbury	PV1UD	2774.98	Class 1	Backus
Little Thunder	FPI1UD	1894.23	Class 1	Backus
Pineview	FPI1UD	2921.17	Class 1	Park Rapids
North Mud	FPO1LC	1699.12	Class 1	Deer River
South Bowstring	FPO1LC	837.05	Class 1	Deer River
Little Cut Foot	FPO1LC	642.64	Class 1	Deer River
Drumbeater	FPO1LC	4201.60	Class 1	Bemidji/Deer
Skimmerhorn Lake	FPO1LC	2043.14	Class 1	Blackduck
Nora/Minerva Conifers	FPO1LC	1658.40	Class 1	Bemidji
Fool's Lake	FPO1UC	813.00	Class 1	Park Rapids
LaPrairie Hardwoods	FPO1UD	2114.07	Class 1	Bemidji
Bear Moose Creek Hardwoods	MFPO1UD	1767.71	Class 1	Bemidji
Draper Tower	FPV1UD	1581.41	Class 1	Backus
Coxie Lake	FPV1UD	1122.37	Class 1	Backus
Lyons Shelter	FPY1UC	1271.24	Class 1	Park Rapids
Lower Lake	FPY1UD	1341.12	Class 1	Backus
Teepee Lakes Hardwoods	FPY1UD	1868.14	Class 1	Park Rapids
Minerva Hardwoods North	FPY1UD	707.70	Class 1	Bemidji
Refuge	FPY1UD	5554.70	Class 1	Park Rapids
South Gould Conifers	PI2LC	393.60	Class 2	Bemidji
Eckles Conifers	PI2UC	622.43	Class 2	Bemidji
Bog Lake	PO2LC	374.76	Class 2	Blackduck
Trestle	PO2UC	316.11	Class 2	Deer River
Leech Lake Conifers	FPI2LC	414.55	Class 2	Bemidji
Northern Conifers	FPI2UC	451.59	Class 2	Bemidji
Hunter Lake	FPI2UC	294.64	Class 2	Backus
Finn Lake	FPI2UC	323.42	Class 2	Park Rapids
Howser's Corner	FPI2UC	467.67	Class 2	Park Rapids
Buzzle Conifers	FPI2UC	270.68	Class 2	Bemidji
McKinley	FPI2UC	393.36	Class 2	Backus
Rockwood Hardwoods North	FPI2UD	505.29	Class 2	Bemidji
Lake Hattie Hardwoods	FPI2UD	516.04	Class 2	Bemidji
Helga Hardwoods	FPI2UD	268.17	Class 2	Bemidji
County 36	FPO2LC	608.37	Class 2	Blackduck

Patch Name	Patch Code	Acres	Size Class	Forestry Area
White Oak	FPO2LC	418.08	Class 2	Deer River
Sucker Bay Conifers East	FPO2LC	593.13	Class 2	Bemidji
Sucker Bay Conifers West	FPO2LC	356.56	Class 2	Bemidji
Rice Lake Bog	FPO2LC	268.33	Class 2	Backus
West Rice	FPO2LC	495.47	Class 2	Deer River
South Grouse Creek	FPO2LC	639.93	Class 2	Deer River
West Drumbeater Conifers	FPO2LC	318.94	Class 2	Bemidji
Section 29	FPO2LC	364.20	Class 2	Deer River
Third River	FPO2LC	568.18	Class 2	Blackduck
Schoolcraft Conifers	FPO2LC	579.01	Class 2	Bemidji
Dagget Brook	FPO2UC	321.50	Class 2	Backus
Decker Lake	FPO2UC	326.83	Class 2	Blackduck
Turtle River Conifers	FPO2UC	404.95	Class 2	Bemidji
Osage	FPO2UC	254.48	Class 2	Park Rapids
Clover Conifers	FPO2UC	528.68	Class 2	Bemidji
Bad Medicine Lake	FPO2UC	272.63	Class 2	Detroit Lakes
South Lake George Conifers	FPO2UC	438.09	Class 2	Bemidji
Rockwood Hardwoods South	FPO2UD	338.59	Class 2	Bemidji
Little Constance	FPO2UD	302.01	Class 2	Blackduck
Medicine Lake	FPO2UD	330.20	Class 2	Blackduck
Wolf Lake Hardwoods	FPO2UD	330.22	Class 2	Park Rapids
Cormant River Headwaters	FPV2LD	334.20	Class 2	Blackduck
Rabideau	FPV2UD	392.89	Class 2	Blackduck
Durand Hardwoods South	FPV2UD	569.76	Class 2	Bemidji
Motley	FPY2LC	299.78	Class 2	Little Falls
North Grouse Creek	FPY2LC	580.34	Class 2	Deer River
Little Ball Club	FPY2LC	619.22	Class 2	Deer River
Grant Valley Conifers East	FPY2UC	282.75	Class 2	Bemidji
Blue Ox	FPY2UD	489.20	Class 2	Blackduck
Cloverleaf	FPY2UD	427.51	Class 2	Blackduck
Castle Creek	FPY2UD	284.76	Class 2	Blackduck
Morff	FPY2UD	328.36	Class 2	Blackduck
Shevlin Hardwoods	MFPY2UD	254.09	Class 2	Bemidji
Minerva Hardwoods South	MFPY2UD	260.26	Class 2	Bemidji
Itasca Hardwoods	MFPY2UD	548.59	Class 2	Bemidji
Clover Hardwoods North	FPY2UD	419.18	Class 2	Bemidji
Clover Hardwoods South	FPY2UD	371.49	Class 2	Bemidji
Crow Wing Tamarack	PI3LC	132.47	Class 3	Park Rapids
Goose Lake Bog	PI3LC	106.80	Class 3	Backus
Teepee Lakes Pine	PI3UC	155.25	Class 3	Park Rapids
LaPrairie Conifers	PI3UC	105.52	Class 3	Bemidji

Patch Name	Patch Code	Acres	Size Class	Forestry Area
Crow Wing Pine	PI3UC	133.89	Class 3	Park Rapids
South Little Elbow Conifers	PI3UC	191.82	Class 3	Bemidji
South Sixmile	PI3UD	135.50	Class 3	Deer River
Blacksmith Hardwoods	PI3UD	186.08	Class 3	Bemidji
Little Moose Lake	PI3UD	106.94	Class 3	Bemidji
South Goose	PI3UD	111.39	Class 3	Deer River
Wallingford Creek Tamarack	PO3LC	116.20	Class 3	Park Rapids
Fairview	PO3UC	104.87	Class 3	Backus
Cedar Lake	PO3UC	134.67	Class 3	Backus
Mission	PO3UC	189.56	Class 3	Backus
Moose River	PO3UC	113.85	Class 3	Backus
Mantrap Lake	PO3UC	127.43	Class 3	Park Rapids
Wolf Lake	PO3UC	120.85	Class 3	Park Rapids
Alp	PO3UD	102.03	Class 3	Deer River
Wilkinson Hardwoods	PO3UD	105.32	Class 3	Bemidji
Shallow Pond	PV3LD	114.91	Class 3	Blackduck
Meadowbrook	PV3LD	104.24	Class 3	Backus
Ansel Old Growth	PV3LD	101.34	Class 3	Backus
Long Ash Corridor	PV3LD	149.75	Class 3	Backus
George Cook	PV3LD	125.32	Class 3	Backus
Popple River	PV3LD	168.49	Class 3	Blackduck
Duck Lake	PV3LD	124.11	Class 3	Backus
Bull Moose Ash	PV3LD	109.84	Class 3	Backus
Ottertail Point	PV3UD	120.69	Class 3	Bemidji
Rice Lake	PV3UD	140.61	Class 3	Blackduck
Cottrell	PY3UC	103.10	Class 3	Park Rapids
Mary Brown East	PY3UC	203.03	Class 3	Park Rapids
Mud Lake Duck Camp	PY3UC	116.07	Class 3	Park Rapids
Rice Hardwoods	MPY3UD	188.87	Class 3	Bemidji
Rode	FPI3UC	212.35	Class 3	Backus
Mary Brown West	FPI3UC	201.54	Class 3	Park Rapids
Bunny Hill	FPI3UC	109.67	Class 3	Park Rapids
Ideal	FPI3UC	207.11	Class 3	Backus
Elbow Lake	FPI3UC	156.36	Class 3	Park Rapids
Indian Creek (Fir)	FPI3UC	145.74	Class 3	Park Rapids
Badoura Patch	FPI3UC	250.15	Class 3	Park Rapids
North Little Elbow Conifers	FPI3UC	161.50	Class 3	Bemidji
Island Lake Hardwoods	FPI3UD	183.84	Class 3	Bemidji
Olivet	FPI3UD	130.42	Class 3	Deer River
Little Jesse	FPI3UD	153.24	Class 3	Deer River
Arrowhead	FPI3UD	158.71	Class 3	Deer River

Patch Name	Patch Code	Acres	Size Class	Forestry Area
Current Lake	FPO3LC	170.37	Class 3	Backus
Trelipe Creek	FPO3LC	127.87	Class 3	Backus
Indian Creek	FPO3LC	158.37	Class 3	Park Rapids
Pikus Powerline	FPO3UC	213.23	Class 3	Backus
Dickerson Hill	FPO3UC	203.30	Class 3	Backus
Wallingford Creek Pine	FPO3UC	157.12	Class 3	Park Rapids
Grant Valley Conifers West	FPO3UC	160.17	Class 3	Bemidji
Small Lake	FPO3UC	208.75	Class 3	Park Rapids
Itasca Conifers	MFPO3UC	122.38	Class 3	Bemidji
Hungry Man	FPO3UC	103.65	Class 3	Park Rapids
North Lake George Conifers	FPO3UC	110.76	Class 3	Bemidji
Shell City	FPO3UC	163.71	Class 3	Park Rapids
Bigfork River	FPO3UD	171.52	Class 3	Blackduck
Sucker Creek Hardwoods	FPO3UD	199.44	Class 3	Bemidji
Squaw Lake	FPO3UD	115.66	Class 3	Blackduck
County 29	FPO3UD	217.69	Class 3	Blackduck
No Name Lake	FPO3UD	190.57	Class 3	Blackduck
Durand Hardwoods North	FPO3UD	247.21	Class 3	Bemidji
South Chapel	FPV3LD	160.51	Class 3	Deer River
North Elbow Lake	FPV3LD	181.15	Class 3	Park Rapids
West Six	FPV3LD	205.05	Class 3	Deer River
Gould Hardwoods	FPV3UD	182.01	Class 3	Bemidji
Range Line Lake	FPV3UD	163.23	Class 3	Bemidji
Boot Lake	FPY3UC	137.02	Class 3	Park Rapids
Thunder Hills	FPY3UC	131.78	Class 3	Backus
Skimmerhorn Creek	FPY3UC	245.52	Class 3	Blackduck
Moose Lake Hardwoods	FPY3UD	156.08	Class 3	Bemidji
Old Grade	FPY3UD	168.88	Class 3	Deer River
Parkway	FPY3UD	146.60	Class 3	Park Rapids

APPENDIX R

Potential Pine Woodlands Areas

Potential Pine Woodlands Areas Planning Process

Background

Below is a map of the Potential Pine Woodlands Areas in the CP and PMOP and management suggestions for these Areas. The map identifies areas where FDc12, FDc23, FDc24, FDn12, and FDn33 Woodland Native Plant Communities (NPC) are likely to occur based on soils and land cover data. These five communities are generally dominated by jack pine but also contain significant components of red pine, aspen, bur oak, birch, and/or white pine. Identifying Potential Pine Woodland Areas was prompted by concern and interest in jack pine because it is a unique and declining habitat/community, it is difficult to regenerate in much of the CP and PMOP, and the CP-PMOP SFRMP establishes aggressive goals to increase jack pine cover type acres during the life of the Plan.

Planning Process

The map was created by starting with a base soil survey layer, which consisted of the STATSGO Soil Survey Polygons layer for Crow Wing county and the SURGO Soil Polygon layer for all other counties, and then selecting certain entisol soil polygons from it. Each of these soil polygons was scored: 2 points for entisols that were well, somewhat excessively, or excessively drained, 1 point for entisols with drainage of moderately well, or 1 point for other soils with a major component of entisols and drainage of moderately well or better. The resulting soils layer was then overlaid with Pre-settlement Vegetation (Marshner's Map) and Gap Analysis Program (GAP) Land Cover layers. In the next step, an additional point was added to the scored soil polygons that contained at least 10% Jack Pine Barrens & Openings from the Pre-settlement Vegetation layer. In the last step, 2 points were added to scored soil polygons that contained at least 5% GAP Jack Pine or 1 point for soil polygons that contained at least 5% GAP Red Pine with less than 5% GAP Jack Pine from the GAP Land Cover layer. This resulting map consists of soil polygons with combined scores of 1 up to 5 (the Woodland NPCs mentioned above are more likely to occur in the areas scoring higher).

Management Suggestions: Potential Pine Woodland Areas

- Common woodland NPCs in the CP-PMOP include FDc12, FDc23, FDc24, FDn12, and FDn33

- Manage for pine woodland conditions where opportunities exist
    - more open conditions (25-100% canopy closure with a longer stand establishment period)
    - predominately early growth stages (normal rotation ages)
    - mostly jack pine with red pine, aspen, bur oak, birch, and/or white pine

- Promote natural regeneration through seed tree and small gap harvests for non-serotinous jack pine, conduct brush and sod control when necessary, manage for prairie grasses and forbs (ground layer) in appropriate NPCs, and use prescribed burning (understory and light slash burns) when possible

- When artificially regenerating a site, use local seed source or unimproved stock (local origin), leave scattered live trees for seed sources and shade, and discourage establishment of invasive or cool-season sod-forming grass species

- Accept lower stocking levels and allow for 10 to 30 year recruitment window with acceptable levels by 5 and/or 10 years

- Separate treatment/prescription types by northern and central floristic regions

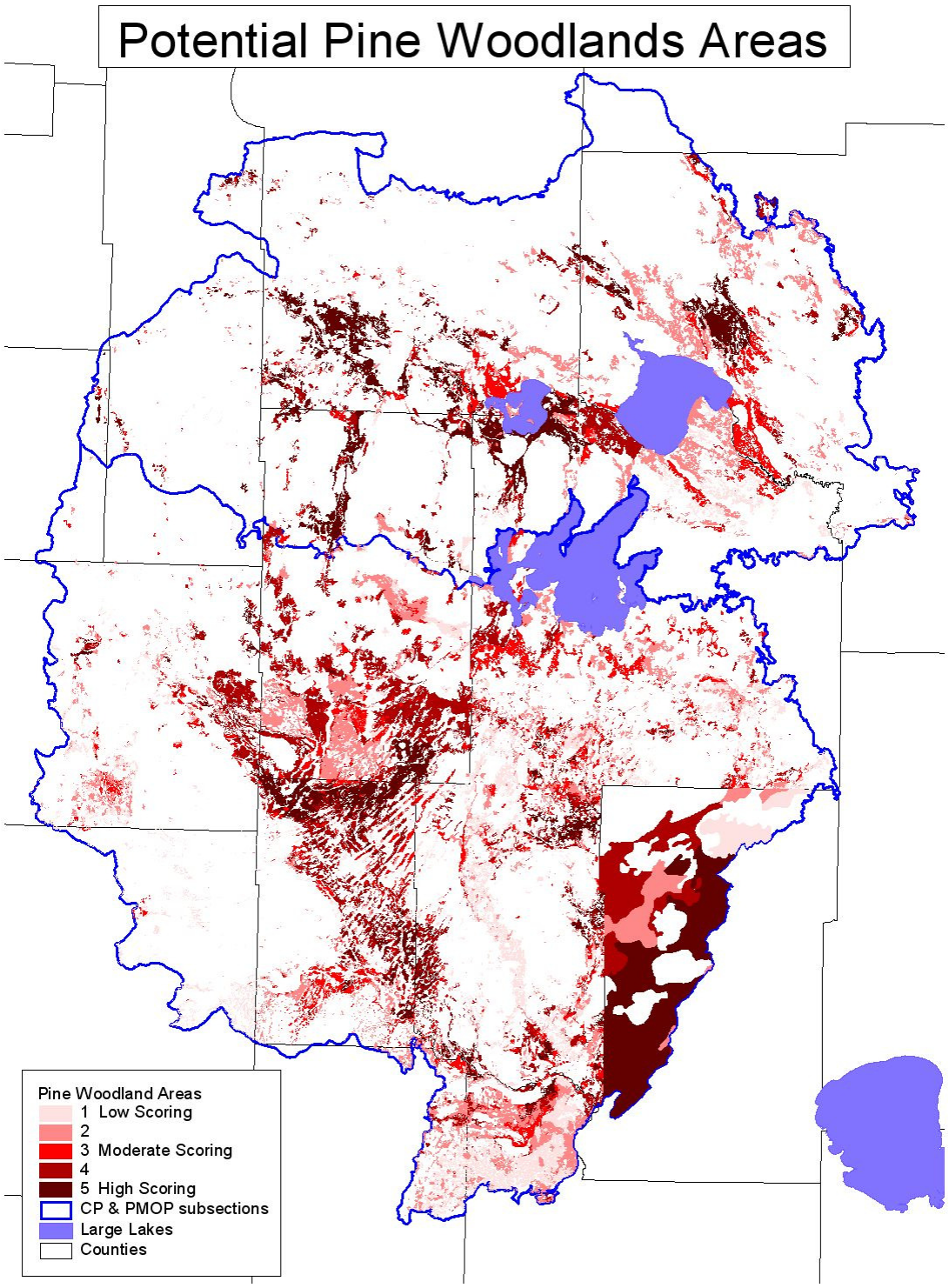
- Manage Jack Pine stands that occur in FDc12 and FDn12 NPCs on a longer rotation when possible (can hold these normal rotation stands longer or ERF stands closer to maximum rotation age)

Pros

Restore and enhance unique and declining community/habitat
Reduces regeneration standards for jack pine (certification and cover type DFFCs)
Less site preparation and planting costs
Greater within stand structural complexity
Grow jack pine on appropriate sites, which are generally drought prone
Takes advantage of jack pine's ability to produce seed at early age (~12 years)
Natural pine regeneration is less susceptible to deer depredation
Lower rotation ages prevent serious jack pine budworm losses

Cons

Possible loss of fiber production
Focus on jack pine rather than red pine and other conifers in these areas
Later stand establishment and potentially longer intervals between final harvests
Younger cohorts within stand may be more susceptible to jack pine budworm
Older stands/trees may not provide sufficient seed source.


Potential Pine Woodlands Areas
Pine Woodland Areas
1 Low Scoring
2
3 Moderate Scoring
4
5 High Scoring
CP & PMOP subsections
Large Lakes
Counties

APPENDIX S Stands with a White Pine Component on the 10-Year Stand Examination List

Subsection	Forestry Area	Location ID	Stand Label	Cover Type	Treatment Acres	Management Ctype	Age	Stand Exam Year	Prescription Description
CP	Bemidji	t14331w1050023	23 WP76	White Pine	13.4	51	115	0	Thinning
CP	Bemidji	t14331w1070095	95 Ash44	Ash	12.1	1	81	0	Manage for Understory
CP	Bemidji	t14335w1130031	31 NP59	Norway Pine	5.6	52	102	0	Thinning
CP	Bemidji	t14428w1100177	177 WP52	White Pine	5.3	51	115	0	Thinning
CP	Bemidji	t14428w1100608	608 NH54	Northern Hardwoods	6.9	20	67	2010	Shelterwood
CP	Bemidji	t14428w1100612	612 A54	Aspen	12.1	12	67	0	Clear Cut w/ Reserves
CP	Bemidji	t14428w1110137	137 NP54	Norway Pine	9.0	52	112	0	Clear Cut w/ Reserves
CP	Bemidji	t14429w1010013	13 NP58	Norway Pine	5.8	52	102	0	Thinning
CP	Bemidji	t14429w1010025	25 NP55	Norway Pine	4.1	52	97	0	Thinning
CP	Bemidji	t14429w1010030	30 A54	Aspen	7.4	12	70	0	Clear Cut w/ Reserves
CP	Bemidji	t14429w1210070	70 Bi54	Birch	13.0	13	94	2008	Clear Cut w/ Reserves
CP	Bemidji	t14429w1230078	78 BF53	Balsam Fir	11.0	62	89	2008	Uneven-aged Harvest
CP	Bemidji	t14430w1260140	140 Bi37	Birch	23.0	13	18	0	Re-inventory
CP	Bemidji	t14430w1260162	162 Bi55	Birch	31.5	13	96	0	Re-inventory
CP	Bemidji	t14430w1260171	171 Bi55	Birch	1.0	13	96	0	Re-inventory
CP	Bemidji	t14431w1010019	19 WP54	White Pine	13.2	51	84	0	Manage for Understory
CP	Bemidji	t14431w1200114	114 NP58	Norway Pine	4.7	52	91	0	Re-inventory
CP	Bemidji	t14431w1200115	115 NP58	Norway Pine	2.5	52	91	0	Re-inventory
CP	Bemidji	t14431w1200116	116 NP58	Norway Pine	5.1	52	91	0	Re-inventory
CP	Bemidji	t14431w1290180	180 WP63	White Pine	10.1	51	116	0	Thinning
CP	Bemidji	t14434w1360293	293 A54	Aspen	4.0	12	76	2008	Clear Cut w/ Reserves
CP	Bemidji	t14434w1360295	295 NP55	Norway Pine	4.4	52	113	0	Thinning
CP	Bemidji	t14436w1100208	208 NP54	Norway Pine	7.1	52	100	0	Thinning
CP	Bemidji	t14436w1100213	213 NP59	Norway Pine	6.5	52	99	0	Thinning
CP	Bemidji	t14436w1100217	217 A42	Aspen	7.2	12	54	0	Clear Cut w/ Reserves
CP	Bemidji	t14436w1100227	227 NP57	Norway Pine	8.4	52	105	0	Thinning
CP	Bemidji	t14436w1220594	594 A43	Aspen	2.4	12	68	0	On-site Visit
CP	Bemidji	t14437w1050083	83 A56	Aspen	3.2	12	66	0	On-site Visit
CP	Bemidji	t14437w1140268	268 WP11	White Pine	22.5	51	6	0	On-site Visit
CP	Bemidji	t14437w1140270	270 NP63	Norway Pine	2.2	52	106	0	On-site Visit
CP	Bemidji	t14437w1150285	285 NP66	Norway Pine	5.0	52	98	0	Thinning
CP	Bemidji	t14437w1150286	286 NP65	Norway Pine	7.7	52	98	0	Thinning
CP	Bemidji	t14437w1190345	345 NP67	Norway Pine	10.7	52	129	0	Thinning

Subsection	Forestry Area	Location ID	Stand Label	Cover Type	Treatment Acres	Management Ctype	Age	Stand Exam Year	Prescription Description
CP	Bemidji	t14438w1120063	63 NP68	Norway Pine	16.1	52	104	2012	Shelterwood
CP	Bemidji	t14438w1140129	129 NP56	Norway Pine	15.9	52	110	0	Thinning
CP	Bemidji	t14438w1140134	134 A55	Aspen	9.5	12	56	0	Clear Cut w/ Reserves
CP	Bemidji	t14529w1170118	118 NP45	Norway Pine	7.7	52	55	0	Thinning
CP	Bemidji	t14529w1190137	137 WP53	White Pine	13.0	51	98	0	Thinning
CP	Bemidji	t14529w1220147	147 NP12	Norway Pine	53.2	52	24	0	Thinning
CP	Bemidji	t14529w1220177	177 NP57	Norway Pine	0.7	52	115	0	Re-inventory
CP	Bemidji	t14529w1300192	192 WP74	White Pine	4.1	51	112	0	Thinning
CP	Bemidji	t14529w1300207	207 NP66	Norway Pine	6.2	52	107	0	Shelterwood
CP	Bemidji	t14530w1010020	20 NP67	Norway Pine	21.3	52	113	2009	Thinning
CP	Bemidji	t14531w1220019	19 NP52	Norway Pine	11.1	52	58	0	Manage for Understory
CP	Bemidji	t14535w1360079	79 A57	Aspen	3.9	12	67	0	Clear Cut w/ Reserves
CP	Bemidji	t14538w1320219	219 WS56	White Spruce	8.7	61	99	0	Manage for Understory
CP	Bemidji	t14538w1320222	222 A56	Aspen	8.1	12	80	0	On-site Visit
CP	Bemidji	t14539w1240187	187 A54	Aspen	12.5	12	85	0	Re-inventory
CP	Bemidji	t14539w1240228	228 A54	Aspen	5.5	12	65	0	Clear Cut w/ Reserves
CP	Bemidji	t14539w1260252	252 A44	Aspen	5.3	12	71	0	On-site Visit
CP	Bemidji	t14628w1060003	3 Bi54	Birch	12.0	13	81	0	Shelterwood
CP	Bemidji	t14629w1020068	68 NP64	Norway Pine	6.0	52	99	0	Thinning
CP	Bemidji	t14629w1070159	159 NP56	Norway Pine	10.2	52	99	0	Manage for Understory
CP	Bemidji	t14629w1070191	191 NP52	Norway Pine	10.7	52	112	0	Manage for Understory
CP	Bemidji	t14629w1180222	222 A55	Aspen	3.7	12	82	0	Clear Cut w/ Reserves
CP	Bemidji	t14629w1310339	339 NP74	Norway Pine	12.5	52	72	0	Re-inventory
CP	Bemidji	t14630w1060024	24 A57	Aspen	5.9	12	104	0	Clear Cut w/ Reserves
CP	Bemidji	t14631w1060004	4 NH55	Northern Hardwoods	7.7	20	76	2010	Shelterwood
CP	Bemidji	t14635w1160075	75 JP45	Jack Pine	5.9	53	64	0	Clear Cut w/ Reserves
CP	Bemidji	t14636w1160098	98 NP56	Norway Pine	8.8	52	103	2016	Shelterwood
CP	Bemidji	t14636w1360258	258 NH55	Northern Hardwoods	23.4	20	81	2013	Uneven-aged Harvest
CP	Bemidji	t14639w1010102	102 JP54	Jack Pine	29.2	53	43	0	On-site Visit
CP	Bemidji	t14731w1060014	14 NP79	Norway Pine	7.9	52	140	0	On-site Visit
CP	Bemidji	t14731w1120039	39 WP52	White Pine	13.1	51	110	0	Re-inventory
CP	Bemidji	t14731w1160058	58 WP75	White Pine	18.5	51	114	0	Shelterwood
CP	Bemidji	t14732w1160057	57 NP55	Norway Pine	29.1	52	52	0	Thinning
CP	Bemidji	t14732w1160063	63 NP58	Norway Pine	27.0	52	63	0	Thinning

Subsection	Forestry Area	Location ID	Stand Label	Cover Type	Treatment Acres	Management Ctype	Age	Stand Exam Year	Prescription Description
CP	Bemidji	t14733w1160034	34 NP43	Norway Pine	17.3	52	66	0	Thinning
CP	Bemidji	t14733w1180014	14 A57	Aspen	10.0	12	72	2008	Uneven-aged Harvest
CP	Bemidji	t14737w1200243	243 BF42	Balsam Fir	9.5	62	70	0	Uneven-aged Harvest
CP	Bemidji	t14738w1320223	223 NP75	Norway Pine	2.6	52	110	0	Thinning
CP	Bemidji	t14832w1260128	128 A29	Aspen	5.7	12	52	0	Re-inventory
CP	Bemidji	t14832w1260201	201 A54	Aspen	4.5	12	65	2009	Clear Cut w/ Reserves
CP	Bemidji	t14832w1360164	164 WP83	White Pine	29.5	51	131	0	Thinning
CP	Bemidji	t14832w1360177	177 WP71	White Pine	10.8	51	125	0	Thinning
CP	Bemidji	t14832w1360183	183 Bi54	Birch	2.0	13	97	2008	Clear Cut w/ Reserves
CP	Bemidji	t14832w1360186	186 A55	Aspen	9.0	12	69	2008	Clear Cut w/ Reserves
CP	Bemidji	t14832w1360204	204 A57	Aspen	18.8	12	78	0	Clear Cut w/ Reserves
CP	Bemidji	t14833w1010120	120 Ash54	Ash	19.5	1	105	0	Uneven-aged Harvest
CP	Bemidji	t14833w1100189	189 A53	Aspen	8.5	12	72	0	Clear Cut w/ Reserves
CP	Bemidji	t14833w1100199	199 A55	Aspen	7.8	12	48	0	Clear Cut w/ Reserves
CP	Bemidji	t14833w1110206	206 NH56	Northern Hardwoods	48.5	20	56	2012	Uneven-aged Harvest
CP	Bemidji	t14833w1360064	64 T42	Tamarack	13.9	72	95	0	Seed Tree
CP	Bemidji	t14833w1360285	285 WP12	White Pine	4.2	51	23	0	Thinning
CP	Blackduck	t14729w1150228	228 WP62	White Pine	1.6	51	163	0	Shelterwood
CP	Blackduck	t14729w1320500	500 NP61	Norway Pine	9.2	52	119	0	On-site Visit
CP	Blackduck	t14729w1320501	501 WP44	White Pine	25.2	51	44	0	Salvage - Selective Harvest
CP	Blackduck	t14729w1330475	475 NH57	Northern Hardwoods	13.1	51	101	0	Uneven-aged Harvest
CP	Blackduck	t14829w1020171	171 WP65	White Pine	3.1	51	110	0	Shelterwood
CP	Blackduck	t14829w1050058	58 NP41	Norway Pine	4.6	52	27	0	Thinning
CP	Blackduck	t14829w1090206	206 WP54	White Pine	6.7	51	69	0	Salvage - Selective Harvest
CP	Blackduck	t14829w1100254	254 WS41	White Spruce	7.0	61	31	0	Thinning
CP	Blackduck	t14829w1170380	380 T55	Tamarack	23.3	72	108	0	Clear Cut w/ Reserves
CP	Blackduck	t14829w1180366	366 Bi43	Birch	7.4	13	86	0	Clear Cut w/ Reserves
CP	Blackduck	t14829w1210931	931 WP55	White Pine	2.1	51	87	0	Salvage - Selective Harvest
CP	Blackduck	t14829w1220477	477 NP69	Norway Pine	1.9	52	78	0	Thinning
CP	Blackduck	t14829w1220500	500 NP52	Norway Pine	7.9	52	77	0	Thinning
CP	Blackduck	t14829w1260589	589 NP59	Norway Pine	12.0	52	80	2008	Thinning
CP	Blackduck	t14829w1270551	551 JP54	Jack Pine	8.1	53	61	0	Clear Cut w/ Reserves
CP	Blackduck	t14829w1280605	605 NP64	Norway Pine	1.4	52	168	0	Clear Cut w/ Reserves
CP	Blackduck	t14831w1240123	123 A42	Aspen	11.0	12	45	2008	Clear Cut w/ Reserves

Subsection	Forestry Area	Location ID	Stand Label	Cover Type	Treatment Acres	Management Ctype	Age	Stand Exam Year	Prescription Description
CP	Blackduck	t14831w1240152	152 WS43	White Spruce	1.9	61	62	0	Clear Cut w/ Reserves
CP	Blackduck	t14831w1280203	203 A45	Aspen	7.0	51	62	0	Seed Tree
CP	Blackduck	t14831w1320208	208 Bi54	Birch	21.4	13	52	0	Clear Cut w/ Reserves
CP	Blackduck	t14831w1320237	237 Bi58	Birch	17.3	13	74	0	Clear Cut w/ Reserves
CP	Blackduck	t14831w1360218	218 WP41	White Pine	13.8	51	71	0	On-site Visit
CP	Blackduck	t14926w1200205	205 A55	Aspen	44.2	12	69	0	Clear Cut w/ Reserves
CP	Blackduck	t14927w1320228	228 NH42	Northern Hardwoods	3.4	20	130	0	On-site Visit
CP	Blackduck	t14929w1280140	140 NP41	Norway Pine	1.6	52	46	0	Thinning
CP	Blackduck	t14929w1280405	405 WP44	White Pine	36.1	51	73	0	Salvage - Selective Harvest
CP	Blackduck	t14929w1310420	420 JP55	Jack Pine	8.9	53	69	0	Clear Cut w/ Reserves
CP	Blackduck	t14932w1280138	138 BSL41	Black Spruce, Lowland	8.0	71	78	2009	On-site Visit
CP	Blackduck	t15027w1080081	81 NP48	Norway Pine	2.4	52	60	0	Thinning
CP	Blackduck	t15027w1160350	350 A44	Aspen	11.9	12	60	0	Clear Cut w/ Reserves
CP	Blackduck	t15027w1170349	349 WP75	White Pine	9.9	51	111	0	Shelterwood
CP	Blackduck	t15027w1280634	634 NP46	Norway Pine	20.1	52	45	0	Thinning
CP	Blackduck	t15027w1360208	208 A59	Aspen	10.4	12	79	2010	Clear Cut w/ Reserves
CP	Blackduck	t15229w1330185	185 BF45	Balsam Fir	5.1	62	85	0	On-site Visit
CP	Deer River	t05826w1060040	40 A45	Aspen	15.2	12	53	0	Clear Cut w/ Reserves
CP	Deer River	t05827w1130045	45 A44	Aspen	32.9	12	54	0	Clear Cut w/ Reserves
CP	Deer River	t05927w1220097	97 BF44	Balsam Fir	10.3	62	53	0	Clear Cut w/ Reserves
CP	Deer River	t05927w1220125	125 A44	Aspen	8.1	12	45	0	Clear Cut w/ Reserves
CP	Deer River	t14426w1090232	232 NP45	Norway Pine	10.4	52	51	0	Thinning
CP	Deer River	t14426w1170433	433 A55	Aspen	18.0	12	44	0	Clear Cut w/ Reserves
CP	Deer River	t14426w1200672	672 A51	Aspen	10.4	12	82	0	Clear Cut w/ Reserves
CP	Deer River	t14427w1110085	85 NP66	Norway Pine	6.0	52	133	2008	Clear Cut w/ Reserves
CP	Deer River	t14427w1130240	240 A53	Aspen	11.0	12	72	2008	Clear Cut w/ Reserves
CP	Deer River	t14427w1140238	238 WP61	White Pine	17.4	51	109	0	Thinning
CP	Deer River	t14427w1140248	248 NP55	Norway Pine	8.6	52	112	0	Thinning
CP	Deer River	t14427w1190283	283 A29	Aspen	48.5	12	4	0	Re-inventory
CP	Deer River	t14427w1210286	286 A54	Aspen	13.0	12	64	0	Clear Cut w/ Reserves
CP	Deer River	t14427w1280337	337 Bi54	Birch	6.1	13	84	0	Uneven-aged Harvest
CP	Deer River	t14427w1280477	477 NP55	Norway Pine	15.0	52	109	2008	Thinning
CP	Deer River	t14427w1310378	378 WP65	White Pine	4.9	51	130	0	Thinning
CP	Deer River	t14427w1330500	500 NP64	Norway Pine	10.0	52	112	2008	Thinning

Subsection	Forestry Area	Location ID	Stand Label	Cover Type	Treatment Acres	Management Ctype	Age	Stand Exam Year	Prescription Description
CP	Deer River	t14427w1360445	445 A54	Aspen	27.0	12	71	2008	Clear Cut w/ Reserves
CP	Deer River	t14526w1200233	233 A44	Aspen	8.7	12	40	0	Thinning
CP	Deer River	t14527w1020106	106 Bi44	Birch	10.5	13	71	2009	Clear Cut w/ Reserves
CP	Deer River	t14527w1040041	41 NP58	Norway Pine	11.0	52	94	0	Thinning
CP	Deer River	t14527w1050147	147 NP63	Norway Pine	2.8	52	109	0	Clear Cut w/ Reserves
CP	Deer River	t14527w1050150	150 NP55	Norway Pine	3.9	52	86	0	Thinning
CP	Deer River	t14527w1080293	293 NP54	Norway Pine	7.7	52	64	0	Thinning
CP	Deer River	t14527w1100257	257 BF54	Balsam Fir	6.6	62	63	0	Clear Cut w/ Reserves
CP	Deer River	t14527w1100285	285 NP64	Norway Pine	14.7	52	121	0	Clear Cut w/ Reserves
CP	Deer River	t14527w1110184	184 NP56	Norway Pine	18.8	52	102	0	Thinning
CP	Deer River	t14527w1110263	263 NP54	Norway Pine	14.0	52	92	0	Thinning
CP	Deer River	t14527w1210464	464 Bi53	Birch	14.0	13	107	2008	Clear Cut w/ Reserves
CP	Deer River	t14527w1250622	622 NP54	Norway Pine	6.9	52	57	0	Thinning
CP	Deer River	t14527w1300601	601 A55	Aspen	6.0	53	74	2009	Clear Cut w/ Reserves
CP	Deer River	t14527w1330873	873 Bi53	Birch	25.3	51	94	0	Uneven-aged Harvest
CP	Deer River	t14527w1350953	953 T41	Tamarack	6.2	72	127	0	Seed Tree
CP	Deer River	t14528w1240079	79 WP43	White Pine	2.8	51	54	2009	Thinning
CP	Deer River	t14528w1280110	110 NH55	Northern Hardwoods	21.5	20	68	0	Uneven-aged Harvest
CP	Deer River	t14528w1330317	317 WP22	White Pine	8.4	51	27	0	Thinning
CP	Deer River	t14528w1340392	392 A44	Aspen	4.9	12	65	0	Clear Cut w/ Reserves
CP	Deer River	t14626w1160544	544 A55	Aspen	8.9	12	56	0	Clear Cut w/ Reserves
CP	Deer River	t14626w1160548	548 NP44	Norway Pine	3.0	52	31	2008	Thinning
CP	Deer River	t14627w1330087	87 Bi44	Birch	14.0	13	69	2008	Clear Cut w/ Reserves
CP	Deer River	t14726w1060124	124 T42	Tamarack	21.9	72	111	0	Thinning
CP	Deer River	t14726w1170750	750 NP59	Norway Pine	3.0	52	44	0	Thinning
CP	Deer River	t14726w1180247	247 T43	Tamarack	14.5	72	124	0	Seed Tree
CP	Deer River	t14726w1180258	258 NP56	Norway Pine	18.1	52	128	2009	Clear Cut w/ Reserves
CP	Deer River	t14726w1180291	291 NP54	Norway Pine	9.9	52	76	0	Thinning
CP	Deer River	t14726w1180292	292 NP66	Norway Pine	6.1	52	132	0	Thinning
CP	Deer River	t14726w1200390	390 A56	Aspen	21.2	12	46	0	Re-inventory
CP	Deer River	t14726w1300526	526 NP53	Norway Pine	12.2	52	94	0	Thinning
CP	Deer River	t14726w1320614	614 A42	Aspen	10.3	12	37	0	Re-inventory
CP	Deer River	t14727w1020020	20 NP44	Norway Pine	59.7	52	35	2009	Thinning
CP	Deer River	t14827w1030011	11 Bi55	Birch	13.5	13	78	0	Re-inventory

Subsection	Forestry Area	Location ID	Stand Label	Cover Type	Treatment Acres	Management Ctype	Age	Stand Exam Year	Prescription Description
CP	Deer River	t14827w1070163	163 A54	Aspen	2.4	51	72	0	Manage for Understory
CP	Deer River	t14827w1250221	221 NP65	Norway Pine	2.9	52	132	0	Clear Cut w/ Reserves
CP	Deer River	t14828w1200143	143 A33	Aspen	5.8	12	41	0	Clear Cut w/ Reserves
Littlefork-Vermillion Uplands	Blackduck	t15027w1240573	573 LH54	Lowland Hardwoods	41.7	9	79	0	On-site Visit
Littlefork-Vermillion Uplands	Blackduck	t15027w1240574	574 A57	Aspen	20.2	12	65	0	Clear Cut w/ Reserves
Littlefork-Vermillion Uplands	Blackduck	t15027w1250579	579 LH54	Lowland Hardwoods	9.0	73	79	0	Uneven-aged Harvest
PMOP	Bemidji	t14333w1340329	329 NP57	Norway Pine	9.0	52	91	0	Thinning
PMOP	Bemidji	t14337w1040088	88 NP58	Norway Pine	6.3	52	104	0	Thinning
PMOP	Bemidji	t14337w1100300	300 NP65	Norway Pine	10.8	52	107	2015	Shelterwood
PMOP	Bemidji	t14337w1180647	647 A52	Aspen	29.7	12	59	0	Clear Cut w/ Reserves
PMOP	Bemidji	t14337w1200751	751 NP 64	Norway Pine	21.1	52	101	0	Re-inventory
PMOP	Bemidji	t14337w1311159	1159 NP54	Norway Pine	3.7	52	50	0	Thinning
PMOP	Bemidji	t14338w1060083	83 WP71	White Pine	5.1	51	115	0	Thinning
PMOP	Bemidji	t14338w1340548	548 A55	Aspen	30.4	12	28	0	Uneven-aged Harvest
PMOP	Bemidji	t14339w1040024	24 BF54	Balsam Fir	21.8	62	65	0	On-site Visit
PMOP	Bemidji	t14339w1090033	33 BF54	Balsam Fir	8.9	62	65	0	On-site Visit
PMOP	Bemidji	t14339w1090048	48 A56	Aspen	4.5	12	69	0	Clear Cut w/ Reserves
PMOP	Bemidji	t14339w1100047	47 A56	Aspen	4.6	12	69	0	Clear Cut w/ Reserves
PMOP	Bemidji	t14339w1130093	93 Bi53	Birch	68.0	13	90	2008	Clear Cut w/ Reserves
PMOP	Bemidji	t14339w1280157	157 A55	Aspen	13.9	12	69	0	On-site Visit
PMOP	Bemidji	t14339w1350236	236 NH51	Northern Hardwoods	23.3	20	85	2018	Re-inventory
PMOP	Bemidji	t14339w1350239	239 NH51	Northern Hardwoods	15.5	20	78	2018	Re-inventory
PMOP	Bemidji	t14339w1360291	291 NP65	Norway Pine	21.0	52	110	0	On-site Visit
PMOP	Bemidji	t14340w1360380	380 A45	Aspen	4.9	12	79	0	On-site Visit
PMOP	Bemidji	t14340w1360381	381 A42	Aspen	7.4	12	79	0	On-site Visit
PMOP	Bemidji	t14340w1360400	400 A45	Aspen	5.9	12	79	0	On-site Visit
PMOP	Bemidji	t14437w1300622	622 A52	Aspen	3.4	12	61	0	On-site Visit
PMOP	Bemidji	t14437w1310734	734 A51	Aspen	3.5	12	73	0	Re-inventory
PMOP	Bemidji	t14437w1330807	807 Bi56	Birch	6.3	13	93	0	Clear Cut w/ Reserves
PMOP	Bemidji	t14438w1040185	185 A54	Aspen	3.9	12	66	0	On-site Visit
PMOP	Bemidji	t14438w1050004	4 A44	Aspen	8.0	12	41	2009	Clear Cut w/ Reserves
PMOP	Bemidji	t14438w1060012	12 NH53	Northern Hardwoods	36.3	20	120	0	Uneven-aged Harvest

Subsection	Forestry Area	Location ID	Stand Label	Cover Type	Treatment Acres	Management Ctype	Age	Stand Exam Year	Prescription Description
PMOP	Brainerd	t13429w1060011	11 WP59	White Pine	3.7	51	63	0	Thinning
PMOP	Brainerd	t13429w1060012	12 WP58	White Pine	3.2	51	67	0	Thinning
PMOP	Brainerd	t13429w1060014	14 WP57	White Pine	2.5	51	107	0	Thinning
PMOP	Brainerd	t13429w1060017	17 WP59	White Pine	3.4	51	63	0	Thinning
PMOP	Brainerd	t13429w1060019	19 WP59	White Pine	1.0	51	63	0	Thinning
PMOP	Brainerd	t13429w1060020	20 NP59	Norway Pine	8.9	52	84	0	Re-inventory
PMOP	Brainerd	t13429w1060021	21 WP59	White Pine	10.0	51	63	2008	Thinning
PMOP	Brainerd	t13429w1060022	22 A56	Aspen	4.0	12	58	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13429w1060027	27 WP56	White Pine	21.6	51	43	0	Thinning
PMOP	Brainerd	t13429w1060029	29 A53	Aspen	5.0	12	46	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13429w1060313	313 WP59	White Pine	0.9	51	76	0	Thinning
PMOP	Brainerd	t13429w1070035	35 O53	Oak	13.0	30	110	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13429w1070051	51 WP11	White Pine	1.7	51	15	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1010014	14 WP44	White Pine	17.0	51	45	2008	Thinning
PMOP	Brainerd	t13430w1010022	22 WP43	White Pine	4.1	51	45	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1010027	27 WP 56	White Pine	17.1	51	63	0	Thinning
PMOP	Brainerd	t13430w1010029	29 WP 56	White Pine	22.0	51	50	0	Shelterwood
PMOP	Brainerd	t13430w1010035	35 WP43	White Pine	4.2	51	44	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1010039	39 NP 57	Norway Pine	27.2	52	49	0	Thinning
PMOP	Brainerd	t13430w1010041	41 NP45	Norway Pine	3.2	52	43	0	Thinning
PMOP	Brainerd	t13430w1010042	42 WP 55	White Pine	8.7	51	49	0	Thinning
PMOP	Brainerd	t13430w1010043	43 WP 56	White Pine	8.5	51	63	0	Thinning
PMOP	Brainerd	t13430w1080149	149 WP57	White Pine	1.5	51	54	0	Thinning
PMOP	Brainerd	t13430w1100054	54 A56	Aspen	8.0	12	52	2011	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1100055	55 A46	Aspen	20.2	12	56	2011	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1100071	71 WP58	White Pine	44.5	51	86	0	Thinning
PMOP	Brainerd	t13430w1100072	72 WP53	White Pine	2.1	51	55	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1100082	82 WP62	White Pine	4.5	51	85	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1100085	85 WP53	White Pine	5.8	51	52	0	Thinning
PMOP	Brainerd	t13430w1100134	134 A57	Aspen	13.2	12	69	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1100164	164 WS43	White Spruce	1.5	61	44	0	Thinning
PMOP	Brainerd	t13430w1110077	77 WP53	White Pine	7.6	51	52	0	Thinning
PMOP	Brainerd	t13430w1110094	94 A54	Aspen	2.4	12	71	0	Re-inventory
PMOP	Brainerd	t13430w1110104	104 WP11	White Pine	2.5	51	17	0	Re-inventory

Subsection	Forestry Area	Location ID	Stand Label	Cover Type	Treatment Acres	Management Ctype	Age	Stand Exam Year	Prescription Description
PMOP	Brainerd	t13430w1110113	113 WP47	White Pine	2.8	51	68	0	Thinning
PMOP	Brainerd	t13430w1110114	114 WP11	White Pine	4.1	51	15	0	Re-inventory
PMOP	Brainerd	t13430w1110137	137 WP47	White Pine	0.7	51	68	0	Thinning
PMOP	Brainerd	t13430w1110140	140 WP47	White Pine	4.5	51	68	0	Thinning
PMOP	Brainerd	t13430w1110157	157 WP47	White Pine	4.2	51	68	0	Thinning
PMOP	Brainerd	t13430w1120091	91 NP59	Norway Pine	51.5	52	95	0	On-site Visit
PMOP	Brainerd	t13430w1120127	127 NP46	Norway Pine	1.5	52	47	2009	Thinning
PMOP	Brainerd	t13430w1120133	133 WP12	White Pine	5.2	51	15	0	Re-inventory
PMOP	Brainerd	t13430w1120144	144 WP43	White Pine	7.0	51	43	2008	Thinning
PMOP	Brainerd	t13430w1120147	147 WP55	White Pine	4.2	51	63	0	Thinning
PMOP	Brainerd	t13430w1120154	154 A55	Aspen	7.7	12	65	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1120178	178 NP57	Norway Pine	13.8	52	84	0	On-site Visit
PMOP	Brainerd	t13430w1120186	186 WP43	White Pine	6.0	51	43	2008	Thinning
PMOP	Brainerd	t13430w1130754	754 A54	Aspen	4.0	12	56	2008	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1130755	755 A54	Aspen	5.3	12	52	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1130757	757 WP53	White Pine	4.3	51	58	0	Thinning
PMOP	Brainerd	t13430w1130782	782 A54	Aspen	4.4	12	52	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1130783	783 A54	Aspen	0.5	12	52	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1150234	234 WP12	White Pine	5.6	51	21	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1150244	244 A54	Aspen	7.7	12	65	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1160289	289 A54	Aspen	1.0	12	58	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1160307	307 A54	Aspen	16.0	12	54	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1160814	814 A54	Aspen	11.0	12	54	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1170202	202 A58	Aspen	11.1	12	65	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1340645	645 WP42	White Pine	1.5	51	38	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1360643	643 NP66	Norway Pine	3.5	52	101	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13430w1360654	654 WP58	White Pine	2.9	51	49	0	Thinning
PMOP	Brainerd	t13430w1360666	666 NP57	Norway Pine	5.8	52	38	0	Thinning
PMOP	Brainerd	t13527w1160068	68 NP 58	Norway Pine	10.6	52	33	0	Thinning
PMOP	Brainerd	t13629w1130015	15 A44	Aspen	18.3	12	55	0	On-site Visit
PMOP	Brainerd	t13632w1160025	25 NP 42	Norway Pine	8.8	52	25	0	Thinning
PMOP	Brainerd	t13727w1150136	136 NP56	Norway Pine	18.7	52	42	0	Thinning
PMOP	Brainerd	t13727w1160301	301 WP12	White Pine	0.5	51	4	0	Re-inventory
PMOP	Brainerd	t13727w1260163	163 WP55	White Pine	1.7	51	56	0	Clear Cut w/ Reserves

Subsection	Forestry Area	Location ID	Stand Label	Cover Type	Treatment Acres	Management Ctype	Age	Stand Exam Year	Prescription Description
PMOP	Brainerd	t13727w1260298	298 Bi54	Birch	29.0	13	61	2008	Clear Cut w/ Reserves
PMOP	Brainerd	t13727w1280068	68 NP75	Norway Pine	9.6	52	102	0	Thinning
PMOP	Brainerd	t13727w1360267	267 NP54	Norway Pine	6.5	52	43	0	Thinning
PMOP	Brainerd	t13728w1210046	46 JP52	Jack Pine	8.5	53	95	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13729w1080202	202 A23	Aspen	16.9	12	27	0	Re-inventory
PMOP	Brainerd	t13729w1360178	178 WP44	White Pine	2.1	51	46	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13729w1360264	264 WP54	White Pine	8.6	51	50	0	Thinning
PMOP	Brainerd	t13729w1360265	265 WP54	White Pine	15.3	51	50	0	Thinning
PMOP	Brainerd	t13729w1360270	270 WP47	White Pine	6.7	51	51	0	Thinning
PMOP	Brainerd	t13731w1060210	210 A54	Aspen	11.0	12	54	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13826w1160027	27 WP55	White Pine	3.8	51	91	0	Thinning
PMOP	Brainerd	t13826w1160034	34 WS20	White Spruce	8.6	61	19	0	Thinning
PMOP	Brainerd	t13827w1210081	81 NP64	Norway Pine	0.7	52	81	0	Thinning
PMOP	Brainerd	t13829w1280142	142 NP69	Norway Pine	15.5	52	110	0	Shelterwood
PMOP	Brainerd	t13829w1280146	146 NP58	Norway Pine	6.8	52	63	0	Thinning
PMOP	Brainerd	t13829w1280147	147 JP55	Jack Pine	12.8	53	57	0	Uneven-aged Harvest
PMOP	Brainerd	t13829w1280152	152 NP69	Norway Pine	5.6	52	109	0	Shelterwood
PMOP	Brainerd	t13829w1300138	138 NP65	Norway Pine	14.8	52	107	2009	Thinning
PMOP	Brainerd	t13832w1360013	13 NP43	Norway Pine	24.0	52	44	2008	Thinning
PMOP	Brainerd	t13832w1360014	14 NP69	Norway Pine	12.7	52	76	0	Thinning
PMOP	Brainerd	t13832w1360018	18 NP55	Norway Pine	22.3	52	57	0	Thinning
PMOP	Brainerd	t13832w1360025	25 WP56	White Pine	7.3	51	52	0	Thinning
PMOP	Brainerd	t13832w1360026	26 NP 69	Norway Pine	14.9	52	75	0	Thinning
PMOP	Brainerd	t13925w1090174	174 A58	Aspen	6.5	12	66	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13926w1160182	182 NP45	Norway Pine	12.1	52	33	0	Thinning
PMOP	Brainerd	t13926w1360191	191 NP55	Norway Pine	3.9	52	59	2010	Thinning
PMOP	Brainerd	t13926w1360192	192 NP55	Norway Pine	15.6	52	59	2010	Thinning
PMOP	Brainerd	t13926w1360200	200 NH43	Northern Hardwoods	16.4	20	67	2010	Thinning
PMOP	Brainerd	t13926w1360253	253 NP55	Norway Pine	9.6	52	59	2010	Thinning
PMOP	Brainerd	t13927w1360046	46 NP51	Norway Pine	21.6	52	86	0	Thinning
PMOP	Brainerd	t13927w1360051	51 NP57	Norway Pine	14.2	52	68	0	Thinning
PMOP	Brainerd	t13928w1360083	83 WP54	White Pine	5.7	51	57	0	Thinning
PMOP	Brainerd	t13928w1360084	84 A43	Aspen	14.1	12	66	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13928w1360093	93 WP54	White Pine	7.4	51	57	0	Thinning

Subsection	Forestry Area	Location ID	Stand Label	Cover Type	Treatment Acres	Management Ctype	Age	Stand Exam Year	Prescription Description
PMOP	Brainerd	t13928w1360121	121 WP54	White Pine	54.0	51	57	0	Thinning
PMOP	Brainerd	t13929w1220046	46 NP 69	Norway Pine	6.0	52	101	2008	Thinning
PMOP	Brainerd	t13929w1230097	97 NP65	Norway Pine	10.0	52	96	2008	Thinning
PMOP	Brainerd	t13929w1270112	112 WP 56	White Pine	7.3	51	79	2016	Thinning
PMOP	Brainerd	t13930w1120015	15 NP74	Norway Pine	10.7	52	101	0	Thinning
PMOP	Brainerd	t13930w1120024	24 Bi44	Birch	13.1	13	75	0	Uneven-aged Harvest
PMOP	Brainerd	t13930w1130038	38 Bi44	Birch	11.8	13	75	0	Uneven-aged Harvest
PMOP	Brainerd	t13930w1130039	39 Bi44	Birch	23.0	13	75	0	Uneven-aged Harvest
PMOP	Brainerd	t13930w1140037	37 NP65	Norway Pine	9.7	52	99	0	Uneven-aged Harvest
PMOP	Brainerd	t13931w1280050	50 A58	Aspen	20.9	12	80	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13931w1280160	160 WS43	White Spruce	10.0	61	49	0	Clear Cut w/ Reserves
PMOP	Brainerd	t13931w1360110	110 WP43	White Pine	3.9	51	61	2010	Thinning
PMOP	Brainerd	t14026w1160046	46 A56	Aspen	19.0	12	82	2008	Clear Cut w/ Reserves
PMOP	Brainerd	t14026w1160051	51 Bi46	Birch	7.0	13	89	2008	Clear Cut w/ Reserves
PMOP	Brainerd	t14026w1160257	257 NP68	Norway Pine	16.0	52	107	0	Clear Cut w/ Reserves
PMOP	Brainerd	t14026w1160311	311 NP57	Norway Pine	10.4	52	100	0	Clear Cut w/ Reserves
PMOP	Brainerd	t14026w1190118	118 Ash53	Ash	9.0	1	114	2008	Thinning
PMOP	Brainerd	t14026w1190133	133 NP59	Norway Pine	5.0	52	94	2008	Thinning
PMOP	Brainerd	t14028w1300121	121 WP78	White Pine	6.5	51	129	0	On-site Visit
PMOP	Brainerd	t14028w1300122	122 WP74	White Pine	2.8	51	106	0	On-site Visit
PMOP	Brainerd	t14028w1310144	144 A55	Aspen	10.0	12	71	0	Clear Cut w/ Reserves
PMOP	Brainerd	t14028w1310148	148 NH45	Northern Hardwoods	21.1	20	68	0	Uneven-aged Harvest
PMOP	Brainerd	t14029w1230056	56 Bi53	Birch	18.6	13	72	0	Clear Cut w/ Reserves
PMOP	Brainerd	t14029w1240024	24 Bi53	Birch	9.2	13	72	2010	Clear Cut w/ Reserves
PMOP	Brainerd	t14030w1160039	39 A 55	Aspen	12.6	12	85	0	Re-inventory
PMOP	Brainerd	t14030w1360078	78 A54	Aspen	20.3	12	66	0	Re-inventory
PMOP	Brainerd	t14030w1360081	81 A54	Aspen	13.8	12	65	0	Re-inventory
PMOP	Brainerd	t14031w1070171	171 WP79	White Pine	13.5	51	101	0	Uneven-aged Harvest
PMOP	Brainerd	t14031w1080013	13 JP44	Jack Pine	17.5	53	51	0	Clear Cut w/ Reserves
PMOP	Brainerd	t14031w1230077	77 Bi56	Birch	6.6	13	72	2008	Clear Cut w/ Reserves
PMOP	Brainerd	t14031w1230081	81 WP44	White Pine	4.0	51	53	2008	Uneven-aged Harvest
PMOP	Brainerd	t14127w1050011	11 WP63	White Pine	10.5	51	129	2009	Uneven-aged Harvest
PMOP	Brainerd	t14127w1060014	14 A54	Aspen	14.1	12	75	0	Re-inventory
PMOP	Brainerd	t14127w1200164	164 NH53	Northern Hardwoods	9.4	20	79	0	Uneven-aged Harvest

Subsection	Forestry Area	Location ID	Stand Label	Cover Type	Treatment Acres	Management Ctype	Age	Stand Exam Year	Prescription Description
PMOP	Brainerd	t14129w1250031	31 A54	Aspen	28.1	12	49	0	Clear Cut w/ Reserves
PMOP	Brainerd	t14130w1020005	5 BF43	Balsam Fir	5.4	62	72	0	Clear Cut w/ Reserves
PMOP	Brainerd	t14130w1110014	14 NP67	Norway Pine	8.9	52	95	0	On-site Visit
PMOP	Brainerd	t14130w1160034	34 A56	Aspen	4.4	12	56	0	On-site Visit
PMOP	Brainerd	t14130w1240017	17 A58	Aspen	7.2	12	68	0	Clear Cut w/ Reserves
PMOP	Brainerd	t14130w1360086	86 NH54	Northern Hardwoods	9.2	20	67	0	Thinning
PMOP	Brainerd	t14131w1160004	4 A57	Aspen	49.9	12	80	2011	Clear Cut w/ Reserves
PMOP	Brainerd	t14131w1220026	26 NP62	Norway Pine	7.1	52	102	0	Re-inventory
PMOP	Brainerd	t14227w1320053	53 WP65	White Pine	6.1	51	129	2009	Uneven-aged Harvest
PMOP	Brainerd	t14231w1160030	30 WP53	White Pine	4.9	51	50	2009	Thinning
PMOP	Brainerd	t14031w1230174	174 WP 44	White Pine	2.3	51	39	2008	Uneven-aged Harvest
PMOP	Brainerd	t13430w113 845	845 WP 43	White Pine	2.4	51	43	0	Thinning
PMOP	Brainerd	t14028w1030xx	xxx Asp	Aspen	2.2	12	16	0	Re-inventory
PMOP	Brainerd	t14028w1030xx	xxx Asp	Aspen	3.9	12	16	0	Re-inventory
PMOP	Detroit Lakes	t13839w1040002	2 WP57	White Pine	24.3	51	100	0	Uneven-aged Harvest
PMOP	Detroit Lakes	t13839w1240011	11 WP65	White Pine	9.9	51	77	0	Uneven-aged Harvest
PMOP	Detroit Lakes	t13839w1240014	14 UG	Upland Grass	4.1	51	12	0	Clear Cut w/ Reserves
PMOP	Detroit Lakes	t13940w1360080	80 A55	Aspen	27.8	12	58	0	Clear Cut w/ Reserves
PMOP	Detroit Lakes	t14038w1160032	32 NH56	Northern Hardwoods	34.0	20	83	0	Uneven-aged Harvest
PMOP	Detroit Lakes	t14038w1220058	58 A56	Aspen	11.8	12	65	0	Clear Cut w/ Reserves
PMOP	Detroit Lakes	t14038w1360081	81 NP67	Norway Pine	5.0	52	99	0	Thinning
PMOP	Detroit Lakes	t14039w1260021	21 A56	Aspen	17.4	12	71	0	On-site Visit
PMOP	Detroit Lakes	t14238w1010011	11 A55	Aspen	13.0	53	77	0	Clear Cut w/ Reserves
PMOP	Detroit Lakes	t14238w1060001	1 NP56	Norway Pine	15.7	52	105	0	Thinning
PMOP	Detroit Lakes	t14238w1060002	2 NP58	Norway Pine	16.6	52	100	2009	Thinning
PMOP	Detroit Lakes	t14238w1120036	36 WS46	White Spruce	25.7	51	63	2009	Seed Tree
PMOP	Detroit Lakes	t14238w1120048	48 A54	Aspen	25.0	12	72	0	Clear Cut w/ Reserves
PMOP	Detroit Lakes	t14238w1120176	176 WP55	White Pine	6.7	51	65	0	Uneven-aged Harvest
PMOP	Detroit Lakes	t14238w1120177	177 WP45	White Pine	10.8	51	65	0	Uneven-aged Harvest
PMOP	Detroit Lakes	t14238w1120178	178 WP43	White Pine	18.7	51	65	0	Uneven-aged Harvest
PMOP	Detroit Lakes	t14238w1190117	117 A52	Aspen	56.9	12	90	0	Manage for Understory
PMOP	Detroit Lakes	t14238w1200105	105 A56	Aspen	7.7	12	80	0	Clear Cut w/ Reserves
PMOP	Detroit Lakes	t14238w1210122	122 NP 44	Norway Pine	34.0	52	39	0	Thinning
PMOP	Detroit Lakes	t14238w1250137	137 NP32	Norway Pine	13.9	52	24	0	On-site Visit

Subsection	Forestry Area	Location ID	Stand Label	Cover Type	Treatment Acres	Management Ctype	Age	Stand Exam Year	Prescription Description
PMOP	Detroit Lakes	t14238w1260130	130 NP66	Norway Pine	29.4	52	81	0	Thinning
PMOP	Detroit Lakes	t14239w1110033	33 Bi57	Birch	5.6	13	77	2009	Clear Cut w/ Reserves
PMOP	Little Falls	t13132w1240081	81 O54	Oak	11.7	30	86	0	Uneven-aged Harvest
PMOP	Little Falls	t13231w1140031	31 WP22	White Pine	1.1	51	26	0	On-site Visit
PMOP	Little Falls	t13231w1140033	33 WP22	White Pine	1.2	51	26	0	On-site Visit
PMOP	Little Falls	t13231w1140057	57 WP41	White Pine	0.9	51	38	0	On-site Visit
PMOP	Little Falls	t13231w1140060	60 WP41	White Pine	10.8	51	38	0	On-site Visit
PMOP	Little Falls	t13231w1140067	67 WP55	White Pine	4.8	51	85	0	Thinning
PMOP	Little Falls	t13232w1020009	9 WP12	White Pine	5.2	51	11	2010	Shelterwood
PMOP	Little Falls	t13232w1360088	88 WP54	White Pine	6.6	51	47	0	On-site Visit
PMOP	Little Falls	t13332w1350107	107 WP12	White Pine	16.0	51	11	2010	Shelterwood
PMOP	Park Rapids	t13735w1040004	4 NP55	Norway Pine	5.5	52	75	0	Thinning
PMOP	Park Rapids	t13735w1160023	23 WP63	White Pine	15.5	51	81	0	On-site Visit
PMOP	Park Rapids	t13735w1200029	29 A54	Aspen	14.2	12	68	0	On-site Visit
PMOP	Park Rapids	t13735w1200030	30 NP57	Norway Pine	5.0	52	90	0	Thinning
PMOP	Park Rapids	t13833w1160171	171 JP43	Jack Pine	5.8	53	57	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t13833w1350441	441 WP11	White Pine	10.3	51	22	0	Thinning
PMOP	Park Rapids	t13834w1360279	279 WP11	White Pine	27.7	51	25	0	Thinning
PMOP	Park Rapids	t13932w1090013	13 NP59	Norway Pine	4.5	52	67	0	Thinning
PMOP	Park Rapids	t13932w1090042	42 WP55	White Pine	3.8	51	67	0	Thinning
PMOP	Park Rapids	t13932w1090044	44 WP46	White Pine	2.4	51	68	0	Thinning
PMOP	Park Rapids	t13932w1090046	46 NP54	Norway Pine	16.2	52	65	0	Thinning
PMOP	Park Rapids	t13933w1210077	77 A43	Aspen	17.4	12	53	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t13933w1220058	58 JP 55	Jack Pine	22.5	53	63	0	On-site Visit
PMOP	Park Rapids	t13933w1220075	75 JP54	Jack Pine	0.0	53	62	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t13933w1220265	265 WP 54	White Pine	14.7	51	79	0	On-site Visit
PMOP	Park Rapids	t13933w1230074	74 Bi44	Birch	24.4	13	94	2009	Clear Cut w/ Reserves
PMOP	Park Rapids	t13936w1070036	36 BF44	Balsam Fir	18.8	62	59	2008	Clear Cut w/ Reserves
PMOP	Park Rapids	t13937w1020024	24 JP57	Jack Pine	12.8	53	65	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t13937w1030008	8 A53	Aspen	7.6	53	70	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t13937w1100142	142 NP59	Norway Pine	18.0	52	90	0	Thinning
PMOP	Park Rapids	t13937w1100158	158 A58	Aspen	27.4	12	73	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t13937w1110144	144 NP56	Norway Pine	40.5	52	97	2008	Thinning
PMOP	Park Rapids	t13937w1110152	152 A56	Aspen	4.0	12	76	2008	Thinning

Subsection	Forestry Area	Location ID	Stand Label	Cover Type	Treatment Acres	Management Ctype	Age	Stand Exam Year	Prescription Description
PMOP	Park Rapids	t13937w1120097	97 NP55	Norway Pine	6.6	52	88	0	Thinning
PMOP	Park Rapids	t13937w1120166	166 A58	Aspen	9.2	12	73	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t13937w1130164	164 NP58	Norway Pine	50.7	52	89	0	Thinning
PMOP	Park Rapids	t13937w1150259	259 A55	Aspen	4.5	12	76	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t13937w1150268	268 Bi44	Birch	10.7	13	83	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t13937w1170251	251 O58	Oak	4.4	30	97	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t13937w1170266	266 O56	Oak	4.6	30	100	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t13937w1360279	279 NH62	Northern Hardwoods	4.2	20	84	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t13937w1360283	283 A55	Aspen	16.8	12	68	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14037w1090039	39 A44	Aspen	11.0	12	68	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14037w1150102	102 NP54	Norway Pine	7.4	52	88	0	Thinning
PMOP	Park Rapids	t14037w1150143	143 Bi43	Birch	11.5	13	81	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14037w1150174	174 JP43	Jack Pine	3.0	53	57	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14037w1150558	558 NP54	Norway Pine	2.8	52	88	0	Thinning
PMOP	Park Rapids	t14037w1160146	146 NP55	Norway Pine	30.0	52	97	2008	Thinning
PMOP	Park Rapids	t14037w1190191	191 A55	Aspen	27.6	12	63	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14037w1200226	226 A55	Aspen	12.0	12	70	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14037w1220227	227 NH53	Northern Hardwoods	16.8	20	87	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14037w1220305	305 A45	Aspen	11.0	12	65	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14037w1240315	315 A44	Aspen	5.3	12	52	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14037w1250336	336 A44	Aspen	17.4	12	52	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14037w1250339	339 WP53	White Pine	4.8	51	76	0	Thinning
PMOP	Park Rapids	t14037w1260382	382 T52	Tamarack	3.3	72	133	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14037w1260392	392 T52	Tamarack	9.8	72	133	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14037w1260407	407 A54	Aspen	5.5	12	74	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14037w1260418	418 A54	Aspen	7.1	12	71	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14037w1270391	391 A53	Aspen	19.2	12	67	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14037w1270393	393 A43	Aspen	8.9	12	48	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14037w1270408	408 A54	Aspen	10.8	12	74	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14037w1280420	420 NP56	Norway Pine	5.0	52	87	0	Thinning
PMOP	Park Rapids	t14132w1020034	34 NP55	Norway Pine	36.6	52	58	2009	Thinning
PMOP	Park Rapids	t14132w1030069	69 NP55	Norway Pine	8.8	52	63	0	Thinning
PMOP	Park Rapids	t14132w1030072	72 NP46	Norway Pine	6.5	52	68	0	Thinning
PMOP	Park Rapids	t14132w1030142	142 A56	Aspen	20.1	12	75	0	Clear Cut w/ Reserves

Subsection	Forestry Area	Location ID	Stand Label	Cover Type	Treatment Acres	Management Ctype	Age	Stand Exam Year	Prescription Description
PMOP	Park Rapids	t14132w1030143	143 A56	Aspen	13.2	12	75	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14132w1060002	2 A56	Aspen	14.4	12	58	0	Re-inventory
PMOP	Park Rapids	t14132w1060025	25 A44	Aspen	24.6	51	66	0	Manage for Understory
PMOP	Park Rapids	t14132w1060027	27 A56	Aspen	11.0	51	79	0	Manage for Understory
PMOP	Park Rapids	t14132w1070181	181 A55	Aspen	24.6	51	76	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14132w1080080	80 WP43	White Pine	9.9	51	87	0	Thinning
PMOP	Park Rapids	t14132w1080091	91 WP53	White Pine	16.0	51	50	0	Thinning
PMOP	Park Rapids	t14132w1080099	99 A54	Aspen	16.8	12	64	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14132w1080174	174 A55	Aspen	6.7	51	76	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14132w1080175	175 A55	Aspen	8.7	51	76	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14132w1160147	147 A55	Aspen	7.7	51	63	0	Manage for Understory
PMOP	Park Rapids	t14133w1010056	56 A54	Aspen	11.9	51	67	0	Manage for Understory
PMOP	Park Rapids	t14133w1010142	142 A57	Aspen	10.0	51	75	0	Manage for Understory
PMOP	Park Rapids	t14133w1010146	146 A57	Aspen	8.4	51	75	0	Manage for Understory
PMOP	Park Rapids	t14133w1010151	151 A57	Aspen	41.6	51	75	0	Manage for Understory
PMOP	Park Rapids	t14133w1019012	9012 A57	Aspen	6.7	51	75	0	Manage for Understory
PMOP	Park Rapids	t14133w1020014	14 A57	Aspen	51.2	51	75	0	Manage for Understory
PMOP	Park Rapids	t14133w1020015	15 A54	Aspen	5.2	51	61	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14133w1030008	8 A45	Aspen	13.8	51	63	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14133w1030032	32 A54	Aspen	8.0	52	81	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14133w1030149	149 A45	Aspen	13.1	51	63	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14133w1040033	33 A51	Aspen	7.0	51	81	0	Manage for Understory
PMOP	Park Rapids	t14133w1040060	60 A55	Aspen	17.8	12	74	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14133w1090049	49 A 54	Aspen	25.0	12	71	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14133w1100071	71 A57	Aspen	8.9	12	72	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14133w1100076	76 A56	Aspen	36.1	12	65	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14133w1100145	145 A56	Aspen	22.2	12	65	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14133w1110080	80 JP51	Jack Pine	11.1	53	72	0	Manage for Understory
PMOP	Park Rapids	t14133w1110098	98 JP54	Jack Pine	5.3	53	76	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14134w1360029	29 A57	Aspen	22.2	51	78	0	Manage for Understory
PMOP	Park Rapids	t14135w1160035	35 A55	Aspen	61.7	51	76	2010	Clear Cut w/ Reserves
PMOP	Park Rapids	t14135w1160040	40 NP59	Norway Pine	29.8	52	71	0	Thinning
PMOP	Park Rapids	t14136w1010015	15 A55	Aspen	8.4	12	76	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14136w1010033	33 JP54	Jack Pine	6.9	53	61	0	Clear Cut w/ Reserves

Subsection	Forestry Area	Location ID	Stand Label	Cover Type	Treatment Acres	Management Ctype	Age	Stand Exam Year	Prescription Description
PMOP	Park Rapids	t14136w1010579	579 A55	Aspen	1.9	12	76	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14136w1010580	580 A55	Aspen	1.1	12	76	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14136w1060041	41 A58	Aspen	5.4	12	73	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14136w1150863	863 A57	Aspen	24.7	12	76	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14136w1150864	864 A57	Aspen	6.8	12	76	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14136w1160102	102 NP56	Norway Pine	19.1	52	63	0	Thinning
PMOP	Park Rapids	t14136w1160102	102 NP56	Norway Pine	19.1	52	63	0	Thinning
PMOP	Park Rapids	t14136w1160110	110 NP56	Norway Pine	3.5	52	60	0	Thinning
PMOP	Park Rapids	t14136w1160161	161 NP59	Norway Pine	16.7	52	59	0	Thinning
PMOP	Park Rapids	t14136w1160183	183 A55	Aspen	9.6	53	79	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14136w1160609	609 A54	Aspen	11.1	52	79	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14136w1160847	847 NP59	Norway Pine	4.9	52	59	0	Thinning
PMOP	Park Rapids	t14136w1170118	118 JP56	Jack Pine	11.2	53	67	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14136w1210226	226 A56	Aspen	25.1	12	67	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14136w1210303	303 NP64	Norway Pine	7.0	52	90	0	Thinning
PMOP	Park Rapids	t14136w1210308	308 JP44	Jack Pine	14.6	53	64	2009	Thinning
PMOP	Park Rapids	t14136w1220865	865 A57	Aspen	19.4	12	76	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14136w1250468	468 NP54	Norway Pine	14.8	52	48	2009	Thinning
PMOP	Park Rapids	t14136w1330836	836 NP53	Norway Pine	5.8	52	55	0	Thinning
PMOP	Park Rapids	t14232w1030075	75 A55	Aspen	4.4	12	88	2009	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1100115	115 A41	Aspen	23.4	12	45	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1100577	577 O52	Oak	21.0	30	82	2009	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1110102	102 NH56	Northern Hardwoods	12.0	20	110	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1110105	105 A44	Aspen	34.0	12	58	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1130231	231 A56	Aspen	7.8	12	88	2009	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1150221	221 JP59	Jack Pine	3.3	53	85	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1200306	306 A51	Aspen	5.3	12	89	2009	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1220296	296 A56	Aspen	26.3	53	83	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1220801	801 JP55	Jack Pine	9.5	53	83	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1230366	366 A43	Aspen	14.6	12	82	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1240265	265 NP64	Norway Pine	17.2	52	90	0	Thinning
PMOP	Park Rapids	t14232w1240625	625 WS41	White Spruce	32.7	61	2	0	Thinning
PMOP	Park Rapids	t14232w1240700	700 WS41	White Spruce	23.7	61	2	0	Thinning
PMOP	Park Rapids	t14232w1250714	714 A56	Aspen	5.3	12	80	0	Clear Cut w/ Reserves

Subsection	Forestry Area	Location ID	Stand Label	Cover Type	Treatment Acres	Management Ctype	Age	Stand Exam Year	Prescription Description
PMOP	Park Rapids	t14232w1260677	677 A56	Aspen	13.7	12	80	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1260773	773 A56	Aspen	18.4	12	80	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1270777	777 A56	Aspen	41.1	12	67	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1280654	654 A56	Aspen	18.6	12	80	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1290426	426 NH52	Northern Hardwoods	11.4	20	83	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1300452	452 A55	Aspen	2.4	12	86	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1310462	462 A54	Aspen	22.2	12	82	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1310473	473 WS11	White Spruce	10.8	61	12	0	Thinning
PMOP	Park Rapids	t14232w1310567	567 JP56	Jack Pine	4.6	53	78	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1310743	743 A54	Aspen	31.4	12	84	2009	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1320469	469 WS57	White Spruce	18.3	61	66	0	Thinning
PMOP	Park Rapids	t14232w1320520	520 NP43	Norway Pine	8.9	52	75	0	Thinning
PMOP	Park Rapids	t14232w1320554	554 WP55	White Pine	11.6	51	86	0	Thinning
PMOP	Park Rapids	t14232w1330795	795 A55	Aspen	57.7	12	83	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14232w1340540	540 NP59	Norway Pine	13.9	52	58	2009	Thinning
PMOP	Park Rapids	t14232w1360542	542 Bi43	Birch	8.1	13	79	2008	Clear Cut w/ Reserves
PMOP	Park Rapids	t14233w1160195	195 A55	Aspen	40.0	12	80	2008	Clear Cut w/ Reserves
PMOP	Park Rapids	t14233w1160794	794 A55	Aspen	9.9	12	89	2009	Clear Cut w/ Reserves
PMOP	Park Rapids	t14233w1160802	802 A55	Aspen	3.7	12	89	2009	Clear Cut w/ Reserves
PMOP	Park Rapids	t14233w1170261	261 JP53	Jack Pine	30.5	53	42	2009	Sanitation - Selective Harvest
PMOP	Park Rapids	t14233w1170284	284 NP42	Norway Pine	25.1	52	42	2009	Thinning
PMOP	Park Rapids	t14233w1170287	287 NP41	Norway Pine	10.3	52	41	2009	Thinning
PMOP	Park Rapids	t14233w1170679	679 NP43	Norway Pine	17.0	52	44	2009	Thinning
PMOP	Park Rapids	t14233w1210793	793 A55	Aspen	18.1	12	89	2009	Clear Cut w/ Reserves
PMOP	Park Rapids	t14233w1220298	298 A43	Aspen	3.8	12	54	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14233w1220340	340 A55	Aspen	7.0	12	85	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14233w1260364	364 NP55	Norway Pine	5.2	52	53	0	Thinning
PMOP	Park Rapids	t14233w1330407	407 JP41	Jack Pine	4.0	53	57	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14233w1330418	418 JP42	Jack Pine	7.6	53	58	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14233w1340442	442 A45	Aspen	4.7	51	76	2009	Clear Cut w/ Reserves
PMOP	Park Rapids	t14233w1350412	412 O42	Oak	13.9	30	83	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14234w1160010	10 A57	Aspen	13.0	12	84	2008	Clear Cut w/ Reserves
PMOP	Park Rapids	t14234w1160012	12 A43	Aspen	25.4	12	61	0	Re-inventory
PMOP	Park Rapids	t14234w1360039	39 A56	Aspen	9.6	12	77	0	Clear Cut w/ Reserves

Subsection	Forestry Area	Location ID	Stand Label	Cover Type	Treatment Acres	Management Ctype	Age	Stand Exam Year	Prescription Description
PMOP	Park Rapids	t14236w1120020	20 NP57	Norway Pine	9.7	52	102	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14236w1160053	53 BF44	Balsam Fir	15.3	62	68	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14236w1160066	66 BF46	Balsam Fir	23.8	61	63	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14237w1020050	50 NP46	Norway Pine	3.4	52	64	0	Thinning
PMOP	Park Rapids	t14237w1040013	13 A56	Aspen	15.5	12	86	2009	Clear Cut w/ Reserves
PMOP	Park Rapids	t14237w1040022	22 NP55	Norway Pine	8.6	52	72	2009	Thinning
PMOP	Park Rapids	t14237w1050045	45 A54	Aspen	16.2	12	87	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14237w1050062	62 NP64	Norway Pine	17.3	52	86	0	Thinning
PMOP	Park Rapids	t14237w1060317	317 COA	Cutover Area	4.5	82	98	0	Re-inventory
PMOP	Park Rapids	t14237w1070086	86 NP58	Norway Pine	21.7	52	75	0	Thinning
PMOP	Park Rapids	t14237w1070111	111 COA	Cutover Area	28.8	82	75	0	Re-inventory
PMOP	Park Rapids	t14237w1070112	112 A57	Aspen	32.7	52	76	2009	Re-inventory
PMOP	Park Rapids	t14237w1140178	178 WS 12	White Spruce	10.4	61	2	0	Thinning
PMOP	Park Rapids	t14237w1180161	161 NP56	Norway Pine	15.3	52	88	2009	Thinning
PMOP	Park Rapids	t14237w1180173	173 A55	Aspen	18.1	12	87	2009	Clear Cut w/ Reserves
PMOP	Park Rapids	t14237w1240191	191 NP54	Norway Pine	12.1	52	102	0	Clear Cut w/ Reserves
PMOP	Park Rapids	t14237w1330242	242 NP56	Norway Pine	21.0	52	67	0	Thinning
St. Louis Moraines	Brainerd	t13727w1250229	229 NP52	Norway Pine	23.7	52	52	0	Thinning
St. Louis Moraines	Brainerd	t13727w1250231	231 NP45	Norway Pine	6.5	52	35	0	Thinning
St. Louis Moraines	Brainerd	t13727w1360101	101 NP56	Norway Pine	25.6	52	72	0	Thinning

APPENDIX T

CP-PMOP SFRMP
10-Year Stand Exam List / New Access Needs List Instructions

The Chippewa Plains/Pine Moraines and Outwash Plains SFRMP Team has developed the following directions for Area staff reference while completing the 10-year Stand Exam List and New Access Needs List process for state timberlands.

The goal is to complete the 10 year Stand Exam List and New Access Needs List within 30 days of starting the project. See **Attachment A**, for Estimated Timelines and start and end dates. The project will be completed in 6 steps:

I. Review Stand Selection background information and participate in one of two Orientation Sessions scheduled as follows:
- Bemidji: July 25, 2007 9 AM Minnesota Energy Resources Conference Room

or
- Brainerd: July 31, 2007 9AM location TBD

II. Select stands for the 10-year Stand Exam List Planning period, add Prescriptions, and Management Objectives and comments as appropriate.

III. Determine those stands to be on the Area's FY 2009 Annual Plan List. Assigning further site visit years is not required.

IV. Conduct a final review of the 10-year Stand Exam List and field visit year portion of the project.

V. Complete the New Access Needs List portion of the project.

VI. Submit completed 10 year Stand Exam List and New Access Needs List project to Mike Locke

I. STAND SELECTION BACKGROUND:

1. Ten year Stand Selection is the critical step in the CP-PMOP SFRMP process. At this stage of the process, the CP-PMOP Preliminary Assessment has been completed and reviewed by the public, GDSs, forest management Strategies and DFFCs have been drafted, conversion acres and harvest level targets have been recommended, all leading to preparing the 10 year Stand Exam Lists and New Access Needs lists.

2. All Forestry Area Supervisors, Area Wildlife Managers, Fisheries Supervisors and Ecological Resources Supervisors have been invited to attend one of the Orientation Sessions.

3. Forestry Areas will need to coordinate stand selection meeting dates with other Divisions (Wildlife, Fisheries and Ecological Services). Staff from these Divisions may or may not choose to attend but they need to be invited. It is likely that Jeff Edmonds, Region Timber Program Coordinator and Erik Thorson or Perry Loegering from Wildlife, will attend the first day of stand selection in each Area. One member of the CP-PMOP Team will be available at each meeting of each Area, during the 10 year Stand Selection process, to answer questions and provide guidance as possible.

Identified below are suggested / target dates for the first meeting for Stand Selection in all Forestry Areas. It is intended that, at the Orientations, the Stand Selection Teams will establish the schedule that works for them.

- Bemidji/Blackduck July 26-30
- Brainerd/Little Falls August 1-3
- Park Rapids/ Detroit Lakes August 6-8
- Deer River August 7-9

It is requested that each Forestry Area identify a Team "leader" to keep the process moving and a Team "recorder" to keep track of any unique notes, comments and decisions made by the Stand Selection Teams not adequately accounted for in the Timber Planning Extension.

4. The CP-PMOP Team has developed this set of **Instructions** and **Attachments** to aid the Area teams in carrying out this critical step of the SFRMP process. Hardcopies will be provided to all those attending the Stand Selection meetings. See the **List of Attachments** for all information to be supplied by the CP-PMOP Team. The more critical and significant steps and Attachments are described in these Instructions.

5. A dedicated computer and ArcView / GIS operator has been identified and scheduled to assist each Area during stand selection. This individual will run the programs, respond to your queries and generally keep track of the stand selection progress. An accounting format has been developed as part of the SFRMP FIM 2 dataset / ArcView project to serve as a method of keeping track of stands selected by the Area Teams (**See Attachment B**).

6. To assist in moving Stand Selection along, Areas are provided with the following spreadsheets which are a critical component of the CP-PMOP plan and recommendations:

   a. Conversion Goals by Cover Type by Forestry Area

   This spreadsheet identifies "target acres" for conversion from one cover type to another consistent with GDSs and Strategies from the draft CP-PMOP Plan.

   b. Age Class Targets by Cover Type and Forestry Area

   This spreadsheet identifies "target acres" recommended by the CP-PMOP Team consistent with the stand selection criteria, and harvest levels from the draft CP-PMOP Plan.

   c. Uneven-Aged Management and Thinning Pool Acres by Cover Type and Forestry Area

   This spreadsheet identifies "target acres" for uneven aged management and thinning as recommended by the CP-PMOP Team.

7. Each Area Stand Selection Team will have to determine when to complete the New Access Needs portion of the 10 year Stand Selection. Layers of forest access have been included in the stand selection ArcView project. Stand Selection Teams will have to decide if it is more efficient to determine access needs as each stand is selected or to first complete the 10 year Stand Exam List, then go back and determine the New Access Needs portion of the project.

II. SELECT STANDS FOR THE 10-YEAR STAND EXAM PLANNING PERIOD

Using the resources provided by the CP-PMOP Team (**See Attachment C**) and Area Forestry, Wildlife, Fisheries and Ecological Resources knowledge, background, history and experience, select the 10-year Stand Exam List for your Area.

1. The Stand Selection Teams should use the following spreadsheets as targets during stand selection:
   - **Even Age Class Targets by Cover Type and Forestry Area (Attachment D-1**) This spreadsheet should be used to select even-aged acres to be treated (excludes thinning acres).

   - **Conversion Goals by Cover Type by Forestry Area (Attachment D-2)** This spreadsheet should be used to select acres to be converted from one cover type to another.

   - **Uneven-Aged Management and Thinning Pool Acres by Cover Type and Forestry Area (Attachment D-3)** This should be used to select acres to be managed unevenly and / or to be thinned.

2. As identified in **Attachment E** the CP-PMOP Team developed a **Stand Scoring System** that assigns scores to stands meeting specific stand management Strategies taken from the draft CP-PMOP Plan. Under the Stand Scoring System, any particular stand could receive a score under either of the scoring systems. The CP-PMOP Team suggests that those stands receiving higher scores should receive more consideration by the Areas and be included on the 10 year Stand Exam Lists, provided the Stand Selection Teams find the FIM 2 data is correct and there is no local or site information indicating that the stand should not be on the 10 year list. The CP-PMOP Team suggests higher scored stands should be included on the Stand Exam Lists unless there are identified reasons not to. All stand scores have been entered into the SFRMP FIM 2 dataset and labeled in the SFRMP ArcView project. Areas can "batch select" all stands with higher scores as a starting point for stand selection if you choose.

   Separate scoring systems were developed for:
   a. Conversion acres; and,
   b. Even-aged management.

   Stands have been tagged (as a pool of stands) that meet the uneven-aged management and thinning criteria as stated in the Cover Type Management Recommendations.

3. Treatment goals have been calculated using FIM2 data as of 2/07. Stands that have been on previous annual stand exam lists, offered, sold or cut have been used in the calculation if the 2/07 inventory still shows standing timber (i.e. not altered following sale or harvest). The stand selection FIM2 dataset has been tagged with prescriptions, treatment acres and stand exam year from FY 2006-2008 Annual Stand Exam Lists.

   This overlap of plans will be accounted for in the following way:
   a. Stands that show older standing timber (not altered) will retain the prescription and treatment acres from any previous stand exam list. These acres will be counted in the summary of acres by prescription in the ArcView project and contribute to Area treatment goals. Additional treatment acres can be added if the whole stand was not previously selected. These stands will not be presented as part of the CP_PM SFRMP public review as they have already been reviewed.

b. Stands tagged with a prescription from a previous plan and have been altered (i.e. stand selection FIM shows A19 or COA, etc.) should have the prescriptions reset to 0. These stands will not contribute to the Area treatment targets as they were not used in calculating the targets.

Forestry Areas are advised to bring their Annual Stand Exam Lists and Annual Plan Additions back to 2005 to the stand selection meetings for reference.

4. In completing the 10 year Stand Exam List, Areas should consider the scores assigned together with a stand by stand evaluation of stand age to select stands and assign Preliminary Prescriptions and Management Objectives where appropriate, to meet GDSs, Strategies and DFFCs identified in the draft CP-PMOP Plan (**see Attachment F**). These GDSs, Strategies and DFFCs have been developed considering the widest range of forest/ wildlife/ fisheries and ecological management factors that could affect stand selection and should be considered by the Areas as the 10 year Stand Exam Lists are completed.

5. If the Area Stand Selection Teams know of stands that are not in the pool but are in need of treatment, these should be discussed during the stand selection process and may be selected, provided all Divisions reach agreement. Examples are: locations for new or expanded gravel pits or I&D problems. It should be noted, however, that the overall CP-PMOP Plan direction, Strategies, DFFCs and resulting cover type treatment levels and conversions have been established through the CP-PMOP planning process.

6. Consult the SMA ArcView layer and take SMAs into consideration as stand selection is implemented. Note that the SMA layer supplied should be supplemented by all local, Area knowledge and experience with SMAs. Do not consider the supplied layer as the only SMA information that should be considered. Corrections to boundaries of SMAs can be discussed and noted during the process to facilitate stand selection. Identification of SMA boundaries or corrections should be noted by the Team Recorder and submitted to Mike Locke. The CP-PMOP Team defers to local knowledge when considering specific SMA boundaries.

7. Keep in mind that with conversion to FIM 2, some inconsistencies or inaccuracies could be found. During the stand selection process, Area Teams should note and record any database corrections or changes so that FIM 2 can be updated.

8. An ArcView operator will be assigned by the CP-PMOP Team to run the SFRMP FIM 2 program, the Timber Planning Extension and the ArcView project, but it is requested that a Team Recorder be assigned to:

    a. keep track of notes and comments which cannot easily be entered into the Stand Selection dataset;

    b. try to document why, what may appear to be obvious stands, are not placed on the 10 year list; and,

    c. record significant, broad issues which affect the Area's stand selection discussions; and,

    d. If Stand Selection Teams deviate significantly from Area targets, record reasons why the deviation is necessary.

    This information will be helpful to the CP-PMOP Planning Team in completing the CP-PMOP Plan.

9. It is recommended that the Stand Selection Teams proceed in the following order to complete the overall 10 year Stand Exam Lists:
    a. Conversion acre targets;
    b. Even-aged acre targets; followed by,
    c. Uneven-aged / thinning acres.

10. Stand Selection Teams must enter appropriate codes into the required Fields as listed below. Each Team will need to determine if codes should be entered into these Fields as stands or groups of stands are selected or if the needed data can be entered more efficiently after the entire stand selection process is completed.

    a. **PRESCRIP Field**: Assign only a general preliminary Prescription to all stands selected for the 10-year Stand Exam List. Preliminary Prescription choices come from the list of options in the Timber Planning Extension **(See Attachment G):**

        - When determining a preliminary Prescription, be sure to consider the preliminary Management Objectives, if any have been assigned.

        - Refer to previous decisions concerning stand management relating to SMAs / SMZs and OFMCs

    b. **OBJECTIVE Field**: Assigning a preliminary Management Objective is not required but can be assigned provided there is agreement among all Divisions. Assign a preliminary Management Objective Code(s) to all stands selected in MCBS Sites ranked outstanding, high or high prime (Mahnomen and Morrison counties) that do not have a code assigned to it already. **(See Attachment G)**

    c. **JT VISIT Field**: The joint field visit field may be filled in during stand selection, if the Division representative has enough information at the time to suggest a joint visit will be necessary. Otherwise, this Field will be filled in during annual plan review.
        - FSH = All stands on Fisheries lands will receive a site visit designation of FSH. Other stands Fisheries staff wants to field visit will be tagged during the 10-year selection or at annual reviews.
        - ECO = Ecological Resources staff will tag stands with ECO when they want to do a joint site visit, either during the 10-year selection process or at annual review of stands.
        - WLD = Wildlife staff will tag stands with WLD when they want to do a joint site visit on that site.

III. ASSIGN A FIELD VISIT YEAR FOR FY 2009

1. In the **SE_YEAR Field**, enter as 2009 only those stands identified for examination during FY 2009. Enter the FY for other stands only if agreement can be reached easily or if the stand is part of a group of stands that should be examined sequentially.

2. Thinning criteria has been recommended in the Cover Type Management Recommendations. All stands meeting the thinning criteria have been tagged in the SFRMP FIM 2 dataset. Treatment levels for thinning should be consistent with the **Uneven-Aged Management and Thinning Pool Acres by Cover Type and Forestry Area** identified in **Attachment D**.

IV. FINAL REVIEW OF THE 10 YEAR STAND EXAM LIST / FIELD VISIT PORTION OF THE PROJECT

1. Ensure that each stand selected has a preliminary Prescription Code assigned to it (PRESCRIP Field) and all stands selected for FY 2009 are so identified. Any stand tagged for potential conversion should have the management cover type changed to reflect the conversion.

   Check to ensure that each stand selected in an MCBS outstanding or high Site has a preliminary Management Objective assigned to it (Mahnomen and Morrison counties) and that the preliminary management objective and the preliminary prescription code assigned are consistent with each other.

2. After having completed the New Access Needs list, check to see if any isolated stands have been selected that might likely not be treated over the next ten years due to access issues. If any such stands have been selected it may be advantageous to select different stands that will most likely be treated. Coordinate changes with other Divisions.

V. COMPLETE THE NEW ACCESS NEEDS PLAN PORTION OF PROJECT

The New Access Needs Plan will be completed concurrently with the 10-year Stand Exam Lists or as a separate process, following selection of the 10 year Stand Exam Lists. The Area Stand Selection Teams must determine which method is most efficient. See **Attachment H** for instructions on how to proceed with completing the New Access Needs List task.

VI. SEND THE FINAL STAND SELECTION AND NEW ACCESS PLAN PROJECT TO

Mike Locke.

APPENDIX U

Stand Examination List
New Access Needs List
by Subsection and Location

This Appendix lists the stands selected for stand examinations and possible treatment for FY 2010-2018. Fiscal Year 09 stands were selected consistent with the treatment levels, DFFCs, and strategies identified in this Plan and are the first year stands of the 10-year plan implementation period. Fiscal Year 09 stands were submitted for public review prior to the formal review of the CP-PMOP SFRMP Stand Exam List and therefore are not included in this Appendix. Treatments to stands on the FY 09 stand exam list are the first year of the 10-year plan and will contribute to the goals identified in this Plan.

The data fields are as follows:

1. **Subsection**
   This SFRMP includes two ECS subsections: Chippewa Plains and Pine Moraines and Outwash Plains.

2. **Forestry Area**
   The stands identified on this Appendix are organized by Forestry Area as follows:
   - Within the Chippewa Plains ECS subsection:
     i. Bemidji Area
     ii. Blackduck Area
     iii. Deer River Area
   - Within the Pine Moraines and Outwash Plains ECS subsection:
     i. Brainerd Area
     ii. Bemidji Area
     iii. Deer River Area
     iv. Detroit Lakes Area
     v. Little Falls Area
     vi. Park Rapids Area

3. **Township:** Township number
4. **Range:** Range number
5. **Section:** Section number

6. **Stand**
   Stand number - a unique number that identifies a stand within a township and range.

7. **Location ID**
   The Location ID is a unique identifier for each stand. The stands are listed in this Appendix in numerical order for each subsection based on the Location ID.

   Using Location ID t05710w1130179 as an example:
   - t057 = township
   - 10 = range
   - w = range direction
   - 1 = state ownership
   - 13 = section, and
   - 0179 = stand number.

8. **Management Cover Type**
   The forest cover type classification of the stand. Typically, the predominant tree species or tree species group in the stand.

9. Acres
Acres in the stand that are recommended for stand examination and possible treatment (may be an entire stand or portion of a stand).

10. Age
Stand age as of 2007 (when stand selection was completed). Stand age is based on the average age of the predominant species (dominant or co-dominant trees) in the stand.

11. Stand Exam Year
Fiscal Year (FY = July 1 through June 30). The FY when the stand examination is planned. Following the stand evaluation, if the stand conditions are suitable for timber harvest then a timber appraisal is completed.

12. New Access Miles
Estimated miles of new road/route needed to access the stand. Mileage is assigned to the stand at the end of the new access route.

13. Preliminary Prescription
The proposed general management prescription assigned to the stand during the planning process.

14. Preliminary Management Objective
A Preliminary Management Objective may be assigned to some stands during selection of the 10-Year Stand Exam List. The preliminary objectives assigned to stands on the list will be provided to appraisers prior to completing the initial stand examination. Final Management Objectives are determined only following stand site evaluations.

Prescription Definitions
General prescriptions are used in SFRMP planning. More detailed or different prescriptions may be assigned after the stand examination is completed.

Even-aged Harvest Methods: General category for harvest methods designed to regenerate a stand with a single age class. The result is a stand of trees containing a single age class in which the range of tree ages is usually less than 20 percent of rotation age. Best suited for management of shade-intolerant species, such as aspen, birch, and jack pine.

- **Clearcut with Reserves:** Removal, or felling, in a single cutting, of essentially all trees in the stand, but leave trees are reserved. Reserve trees may be left in clumps, strips, or islands and they occupy a minimum of 5 percent of the clearcut harvest unit, or greater than five leave trees are left scattered throughout the harvested site.

- **Seed Tree:** An even-aged regeneration method in which an area is clearcut except that certain trees, called seed trees, are left standing singly or in groups for the purpose of providing seed to restock the cleared area. Seed trees may be removed after regeneration is established.

- **Shelterwood:** A method of regenerating an even-aged stand by a series of partial cuttings, resembling thinnings, that extend over a small fraction of the rotation and provide protected seedbeds for regeneration. The sequence of treatments can include three distinct types of cuttings: a) an option preparatory cut to enhance seed production, b) an establishment cut to prepare the seedbed and to create a new age class, and c) a final removal cut to release established regeneration. The final removal cut may retain leave or reserve trees.

Uneven-aged Harvest Methods: Methods of regenerating a stand, and maintaining an uneven aged structure by removing some trees in all size classes either singly, in small groups, or in strips. The result is a stand of trees of three or more distinct age classes, either intimately mixed or in small groups. Best suited for management of shade-tolerant species, such as northern hardwoods.

- **Group Selection:** A method of regenerating uneven-aged stands in which trees are removed, and new age classes are established, in small groups. The maximum width of the groups is approximately twice the height of the mature trees. Also, know as gap management.

- **Single Tree Selection:** A method of creating new age classes in uneven-aged stands in which individual trees of all size classes are removed more-or-less uniformly throughout the stand to achieve a desired stand structure.

- **Thinning:** A harvest made to reduce the density of trees within a forest stand primarily to improve growth, enhance forest health, or recover potential mortality. *Commercial thinning* (general prescription) is thinning after the trees are of merchantable size for timber markets. *Row or strip thinning* is thinning in which selected rows or strips are harvested, usually used during the initial thinning, providing equipment operating room for future selective thinnings. *Selective thinning* is thinning in which individual trees that have been marked or specified (e.g., by diameter, spacing, or quality) are harvested.

On-Site Evaluation: The stand needs a field visit to accurately determine the stand condition in order to make a management prescription.

See Appendix I (Standard Codes in SFRMP) definitions for a more detailed list of harvest prescriptions used in the CP-PMOP SFRMP.

Stand Examination List by Subsection and Forestry Area FY 2010 to 2018

Subsection **Chippewa Plains**

Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
143	28	4	18	t14328w1040018	Tamarack	18 T41	38.4	114	0	0	Seed Tree	
143	28	16	170	t14328w1160170	Aspen	170 A42	6.6	55	0	0	Clearcut with Reserves	
143	28	18	129	t14328w1180129	Tamarack	129 T41	6.4	126	2014	0	Seed Tree with Reserves	
143	28	18	477	t14328w1180477	Birch	477 Bi55	29.8	97	0	0	Clearcut with Reserves	
143	28	18	486	t14328w1180486	Northern Hardwoods	486 NH54	58	101	0	0	Uneven-aged Harvest	
143	28	18	497	t14328w1180497	Balm of Gilead	497 BG54	5.4	85	0	0	Clearcut with Reserves	
143	28	18	528	t14328w1180528	Northern Hardwoods	528 NH51	28.5	77	2018	0	Uneven-aged Harvest	
143	28	19	510	t14328w1190510	Aspen	510 A53	11.6	72	0	0	Clearcut with Reserves	
143	28	19	512	t14328w1190512	Balm of Gilead	512 BG52	4.8	83	0	0	Re-inventory.	
143	28	25	358	t14328w1250358	Aspen	358 A41	10.2	68	0	0	Clearcut with Reserves	
143	29	6	35	t14329w1060035	Northern Hardwoods	35 NH54	8.5	75	0	0	On-site Evaluation	
143	29	6	37	t14329w1060037	Northern Hardwoods	37 NH55	10.1	97	0	0	On-site Evaluation	
143	29	24	28	t14329w1240028	Aspen	28 A56	10.2	83	0	0	Re-inventory.	
143	29	24	29	t14329w1240029	Aspen	29 A54	5.1	70	0	0.4	Re-inventory.	
143	29	25	63	t14329w1250063	Ash	63 Ash44	9.6	99	0	0	Uneven-aged Harvest	
143	29	26	61	t14329w1260061	Northern Hardwoods	61 NH57	15.7	102	0	0	Uneven-aged Harvest	
143	29	26	66	t14329w1260066	Northern Hardwoods	66 NH58	8.9	101	0	0.2	Uneven-aged Harvest	
143	30	5	9	t14330w1050009	White Spruce	9 WS46	25.7	82	0	0.2	On-site Evaluation	
143	30	5	10	t14330w1050010	Northern Hardwoods	10 NH53	23.1	83	0	0	On-site Evaluation	
143	30	6	4	t14330w1060004	Aspen	4 A59	5.5	75	0	0	Re-inventory.	
143	30	22	54	t14330w1220054	Northern Hardwoods	54 NH53	29.7	87	2017	0	Uneven-aged Harvest	
143	31	1	16	t14331w1010016	Tamarack	16 T42	25	120	0	0	Clearcut with Reserves	
143	31	1	65	t14331w1010065	Aspen	65 A43	4.1	53	0	0.3	Clearcut with Reserves	
143	31	1	69	t14331w1010069	Norway Pine	69 NP58	8.5	105	0	0	Thinning	
143	31	5	23	t14331w1050023	White Pine	23 WP76	13.4	115	0	0	Thinning	
143	31	5	24	t14331w1050024	Norway Pine	24 NP43	5.2	48	0	0.1	Thinning	
143	31	6	33	t14331w1060033	Aspen	33 A54	3.3	103	0	0	Manage for understory	
143	31	6	35	t14331w1060035	Ash	35 Ash56	8	115	0	0	Uneven-aged Harvest	
143	31	7	72	t14331w1070072	Balsam Fir	72 BF58	6.4	74	0	0	Manage for understory	
143	31	7	82	t14331w1070082	Aspen	82 A43	13	38	0	0	Manage for understory	
143	31	7	87	t14331w1070087	Ash	87 Ash55	5.6	96	0	0	Manage for understory	

Subsection **Chippewa Plains**

Forestry Area ***Bemidji Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
143	31	7	95	t14331w1070095	Ash	95 Ash44	12.1	81	0	0	Manage for understory	
143	32	1	5	t14332w1010005	Cutover Area	5 COA	7.5	15	0	0	Re-inventory.	COV53
143	32	1	14	t14332w1010014	Aspen	14 A56	13.8	80	0	0	Clearcut with Reserves	
143	32	1	15	t14332w1010015	Aspen	15 A56	8.8	70	0	0	Clearcut with Reserves	
143	32	1	58	t14332w1010058	Aspen	58 A57	8.7	79	0	0	Clearcut with Reserves	
143	32	6	1	t14332w1060001	Black Spruce, Lowland	1 BSL44	13.5	122	0	0	Seed Tree	
143	32	6	2	t14332w1060002	Tamarack	2 T41	7	121	0	0	Seed Tree	
143	32	6	3	t14332w1060003	Jack Pine	3 JP45	16	59	0	0	Clearcut with Reserves	
143	32	6	4	t14332w1060004	Norway Pine	4 NP67	4.5	111	0	0	Thinning	
143	32	16	24	t14332w1160024	Tamarack	24 T43	12.5	119	0	0	Seed Tree	
143	32	16	40	t14332w1160040	Norway Pine	40 NP22	2.4	25	0	0	Thinning	
143	32	16	42	t14332w1160042	Norway Pine	42 NP11	6.9	27	0	0	Thinning	
143	32	18	26	t14332w1180026	Jack Pine	26 JP43	7.5	72	0	0	Clearcut with Reserves	
143	32	18	33	t14332w1180033	Balsam Fir	33 BF42	3.6	74	0	0	Manage for understory	
143	32	18	34	t14332w1180034	Cutover Area	34 COA	1.7	13	0	0	Re-inventory.	COV53
143	32	18	41	t14332w1180041	Cutover Area	41 COA	13.3	13	0	0	Re-inventory.	COV53
143	32	26	55	t14332w1260055	Norway Pine	55 NP59	5	92	0	0	Thinning	
143	33	12	18	t14333w1120018	Cutover Area	18 COA	6.2	7	0	0	Re-inventory.	COV53
143	33	23	156	t14333w1230156	Jack Pine	156 JP42	5.3	61	0	0	Clearcut with Reserves	
143	33	24	85	t14333w1240085	White Spruce	85 WS11	13	21	0	0	Thinning	
143	33	24	92	t14333w1240092	Jack Pine	92 JP47	8.3	59	0	0	Re-inventory.	
143	33	24	118	t14333w1240118	Jack Pine	118 JP54	9.5	69	0	0	Re-inventory.	
143	33	24	119	t14333w1240119	White Spruce	119 WS22	16.6	34	0	0	Thinning	
143	33	24	133	t14333w1240133	Aspen	133 A19	18	19	0	0	Re-inventory.	
143	33	24	153	t14333w1240153	Aspen	153 A43	7.4	58	0	0	On-site Evaluation	
143	33	24	161	t14333w1240161	Jack Pine	161 JP44	13.8	65	0	0	Clearcut with Reserves	
143	33	25	212	t14333w1250212	Jack Pine	212 JP55	7.4	75	0	0.3	Clearcut with Reserves	
143	33	25	226	t14333w1250226	Jack Pine	226 JP52	19.8	73	0	0	Clearcut with Reserves	
143	33	26	201	t14333w1260201	White Spruce	201 WS42	9.6	47	0	0	Thinning	
143	33	26	236	t14333w1260236	Aspen	236 A53	16.1	58	0	0	Clearcut with Reserves	COV53
143	33	26	248	t14333w1260248	Norway Pine	248 NP63	5.2	134	0	0	Thinning	
143	34	4	4	t14334w1040004	Norway Pine	4 NP32	5.8	22	0	0	Thinning	
143	34	4	5	t14334w1040005	Norway Pine	5 NP31	102.7	24	0	0	Thinning	
143	34	4	6	t14334w1040006	Jack Pine	6 JP43	2.8	66	0	0	Re-inventory.	

Subsection **Chippewa Plains**

Forestry Area ***Bemidji Area***

Township	*Range*	*Section*	*Stand*	*Location ID*	*Management Cover Type*	*Stand Label*	*Acres*	*Age*	*Stand Exam Year*	*New Access Miles*	*Preliminary Prescription*	*Management Objectives*
143	34	4	8	t14334w1040008	Cutover Area	8 COA	8	8	0	0	Re-inventory.	INC53
143	34	4	10	t14334w1040010	Cutover Area	10 COA	19.9	3	0	0	Re-inventory.	INC53
143	34	4	16	t14334w1040016	Cutover Area	16 COA	4.6	8	0	0	Re-inventory.	INC53
143	34	5	11	t14334w1050011	Jack Pine	11 JP44	6.6	58	0	0	Re-inventory.	con2
143	34	5	15	t14334w1050015	Jack Pine	15 JP42	10.7	55	0	0	Re-inventory.	
143	34	6	133	t14334w1060133	Jack Pine	133 JP42	6.9	56	0	0.3	Clearcut with Reserves	
143	34	8	37	t14334w1080037	Norway Pine	37 NP22	28.8	26	0	0	Thinning	
143	34	8	46	t14334w1080046	Jack Pine	46 JP44	20.1	58	0	0	Clearcut with Reserves	
143	34	8	49	t14334w1080049	Norway Pine	49 NP22	20.5	22	0	0	Thinning	
143	34	9	22	t14334w1090022	Cutover Area	22 COA	61	6	0	0	Re-inventory.	INC53
143	34	9	23	t14334w1090023	Norway Pine	23 NP57	4.7	96	0	0	Shelterwood	
143	34	9	39	t14334w1090039	Jack Pine	39 JP45	76	76	0	0	Shelterwood	
143	34	9	43	t14334w1090043	Norway Pine	43 NP41	6.1	15	0	0	Thinning	
143	34	9	48	t14334w1090048	Norway Pine	48 NP53	3.5	66	0	0	Thinning	
143	34	10	24	t14334w1100024	Cutover Area	24 COA	4.4	52	0	0	Re-inventory.	COV53
143	34	10	26	t14334w1100026	Norway Pine	26 NP22	29.9	22	0	0	Thinning	
143	34	10	34	t14334w1100034	Cutover Area	34 COA	9.4	55	0	0	Re-inventory.	COV53
143	34	10	40	t14334w1100040	Cutover Area	40 COA	49.4	49	0	0	Re-inventory.	INC53
143	34	10	41	t14334w1100041	Cutover Area	41 COA	5.7	56	0	0	Re-inventory.	COV53
143	34	10	54	t14334w1100054	Norway Pine	54 NP31	10	17	0	0	Thinning	
143	34	10	57	t14334w1100057	Jack Pine	57 JP42	6.1	61	0	0	Clearcut with Reserves	
143	34	16	71	t14334w1160071	Norway Pine	71 NP31	9.3	22	0	0	Thinning	
143	34	16	77	t14334w1160077	Norway Pine	77 NP21	8.5	17	0	0	Thinning	
143	34	16	82	t14334w1160082	Norway Pine	82 NP22	15.4	25	0	0	Thinning	
143	34	16	128	t14334w1160128	Norway Pine	128 NP54	5.2	74	0	0	Thinning	
143	34	16	142	t14334w1160142	Jack Pine	142 JP45	3.7	76	0	0	Clearcut with Reserves	
143	34	16	156	t14334w1160156	Norway Pine	156 NP 42	15.9	31	0	0	Re-inventory.	
143	35	12	6	t14335w1120006	Lowland Grass	6 LG	4.4	15	0	0	Re-inventory.	INC72
143	35	12	9	t14335w1120009	Stagnant Tamarack - SI <= 22	9 TX23	7.8	80	0	0	Re-inventory.	
143	35	12	12	t14335w1120012	Jack Pine	12 JP42	5.4	50	0	0	Re-inventory.	
143	35	12	13	t14335w1120013	Tamarack	13 T43	7.8	118	0	0.1	Re-inventory.	
143	35	13	31	t14335w1130031	Norway Pine	31 NP59	5.6	102	0	0	Thinning	
143	35	13	35	t14335w1130035	Norway Pine	35 NP49	12.7	37	0	0	Thinning	
143	35	13	105	t14335w1130105	Birch	105 Bi43	4.6	89	0	0	On-site Evaluation	

Subsection **Chippewa Plains**

Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
143	35	13	113	t14335w1130113	Aspen	113 A54	5.5	77	0	0	On-site Evaluation	
143	35	16	26	t14335w1160026	Cutover Area	26 COA	9.5	2	0	0	Re-inventory.	COV53
143	35	16	43	t14335w1160043	Cutover Area	43 COA	7.8	4	0	0	Re-inventory.	COV53
143	35	16	46	t14335w1160046	Aspen	46 A44	35.6	55	0	0	Clearcut with Reserves	
143	35	16	48	t14335w1160048	Norway Pine	48 NP21	19.8	24	0	0	Thinning	
143	35	16	52	t14335w1160052	Norway Pine	52 NP66	4.4	118	0	0	Thinning	
143	35	16	54	t14335w1160054	Norway Pine	54 NP56	27.2	96	0	0	Thinning	
143	35	16	61	t14335w1160061	Norway Pine	61 NP42	45.6	40	0	0	Thinning	
143	35	16	62	t14335w1160062	Norway Pine	62 NP21	13.8	24	0	0	Thinning	
143	35	16	65	t14335w1160065	Jack Pine	65 JP51	6.9	59	0	0	Re-inventory.	
143	35	16	66	t14335w1160066	Aspen	66 A43	5.4	48	0	0	Clearcut with Reserves	INC61
143	35	16	115	t14335w1160115	Balsam Fir	115 BF41	5.3	73	0	0	Re-inventory.	
143	35	16	278	t14335w1360278	Cutover Area	278 COA	10	2	0	0	Re-inventory.	
144	28	2	12	t14428w1020012	Tamarack	12 T44	9.6	103	0	0.2	Clearcut with Reserves	
144	28	3	43	t14428w1030043	Tamarack	43 T43	4.4	103	0	0	Seed Tree	
144	28	5	100	t14428w1050100	Aspen	100 A52	4.2	93	0	0	Uneven-aged Harvest	
144	28	5	111	t14428w1050111	Ash	111 Ash46	4.9	106	0	0	Uneven-aged Harvest	
144	28	5	596	t14428w1050596	Ash	596 Ash52	12.3	86	0	0.6	Uneven-aged Harvest	
144	28	6	530	t14428w1060530	Norway Pine	530 NP53	11.6	99	0	0	Shelterwood	
144	28	8	538	t14428w1080538	Northern Hardwoods	538 NH52	24.5	84	2014	0	Uneven-aged Harvest	
144	28	10	131	t14428w1100131	Tamarack	131 T42	18.5	105	0	0	Seed Tree	
144	28	10	177	t14428w1100177	White Pine	177 WP52	5.3	115	0	0	Thinning	
144	28	10	608	t14428w1100608	Northern Hardwoods	608 NH54	6.9	67	2010	0	Shelterwood	
144	28	10	612	t14428w1100612	Aspen	612 A54	12.1	67	0	0	Clearcut with Reserves	
144	28	11	137	t14428w1110137	Norway Pine	137 NP54	9	112	0	0	Clearcut with Reserves	
144	28	11	191	t14428w1110191	Tamarack	191 T42	24.2	102	0	0	Seed Tree	
144	28	14	273	t14428w1140273	Tamarack	273 T42	19	101	0	0	Seed Tree	
144	28	15	293	t14428w1150293	Tamarack	293 T43	5.6	124	0	0	Seed Tree	
144	28	22	299	t14428w1220299	Black Spruce, Lowland	299 BSL41	44.1	121	0	0	Clearcut with Reserves	
144	28	22	321	t14428w1220321	Tamarack	321 T43	29.7	102	0	0	Seed Tree	
144	28	22	344	t14428w1220344	Northern Hardwoods	344 NH42	20.6	102	2014	0	Uneven-aged Harvest	
144	28	26	451	t14428w1260451	Tamarack	451 T51	6.2	122	0	0	Re-inventory.	
144	28	26	556	t14428w1260556	Tamarack	556 T43	12.8	116	0	0	Seed Tree	
144	28	31	480	t14428w1310480	Northern Hardwoods	480 NH53	6.9	71	2017	0	Uneven-aged Harvest	

Subsection **Chippewa Plains**

Forestry Area ***Bemidji Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
144	28	32	460	t14428w1320460	Northern Hardwoods	460 NH53	46	71	2017	0	Uneven-aged Harvest	
144	28	34	455	t14428w1340455	Tamarack	455 T42	7.6	113	0	0	Re-inventory.	
144	28	34	465	t14428w1340465	Tamarack	465 T41	6.1	133	0	0	Re-inventory.	
144	28	35	458	t14428w1350458	Tamarack	458 T41	17.6	84	0	0.2	Re-inventory.	
144	28	35	459	t14428w1350459	Tamarack	459 T42	8.7	109	0	0	Re-inventory.	
144	28	35	462	t14428w1350462	Lowland Brush	462 LB	11.6	25	0	0	Re-inventory.	INC72
144	29	1	13	t14429w1010013	Norway Pine	13 NP58	5.8	102	0	0	Thinning	
144	29	1	24	t14429w1010024	Birch	24 Bi43	4.7	82	0	0	Clearcut with Reserves	
144	29	1	25	t14429w1010025	Norway Pine	25 NP55	4.1	97	0	0	Thinning	
144	29	1	28	t14429w1010028	Balsam Fir	28 BF53	5.5	76	0	0	Clearcut with Reserves	
144	29	1	30	t14429w1010030	Aspen	30 A54	7.4	70	0	0	Clearcut with Reserves	
144	29	3	7	t14429w1030007	Northern Hardwoods	7 NH55	25.9	98	0	0	Uneven-aged Harvest	
144	29	3	98	t14429w1030098	Aspen	98 A42	4.8	49	0	0	Clearcut with Reserves	
144	29	12	34	t14429w1120034	Aspen	34 A42	20	52	0	0	Clearcut with Reserves	
144	30	13	79	t14430w1130079	Ash	79 Ash44	15.6	92	0	0	Uneven-aged Harvest	INC73
144	30	14	83	t14430w1140083	Aspen	83 A54	18.4	68	0	0	Re-inventory.	
144	30	14	84	t14430w1140084	Birch	84 Bi24	12.6	36	0	0.3	Re-inventory.	
144	30	14	86	t14430w1140086	Ash	86 Ash54	7.1	87	0	0.2	On-site Evaluation	
144	30	14	99	t14430w1140099	Jack Pine	99 JP54	4.7	71	0	0.4	Clearcut with Reserves	
144	30	14	102	t14430w1140102	Aspen	102 A44	7.4	68	0	0	Clearcut with Reserves	
144	30	23	108	t14430w1230108	Northern Hardwoods	108 NH53	21.3	86	2011	0	Uneven-aged Harvest	
144	30	26	140	t14430w1260140	Birch	140 Bi37	23	18	0	0	Re-inventory.	
144	30	26	142	t14430w1260142	Northern Hardwoods	142 NH55	65.9	78	0	0	Re-inventory.	
144	30	26	162	t14430w1260162	Birch	162 Bi55	31.5	96	0	0	Re-inventory.	
144	30	26	163	t14430w1260163	Birch	163 Bi55	7.5	90	0	0	Re-inventory.	
144	30	26	171	t14430w1260171	Birch	171 Bi55	1	96	0	0	Re-inventory.	
144	30	28	164	t14430w1280164	Northern Hardwoods	164 NH55	5.5	74	0	0	Uneven-aged Harvest	
144	30	28	168	t14430w1280168	Ash	168 Ash44	12.7	137	0	0	Uneven-aged Harvest	
144	30	29	151	t14430w1290151	Ash	151 Ash43	10.1	64	0	0	Re-inventory.	
144	30	29	153	t14430w1290153	Ash	153 Ash44	35.8	82	0	0.1	Re-inventory.	INC73
144	31	1	19	t14431w1010019	White Pine	19 WP54	13.2	84	0	0	Manage for understory	
144	31	1	20	t14431w1010020	Tamarack	20 T41	12.2	114	2010	0	Seed Tree with Reserves	
144	31	3	1	t14431w1030001	Aspen	1 A54	5.6	61	0	0	Clearcut with Reserves	
144	31	3	2	t14431w1030002	Norway Pine	2 NP12	2.4	29	0	0	Thinning	

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Forestry Area ***Bemidji Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
144	31	3	4	t14431w1030004	Norway Pine	4 NP12	1.6	29	0	0	Thinning	
144	31	3	6	t14431w1030006	Norway Pine	6 NP12	6.3	29	0	0	Thinning	
144	31	9	23	t14431w1090023	Norway Pine	23 NP41	12.5	41	0	0	Thinning	
144	31	9	76	t14431w1090076	White Spruce	76 WS27	4.5	27	0	0	On-site Evaluation	
144	31	10	32	t14431w1100032	Aspen	32 A33	3.7	35	0	0	On-site Evaluation	
144	31	10	36	t14431w1100036	Aspen	36 A33	0.5	35	0	0	On-site Evaluation	
144	31	10	37	t14431w1100037	Aspen	37 A33	9.3	35	0	0.2	On-site Evaluation	
144	31	10	47	t14431w1100047	Offsite Oak - SI <= 39	47 OX54	10.5	75	0	0	On-site Evaluation	
144	31	10	59	t14431w1100059	Cutover Area	59 COA	6.1	49	0	0.2	Re-inventory.	INC53
144	31	10	71	t14431w1100071	Cutover Area	71 COA	12.8	57	0	0	Re-inventory.	
144	31	10	72	t14431w1100072	Cutover Area	72 COA	9.9	49	0	0.1	Re-inventory.	INC53
144	31	13	101	t14431w1130101	Norway Pine	101 NP13	20.7	18	0	0	Thinning	
144	31	20	114	t14431w1200114	Norway Pine	114 NP58	4.7	91	0	0	Re-inventory.	
144	31	20	115	t14431w1200115	Norway Pine	115 NP58	2.5	91	0	0	Re-inventory.	
144	31	20	116	t14431w1200116	Norway Pine	116 NP58	5.1	91	0	0	Re-inventory.	
144	31	23	108	t14431w1230108	Marsh	108 Mh	55.1	26	2010	0	Re-inventory.	
144	31	24	122	t14431w1240122	Jack Pine	122 JP41	4	78	0	0.2	Clearcut with Reserves	
144	31	26	164	t14431w1260164	Aspen	164 A45	10.2	66	0	0.4	Clearcut with Reserves	
144	31	26	225	t14431w1260225	Aspen	225 A44	16.1	68	0	0.5	Clearcut with Reserves	
144	31	28	170	t14431w1280170	Norway Pine	170 NP45	11.7	48	0	0	Thinning	
144	31	29	180	t14431w1290180	White Pine	180 WP63	10.1	116	0	0	Thinning	
144	31	35	253	t14431w1350253	Tamarack	253 T41	4.9	129	0	0	Seed Tree	
144	32	8	24	t14432w1080024	Balsam Fir	24 BF43	4.8	82	0	0	Manage for understory	
144	32	13	42	t14432w1130042	Ash	42 Ash44	8.6	101	0	0	Shelterwood	
144	32	16	37	t14432w1160037	Birch	37 Bi45	42	60	0	0	Clearcut with Reserves	
144	32	16	39	t14432w1160039	Oak	39 O57	7.9	82	0	0	Shelterwood	
144	32	16	94	t14432w1160094	Cutover Area	94 COA	9.6	7	0	0	Re-inventory.	
144	32	16	95	t14432w1160095	Jack Pine	95 JP54	4.4	77	0	0	Manage for understory	
144	32	20	57	t14432w1200057	Tamarack	57 T41	4	103	0	0	Manage for understory	
144	32	20	63	t14432w1200063	Northern Hardwoods	63 NH45	8.2	67	2015	0	Uneven-aged Harvest	
144	32	26	92	t14432w1260092	Cutover Area	92 COA	5.8	22	0	0	Re-inventory.	INC72
144	32	28	80	t14432w1280080	Aspen	80 A53	5.6	84	0	0	Clearcut with Reserves	
144	32	30	84	t14432w1300084	Cutover Area	84 COA	9.2	5	0	0	Re-inventory.	
144	33	4	1	t14433w1040001	Aspen	1 A55	18.3	58	0	0	Clearcut with Reserves	

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Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
144	33	16	15	t14433w1160015	Aspen	15 A54	9.1	49	0	0	Clearcut with Reserves	
144	33	16	21	t14433w1160021	Aspen	21 A52	10.4	63	0	0	Clearcut with Reserves	
144	33	16	25	t14433w1160025	Aspen	25 A42	9.2	47	0	0	Clearcut with Reserves	
144	33	29	36	t14433w1290036	Oak	36 O53	21.1	80	0	0	Uneven-aged Harvest	
144	33	29	39	t14433w1290039	Aspen	39 A53	4.8	70	0	0	Clearcut with Reserves	
144	33	30	40	t14433w1300040	White Spruce	40 WS22	4.6	42	2010	0	Thinning	
144	33	30	46	t14433w1300046	Aspen	46 A41	6.5	69	0	0	Clearcut with Reserves	
144	33	30	47	t14433w1300047	White Spruce	47 WS11	26.9	29	0	0	On-site Evaluation	
144	33	32	68	t14433w1320068	Aspen	68 A43	5	54	0	0	Clearcut with Reserves	
144	33	36	69	t14433w1360069	White Spruce	69 WS21	15.1	28	0	0	Thinning	
144	33	36	71	t14433w1360071	Oak	71 O41	4	73	0	0	Uneven-aged Harvest	
144	34	1	38	t14434w1010038	Tamarack	38 T42	4.3	126	0	0	On-site Evaluation	
144	34	3	15	t14434w1030015	Jack Pine	15 JP41	8.8	70	0	0.3	On-site Evaluation	
144	34	11	59	t14434w1110059	Jack Pine	59 JP44	14.4	68	0	0	Seed Tree	
144	34	11	68	t14434w1110068	Norway Pine	68 NP21	4.3	31	0	0	Thinning	
144	34	11	79	t14434w1110079	Jack Pine	79 JP42	3	55	0	0	Re-inventory.	
144	34	11	81	t14434w1110081	Tamarack	81 T51	9	137	0	0	Manage for understory	
144	34	11	88	t14434w1110088	Tamarack	88 T42	8.3	124	0	0	On-site Evaluation	
144	34	11	97	t14434w1110097	Tamarack	97 T42	14.4	124	0	0	On-site Evaluation	
144	34	12	90	t14434w1120090	Tamarack	90 T42	28.5	124	0	0	On-site Evaluation	
144	34	12	96	t14434w1120096	Aspen	96 A57	8.3	72	0	0	Clearcut with Reserves	
144	34	12	100	t14434w1120100	White Spruce	100 WS56	5.5	81	0	0	Clearcut with Reserves	
144	34	14	137	t14434w1140137	Jack Pine	137 JP55	7.2	65	0	0	Manage for understory	
144	34	15	138	t14434w1150138	Balsam Fir	138 BF31	16.1	74	0	0	On-site Evaluation	
144	34	16	124	t14434w1160124	Norway Pine	124 NP53	44	42	0	0	Thinning	
144	34	16	128	t14434w1160128	White Spruce	128 WS54	4.1	47	0	0	Thinning	
144	34	16	159	t14434w1160159	Cutover Area	159 COA	5.3	64	0	0	Re-inventory.	
144	34	20	199	t14434w1200199	White Spruce	199 WS11	9.3	16	0	0	Re-inventory.	
144	34	22	178	t14434w1220178	Balsam Fir	178 BF42	3.7	94	0	0	On-site Evaluation	
144	34	24	179	t14434w1240179	Tamarack	179 T32	15.8	140	0	0	On-site Evaluation	
144	34	24	184	t14434w1240184	Tamarack	184 T44	11.1	131	0	0	Seed Tree	
144	34	25	246	t14434w1250246	Jack Pine	246 JP42	8.6	46	0	0	On-site Evaluation	
144	34	27	234	t14434w1270234	Jack Pine	234 JP44	9	57	0	0	Clearcut with Reserves	
144	34	34	257	t14434w1340257	Unknown	*Unk	5.7	0	0	0	Clearcut with Reserves	

Subsection **Chippewa Plains**

Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
144	34	34	269	t14434w1340269	Jack Pine	269 JP42	35.9	65	0	0	Clearcut with Reserves	
144	34	34	285	t14434w1340285	Jack Pine	285 JP44	20.3	74	0	0	Clearcut with Reserves	
144	34	36	264	t14434w1360264	Cutover Area	264 COA	10.3	13	0	0	Re-inventory.	
144	34	36	268	t14434w1360268	White Spruce	268 WS21	24	26	0	0	Thinning	
144	34	36	295	t14434w1360295	Norway Pine	295 NP55	4.4	113	0	0	Thinning	
144	34	36	309	t14434w1360309	White Spruce	309 WS 42	21.9	27	0	0	Thinning	
144	35	3	3	t14435w1030003	Upland Grass	3 UG	5.5	14	0	0	Re-inventory.	
144	35	10	4	t14435w1030004	Cutover Area	4 COA	6.7	18	0	0.2	Re-inventory.	INC53
144	35	16	26	t14435w1160026	Northern Hardwoods	26 NH54	13	63	2016	0	Uneven-aged Harvest	
144	35	16	47	t14435w1160047	Norway Pine	47 NP59	3.3	86	0	0	Selective Thinning-Commercial	
144	35	21	51	t14435w1210051	Norway Pine	51 NP11	10.9	20	0	0	Thinning	
144	35	21	58	t14435w1210058	Balsam Fir	58 BF43	4.4	56	0	0	Clearcut with Reserves	
144	35	25	69	t14435w1250069	Cutover Area	69 COA	12.5	4	0	0	Re-inventory.	
144	35	26	65	t14435w1260065	Balsam Fir	65 BF22	7.8	56	0	0.3	On-site Evaluation	
144	35	26	67	t14435w1260067	Tamarack	67 T51	8.9	118	0	0.1	On-site Evaluation	
144	35	31	82	t14435w1310082	Balsam Fir	82 BF 42	7.1	99	0	0	Manage for understory	
144	35	36	71	t14435w1360071	Norway Pine	71 NP21	26.7	23	0	0	Thinning	
144	35	36	72	t14435w1360072	White Spruce	72 WS22	14.5	23	0	0	Thinning	
144	35	36	73	t14435w1360073	Norway Pine	73 NP51	6.2	65	0	0	On-site Evaluation	
144	35	36	74	t14435w1360074	Jack Pine	74 JP43	7	57	0	0	On-site Evaluation	
144	35	36	85	t14435w1360085	Jack Pine	85 JP59	5.4	53	0	0	Seed Tree	
144	35	36	103	t14435w1360103	Norway Pine	103 NP44	6.9	57	0	0	Thinning	
144	35	36	104	t14435w1360104	Norway Pine	104 NP65	6	99	0	0	On-site Evaluation	
144	35	36	109	t14435w1360109	Norway Pine	109 NP22	20.9	24	0	0	Thinning	
144	35	36	111	t14435w1360111	Jack Pine	111 JP58	4.3	65	0	0	On-site Evaluation	
144	35	36	112	t14435w1360112	Norway Pine	112 NP63	4.2	85	0	0	Thinning	
144	35	36	119	t14435w1360119	Jack Pine	119 JP52	7	50	0	0	On-site Evaluation	
144	36	1	115	t14436w1010115	Cutover Area	115 COA	2.5	8	0	0	Re-inventory.	
144	36	1	117	t14436w1010117	Oak	117 O51	1.5	98	0	0	Uneven-aged Harvest	
144	36	1	122	t14436w1010122	White Spruce	122 WS58	1	56	0	0	Thinning	
144	36	1	125	t14436w1010125	Northern Hardwoods	125 NH42	12.3	69	2010	0	Uneven-aged Harvest	
144	36	1	132	t14436w1010132	Norway Pine	132 NP59	4.4	66	2010	0	Thinning	
144	36	2	77	t14436w1020077	Tamarack	77 T43	5.7	226	2011	0.1	Seed Tree	
144	36	2	148	t14436w1020148	Tamarack	148 T43	4.1	76	2011	0.3	Seed Tree	

Subsection **Chippewa Plains**

Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
144	36	5	146	t14436w1050146	Norway Pine	146 NP 71	4.2	101	2013	0	Re-inventory.	
144	36	8	271	t14436w1080271	Birch	271 Bi52	8.4	72	0	0	On-site Evaluation	
144	36	10	208	t14436w1100208	Norway Pine	208 NP54	7.1	100	0	0	Thinning	
144	36	10	213	t14436w1100213	Norway Pine	213 NP59	6.5	99	0	0	Thinning	
144	36	10	217	t14436w1100217	Aspen	217 A42	7.2	54	0	0	Clearcut with Reserves	INC51 INC61
144	36	10	227	t14436w1100227	Norway Pine	227 NP57	8.4	105	0	0	Thinning	
144	36	10	228	t14436w1100228	Jack Pine	228 JP41	2.8	52	0	0	Clearcut with Reserves	
144	36	14	398	t14436w1140398	Black Spruce, Lowland	398 BSL44	12.5	102	0	0	Seed Tree	
144	36	14	403	t14436w1140403	Cutover Area	403 COA	4.6	8	0	0.4	Re-inventory.	INC72
144	36	14	404	t14436w1140404	Tamarack	404 T45	7.4	143	0	0	Seed Tree	
144	36	14	407	t14436w1140407	Tamarack	407 T42	7.2	112	0	0	On-site Evaluation	
144	36	14	430	t14436w1140430	Cutover Area	430 COA	4.8	8	0	0	Re-inventory.	INC72
144	36	14	439	t14436w1140439	Tamarack	439 T44	5.2	115	0	0	Seed Tree	
144	36	16	355	t14436w1160355	Northern Hardwoods	355 NH54	7.8	99	2010	0	Uneven-aged Harvest	
144	36	16	388	t14436w1160388	Tamarack	388 T44	8.1	96	2010	0	Re-inventory.	
144	36	22	449	t14436w1220449	Aspen	449 A43	11	64	0	0	Clearcut with Reserves	
144	36	22	450	t14436w1220450	Balsam Fir	450 BF42	4.3	62	0	0	Uneven-aged Harvest	
144	36	22	485	t14436w1220485	Norway Pine	485 NP45	6.1	43	0	0	Thinning	
144	36	22	496	t14436w1220496	Black Spruce, Lowland	496 BSL45	1.3	131	0	0	On-site Evaluation	
144	36	22	498	t14436w1220498	Tamarack	498 T43	5	111	0	0	Seed Tree	
144	36	22	594	t14436w1220594	Aspen	594 A43	2.4	68	0	0.1	On-site Evaluation	
144	36	28	700	t14436w1280700	Cutover Area	700 COA	8.8	15	0	0	On-site Evaluation	
144	36	29	681	t14436w1290681	Tamarack	681 T51	6.8	99	2011	0	Re-inventory.	
144	36	36	914	t14436w1360914	Norway Pine	914 NP45	11.5	36	0	0	Thinning	
144	37	1	66	t14437w1010066	Northern Hardwoods	66 NH52	15.2	83	2015	0	Re-inventory.	
144	37	5	75	t14437w1050075	Balsam Fir	75 BF55	2.1	84	0	0	On-site Evaluation	
144	37	5	83	t14437w1050083	Aspen	83 A56	3.2	66	0	0	On-site Evaluation	
144	37	6	47	t14437w1060047	Cutover Area	47 COA	10.6	6	0	0	On-site Evaluation	
144	37	6	49	t14437w1060049	Aspen	49 A17	30	26	0	0	Re-inventory.	
144	37	6	70	t14437w1060070	Balsam Fir	70 BF41	7.1	97	0	0	On-site Evaluation	
144	37	6	73	t14437w1060073	Aspen	73 A19	10.8	22	0	0	Re-inventory.	
144	37	7	140	t14437w1070140	Lowland Grass	140 LG	5.6	20	0	0	On-site Evaluation	
144	37	7	141	t14437w1070141	Norway Pine	141 NP64	8.3	99	0	0	Re-inventory.	
144	37	7	189	t14437w1070189	Jack Pine	189 JP42	7.7	49	0	0	On-site Evaluation	

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Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
144	37	8	100	t14437w1080100	Tamarack	100 T43	26.4	114	0	0	On-site Evaluation	
144	37	8	122	t14437w1080122	Cutover Area	122 COA	1.8	16	0	0	On-site Evaluation	
144	37	11	130	t14437w1110130	Aspen	130 A54	3.3	90	0	0	Clearcut with Reserves	
144	37	12	195	t14437w1120195	Aspen	195 A51	9.3	67	0	0.1	On-site Evaluation	
144	37	13	253	t14437w1130253	Aspen	253 A41	3.6	53	0	0	On-site Evaluation	
144	37	14	249	t14437w1140249	Aspen	249 A43	13.4	53	0	0	Clearcut with Reserves	
144	37	14	259	t14437w1140259	Aspen	259 A53	11	77	0	0	Clearcut with Reserves	
144	37	14	268	t14437w1140268	White Pine	268 WP11	22.5	6	0	0	On-site Evaluation	
144	37	14	270	t14437w1140270	Norway Pine	270 NP63	2.2	106	0	0	On-site Evaluation	
144	37	14	309	t14437w1140309	Aspen	309 A42	3.7	48	0	0	Clearcut with Reserves	
144	37	14	322	t14437w1140322	Aspen	322 A53	7.5	58	0	0	Clearcut with Reserves	
144	37	14	323	t14437w1140323	Aspen	323 A42	7	52	0	0	Clearcut with Reserves	
144	37	14	328	t14437w1140328	Balsam Fir	328 BF46	8.3	82	0	0	Uneven-aged Harvest	
144	37	14	331	t14437w1140331	Aspen	331 A42	4.6	52	0	0	Clearcut with Reserves	
144	37	15	285	t14437w1150285	Norway Pine	285 NP66	5	98	0	0	Thinning	
144	37	15	286	t14437w1150286	Norway Pine	286 NP65	7.7	98	0	0	Thinning	
144	37	15	308	t14437w1150308	Aspen	308 A55	2.2	72	0	0	Clearcut with Reserves	
144	37	18	202	t14437w1180202	Jack Pine	202 JP42	3.9	49	0	0	On-site Evaluation	
144	37	18	239	t14437w1180239	Aspen	239 A41	8.3	49	0	0	Clearcut with Reserves	
144	37	18	247	t14437w1180247	Balsam Fir	247 BF41	14.5	57	0	0	Uneven-aged Harvest	
144	37	18	248	t14437w1180248	Aspen	248 A19	6.8	25	0	0	Re-inventory.	
144	37	18	254	t14437w1180254	Balm of Gilead	254 BG42	4.3	63	0	0	Clearcut with Reserves	
144	37	23	356	t14437w1230356	Balsam Fir	356 BF46	7.7	82	0	0	Uneven-aged Harvest	
144	38	1	83	t14438w1010083	Norway Pine	83 NP76	23.4	118	0	0	Thinning	
144	38	3	166	t14438w1030166	Aspen	166 A15	10.7	22	0	0	Re-inventory.	
144	38	3	169	t14438w1030169	Aspen	169 A55	23.1	81	0	0	Clearcut with Reserves	
144	38	3	170	t14438w1030170	Balsam Fir	170 BF58	3.9	61	0	0	On-site Evaluation	
144	38	3	171	t14438w1030171	Norway Pine	171 NP56	5.4	71	0	0	On-site Evaluation	
144	38	3	172	t14438w1030172	Northern Hardwoods	172 NH54	7.8	66	2014	0	Re-inventory.	
144	38	5	9	t14438w1050009	Aspen	9 A45	11.1	71	0	0.3	Re-inventory.	
144	38	6	10	t14438w1060010	Birch	10 Bi44	5.9	89	0	0	Re-inventory.	
144	38	11	92	t14438w1110092	Aspen	92 A44	23.6	56	2015	0	Clearcut with Reserves	
144	38	11	100	t14438w1110100	Tamarack	100 T54	3.7	111	0	0	On-site Evaluation	
144	38	11	108	t14438w1110108	Tamarack	108 T49	4	126	0	0	On-site Evaluation	

Subsection **Chippewa Plains**

Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
144	38	11	112	t14438w1110112	Aspen	112 A52	12	81	0	0	On-site Evaluation	
144	38	11	115	t14438w1110115	Aspen	115 A29	16.3	34	0	0	Re-inventory.	
144	38	11	116	t14438w1110116	Aspen	116 A45	5.6	58	0	0	Re-inventory.	
144	38	12	61	t14438w1120061	Aspen	61 A57	6.7	66	0	0	Re-inventory.	
144	38	12	63	t14438w1120063	Norway Pine	63 NP68	16.1	104	2012	0	Shelterwood	
144	38	12	180	t14438w1120180	Cutover Area	180 COA	22.4	23	0	0.5	Re-inventory.	INC72
144	38	12	182	t14438w1120182	Tamarack	182 T42	51.2	124	0	0	Re-inventory.	
144	38	13	127	t14438w1130127	Norway Pine	127 NP65	10.1	126	0	0	Thinning	
144	38	14	129	t14438w1140129	Norway Pine	129 NP56	15.9	110	0	0	Thinning	
144	38	14	132	t14438w1140132	Lowland Hardwoods	132 LH42	10.1	106	0	0	On-site Evaluation	
144	38	14	134	t14438w1140134	Aspen	134 A55	9.5	56	0	0	Clearcut with Reserves	INC52 INC51
145	29	6	26	t14529w1060026	Jack Pine	26 JP41	66.8	22	0	0	Thinning	
145	29	6	27	t14529w1060027	Norway Pine	27 NP12	21.5	24	0	0	Thinning	
145	29	7	54	t14529w1070054	Norway Pine	54 NP12	26.7	22	0	0	Thinning	
145	29	7	64	t14529w1070064	Tamarack	64 T41	15.1	145	2013	0	Seed Tree with Reserves	
145	29	7	66	t14529w1070066	Tamarack	66 T41	13.2	91	2013	0	Seed Tree with Reserves	
145	29	11	41	t14529w1110041	Oak	41 O42	13.3	87	0	0	Uneven-aged Harvest	
145	29	11	47	t14529w1110047	Tamarack	47 T41	5.4	92	0	0	Seed Tree	
145	29	11	52	t14529w1110052	Tamarack	52 T44	7.7	89	0	0	Seed Tree	
145	29	11	55	t14529w1110055	Norway Pine	55 NP54	10.3	50	0	0	Thinning	
145	29	11	56	t14529w1110056	Norway Pine	56 NP33	10.7	18	0	0	Thinning	
145	29	15	94	t14529w1150094	Jack Pine	94 JP45	10.9	73	0	0	Re-inventory.	
145	29	15	95	t14529w1150095	Norway Pine	95 NP11	36.2	24	0	0	Thinning	
145	29	15	115	t14529w1150115	Tamarack	115 T43	12	118	0	0	Seed Tree	
145	29	17	111	t14529w1170111	Norway Pine	111 NP11	23.3	24	0	0	Thinning	
145	29	17	117	t14529w1170117	Norway Pine	117 NP11	9.6	24	0	0	Thinning	
145	29	17	118	t14529w1170118	Norway Pine	118 NP45	7.7	55	0	0	Thinning	
145	29	18	100	t14529w1180100	Norway Pine	100 NP54	12.6	45	0	0	Thinning	
145	29	18	114	t14529w1180114	Norway Pine	114 NP11	8.2	24	0	0.1	Thinning	
145	29	19	133	t14529w1190133	Norway Pine	133 NP12	16.7	24	0	0	Thinning	
145	29	19	137	t14529w1190137	White Pine	137 WP53	13	98	0	0	Thinning	
145	29	19	161	t14529w1190161	Norway Pine	161 NP 61	8.1	79	0	0	Thinning	
145	29	22	147	t14529w1220147	Norway Pine	147 NP12	53.2	24	0	0	Thinning	
145	29	22	177	t14529w1220177	Norway Pine	177 NP57	0.7	115	0	0	Re-inventory.	

Subsection **Chippewa Plains**

Forestry Area ***Bemidji Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
145	29	23	172	t14529w1230172	Norway Pine	172 NP23	16	25	0	0	Thinning	
145	29	24	231	t14529w1240231	Norway Pine	231 NP31	15	24	0	0	Thinning	
145	29	24	233	t14529w1240233	Norway Pine	233 NP46	4.6	24	0	0	Thinning	
145	29	27	196	t14529w1270196	Balsam Fir	196 BF43	16.7	89	0	0	Re-inventory.	
145	29	27	197	t14529w1270197	Northern Hardwoods	197 NH53	3.4	102	0	0.1	Re-inventory.	
145	29	27	198	t14529w1270198	Lowland Brush	198 LB	4.3	25	0	0.2	Re-inventory.	INC72
145	29	27	200	t14529w1270200	White Cedar	200 C44	21.6	99	0	0	Re-inventory.	
145	29	27	201	t14529w1270201	White Cedar	201 C42	4.4	81	0	0	Re-inventory.	
145	29	30	178	t14529w1190178	Tamarack	178 T 54	87.1	96	0	0	Seed Tree with Reserves	
145	29	30	192	t14529w1300192	White Pine	192 WP74	4.1	112	0	0	Thinning	
145	29	30	193	t14529w1300193	Norway Pine	193 NP 45	15.4	93	0	0	Thinning	
145	29	30	203	t14529w1300203	Birch	203 Bi41	11.2	75	0	0	Re-inventory.	
145	29	30	204	t14529w1300204	Norway Pine	204 NP11	11.2	18	0	0	Thinning	
145	29	30	207	t14529w1300207	Norway Pine	207 NP66	6.2	107	0	0	Shelterwood	
145	29	30	210	t14529w1300210	Norway Pine	210 NP11	4.8	30	0	0	Thinning	
145	29	31	213	t14529w1310213	Lowland Brush	213 LB	12.9	25	0	0	Re-inventory.	INC72
145	29	31	214	t14529w1310214	White Cedar	214 C42	10.5	98	0	0	Re-inventory.	
145	29	31	225	t14529w1310225	White Cedar	225 C53	17.8	86	0	0	Re-inventory.	
145	29	31	226	t14529w1310226	Aspen	226 A17	21	29	0	0	Re-inventory.	
145	29	34	218	t14529w1340218	Aspen	218 A45	21.1	45	0	0	Clearcut with Reserves	
145	29	34	224	t14529w1340224	Lowland Hardwoods	224 LH42	10.5	75	0	0.4	Uneven-aged Harvest	
145	29	35	227	t14529w1350227	Ash	227 Ash16	11.6	35	0	0	Re-inventory.	
145	29	35	228	t14529w1350228	Ash	228 Ash54	16.1	75	0	0	Re-inventory.	
145	29	35	229	t14529w1350229	Birch	229 Bi54	10.3	81	0	0	Re-inventory.	
145	29	35	238	t14529w1350238	Norway Pine	238 NP 62	1.5	57	0	0	Re-inventory.	
145	30	3	12	t14530w1030012	Norway Pine	12 NP22	5.1	21	0	0	Thinning	
145	30	3	14	t14530w1030014	Norway Pine	14 NP21	13.6	25	0	0	Thinning	
145	30	12	38	t14530w1120038	Norway Pine	38 NP11	17.8	24	0	0	Thinning	
145	30	12	44	t14530w1120044	Norway Pine	44 NP21	21.3	25	0	0	Thinning	
145	30	18	56	t14530w1180056	Aspen	56 A55	8.5	63	0	0	On-site Evaluation	
145	30	23	85	t14530w1230085	Norway Pine	85 NP12	7.5	27	0	0	Thinning	
145	30	24	81	t14530w1130081	Tamarack	81 T53	6.9	90	0	0	Seed Tree	
145	30	25	107	t14530w1250107	Northern Hardwoods	107 NH45	11.2	89	0	0.5	Uneven-aged Harvest	
145	30	25	109	t14530w1250109	Lowland Hardwoods	109 LH52	11.5	81	0	0	Uneven-aged Harvest	

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Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
145	30	32	119	t14530w1320119	Birch	119 Bi54	3.5	75	0	0.2	Clearcut with Reserves	
145	31	4	2	t14531w1040002	Cutover Area	2 COA	17.2	12	0	0	On-site Evaluation	INC72
145	31	4	51	t14531w1040051	Aspen	51 A 55	22.7	58	0	0	Clearcut with Reserves	
145	31	4	52	t14531w1040052	Tamarack	52 T 52	18.3	111	0	0	Seed Tree	
145	31	17	15	t14531w1170015	Balsam Fir	15 BF23	8.1	13	0	0	Manage for understory	
145	31	18	4	t14531w1180004	Aspen	4 A41	14.8	54	0	0	Re-inventory.	
145	31	18	5	t14531w1180005	Lowland Brush	5 LB	11.3	25	0	0	Re-inventory.	INC72
145	31	18	6	t14531w1180006	Lowland Brush	6 LB	44.5	15	0	0	On-site Evaluation	INC72
145	31	22	19	t14531w1220019	Norway Pine	19 NP52	11.1	58	0	0	Manage for understory	INC51 INC52
145	31	27	27	t14531w1270027	Norway Pine	27 NP64	3.4	79	0	0	Manage for understory	
145	31	27	28	t14531w1270028	Norway Pine	28 NP61	1.8	79	0	0.1	Manage for understory	INC52
145	31	27	36	t14531w1270036	Balsam Fir	36 BF45	7	92	0	0	Clearcut with Reserves	
145	31	28	33	t14531w1280033	Norway Pine	33 NP44	15	48	0	0	Thinning	
145	32	10	19	t14532w1100019	Cutover Area	19 COA	12.9	15	0	0	Re-inventory.	INC53
145	32	12	18	t14532w1120018	Norway Pine	18 NP11	5.7	25	0	0	Thinning	
145	32	16	27	t14532w1160027	Tamarack	27 T41	15.3	145	0	0	On-site Evaluation	
145	32	16	30	t14532w1160030	Jack Pine	30 JP56	4.2	43	0	0	Uneven-aged Harvest	
145	32	18	42	t14532w1180042	Aspen	42 A42	5.5	47	0	0	On-site Evaluation	
145	32	18	50	t14532w1180050	Balsam Fir	50 BF21	13	51	0	0	On-site Evaluation	
145	32	28	73	t14532w1280073	Balsam Fir	73 BF45	9.5	80	0	0	Clearcut with Reserves	
145	32	28	76	t14532w1280076	Aspen	76 A54	3.2	78	0	0.2	Clearcut with Reserves	
145	32	28	78	t14532w1280078	Balm of Gilead	78 BG43	6.5	67	0	0	Clearcut with Reserves	
145	32	28	82	t14532w1280082	Tamarack	82 T42	9.1	111	0	0.3	Seed Tree	
145	32	28	83	t14532w1280083	Balm of Gilead	83 BG52	8.2	86	0	0	Clearcut with Reserves	
145	32	34	97	t14532w1340097	Tamarack	97 T53	11.1	82	0	0	Re-inventory.	
145	32	34	98	t14532w1340098	Aspen	98 A56	14.3	77	0	0.2	Re-inventory.	
145	32	34	101	t14532w1340101	Jack Pine	101 JP43	13.6	85	0	0	Re-inventory.	
145	32	34	106	t14532w1340106	Norway Pine	106 NP64	12.9	128	0	0	Re-inventory.	
145	33	34	45	t14533w1340045	Balm of Gilead	45 BG53	3.8	87	0	0.2	On-site Evaluation	
145	33	36	29	t14533w1360029	White Spruce	29 WS21	16.2	23	0	0	Thinning	
145	34	10	7	t14534w1100007	White Spruce	7 WS13	17	23	0	0	Thinning	
145	34	10	10	t14534w1100010	Jack Pine	10 JP56	3.7	74	0	0	Clearcut with Reserves	
145	34	10	11	t14534w1100011	Norway Pine	11 NP52	8.6	84	0	0	Thinning	
145	34	16	19	t14534w1160019	White Spruce	19 WS12	7.2	23	0	0	On-site Evaluation	

Subsection **Chippewa Plains**

Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
145	34	16	31	t14534w1160031	Aspen	31 A56	27.6	43	0	0	Uneven-aged Harvest	PAT2
145	34	20	104	t14534w1200104	Black Spruce, Lowland	104 BSL45	6	124	0	0.2	Re-inventory.	
145	34	21	53	t14534w1210053	Black Spruce, Lowland	53 BSL47	6.8	121	0	0	Re-inventory.	
145	34	21	106	t14534w1210106	Marsh	106 Mh	15.4	24	0	0	Re-inventory.	
145	34	21	108	t14534w1210108	Black Spruce, Lowland	108 BSL44	8.6	118	0	0	Re-inventory.	
145	34	22	42	t14534w1220042	Norway Pine	42 NP66	2.4	100	0	0	Shelterwood	
145	34	26	131	t14534w1260131	Jack Pine	131 JP43	9.3	52	0	0	Clearcut with Reserves	
145	34	28	58	t14534w1280058	Aspen	58 A54	4.2	64	0	0	Re-inventory.	
145	34	28	61	t14534w1280061	Balsam Fir	61 BF42	8.2	94	0	0	Re-inventory.	
145	34	28	63	t14534w1280063	Balsam Fir	63 BF44	11.6	85	0	0	Re-inventory.	
145	34	28	69	t14534w1280069	Balsam Fir	69 BF43	6.4	80	0	0	Clearcut with Reserves	
145	34	28	70	t14534w1280070	Aspen	70 A45	10.6	45	0	0	Clearcut with Reserves	
145	34	28	73	t14534w1280073	Ash	73 Ash43	4.2	70	0	0	On-site Evaluation	
145	34	28	102	t14534w1280102	Balsam Fir	102 BF 29	6.3	26	0	0	Manage for understory	
145	34	34	118	t14534w1340118	Jack Pine	118 JP54	19.1	56	0	0	Clearcut with Reserves	
145	34	36	76	t14534w1360076	Birch	76 Bi42	61.8	70	0	0	Re-inventory.	COV61
145	34	36	77	t14534w1360077	White Spruce	77 WS55	7.5	64	0	0	Re-inventory.	
145	34	36	80	t14534w1360080	Oak	80 O44	10	77	0	0	Shelterwood	
145	34	36	96	t14534w1360096	Balsam Fir	96 BF41	8.1	71	0	0	Manage for understory	
145	34	36	121	t14534w1360121	Balsam Fir	121 BF46	9.2	69	0	0	Re-inventory.	
145	35	2	8	t14535w1020008	Norway Pine	8 NP22	7.8	23	0	0	Thinning	
145	35	4	1	t14535w1040001	Black Spruce, Lowland	1 BSL44	52.4	122	0	0	Seed Tree	
145	35	4	2	t14535w1040002	Tamarack	2 T44	32.4	100	0	0	Seed Tree	
145	35	16	14	t14535w1160014	Jack Pine	14 JP58	46	76	0	0	Clearcut with Reserves	
145	35	16	16	t14535w1160016	Aspen	16 A41	110.2	48	0	0	Clearcut with Reserves	
145	35	16	19	t14535w1160019	Cutover Area	19 COA	13.6	15	0	0	Re-inventory.	INC53
145	35	16	30	t14535w1160030	White Spruce	30 WS 42	34.4	23	0	0	Thinning	
145	35	16	34	t14535w1160034	White Spruce	34 WS 43	12.4	35	0	0	Thinning	
145	35	16	35	t14535w1160035	Norway Pine	35 NP57	8.7	93	0	0	Thinning	
145	35	16	40	t14535w1160040	Cutover Area	40 COA	14.9	6	0	0	Re-inventory.	INC53
145	35	16	45	t14535w1160045	Norway Pine	45 NP57	3.5	103	0	0	Thinning	
145	35	16	92	t14535w1160092	Cutover Area	92 COA	8.9	13	0	0	Re-inventory.	INC53
145	35	36	79	t14535w1360079	Aspen	79 A57	3.9	67	0	0	Clearcut with Reserves	INC53
145	35	36	81	t14535w1360081	Aspen	81 A58	13.2	67	0	0	Re-inventory.	

Subsection **Chippewa Plains**

Forestry Area ***Bemidji Area***

Township	*Range*	*Section*	*Stand*	*Location ID*	*Management Cover Type*	*Stand Label*	*Acres*	*Age*	*Stand Exam Year*	*New Access Miles*	*Preliminary Prescription*	*Management Objectives*
145	35	36	96	t14535w1360096	White Spruce	96 WS21	3.7	25	0	0	Thinning	
145	35	36	97	t14535w1360097	White Spruce	97 WS21	10.3	25	0	0	Thinning	
145	36	5	43	t14536w1050043	Tamarack	43 T42	2.8	114	0	0.7	Re-inventory.	
145	36	6	4	t14536w1060004	Tamarack	4 T42	8.3	114	0	0	Re-inventory.	
145	36	16	153	t14536w1160153	Oak	153 O54	31.9	64	0	0	Uneven-aged Harvest	
145	36	16	164	t14536w1160164	Cutover Area	164 COA	13.2	14	0	0	Re-inventory.	
145	36	16	202	t14536w1160202	Northern Hardwoods	202 NH45	17.4	69	0	0	Uneven-aged Harvest	
145	36	16	204	t14536w1160204	Cutover Area	204 COA	5	14	0	0	Re-inventory.	
145	36	18	182	t14536w1180182	Oak	182 O53	18.3	73	0	0	Uneven-aged Harvest	
145	36	18	187	t14536w1180187	Northern Hardwoods	187 NH52	10.7	73	0	0	Uneven-aged Harvest	
145	36	23	264	t14536w1230264	Norway Pine	264 NP64	10.1	102	0	0	Thinning	
145	36	23	268	t14536w1230268	Aspen	268 A44	11.5	48	0	0	Clearcut with Reserves	
145	36	36	431	t14536w1360431	Aspen	431 A41	21.2	42	0	0	Clearcut with Reserves	
145	36	36	432	t14536w1360432	Aspen	432 A53	11.2	57	0	0	Clearcut with Reserves	
145	36	36	512	t14536w1360512	Jack Pine	512 JP44	5.4	55	0	0	Clearcut with Reserves	
145	37	1	20	t14537w1010020	Northern Hardwoods	20 NH44	35.8	72	2017	0	Uneven-aged Harvest	
145	37	3	30	t14537w1030030	Aspen	30 A54	5.5	74	0	0	Clearcut with Reserves	
145	37	3	34	t14537w1030034	Aspen	34 A44	39.2	61	0	0	Clearcut with Reserves	
145	37	4	60	t14537w1040060	Aspen	60 A44	43.2	53	0	0	Clearcut with Reserves	
145	37	4	64	t14537w1040064	Aspen	64 A43	35.2	56	0	0	Clearcut with Reserves	
145	37	4	84	t14537w1040084	Aspen	84 A43	2.6	56	0	0	Clearcut with Reserves	
145	37	4	93	t14537w1040093	Aspen	93 A43	3.8	56	0	0	Clearcut with Reserves	
145	37	10	116	t14537w1100116	Tamarack	116 T44	52.2	93	2010	0	Seed Tree	
145	37	11	382	t14537w1110382	Aspen	382 A45	9.1	55	0	0	Clearcut with Reserves	
145	37	11	384	t14537w1110384	Aspen	384 A43	25.4	63	0	0	Clearcut with Reserves	
145	37	11	393	t14537w1110393	Aspen	393 A41	9.2	38	0	0	Clearcut with Reserves	PAT2
145	37	11	399	t14537w1110399	Aspen	399 A42	4	63	0	0	Clearcut with Reserves	
145	37	15	183	t14537w1150183	Northern Hardwoods	183 NH53	9.8	88	2011	0	Uneven-aged Harvest	
145	37	16	167	t14537w1160167	Tamarack	167 T41	16.4	142	0	0	Re-inventory.	
145	37	21	226	t14537w1210226	Cutover Area	226 COA	23.2	7	0	0	Re-inventory.	INC72
145	37	21	416	t14537w1210416	Balsam Fir	416 BF41	55.9	82	0	0	Uneven-aged Harvest	
145	37	29	272	t14537w1290272	Cutover Area	272 COA	16.5	17	0	0	Re-inventory.	INC72
145	37	29	273	t14537w1290273	Balsam Fir	273 BF43	5.3	84	0	0	On-site Evaluation	
145	37	30	243	t14537w1300243	Oak	243 O54	10.2	90	0	0	Thinning	

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Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
145	37	30	244	t14537w1300244	Northern Hardwoods	244 NH52	27.2	82	0	0	Thinning	
145	37	30	246	t14537w1300246	Northern Hardwoods	246 NH52	9.1	83	0	0	Thinning	
145	37	31	326	t14537w1310326	Cutover Area	326 COA	18.8	515	0	0	Re-inventory.	
145	37	33	321	t14537w1330321	Northern Hardwoods	321 NH53	12.7	81	2018	0	Uneven-aged Harvest	
145	37	33	328	t14537w1330328	Northern Hardwoods	328 NH53	18.5	99	2018	0	Uneven-aged Harvest	
145	37	35	335	t14537w1350335	Aspen	335 A44	15.6	52	0	0	Clearcut with Reserves	
145	38	17	23	t14538w1170023	Cutover Area	23 COA	2.5	2	0	0	Re-inventory.	COV53
145	38	17	156	t14538w1170156	Aspen	156 A47	6.7	66	0	0.3	Clearcut with Reserves	
145	38	18	31	t14538w1180031	Aspen	31 A43	39.3	51	0	0	Clearcut with Reserves	
145	38	18	160	t14538w1180160	Aspen	160 A42	10.1	56	0	0	Re-inventory.	
145	38	18	162	t14538w1180162	Tamarack	162 T31	6.5	114	0	0	Re-inventory.	
145	38	19	167	t14538w1190167	Cutover Area	167 COA	7.7	6	0	0	Re-inventory.	
145	38	19	169	t14538w1190169	Northern Hardwoods	169 NH41	21.7	58	2010	0	Re-inventory.	
145	38	19	174	t14538w1190174	Aspen	174 A42	6.5	72	0	0	Clearcut with Reserves	
145	38	21	257	t14538w1210257	Cutover Area	257 COA	13.6	3	0	0	On-site Evaluation	INC72
145	38	25	203	t14538w1250203	Aspen	203 A25	33.7	31	0	0	Re-inventory.	
145	38	28	75	t14538w1280075	Balsam Fir	75 BF42	7.9	72	0	0.5	On-site Evaluation	
145	38	28	258	t14538w1280258	Cutover Area	258 COA	4.3	3	0	0	Re-inventory.	INC72
145	38	29	194	t14538w1290194	Balsam Fir	194 BF44	6.1	96	0	0	Re-inventory.	
145	38	31	231	t14538w1310231	Tamarack	231 T52	16.8	118	0	0	Manage for understory	
145	38	31	244	t14538w1310244	Aspen	244 A53	7.7	81	0	0	On-site Evaluation	
145	38	32	219	t14538w1320219	White Spruce	219 WS56	8.7	99	0	0	Manage for understory	
145	38	32	222	t14538w1320222	Aspen	222 A56	8.1	80	0	0.5	On-site Evaluation	
145	38	33	236	t14538w1330236	Balsam Fir	236 BF41	8	96	0	0.1	On-site Evaluation	
145	39	1	28	t14539w1010028	Tamarack	28 T44	7.3	134	0	0	On-site Evaluation	
145	39	2	6	t14539w1020006	Norway Pine	6 NP 32	57.7	22	0	0	Thinning	
145	39	2	20	t14539w1020020	Aspen	20 A 45	5.2	53	0	0	Clearcut with Reserves	
145	39	2	22	t14539w1020022	Aspen	22 A53	19.4	72	0	0.3	Clearcut with Reserves	
145	39	2	286	t14539w1020286	Aspen	286 A43	3.7	51	0	0	Clearcut with Reserves	
145	39	10	110	t14539w1100110	Oak	110 O58	17.1	139	0	0	Manage for understory	
145	39	11	106	t14539w1110106	Norway Pine	106 NP 56	21.7	42	0	0	Re-inventory.	
145	39	11	125	t14539w1110125	Cutover Area	125 COA	35.4	2	0	0	Re-inventory.	INC53
145	39	12	293	t14539w1120293	Cutover Area	293 COA	5.3	3	0	0	On-site Evaluation	
145	39	13	102	t14539w1140102	Jack Pine	102 JP45	24.7	80	0	0	On-site Evaluation	

Subsection **Chippewa Plains**

Forestry Area ***Bemidji Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
145	39	13	122	t14539w1130122	Tamarack	122 T44	17.1	106	0	0	On-site Evaluation	
145	39	13	150	t14539w1130150	Tamarack	150 T41	12	78	0	0	Seed Tree	
145	39	13	153	t14539w1130153	Black Spruce, Lowland	153 BSL46	11.4	106	0	0.4	On-site Evaluation	
145	39	13	154	t14539w1130154	Tamarack	154 T54	16.8	96	0	0	Seed Tree	
145	39	13	158	t14539w1130158	Tamarack	158 T44	15.6	99	0	0	Seed Tree	
145	39	13	160	t14539w1130160	Tamarack	160 T43	19	118	0	0	Seed Tree	
145	39	13	161	t14539w1130161	Tamarack	161 T41	30	132	0	0	Seed Tree	
145	39	14	142	t14539w1140142	Aspen	142 A42	17.4	50	0	0	Clearcut with Reserves	
145	39	14	159	t14539w1140159	Aspen	159 A56	8	79	0	0	Clearcut with Reserves	
145	39	14	296	t14539w1140296	Balm of Gilead	296 BG52	6.1	84	0	0	On-site Evaluation	
145	39	14	308	t14539w1140308	Cutover Area	308 COA	29.6	1	0	0	Re-inventory.	INC53
145	39	15	123	t14539w1150123	Tamarack	123 T54	13.8	150	0	0.1	On-site Evaluation	
145	39	15	131	t14539w1150131	Balsam Fir	131 BF43	8.2	82	0	0	Manage for understory	
145	39	15	165	t14539w1150165	Northern Hardwoods	165 NH56	20	96	0	0	Uneven-aged Harvest	
145	39	15	297	t14539w1150297	Balm of Gilead	297 BG55	6.5	81	0	0	Clearcut with Reserves	
145	39	22	200	t14539w1220200	Tamarack	200 T55	7.2	138	0	0.1	Re-inventory.	
145	39	22	218	t14539w1220218	Tamarack	218 T55	7.3	138	0	0	Re-inventory.	
145	39	23	189	t14539w1230189	Aspen	189 A56	9.3	66	0	0	Re-inventory.	
145	39	23	224	t14539w1230224	Oak	224 O42	16.2	98	0	0	Uneven-aged Harvest	
145	39	23	226	t14539w1230226	Aspen	226 A43	38.2	63	0	0	Clearcut with Reserves	
145	39	23	321	t14539w1230321	Aspen	321 A56	11.3	60	0	0	Clearcut with Reserves	
145	39	24	179	t14539w1240179	Northern Hardwoods	179 NH54	40	96	2018	0	Uneven-aged Harvest	
145	39	24	187	t14539w1240187	Aspen	187 A54	12.5	85	0	0	Re-inventory.	
145	39	24	203	t14539w1240203	Aspen	203 A46	54.6	56	0	0	Clearcut with Reserves	
145	39	24	228	t14539w1240228	Aspen	228 A54	5.5	65	0	0	Clearcut with Reserves	
145	39	25	251	t14539w1260251	Aspen	251 A54	26.3	65	0	0.6	Clearcut with Reserves	
145	39	25	256	t14539w1250256	Balm of Gilead	256 BG52	6.3	72	0	0	Re-inventory.	
145	39	25	324	t14539w1250324	Cutover Area	324 COA	13	2	0	0	Re-inventory.	INC72
145	39	26	245	t14539w1260245	Tamarack	245 T54	24.7	116	0	0.5	On-site Evaluation	
145	39	26	252	t14539w1260252	Aspen	252 A44	5.3	71	0	0	On-site Evaluation	
145	39	35	272	t14539w1350272	Tamarack	272 T42	65.8	106	0	0.6	On-site Evaluation	
146	28	6	3	t14628w1060003	Birch	3 Bi54	12	81	0	0	Shelterwood	
146	29	1	51	t14629w1010051	Tamarack	51 T41	36.8	103	0	0	Re-inventory.	
146	29	2	68	t14629w1020068	Norway Pine	68 NP64	6	99	0	0	Thinning	

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Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
146	29	3	87	t14629w1030087	Norway Pine	87 NP31	10.4	6	0	0	Thinning	
146	29	3	89	t14629w1030089	Norway Pine	89 NP31	1.6	23	0	0	Thinning	
146	29	3	362	t14629w1030362	Tamarack	362 T44	21.3	64	0	0	Seed Tree	
146	29	5	28	t14629w1050028	Aspen	28 A42	22.3	36	0	0	Clearcut with Reserves	
146	29	5	48	t14629w1050048	Aspen	48 A41	49.5	36	0	0	Clearcut with Reserves	
146	29	5	56	t14629w1050056	Tamarack	56 T42	18.4	88	0	0	Seed Tree	
146	29	5	92	t14629w1050092	Tamarack	92 T41	7.7	120	0	0	Seed Tree	
146	29	6	9	t14629w1060009	Aspen	9 A19	6.9	33	0	0	Re-inventory.	
146	29	6	13	t14629w1060013	Tamarack	13 T43	56.4	171	0	0	Re-inventory.	
146	29	6	31	t14629w1060031	Aspen	31 A42	46.3	36	0	0	Clearcut with Reserves	
146	29	6	37	t14629w1060037	Aspen	37 A34	5.6	21	0	0	Manage for understory	INC62
146	29	6	39	t14629w1060039	Aspen	39 A54	4.9	78	0	0	Manage for understory	INC62
146	29	6	94	t14629w1060094	Birch	94 Bi54	3.6	109	0	0.3	Manage for understory	INC62
146	29	7	134	t14629w1070134	Birch		3.2	95	0	0	Manage for understory	
146	29	7	140	t14629w1070140	Northern Hardwoods	140 NH55	5.6	98	0	0.2	Uneven-aged Harvest	
146	29	7	159	t14629w1070159	Norway Pine	159 NP56	10.2	99	0	0	Manage for understory	
146	29	7	177	t14629w1070177	Aspen	177 A48	4.9	33	0	0	Shelterwood	INC51
146	29	7	191	t14629w1070191	Norway Pine	191 NP52	10.7	112	0	0	Manage for understory	
146	29	9	107	t14629w1090107	Aspen	107 A17	12.9	31	2015	0	Re-inventory.	
146	29	9	122	t14629w1090122	Tamarack	122 T41	6.8	101	2015	0	On-site Evaluation	
146	29	9	167	t14629w1090167	Norway Pine	167 NP11	12.3	23	0	0	Thinning	
146	29	10	115	t14629w1100115	Norway Pine	115 NP31	23.9	22	0	0	Thinning	
146	29	10	117	t14629w1100117	White Spruce	117 WS41	29.8	24	0	0	Thinning	
146	29	10	356	t14629w1100356	Black Spruce, Lowland	356 BSL42	17.7	90	0	0	Seed Tree	INC72
146	29	11	121	t14629w1110121	Northern Hardwoods	121 NH56	15.6	90	0	0	Uneven-aged Harvest	
146	29	14	348	t14629w1140348	Northern Hardwoods	348 NH55	5.6	69	0	0	Uneven-aged Harvest	
146	29	15	226	t14629w1150226	White Spruce	226 WS31	33.7	5	0	0	Thinning	
146	29	15	252	t14629w1150252	Northern Hardwoods	252 NH54	34.9	69	0	0	Uneven-aged Harvest	
146	29	15	258	t14629w1150258	Northern Hardwoods	258 NH41	4.8	85	0	0	Uneven-aged Harvest	
146	29	17	242	t14629w1170242	Aspen	242 A36	18.5	31	2017	0	Clearcut with Reserves	
146	29	18	222	t14629w1180222	Aspen	222 A55	3.7	82	0	0	Clearcut with Reserves	
146	29	20	286	t14629w1200286	Tamarack	286 T41	47.4	132	0	0	Seed Tree	
146	29	22	273	t14629w1220273	Northern Hardwoods	273 NH44	9.1	69	0	0	Uneven-aged Harvest	
146	29	28	313	t14629w1280313	Tamarack	313 T41	5.7	85	0	0	Seed Tree	

Subsection **Chippewa Plains**

Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
146	29	31	339	t14629w1310339	Norway Pine	339 NP74	12.5	72	0	0	Re-inventory.	
146	30	1	117	t14630w1010117	Unknown	117 *Unk	25.6	4	0	0	Re-inventory.	
146	30	1	122	t14630w1010122	Unknown	122 *Unk	24.2	4	0	0	Re-inventory.	
146	30	1	124	t14630w1010124	Unknown	124 *Unk	13.5	4	0	0	Re-inventory.	
146	30	1	125	t14630w1010125	Unknown	125 *Unk	6.6	4	0	0	Re-inventory.	
146	30	6	22	t14630w1060022	Lowland Grass	22 LG	18.1	25	0	0	Uneven-aged Harvest	
146	30	6	24	t14630w1060024	Aspen	24 A57	5.9	104	0	0	Clearcut with Reserves	
146	30	12	41	t14630w1120041	White Spruce	41 WS21	11.1	26	0	0	Thinning	
146	30	12	42	t14630w1120042	Norway Pine	42 NP63	9	5	0	0	Manage for understory	
146	30	15	76	t14630w1150076	Tamarack	76 T42	23	82	0	0.6	On-site Evaluation	
146	30	22	87	t14630w1220087	Norway Pine	87 NP12	13	18	0	0	Thinning	
146	30	22	90	t14630w1220090	Aspen	90 A26	12.2	38	0	0	Clearcut with Reserves	
146	30	27	99	t14630w1270099	Norway Pine	99 NP11	22.4	30	0	0	Thinning	
146	30	27	100	t14630w1270100	Norway Pine	100 NP45	54.9	45	0	0	Thinning	
146	30	34	114	t14630w1340114	Aspen	114 A34	9.3	35	0	0	Intermediate Harvest	
146	30	34	116	t14630w1340116	Norway Pine	116 NP42	15.1	58	0	0	Thinning	
146	31	6	4	t14631w1060004	Northern Hardwoods	4 NH55	7.7	76	2010	0.3	Shelterwood	
146	32	10	19	t14632w1100019	Aspen	19 A53	14.2	69	0	0	Clearcut with Reserves	INC53
146	32	10	21	t14632w1100021	Jack Pine	21 JP54	22.8	65	0	0	Clearcut with Reserves	MA1
146	32	14	68	t14632w1140068	Birch	68 Bi44	23.4	81	0	0	Clearcut with Reserves	
146	32	16	29	t14632w1160029	Norway Pine	29 NP11	33.9	26	0	0	Thinning	
146	32	16	72	t14632w1160072	Norway Pine	72 NP42	2.8	32	0	0	Thinning	
146	34	5	3	t14634w1050003	Cutover Area	3 COA	9.1	19	0	0	On-site Evaluation	
146	34	5	11	t14634w1050011	Aspen	11 A54	4.1	74	0	0	Clearcut with Reserves	
146	34	5	12	t14634w1050012	Aspen	12 A54	16.1	82	0	0	Clearcut with Reserves	
146	34	5	171	t14634w1050171	Cutover Area	171 COA	5.4	1	0	0	On-site Evaluation	
146	34	6	23	t14634w1060023	Aspen	23 A44	23.9	59	0	0	Clearcut with Reserves	
146	34	6	25	t14634w1060025	Jack Pine	25 JP45	5.9	62	0	0	Clearcut with Reserves	
146	34	6	29	t14634w1060029	Cutover Area	29 COA	9.8	1	0	0	Re-inventory.	INC53
146	34	6	30	t14634w1060030	Norway Pine	30 NP45	7.6	51	0	0	Thinning	
146	34	7	42	t14634w1070042	Tamarack	42 T41	14.9	91	2017	0	Seed Tree	
146	34	8	34	t14634w1080034	Cutover Area	34 COA	13	25	0	0	On-site Evaluation	INC72
146	34	10	45	t14634w1100045	Jack Pine	45 JP46	29	63	0	0	Clearcut with Reserves	MA1
146	34	10	46	t14634w1100046	Aspen	46 A55	13	59	0	0	Clearcut with Reserves	

Subsection **Chippewa Plains**

Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
146	34	16	70	t14634w1160070	Birch	70 Bi43	24.8	86	0	0	Clearcut with Reserves	MA1
146	34	18	48	t14634w1180048	Tamarack	48 T41	31.3	112	2017	0	Seed Tree	MA1
146	34	18	50	t14634w1180050	Jack Pine	50 JP51	7.9	67	0	0	Clearcut with Reserves	
146	34	18	67	t14634w1180067	Aspen	67 A52	13.8	66	0	0.3	Clearcut with Reserves	
146	34	19	88	t14634w1190088	Jack Pine	88 JP44	8.6	63	0	0	Clearcut with Reserves	MA1
146	34	19	89	t14634w1190089	Norway Pine	89 NP 54	10.3	63	0	0	Thinning	
146	34	19	101	t14634w1190101	Balsam Fir	101 BF21	4.9	45	0	0	Clearcut with Reserves	MA1
146	34	20	99	t14634w1200099	Balsam Fir	99 BF21	5.9	45	0	0	Clearcut with Reserves	MA1
146	34	28	112	t14634w1280112	Oak	112 O44	9.6	87	0	0	On-site Evaluation	
146	34	28	132	t14634w1280132	Jack Pine	132 JP42	30.3	61	0	0	Clearcut with Reserves	
146	34	30	127	t14634w1300127	Balsam Fir	127 BF42	5.7	93	0	0.3	On-site Evaluation	
146	34	30	131	t14634w1300131	Balsam Fir	131 BF41	25.3	77	0	0	Clearcut with Reserves	
146	34	31	140	t14634w1310140	Tamarack	140 T41	27.6	93	2013	0	Seed Tree	
146	34	36	147	t14634w1360147	Norway Pine	147 NP 56	7.6	68	0	0	Thinning	
146	34	36	150	t14634w1360150	White Spruce	150 WS45	24.2	68	0	0	Clearcut with Reserves	
146	34	36	151	t14634w1360151	Norway Pine	151 NP45	14.8	47	0	0	Thinning	
146	34	36	157	t14634w1360157	Norway Pine	157 NP 56	27.7	66	0	0	Thinning	
146	34	36	159	t14634w1360159	White Spruce	159 WS 52	53.1	69	0	0	Clearcut with Reserves	COV53
146	34	36	161	t14634w1360161	White Spruce	161 WS45	9.8	68	0	0	Clearcut with Reserves	COV53
146	35	4	5	t14635w1040005	Tamarack	5 T54	40.9	98	2010	0	Seed Tree	
146	35	12	45	t14635w1120045	Tamarack	45 T52	6.9	115	0	0	Seed Tree	
146	35	12	47	t14635w1120047	Norway Pine	47 NP 56	15.8	66	2017	0	Thinning	
146	35	12	52	t14635w1120052	Aspen	52 A55	8.7	74	2017	0	Thinning	INC52
146	35	12	61	t14635w1120061	Tamarack	61 T42	8.4	109	2017	0	Seed Tree	
146	35	14	88	t14635w1140088	Norway Pine	88 NP 55	13.4	81	0	0	Thinning	
146	35	14	92	t14635w1140092	Cutover Area	92 COA	9.2	19	0	0	Re-inventory.	COV53 INC52
146	35	14	93	t14635w1140093	Tamarack	93 T41	3.8	132	0	0	Seed Tree	
146	35	16	69	t14635w1160069	Norway Pine	69 NP56	4.9	92	0	0	Thinning	
146	35	16	70	t14635w1160070	Norway Pine	70 NP43	4.6	40	0	0	Thinning	
146	35	16	71	t14635w1160071	Norway Pine	71 NP57	20.4	73	0	0	Thinning	
146	35	16	75	t14635w1160075	Jack Pine	75 JP45	5.9	64	0	0	Clearcut with Reserves	
146	35	16	79	t14635w1160079	Jack Pine	79 JP43	8.3	57	0	0	Clearcut with Reserves	
146	35	16	81	t14635w1160081	Norway Pine	81 NP53	4.6	112	2010	0	Shelterwood	
146	35	16	84	t14635w1160084	Cutover Area	84 COA	12.9	16	0	0	On-site Evaluation	

Subsection **Chippewa Plains**

Forestry Area ***Bemidji Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
146	35	16	195	t14635w1160195	Norway Pine	195 NP 43	1.8	40	0	0	Thinning	
146	35	22	108	t14635w1220108	Upland Brush	108 UB	13.1	25	0	0	On-site Evaluation	COV53
146	35	22	109	t14635w1220109	Upland Brush	109 UB	20.7	6	0	0	On-site Evaluation	COV53
146	35	22	110	t14635w1220110	Cutover Area	110 COA	26.4	19	0	0	Re-inventory.	COV52 INC53
146	35	22	111	t14635w1220111	Cutover Area	111 COA	18.8	5	2012	0	Re-inventory.	COV72
146	35	22	112	t14635w1220112	Black Spruce, Lowland	112 BSL43	18.5	130	0	0	Seed Tree	
146	35	22	114	t14635w1220114	Upland Brush	114 UB	3.4	6	0	0	On-site Evaluation	COV53
146	35	30	131	t14635w1300131	Aspen	131 A56	42.9	68	0	0	Clearcut with Reserves	
146	35	32	153	t14635w1320153	Tamarack	153 T52	34.9	103	0	0	Seed Tree	
146	35	32	182	t14635w1320182	Cutover Area	182 COA	25.6	19	0	0.1	On-site Evaluation	
146	35	32	184	t14635w1320184	Balsam Fir	184 BF53	5.7	87	0	0	Clearcut with Reserves	
146	35	34	154	t14635w1340154	Cutover Area	154 COA	6.4	11	0	0	Re-inventory.	COV53
146	35	34	160	t14635w1340160	Norway Pine	160 NP42	11.2	46	0	0	Thinning	
146	35	34	167	t14635w1340167	Jack Pine	167 JP46	10	61	0	0	Clearcut with Reserves	
146	35	36	163	t14635w1360163	Tamarack	163 T41	26.3	93	2013	0	Seed Tree	
146	35	36	174	t14635w1360174	Jack Pine	174 JP43	4.7	62	0	0	Clearcut with Reserves	
146	35	36	176	t14635w1360176	Norway Pine	176 NP21	20.4	24	0	0	Thinning	
146	35	36	191	t14635w1360191	Norway Pine	191 NP54	7.9	86	0	0	Thinning	
146	36	16	79	t14636w1160079	Northern Hardwoods	79 NH54	12.7	80	2016	0	Uneven-aged Harvest	
146	36	16	80	t14636w1160080	Northern Hardwoods	80 NH54	18.8	99	2016	0	Uneven-aged Harvest	
146	36	16	81	t14636w1160081	Northern Hardwoods	81 NH53	27.2	81	2016	0	Uneven-aged Harvest	
146	36	16	83	t14636w1160083	Northern Hardwoods	83 NH53	30	88	2016	0	Uneven-aged Harvest	
146	36	16	84	t14636w1160084	Northern Hardwoods	84 NH53	13.2	82	2016	0	Uneven-aged Harvest	
146	36	16	94	t14636w1160094	Norway Pine	94 NP64	9.3	103	0	0	Thinning	
146	36	16	95	t14636w1160095	Northern Hardwoods	95 NH51	12.2	71	2016	0	Uneven-aged Harvest	
146	36	16	98	t14636w1160098	Norway Pine	98 NP56	8.8	103	2016	0	Shelterwood	
146	36	16	102	t14636w1160102	Norway Pine	102 NP56	6.8	97	2016	0	Shelterwood	
146	36	16	137	t14636w1160137	Northern Hardwoods	137 NH44	8.2	78	2016	0	Uneven-aged Harvest	
146	36	36	257	t14636w1360257	Northern Hardwoods	257 NH55	34.5	93	2013	0	Uneven-aged Harvest	
146	36	36	258	t14636w1360258	Northern Hardwoods	258 NH55	23.4	81	2013	0	Uneven-aged Harvest	
146	36	36	259	t14636w1360259	Northern Hardwoods	259 NH54	18	92	2013	0	Uneven-aged Harvest	
146	36	36	302	t14636w1360302	Northern Hardwoods	302 NH54	9.1	88	2013	0	Uneven-aged Harvest	
146	36	36	309	t14636w1360309	Northern Hardwoods	309 NH56	29.6	99	2013	0	Uneven-aged Harvest	
146	37	1	9	t14637w1010009	Balsam Fir	9 BF57	7.2	69	0	0	On-site Evaluation	

Subsection **Chippewa Plains**

Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
146	37	1	10	t14637w1010010	Balsam Fir	10 BF54	6.6	78	0	0	On-site Evaluation	
146	37	19	159	t14637w1190159	Oak	159 O53	6.1	72	0	0	Uneven-aged Harvest	
146	37	19	163	t14637w1190163	Aspen	163 A54	4.3	64	0	0	Clearcut with Reserves	
146	37	19	165	t14637w1190165	Aspen	165 A55	6.3	58	0	0	Clearcut with Reserves	
146	37	25	66	t14637w1250066	Tamarack	66 T42	5.2	96	2013	0.3	Re-inventory.	
146	37	30	100	t14637w1300100	Aspen	100 A19	9.2	62	0	0	Re-inventory.	
146	37	30	115	t14637w1300115	Tamarack	115 T51	7.4	120	0	0.2	Re-inventory.	
146	37	34	156	t14637w1340156	Tamarack	156 T44	4	161	0	0.1	Re-inventory.	
146	38	17	60	t14638w1170060	Aspen	60 A44	4.3	56	0	0	Clearcut with Reserves	
146	38	18	56	t14638w1180056	Northern Hardwoods	56 NH53	13.9	78	2016	0	Uneven-aged Harvest	
146	38	25	81	t14638w1250081	Cutover Area	81 COA	10.3	19	0	0	Re-inventory.	
146	38	26	75	t14638w1260075	Tamarack	75 T43	4.9	155	2010	0	Seed Tree	
146	38	26	78	t14638w1260078	Cutover Area	78 COA	27.9	108	0	0	Re-inventory.	INC72
146	38	26	99	t14638w1260099	Aspen	99 A44	7	57	0	0	Clearcut with Reserves	
146	38	35	148	t14638w1350148	Aspen	148 A45	19	43	0	0	Clearcut with Reserves	
146	39	1	87	t14639w1010087	Jack Pine	87 JP55	6.7	40	0	0.2	On-site Evaluation	
146	39	1	102	t14639w1010102	Jack Pine	102 JP54	29.2	43	0	0	On-site Evaluation	
146	39	1	103	t14639w1010103	Aspen	103 A57	11	50	0	0	On-site Evaluation	
146	39	14	24	t14639w1140024	Aspen	24 A53	8.8	52	0	0	Clearcut with Reserves	
146	39	14	25	t14639w1140025	Aspen	25 A45	6.6	55	0	0.5	Clearcut with Reserves	
146	39	24	46	t14639w1240046	Aspen	46 A54	5.3	78	0	0	Clearcut with Reserves	
146	39	35	67	t14639w1350067	Cutover Area	67 COA	25.8	4	0	0	Re-inventory.	
146	39	35	105	t14639w1350105	Jack Pine	105 JP 55	14.5	63	0	0	Clearcut with Reserves	
146	39	36	54	t14639w1360054	Jack Pine	54 JP54	11.7	65	0	0	Clearcut with Reserves	
147	30	2	12	t14730w1020012	Aspen	12 A19	20.3	29	0	0	Intermediate Harvest	
147	30	2	13	t14730w1020013	Aspen	13 A42	40.4	37	0	0	Intermediate Harvest	
147	30	2	14	t14730w1020014	Aspen	14 A41	13.2	33	0	0	Intermediate Harvest	
147	30	2	16	t14730w1020016	Aspen	16 A19	46.2	27	0	0	Intermediate Harvest	
147	30	12	54	t14730w1120054	Aspen	54 A52	68.3	69	0	0	Clearcut with Reserves	
147	30	12	61	t14730w1120061	Aspen	61 A22	37.4	35	0	0	Clearcut with Reserves	
147	30	12	64	t14730w1120064	Aspen	64 A51	5.1	68	0	0.3	Clearcut with Reserves	
147	30	13	102	t14730w1130102	Aspen	102 A43	23.6	37	0	0	Clearcut with Reserves	
147	30	16	68	t14730w1160068	Northern Hardwoods	68 NH54	21.9	83	0	0	Manage for understory	
147	30	16	69	t14730w1160069	Northern Hardwoods	69 NH19	8.5	8	0	0	Manage for understory	

Subsection **Chippewa Plains**

Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
147	30	16	85	t14730w1160085	Northern Hardwoods	85 NH53	38.9	69	0	0	Manage for understory	
147	30	16	89	t14730w1160089	Northern Hardwoods	89 NH19	33.5	8	0	0	Manage for understory	
147	30	16	93	t14730w1160093	Northern Hardwoods	93 NH55	13	114	0	0	Manage for understory	INC61
147	30	18	96	t14730w1180096	Aspen	96 A58	15	59	0	0	Clearcut with Reserves	
147	30	20	125	t14730w1200125	Northern Hardwoods	125 NH52	6.9	76	2010	0	Uneven-aged Harvest	
147	30	20	255	t14730w1200255	Northern Hardwoods	255 NH 42	2.3	61	2010	0	Uneven-aged Harvest	
147	30	23	158	t14730w1230158	Upland Grass	158 UG	22	25	0	0	On-site Evaluation	
147	30	25	206	t14730w1250206	Birch	206 Bi42	6.3	53	0	0	Clearcut with Reserves	
147	30	25	208	t14730w1250208	Tamarack	208 T52	12.3	91	0	0	Seed Tree	
147	30	28	177	t14730w1280177	Northern Hardwoods	177 NH53	15.7	64	2010	0	Uneven-aged Harvest	
147	30	33	225	t14730w1330225	Norway Pine	225 NP56	5.2	110	0	0	Manage for understory	
147	30	35	231	t14730w1350231	Aspen	231 A56	22.5	60	0	0	Clearcut with Reserves	
147	30	35	237	t14730w1350237	Aspen	237 A43	42.3	55	0	0	Clearcut with Reserves	
147	30	35	239	t14730w1350239	Aspen	239 A51	8.6	61	0	0.1	Clearcut with Reserves	
147	31	6	14	t14731w1060014	Norway Pine	14 NP79	7.9	140	0	0	On-site Evaluation	
147	31	6	20	t14731w1060020	Northern Hardwoods	20 NH54	20.9	78	0	0	Uneven-aged Harvest	
147	31	12	39	t14731w1120039	White Pine	39 WP52	13.1	110	0	0	Re-inventory.	
147	31	13	81	t14731w1130081	Tamarack	81 T43	18	120	0	0	Seed Tree	
147	31	16	48	t14731w1160048	Aspen	48 A54	41.9	58	2015	0	Clearcut with Reserves	
147	31	16	52	t14731w1160052	Tamarack	52 T44	9.1	113	0	0.2	Seed Tree	
147	31	16	58	t14731w1160058	White Pine	58 WP75	18.5	114	0	0	Shelterwood	
147	31	16	60	t14731w1160060	Aspen	60 A55	9.1	61	2015	0	Clearcut with Reserves	
147	31	16	61	t14731w1160061	White Spruce	61 WS11	13.8	24	0	0	Thinning	
147	31	16	70	t14731w1160070	White Spruce	70 WS11	39.5	24	0	0	Thinning	
147	31	16	72	t14731w1160072	Northern Hardwoods	72 NH51	38	135	2016	0	Uneven-aged Harvest	
147	31	16	74	t14731w1160074	Birch	74 Bi53	9	83	0	0	Manage for understory	INC61
147	31	16	76	t14731w1160076	Northern Hardwoods	76 NH53	20.5	89	2016	0	Uneven-aged Harvest	
147	31	16	84	t14731w1160084	Aspen	84 A56	12.4	66	0	0	Clearcut with Reserves	
147	31	16	89	t14731w1160089	Tamarack	89 T41	5.8	105	2010	0	Seed Tree with Reserves	
147	31	21	118	t14731w1210118	Aspen	118 A55	7	70	0	0	Clearcut with Reserves	
147	31	21	131	t14731w1210131	Black Spruce, Lowland	131 BSL53	49.3	137	0	0	Clearcut with Reserves	
147	31	21	147	t14731w1210147	Tamarack	147 T42	8	119	0	0	Seed Tree	
147	31	21	161	t14731w1210161	Aspen	161 A54	7.6	71	0	0	Clearcut with Reserves	
147	31	22	116	t14731w1220116	Balm of Gilead	116 BG53	12.1	91	0	0	Clearcut with Reserves	

Subsection **Chippewa Plains**

Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
147	31	22	128	t14731w1220128	Black Spruce, Lowland	128 BSL43	11.5	130	0	0	On-site Evaluation	
147	31	26	204	t14731w1260204	Tamarack	204 T41	2.8	114	0	0	Re-inventory.	
147	31	26	207	t14731w1260207	Black Spruce, Lowland	207 BSL41	2.9	114	0	0	Re-inventory.	
147	31	27	197	t14731w1270197	Tamarack	197 T42	19.8	124	0	0	On-site Evaluation	
147	32	2	114	t14732w1020114	Northern Hardwoods	114 NH43	19.4	61	0	0	Uneven-aged Harvest	
147	32	2	116	t14732w1020116	Northern Hardwoods	116 NH54	16.4	67	0	0	Uneven-aged Harvest	
147	32	8	29	t14732w1080029	Tamarack	29 T45	10.7	110	0	0	Seed Tree	
147	32	8	31	t14732w1080031	Black Spruce, Lowland	31 BSL42	62.2	99	0	0	Seed Tree	
147	32	16	42	t14732w1160042	White Spruce	42 WS45	21.4	64	0	0	Clearcut with Reserves	COV52
147	32	16	49	t14732w1160049	White Spruce	49 WS47	30.9	64	0	0	Clearcut with Reserves	COV52
147	32	16	50	t14732w1160050	Norway Pine	50 NP57	10.7	41	0	0	Thinning	
147	32	16	52	t14732w1160052	Norway Pine	52 NP21	53.6	15	0	0	Thinning	
147	32	16	53	t14732w1160053	Norway Pine	53 NP21	49.2	23	0	0	Thinning	
147	32	16	56	t14732w1160056	Norway Pine	56 NP51	8	72	0	0	Thinning	
147	32	16	57	t14732w1160057	Norway Pine	57 NP55	29.1	52	0	0	Thinning	
147	32	16	63	t14732w1160063	Norway Pine	63 NP58	27	63	0	0	Thinning	
147	32	16	65	t14732w1160065	White Spruce	65 WS46	18.5	44	0	0	Clearcut with Reserves	COV53
147	32	34	109	t14732w1340109	Northern Hardwoods	109 NH43	9	78	0	0	Uneven-aged Harvest	
147	33	16	34	t14733w1160034	Norway Pine	34 NP43	17.3	66	0	0	Thinning	
147	33	16	49	t14733w1160049	Jack Pine	49 JP55	2.3	77	0	0	Clearcut with Reserves	
147	33	16	56	t14733w1160056	Jack Pine	56 JP44	9.2	71	0	0	Clearcut with Reserves	
147	33	16	141	t14733w1160141	Norway Pine	141 NP45	28.4	71	0	0	Thinning	
147	33	16	146	t14733w1160146	Jack Pine	146 JP45	10.5	71	0	0	Clearcut with Reserves	
147	33	30	114	t14733w1300114	Tamarack	114 T43	15	94	2011	0	Seed Tree with Reserves	
147	33	36	116	t14733w1360116	Birch	116 Bi 42	17.6	36	0	0	Shelterwood	INC52
147	33	36	120	t14733w1360120	Aspen	120 A46	26.6	45	0	0	Clearcut with Reserves	
147	33	36	181	t14733w1360181	Aspen	181 A54	10.9	60	0	0	Clearcut with Reserves	
147	33	36	200	t14733w1360200	Norway Pine	200 NP52	2.4	91	0	0	Thinning	
147	34	6	8	t14734w1060008	Jack Pine	8 JP44	33.3	54	0	0	On-site Evaluation	
147	34	6	10	t14734w1060010	Aspen	10 A55	19.4	61	0	0	On-site Evaluation	
147	34	6	10	t14734w1060010	Aspen	10 A55	23.7	61	0	0	On-site Evaluation	
147	36	14	42	t14736w1140042	Cutover Area	42 COA	5	7	0	0	Re-inventory.	INC72
147	36	16	41	t14736w1160041	Tamarack	41 T44	10.7	109	0	0.3	Seed Tree	
147	36	28	130	t14736w1280130	Jack Pine	130 JP44	6.9	54	0	0	Clearcut with Reserves	

Subsection **Chippewa Plains**

Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
147	36	30	140	t14736w1300140	Tamarack	140 T54	12.3	93	2015	0	Seed Tree	
147	36	30	149	t14736w1300149	White Spruce	149 WS11	5.7	26	0	0	On-site Evaluation	
147	36	30	150	t14736w1300150	White Spruce	150 WS51	5.1	83	0	0	On-site Evaluation	
147	36	32	159	t14736w1320159	Tamarack	159 T55	4.7	93	2015	0	Seed Tree	
147	36	36	165	t14736w1360165	Norway Pine	165 NP66	20.8	104	0	0	Thinning	
147	36	36	172	t14736w1360172	Aspen	172 A52	6	75	0	0	Clearcut with Reserves	
147	36	36	185	t14736w1360185	Aspen	185 A25	3.2	33	2017	0	Clearcut with Reserves	
147	36	36	187	t14736w1360187	White Spruce	187 WS12	10.3	22	0	0	Thinning	
147	36	36	198	t14736w1360198	Norway Pine	198 NP11	3.8	22	0	0	Thinning	
147	36	36	199	t14736w1360199	Aspen	199 A24	5.5	32	2017	0	Clearcut with Reserves	
147	36	36	214	t14736w1360214	Balsam Fir	214 BF44	6	65	0	0.3	On-site Evaluation	
147	37	16	185	t14737w1160185	White Spruce	185 WS52	12.1	68	0	0	Thinning	
147	37	16	196	t14737w1160196	Aspen	196 A51	7.6	56	0	0	Clearcut with Reserves	
147	37	17	198	t14737w1170198	Norway Pine	198 NP43	2.8	28	0	0	Thinning	
147	37	19	289	t14737w1190289	Aspen	289 A42	8.6	50	0	0.2	Clearcut with Reserves	
147	37	20	205	t14737w1200205	Norway Pine	205 NP21	3.7	28	0	0	Thinning	
147	37	20	223	t14737w1200223	Norway Pine	223 NP21	8.8	28	0	0	Thinning	
147	37	20	243	t14737w1200243	Balsam Fir	243 BF42	9.5	70	0	0	Uneven-aged Harvest	
147	37	21	252	t14737w1210252	Balm of Gilead	252 BG52	4.5	72	0	0	Clearcut with Reserves	
147	37	22	284	t14737w1220284	Aspen	284 A42	20.2	42	0	0	Clearcut with Reserves	
147	37	34	340	t14737w1340340	Aspen	340 A53	32.9	64	0	0	Clearcut with Reserves	
147	37	36	333	t14737w1360333	Tamarack	333 T42	4.2	129	0	0	On-site Evaluation	
147	38	32	204	t14738w1320204	Aspen	204 A42	10	41	0	0	Clearcut with Reserves	
147	38	32	213	t14738w1320213	Balsam Fir	213 BF42	11	44	0	0	Uneven-aged Harvest	
147	38	32	214	t14738w1320214	Black Spruce, Lowland	214 BSL43	6	136	0	0	Seed Tree	
147	38	32	215	t14738w1320215	Tamarack	215 T43	7.5	115	0	0	Seed Tree	
147	38	32	223	t14738w1320223	Norway Pine	223 NP75	2.6	110	0	0	Thinning	
148	32	4	206	t14832w1040206	Norway Pine	206 NP52	1.1	51	0	0	Thinning	
148	32	10	59	t14832w1100059	Northern Hardwoods	59 NH53	12.6	85	0	0	Uneven-aged Harvest	
148	32	10	64	t14832w1100064	Northern Hardwoods	64 NH54	28.2	90	0	0	Uneven-aged Harvest	
148	32	20	99	t14832w1200099	Aspen	99 A54	13.1	61	0	0	Clearcut with Reserves	
148	32	20	101	t14832w1200101	Jack Pine	101 JP44	9	60	0	0	Clearcut with Reserves	
148	32	20	102	t14832w1200102	Aspen	102 A54	8.7	69	0	0	Clearcut with Reserves	
148	32	26	112	t14832w1260112	Norway Pine	112 NP54	21.7	47	0	0	Thinning	

Subsection **Chippewa Plains**

Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
148	32	26	126	t14832w1260126	Norway Pine	126 NP54	21.4	32	0	0	Thinning	
148	32	26	128	t14832w1260128	Aspen	128 A29	5.7	52	0	0	Re-inventory.	
148	32	28	9	t14832w1280009	Ash	9 Ash57	5.1	96	0	0	Uneven-aged Harvest	INC73
148	32	28	132	t14832w1280132	Balsam Fir	132 BF42	12.9	81	0	0	Manage for understory	
148	32	28	134	t14832w1280134	Aspen	134 A55	6.5	60	0	0.2	On-site Evaluation	RIP1
148	32	28	143	t14832w1280143	Balsam Fir	143 BF44	9.1	50	0	0	Clearcut with Reserves	INC73
148	32	36	164	t14832w1360164	White Pine	164 WP83	29.5	131	0	0	Thinning	INC51
148	32	36	177	t14832w1360177	White Pine	177 WP71	10.8	125	0	0	Thinning	
148	32	36	179	t14832w1360179	Aspen	179 A17	13.8	20	0	0	Re-inventory.	
148	32	36	180	t14832w1360180	Aspen	180 A53	27	77	0	0	Clearcut with Reserves	
148	32	36	187	t14832w1360187	Aspen	187 A19	14.4	15	0	0	Re-inventory.	
148	32	36	204	t14832w1360204	Aspen	204 A57	18.8	78	0	0	Clearcut with Reserves	INC51
148	33	1	7	t14833w1010007	Aspen	7 A 47	17.4	54	0	0	Clearcut with Reserves	
148	33	1	120	t14833w1010120	Ash	120 Ash54	19.5	105	0	0	Uneven-aged Harvest	
148	33	1	122	t14833w1010122	Aspen	122 A54	11.2	55	0	0	Clearcut with Reserves	
148	33	1	132	t14833w1010132	Aspen	132 A 57	6.9	55	0	0	Clearcut with Reserves	
148	33	2	3	t14833w1020003	Ash	3 Ash55	14.6	125	0	0	Uneven-aged Harvest	
148	33	2	151	t14833w1020151	Aspen	151 A44	3	65	0	0	Clearcut with Reserves	
148	33	10	12	t14833w1100012	Aspen	12 A55	10.6	68	0	0	Re-inventory.	
148	33	10	21	t14833w1100021	Northern Hardwoods	21 NH55	16.4	79	2012	0	Uneven-aged Harvest	
148	33	10	156	t14833w1100156	Aspen	156 A45	23.1	31	0	0	Re-inventory.	
148	33	10	157	t14833w1100157	Aspen	157 A46	52.9	63	0	0	Re-inventory.	
148	33	10	187	t14833w1100187	Oak	187 O53	10.4	133	0	0	Uneven-aged Harvest	
148	33	10	189	t14833w1100189	Aspen	189 A53	8.5	72	0	0	Clearcut with Reserves	
148	33	10	190	t14833w1100190	Ash	190 Ash53	5.9	111	0	0	Uneven-aged Harvest	
148	33	10	199	t14833w1100199	Aspen	199 A55	7.8	48	0	0	Clearcut with Reserves	
148	33	10	208	t14833w1100208	Cutover Area	208 COA	1.4	12	0	0	Re-inventory.	INC53
148	33	11	165	t14833w1110165	Aspen	165 A43	26.4	47	2012	0	Clearcut with Reserves	
148	33	11	203	t14833w1110203	Northern Hardwoods	203 NH43	16.2	67	2012	0	Uneven-aged Harvest	
148	33	11	206	t14833w1110206	Northern Hardwoods	206 NH56	48.5	56	2012	0	Uneven-aged Harvest	
148	33	11	218	t14833w1110218	Lowland Hardwoods	218 LH53	58.9	114	0	0	Re-inventory.	
148	33	14	240	t14833w1140240	Northern Hardwoods	240 NH45	26	84	0	0	Re-inventory.	
148	33	24	257	t14833w1240257	Cutover Area	257 COA	2.6	12	0	0.2	Re-inventory.	
148	33	34	275	t14833w1340275	Aspen	275 A54	15	76	0	0	Clearcut with Reserves	

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Forestry Area ***Bemidji Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
148	33	34	277	t14833w1340277	Norway Pine	277 NP55	15	89	0	0	Re-inventory.	MA1
148	33	36	64	t14833w1360064	Tamarack	64 T42	13.9	95	0	0	Seed Tree with Reserves	
148	33	36	285	t14833w1360285	White Pine	285 WP12	4.2	23	0	0	Thinning	
148	33	36	290	t14833w1360290	Black Spruce, Lowland	290 BSL42	14	103	0	0	Seed Tree	
148	35	36	36	t14835w1360036	Norway Pine	36 NP 45	25.4	34	0	0	Thinning	
148	35	36	39	t14835w1360039	Norway Pine	39 NP55	185	43	0	0	Thinning	
148	35	36	57	t14835w1360057	Norway Pine	57 NP21	8.1	22	0	0	Thinning	
148	37	24	41	t14837w1240041	Aspen	41 A45	6.4	58	0	0	Clearcut with Reserves	
148	37	24	45	t14837w1240045	Aspen	45 A41	6.1	56	0	0	Clearcut with Reserves	
148	37	24	102	t14837w1240102	Aspen	102 A57	2.5	57	0	0	Clearcut with Reserves	
148	37	24	158	t14837w1240158	Aspen	158 A53	2.6	63	0	0	Clearcut with Reserves	
148	37	25	126	t14837w1250126	Aspen	126 A52	9.1	58	0	0	Clearcut with Reserves	
148	37	26	132	t14837w1260132	Aspen	132 A43	13	60	2010	0	Clearcut with Reserves	
148	37	26	163	t14837w1260163	Aspen	163 A56	7.7	52	2018	0	Clearcut with Reserves	
148	37	26	164	t14837w1260164	Aspen	164 A56	3.8	52	2010	0	Clearcut with Reserves	
149	33	24	34	t14933w1240034	Northern Hardwoods	34 NH55	84	66	2018	0	Uneven-aged Harvest	
149	33	24	47	t14933w1240047	Northern Hardwoods	47 NH55	41.6	59	2018	0	Uneven-aged Harvest	
149	33	25	55	t14933w1250055	Aspen	55 A56	25.3	66	0	0	Clearcut with Reserves	
149	33	25	88	t14933w1250088	Northern Hardwoods	88 NH55	28.6	77	0	0.2	Uneven-aged Harvest	
149	33	25	93	t14933w1250093	Northern Hardwoods	93 NH57	22.2	128	0	0	Uneven-aged Harvest	
149	33	25	96	t14933w1250096	Northern Hardwoods	96 NH57	52.8	128	2010	0	Uneven-aged Harvest	
149	33	26	52	t14933w1260052	Aspen	52 A55	4.9	72	0	0	Clearcut with Reserves	
149	33	26	53	t14933w1260053	Aspen	53 A57	29.1	66	0	0	Clearcut with Reserves	
149	33	26	58	t14933w1260058	Aspen	58 A19	22.4	24	2010	0	Re-inventory.	
149	33	36	76	t14933w1360076	Tamarack	76 T44	10.3	94	0	0	Seed Tree with Reserves	
149	33	36	82	t14933w1360082	Aspen	82 A57	9.6	71	0	0	Uneven-aged Harvest	
149	36	2	19	t14936w1020019	Oak	19 O52	18.8	78	0	0.3	Re-inventory.	

Forestry Area ***Blackduck Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
147	29	1	56	t14729w1010056	Tamarack	56 T52	3.2	116	0	0	Clearcut with Reserves	
147	29	1	65	t14729w1010065	Tamarack	65 T52	7.1	112	0	0	Clearcut with Reserves	
147	29	2	18	t14729w1020018	White Spruce	18 WS42	38.5	8	0	0	On-site Evaluation	

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Forestry Area *Blackduck Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
147	29	2	543	t14729w1020543	Aspen	543 A41	10.7	45	0	0	Clearcut with Reserves	
147	29	2	545	t14729w1020545	Tamarack	545 T44	2	122	0	0	Clearcut with Reserves	
147	29	3	5	t14729w1030005	Norway Pine	5 NP41	15.8	22	0	0	Thinning	
147	29	4	7	t14729w1040007	Tamarack	7 T55	8.4	107	0	0	Clearcut with Reserves	
147	29	4	13	t14729w1040013	Tamarack	13 T54	2.1	126	0	0	Clearcut with Reserves	
147	29	4	27	t14729w1040027	Aspen	27 A55	39.1	64	0	0	Clearcut with Reserves	
147	29	4	71	t14729w1040071	Aspen	71 A53	6.3	60	0	0	Clearcut with Reserves	
147	29	4	553	t14729w1040553	Aspen	553 A54	17.1	60	0	0	Clearcut with Reserves	
147	29	4	554	t14729w1040554	Aspen	554 A53	5.9	48	0	0.5	Clearcut with Reserves	
147	29	4	776	t14729w1040776	Tamarack	776 T54	2.3	109	0	0.5	Clearcut with Reserves	
147	29	5	755	t14729w1050755	Ash	755 Ash54	27.3	64	0	0	On-site Evaluation	
147	29	5	759	t14729w1050759	Aspen	759 A52	3.8	62	0	0	Clearcut with Reserves	
147	29	5	764	t14729w1050764	Aspen	764 A58	14.1	61	0	0	Clearcut with Reserves	
147	29	5	783	t14729w1050783	Aspen	783 A56	32	66	0	0	Clearcut with Reserves	
147	29	5	798	t14729w1050798	Aspen	798 A56	6.2	72	0	0	Clearcut with Reserves	
147	29	5	897	t14729w1050897	Tamarack	897 T54	33	109	0	0	Clearcut with Reserves	
147	29	7	720	t14729w1070720	Aspen	720 A55	25.1	50	0	0	Clearcut with Reserves	
147	29	8	809	t14729w1080809	Aspen	809 A55	23	56	0	0	Clearcut with Reserves	
147	29	9	93	t14729w1090093	Tamarack	93 T52	3.2	125	0	0	Clearcut with Reserves	
147	29	9	125	t14729w1090125	Tamarack	125 T45	30.6	107	0	0	Clearcut with Reserves	
147	29	10	136	t14729w1100136	Tamarack	136 T45	4.5	107	0	0	Clearcut with Reserves	
147	29	10	919	t14729w1100919	Black Spruce, Lowland	919 BSL58	4.2	115	0	0	Clearcut with Reserves	
147	29	11	187	t14729w1110187	Tamarack	187 T56	5	108	0	0.2	Clearcut with Reserves	
147	29	12	144	t14729w1120144	Aspen	144 A55	3.9	67	0	0.4	Clearcut with Reserves	
147	29	12	189	t14729w1120189	Aspen	189 A54	2.7	64	0	0	Clearcut with Reserves	
147	29	12	215	t14729w1120215	Aspen	215 A54	8.5	70	0	0	Clearcut with Reserves	
147	29	12	615	t14729w1120615	Aspen	615 A54	26.7	64	0	0	Clearcut with Reserves	
147	29	12	616	t14729w1120616	Aspen	616 A54	8.4	64	0	0	Clearcut with Reserves	
147	29	12	621	t14729w1120621	Aspen	621 A52	22.6	69	0	0	Clearcut with Reserves	
147	29	13	576	t14729w1130576	Tamarack	576 T42	1.6	118	0	0	Clearcut with Reserves	
147	29	13	626	t14729w1130626	Aspen	626 A54	17.5	67	0	0	Clearcut with Reserves	
147	29	13	912	t14729w1130912	Aspen	912 A54	11.6	50	0	0	Clearcut with Reserves	
147	29	13	915	t14729w1130915	Aspen	915 A54	4.3	50	0	0	Clearcut with Reserves	
147	29	15	228	t14729w1150228	White Pine	228 WP62	1.6	163	0	0	Shelterwood	

Subsection **Chippewa Plains**

Forestry Area ***Blackduck Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
147	29	17	649	t14729w1170649	Aspen	649 A54	3.6	70	0	0	Clearcut with Reserves	
147	29	17	655	t14729w1170655	Aspen	655 A57	5.1	52	0	0	Clearcut with Reserves	
147	29	18	645	t14729w1180645	Aspen	645 A41	5.2	52	0	0	Clearcut with Reserves	
147	29	18	665	t14729w1180665	Aspen	665 A45	29.1	45	0	0	Clearcut with Reserves	
147	29	19	328	t14729w1190328	Tamarack	328 T52	3.5	109	0	0	Clearcut with Reserves	
147	29	19	706	t14729w1190706	Tamarack	706 T51	11.9	104	0	0	Clearcut with Reserves	
147	29	19	747	t14729w1190747	Aspen	747 A55	22.2	64	0	0	Clearcut with Reserves	
147	29	19	748	t14729w1190748	Tamarack	748 T41	8.4	116	0	0.1	Clearcut with Reserves	
147	29	20	307	t14729w1200307	Black Spruce, Lowland	307 BSL43	4.4	99	0	0	Clearcut with Reserves	
147	29	20	702	t14729w1200702	Aspen	702 A45	6	46	0	0	Clearcut with Reserves	
147	29	22	733	t14729w1150733	Tamarack	733 T44	22	138	0	0	Clearcut with Reserves	
147	29	22	743	t14729w1220743	Balsam Fir	743 BF44	7	99	0	0	Clearcut with Reserves	COV73
147	29	23	742	t14729w1230742	Balsam Fir	742 BF44	7	99	0	0	Clearcut with Reserves	COV73
147	29	23	880	t14729w1230880	Balsam Fir	880 BF43	6	64	0	0	Clearcut with Reserves	COV73
147	29	23	883	t14729w1230883	Norway Pine	883 NP41	20.6	21	0	0	Thinning	
147	29	23	884	t14729w1230884	Aspen	884 A47	27.1	55	0	0	Clearcut with Reserves	
147	29	23	887	t14729w1230887	Norway Pine	887 NP41	14.4	19	0	0	Thinning	
147	29	27	428	t14729w1270428	Northern Hardwoods	428 NH57	19.4	144	0	0	On-site Evaluation	
147	29	30	333	t14729w1300333	Tamarack	333 T52	15.8	109	0	0	Clearcut with Reserves	
147	29	30	343	t14729w1300343	Tamarack	343 T44	30	124	0	0.1	Clearcut with Reserves	
147	29	32	500	t14729w1320500	Norway Pine	500 NP61	9.2	119	0	0	On-site Evaluation	
147	29	32	501	t14729w1320501	White Pine	501 WP44	25.2	44	0	0	Salvage Cut ? Selective Harvest	
147	29	33	475	t14729w1330475	Northern Hardwoods	475 NH57	13.1	101	0	0	Uneven-aged Harvest	COV51
147	29	33	491	t14729w1330491	White Spruce	491 WS33	18.4	23	0	0	Thinning	
148	29	2	71	t14829w1020071	Northern Hardwoods	71 NH54	27.3	83	0	0	On-site Evaluation	
148	29	2	72	t14829w1020072	Northern Hardwoods	72 NH54	63	82	0	0	On-site Evaluation	
148	29	2	112	t14829w1020112	Northern Hardwoods	112 NH54	22.3	71	0	0	On-site Evaluation	
148	29	2	115	t14829w1020115	Aspen	115 A33	7.2	42	0	0	Clearcut with Reserves	
148	29	2	171	t14829w1020171	White Pine	171 WP65	3.1	110	0	0	Shelterwood	
148	29	4	64	t14829w1040064	Black Spruce, Lowland	64 BSL43	5.1	131	0	0	Clearcut with Reserves	
148	29	4	74	t14829w1040074	White Spruce	74 WS24	12.5	29	0	0	Thinning	
148	29	4	87	t14829w1040087	Tamarack	87 T42	18	104	0	0	Clearcut with Reserves	
148	29	5	56	t14829w1050056	Tamarack	56 T41	22.4	126	0	0	Clearcut with Reserves	
148	29	5	58	t14829w1050058	Norway Pine	58 NP41	4.6	27	0	0	Thinning	

Subsection **Chippewa Plains**

Forestry Area ***Blackduck Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
148	29	5	65	t14829w1050065	Tamarack	65 T42	7.8	116	0	0	Clearcut with Reserves	
148	29	5	80	t14829w1050080	Tamarack	80 T42	28	104	0	0	Clearcut with Reserves	
148	29	5	95	t14829w1050095	Norway Pine	95 NP42	3.3	27	0	0	Thinning	
148	29	5	116	t14829w1050116	Norway Pine	116 NP43	5.2	27	0	0	Thinning	
148	29	6	20	t14829w1060020	Norway Pine	20 NP68	5.3	91	0	0	Thinning	
148	29	6	41	t14829w1060041	Norway Pine	41 NP31	15.2	24	0	0	Thinning	
148	29	6	90	t14829w1060090	Norway Pine	90 NP31	21.4	23	0	0	Thinning	
148	29	6	100	t14829w1060100	Norway Pine	100 NP32	5.2	16	0	0	Thinning	
148	29	6	915	t14829w1060915	Norway Pine	915 NP68	5.8	91	0	0	Thinning	
148	29	9	206	t14829w1090206	White Pine	206 WP54	6.7	69	0	0	Salvage Cut ? Selective Harvest	
148	29	10	195	t14829w1100195	Aspen	195 A44	5.6	51	0	0	Clearcut with Reserves	
148	29	10	196	t14829w1100196	White Spruce	196 WS41	18.9	28	0	0	Thinning	
148	29	10	211	t14829w1100211	Balsam Fir	211 BF43	5.3	50	0	0	Clearcut with Reserves	
148	29	10	240	t14829w1100240	White Spruce	240 WS41	25.5	31	0	0	Thinning	
148	29	10	254	t14829w1100254	White Spruce	254 WS41	7	31	0	0	Thinning	
148	29	10	294	t14829w1100294	Aspen	294 A53	1.8	63	0	0	Clearcut with Reserves	
148	29	14	356	t14829w1140356	Norway Pine	356 NP55	3.1	39	0	0	Thinning	
148	29	15	389	t14829w1150389	Tamarack	389 T44	9.4	123	0	0	Clearcut with Reserves	
148	29	16	310	t14829w1160310	Norway Pine	310 NP41	19	27	0	0	Thinning	
148	29	16	314	t14829w1160314	Aspen	314 A53	3.8	63	0	0	Clearcut with Reserves	
148	29	16	318	t14829w1160318	White Spruce	318 WS42	5.2	27	0	0	Thinning	
148	29	16	322	t14829w1160322	Aspen	322 A53	55.3	63	0	0	Clearcut with Reserves	
148	29	16	359	t14829w1160359	White Spruce	359 WS43	7.7	27	0	0	Thinning	
148	29	16	362	t14829w1160362	Tamarack	362 T42	111.9	108	0	0.3	Clearcut with Reserves	
148	29	16	408	t14829w1160408	Norway Pine	408 NP42	7.8	27	0	0	Thinning	
148	29	16	418	t14829w1160418	Tamarack	418 T43	20.2	114	0	0	Clearcut with Reserves	
148	29	16	428	t14829w1160428	Tamarack	428 T41	4	158	0	0	Clearcut with Reserves	
148	29	17	305	t14829w1170305	White Spruce	305 WS42	12.8	29	0	0	Thinning	
148	29	17	350	t14829w1170350	Aspen	350 A51	3.1	66	0	0.2	Clearcut with Reserves	
148	29	17	376	t14829w1170376	Norway Pine	376 NP42	6.6	23	0	0	Thinning	
148	29	17	380	t14829w1170380	Tamarack	380 T55	23.3	108	0	0	Clearcut with Reserves	
148	29	17	386	t14829w1170386	Norway Pine	386 NP22	14.1	16	0	0	Thinning	
148	29	17	419	t14829w1170419	Norway Pine	390 NP56	28.8	71	0	0	Thinning	
148	29	17	920	t14829w1170920	Norway Pine	920 NP54	1.7	77	0	0	Thinning	

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Forestry Area ***Blackduck Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
148	29	17	927	t14829w1160927	Aspen	927 A53	8.1	65	0	0	Clearcut with Reserves	
148	29	18	329	t14829w1180329	Norway Pine	329 NP43	7.2	37	0	0	Thinning	
148	29	18	366	t14829w1180366	Birch	366 Bi43	7.4	86	0	0	Clearcut with Reserves	
148	29	19	451	t14829w1190451	Tamarack	451 T41	2.1	125	0	0	Clearcut with Reserves	
148	29	20	443	t14829w1200443	Norway Pine	443 NP33	10.9	20	0	0	Thinning	
148	29	20	453	t14829w1200453	Norway Pine	453 NP33	2.4	20	0	0	Thinning	
148	29	20	457	t14829w1200457	Norway Pine	457 NP41	17	26	0	0	Thinning	
148	29	20	480	t14829w1200480	Aspen	480 A42	14.3	51	0	0	Clearcut with Reserves	
148	29	20	502	t14829w1200502	Aspen	502 A43	9.1	57	0	0	Clearcut with Reserves	
148	29	20	510	t14829w1200510	Aspen	510 A42	1.8	51	0	0	Clearcut with Reserves	
148	29	20	523	t14829w1200523	Black Spruce, Lowland	523 BSL43	14.3	131	0	0	Clearcut with Reserves	
148	29	21	444	t14829w1210444	Tamarack	444 T43	38.3	114	0	0	Clearcut with Reserves	
148	29	21	471	t14829w1210471	Aspen	471 A45	16	49	0	0	Clearcut with Reserves	
148	29	21	508	t14829w1210508	Norway Pine	508 NP66	3.9	107	0	0	Thinning	
148	29	21	518	t14829w1210518	Aspen	518 A42	3.2	59	0	0	Clearcut with Reserves	
148	29	21	526	t14829w1210526	Aspen	526 A53	2.4	66	0	0	Clearcut with Reserves	
148	29	21	931	t14829w1210931	White Pine	931 WP55	2.1	87	0	0	Salvage Cut ? Selective Harvest	
148	29	21	934	t14829w1210934	Aspen	934 A 45	2.4	58	0	0	Clearcut with Reserves	
148	29	22	446	t14829w1220446	Black Spruce, Lowland	446 BSL41	15.4	128	0	0	Clearcut with Reserves	
148	29	22	477	t14829w1220477	Norway Pine	477 NP69	1.9	78	0	0	Thinning	
148	29	22	478	t14829w1220478	Norway Pine	478 NP32	23.3	19	0	0	Thinning	
148	29	22	494	t14829w1220494	Black Spruce, Lowland	494 BSL43	13.3	91	0	0	On-site Evaluation	
148	29	22	497	t14829w1220497	Norway Pine	497 NP21	6.3	28	0	0	Thinning	
148	29	22	500	t14829w1220500	Norway Pine	500 NP52	7.9	77	0	0	Thinning	
148	29	26	565	t14829w1260565	Aspen	565 A44	3.4	52	0	0	Clearcut with Reserves	
148	29	26	644	t14829w1260644	Norway Pine	644 NP41	2.7	27	0	0	Thinning	
148	29	26	712	t14829w1260712	Norway Pine	712 NP42	5.6	23	0	0	Thinning	
148	29	27	547	t14829w1270547	Birch	547 Bi44	8.2	58	0	0	On-site Evaluation	
148	29	27	550	t14829w1270550	Aspen	550 A 56	5.3	54	0	0	Clearcut with Reserves	
148	29	27	551	t14829w1270551	Jack Pine	551 JP54	8.1	61	0	0	Clearcut with Reserves	
148	29	27	583	t14829w1270583	Norway Pine	583 NP58	21.1	93	0	0	Thinning	
148	29	27	591	t14829w1270591	Black Spruce, Lowland	591 BSL43	3.7	123	0	0	Clearcut with Reserves	
148	29	27	595	t14829w1270595	Norway Pine	595 NP42	54.9	23	0	0	Thinning	
148	29	27	601	t14829w1270601	Black Spruce, Lowland	601 BSL45	2.1	111	0	0.1	Clearcut with Reserves	

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Forestry Area ***Blackduck Area***

Township	*Range*	*Section*	*Stand*	*Location ID*	*Management Cover Type*	*Stand Label*	*Acres*	*Age*	*Stand Exam Year*	*New Access Miles*	*Preliminary Prescription*	*Management Objectives*
148	29	27	647	t14829w1270647	Norway Pine	647 NP42	10.9	9	0	0	Thinning	
148	29	28	605	t14829w1280605	Norway Pine	605 NP64	1.4	168	0	0	Clearcut with Reserves	
148	29	28	675	t14829w1280675	Northern Hardwoods	675 NH55	9.2	114	0	0.4	On-site Evaluation	
148	29	28	702	t14829w1280702	Aspen	702 A48	3.2	54	0	0	Clearcut with Reserves	
148	29	31	924	t14829w1310924	Aspen	924 A56	17.8	68	0	0	Clearcut with Reserves	
148	29	32	714	t14829w1320714	Aspen	714 A41	12.2	56	0	0	Clearcut with Reserves	
148	29	32	818	t14829w1320818	Ash	818 Ash46	4.6	88	0	0	On-site Evaluation	
148	29	32	835	t14829w1320835	Birch	835 Bi43	6.1	61	0	0	On-site Evaluation	
148	29	32	880	t14829w1320880	Aspen	880 A57	44.8	61	0	0	Clearcut with Reserves	COV73
148	29	33	734	t14829w1330734	Northern Hardwoods	734 NH55	8.1	86	0	0	On-site Evaluation	
148	29	33	773	t14829w1330773	Tamarack	773 T45	22.5	108	0	0	Clearcut with Reserves	
148	29	33	802	t14829w1330802	Aspen	802 A43	7.9	57	0	0	Clearcut with Reserves	
148	29	34	769	t14829w1340769	Aspen	769 A41	3.4	60	0	0	Clearcut with Reserves	
148	29	34	800	t14829w1340800	Aspen	800 A44	10.7	48	0	0	Clearcut with Reserves	
148	29	34	822	t14829w1340822	Aspen	822 A54	60	59	0	0	Clearcut with Reserves	
148	29	34	891	t14829w1340891	Tamarack	891 T56	15.9	126	0	0	Clearcut with Reserves	
148	29	35	748	t14829w1350748	Tamarack	748 T54	6.2	123	0	0	Clearcut with Reserves	
148	29	35	804	t14829w1350804	Balsam Fir	804 BF22	7.3	52	0	0	Clearcut with Reserves	
148	29	35	911	t14829w1350911	Aspen	911 A42	3.3	49	0	0	Clearcut with Reserves	
148	29	36	755	t14829w1360755	Norway Pine	755 NP11	14.8	19	0	0	Thinning	
148	29	36	789	t14829w1360789	Tamarack	789 T54	3.6	123	0	0	Clearcut with Reserves	
148	30	2	18	t14830w1020018	Jack Pine	18 JP59	26.8	66	0	0	Clearcut with Reserves	
148	30	2	20	t14830w1020020	Aspen	20 A56	3.9	68	0	0	Clearcut with Reserves	
148	30	2	177	t14830w1020177	Aspen	177 A58	5.7	68	0	0	Clearcut with Reserves	
148	30	8	35	t14830w1080035	Birch	35 Bi55	5.6	67	0	0.2	On-site Evaluation	
148	30	10	28	t14830w1100028	Tamarack	28 T44	18.6	109	0	0.4	Clearcut with Reserves	
148	30	10	193	t14830w1100193	Tamarack	193 T44	6.2	109	0	0	Clearcut with Reserves	
148	30	10	196	t14830w1100196	Tamarack	196 T45	1.8	109	0	0	Clearcut with Reserves	
148	30	12	31	t14830w1120031	Tamarack	31 T 57	13.5	102	0	0	Clearcut with Reserves	
148	30	17	187	t14830w1170187	Birch	187 Bi55	31.6	97	0	0	Clearcut with Reserves	
148	30	26	123	t14830w1260123	White Spruce	123 WS43	9	30	2017	0.2	Thinning	
148	30	36	141	t14830w1360141	White Spruce	141 WS42	16.6	31	0	0	Thinning	
148	30	36	152	t14830w1360152	Norway Pine	152 NP44	12.5	50	0	0	Thinning	
148	31	4	16	t14831w1040016	Northern Hardwoods	16 NH56	3.3	83	0	0.3	Uneven-aged Harvest	INC61

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Forestry Area ***Blackduck Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
148	31	4	19	t14831w1040019	Northern Hardwoods	19 NH56	6	83	0	0.3	Uneven-aged Harvest	INC61
148	31	4	21	t14831w1040021	Black Spruce, Lowland	21 BSL42	12.1	134	0	0.2	Clearcut with Reserves	
148	31	4	24	t14831w1040024	Northern Hardwoods	24 NH46	6.2	85	0	0.2	Thinning	
148	31	10	31	t14831w1100031	Northern Hardwoods	31 NH55	25.2	83	0	0	Uneven-aged Harvest	
148	31	10	39	t14831w1100039	Ash	39 Ash44	16.4	137	0	0.3	On-site Evaluation	
148	31	14	95	t14831w1140095	Black Spruce, Lowland	95 BSL42	24.2	119	0	0.3	Clearcut with Reserves	
148	31	14	281	t14831w1140281	Balsam Fir	281 BF56	4	61	0	0	Clearcut with Reserves	INC61
148	31	16	73	t14831w1160073	Aspen	73 A 45	19.1	50	0	0	Clearcut with Reserves	
148	31	18	299	t14831w1180299	Aspen	299 A56	2.2	70	0	0.4	Clearcut with Reserves	
148	31	22	122	t14831w1220122	Northern Hardwoods	122 NH55	8.8	81	0	0	Uneven-aged Harvest	
148	31	24	152	t14831w1240152	White Spruce	152 WS43	1.9	62	0	0	Clearcut with Reserves	
148	31	26	284	t14831w1260284	Balsam Fir	284 BF56	4	63	0	0	Clearcut with Reserves	MA1
148	31	28	182	t14831w1280182	Balsam Fir	182 BF55	14.6	89	0	0	Clearcut with Reserves	MA1
148	31	28	203	t14831w1280203	Aspen	203 A45	7	62	0	0.4	Seed Tree	COV51
148	31	32	208	t14831w1320208	Birch	208 Bi54	21.4	52	0	0	Clearcut with Reserves	
148	31	32	237	t14831w1320237	Birch	237 Bi58	17.3	74	0	0	Clearcut with Reserves	
148	31	34	272	t14831w1340272	Aspen	272 A53	31.2	68	0	0	Clearcut with Reserves	
148	31	36	218	t14831w1360218	White Pine	218 WP41	13.8	71	0	0	On-site Evaluation	
148	31	36	265	t14831w1360265	Northern Hardwoods	265 NH43	28.4	78	0	0	Manage for understory	INC51 INC61
148	31	36	278	t14831w1360278	Northern Hardwoods	278 NH56	18.2	85	0	0	Thinning	
148	31	36	309	t14831w1360309	Tamarack	309 T 55	41.6	111	0	0	Clearcut with Reserves	
149	26	13	309	t14926w1130309	Northern Hardwoods	309 NH57	41.1	66	0	0	Uneven-aged Harvest	
149	26	18	117	t14926w1180117	Black Spruce, Lowland	117 BSL43	4.1	126	0	0	Clearcut with Reserves	
149	26	18	173	t14926w1180173	Ash	173 Ash57	7	150	0	0.4	Re-inventory.	
149	26	20	202	t14926w1200202	Ash	202 Ash56	3.9	139	0	0	On-site Evaluation	
149	26	20	203	t14926w1200203	Aspen	203 A41	7.4	41	0	0	Clearcut with Reserves	
149	26	20	205	t14926w1200205	Aspen	205 A55	44.2	69	0	0	Clearcut with Reserves	White pine? CON
149	26	20	313	t14926w1200313	Aspen	313 A57	9.7	65	0	0	Clearcut with Reserves	
149	26	30	233	t14926w1300233	Aspen	233 A53	17.3	60	0	0	Clearcut with Reserves	
149	26	30	235	t14926w1300235	Aspen	235 A55	8.4	46	0	0	Clearcut with Reserves	
149	26	30	238	t14926w1300238	Aspen	238 A55	13.4	57	0	0	Clearcut with Reserves	
149	26	30	330	t14926w1300330	Northern Hardwoods	330 NH54	15.5	68	0	0	Uneven-aged Harvest	
149	26	31	336	t14926w1310336	Aspen	334 A55	18.1	60	0	0	Clearcut with Reserves	COV61
149	26	36	264	t14926w1360264	Norway Pine	264 NP56	4.4	91	0	0	Clearcut with Reserves	

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Forestry Area ***Blackduck Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
149	26	36	342	t14926w1360342	Northern Hardwoods	342 NH56	10.5	76	0	0	Uneven-aged Harvest	
149	26	36	423	t14926w1360423	Ash	423 Ash44	3.1	82	0	0	On-site Evaluation	COV73
149	27	2	39	t14927w1020039	Aspen	39 A57	6.4	64	0	0	Clearcut with Reserves	
149	27	2	40	t14927w1020040	Aspen	40 A54	16.6	52	0	0	Clearcut with Reserves	
149	27	2	42	t14927w1020042	Northern Hardwoods	42 NH55	4	114	0	0	Uneven-aged Harvest	
149	27	2	43	t14927w1020043	Aspen	43 A57	6.9	61	0	0	Clearcut with Reserves	
149	27	3	27	t14927w1030027	Aspen	27 A53	23.1	62	0	0	Clearcut with Reserves	COV73
149	27	4	10	t14927w1040010	Aspen	10 A59	1.2	65	0	0	Clearcut with Reserves	
149	27	4	13	t14927w1040013	Northern Hardwoods	13 NH55	20.2	114	0	0	Uneven-aged Harvest	
149	27	4	24	t14927w1040024	Aspen	24 A55	13.3	59	0	0	Clearcut with Reserves	
149	27	4	161	t14927w1040161	Northern Hardwoods	161 NH56	9.6	92	0	0	Uneven-aged Harvest	
149	27	4	299	t14927w1040299	Norway Pine	299 NP41	4	39	0	0	Thinning	
149	27	4	300	t14927w1040300	White Spruce	300 WS11	27.1	18	0	0	On-site Evaluation	
149	27	4	303	t14927w1040303	Norway Pine	303 NP31	10.5	37	0	0	Thinning	
149	27	4	304	t14927w1040304	Norway Pine	304 NP42	1	40	0	0	Thinning	
149	27	4	305	t14927w1040305	Aspen	305 A56	30	57	0	0	Clearcut with Reserves	
149	27	4	312	t14927w1040312	Aspen	312 A59	3.8	61	0	0.1	Clearcut with Reserves	
149	27	4	628	t15027w1330628	Aspen	628 A59	1.9	65	0	0	Clearcut with Reserves	
149	27	6	8	t14927w1060008	Black Spruce, Lowland	8 BSL43	8.6	136	0	0	Clearcut with Reserves	
149	27	6	25	t14927w1060025	Aspen	25 A55	12.4	61	0	0	Clearcut with Reserves	
149	27	6	41	t14927w1060041	Tamarack	41 T43	7.6	119	0	0	Clearcut with Reserves	
149	27	7	68	t14927w1070068	Northern Hardwoods	68 NH55	11.2	108	0	0	On-site Evaluation	
149	27	7	69	t14927w1070069	Birch	69 Bi53	6.1	44	0	0	On-site Evaluation	
149	27	7	77	t14927w1070077	Northern Hardwoods	77 NH54	2.6	98	0	0	On-site Evaluation	
149	27	7	264	t14927w1070264	Aspen	264 A54	13.1	61	0	0.3	On-site Evaluation	
149	27	8	61	t14927w1080061	Northern Hardwoods	61 NH55	12.9	131	0	0	On-site Evaluation	
149	27	9	62	t14927w1090062	Black Spruce, Lowland	62 BSL42	15.8	131	2010	0.2	Clearcut with Reserves	
149	27	9	71	t14927w1090071	Black Spruce, Lowland	71 BSL42	16	139	2010	0	Clearcut with Reserves	
149	27	9	74	t14927w1090074	Balsam Fir	74 BF43	11	79	2010	0	Clearcut with Reserves	
149	27	14	100	t14927w1140100	Oak	100 O53	5.9	101	0	0.2	On-site Evaluation	
149	27	15	190	t14927w1150190	Black Spruce, Lowland	190 BSL41	3.2	128	0	0	Clearcut with Reserves	
149	27	16	176	t14927w1160176	Aspen	176 A54	7.3	66	0	0	Clearcut with Reserves	
149	27	16	181	t14927w1160181	Aspen	181 A56	9.1	44	0	0	Clearcut with Reserves	
149	27	24	112	t14927w1240112	Tamarack	112 T53	4.4	122	0	0	Clearcut with Reserves	

Subsection **Chippewa Plains**

Forestry Area ***Blackduck Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
149	27	24	114	t14927w1240114	Aspen	114 A56	12.8	69	0	0	Clearcut with Reserves	
149	27	24	120	t14927w1240120	Aspen	120 A58	5.7	68	0	0	Clearcut with Reserves	COV61
149	27	24	276	t14927w1240276	Aspen	276 A55	3.4	69	0	0	Clearcut with Reserves	COV61
149	27	24	277	t14927w1240277	Tamarack	277 T43	3.4	113	0	0	Clearcut with Reserves	
149	27	31	246	t14927w1310246	Black Spruce, Lowland	246 BSL42	10	137	0	0.3	Clearcut with Reserves	
149	27	32	228	t14927w1320228	Northern Hardwoods	228 NH42	3.4	130	0	0.3	On-site Evaluation	
149	27	32	244	t14927w1320244	Northern Hardwoods	244 NH57	17.8	63	0	0.2	On-site Evaluation	RIP1
149	27	34	282	t14927w1340282	Aspen	282 A45	39.3	73	0	0	Clearcut with Reserves	
149	27	35	145	t14927w1350145	Birch	145 Bi42	8.5	84	0	0	Clearcut with Reserves	
149	27	36	154	t14927w1360154	Aspen	154 A55	10.2	69	0	0	Clearcut with Reserves	
149	27	36	345	t14927w1360345	Norway Pine	345 NP41	22.2	29	0	0	On-site Evaluation	
149	27	36	356	t14927w1360356	Aspen	356 A56	18.2	65	0	0	Clearcut with Reserves	
149	28	2	38	t14928w1020038	Northern Hardwoods	38 NH54	10.1	128	0	0.2	On-site Evaluation	
149	28	4	64	t14928w1040064	Aspen	64 A54	5.6	61	0	0.3	On-site Evaluation	
149	28	4	482	t14928w1040482	Ash	482 Ash42	11.2	140	0	0	On-site Evaluation	
149	28	4	483	t14928w1040483	Ash	483 Ash54	8.7	108	0	0	On-site Evaluation	
149	28	4	484	t14928w1040484	Aspen	484 A57	2.1	69	0	0	On-site Evaluation	
149	28	6	617	t14928w1060617	Cutover Area	617 COA	152.1	2	0	0	Re-inventory.	
149	28	8	63	t14928w1050063	Lowland Brush	63 LB	153	19	0	0	On-site Evaluation	COV72
149	28	8	94	t14928w1080094	Aspen	94 A57	5.7	72	0	0	On-site Evaluation	
149	28	9	158	t14928w1090158	Aspen	158 A42	2.3	53	0	0	Clearcut with Reserves	
149	28	9	160	t14928w1090160	Black Spruce, Lowland	160 BSL44	1.2	126	0	0	Clearcut with Reserves	
149	28	14	220	t14928w1140220	Aspen	220 A56	19.5	69	0	0.3	Clearcut with Reserves	
149	28	14	230	t14928w1140230	Balsam Fir	230 BF44	2.6	61	0	0	Clearcut with Reserves	
149	28	14	250	t14928w1140250	Aspen	250 A45	7.3	55	0	0	Clearcut with Reserves	COV61
149	28	15	183	t14928w1150183	Aspen	183 A54	3.8	67	0	0	Clearcut with Reserves	
149	28	16	181	t14928w1160181	Aspen	181 A43	2.4	58	0	0	Clearcut with Reserves	
149	28	21	273	t14928w1210273	Balsam Fir	273 BF41	11	47	0	0	On-site Evaluation	
149	28	21	276	t14928w1210276	Aspen	276 A54	3.7	63	0	0.3	On-site Evaluation	
149	28	23	264	t14928w1230264	Black Spruce, Lowland	264 BSL41	18.4	138	0	0	Clearcut with Reserves	
149	28	23	274	t14928w1230274	Aspen	274 A43	9.7	70	0	0	Clearcut with Reserves	
149	28	23	554	t14928w1230554	Aspen	554 A47	54.6	60	0	0	Clearcut with Reserves	
149	28	24	266	t14928w1240266	Black Spruce, Lowland	266 BSL41	18.2	138	0	0	Clearcut with Reserves	
149	28	24	268	t14928w1240268	Black Spruce, Lowland	268 BSL41	3.8	138	0	0	Clearcut with Reserves	

Subsection **Chippewa Plains**

Forestry Area ***Blackduck Area***

Township	*Range*	*Section*	*Stand*	*Location ID*	*Management Cover Type*	*Stand Label*	*Acres*	*Age*	*Stand Exam Year*	*New Access Miles*	*Preliminary Prescription*	*Management Objectives*
149	28	25	400	t14928w1250400	Black Spruce, Lowland	400 BSL43	4.8	129	0	0.4	Clearcut with Reserves	
149	28	29	332	t14928w1290332	Ash	332 Ash43	19.2	91	0	0	Uneven-aged Harvest	
149	28	29	333	t14928w1290333	Aspen	333 A55	23.1	62	0	0.3	Clearcut with Reserves	
149	28	29	355	t14928w1290355	Balm of Gilead	355 BG51	32.5	69	0	0	Clearcut with Reserves	
149	28	29	358	t14928w1290358	Balsam Fir	358 BF42	3	65	0	0	Clearcut with Reserves	
149	28	29	368	t14928w1290368	Balsam Fir	368 BF42	5.4	57	0	0	Clearcut with Reserves	
149	28	31	505	t14928w1310505	White Spruce	505 WS43	10.2	31	0	0.3	Thinning	
149	28	33	430	t14928w1330430	Lowland Hardwoods	430 LH53	52	101	0	0	On-site Evaluation	
149	28	33	434	t14928w1330434	Tamarack	434 T54	12.7	108	0	0	Clearcut with Reserves	
149	28	33	436	t14928w1330436	Tamarack	436 T51	10.2	128	0	0	Clearcut with Reserves	
149	28	33	440	t14928w1330440	Aspen	440 A55	12.5	62	0	0	Clearcut with Reserves	
149	28	33	449	t14928w1330449	Black Spruce, Lowland	449 BSL41	24.5	95	0	0	On-site Evaluation	
149	28	33	454	t14928w1330454	Aspen	454 A53	8.2	62	0	0	Clearcut with Reserves	
149	28	36	443	t14928w1360443	Tamarack	443 T41	5.1	117	0	0	Clearcut with Reserves	
149	29	5	340	t14929w1050340	Tamarack	340 T45	3.4	123	0	0	Clearcut with Reserves	
149	29	25	133	t14929w1250133	Black Spruce, Lowland	133 BSL41	110.4	121	0	0	Clearcut with Reserves	
149	29	26	153	t14929w1260153	Tamarack	153 T52	1.9	109	0	0	Clearcut with Reserves	
149	29	26	367	t14929w1260367	Black Spruce, Lowland	367 BSL41	188	127	0	0.4	Clearcut with Reserves	
149	29	28	132	t14929w1280132	Jack Pine	132 JP46	4.2	64	0	0	Clearcut with Reserves	
149	29	28	140	t14929w1280140	Norway Pine	140 NP41	1.6	46	0	0	Thinning	
149	29	28	142	t14929w1280142	Aspen	142 A46	7	62	0	0	Clearcut with Reserves	
149	29	28	165	t14929w1280165	Norway Pine	165 NP47	14.1	47	0	0	On-site Evaluation	
149	29	28	344	t14929w1280344	Aspen	344 A43	17	63	0	0	Clearcut with Reserves	COV53
149	29	28	370	t14929w1280370	Aspen	370 A58	15.4	71	0	0	Clearcut with Reserves	COV53
149	29	28	405	t14929w1280405	White Pine	405 WP44	36.1	73	0	0	Salvage Cut ? Selective Harvest	
149	29	28	412	t14929w1280412	White Spruce	412 WS55	0.9	56	0	0	Clearcut with Reserves	
149	29	31	229	t14929w1310229	Black Spruce, Lowland	229 BSL42	74.5	121	0	0.3	Clearcut with Reserves	
149	29	31	268	t14929w1310268	Tamarack	268 T43	47.8	132	0	0	Clearcut with Reserves	
149	29	31	302	t14929w1310302	Norway Pine	302 NP41	15.3	20	0	0	Thinning	
149	29	31	420	t14929w1310420	Jack Pine	420 JP55	8.9	69	0	0	Clearcut with Reserves	INC51
149	29	32	323	t14929w1320323	Aspen	323 A42	2.9	52	0	0	Clearcut with Reserves	
149	29	33	300	t14929w1330300	Oak	300 O51	19.7	119	0	0	Clearcut with Reserves	
149	29	34	379	t14929w1340379	Tamarack	379 T44	8.1	109	0	0.2	Clearcut with Reserves	
149	29	35	272	t14929w1350272	Black Spruce, Lowland	272 BSL41	8.3	133	0	0	Clearcut with Reserves	

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Forestry Area ***Blackduck Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
149	29	36	209	t14929w1360209	Black Spruce, Lowland	209 BSL41	71.6	121	0	0	Clearcut with Reserves	
149	29	36	228	t14929w1360228	Balsam Fir	228 BF56	3.7	79	0	0	On-site Evaluation	
149	30	13	21	t14930w1130021	White Spruce	21 WS33	21.7	31	0	0	Thinning	
149	30	20	79	t14930w1200079	Northern Hardwoods	79 NH43	21.8	69	0	0	Thinning	
149	30	20	81	t14930w1200081	Northern Hardwoods	81 NH44	15.8	67	0	0	Thinning	
149	30	20	83	t14930w1200083	Northern Hardwoods	83 NH55	31.8	73	0	0	Uneven-aged Harvest	
149	30	34	114	t14930w1340114	Black Spruce, Lowland	114 BSL42	17.6	133	0	0	Clearcut with Reserves	
149	30	34	115	t14930w1340115	Aspen	115 A55	3.1	68	0	0	Clearcut with Reserves	
149	30	36	62	t14930w1360062	Norway Pine	62 NP36	7.1	18	0	0	Thinning	
149	30	36	111	t14930w1360111	Norway Pine	111 NP41	21.1	23	0	0	Thinning	
149	31	5	17	t14931w1050017	Aspen	17 A56	9.1	58	0	0	Clearcut with Reserves	
149	31	9	25	t14931w1090025	Birch	25 Bi54	6.8	82	0	0	Clearcut with Reserves	
149	31	33	98	t14931w1330098	Northern Hardwoods	98 NH45	9.6	79	0	0.5	Thinning	
149	32	2	18	t14932w1020018	Northern Hardwoods	18 NH55	13.6	67	0	0	Thinning	
149	32	5	16	t14932w1050016	Aspen	16 A45	8.1	54	0	0.2	On-site Evaluation	INC73
149	32	8	34	t14932w1080034	Aspen	34 A43	11	50	0	0	Clearcut with Reserves	
149	32	8	41	t14932w1080041	Aspen	41 A43	6	50	0	0	Clearcut with Reserves	
149	32	8	50	t14932w1080050	Aspen	50 A43	4.6	50	0	0	Clearcut with Reserves	
149	32	12	55	t14932w1120055	Northern Hardwoods	55 NH55	20.8	63	0	0	Thinning	
149	32	16	64	t14932w1160064	Northern Hardwoods	64 NH55	58.4	101	0	0	Uneven-aged Harvest	
149	32	16	65	t14932w1160065	Aspen	65 A53	7.2	60	0	0	Clearcut with Reserves	
149	32	16	71	t14932w1160071	Northern Hardwoods	71 NH52	128.2	75	0	0	Uneven-aged Harvest	
149	32	21	97	t14932w1210097	Aspen	97 A44	19.4	52	0	0	Clearcut with Reserves	
149	32	21	104	t14932w1210104	Aspen	104 A53	3.9	67	0	0	Clearcut with Reserves	
149	32	31	167	t14932w1310167	Northern Hardwoods	167 NH53	14.9	91	0	0.4	Uneven-aged Harvest	
149	32	31	173	t14932w1310173	Aspen	173 A54	4.1	71	0	0	Clearcut with Reserves	
149	32	31	178	t14932w1310178	Northern Hardwoods	178 NH53	15.4	80	0	0	Uneven-aged Harvest	
149	32	32	152	t14932w1320152	Aspen	152 A54	24	71	0	0	Clearcut with Reserves	
149	32	32	161	t14932w1320161	Northern Hardwoods	161 NH54	2.9	56	0	0	Uneven-aged Harvest	
150	27	5	478	t15027w1050478	White Spruce	478 WS44	7.7	37	0	0	Thinning	
150	27	5	481	t15027w1050481	Norway Pine	481 NP44	3.2	32	0	0	Thinning	
150	27	8	47	t15027w1080047	Aspen	47 A56	21.7	71	0	0	Clearcut with Reserves	COV52
150	27	8	48	t15027w1080048	Norway Pine	48 NP54	5.5	59	0	0	Thinning	
150	27	8	51	t15027w1080051	Norway Pine	51 NP55	5.9	48	0	0	Thinning	

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Forestry Area ***Blackduck Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
150	27	8	52	t15027w1080052	Black Spruce, Lowland	52 BSL43	5.3	134	0	0	Clearcut with Reserves	
150	27	8	67	t15027w1080067	Balsam Fir	67 BF55	4.6	75	0	0	Clearcut with Reserves	
150	27	8	81	t15027w1080081	Norway Pine	81 NP48	2.4	60	0	0	Thinning	
150	27	8	299	t15027w1080299	Black Spruce, Lowland	299 BSL43	8.5	134	0	0	Clearcut with Reserves	
150	27	8	306	t15027w1090306	Black Spruce, Lowland	306 BSL44	31	134	0	0	Clearcut with Reserves	
150	27	8	315	t15027w1080315	Balsam Fir	315 BF43	15.9	63	0	0	Clearcut with Reserves	
150	27	9	316	t15027w1080316	Tamarack	316 T43	34.3	125	0	0	Clearcut with Reserves	
150	27	9	547	t15027w1090547	Norway Pine	547 NP55	24.2	61	0	0	Thinning	
150	27	9	645	t15027w1090645	Jack Pine	645 JP53	2.4	63	0	0	Clearcut with Reserves	
150	27	16	90	t15027w1160090	Norway Pine	90 NP44	5	62	0	0	Thinning	
150	27	16	106	t15027w1160106	Northern Hardwoods	106 NH54	7.1	69	0	0	On-site Evaluation	
150	27	16	338	t15027w1160338	Black Spruce, Lowland	338 BSL42	53.1	136	0	0	Clearcut with Reserves	
150	27	16	350	t15027w1160350	Aspen	350 A44	11.9	60	0	0	Clearcut with Reserves	
150	27	16	359	t15027w1160359	Tamarack	359 T22	5.6	177	0	0	Clearcut with Reserves	
150	27	16	643	t15027w1160643	Norway Pine	643 NP43	4.7	63	0	0	Thinning	
150	27	17	345	t15027w1170345	Black Spruce, Lowland	345 BSL42	6.3	136	0	0	Clearcut with Reserves	
150	27	17	349	t15027w1170349	White Pine	349 WP75	9.9	111	0	0	Shelterwood	
150	27	18	459	t15027w1180459	Northern Hardwoods	459 NH43	5.7	81	0	0	Thinning	
150	27	19	372	t15027w1190372	Northern Hardwoods	372 NH57	41.5	125	0	0	On-site Evaluation	
150	27	19	375	t15027w1190375	Northern Hardwoods	375 NH57	35	125	0	0.1	On-site Evaluation	
150	27	20	164	t15027w1200164	Black Spruce, Lowland	164 BSL42	15.1	122	0	0	Clearcut with Reserves	
150	27	22	138	t15027w1220138	Balsam Fir	138 BF54	6	70	0	0.3	Clearcut with Reserves	cov61
150	27	22	140	t15027w1220140	Birch	140 Bi43	4.6	59	0	0	On-site Evaluation	
150	27	23	158	t15027w1230158	Aspen	158 A42	6.9	46	0	0.2	Clearcut with Reserves	
150	27	23	374	t15027w1230374	Black Spruce, Lowland	374 BSL42	9.3	147	0	0	Clearcut with Reserves	
150	27	23	385	t15027w1230385	Black Spruce, Lowland	385 BSL41	5.7	132	0	0	Clearcut with Reserves	
150	27	24	573	t15027w1240573	Lowland Hardwoods	573 LH54	41.7	79	0	0	On-site Evaluation	
150	27	24	574	t15027w1240574	Aspen	574 A57	20.2	65	0	0.2	Clearcut with Reserves	
150	27	25	579	t15027w1250579	Lowland Hardwoods	579 LH54	9	79	0	0	Uneven-aged Harvest	COV73
150	27	25	588	t15027w1250588	Ash	588 Ash54	35.8	181	0	0.2	Uneven-aged Harvest	COV73
150	27	27	409	t15027w1270409	Aspen	409 A58	29.7	72	0	0.3	Clearcut with Reserves	COV61
150	27	27	594	t15027w1270594	Aspen	594 A57	13.7	64	0	0	Clearcut with Reserves	
150	27	28	493	t15027w1280493	Aspen	493 A55	32	74	0	0	Clearcut with Reserves	
150	27	28	507	t15027w1280507	Aspen	507 A54	20	68	0	0	Clearcut with Reserves	

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Forestry Area ***Blackduck Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
150	27	28	634	t15027w1280634	Norway Pine	634 NP46	20.1	45	0	0	Thinning	
150	27	28	644	t15027w1280644	Aspen	644 A56	9.3	67	0	0	Clearcut with Reserves	
150	27	29	177	t15027w1290177	Aspen	177 A56	5	68	0	0	Clearcut with Reserves	
150	27	29	496	t15027w1290496	Aspen	496 A56	67.9	72	0	0	Clearcut with Reserves	
150	27	29	499	t15027w1290499	Balsam Fir	499 BF41	5.6	82	0	0	Clearcut with Reserves	
150	27	33	517	t15027w1330517	Aspen	517 A59	3.2	61	0	0	Clearcut with Reserves	COV61
150	27	33	519	t15027w1330519	Aspen	519 A59	2.5	61	0	0.2	Clearcut with Reserves	COV61
150	27	34	608	t15027w1340608	Aspen	608 A56	5.5	67	0	0	Clearcut with Reserves	
150	27	36	188	t15027w1360188	Aspen	188 A55	8.6	65	2010	0	Clearcut with Reserves	
150	27	36	191	t15027w1360191	Ash	191 Ash45	31.9	116	2010	0	On-site Evaluation	
150	27	36	205	t15027w1360205	Aspen	205 A64	13.2	68	2010	0.3	Clearcut with Reserves	
150	27	36	208	t15027w1360208	Aspen	208 A59	10.4	79	2010	0	Clearcut with Reserves	
150	27	36	215	t15027w1360215	Balsam Fir	215 BF54	6.8	94	0	0	Clearcut with Reserves	
150	27	36	418	t15027w1360418	Ash	418 Ash49	5	97	0	0	Uneven-aged Harvest	COV73
150	27	36	420	t15027w1360420	Aspen	420 A56	17.7	68	0	0	Clearcut with Reserves	
150	27	36	421	t15027w1360421	Aspen	421 A59	75.4	66	2010	0	Clearcut with Reserves	
150	27	36	422	t15027w1360422	Aspen	422 A48	14.9	70	2010	0	Clearcut with Reserves	
150	27	36	440	t15027w1360440	Aspen	440 A56	12.3	57	0	0.4	Clearcut with Reserves	
150	27	36	449	t15027w1360449	Aspen	449 A58	10	62	0	0	Clearcut with Reserves	
150	27	36	453	t15027w1360453	Ash	453 Ash42	3.2	75	0	0	Uneven-aged Harvest	COV73
150	27	36	455	t15027w1360455	Oak	455 O45	4.8	95	0	0	Clearcut with Reserves	
150	27	36	456	t15027w1360456	Aspen	456 A59	5.4	68	0	0	Clearcut with Reserves	COV73
150	28	22	72	t15028w1220072	Aspen	72 A57	14.1	73	0	0	Clearcut with Reserves	
150	28	22	85	t15028w1220085	Aspen	85 A59	5.3	67	0	0.3	Seed Tree	COV61
150	28	23	80	t15028w1230080	Black Spruce, Lowland	80 BSL41	10.9	130	0	0	Clearcut with Reserves	
150	28	23	81	t15028w1230081	Aspen	81 A57	6.3	65	0	0	Clearcut with Reserves	
150	28	23	83	t15028w1230083	Aspen	83 A58	5.6	67	0	0	Clearcut with Reserves	
150	28	30	109	t15028w1300109	Northern Hardwoods	109 NH54	18.6	82	0	0	Uneven-aged Harvest	COV61
150	28	30	110	t15028w1300110	Aspen	110 A53	18.3	64	0	0	Clearcut with Reserves	COV61
150	28	36	131	t15028w1360131	Tamarack	131 T42	9.8	102	0	0	Clearcut with Reserves	
150	28	36	136	t15028w1360136	Aspen	136 A57	34.5	71	0	0	Clearcut with Reserves	
150	28	36	138	t15028w1360138	Black Spruce, Lowland	138 BSL41	11.1	134	0	0	Clearcut with Reserves	
150	28	36	147	t15028w1360147	Norway Pine	147 NP41	9.2	25	0	0	Thinning	
150	28	36	148	t15028w1360148	Ash	148 Ash43	5.5	70	0	0	Uneven-aged Harvest	COV73

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Forestry Area ***Blackduck Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
150	28	36	156	t15028w1360156	Aspen	156 A58	7.9	65	0	0	Clearcut with Reserves	
150	29	6	162	t15029w1060162	Aspen	162 A43	9.1	70	0	0	Clearcut with Reserves	
150	29	7	344	t15029w1070344	Black Spruce, Lowland	344 BSL42	10.1	127	0	0	Clearcut with Reserves	
150	29	7	346	t15029w1070346	Black Spruce, Lowland	346 BSL42	6.4	127	0	0	Clearcut with Reserves	
150	29	7	356	t15029w1070356	Black Spruce, Lowland	356 BSL41	20.4	136	0	0	Clearcut with Reserves	
150	29	8	48	t15029w1080048	Tamarack	48 T43	7.8	83	0	0	Seed Tree	
150	29	10	35	t15029w1100035	Aspen	35 A55	16.7	58	0	0	Clearcut with Reserves	
150	29	10	52	t15029w1100052	Aspen	52 A43	9.9	40	0	0	Clearcut with Reserves	
150	29	10	209	t15029w1100209	Balm of Gilead	209 BG56	9.7	68	0	0	Clearcut with Reserves	
150	29	11	224	t15029w1110224	Northern Hardwoods	224 NH54	18.3	71	0	0	Uneven-aged Harvest	
150	29	11	228	t15029w1110228	Tamarack	228 T42	10.4	123	0	0	Clearcut with Reserves	
150	29	12	29	t15029w1120029	Birch	29 Bi41	13.1	83	0	0	Clearcut with Reserves	
150	29	12	44	t15029w1120044	Black Spruce, Lowland	44 BSL41	8.2	133	0	0	Clearcut with Reserves	
150	29	12	225	t15029w1120225	Northern Hardwoods	225 NH45	24.5	99	0	0	On-site Evaluation	
150	29	12	230	t15029w1120230	Tamarack	230 T43	8.7	123	0	0	Clearcut with Reserves	
150	29	12	338	t15029w1120338	Aspen	338 A57	54.7	60	0	0	Clearcut with Reserves	
150	29	14	72	t15029w1140072	Aspen	72 A58	7.7	72	0	0	Clearcut with Reserves	
150	29	14	252	t15029w1140252	Aspen	252 A55	10.4	56	0	0	Clearcut with Reserves	
150	29	15	260	t15029w1150260	Balm of Gilead	260 BG56	8.9	74	0	0	Clearcut with Reserves	
150	29	17	61	t15029w1170061	Aspen	61 A42	6.2	50	0	0	Clearcut with Reserves	
150	29	24	110	t15029w1240110	Tamarack	110 T42	12.3	136	0	0	Clearcut with Reserves	
150	29	30	385	t15029w1300385	Tamarack	385 T43	16.2	102	0	0	Clearcut with Reserves	
150	29	34	306	t15029w1340306	Ash	306 Ash55	25.3	97	0	0	On-site Evaluation	
150	29	36	315	t15029w1360315	Ash	315 Ash41	8	91	0	0	On-site Evaluation	COV72
150	30	2	39	t15030w1020039	Aspen	39 A42	21.2	59	0	0	Clearcut with Reserves	
150	30	14	71	t15030w1140071	Aspen	71 A43	9.5	57	0	0	Clearcut with Reserves	
150	30	14	79	t15030w1140079	Aspen	79 A 56	19.9	57	0	0.3	Clearcut with Reserves	
150	30	28	156	t15030w1280156	Balm of Gilead	156 BG53	4.8	65	0	0	Clearcut with Reserves	
150	30	36	149	t15030w1360149	Ash	149 Ash43	7.1	96	0	0.4	On-site Evaluation	INC73
151	28	5	3	t15128w1050003	Aspen	3 A56	15	57	0	0	Clearcut with Reserves	
151	28	5	13	t15128w1050013	Aspen	13 A57	19.4	61	0	0	Clearcut with Reserves	
151	28	29	234	t15128w1290234	Birch	557 Bi 52	4.2	88	0	0	Clearcut with Reserves	
151	28	29	470	t15128w1290470	Balsam Fir	470 BF 42	15.8	57	0	0	Clearcut with Reserves	
151	28	29	477	t15128w1290477	Aspen	477 A 56	24.6	56	0	0	Clearcut with Reserves	

Subsection **Chippewa Plains**

Forestry Area ***Blackduck Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
151	28	29	550	t15128w1290550	Aspen	550 A 56	3.1	68	0	0	Clearcut with Reserves	
151	28	32	545	t15128w1320545	Aspen	545 A59	1.8	67	0	0	Re-inventory.	
151	28	36	334	t15128w1360334	Northern Hardwoods	334 NH54	5.3	66	0	0	On-site Evaluation	
151	28	36	495	t15128w1360495	Aspen	495 A56	34.3	64	0	0	Clearcut with Reserves	
151	28	36	509	t15128w1360509	Northern Hardwoods	509 NH46	32.3	76	0	0.2	On-site Evaluation	
151	28	36	536	t15128w1360536	Ash	536 Ash44	13.5	68	0	0	On-site Evaluation	
151	29	8	45	t15129w1080045	Aspen	45 A43	6.9	51	0	0	Clearcut with Reserves	
151	29	16	68	t15129w1160068	Balm of Gilead	68 BG55	9	72	0	0	Clearcut with Reserves	
151	29	16	185	t15129w1160185	Aspen	185 A57	28.6	55	0	0	Clearcut with Reserves	
151	29	24	94	t15129w1240094	Aspen	94 A58	11.8	54	0	0	Clearcut with Reserves	
151	29	28	117	t15129w1290117	Aspen	117 A55	15.4	63	0	0	Clearcut with Reserves	
151	29	31	122	t15129w1310122	Aspen	122 A42	8.9	48	0	0	Clearcut with Reserves	
151	29	31	123	t15129w1310123	Black Spruce, Lowland	123 BSL41	11.1	134	0	0	Clearcut with Reserves	
151	29	31	128	t15129w1310128	Aspen	128 A42	7.7	41	0	0	Clearcut with Reserves	
151	29	31	136	t15129w1310136	Aspen	136 A56	7.1	63	0	0	Clearcut with Reserves	
151	29	31	138	t15129w1310138	Balsam Fir	138 BF49	4.6	62	0	0	Clearcut with Reserves	COV61
151	29	32	143	t15129w1320143	Aspen	143 A58	18.8	67	0	0	Clearcut with Reserves	
151	29	35	144	t15129w1350144	Balsam Fir	144 BF56	10.4	83	0	0	Clearcut with Reserves	
151	29	35	145	t15129w1350145	Aspen	145 A43	30.2	46	0	0	Clearcut with Reserves	
151	29	36	132	t15129w1360132	Northern Hardwoods	132 NH56	18.1	98	0	0	On-site Evaluation	
151	29	36	164	t15129w1360164	Aspen	164 A56	39.3	69	0	0	Clearcut with Reserves	
151	29	36	170	t15129w1360170	Balsam Fir	170 BF42	22	78	0	0	Clearcut with Reserves	
152	28	30	191	t15228w1300191	Aspen	191 A58	18.2	70	0	0	Clearcut with Reserves	
152	28	32	223	t15228w1320223	Aspen	223 A45	14.4	57	0	0	Clearcut with Reserves	
152	28	32	234	t15228w1320234	Aspen	234 A45	28.3	49	0	0	Clearcut with Reserves	
152	29	30	166	t15229w1300166	Aspen	166 A 17	14.8	48	0	0	Clearcut with Reserves	
152	29	32	207	t15229w1320207	Aspen	207 A56	20.4	52	0	0	Clearcut with Reserves	
152	29	32	232	t15229w1320232	Aspen	232 A58	23.2	57	0	0	Clearcut with Reserves	
152	29	32	291	t15229w1320291	Balm of Gilead	291 BG54	14.8	46	0	0	Clearcut with Reserves	
152	29	32	292	t15229w1320292	Birch	292 Bi54	4.8	55	0	0	Clearcut with Reserves	
152	29	33	185	t15229w1330185	Balsam Fir	185 BF45	5.1	85	0	0	On-site Evaluation	
152	29	36	182	t15229w1360182	Northern Hardwoods	182 NH54	13.3	108	0	0	On-site Evaluation	
152	29	36	183	t15229w1360183	Aspen	183 A54	28.1	59	0	0	On-site Evaluation	COV61
152	29	36	188	t15229w1360188	Balm of Gilead	188 BG55	4.7	69	0	0	Clearcut with Reserves	

Subsection **Chippewa Plains**

Forestry Area ***Blackduck Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
152	29	36	205	t15229w1360205	White Spruce	205 WS11	27.3	22	0	0	On-site Evaluation	
152	30	24	7	t15230w1241007	Aspen	1007 A56	3.4	64	0	0	Clearcut with Reserves	

Forestry Area ***Deer River Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
55	26	16	54	t05526w1160054	Aspen	54 A55	17.4	77	0	0	Clearcut with Reserves	
55	26	16	65	t05526w1160065	Aspen	65 A54	3.7	77	0	0	Clearcut with Reserves	
55	26	18	74	t05526w1180074	Tamarack	74 T43	4.7	126	0	0	Seed Tree	
55	27	1	63	t05527w1010063	Aspen	63 A44	24.4	45	0	0	Clearcut with Reserves	
55	27	10	9	t05527w1100009	Balm of Gilead	9 BG56	5.9	111	0	0	Clearcut with Reserves	RIP1
55	27	10	18	t05527w1100018	Ash	18 Ash56	8.4	168	0	0	Manage for understory	COV73
55	27	15	34	t05527w1150034	Aspen	34 A33	9.5	37	0	0	Clearcut with Reserves	
55	27	16	95	t05527w1160095	Aspen	95 A52	15.2	81	0	0	Clearcut with Reserves	
55	27	28	172	t05527w1280172	Aspen	172 A57	4.7	78	0	0	Clearcut with Reserves	
56	26	16	24	t05626w1160024	Black Spruce, Lowland	24 BSL43	6.1	106	0	0	Clearcut with Reserves	
56	26	16	36	t05626w1160036	Norway Pine	36 NP 44	3.8	26	0	0	Thinning	
56	26	16	38	t05626w1160038	Birch	38 Bi55	4.1	87	0	0	Re-inventory.	RIP1
56	26	16	141	t05626w1160141	Norway Pine	141 NP 43	7.1	26	0	0	Thinning	
56	26	16	142	t05626w1160142	Birch	142 Bi 43	5.7	2	0	0	Thinning	
57	27	2	44	t05727w1020044	Balm of Gilead	44 BG55	8.8	75	0	0	Clearcut with Reserves	
57	27	2	48	t05727w1020048	Balsam Fir	48 BF45	13.8	92	0	0	Manage for understory	COV73
57	27	2	55	t05727w1020055	Lowland Hardwoods	55 LH54	12.4	109	0	0	Uneven-aged Harvest	COV73
57	27	3	11	t05727w1030011	Black Spruce, Lowland	11 BSL41	6.2	142	0	0	Clearcut with Reserves	
57	27	15	16	t05727w1150016	Aspen	16 A42	7.2	49	0	0	Clearcut with Reserves	
57	27	34	28	t05727w1340028	Lowland Hardwoods	28 LH44	5.9	121	0	0	Manage for understory	COV72
58	26	6	40	t05826w1060040	Aspen	40 A45	15.2	53	0	0	Clearcut with Reserves	INC51
58	26	6	48	t05826w1060048	Aspen	48 A 41	11.8	30	0	0	Re-inventory.	
58	26	6	51	t05826w1060051	Aspen	51 A17	26.4	14	0	0	Re-inventory.	
58	27	2	12	t05827w1020012	Aspen	12 A54	16.1	76	0	0	Re-inventory.	
58	27	2	15	t05827w1020015	Tamarack	15 T43	16.2	111	0	0	Seed Tree	
58	27	2	16	t05827w1020016	Black Spruce, Lowland	16 BSL45	34.9	128	0	0	Clearcut with Reserves	
58	27	2	18	t05827w1020018	Tamarack	18 T41	7.4	95	0	0	Seed Tree	
58	27	2	19	t05827w1020019	Black Spruce, Lowland	19 BSL46	22.6	84	0	0	Clearcut with Reserves	

Subsection **Chippewa Plains**

Forestry Area ***Deer River Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
58	27	13	43	t05827w1130043	Aspen	43 A43	28.3	46	0	0	Clearcut with Reserves	
58	27	13	45	t05827w1130045	Aspen	45 A44	32.9	54	0	0	Clearcut with Reserves	
58	27	14	46	t05827w1140046	Aspen	46 A59	7.5	87	0	0	Clearcut with Reserves	
58	27	23	89	t05827w1230089	Lowland Brush	89 LB	80.3	15	0	0	Re-inventory.	COV72
58	27	23	93	t05827w1230093	Black Spruce, Lowland	93 BSL43	21.9	107	0	0.3	Clearcut with Reserves	
58	27	23	95	t05827w1230095	Tamarack	95 T54	7.8	84	0	0	Seed Tree	
58	27	23	96	t05827w1230096	Black Spruce, Lowland	96 BSL42	9.1	146	0	0	Clearcut with Reserves	
58	27	23	98	t05827w1230098	Tamarack	98 T53	6.8	77	0	0	Seed Tree	
58	27	23	99	t05827w1230099	Ash	99 Ash53	5.9	85	0	0	Uneven-aged Harvest	
58	27	27	100	t05827w1270100	Black Spruce, Lowland	100 BSL42	16.5	125	0	0	Clearcut with Reserves	
58	27	35	157	t05827w1350157	Tamarack	157 T43	21.8	119	0	0	Seed Tree	
58	27	35	166	t05827w1350166	Balm of Gilead	166 BG55	3.1	75	0	0	Manage for understory	COV73
58	27	36	130	t05827w1360130	Birch	130 Bi44	18.4	72	0	0	Clearcut with Reserves	
58	27	36	131	t05827w1360131	Aspen	131 A56	20.7	76	0	0	Clearcut with Reserves	
59	27	13	24	t05927w1130024	Ash	24 Ash54	16.2	138	0	0	On-site Evaluation	
59	27	14	17	t05927w1140017	Ash	17 Ash44	66.6	108	0	0.3	On-site Evaluation	
59	27	22	97	t05927w1220097	Balsam Fir	97 BF44	10.3	53	0	0	Clearcut with Reserves	
59	27	22	125	t05927w1220125	Aspen	125 A44	8.1	45	0	0	Clearcut with Reserves	
59	27	24	45	t05927w1240045	Aspen	45 A44	20.6	45	0	0	Clearcut with Reserves	
59	27	36	77	t05927w1360077	Aspen	77 A43	8.4	49	0	0	Clearcut with Reserves	
59	27	36	113	t05927w1360113	Balm of Gilead	113 BG55	4.5	70	0	0	Clearcut with Reserves	COV73
59	27	36	115	t05927w1360115	White Spruce	115 WS11	63.1	22	0	0	Thinning	
59	27	36	118	t05927w1360118	Aspen	118 A42	5.8	44	0	0	Clearcut with Reserves	
59	27	36	122	t05927w1360122	Aspen	122 A45	3.6	43	0	0	Clearcut with Reserves	
59	27	36	127	t05927w1360127	Aspen	127 A45	2.4	43	0	0	Clearcut with Reserves	
143	25	8	78	t14325w1080078	Aspen	78 A54	10.4	77	0	0	On-site Evaluation	
143	25	8	88	t14325w1080088	Aspen	88 A54	10.9	77	0	0	On-site Evaluation	
143	25	8	89	t14325w1080089	Balm of Gilead	89 BG54	14.7	75	0	0	On-site Evaluation	
143	25	16	95	t14325w1160095	Balsam Fir	95 BF42	4.5	85	0	0	Clearcut with Reserves	
143	25	16	100	t14325w1160100	Aspen	100 A55	4	74	0	0	Clearcut with Reserves	
143	25	16	116	t14325w1160116	Lowland Hardwoods	116 LH51	9.1	78	0	0	Uneven-aged Harvest	
143	25	16	117	t14325w1160117	Balsam Fir	117 BF42	11.6	77	0	0	Clearcut with Reserves	
143	25	16	155	t14325w1160155	Lowland Hardwoods	155 LH53	16	75	0	0.3	Uneven-aged Harvest	
143	25	24	168	t14325w1240168	Black Spruce, Lowland	168 BSL41	4.2	149	0	0	Clearcut with Reserves	

Subsection **Chippewa Plains**

Forestry Area ***Deer River Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
143	25	24	181	t14325w1240181	Balsam Fir	181 BF44	7.3	65	0	0	Clearcut with Reserves	
143	26	1	47	t14326w1010047	Tamarack	47 T41	13.5	129	0	0	Seed Tree	
143	26	2	644	t14326w1020644	Balm of Gilead	644 BG53	9.2	92	0	0	On-site Evaluation	
143	26	7	159	t14326w1070159	Balsam Fir	159 BF42	17.1	79	0	0	Re-inventory.	
143	26	7	175	t14326w1180175	Balm of Gilead	175 BG55	45.3	75	0	0	Re-inventory.	
143	26	8	161	t14326w1080161	Balm of Gilead	161 BG56	25.6	78	0	0	Re-inventory.	
143	26	10	166	t14326w1100166	Ash	166 Ash43	5.3	73	0	0	Uneven-aged Harvest	
143	26	10	707	t14326w1100707	Ash	707 Ash43	8.6	73	0	0	Uneven-aged Harvest	
143	26	11	121	t14326w1110121	Balm of Gilead	121 BG43	3.8	69	0	0	Clearcut with Reserves	
143	26	15	713	t14326w1150713	Ash	713 Ash43	21.7	86	0	0	Uneven-aged Harvest	
143	26	15	714	t14326w1150714	Ash	714 Ash53	8.5	67	0	0	Uneven-aged Harvest	
143	26	15	719	t14326w1150719	Balm of Gilead	719 BG52	24	66	0	0	Clearcut with Reserves	
143	26	16	715	t14326w1160715	Ash	715 Ash53	11.6	67	0	0	Uneven-aged Harvest	
143	26	17	198	t14326w1170198	Ash	198 Ash53	11.6	87	0	0	Uneven-aged Harvest	
143	27	16	43	t14327w1160043	Northern Hardwoods	43 NH44	20.3	85	0	0	On-site Evaluation	
144	25	22	229	t14425w1220229	Aspen	229 A53	7.1	80	0	0	Re-inventory.	
144	25	22	248	t14425w1220248	Northern Hardwoods	248 NH54	17.3	117	0	0	Uneven-aged Harvest	
144	25	22	250	t14425w1220250	Aspen	250 A19	26.4	70	0	0	Clearcut with Reserves	
144	25	26	277	t14425w1260277	Aspen	277 A54	7.5	80	0	0	Re-inventory.	
144	25	34	334	t14425w1340334	Aspen	334 A51	11.3	72	0	0	On-site Evaluation	
144	25	34	344	t14425w1340344	Aspen	344 A54	2.3	77	0	0	On-site Evaluation	
144	26	5	14	t14426w1050014	Industrial Develop	14 DEV	11.6	21	0	0	On-site Evaluation	
144	26	5	28	t14426w1050028	Aspen	28 A41	9.8	50	0	0	Clearcut with Reserves	
144	26	5	40	t14426w1050040	Ash	40 Ash12	5.4	30	0	0.5	Uneven-aged Harvest	
144	26	7	223	t14426w1070223	Tamarack	223 T43	24	111	0	0	Seed Tree	
144	26	8	203	t14426w1080203	Norway Pine	203 NP11	22.8	23	0	0	Thinning	
144	26	8	212	t14426w1080212	Norway Pine	212 NP 41	6.4	25	0	0	Thinning	
144	26	8	271	t14426w1080271	Norway Pine	271 NP11	10.7	21	0	0	Thinning	
144	26	8	367	t14426w1080367	Aspen	367 A42	10	46	0	0	Clearcut with Reserves	
144	26	9	232	t14426w1090232	Norway Pine	232 NP45	10.4	51	0	0	Thinning	
144	26	9	352	t14426w1090352	Aspen	352 A44	20.3	46	0	0	Clearcut with Reserves	
144	26	13	445	t14426w1130445	Balsam Fir	445 BF43	7.5	58	0	0	Clearcut with Reserves	
144	26	13	482	t14426w1130482	Balsam Fir	482 BF42	8.6	60	0	0	Clearcut with Reserves	
144	26	13	503	t14426w1130503	Aspen	503 A44	5.8	53	0	0	Clearcut with Reserves	

Subsection **Chippewa Plains**

Forestry Area ***Deer River Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
144	26	13	504	t14426w1130504	Balsam Fir	504 BF56	4.7	74	0	0	Clearcut with Reserves	
144	26	13	559	t14426w1130559	Balm of Gilead	559 BG41	7	74	0	0	Clearcut with Reserves	
144	26	13	569	t14426w1130569	Balm of Gilead	569 BG41	5.6	74	0	0	Clearcut with Reserves	
144	26	14	463	t14426w1140463	Ash	463 Ash42	20.9	106	0	0	Re-inventory.	
144	26	15	457	t14426w1150457	Tamarack	457 T43	43.6	109	0	0.3	Seed Tree	
144	26	17	393	t14426w1170393	Tamarack	393 T42	510.4	104	0	0.5	Seed Tree	
144	26	17	433	t14426w1170433	Aspen	433 A55	18	44	0	0	Clearcut with Reserves	
144	26	18	365	t14426w1180365	Tamarack	365 T42	206.6	104	0	0	Seed Tree	
144	26	18	456	t14426w1180456	Aspen	456 A42	16.4	48	0	0	Clearcut with Reserves	
144	26	19	535	t14426w1190535	Tamarack	535 T42	16.6	104	0	0	Seed Tree	
144	26	20	618	t14426w1200618	Aspen	618 A54	4.7	68	0	0	Clearcut with Reserves	
144	26	20	672	t14426w1200672	Aspen	672 A51	10.4	82	0	0	Clearcut with Reserves	INC51
144	26	22	755	t14426w1220755	Aspen	755 A53	7.2	71	0	0	Clearcut with Reserves	
144	26	23	750	t14426w1230750	Ash	750 Ash45	8.3	82	0	0	Uneven-aged Harvest	COV73
144	26	23	768	t14426w1230768	Balm of Gilead	768 BG43	10	69	0	0	Clearcut with Reserves	
144	26	24	624	t14426w1240624	Balm of Gilead	624 BG52	16.2	62	0	0.5	Clearcut with Reserves	
144	26	24	626	t14426w1240626	Northern Hardwoods	626 NH53	1.4	90	0	0	Uneven-aged Harvest	COV61
144	26	24	633	t14426w1240633	Northern Hardwoods	633 NH54	2.9	79	0	0	Uneven-aged Harvest	COV61
144	26	36	924	t14426w1360924	Birch	924 Bi53	33	72	0	0	Clearcut with Reserves	
144	26	36	960	t14426w1360960	Balm of Gilead	960 BG54	11	63	0	0	Re-inventory.	
144	27	2	73	t14427w1020073	Tamarack	73 T43	15.4	121	0	0	Seed Tree	
144	27	3	77	t14427w1030077	White Cedar	77 C 56	4	100	0	0	Re-inventory.	
144	27	3	92	t14427w1030092	Aspen	92 A52	6.2	75	0	0	Clearcut with Reserves	
144	27	4	37	t14427w1040037	Aspen	37 A53	4.7	64	0	0	Clearcut with Reserves	
144	27	4	529	t14427w1040529	Birch	529 Bi54	3.4	87	0	0	Re-inventory.	
144	27	7	175	t14427w1070175	Northern Hardwoods	175 NH55	4.5	65	0	0	Uneven-aged Harvest	
144	27	8	107	t14427w1080107	Norway Pine	107 NP21	3.4	24	0	0	Thinning	
144	27	8	128	t14427w1080128	Norway Pine	128 NP22	20.5	27	0	0	Thinning	
144	27	10	101	t14427w1100101	Tamarack	101 T44	13.3	92	0	0	Seed Tree	
144	27	10	119	t14427w1100119	Tamarack	119 T44	2.3	92	0	0.4	Seed Tree	
144	27	12	62	t14427w1010062	Tamarack	62 T41	20.5	142	0	0	Seed Tree	
144	27	14	183	t14427w1140183	Aspen	183 A54	6.9	75	0	0	Clearcut with Reserves	
144	27	14	188	t14427w1140188	Aspen	188 A53	7.9	79	0	0	Clearcut with Reserves	
144	27	14	191	t14427w1140191	Tamarack	191 T42	20.1	102	0	0	Seed Tree	

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Forestry Area ***Deer River Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
144	27	14	207	t14427w1140207	Tamarack	207 T43	42.5	110	0	0	Seed Tree	
144	27	14	215	t14427w1140215	Balsam Fir	215 BF43	9.8	85	0	0	Re-inventory.	
144	27	14	227	t14427w1140227	Birch	227 Bi54	13.4	97	0	0	Re-inventory.	
144	27	14	228	t14427w1140228	Balsam Fir	228 BF53	15.8	81	0	0	Re-inventory.	
144	27	14	231	t14427w1140231	Norway Pine	231 NP12	8	22	0	0	Thinning	
144	27	14	238	t14427w1140238	White Pine	238 WP61	17.4	109	0	0	Thinning	
144	27	14	242	t14427w1140242	Lowland Hardwoods	242 LH43	5.2	85	0	0	On-site Evaluation	
144	27	14	248	t14427w1140248	Norway Pine	248 NP55	8.6	112	0	0	Thinning	
144	27	15	194	t14427w1150194	Aspen	194 A53	7.2	79	0	0.3	Clearcut with Reserves	
144	27	19	283	t14427w1190283	Aspen	283 A29	48.5	4	0	0	Re-inventory.	
144	27	19	285	t14427w1190285	Tamarack	285 T42	10.5	113	0	0	Seed Tree	
144	27	21	286	t14427w1210286	Aspen	286 A54	13	64	0	0	Clearcut with Reserves	
144	27	25	318	t14427w1250318	Tamarack	318 T43	11.5	100	0	0	Seed Tree	
144	27	25	319	t14427w1250319	Tamarack	319 T43	13.7	100	0	0	Seed Tree	
144	27	25	345	t14427w1250345	Tamarack	345 T43	15.3	100	0	0	Seed Tree	
144	27	28	337	t14427w1280337	Birch	337 Bi54	6.1	84	0	0	Uneven-aged Harvest	
144	27	29	331	t14427w1290331	Norway Pine	331 NP65	5.5	100	0	0	Thinning	
144	27	29	341	t14427w1290341	Norway Pine	341 NP65	4.2	100	0	0	Thinning	
144	27	30	543	t14427w1310543	Unknown	543 *Unk	199.3	1	0	0	Re-inventory.	
144	27	31	372	t14427w1310372	Aspen	372 A43	5.3	71	0	0	Clearcut with Reserves	
144	27	31	378	t14427w1310378	White Pine	378 WP65	4.9	130	0	0	Thinning	
144	27	31	458	t14427w1310458	Balm of Gilead	458 BG53	5.6	79	0	0	Re-inventory.	
144	27	31	530	t14427w1310530	Tamarack	530 T 43	104.9	119	0	0	Seed Tree	
144	27	32	400	t14427w1310400	Tamarack	400 T43	63.5	119	0	0	Seed Tree	
144	27	33	536	t14427w1330536	Unknown	536 *Unk	54.2	1	0	0	Re-inventory.	
145	25	1	45	t14525w1010045	Ash	45 Ash44	8.3	86	0	0	Re-inventory.	
145	25	6	161	t14525w1060161	Ash	161 Ash44	7.5	95	0	0.5	Uneven-aged Harvest	
145	25	7	294	t14525w1070294	Balsam Fir	294 BF53	2.6	69	0	0	Clearcut with Reserves	
145	25	7	341	t14525w1070341	Balsam Fir	341 BF53	4.1	69	0	0	Clearcut with Reserves	
145	25	9	247	t14525w1090247	Black Spruce, Lowland	247 BSL42	128.6	142	0	0	Clearcut with Reserves	
145	25	10	347	t14525w1100347	Tamarack	347 T41	12.3	104	0	0	Seed Tree	
145	25	14	460	t14525w1140460	Black Spruce, Lowland	460 BSL42	22.6	133	0	0	Clearcut with Reserves	
145	25	22	614	t14525w1220614	Black Spruce, Lowland	614 BSL41	66.4	123	0	0.3	Clearcut with Reserves	
145	25	27	849	t14525w1270849	Tamarack	849 T42	33.3	119	0	0	Seed Tree	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
145	25	27	898	t14525w1270898	Tamarack	898 T42	9.1	119	0	0	Seed Tree	
145	25	27	907	t14525w1270907	Tamarack	907 T42	14	117	0	0	Seed Tree	
145	25	28	855	t14525w1280855	Tamarack	855 T42	16.4	119	0	0	Seed Tree	
145	25	29	777	t14525w1290777	Tamarack	777 T51	10.1	134	0	0	Seed Tree	
145	25	34	109	t14525w1341109	Aspen	1109 A41	15.8	46	0	0	Clearcut with Reserves	
145	26	1	18	t14526w1010018	Tamarack	18 T56	16.9	72	0	0	Seed Tree	
145	26	1	303	t14526w1010303	Tamarack	303 T44	9.5	91	0	0	Seed Tree	
145	26	4	26	t14526w1040026	Norway Pine	26 NP 44	14	25	0	0	Thinning	
145	26	4	71	t14526w1040071	Balm of Gilead	71 BG41	6.2	66	0	0	Clearcut with Reserves	
145	26	7	85	t14526w1070085	Norway Pine	85 NP54	6	104	0	0.4	Thinning	
145	26	7	103	t14526w1070103	Norway Pine	103 NP54	4	104	0	0	Thinning	
145	26	12	114	t14526w1120114	Tamarack	114 T43	10.6	103	0	0	Seed Tree	
145	26	12	124	t14526w1120124	Tamarack	124 T43	23	126	0	0	Seed Tree	
145	26	12	134	t14526w1120134	Tamarack	134 T42	16.5	101	0	0	Seed Tree	
145	26	13	178	t14526w1130178	Aspen	178 A52	5.8	64	0	0	Clearcut with Reserves	
145	26	13	185	t14526w1130185	Aspen	185 A41	11.8	56	0	0	Clearcut with Reserves	
145	26	13	193	t14526w1130193	Balm of Gilead	193 BG52	5.2	64	0	0	Clearcut with Reserves	
145	26	17	180	t14526w1170180	Tamarack	180 T43	16.3	107	0	0	Seed Tree	
145	26	20	233	t14526w1200233	Aspen	233 A44	8.7	40	0	0	Thinning	INC52
145	26	20	237	t14526w1200237	Norway Pine	237 NP44	7.5	42	0	0	Thinning	
145	26	20	238	t14526w1200238	Aspen	238 A41	4.3	40	0	0	Thinning	INC52
145	26	20	240	t14526w1200240	Birch	240 Bi52	4.8	68	0	0	Clearcut with Reserves	
145	26	31	271	t14526w1310271	Norway Pine	271 NP 54	5.2	42	0	0	Thinning	
145	26	31	282	t14526w1310282	Balsam Fir	282 BF 43	9.1	32	0	0	Clearcut with Reserves	
145	26	33	302	t14526w1330302	Norway Pine	302 NP43	2.8	58	0	0	Thinning	
145	27	3	160	t14527w1030160	Norway Pine	160 NP32	5.4	33	0	0	Thinning	
145	27	4	41	t14527w1040041	Norway Pine	41 NP58	11	94	0	0	Thinning	
145	27	5	147	t14527w1050147	Norway Pine	147 NP63	2.8	109	0	0	Clearcut with Reserves	
145	27	5	150	t14527w1050150	Norway Pine	150 NP55	3.9	86	0	0	Thinning	
145	27	7	157	t14527w1070157	Tamarack	157 T42	79	116	0	0	Seed Tree	
145	27	8	231	t14527w1080231	Tamarack	231 T42	19.2	116	0	0	Seed Tree	
145	27	8	279	t14527w1080279	Norway Pine	279 NP63	9.2	109	0	0	Clearcut with Reserves	
145	27	8	293	t14527w1080293	Norway Pine	293 NP54	7.7	64	0	0	Thinning	
145	27	9	216	t14527w1090216	Aspen	216 A25	28.1	33	0	0	Thinning	

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Township	*Range*	*Section*	*Stand*	*Location ID*	*Management Cover Type*	*Stand Label*	*Acres*	*Age*	*Stand Exam Year*	*New Access Miles*	*Preliminary Prescription*	*Management Objectives*
145	27	9	226	t14527w1090226	Tamarack	226 T41	19.2	118	0	0	Seed Tree	
145	27	9	276	t14527w1090276	Norway Pine	276 NP42	3.4	48	0	0	Thinning	
145	27	9	281	t14527w1090281	Norway Pine	281 NP62	13.6	114	0	0.3	Clearcut with Reserves	
145	27	9	289	t14527w1090289	Aspen	289 A42	5.7	46	0	0	Clearcut with Reserves	
145	27	10	257	t14527w1100257	Balsam Fir	257 BF54	6.6	63	0	0	Clearcut with Reserves	
145	27	10	285	t14527w1100285	Norway Pine	285 NP64	14.7	121	0	0	Clearcut with Reserves	
145	27	10	1000	t14527w1101000	Norway Pine	1000 NP69	12.2	107	0	0	Clearcut with Reserves	
145	27	11	184	t14527w1110184	Norway Pine	184 NP56	18.8	102	0	0	Thinning	
145	27	11	198	t14527w1110198	Jack Pine	198 JP23	8	41	0	0	Thinning	
145	27	11	230	t14527w1110230	Balsam Fir	230 BF42	13.9	120	0	0	Clearcut with Reserves	
145	27	11	243	t14527w1110243	Black Spruce, Lowland	243 BSL42	43.7	128	0	0	Clearcut with Reserves	
145	27	11	263	t14527w1110263	Norway Pine	263 NP54	14	92	0	0	Thinning	
145	27	11	999	t14527w1110999	Tamarack	999 T42	6.7	111	0	0	Seed Tree	
145	27	14	346	t14527w1140346	Balsam Fir	346 BF44	6.5	82	0	0	Re-inventory.	
145	27	18	306	t14527w1180306	Tamarack	306 T41	16.3	120	0	0	Seed Tree	
145	27	18	316	t14527w1180316	Tamarack	316 T44	8.3	117	0	0	Seed Tree	
145	27	18	378	t14527w1180378	Tamarack	378 T41	33.2	114	0	0	Seed Tree	
145	27	20	470	t14527w1200470	White Spruce	470 WS11	11.5	24	0	0	Thinning	
145	27	21	527	t14527w1210527	Norway Pine	527 NP56	21.8	91	0	0	Thinning	
145	27	23	573	t14527w1230573	Norway Pine	573 NP67	5.7	118	0	0	Clearcut with Reserves	
145	27	23	984	t14527w1230984	Tamarack	984 T43	2.4	118	0	0.4	Seed Tree	
145	27	25	622	t14527w1250622	Norway Pine	622 NP54	6.9	57	0	0	Thinning	
145	27	25	625	t14527w1250625	Tamarack	625 T42	159.3	112	0	0	Seed Tree	
145	27	25	631	t14527w1250631	Norway Pine	631 NP64	10.6	103	0	0	Clearcut with Reserves	
145	27	26	608	t14527w1260608	Norway Pine	608 NP66	19.3	118	0	0.3	Clearcut with Reserves	
145	27	26	636	t14527w1260636	Aspen	636 A53	10.4	66	0	0	Clearcut with Reserves	
145	27	26	698	t14527w1260698	Tamarack	698 T42	8.3	111	0	0	Seed Tree	
145	27	26	757	t14527w1260757	Aspen	757 A45	12.4	64	0	0	Clearcut with Reserves	
145	27	26	762	t14527w1260762	Norway Pine	762 NP53	7.3	119	0	0	Clearcut with Reserves	
145	27	27	751	t14527w1270751	Norway Pine	751 NP64	3.2	121	0	0.3	Clearcut with Reserves	
145	27	27	756	t14527w1270756	Norway Pine	756 NP54	3.4	118	0	0	Clearcut with Reserves	
145	27	27	770	t14527w1270770	Tamarack	770 T31	11.1	101	0	0	Seed Tree	
145	27	28	674	t14527w1280674	Aspen	674 A51	18.4	63	0	0.4	Clearcut with Reserves	
145	27	33	873	t14527w1330873	Birch	873 Bi53	25.3	94	0	0.3	Uneven-aged Harvest	COV51

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Township	*Range*	*Section*	*Stand*	*Location ID*	*Management Cover Type*	*Stand Label*	*Acres*	*Age*	*Stand Exam Year*	*New Access Miles*	*Preliminary Prescription*	*Management Objectives*
145	27	33	966	t14527w1330966	Aspen	966 A52	10.1	73	0	0	Clearcut with Reserves	
145	27	35	953	t14527w1350953	Tamarack	953 T41	6.2	127	0	0	Seed Tree	
145	27	35	956	t14527w1350956	Tamarack	956 T41	12.7	128	0	0	Seed Tree	
145	28	13	14	t14528w1130014	Norway Pine	14 NP21	9.7	24	0	0	Thinning	
145	28	18	9	t14528w1180009	Norway Pine	9 NP44	12.4	46	0	0	Thinning	
145	28	20	45	t14528w1200045	Norway Pine	45 NP44	49.3	30	0	0	Thinning	
145	28	20	60	t14528w1200060	Aspen	60 A56	14.6	57	0	0	Clearcut with Reserves	COV53
145	28	24	77	t14528w1240077	Birch	77 Bi44	5	64	0	0	Clearcut with Reserves	
145	28	25	102	t14528w1250102	Tamarack	102 T42	8.6	101	0	0	Seed Tree	
145	28	25	135	t14528w1250135	Norway Pine	135 NP11	13.9	25	0	0	Thinning	
145	28	25	171	t14528w1250171	Northern Hardwoods	171 NH53	7.4	68	0	0	Thinning	
145	28	26	149	t14528w1260149	Norway Pine	149 NP21	32.7	23	0	0	Thinning	
145	28	26	249	t14528w1260249	Tamarack	249 T42	37.8	107	0	0	Seed Tree	
145	28	26	257	t14528w1260257	Norway Pine	257 NP64	9	116	0	0	Clearcut with Reserves	
145	28	28	110	t14528w1280110	Northern Hardwoods	110 NH55	21.5	68	0	0.3	Uneven-aged Harvest	
145	28	29	231	t14528w1290231	Roads	231 Rd	11.6	25	0	0	Re-inventory.	
145	28	29	232	t14528w1290232	Aspen	232 A24	6.8	40	0	0	Thinning	INC52
145	28	29	244	t14528w1290244	Birch	244 Bi43	4.9	71	0	0	Clearcut with Reserves	
145	28	32	386	t14528w1320386	Northern Hardwoods	386 NH57	11.3	90	0	0	Uneven-aged Harvest	
145	28	33	317	t14528w1330317	White Pine	317 WP22	8.4	27	0	0	Thinning	
145	28	33	324	t14528w1330324	Norway Pine	324 NP21	19.7	27	0	0	Thinning	
145	28	33	347	t14528w1330347	Norway Pine	347 NP15	18.4	21	0	0	Thinning	
145	28	33	360	t14528w1330360	Aspen	360 A24	4	39	0	0	Clearcut with Reserves	COV53
145	28	33	368	t14528w1330368	Aspen	368 A24	11.1	39	0	0	Clearcut with Reserves	COV53
145	28	33	376	t14528w1330376	Norway Pine	376 NP11	13.9	22	0	0	Thinning	
145	28	34	330	t14528w1340330	Aspen	330 A43	14.5	53	0	0	Clearcut with Reserves	
145	28	34	359	t14528w1340359	Aspen	359 A24	14.7	38	0	0	Clearcut with Reserves	
145	28	34	392	t14528w1340392	Aspen	392 A44	4.9	65	0	0	Clearcut with Reserves	
146	25	2	119	t14625w1020119	Tamarack	119 T42	7.8	107	0	0	Clearcut with Reserves	
146	25	2	126	t14625w1020126	Black Spruce, Lowland	126 BSL43	2.9	107	0	0	Clearcut with Reserves	
146	25	3	110	t14625w1030110	Tamarack	110 T42	8	107	0	0	Clearcut with Reserves	
146	25	3	121	t14625w1030121	Black Spruce, Lowland	121 BSL43	14.6	107	0	0	Clearcut with Reserves	
146	25	4	118	t14625w1040118	Black Spruce, Lowland	118 BSL41	19.3	110	0	0.5	Clearcut with Reserves	
146	25	5	404	t14625w1050404	Balm of Gilead	404 BG55	13.7	75	0	0	Clearcut with Reserves	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
146	25	6	69	t14625w1060069	Ash	69 Ash43	10.5	87	0	0	Uneven-aged Harvest	COV72
146	25	9	138	t14625w1090138	Black Spruce, Lowland	138 BSL41	39.2	133	0	0	Clearcut with Reserves	
146	25	10	147	t14625w1100147	Black Spruce, Lowland	147 BSL43	42.1	115	0	0	Clearcut with Reserves	
146	25	10	148	t14625w1100148	Black Spruce, Lowland	148 BSL43	7.9	107	0	0	Clearcut with Reserves	
146	25	10	156	t14625w1100156	Tamarack	156 T44	12.8	120	0	0	Seed Tree	
146	25	10	161	t14625w1100161	Black Spruce, Lowland	161 BSL41	8.1	133	0	0	Clearcut with Reserves	
146	25	10	166	t14625w1100166	Black Spruce, Lowland	166 BSL41	35.2	154	0	0	Clearcut with Reserves	
146	25	10	167	t14625w1100167	Black Spruce, Lowland	167 BSL42	72.9	113	0	0	Clearcut with Reserves	
146	25	10	171	t14625w1100171	Black Spruce, Lowland	171 BSL 41	31.3	124	0	0	Clearcut with Reserves	
146	25	10	172	t14625w1100172	Black Spruce, Lowland	172 BSL42	21.7	126	0	0	Clearcut with Reserves	
146	25	10	182	t14625w1100182	Tamarack	182 T42	14	119	0	0	Seed Tree	
146	25	10	185	t14625w1100185	Black Spruce, Lowland	185 BSL43	56.5	120	0	0	Clearcut with Reserves	
146	25	11	149	t14625w1110149	Black Spruce, Lowland	149 BSL43	26	107	0	0.6	Clearcut with Reserves	
146	25	11	174	t14625w1110174	Black Spruce, Lowland	174 BSL43	6	120	0	0	Clearcut with Reserves	
146	25	14	242	t14625w1140242	Aspen	242 A43	12.3	49	0	0	Clearcut with Reserves	
146	25	14	251	t14625w1140251	Ash	251 Ash44	28.6	93	0	0	Uneven-aged Harvest	INC73
146	25	14	256	t14625w1140256	Aspen	256 A42	10.6	44	0	0.5	Clearcut with Reserves	
146	25	15	257	t14625w1150257	Tamarack	257 T44	9.8	125	0	0	Seed Tree	
146	25	15	262	t14625w1150262	Tamarack	262 T51	12.1	142	0	0	Seed Tree	
146	25	18	216	t14625w1180216	Ash	216 Ash45	16.1	87	0	0	Uneven-aged Harvest	INC73
146	25	26	320	t14625w1260320	Ash	320 Ash53	17.9	127	0	0.3	Uneven-aged Harvest	
146	25	26	342	t14625w1260342	Ash	342 Ash43	11.3	103	0	0.3	Uneven-aged Harvest	COV72
146	25	31	355	t14625w1310355	Cutover Area	355 COA	21.2	20	0	0	On-site Evaluation	
146	25	34	394	t14625w1340394	Lowland Brush	394 LB	49.3	22	0	0	On-site Evaluation	COV73
146	25	35	385	t14625w1350385	Aspen	385 A41	11.5	42	0	0	Clearcut with Reserves	
146	25	36	368	t14625w1360368	Tamarack	368 T44	16.6	128	0	0	Seed Tree	
146	26	2	72	t14626w1020072	Aspen	72 A52	5.4	65	0	0	Clearcut with Reserves	
146	26	3	11	t14626w1030011	Tamarack	11 T41	4.7	117	0	0	Seed Tree	
146	26	3	40	t14626w1030040	Aspen	40 A52	6.3	72	0	0	Clearcut with Reserves	
146	26	10	140	t14626w1100140	White Spruce	140 WS43	17.7	43	0	0	Thinning	
146	26	11	108	t14626w1110108	White Spruce	108 WS21	3.5	20	0	0	Thinning	
146	26	12	117	t14626w1120117	Aspen	117 A56	3.2	67	0	0.3	Clearcut with Reserves	
146	26	12	124	t14626w1120124	Ash	124 Ash44	18.1	90	0	0.3	Uneven-aged Harvest	
146	26	13	144	t14626w1130144	Tamarack	144 T55	5.3	124	0	0	Seed Tree	

Subsection **Chippewa Plains**

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
146	26	13	167	t14626w1130167	Aspen	167 A54	15.3	61	0	0	Clearcut with Reserves	
146	26	13	196	t14626w1130196	Black Spruce, Lowland	196 BSL42	10.7	84	0	0	On-site Evaluation	
146	26	13	213	t14626w1130213	Ash	213 Ash56	9.6	89	0	0	Uneven-aged Harvest	INC73
146	26	14	159	t14626w1140159	Tamarack	159 T44	19.4	116	0	0	Seed Tree	
146	26	14	195	t14626w1140195	Tamarack	195 T44	203.6	123	0	1.5	Seed Tree	
146	26	14	223	t14626w1140223	Black Spruce, Lowland	223 BSL44	10.5	122	0	0	Clearcut with Reserves	
146	26	15	150	t14626w1150150	White Spruce	150 WS42	44.3	43	0	0	Thinning	
146	26	15	197	t14626w1150197	Tamarack	197 T42	19	122	0	0	Seed Tree	
146	26	15	206	t14626w1150206	Tamarack	206 T44	36.1	125	0	0	Seed Tree	
146	26	15	225	t14626w1150225	Black Spruce, Lowland	225 BSL43	10.8	91	0	0	Clearcut with Reserves	
146	26	15	230	t14626w1150230	Tamarack	230 T41	12.3	97	0	0	Seed Tree	
146	26	16	544	t14626w1160544	Aspen	544 A55	8.9	56	0	0	Clearcut with Reserves	
146	26	16	550	t14626w1160550	Ash	550 Ash42	13	66	0	0	Uneven-aged Harvest	
146	26	17	211	t14626w1170211	Tamarack	211 T43	21.4	126	0	0	Seed Tree	
146	26	17	239	t14626w1170239	Black Spruce, Lowland	239 BSL44	11.1	133	0	0	Clearcut with Reserves	
146	26	19	247	t14626w1190247	Tamarack	247 T41	16.3	130	0	0	Seed Tree	
146	26	20	262	t14626w1200262	Tamarack	262 T41	23.2	130	0	0	Seed Tree	
146	26	21	265	t14626w1210265	Black Spruce, Lowland	265 BSL42	25.6	88	0	0	Clearcut with Reserves	PAT2
146	26	21	317	t14626w1210317	Tamarack	317 T42	25.9	119	0	0	Seed Tree	
146	26	21	350	t14626w1210350	Tamarack	350 T53	7.7	117	0	0	Seed Tree	
146	26	22	267	t14626w1220267	Black Spruce, Lowland	267 BSL42	19	88	0	0	Clearcut with Reserves	PAT2
146	26	22	269	t14626w1220269	Aspen	269 A43	14.7	36	0	0	Clearcut with Reserves	
146	26	22	291	t14626w1220291	Tamarack	291 T43	48.3	116	0	0	Seed Tree	
146	26	22	316	t14626w1220316	Black Spruce, Lowland	316 BSL41	35.6	56	0	0	Clearcut with Reserves	PAT2
146	26	22	348	t14626w1220348	Aspen	348 A34	12.8	40	0	0	Clearcut with Reserves	
146	26	22	358	t14626w1220358	Aspen	358 A55	10.2	60	0	0	Clearcut with Reserves	
146	26	22	364	t14626w1220364	Black Spruce, Lowland	364 BSL42	8.4	113	0	0	Clearcut with Reserves	
146	26	23	300	t14626w1230300	Tamarack	300 T43	20	124	0	0	Seed Tree	
146	26	23	322	t14626w1230322	Tamarack	322 T41	9.2	141	0	0	Seed Tree	
146	26	23	326	t14626w1230326	Tamarack	326 T43	24.2	108	0	0	Seed Tree	
146	26	23	355	t14626w1230355	Tamarack	355 T42	9.1	108	0	0.5	Seed Tree	
146	26	26	394	t14626w1260394	Aspen	394 A41	9.6	48	0	0	Clearcut with Reserves	
146	26	26	395	t14626w1260395	Tamarack	395 T42	19.6	77	0	0.3	Seed Tree	
146	26	26	403	t14626w1260403	Tamarack	403 T42	22.6	78	0	0	Seed Tree	

Subsection **Chippewa Plains**

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
146	26	27	377	t14626w1270377	Black Spruce, Lowland	377 BSL42	5.6	113	0	0	Clearcut with Reserves	
146	26	27	381	t14626w1270381	Black Spruce, Lowland	381 BSL41	23.8	56	0	0	Clearcut with Reserves	PAT2
146	26	27	397	t14626w1270397	Tamarack	397 T41	7	104	0	0	Seed Tree	
146	26	27	411	t14626w1270411	Black Spruce, Lowland	411 BSL43	5.3	81	0	0	Clearcut with Reserves	
146	26	27	425	t14626w1270425	Black Spruce, Lowland	425 BSL42	11.4	72	0	0	Clearcut with Reserves	
146	26	27	434	t14626w1270434	Black Spruce, Lowland	434 BSL44	4.9	64	0	0	Clearcut with Reserves	PAT2
146	26	27	435	t14626w1270435	Black Spruce, Lowland	435 BSL43	5.7	83	0	0	Clearcut with Reserves	PAT2
146	26	28	412	t14626w1280412	Black Spruce, Lowland	412 BSL43	6.1	94	0	0	Clearcut with Reserves	PAT2
146	26	28	470	t14626w1280470	Norway Pine	470 NP43	17.6	52	0	0	Thinning	
146	26	34	519	t14626w1340519	Aspen	519 A55	2.7	77	0	0	Clearcut with Reserves	
146	26	34	532	t14626w1340532	Aspen	532 A53	5.6	72	0	0	Clearcut with Reserves	
146	26	34	534	t14626w1340534	Norway Pine	534 NP 46	8.7	30	0	0	Thinning	
146	26	35	505	t14626w1350505	Aspen	505 A51	5.6	67	0	0	Clearcut with Reserves	
146	26	35	507	t14626w1350507	Tamarack	507 T41	34.1	82	0	0	Seed Tree	
146	26	35	515	t14626w1350515	Black Spruce, Lowland	515 BSL44	37.2	110	0	0	Clearcut with Reserves	
146	26	35	517	t14626w1350517	Tamarack	517 T44	43.7	125	0	0	Seed Tree	
146	27	32	50	t14627w1320050	Northern Hardwoods	50 NH41	14.1	102	0	0	Uneven-aged Harvest	
146	27	33	56	t14627w1330056	Aspen	56 A54	5.4	67	0	0.3	On-site Evaluation	
147	25	14	179	t14725w1140179	Birch	179 Bi45	14	80	0	0	On-site Evaluation	
147	25	16	182	t14725w1160182	Aspen	182 A44	28.5	51	0	0	Clearcut with Reserves	
147	25	16	183	t14725w1160183	Aspen	183 A55	16.2	60	0	0	Clearcut with Reserves	
147	25	16	251	t14725w1160251	Unknown	251 *Unk	10.1	1	0	0	On-site Evaluation	
147	25	21	53	t14725w1210053	Aspen	53 A44	5.1	77	0	0.5	Clearcut with Reserves	
147	25	22	192	t14725w1220192	Balm of Gilead	192 BG55	8.9	82	0	0	On-site Evaluation	
147	25	22	210	t14725w1220210	Tamarack	210 T44	9.3	108	0	0.3	Seed Tree	
147	25	26	79	t14725w1260079	Ash	79 Ash41	22.4	93	0	0	On-site Evaluation	
147	25	26	98	t14725w1260098	Aspen	98 A54	3.6	71	0	0	On-site Evaluation	
147	25	32	133	t14725w1320133	Tamarack	133 T42	24.1	94	0	0.3	Seed Tree	
147	25	33	137	t14725w1330137	Tamarack	137 T44	6.2	89	0	0.3	Clearcut with Reserves	
147	25	33	146	t14725w1330146	Northern Hardwoods	146 NH54	21.2	95	0	0	Uneven-aged Harvest	
147	26	1	35	t14726w1010035	Aspen	35 A42	18.6	53	0	0	Clearcut with Reserves	
147	26	2	26	t14726w1020026	Aspen	26 A 52	1.8	78	0	0.2	Clearcut with Reserves	RIP1
147	26	4	65	t14726w1040065	Norway Pine	65 NP66	4.8	150	0	0	Clearcut with Reserves	
147	26	4	89	t14726w1040089	Tamarack	89 T43	4.5	121	0	0	Seed Tree	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
147	26	5	12	t14726w1050012	Lowland Hardwoods	12 LH41	4.5	93	0	0	Uneven-aged Harvest	
147	26	5	56	t14726w1050056	Tamarack	56 T43	12.6	135	0	0	Seed Tree	
147	26	5	80	t14726w1050080	Black Spruce, Lowland	80 BSL43	15.9	106	0	0	Clearcut with Reserves	
147	26	5	87	t14726w1050087	Tamarack	87 T44	19	136	0	0	Seed Tree	
147	26	6	124	t14726w1060124	Tamarack	124 T42	21.9	111	0	0	Thinning	
147	26	9	188	t14726w1090188	Aspen	188 A53	10	73	0	0	Clearcut with Reserves	COV52
147	26	17	238	t14726w1170238	Norway Pine	238 NP52	13.7	27	0	0	Thinning	
147	26	17	244	t14726w1170244	Norway Pine	244 NP54	3.1	98	0	0	Thinning	
147	26	17	257	t14726w1170257	Norway Pine	257 NP56	6.9	27	0	0	Thinning	
147	26	17	750	t14726w1170750	Norway Pine	750 NP59	3	44	0	0	Thinning	
147	26	17	754	t14726w1170754	Tamarack	754 T53	4.6	144	0	0	Seed Tree	
147	26	18	237	t14726w1180237	Tamarack	237 T42	12.7	107	0	0	Seed Tree	
147	26	18	247	t14726w1180247	Tamarack	247 T43	14.5	124	0	0	Seed Tree	
147	26	18	250	t14726w1180250	Norway Pine	250 NP32	11.3	21	0	0	Thinning	
147	26	18	252	t14726w1180252	Balsam Fir	252 BF55	5.7	73	0	0	Uneven-aged Harvest	
147	26	18	255	t14726w1180255	Norway Pine	255 NP42	4.8	30	0	0	Thinning	
147	26	18	269	t14726w1180269	Tamarack	269 T44	17.8	116	0	0	Seed Tree	
147	26	18	273	t14726w1180273	Tamarack	273 T52	10.7	149	0	0	Seed Tree	
147	26	18	284	t14726w1180284	Black Spruce, Lowland	284 BSL42	15.2	138	0	0	Clearcut with Reserves	
147	26	18	288	t14726w1180288	Tamarack	288 T45	7.5	145	0	0	Seed Tree	
147	26	18	291	t14726w1180291	Norway Pine	291 NP54	9.9	76	0	0	Thinning	
147	26	18	292	t14726w1180292	Norway Pine	292 NP66	6.1	132	0	0	Thinning	
147	26	18	296	t14726w1180296	Tamarack	296 T44	19.4	104	0	0	Seed Tree	
147	26	18	752	t14726w1180752	Balsam Fir	752 BF55	5.4	73	0	0	Uneven-aged Harvest	
147	26	19	347	t14726w1190347	Norway Pine	347 NP42	20.5	41	0	0	Thinning	
147	26	19	355	t14726w1190355	Norway Pine	355 NP56	15	108	0	0	Thinning	
147	26	19	365	t14726w1190365	Norway Pine	365 NP11	5.4	22	0	0	Thinning	
147	26	20	320	t14726w1200320	Tamarack	320 T42	5.4	125	0	0	Seed Tree	
147	26	20	332	t14726w1200332	Norway Pine	332 NP42	13.9	34	0	0	Thinning	
147	26	20	375	t14726w1200375	Tamarack	375 T42	31.5	114	0	0	Seed Tree	
147	26	20	390	t14726w1200390	Aspen	390 A56	21.2	46	0	0	Re-inventory.	
147	26	22	431	t14726w1220431	Tamarack	431 T42	7.6	95	0	0	Seed Tree	
147	26	26	582	t14726w1260582	Aspen	582 A54	5.3	93	0	0	Clearcut with Reserves	
147	26	27	454	t14726w1270454	Tamarack	454 T43	9	95	0	0	Seed Tree	

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Forestry Area ***Deer River Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
147	26	27	491	t14726w1270491	Aspen	491 A44	8.4	42	0	0	Clearcut with Reserves	
147	26	27	560	t14726w1270560	Aspen	560 A62	5.9	84	0	0	Clearcut with Reserves	
147	26	28	439	t14726w1280439	Aspen	439 A43	10.5	47	0	0	Clearcut with Reserves	
147	26	28	447	t14726w1280447	Tamarack	447 T43	30.3	95	0	0	Seed Tree	
147	26	30	450	t14726w1300450	Norway Pine	450 NP11	12.3	30	0	0	Thinning	
147	26	30	526	t14726w1300526	Norway Pine	526 NP53	12.2	94	0	0	Thinning	
147	26	30	537	t14726w1300537	Marsh	537 Mh	18.9	6	0	0	On-site Evaluation	
147	26	31	612	t14726w1310612	Norway Pine	612 NP54	5.4	95	0	0	Thinning	
147	26	32	576	t14726w1290576	Tamarack	576 T43	22.2	116	0	0	Seed Tree	
147	26	32	611	t14726w1320611	Tamarack	611 T51	22.2	139	0	0	Seed Tree	
147	26	32	614	t14726w1320614	Aspen	614 A42	10.3	37	0	0	Re-inventory.	
147	26	33	589	t14726w1330589	Tamarack	589 T43	71.8	116	0	0	Seed Tree	
147	26	33	592	t14726w1330592	Aspen	592 A42	15.7	52	0	0	Clearcut with Reserves	
147	26	33	596	t14726w1330596	Norway Pine	596 NP43	9	39	0	0	Thinning	
147	26	34	624	t14726w1340624	Norway Pine	624 NP43	13.5	39	0	0	Thinning	
147	26	34	691	t14726w1340691	Norway Pine	691 NP43	10.4	39	0	0	Thinning	
147	26	35	607	t14726w1350607	Aspen	607 A55	23.3	93	0	0.6	Clearcut with Reserves	
147	27	3	33	t14727w1030033	Norway Pine	33 NP12	11.6	27	0	0	Thinning	
147	27	4	16	t14727w1040016	Norway Pine	16 NP54	6.5	43	0	0	Thinning	
147	27	5	45	t14727w1050045	Tamarack	45 T45	12.1	106	0	0	Re-inventory.	
147	27	13	74	t14727w1130074	Norway Pine	74 NP40	53.5	25	0	0	On-site Evaluation	
147	27	25	95	t14727w1250095	Birch	95 Bi52	9.9	91	0	0	Re-inventory.	
148	25	6	24	t14825w1060024	Aspen	24 A23	20.8	39	0	0.4	Clearcut with Reserves	
148	25	8	40	t14825w1080040	Balsam Fir	40 BF44	6.9	86	0	0	On-site Evaluation	
148	25	10	35	t14825w1100035	Northern Hardwoods	35 NH54	22.7	76	0	0	Uneven-aged Harvest	INC51
148	25	16	71	t14825w1160071	Black Spruce, Lowland	71 BSL44	4.8	86	0	0	On-site Evaluation	
148	25	20	113	t14825w1200113	Norway Pine	113 NP56	2.7	86	0	0	Thinning	
148	25	26	170	t14825w1260170	Aspen	170 A44	11.7	49	0	0	Clearcut with Reserves	
148	25	30	165	t14825w1300165	Lowland Brush	165 LB	15.2	23	0	0	Manage for understory	COV73
148	25	36	199	t14825w1360199	Ash	199 Ash43	9.5	101	0	0.3	Uneven-aged Harvest	
148	26	2	26	t14826w1020026	Ash	26 Ash43	6.4	83	0	0	On-site Evaluation	COV73
148	26	6	50	t14826w1060050	Aspen	50 A53	12.3	61	0	0	Re-inventory.	RIP1
148	26	10	59	t14826w1100059	Tamarack	59 T41	17.7	161	0	0.2	Seed Tree	
148	26	11	79	t14826w1110079	Tamarack	79 T41	4.4	103	0	0	Seed Tree	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
148	26	27	142	t14826w1270142	Ash	142 Ash54	19.8	105	0	0	Uneven-aged Harvest	
148	26	33	165	t14826w1330165	Aspen	165 A55	5.6	78	0	0	Clearcut with Reserves	
148	27	3	5	t14827w1030005	Aspen	5 A54	18	59	0	0	Clearcut with Reserves	
148	27	3	6	t14827w1030006	Black Spruce, Lowland	6 BSL41	16	101	0	0	Clearcut with Reserves	
148	27	3	11	t14827w1030011	Birch	11 Bi55	13.5	78	0	0	Re-inventory.	
148	27	3	151	t14827w1030151	Aspen	151 A56	5	69	0	0	Re-inventory.	
148	27	4	21	t14827w1040021	Aspen	21 A55	7.7	78	0	0	Re-inventory.	
148	27	7	54	t14827w1070054	Ash	54 Ash 55	15.1	92	0	0	Uneven-aged Harvest	
148	27	7	163	t14827w1070163	Aspen	163 A54	2.4	72	0	0	Manage for understory	COV51
148	27	7	192	t14827w1070192	Birch	192 Bi53	11.8	71	0	0	Manage for understory	COV51
148	27	8	189	t14827w1080189	Northern Hardwoods	189 NH55	12.1	72	0	0	Uneven-aged Harvest	
148	27	8	190	t14827w1080190	Northern Hardwoods	190 NH54	14	81	0	0	Uneven-aged Harvest	
148	27	11	176	t14827w1110176	Lowland Brush	176 LB	10.8	23	0	0	On-site Evaluation	COV72
148	27	21	89	t14827w1210089	Lowland Brush	89 LB	106.2	23	0	0	On-site Evaluation	COV72
148	27	21	90	t14827w1210090	Tamarack	90 T43	54.4	115	0	0	Seed Tree	
148	27	21	96	t14827w1210096	Tamarack	96 T43	19.6	113	0	0	Seed Tree	
148	27	21	116	t14827w1210116	Aspen	116 A56	13.8	65	0	1	Clearcut with Reserves	
148	27	21	119	t14827w1210119	Lowland Brush	119 LB	9	22	0	0	On-site Evaluation	COV72
148	27	21	229	t14827w1210229	Aspen	229 A56	4	65	0	0	Clearcut with Reserves	
148	27	21	230	t14827w1210230	Aspen	230 A56	3.7	65	0	0	Clearcut with Reserves	
148	27	21	231	t14827w1210231	Aspen	231 A56	2	65	0	0	Clearcut with Reserves	
148	27	22	103	t14827w1220103	Tamarack	103 T41	14.8	101	0	0	Seed Tree	
148	27	25	218	t14827w1250218	Norway Pine	218 NP 42	12.2	26	0	0	Thinning	
148	27	25	219	t14827w1250219	Lowland Brush	219 LB	25.9	22	0	0	On-site Evaluation	COV73
148	27	25	221	t14827w1250221	Norway Pine	221 NP65	2.9	132	0	0	Clearcut with Reserves	
148	27	27	127	t14827w1270127	Ash	127 Ash21	27	60	0	0	Uneven-aged Harvest	
148	27	27	128	t14827w1270128	Ash	128 Ash44	12	101	0	0	Uneven-aged Harvest	
148	27	28	124	t14827w1280124	Lowland Brush	124 LB	21.8	23	0	0	On-site Evaluation	COV72
148	27	28	125	t14827w1280125	Lowland Brush	125 LB	17.3	23	0	0	On-site Evaluation	COV72
148	28	4	4	t14828w1040004	Black Spruce, Lowland	4 BSL41	8.8	74	0	0.2	Clearcut with Reserves	
148	28	4	14	t14828w1040014	Balm of Gilead	14 BG42	6.6	63	0	0	Clearcut with Reserves	
148	28	4	15	t14828w1040015	Black Spruce, Lowland	15 BSL43	4.8	70	0	0	Clearcut with Reserves	
148	28	6	25	t14828w1060025	Aspen	25 A45	3.1	56	0	0	Clearcut with Reserves	
148	28	6	37	t14828w1060037	Black Spruce, Lowland	37 BSL44	0.9	142	0	0	Clearcut with Reserves	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
148	28	6	40	t14828w1060040	Tamarack	40 T53	21	109	0	0	Re-inventory.	
148	28	17	104	t14828w1170104	Jack Pine	104 JP43	1.1	83	0	0	Re-inventory.	
148	28	19	122	t14828w1190122	Aspen	122 A54	2.7	64	0	0	Clearcut with Reserves	
148	28	20	143	t14828w1200143	Aspen	143 A33	5.8	41	0	0	Clearcut with Reserves	
148	28	34	257	t14828w1340257	Aspen	257 A42	3.4	66	0	0	Clearcut with Reserves	
149	25	5	208	t14925w1050208	Aspen	208 A53	8.6	45	0	0	Clearcut with Reserves	
149	25	5	220	t14925w1050220	Ash	220 Ash43	15.5	110	0	0	Uneven-aged Harvest	
149	25	5	223	t14925w1050223	Aspen	223 A42	9.9	43	0	0	Clearcut with Reserves	
149	25	8	61	t14925w1080061	Norway Pine	61 NP41	31.4	24	0	0	Thinning	
149	25	16	89	t14925w1160089	Northern Hardwoods	89 NH57	20.6	70	0	0	Uneven-aged Harvest	
149	25	16	94	t14925w1160094	Northern Hardwoods	94 NH57	2.8	70	0	0	Uneven-aged Harvest	
149	25	16	98	t14925w1160098	White Spruce	98 WS45	29.7	39	0	0	Thinning	
149	25	16	102	t14925w1160102	Northern Hardwoods	102 NH54	57.6	81	0	0	Uneven-aged Harvest	
149	25	16	103	t14925w1160103	Norway Pine	103 NP54	26.5	39	0	0	Thinning	
149	25	16	107	t14925w1160107	Norway Pine	107 NP55	6.1	42	0	0	Thinning	
149	25	16	110	t14925w1160110	Norway Pine	110 NP58	13.2	39	0	0	Thinning	
149	25	16	111	t14925w1160111	Norway Pine	111 NP54	15.8	34	0	0	Thinning	
149	25	16	112	t14925w1160112	White Spruce	112 WS43	5.4	37	0	0	Thinning	
149	25	16	114	t14925w1160114	White Spruce	114 WS43	24.5	37	0	0	Thinning	
149	25	16	265	t14925w1160265	Norway Pine	265 NP52	53.3	39	0	0	Thinning	
149	25	16	267	t14925w1160267	Northern Hardwoods	267 NH53	16.3	134	0	0	Uneven-aged Harvest	
149	25	30	288	t14925w1300288	Birch	288 Bi45	7.1	81	0	0	Re-inventory.	

Subsection Pine Moraines & Outwash Plains

Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
143	33	16	23	t14333w1160023	Aspen	23 A53	15	60	0	0	Re-inventory.	COV20
143	33	16	26	t14333w1160026	Aspen	26 A44	28.5	58	0	0	Clearcut with Reserves	
143	33	16	41	t14333w1160041	Aspen	41 A45	4.7	69	0	0	Re-inventory.	COV20
143	33	16	44	t14333w1160044	Northern Hardwoods	44 NH54	21.3	67	0	0	Uneven-aged Harvest	
143	33	19	49	t14333w1190049	Norway Pine	49 NP57	33.3	69	0	0	Re-inventory.	
143	33	20	65	t14333w1200065	Birch	65 Bi47	6.9	71	0	0	Clearcut with Reserves	
143	33	20	70	t14333w1200070	Aspen	70 A49	7.9	61	0	0	Clearcut with Reserves	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
143	33	20	83	t14333w1200083	Birch	83 Bi44	6.7	65	0	0	Clearcut with Reserves	
143	33	20	90	t14333w1200090	Birch	90 Bi43	6.8	60	0	0	Clearcut with Reserves	
143	33	20	96	t14333w1200096	Aspen	96 A57	32.5	68	0	0	Clearcut with Reserves	
143	33	20	101	t14333w1200101	Northern Hardwoods	101 NH44	6.8	73	2012	0	Shelterwood	
143	33	20	127	t14333w1200127	Aspen	127 A45	14.8	66	0	0	Re-inventory.	COV20
143	33	20	128	t14333w1200128	Birch	128 Bi44	12.3	57	0	0	Clearcut with Reserves	
143	33	20	154	t14333w1200154	Aspen	154 A45	14.7	43	0	0	Manage for understory	INC51
143	33	20	160	t14333w1200160	Aspen	160 A44	10.2	57	0	0	Uneven-aged Harvest	INC51
143	33	21	165	t14333w1210165	Aspen	165 A43	8.3	43	0	0	Manage for understory	INC51
143	33	22	109	t14333w1220109	Birch	109 Bi54	21.8	70	0	0	Re-inventory.	
143	33	22	114	t14333w1220114	Aspen	114 A52	12.5	45	0	0	Clearcut with Reserves	
143	33	22	125	t14333w1220125	Aspen	125 A53	34.7	41	0	0	Clearcut with Reserves	
143	33	22	139	t14333w1220139	Aspen	139 A43	5.5	60	0	0	Clearcut with Reserves	INC52
143	33	22	145	t14333w1220145	Aspen	145 A58	17.1	69	0	0	Clearcut with Reserves	
143	33	22	146	t14333w1220146	Oak	146 O55	6.6	63	0	0	Shelterwood	
143	33	22	147	t14333w1220147	Northern Hardwoods	147 NH43	17.7	79	0	0	Uneven-aged Harvest	
143	33	22	149	t14333w1220149	Northern Hardwoods	149 NH43	6.1	67	2017	0	Uneven-aged Harvest	
143	33	26	237	t14333w1260237	Aspen	237 A44	6	65	0	0	Clearcut with Reserves	COV52
143	33	26	251	t14333w1260251	Aspen	251 A45	44.1	71	0	0	Clearcut with Reserves	
143	33	26	289	t14333w1260289	Northern Hardwoods	289 NH56	3.9	75	2013	0	Uneven-aged Harvest	
143	33	27	184	t14333w1270184	Aspen	184 A56	15.7	64	0	0	Re-inventory.	
143	33	27	209	t14333w1270209	Aspen	209 A56	6.4	69	0	0	Manage for understory	INC51
143	33	27	220	t14333w1270220	Norway Pine	220 NP63	7.9	99	0	0	Shelterwood	
143	33	27	242	t14333w1270242	Birch	242 Bi 53	7.4	58	0	0	On-site Evaluation	
143	33	27	267	t14333w1270267	White Spruce	267 WS41	59.2	25	0	0	On-site Evaluation	
143	33	27	285	t14333w1270285	Cutover Area	285 COA	29.9	1	0	0	Re-inventory.	COV53
143	33	27	294	t14333w1270294	Northern Hardwoods	294 NH56	12.4	75	2013	0	Uneven-aged Harvest	
143	33	27	300	t14333w1270300	Aspen	300 A57	16.1	73	0	0	Clearcut with Reserves	
143	33	28	181	t14333w1280181	Aspen	181 A44	9.3	54	0	0	Clearcut with Reserves	
143	33	28	182	t14333w1280182	Aspen	182 A56	19.4	74	0	0	Clearcut with Reserves	
143	33	28	188	t14333w1280188	Aspen	188 A57	5	81	0	0	Clearcut with Reserves	
143	33	28	208	t14333w1280208	Aspen	208 A56	8.8	63	0	0	Manage for understory	INC51
143	33	28	253	t14333w1280253	Northern Hardwoods	253 NH55	3.8	89	2015	0	Shelterwood	
143	33	29	255	t14333w1290255	Aspen	255 A 29	39.1	41	0	0	Re-inventory.	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
143	33	30	173	t14333w1300173	Norway Pine	173 NP58	5.9	88	0	0	Thinning	
143	33	30	191	t14333w1300191	Aspen	191 A44	3.5	72	0	0	Clearcut with Reserves	
143	33	30	275	t14333w1300275	Aspen	275 A54	15.5	61	0	0	Clearcut with Reserves	
143	33	30	277	t14333w1300277	Aspen	277 A55	7.5	74	0	0	Re-inventory.	
143	33	31	292	t14333w1310292	Oak	292 O56	12.2	75	0	0	Shelterwood	
143	33	31	298	t14333w1310298	Aspen	298 A55	12.8	60	0	0	Clearcut with Reserves	
143	33	31	312	t14333w1310312	Aspen	312 A55	5.2	57	0	0	Clearcut with Reserves	
143	33	31	338	t14333w1310338	Aspen	338 A57	6.2	80	0	0	Re-inventory.	
143	33	32	303	t14333w1320303	Aspen	303 A53	6.4	56	0	0	Clearcut with Reserves	
143	33	32	304	t14333w1320304	Aspen	304 A47	15.9	71	0	0	Clearcut with Reserves	
143	33	32	310	t14333w1320310	Aspen	310 A55	12.4	59	0	0	Re-inventory.	
143	33	32	466	t14333w1320466	Aspen	466 A54	20.7	73	0	0	Clearcut with Reserves	
143	33	33	431	t14333w1330431	Aspen	431 A54	27.8	69	0	0	Clearcut with Reserves	
143	33	33	442	t14333w1330442	Cutover Area	442 COA	12.9	65	0	0	Re-inventory.	COV53
143	33	33	449	t14333w1330449	Aspen	449 A43	10.5	66	0	0	Clearcut with Reserves	
143	33	34	325	t14333w1340325	Northern Hardwoods	325 NH55	16.5	75	2013	0	Uneven-aged Harvest	
143	33	34	329	t14333w1340329	Norway Pine	329 NP57	9	91	0	0	Thinning	
143	33	34	337	t14333w1340337	Cutover Area	337 COA	26.1	7	0	0	Re-inventory.	COV52
143	33	34	344	t14333w1340344	Birch	344 Bi55	37.1	70	0	0	Uneven-aged Harvest	
143	33	34	430	t14333w1340430	Northern Hardwoods	430 NH55	7.1	87	2013	0	Shelterwood	
143	33	35	404	t14333w1350404	Oak	404 O54	17.1	73	0	0	Shelterwood	
143	33	35	418	t14333w1350418	Aspen	418 A54	27.9	70	0	0	Clearcut with Reserves	
143	33	35	445	t14333w1350445	Aspen	445 A54	27.7	70	0	0	Clearcut with Reserves	
143	33	36	363	t14333w1360363	Northern Hardwoods	363 NH53	9.4	58	2014	0	Shelterwood	
143	33	36	407	t14333w1360407	Northern Hardwoods	407 NH53	59.4	85	2014	0	Shelterwood	
143	34	25	146	t14334w1250146	Aspen	146 A54	21.8	60	0	0	Clearcut with Reserves	
143	34	36	88	t14334w1360088	Aspen	88 A53	9.8	60	0	0	Clearcut with Reserves	
143	34	36	93	t14334w1360093	White Spruce	93 WS42	7.5	30	0	0	Thinning	
143	34	36	96	t14334w1360096	Norway Pine	96 NP43	16.4	30	0	0	Thinning	
143	34	36	98	t14334w1360098	Aspen	98 A58	18.9	69	0	0	Clearcut with Reserves	
143	34	36	104	t14334w1360104	Oak	104 O45	8.3	79	0	0	Shelterwood	
143	34	36	107	t14334w1360107	Aspen	107 A56	23.3	69	0	0	Clearcut with Reserves	
143	34	36	108	t14334w1360108	Oak	108 O44	24.8	84	0	0	Shelterwood	
143	34	36	112	t14334w1360112	Aspen	112 A54	13.1	61	0	0	Clearcut with Reserves	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Bemidji Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
143	34	36	126	t14334w1360126	Aspen	126 A57	8.6	66	0	0	Clearcut with Reserves	
143	35	17	16	t14335w1170016	Aspen	16 A54	19.2	53	0	0	Clearcut with Reserves	
143	35	17	17	t14335w1170017	Jack Pine	17 JP54	5.5	62	0	0	Clearcut with Reserves	
143	35	34	69	t14335w1340069	Aspen	69 A43	35.5	42	0	0	Clearcut with Reserves	
143	35	34	70	t14335w1340070	Aspen	70 A54	27.6	72	0	0	Re-inventory.	
143	35	35	94	t14335w1350094	Aspen	94 A54	17	61	0	0	Clearcut with Reserves	
143	35	36	72	t14335w1360072	Oak	72 O53	14.8	59	0	0	Shelterwood	
143	35	36	74	t14335w1360074	Northern Hardwoods	74 NH53	17.4	71	2012	0	Shelterwood	
143	35	36	110	t14335w1360110	Oak	110 O52	36.8	65	0	0	Shelterwood	
143	35	36	278	t14335w1360278	Cutover Area	278 COA	10	2	0	0	Re-inventory.	
143	37	3	931	t14336w1030931	None	59*???	5.9	0	0	0.2	Re-inventory.	
143	37	4	17	t14337w1040017	Cutover Area	17 COA	13.7	18	0	0	Re-inventory.	
143	37	4	88	t14337w1040088	Norway Pine	88 NP58	6.3	104	0	0	Thinning	
143	37	4	118	t14337w1040118	Aspen	118 A52	5.2	72	0	0	Re-inventory.	
143	37	4	376	t14337w1041376	Birch	1376 Bi52	8.1	84	0	0	On-site Evaluation	
143	37	10	300	t14337w1100300	Norway Pine	300 NP65	10.8	107	2015	0	Shelterwood	
143	37	13	765	t14337w1130765	Aspen	765 A54	2.8	73	0	0	Clearcut with Reserves	
143	37	18	647	t14337w1180647	Aspen	647 A52	29.7	59	0	0	Clearcut with Reserves	
143	37	20	751	t14337w1200751	Norway Pine	751 NP 64	21.1	101	0	0	Re-inventory.	
143	37	28	38	t14337w1281038	Norway Pine	1038 NP64	9.8	126	0	0	Thinning	
143	37	30	123	t14337w1301123	Jack Pine	1123 JP45	3.6	52	0	0	Clearcut with Reserves	
143	37	31	136	t14337w1311136	Jack Pine	1136 JP45	11.5	52	0	0	Clearcut with Reserves	
143	37	31	159	t14337w1311159	Norway Pine	1159 NP54	3.7	50	0	0	Thinning	
143	38	4	72	t14338w1040072	Balsam Fir	72 BF53	4.1	93	0	0	On-site Evaluation	
143	38	4	107	t14338w1040107	Balsam Fir	107 BF53	8	81	0	0	On-site Evaluation	
143	38	6	83	t14338w1060083	White Pine	83 WP71	5.1	115	0	0	Thinning	
143	38	9	213	t14338w1090213	Balsam Fir	213 BF52	6.1	96	0	0	On-site Evaluation	
143	38	9	226	t14338w1090226	Balsam Fir	226 BF52	3.9	96	0	0	On-site Evaluation	
143	38	10	207	t14338w1100207	Balsam Fir	207 BF41	7	81	0	0	On-site Evaluation	
143	38	10	209	t14338w1100209	Birch	209 Bi52	7.6	81	0	0.1	On-site Evaluation	
143	38	10	216	t14338w1100216	Balsam Fir	216 BF41	5.4	81	0	0.1	On-site Evaluation	
143	38	13	314	t14338w1130314	White Spruce	314 WS45	36.3	43	0	0	Thinning	
143	38	14	293	t14338w1140293	Birch	293 Bi53	9.7	76	0	0	Clearcut with Reserves	
143	38	15	306	t14338w1150306	Oak	306 O55	4	110	0	0	On-site Evaluation	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area *Bemidji Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
143	38	15	325	t14338w1150325	Oak	325 O55	11.7	110	0	0	On-site Evaluation	
143	38	15	326	t14338w1150326	Aspen	326 A53	5.2	82	0	0.2	On-site Evaluation	
143	38	16	295	t14338w1160295	Oak	295 O55	9.3	110	0	0	On-site Evaluation	
143	38	16	315	t14338w1160315	Oak	315 O55	3.2	110	0	0	On-site Evaluation	
143	38	16	316	t14338w1160316	Oak	316 O52	9	98	0	0	On-site Evaluation	
143	38	16	318	t14338w1160318	Oak	318 O57	4.6	119	0	0	On-site Evaluation	
143	38	16	321	t14338w1160321	Oak	321 O55	6.7	110	0	0	On-site Evaluation	
143	38	16	331	t14338w1160331	Oak	331 O55	12.2	110	0	0	On-site Evaluation	
143	38	22	377	t14338w1220377	Tamarack	377 T51	8.4	110	0	0	On-site Evaluation	
143	38	24	408	t14338w1240408	White Spruce	408 WS46	44.6	33	0	0	Thinning	
143	38	31	508	t14338w1310508	Northern Hardwoods	508 NH51	12.6	83	2018	0	Re-inventory.	
143	38	31	515	t14338w1310515	Northern Hardwoods	515 NH53	7.1	81	2018	0	Re-inventory.	
143	38	34	548	t14338w1340548	Aspen	548 A55	30.4	28	0	0	Uneven-aged Harvest	
143	39	4	24	t14339w1040024	Balsam Fir	24 BF54	21.8	65	0	0.2	On-site Evaluation	
143	39	4	25	t14339w1040025	Aspen	25 A56	16.3	75	0	0.2	Clearcut with Reserves	
143	39	9	33	t14339w1090033	Balsam Fir	33 BF54	8.9	65	0	0	On-site Evaluation	
143	39	9	48	t14339w1090048	Aspen	48 A56	4.5	69	0	0	Clearcut with Reserves	
143	39	10	47	t14339w1100047	Aspen	47 A56	4.6	69	0	0.4	Clearcut with Reserves	
143	39	13	262	t14339w1130262	Oak	262 O54	29.1	91	0	0	On-site Evaluation	
143	39	14	94	t14339w1140094	Aspen	94 A54	10.7	70	0	0	On-site Evaluation	
143	39	15	263	t14339w1150263	Aspen	263 A29	9.7	63	0	0	Re-inventory.	
143	39	16	264	t14339w1160264	Aspen	264 A29	6.6	68	0	0	Re-inventory.	
143	39	17	79	t14339w1170079	Aspen	79 A47	43.4	57	0	0	Clearcut with Reserves	
143	39	17	81	t14339w1170081	Tamarack	81 T53	4.6	105	0	0	On-site Evaluation	
143	39	24	280	t14339w1240280	Oak	280 O52	21.6	73	0	0	On-site Evaluation	
143	39	25	132	t14339w1250132	Northern Hardwoods	132 NH42	12.2	70	2018	0	Re-inventory.	
143	39	25	166	t14339w1250166	Northern Hardwoods	166 NH52	6.2	105	2018	0	Re-inventory.	
143	39	28	157	t14339w1280157	Aspen	157 A55	13.9	69	0	0	On-site Evaluation	
143	39	30	116	t14339w1300116	Tamarack	116 T52	6.1	146	0	0.2	On-site Evaluation	
143	39	33	224	t14339w1330224	Aspen	224 A34	10	44	0	0	On-site Evaluation	
143	39	34	178	t14339w1340178	Oak	178 O52	40.6	98	0	0	On-site Evaluation	
143	39	35	203	t14339w1350203	Tamarack	203 T42	7	108	0	0	On-site Evaluation	
143	39	35	235	t14339w1350235	Aspen	235 A52	5.9	80	0	0	Re-inventory.	
143	39	35	236	t14339w1350236	Northern Hardwoods	236 NH51	23.3	85	2018	0	Re-inventory.	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Bemidji Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
143	39	35	237	t14339w1350237	Balsam Fir	237 BF14	19.7	51	0	0	On-site Evaluation	
143	39	35	239	t14339w1350239	Northern Hardwoods	239 NH51	15.5	78	2018	0	Re-inventory.	
143	39	36	190	t14339w1360190	Norway Pine	190 NP32	80.6	31	0	0	Thinning	
143	39	36	231	t14339w1360231	White Spruce	231 WS33	26.3	47	2010	0	Thinning	
143	39	36	291	t14339w1360291	Norway Pine	291 NP65	21	110	0	0	On-site Evaluation	
143	40	25	263	t14340w1250263	Aspen	263 A51	8.4	79	0	0	On-site Evaluation	
143	40	25	265	t14340w1250265	Balsam Fir	265 BF24	9.4	41	0	0.1	On-site Evaluation	
143	40	25	285	t14340w1250285	Oak	285 O41	10.9	71	0	0	On-site Evaluation	
143	40	35	307	t14340w1350307	Aspen	307 A42	21.7	82	0	0	On-site Evaluation	
143	40	35	334	t14340w1350334	Aspen	334 A52	13.2	74	0	0.1	On-site Evaluation	
143	40	35	343	t14340w1350343	Aspen	343 A53	4.9	74	0	0	On-site Evaluation	
143	40	35	372	t14340w1350372	Aspen	372 A52	4.7	74	0	0	On-site Evaluation	
143	40	35	393	t14340w1350393	Aspen	393 A55	8.7	70	0	0	On-site Evaluation	
143	40	36	299	t14340w1360299	Oak	299 O41	3.5	71	0	0	On-site Evaluation	
143	40	36	316	t14340w1360316	Tamarack	316 T43	6.4	98	0	0	Re-inventory.	
143	40	36	324	t14340w1360324	Tamarack	324 T44	10.5	104	2010	0	Seed Tree	
143	40	36	380	t14340w1360380	Aspen	380 A45	4.9	79	0	0	On-site Evaluation	
143	40	36	381	t14340w1360381	Aspen	381 A42	7.4	79	0	0	On-site Evaluation	
143	40	36	400	t14340w1360400	Aspen	400 A45	5.9	79	0	0.1	On-site Evaluation	
144	37	19	345	t14437w1190345	Norway Pine	345 NP67	10.7	129	0	0	Thinning	
144	37	19	359	t14437w1190359	Norway Pine	359 NP65	14	124	0	0	Thinning	
144	37	19	379	t14437w1190379	Tamarack	379 T53	5.5	173	2010	0	Seed Tree	
144	37	19	429	t14437w1190429	Black Spruce, Lowland	429 BSL42	7.5	115	0	0	Seed Tree	
144	37	19	439	t14437w1190439	Cutover Area	439 COA	24.2	18	0	0	Re-inventory.	INC72
144	37	19	458	t14437w1190458	Tamarack	458 T45	4.3	136	0	0	Seed Tree	
144	37	19	473	t14437w1190473	Black Spruce, Lowland	473 BSL41	3.2	128	0	0	Seed Tree	
144	37	19	474	t14437w1190474	Cutover Area	474 COA	1.5	11	0	0	On-site Evaluation	
144	37	28	628	t14437w1280628	Birch	628 Bi52	23.8	84	0	0	Clearcut with Reserves	
144	37	30	485	t14437w1300485	Cutover Area	485 COA	6.5	11	0	0	Re-inventory.	INC72
144	37	30	512	t14437w1300512	Cutover Area	512 COA	6.1	11	0	0	Re-inventory.	INC72
144	37	30	548	t14437w1300548	Aspen	548 A53	6.3	74	0	0.2	On-site Evaluation	
144	37	30	549	t14437w1300549	Birch	549 Bi51	10.2	85	0	0	On-site Evaluation	
144	37	30	622	t14437w1300622	Aspen	622 A52	3.4	61	0	0	On-site Evaluation	
144	37	30	682	t14437w1300682	Norway Pine	682 NP57	3.1	101	0	0	Thinning	

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Forestry Area Bemidji Area

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
144	37	31	734	t14437w1310734	Aspen	734 A51	3.5	73	0	0	Re-inventory.	
144	37	33	807	t14437w1330807	Birch	807 Bi56	6.3	93	0	0	Clearcut with Reserves	
144	37	33	849	t14437w1330849	Tamarack	849 T42	19.2	102	0	0.2	Re-inventory.	
144	38	4	84	t14438w1040084	Tamarack	84 T42	5.6	111	0	0	On-site Evaluation	
144	38	4	185	t14438w1040185	Aspen	185 A54	3.9	66	0	0	On-site Evaluation	
144	38	6	12	t14438w1060012	Northern Hardwoods	12 NH53	36.3	120	0	0	Uneven-aged Harvest	
144	38	6	14	t14438w1060014	Ash	14 Ash55	16.7	134	0	0	Uneven-aged Harvest	
144	38	15	19	t14438w1150019	Northern Hardwoods	19 NH55	27.3	87	2013	0	Uneven-aged Harvest	
144	38	15	20	t14438w1150020	Aspen	20 A16	35.2	22	0	0	Re-inventory.	
144	38	21	27	t14438w1210027	Northern Hardwoods	27 NH55	32.2	79	2013	0	Group Selection	
144	38	24	138	t14438w1240138	Black Spruce, Lowland	138 BSL41	4	104	0	0	On-site Evaluation	
144	38	25	149	t14438w1250149	Aspen	149 A42	3.6	61	0	0	On-site Evaluation	
144	38	25	153	t14438w1250153	Birch	153 Bi42	5.8	43	0	0	On-site Evaluation	
144	38	25	154	t14438w1250154	Birch	154 Bi42	2.7	43	0	0	On-site Evaluation	
144	39	27	64	t14439w1270064	Balsam Fir	64 BF41	6.1	66	0	0.2	On-site Evaluation	
144	39	27	66	t14439w1270066	Aspen	66 A45	8.5	55	0	0	On-site Evaluation	

Forestry Area Brainerd Area

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
44	31	16	58	t04431w1160058	Norway Pine	58 NP31	5.8	27	0	0	Thinning	
44	31	16	59	t04431w1160059	Jack Pine	59 JP42	26	63	0	0	Clearcut with Reserves	
44	31	16	63	t04431w1160063	Norway Pine	63 NP21	2.5	22	0	0	Thinning	
44	31	16	64	t04431w1160064	Norway Pine	64 NP22	20.8	23	0	0	Thinning	
44	31	16	66	t04431w1160066	Norway Pine	66 NP31	8.6	20	0	0	Thinning	
44	31	16	115	t04431w1160115	Norway Pine	115 NP44	3.8	33	0	0	Thinning	
133	32	2	29	t13332w1020029	Norway Pine	29 NP12	54.5	20	0	0.2	Thinning	INC53
133	32	11	36	t13332w1110036	Oak	36 O 41	9.3	76	0	0.8	Clearcut with Reserves	COV53
133	32	11	128	t13332w1110128	White Spruce	128 WS 41	39.5	25	0	0	Thinning	INC53
133	32	11	129	t13332w1110129	Jack Pine	129 JP 55	3.8	46	0	0	Clearcut with Reserves	
134	28	16	29	t13428w1160029	Oak	29 O53	58.4	101	0	0	Thinning	
134	28	16	30	t13428w1160030	Oak	30 O55	2.7	78	0	0	Clearcut with Reserves	
134	28	16	33	t13428w1160033	Oak	33 O50	1.8	52	0	0	On-site Evaluation	
134	28	16	34	t13428w1160034	Oak	34 O55	2.8	78	0	0	Clearcut with Reserves	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area *Brainerd Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
134	28	16	37	t13428w1160037	Oak	37 O53	3.7	88	0	0	Clearcut with Reserves	
134	28	16	40	t13428w1160040	Oak	40 O53	1.6	88	0	0	Clearcut with Reserves	
134	28	16	44	t13428w1160044	Oak	44 O54	13.2	106	2012	0	Clearcut with Reserves	
134	28	16	49	t13428w1160049	Oak	49 O53	19.7	96	0	0	Clearcut with Reserves	
134	28	16	50	t13428w1160050	Oak	50 O54	16.7	106	2012	0	Clearcut with Reserves	
134	28	16	54	t13428w1160054	Oak	54 O53	29.4	113	0	0	Thinning	
134	28	16	59	t13428w1160059	Oak	59 O53	13.6	113	2012	0	Clearcut with Reserves	
134	28	16	63	t13428w1160063	Oak	63 O55	0.6	78	0	0	Clearcut with Reserves	
134	28	16	66	t13428w1160066	Oak	66 O42	1.4	86	0	0	Clearcut with Reserves	
134	28	16	70	t13428w1160070	Oak	70 O55	4.8	78	0	0	Clearcut with Reserves	
134	28	16	73	t13428w1160073	Oak	73 O53	13.8	96	0	0	Clearcut with Reserves	
134	29	6	11	t13429w1060011	White Pine	11 WP59	3.7	63	0	0	Thinning	
134	29	6	12	t13429w1060012	White Pine	12 WP58	3.2	67	0	0	Thinning	
134	29	6	14	t13429w1060014	White Pine	14 WP57	2.5	107	0	0	Thinning	
134	29	6	16	t13429w1060016	White Spruce	16 WS 59	3	76	0	0	Clearcut with Reserves	INC51 INC61
134	29	6	17	t13429w1060017	White Pine	17 WP59	3.4	63	0	0	Thinning	
134	29	6	19	t13429w1060019	White Pine	19 WP59	1	63	0	0	Thinning	
134	29	6	20	t13429w1060020	Norway Pine	20 NP59	8.9	84	0	0	Re-inventory.	
134	29	6	22	t13429w1060022	Aspen	22 A56	4	58	0	0	Clearcut with Reserves	INC51
134	29	6	27	t13429w1060027	White Pine	27 WP56	21.6	43	0	0	Thinning	
134	29	6	28	t13429w1060028	Norway Pine	28 NP21	12.3	24	0	0	Thinning	
134	29	6	29	t13429w1060029	Aspen	29 A53	5	46	0	0	Clearcut with Reserves	INC51
134	29	6	313	t13429w1060313	White Pine	313 WP59	0.9	76	0	0	Thinning	
134	29	6	334	t13429w1060334	Oak	334 O 58	0.2	93	0	0	Clearcut with Reserves	
134	29	7	35	t13429w1070035	Oak	35 O53	13	110	0	0	Clearcut with Reserves	
134	29	7	36	t13429w1070036	Aspen	36 A43	9.5	54	0	0	Clearcut with Reserves	
134	29	7	44	t13429w1070044	Oak	44 O54	29.2	105	0	0	Shelterwood	
134	29	7	45	t13429w1070045	Oak	45 O52	2.5	125	0	0	Clearcut with Reserves	
134	29	7	47	t13429w1070047	Aspen	47 A55	2.1	84	0	0	Re-inventory.	
134	29	7	51	t13429w1070051	White Pine	51 WP11	1.7	15	0	0	Clearcut with Reserves	
134	29	7	59	t13429w1070059	Jack Pine	59 JP54	1.8	85	0	0	Re-inventory.	
134	29	7	314	t13429w1070314	Oak	314 O53	0.7	96	0	0	Re-inventory.	COV61
134	29	7	315	t13429w1070315	Oak	315 O53	0.7	96	0	0	Re-inventory.	COV61
134	29	7	316	t13429w1070316	Oak	316 O53	0.7	96	0	0	Re-inventory.	COV61

Subsection **Pine Moraines & Outwash Plains**

Forestry Area *Brainerd Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
134	29	22	127	t13429w1220127	Norway Pine	127 NP22	5.4	22	0	0	Thinning	
134	29	22	128	t13429w1220128	Northern Hardwoods	128 NH56	3.5	99	0	0	Re-inventory.	
134	29	22	130	t13429w1220130	Jack Pine	130 JP54	23.5	61	0	0	Clearcut with Reserves	
134	29	34	232	t13429w1340232	Jack Pine	232 JP56	2.8	54	0	0	Clearcut with Reserves	
134	29	34	238	t13429w1340238	Oak	238 O53	7.3	72	0	0	Clearcut with Reserves	
134	29	34	247	t13429w1340247	Jack Pine	247 JP43	3.3	61	0	0	Clearcut with Reserves	
134	29	34	262	t13429w1340262	Norway Pine	262 NP21	9.9	23	0	0	Thinning	
134	29	34	268	t13429w1340268	Norway Pine	268 NP21	3.2	22	0	0	Thinning	
134	30	1	10	t13430w1010010	Norway Pine	10 NP45	14.2	45	0	0	Thinning	
134	30	1	22	t13430w1010022	White Pine	22 WP43	4.1	45	0	0	Clearcut with Reserves	
134	30	1	24	t13430w1010024	White Spruce	24 WS56	3.8	45	0	0	Thinning	
134	30	1	27	t13430w1010027	White Pine	27 WP 56	17.1	63	0	0	Thinning	
134	30	1	28	t13430w1010028	Norway Pine	28 NP57	26.2	44	0	0	Thinning	
134	30	1	29	t13430w1010029	White Pine	29 WP 56	22	50	0	0	Shelterwood	
134	30	1	30	t13430w1010030	White Spruce	30 WS56	8.1	45	0	0	Thinning	
134	30	1	35	t13430w1010035	White Pine	35 WP43	4.2	44	0	0	Clearcut with Reserves	
134	30	1	39	t13430w1010039	Norway Pine	39 NP 57	27.2	49	0	0	Thinning	
134	30	1	41	t13430w1010041	Norway Pine	41 NP45	3.2	43	0	0	Thinning	
134	30	1	42	t13430w1010042	White Pine	42 WP 55	8.7	49	0	0	Thinning	
134	30	1	43	t13430w1010043	White Pine	43 WP 56	8.5	63	0	0	Thinning	
134	30	8	110	t13430w1080110	Norway Pine	110 NP58	15	54	0	0	Thinning	INC51
134	30	8	119	t13430w1080119	Norway Pine	119 NP55	9.8	40	0	0	Thinning	INC51
134	30	8	126	t13430w1080126	Norway Pine	126 NP59	4.3	52	0	0	Thinning	INC51
134	30	8	149	t13430w1080149	White Pine	149 WP57	1.5	54	0	0	Thinning	
134	30	10	54	t13430w1100054	Aspen	54 A56	8	52	2011	0	Clearcut with Reserves	INC51
134	30	10	55	t13430w1100055	Aspen	55 A46	20.2	56	2011	0	Clearcut with Reserves	INC51
134	30	10	71	t13430w1100071	White Pine	71 WP58	44.5	86	0	0	Thinning	
134	30	10	72	t13430w1100072	White Pine	72 WP53	2.1	55	0	0	Clearcut with Reserves	
134	30	10	82	t13430w1100082	White Pine	82 WP62	4.5	85	0	0	Clearcut with Reserves	
134	30	10	85	t13430w1100085	White Pine	85 WP53	5.8	52	0	0	Thinning	
134	30	10	105	t13430w1100105	Aspen	105 A54	21.5	74	0	0	Clearcut with Reserves	
134	30	10	112	t13430w1100112	Norway Pine	112 NP21	5.1	17	0	0	Thinning	
134	30	10	115	t13430w1100115	Jack Pine	115 JP57	2.1	63	0	0	Clearcut with Reserves	
134	30	10	134	t13430w1100134	Aspen	134 A57	13.2	69	0	0	Clearcut with Reserves	COV51

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Brainerd Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
134	30	10	148	t13430w1100148	Oak	148 O56	44.2	83	0	0	On-site Evaluation	
134	30	10	155	t13430w1100155	Norway Pine	155 NP45	4.2	43	0	0	Thinning	
134	30	10	164	t13430w1100164	White Spruce	164 WS43	1.5	44	0	0	Thinning	
134	30	10	191	t13430w1100191	Aspen	191 A56	22.7	62	0	0	Clearcut with Reserves	
134	30	11	77	t13430w1110077	White Pine	77 WP53	7.6	52	0	0	Thinning	
134	30	11	94	t13430w1110094	Aspen	94 A54	2.4	71	0	0	Re-inventory.	
134	30	11	96	t13430w1110096	Norway Pine	96 NP32	6	17	2016	0	On-site Evaluation	
134	30	11	104	t13430w1110104	White Pine	104 WP11	2.5	17	0	0	Re-inventory.	
134	30	11	113	t13430w1110113	White Pine	113 WP47	2.8	68	0	0	Thinning	
134	30	11	114	t13430w1110114	White Pine	114 WP11	4.1	15	0	0	Re-inventory.	
134	30	11	137	t13430w1110137	White Pine	137 WP47	0.7	68	0	0	Thinning	
134	30	11	140	t13430w1110140	White Pine	140 WP47	4.5	68	0	0	Thinning	
134	30	11	146	t13430w1110146	Aspen	146 A54	5.7	72	0	0	Re-inventory.	
134	30	11	157	t13430w1110157	White Pine	157 WP47	4.2	68	0	0	Thinning	
134	30	11	160	t13430w1110160	Aspen	160 A57	1.5	55	0	0	Re-inventory.	
134	30	12	90	t13430w1120090	Norway Pine	90 NP21	9	23	0	0	Thinning	
134	30	12	91	t13430w1120091	Norway Pine	91 NP59	51.5	95	0	0	On-site Evaluation	
134	30	12	121	t13430w1120121	Cutover Area	121 COA	26	7	0	0	Re-inventory.	COV52
134	30	12	128	t13430w1120128	Aspen	128 A56	3.4	75	0	0	Re-inventory.	
134	30	12	133	t13430w1120133	White Pine	133 WP12	5.2	15	0	0	Re-inventory.	
134	30	12	147	t13430w1120147	White Pine	147 WP55	4.2	63	0	0	Thinning	
134	30	12	154	t13430w1120154	Aspen	154 A55	7.7	65	0	0	Clearcut with Reserves	INC53 INC51
134	30	12	178	t13430w1120178	Norway Pine	178 NP57	13.8	84	0	0	On-site Evaluation	
134	30	13	225	t13430w1130225	White Spruce	225 WS21	7.4	4	0	0	Re-inventory.	
134	30	13	755	t13430w1130755	Aspen	755 A54	5.3	52	0	0	Clearcut with Reserves	
134	30	13	757	t13430w1130757	White Pine	757 WP53	4.3	58	0	0	Thinning	
134	30	13	782	t13430w1130782	Aspen	782 A54	4.4	52	0	0	Clearcut with Reserves	
134	30	13	783	t13430w1130783	Aspen	783 A54	0.5	52	0	0	Clearcut with Reserves	
134	30	13	845	t13430w1130845	White Pine	845 WP 43	2.4	43	0	0	Thinning	
134	30	14	270	t13430w1140270	Aspen	270 A32	58.3	31	2016	0	Clearcut with Reserves	
134	30	14	305	t13430w1140305	Aspen	305 A53	36.9	47	2016	0	Clearcut with Reserves	
134	30	14	337	t13430w1140337	White Spruce	337 WS21	8.6	17	0	0	Thinning	
134	30	15	214	t13430w1150214	Aspen	214 A55	8.4	58	0	0	Clearcut with Reserves	
134	30	15	218	t13430w1150218	Aspen	218 A55	31.5	58	0	0	Clearcut with Reserves	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area *Brainerd Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
134	30	15	234	t13430w1150234	White Pine	234 WP12	5.6	21	0	0	Clearcut with Reserves	
134	30	15	238	t13430w1150238	Aspen	238 A43	56.2	65	0	0	Clearcut with Reserves	
134	30	15	244	t13430w1150244	Aspen	244 A54	7.7	65	0	0	Clearcut with Reserves	
134	30	15	277	t13430w1150277	Aspen	277 A44	11	61	0	0	Clearcut with Reserves	
134	30	15	283	t13430w1150283	Aspen	283 A55	47.2	66	0	0	Clearcut with Reserves	
134	30	15	336	t13430w1150336	Aspen	336 A55	15.9	66	0	0	Clearcut with Reserves	
134	30	16	288	t13430w1160288	Oak	288 O53	115.7	73	0	0	Clearcut with Reserves	
134	30	16	289	t13430w1160289	Aspen	289 A54	1	58	0	0	Clearcut with Reserves	
134	30	16	307	t13430w1160307	Aspen	307 A54	16	54	0	0	Clearcut with Reserves	
134	30	16	334	t13430w1160334	Norway Pine	334 NP46	23.1	43	0	0	Thinning	
134	30	16	346	t13430w1160346	Norway Pine	346 NP46	2.7	43	0	0	Thinning	
134	30	16	814	t13430w1160814	Aspen	814 A54	11	54	0	0	Clearcut with Reserves	
134	30	17	202	t13430w1170202	Aspen	202 A58	11.1	65	0	0	Clearcut with Reserves	INC51
134	30	17	339	t13430w1170339	Oak	339 O54	19.6	83	0	0	Clearcut with Reserves	
134	30	17	350	t13430w1170350	Oak	350 O54	48.1	83	0	0	Clearcut with Reserves	
134	30	20	439	t13430w1200439	Norway Pine	439 NP31	4.8	28	0	0	Thinning	
134	30	20	456	t13430w1200456	Norway Pine	456 NP12	31.1	26	0	0	Thinning	
134	30	21	365	t13430w1210365	Oak	365 O54	44.4	84	0	0	Clearcut with Reserves	
134	30	21	385	t13430w1210385	Jack Pine	385 JP32	40.2	33	0	0	Uneven-aged Harvest	
134	30	21	402	t13430w1210402	Aspen	402 A23	10.6	34	0	0	Uneven-aged Harvest	
134	30	21	460	t13430w1210460	Norway Pine	460 NP12	32.2	20	0	0	Thinning	
134	30	22	403	t13430w1220403	Oak	403 O53	15	64	0	0	Clearcut with Reserves	
134	30	22	405	t13430w1220405	Oak	405 O53	10.2	64	0	0	Clearcut with Reserves	
134	30	22	423	t13430w1220423	Oak	423 O53	15	64	0	0	Clearcut with Reserves	
134	30	22	835	t13430w1220835	Norway Pine	835 NP 59	3	39	0	0	On-site Evaluation	
134	30	22	836	t13430w1220836	Oak	836 O 54	124.7	62	0	0	On-site Evaluation	
134	30	23	387	t13430w1230387	Norway Pine	387 NP21	15.9	23	0	0	Thinning	
134	30	26	487	t13430w1260487	Unknown	487 *Unk	8	4	0	0	Re-inventory.	
134	30	26	526	t13430w1260526	Unknown	526 *Unk	28.8	4	0	0	Re-inventory.	
134	30	26	543	t13430w1260543	Norway Pine	543 NP21	20.7	23	0	0	Thinning	
134	30	26	574	t13430w1260574	Oak	574 O54	13	77	0	0	Clearcut with Reserves	
134	30	26	587	t13430w1260587	Oak	587 O54	30.7	68	0	0	Clearcut with Reserves	
134	30	27	482	t13430w1270482	Oak	482 O45	292.8	71	0	0	On-site Evaluation	
134	30	27	498	t13430w1270498	Oak	498 O45	24	71	0	0	Clearcut with Reserves	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Brainerd Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
134	30	27	523	t13430w1270523	Aspen	523 A45	17.9	63	0	0	Clearcut with Reserves	
134	30	27	525	t13430w1270525	Oak	525 O45	34.8	71	0	0	Clearcut with Reserves	
134	30	27	529	t13430w1270529	White Spruce	529 WS11	2.5	21	0	0	Thinning	
134	30	27	537	t13430w1270537	Jack Pine	537 JP43	14.3	41	0	0	On-site Evaluation	
134	30	27	539	t13430w1270539	Aspen	539 A42	3.6	42	0	0	On-site Evaluation	
134	30	27	561	t13430w1270561	Aspen	561 A42	3.6	41	0	0	On-site Evaluation	
134	30	27	565	t13430w1270565	Norway Pine	565 NP57	16	41	0	0	Thinning	
134	30	27	567	t13430w1270567	Norway Pine	567 NP51	1.5	41	0	0	Thinning	
134	30	27	573	t13430w1270573	Norway Pine	573 NP54	12.5	41	0	0	Thinning	
134	30	28	509	t13430w1280509	Norway Pine	509 NP21	2.7	28	0	0	Thinning	
134	30	28	511	t13430w1280511	Norway Pine	511 NP21	2.5	28	0	0	Thinning	
134	30	28	513	t13430w1280513	Norway Pine	513 NP21	32.4	28	0	0	Thinning	
134	30	28	514	t13430w1280514	Norway Pine	514 NP21	6.3	28	0	0	Thinning	
134	30	28	536	t13430w1280536	Jack Pine	536 JP43	3.3	48	0	0	Clearcut with Reserves	
134	30	28	548	t13430w1280548	Norway Pine	548 NP21	15	23	0	0	Thinning	
134	30	28	715	t13430w1280715	Oak	715 O45	183.1	71	0	0	Shelterwood	
134	30	28	716	t13430w1280716	Norway Pine	716 NP57	11.4	37	0	0	Thinning	
134	30	33	630	t13430w1330630	Jack Pine	630 JP53	2	46	0	0	Clearcut with Reserves	
134	30	33	640	t13430w1330640	Norway Pine	640 NP23	4.4	24	0	0	Thinning	
134	30	33	722	t13430w1330722	Norway Pine	722 NP43	40.9	40	0	0	Thinning	
134	30	33	723	t13430w1330723	Birch	723 Bi53	4.3	54	0	0	Clearcut with Reserves	
134	30	33	730	t13430w1330730	Aspen	730 A53	2.6	69	0	0	Clearcut with Reserves	
134	30	33	732	t13430w1330732	Aspen	732 A44	3.3	54	0	0	Clearcut with Reserves	
134	30	33	733	t13430w1330733	Jack Pine	733 JP52	1.9	56	0	0	Clearcut with Reserves	
134	30	33	735	t13430w1330735	Aspen	735 A54	5.5	34	0	0	On-site Evaluation	
134	30	33	737	t13430w1330737	Aspen	737 A44	8.9	44	0	0	Clearcut with Reserves	
134	30	34	645	t13430w1340645	White Pine	645 WP42	1.5	38	0	0	Clearcut with Reserves	
134	30	34	668	t13430w1340668	Norway Pine	668 NP44	26.1	41	0	0	Thinning	
134	30	34	670	t13430w1340670	Oak	670 O44	40.1	68	0	0	Clearcut with Reserves	
134	30	34	698	t13430w1340698	Jack Pine	698 JP43	16.6	57	0	0	Clearcut with Reserves	
134	30	35	606	t13430w1350606	Oak	606 O54	117.9	68	0	0	Clearcut with Reserves	
134	30	35	799	t13430w1350799	Oak	799 O59	105.7	67	0	0	Shelterwood	
134	30	36	643	t13430w1360643	Norway Pine	643 NP66	3.5	101	0	0	Clearcut with Reserves	
134	30	36	654	t13430w1360654	White Pine	654 WP58	2.9	49	0	0	Thinning	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
134	30	36	666	t13430w1360666	Norway Pine	666 NP57	5.8	38	0	0	Thinning	
134	31	36	46	t13431w1360046	Aspen	46 A43	7.9	67	0	0	On-site Evaluation	
134	32	16	92	t13432w1160092	Jack Pine	92 JP45	10	45	0	0	Clearcut with Reserves	MA1
134	32	16	94	t13432w1160094	Jack Pine	94 JP54	10.9	48	0	0	Clearcut with Reserves	MA1
134	32	16	96	t13432w1160096	Aspen	96 A 44	40.9	41	0	0	Clearcut with Reserves	
134	32	16	98	t13432w1160098	Jack Pine	98 JP54	3.3	48	0	0	Clearcut with Reserves	MA1
134	32	16	139	t13432w1160139	Aspen	139 A 43	9.2	46	0	0	Clearcut with Reserves	
135	27	9	18	t13527w1090018	Norway Pine	18 NP44	3.7	56	0	0	On-site Evaluation	
135	27	9	19	t13527w1090019	Aspen	19 A53	10.4	69	0	0	Re-inventory.	
135	27	9	21	t13527w1090021	Ash	21 Ash52	16.7	88	0	0	Re-inventory.	
135	27	16	36	t13527w1160036	Oak	36 O52	11.7	77	0	0	Clearcut with Reserves	
135	27	16	67	t13527w1160067	Norway Pine	67 NP 44	25.2	29	0	0	Thinning	
135	27	16	68	t13527w1160068	Norway Pine	68 NP 58	10.6	33	0	0	Thinning	
135	28	16	22	t13528w1160022	Norway Pine	22 NP11	18.3	27	0	0	Thinning	
135	28	16	37	t13528w1160037	Aspen	37 A55	7.1	65	2011	0	Clearcut with Reserves	
135	28	16	38	t13528w1160038	Norway Pine	38 NP44	8.5	33	2011	0	Thinning	
135	28	16	39	t13528w1160039	Norway Pine	39 NP31	10.8	23	2011	0	Thinning	
135	28	16	40	t13528w1160040	Oak	40 O53	6	79	2011	0	Clearcut with Reserves	
135	28	16	41	t13528w1160041	Norway Pine	41 NP44	7.6	34	2011	0	Thinning	
135	28	16	43	t13528w1160043	Aspen	43 A44	10.1	54	0	0	Clearcut with Reserves	
135	28	16	89	t13528w1160089	Jack Pine	89 JP42	4.9	51	0	0	Uneven-aged Harvest	
135	28	36	67	t13528w1360067	Oak	67 O55	48.2	85	0	0	On-site Evaluation	INC53
135	28	36	77	t13528w1360077	Black Spruce, Lowland	77 BSL31	13.7	22	0	0	Re-inventory.	
135	28	36	81	t13528w1360081	Aspen	81 A33	11.1	32	0	0	Re-inventory.	
135	28	36	83	t13528w1360083	Jack Pine	83 JP51	3.6	53	0	0	Re-inventory.	
135	28	36	84	t13528w1360084	Jack Pine	84 JP42	8	57	0	0	On-site Evaluation	
135	28	36	87	t13528w1360087	Black Spruce, Lowland	87 BSL31	17	22	0	0	Re-inventory.	
135	29	12	15	t13529w1120015	Oak	15 O52	15.1	85	0	0	Clearcut with Reserves	
135	29	12	23	t13529w1120023	Jack Pine	23 JP42	3	38	2016	0	Clearcut with Reserves	
135	30	36	62	t13530w1360062	Jack Pine	62 JP45	2.8	45	0	0.4	Clearcut with Reserves	
135	30	36	64	t13530w1360064	Jack Pine	64 JP54	5.3	67	0	0	Clearcut with Reserves	
135	30	36	66	t13530w1360066	Aspen	66 A56	3.2	56	0	0	Clearcut with Reserves	
135	30	36	73	t13530w1360073	Aspen	73 A56	0.8	56	0	0	Clearcut with Reserves	
135	31	14	224	t13531w1140224	Aspen	224 A53	16.6	67	0	0	Clearcut with Reserves	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
135	31	14	237	t13531w1140237	Aspen	237 A55	8.8	66	0	0	Clearcut with Reserves	
135	31	14	239	t13531w1140239	Birch	239 Bi54	6.7	62	0	0	Clearcut with Reserves	
135	31	14	261	t13531w1140261	Birch	261 Bi54	1.9	62	0	0	Clearcut with Reserves	
135	31	14	270	t13531w1140270	Aspen	270 A54	12.8	73	0	0	Clearcut with Reserves	
135	31	14	718	t13531w1140718	Aspen	718 A54	9.4	70	0	0	Clearcut with Reserves	
135	31	15	196	t13531w1150196	Birch	196 Bi44	2.5	77	0	0.4	Clearcut with Reserves	
135	31	15	238	t13531w1150238	Birch	238 Bi44	22.3	72	0	0	Clearcut with Reserves	
135	31	15	243	t13531w1150243	Ash	243 Ash55	9.8	85	0	0	Thinning	
135	31	15	255	t13531w1150255	Aspen	255 A52	30.7	68	0	0	Clearcut with Reserves	
135	31	15	264	t13531w1150264	Ash	264 Ash55	7.4	90	0	0	Thinning	
135	31	15	269	t13531w1150269	Ash	269 Ash44	10.9	84	0	0	Thinning	
135	31	15	695	t13531w1150695	Ash	695 Ash55	16.6	85	0	0.6	Thinning	
135	31	21	285	t13531w1210285	Aspen	284 A43	27.8	62	0	0	Re-inventory.	
135	31	21	305	t13531w1210305	Aspen	305 A45	13.2	66	0	1.4	Clearcut with Reserves	
135	31	21	309	t13531w1210309	Birch	309 Bi53	14.6	71	2010	0	Clearcut with Reserves	MA1
135	31	21	334	t13531w1210334	Aspen	334 A52	2	82	0	0	Clearcut with Reserves	
135	31	21	342	t13531w1210342	Aspen	342 A52	7.4	82	0	0	Clearcut with Reserves	
135	31	21	376	t13531w1210376	Aspen	376 A56	2.1	54	0	0	Clearcut with Reserves	
135	31	21	412	t13531w1210412	Oak	412 O45	8.5	85	0	0	Clearcut with Reserves	
135	31	22	291	t13531w1220291	Ash	291 Ash44	85.9	84	0	0	Thinning	
135	31	22	311	t13531w1220311	Aspen	311 A52	12.4	82	0	0	Clearcut with Reserves	
135	31	22	340	t13531w1220340	Aspen	340 A44	9.7	59	0	0	Clearcut with Reserves	
135	31	22	380	t13531w1220380	Aspen	380 A53	12	71	0	0	Clearcut with Reserves	
135	31	22	381	t13531w1220381	Aspen	381 A56	1.5	54	0	0	Clearcut with Reserves	
135	31	23	302	t13531w1230302	Aspen	302 A55	32	70	0	0	Clearcut with Reserves	
135	31	23	407	t13531w1230407	Aspen	407 A55	9.5	70	0	0	Clearcut with Reserves	
135	31	23	422	t13531w1230422	Aspen	422 A53	16.3	68	0	0	Clearcut with Reserves	
135	31	24	360	t13531w1240360	Oak	360 O55	88.1	94	2015	0	Shelterwood	MA1
135	31	24	368	t13531w1240368	Oak	368 O54	4.1	82	0	0	On-site Evaluation	
135	31	25	480	t13531w1250480	Aspen	480 A55	16.4	66	0	0	Re-inventory.	
135	31	25	501	t13531w1250501	Birch	501 Bi45	20	67	0	0	Clearcut with Reserves	
135	31	25	504	t13531w1250504	Aspen	504 A55	11.4	66	0	0.6	Clearcut with Reserves	
135	31	25	527	t13531w1250527	Birch	527 Bi45	16.1	67	0	0	Clearcut with Reserves	
135	31	25	562	t13531w1250562	Aspen	562 A54	9.8	71	0	0	Clearcut with Reserves	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
135	31	26	443	t13531w1260443	Aspen	443 A54	17.6	58	0	0	Clearcut with Reserves	
135	31	26	459	t13531w1260459	Cutover Area	459 COA	7.7	46	0	0	Re-inventory.	
135	31	26	484	t13531w1260484	Cutover Area	484 COA	9.1	70	0	0	Re-inventory.	
135	31	26	513	t13531w1260513	Aspen	513 A54	7.6	76	0	0	Clearcut with Reserves	
135	31	26	526	t13531w1260526	Aspen	526 A55	19	70	0	0	Clearcut with Reserves	
135	31	26	554	t13531w1260554	Aspen	554 A55	10.1	70	0	0	Clearcut with Reserves	
135	31	27	442	t13531w1270442	Unknown	*Unk	78.1	0	0	0	Re-inventory.	
135	31	27	450	t13531w1270450	Unknown	*Unk	26.9	0	0	0	Re-inventory.	
135	31	27	551	t13531w1270551	Oak	551 O53	11.9	88	0	0	Clearcut with Reserves	
135	31	27	733	t13531w1270733	Aspen	733 A 54	32.2	63	0	0.5	Clearcut with Reserves	
135	31	36	594	t13531w1360594	Aspen	594 A54	2.1	71	0	0	Clearcut with Reserves	
135	31	36	627	t13531w1360627	Aspen	627 A55	13.7	78	0	0	Clearcut with Reserves	
135	31	36	676	t13531w1360676	Aspen	676 A54	5.3	77	0	0	Clearcut with Reserves	
135	31	36	680	t13531w1360680	Oak	680 O54	10.6	82	0	0	Clearcut with Reserves	
135	31	36	681	t13531w1360681	Aspen	681 A55	9.4	69	0	0.5	Clearcut with Reserves	
135	32	6	32	t13532w1060032	Cutover Area	32 COA	29.9	5	0	0	Re-inventory.	COV84
135	32	16	69	t13532w1160069	Jack Pine	69 JP 55	5.5	62	0	0	Clearcut with Reserves	
135	32	16	86	t13532w1160086	Jack Pine	86 JP 55	2	62	0	0	Clearcut with Reserves	
135	32	16	87	t13532w1160087	Aspen	87 A 54	19.5	53	0	0	Clearcut with Reserves	
136	27	2	120	t13627w1020120	Norway Pine	120 NP44	29.8	30	0	0	Thinning	
136	27	2	124	t13627w1020124	Norway Pine	124 NP24	6.2	21	0	0	Thinning	
136	27	2	145	t13627w1020145	Oak	145 O 55	28.1	66	0	0	Clearcut with Reserves	
136	27	2	149	t13627w1020149	Oak	149 O 54	17.8	66	0	0	Clearcut with Reserves	
136	27	2	155	t13627w1020155	Jack Pine	155 JP 54	6.7	55	0	0	Clearcut with Reserves	
136	27	5	3	t13627w1050003	Norway Pine	3 NP54	15.1	37	2016	0	Thinning	
136	27	5	107	t13627w1050107	Oak	107 O43	27.3	66	0	0	Clearcut with Reserves	INC53
136	27	5	111	t13627w1050111	Aspen	111 A57	7.8	59	2010	0	Clearcut with Reserves	
136	27	5	117	t13627w1050117	Aspen	117 A43	5.4	42	2010	0	Clearcut with Reserves	
136	27	5	178	t13627w1050178	Norway Pine	178 NP54	30	37	2016	0	Thinning	
136	27	6	5	t13627w1060005	Oak	5 O53	9.1	87	0	0	Clearcut with Reserves	
136	27	6	6	t13627w1060006	Aspen	6 A54	9.2	54	0	0	Clearcut with Reserves	
136	27	6	7	t13627w1060007	Oak	7 O53	6.9	87	0	0	Clearcut with Reserves	
136	27	6	8	t13627w1060008	Oak	8 O53	3.1	102	0	0	Re-inventory.	
136	27	6	9	t13627w1060009	Jack Pine	9 JP55	5.9	69	0	0	Clearcut with Reserves	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
136	27	6	11	t13627w1060011	Oak	11 O53	4.2	87	0	0	Clearcut with Reserves	
136	27	6	13	t13627w1060013	Oak	13 O53	3.2	87	0	0	Clearcut with Reserves	
136	27	6	15	t13627w1060015	Oak	15 O53	5.3	113	0	0	Clearcut with Reserves	
136	27	16	41	t13627w1160041	Norway Pine	41 NP46	7.2	43	2013	0	Thinning	
136	27	16	52	t13627w1160052	Norway Pine	52 NP32	3.4	23	2013	0	Thinning	
136	27	16	59	t13627w1160059	Norway Pine	59 NP32	15.8	23	0	0	Thinning	
136	27	16	67	t13627w1160067	Norway Pine	67 NP58	6.7	64	2017	0	Thinning	
136	27	16	179	t13627w1160179	Norway Pine	179 NP 57	31.6	50	2017	0	Thinning	
136	27	18	31	t13627w1180031	Norway Pine	31 NP53	6.2	43	0	0	Thinning	
136	27	18	49	t13627w1180049	Norway Pine	49 NP22	8.2	20	0	0	Thinning	
136	28	1	8	t13628w1010008	Oak	8 O53	14.9	82	0	0	Clearcut with Reserves	INC53
136	28	1	18	t13628w1010018	Oak	18 O53	10.2	89	0	0.3	Clearcut with Reserves	
136	28	9	26	t13628w1090026	Norway Pine	26 NP47	41	44	2015	0	Thinning	
136	29	13	15	t13629w1130015	Aspen	15 A44	18.3	55	0	0	On-site Evaluation	
136	29	13	16	t13629w1130016	Oak	16 O55	4.3	89	0	1.7	On-site Evaluation	
136	29	13	19	t13629w1130019	Oak	19 O53	5.7	89	0	0	On-site Evaluation	
136	29	16	13	t13629w1160013	Norway Pine	13 NP11	6	17	0	0.2	Thinning	
136	29	16	17	t13629w1160017	Norway Pine	17 NP 31	4.1	17	0	0	Thinning	
136	29	16	20	t13629w1160020	Jack Pine	20 JP45	7.7	51	0	0	Clearcut with Reserves	
136	29	16	21	t13629w1160021	Norway Pine	21 NP33	4.5	32	0	0	Thinning	
136	29	16	25	t13629w1160025	Norway Pine	25 NP44	9.4	58	0	0.2	Thinning	
136	29	16	26	t13629w1160026	Norway Pine	26 NP33	14.5	32	0	0	Thinning	
136	29	20	28	t13629w1200028	Tamarack	28 T43	3.5	120	0	1	Clearcut with Reserves	
136	29	20	32	t13629w1200032	Norway Pine	32 NP11	2.7	17	0	0	Thinning	
136	29	20	33	t13629w1200033	White Spruce	33 WS11	10.9	17	0	0	Thinning	
136	29	20	35	t13629w1200035	White Spruce	35 WS11	7.3	17	0	0	Thinning	
136	29	36	45	t13629w1360045	Norway Pine	45 NP52	2.2	66	0	0	Thinning	
136	29	36	52	t13629w1360052	Tamarack	52 T42	12.8	130	0	0	Seed Tree	
136	29	36	54	t13629w1360054	Norway Pine	54 NP43	2.8	30	0	0	Thinning	
136	29	36	55	t13629w1360055	Norway Pine	55 NP22	4.1	15	0	0	Thinning	
136	29	36	62	t13629w1360062	White Spruce	62 WS11	22.1	22	0	0	Thinning	
136	29	36	63	t13629w1360063	Norway Pine	63 NP42	5.2	30	0	0	Thinning	
136	31	12	6	t13631w1120006	Balsam Fir	6 BF41	26.9	51	0	0.6	Clearcut with Reserves	
136	31	16	38	t13631w1160038	Birch	38 Bi53	66.2	75	0	0	Clearcut with Reserves	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
136	31	16	39	t13631w1160039	Aspen	39 A54	41.8	71	0	0	Re-inventory.	
136	31	16	42	t13631w1160042	Oak	42 O53	9.3	61	0	0.5	Re-inventory.	
136	31	16	43	t13631w1160043	Norway Pine	43 NP76	4.5	104	0	0	Re-inventory.	
136	31	16	48	t13631w1160048	Aspen	48 A54	12.3	63	0	0.4	Clearcut with Reserves	
136	31	16	53	t13631w1160053	Oak	53 O55	77.1	75	0	0	Clearcut with Reserves	
136	31	22	59	t13631w1220059	Tamarack	59 T41	7.1	44	0	0	On-site Evaluation	
136	31	22	60	t13631w1220060	Tamarack	60 T42	15.8	90	0	0.7	Clearcut with Reserves	
136	31	22	62	t13631w1220062	Aspen	62 A53	2.2	64	0	0	Clearcut with Reserves	
136	31	22	70	t13631w1220070	Aspen	70 A52	3.8	64	0	0	Clearcut with Reserves	
136	31	36	81	t13631w1360081	Oak	81 O53	5.5	97	0	0	On-site Evaluation	
136	31	36	91	t13631w1360091	Oak	91 O52	55.1	87	0	0.3	Shelterwood	
136	31	36	96	t13631w1360096	White Spruce	96 WS11	8.5	25	0	0	Thinning	
136	31	36	104	t13631w1360104	Oak	104 O53	5.1	86	0	0	Clearcut with Reserves	
136	31	36	108	t13631w1360108	Aspen	108 A15	6.1	107	0	0	Re-inventory.	
136	32	8	10	t13632w1080010	Aspen	10 A42	14.3	48	2016	0	Clearcut with Reserves	
136	32	8	13	t13632w1080013	Jack Pine	13 JP41	5	50	2016	0	Clearcut with Reserves	
136	32	8	14	t13632w1080014	Aspen	14 A42	5.3	49	2016	0.9	Clearcut with Reserves	
136	32	16	25	t13632w1160025	Norway Pine	25 NP 42	8.8	25	0	0	Thinning	
136	32	16	33	t13632w1160033	Norway Pine	33 NP 41	7.6	24	0	0	Thinning	
136	32	16	34	t13632w1160034	Norway Pine	34 NP42	10.8	30	0	0	Thinning	
136	32	16	38	t13632w1160038	White Spruce	38 WS12	14.7	21	0	0	Thinning	
136	32	16	42	t13632w1160042	Oak	42 O42	3.5	50	0	0	On-site Evaluation	INC53
136	32	16	49	t13632w1160049	Oak	49 O41	10.2	51	2012	0.3	On-site Evaluation	INC53
136	32	31	69	t13632w1310069	Jack Pine	69 JP41	30.9	51	0	0	Clearcut with Reserves	
136	32	31	70	t13632w1310070	Jack Pine	70 JP41	18.5	51	0	0	Clearcut with Reserves	
136	32	31	71	t13632w1310071	Jack Pine	71 JP41	1.4	51	0	0	Clearcut with Reserves	
137	27	14	38	t13727w1140038	Oak	38 O56	5.8	73	0	0	Clearcut with Reserves	
137	27	14	196	t13727w1140196	Oak	196 O55	23.1	77	0	0	Clearcut with Reserves	
137	27	14	212	t13727w1140212	Oak	212 O46	8.3	77	0	0	Clearcut with Reserves	
137	27	14	214	t13727w1140214	White Spruce	214 WS11	25.1	18	0	0	Thinning	
137	27	14	215	t13727w1140215	Northern Hardwoods	215 NH56	2.6	73	0	0	Thinning	
137	27	15	22	t13727w1150022	Norway Pine	22 NP59	13.7	46	0	0	Thinning	
137	27	15	23	t13727w1150023	Norway Pine	23 NP31	25.4	33	0	0	Thinning	
137	27	15	24	t13727w1150024	Norway Pine	24 NP59	16	48	0	0	Thinning	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
137	27	15	136	t13727w1150136	Norway Pine	136 NP56	18.7	42	0	0	Thinning	
137	27	15	199	t13727w1150199	Oak	199 O55	10.7	84	0	0	Clearcut with Reserves	
137	27	15	208	t13727w1150208	Oak	208 O55	3.9	84	0	0	Clearcut with Reserves	
137	27	15	213	t13727w1150213	White Spruce	213 WS11	40.3	18	0	0	Thinning	
137	27	16	32	t13727w1160032	Oak	32 O54	20	75	0	0	Clearcut with Reserves	INC53
137	27	16	37	t13727w1160037	Oak	37 O52	17.2	78	0	0	Clearcut with Reserves	COV53
137	27	16	140	t13727w1160140	Norway Pine	140 NP22	8	13	0	0	Thinning	
137	27	16	301	t13727w1160301	White Pine	301 WP12	0.5	4	0	0	Re-inventory.	
137	27	22	54	t13727w1220054	Norway Pine	54 NP44	3.5	41	0	0	Thinning	
137	27	22	58	t13727w1220058	Norway Pine	58 NP43	4.5	41	0	0	Thinning	
137	27	22	148	t13727w1220148	Norway Pine	148 NP44	11.6	41	0	0	Thinning	
137	27	22	149	t13727w1220149	Jack Pine	149 JP57	4.3	69	0	0	Clearcut with Reserves	
137	27	22	150	t13727w1220150	Oak	150 O53	5.6	85	0	0	Re-inventory.	
137	27	22	151	t13727w1220151	Oak	151 O53	14.1	85	0	0	Clearcut with Reserves	
137	27	22	152	t13727w1220152	Norway Pine	152 NP45	18.1	41	0	0	Thinning	
137	27	22	153	t13727w1220153	Norway Pine	153 NP44	24	41	0	0	Thinning	
137	27	22	154	t13727w1220154	Jack Pine	154 JP44	4.3	41	0	0	Clearcut with Reserves	
137	27	22	155	t13727w1220155	Oak	155 O53	5.4	85	0	0	Re-inventory.	
137	27	25	222	t13727w1250222	Norway Pine	222 NP 21	6.5	15	2017	0	Thinning	
137	27	25	229	t13727w1250229	Norway Pine	229 NP52	23.7	52	0	0	Thinning	
137	27	25	231	t13727w1250231	Norway Pine	231 NP45	6.5	35	0	0.2	Thinning	
137	27	25	232	t13727w1250232	Norway Pine	232 NP73	5.7	103	0	0	Clearcut with Reserves	
137	27	25	282	t13727w1250282	Norway Pine	282 NP21	23.8	26	0	0	Thinning	
137	27	25	294	t13727w1250294	Oak	294 O54	13.5	79	0	0	Clearcut with Reserves	
137	27	25	296	t13727w1250296	Norway Pine	296 NP21	4.3	23	2017	0	Thinning	
137	27	26	72	t13727w1260072	Norway Pine	72 NP21	11.3	20	2017	0	Thinning	
137	27	26	76	t13727w1260076	Norway Pine	76 NP11	2.3	18	2017	0	Thinning	
137	27	26	163	t13727w1260163	White Pine	163 WP55	1.7	56	0	0	Clearcut with Reserves	
137	27	26	168	t13727w1260168	Norway Pine	168 NP21	15.6	18	2017	0	Thinning	
137	27	28	62	t13727w1280062	Norway Pine	62 NP54	13.9	40	2014	0	Thinning	
137	27	28	63	t13727w1280063	Norway Pine	63 NP54	14.4	40	2014	0	Thinning	
137	27	28	68	t13727w1280068	Norway Pine	68 NP75	9.6	102	0	0	Thinning	INC51
137	27	28	69	t13727w1280069	Norway Pine	69 NP31	7.8	19	2017	0	Thinning	
137	27	28	71	t13727w1280071	Aspen	71 A41	6.9	41	2014	0	Clearcut with Reserves	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
137	27	32	246	t13727w1320246	Norway Pine	246 NP45	27.3	40	2014	0	Thinning	
137	27	32	256	t13727w1320256	White Spruce	256 WS43	5	39	2014	0	Thinning	
137	27	32	257	t13727w1320257	Oak	257 O53	9.1	76	0	0	Clearcut with Reserves	INC53
137	27	32	262	t13727w1320262	Norway Pine	262 NP21	10.6	21	0	0	Thinning	
137	27	33	97	t13727w1330097	Oak	97 O54	21	75	0	0	Clearcut with Reserves	
137	27	34	96	t13727w1340096	Oak	96 O54	39	75	0	0	Clearcut with Reserves	
137	27	35	94	t13727w1350094	Norway Pine	94 NP41	13.5	31	0	0	Thinning	
137	27	35	98	t13727w1350098	Norway Pine	98 NP43	3.8	34	0	0	Thinning	
137	27	35	107	t13727w1350107	Norway Pine	107 NP54	7.9	44	0	0	Thinning	
137	27	35	108	t13727w1350108	White Spruce	108 WS41	5	53	0	0	Thinning	
137	27	35	112	t13727w1350112	Norway Pine	112 NP54	5.2	44	0	0	Thinning	
137	27	35	174	t13727w1350174	Norway Pine	174 NP43	7.9	34	0	0	Thinning	
137	27	35	178	t13727w1350178	White Spruce	178 WS41	4.3	53	0	0	Thinning	
137	27	35	183	t13727w1350183	Norway Pine	183 NP41	15.1	31	0	0	Thinning	
137	27	35	186	t13727w1350186	Norway Pine	186 NP43	7.5	34	0	0	Thinning	
137	27	36	90	t13727w1360090	Norway Pine	90 NP44	20.4	43	0	0	Thinning	
137	27	36	101	t13727w1360101	Norway Pine	101 NP56	25.6	72	0	0	Thinning	
137	27	36	104	t13727w1360104	Oak	104 O43	5	74	0	0	Clearcut with Reserves	
137	27	36	115	t13727w1360115	Jack Pine	115 JP53	4.9	69	0	0	Clearcut with Reserves	
137	27	36	189	t13727w1350189	Norway Pine	189 NP45	35.7	35	0	0	Thinning	
137	27	36	259	t13727w1360259	Norway Pine	259 NP44	19.1	41	0	0	Thinning	
137	27	36	260	t13727w1360260	Jack Pine	260 JP53	14.7	58	0	0	Clearcut with Reserves	
137	27	36	267	t13727w1360267	Norway Pine	267 NP54	6.5	43	0	0	Thinning	
137	27	36	342	t13727w1360342	Norway Pine	342 NP64	1	101	0	0	Clearcut with Reserves	
137	28	21	42	t13728w1210042	Oak	42 O45	7.8	90	0	0	Re-inventory.	
137	28	21	46	t13728w1210046	Jack Pine	46 JP52	8.5	95	0	0	Clearcut with Reserves	
137	28	21	48	t13728w1210048	Norway Pine	48 NP11	16.6	25	0	0	Thinning	
137	28	24	36	t13728w1240036	Jack Pine	36 JP55	7	59	0	0	Clearcut with Reserves	
137	28	24	40	t13728w1240040	Jack Pine	40 JP56	6.9	79	0	0	Clearcut with Reserves	
137	28	24	44	t13728w1240044	Jack Pine	44 JP55	4.5	68	0	0.6	Clearcut with Reserves	
137	28	36	68	t13728w1360068	Norway Pine	68 NP43	11.1	42	0	0	Thinning	
137	28	36	91	t13728w1360091	Norway Pine	91 NP55	22.6	43	0	0	Thinning	
137	28	36	92	t13728w1360092	Norway Pine	92 NP57	44.1	44	0	0	Thinning	
137	28	36	93	t13728w1360093	Norway Pine	93 NP55	25.3	43	0	0	Thinning	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
137	28	36	95	t13728w1360095	Norway Pine	95 NP41	23.2	45	0	0	Thinning	
137	29	8	41	t13729w1080041	Jack Pine	41 JP54	5.6	62	2010	0	Uneven-aged Harvest	
137	29	8	46	t13729w1080046	Jack Pine	46 JP53	16	62	2010	0	Uneven-aged Harvest	
137	29	8	202	t13729w1080202	Aspen	202 A23	16.9	27	0	0	Re-inventory.	
137	29	20	92	t13729w1200092	Aspen	92 A42	30.9	33	2017	0.6	Clearcut with Reserves	
137	29	36	178	t13729w1360178	White Pine	178 WP44	2.1	46	0	0	Clearcut with Reserves	
137	29	36	264	t13729w1360264	White Pine	264 WP54	8.6	50	0	0	Thinning	
137	29	36	265	t13729w1360265	White Pine	265 WP54	15.3	50	0	0	Thinning	
137	29	36	267	t13729w1360267	Recreational Develop	267 Rec	6	25	0	0	Re-inventory.	
137	29	36	269	t13729w1360269	Norway Pine	269 NP41	11.2	30	0	0	Thinning	
137	29	36	270	t13729w1360270	White Pine	270 WP47	6.7	51	0	0	Thinning	
137	31	6	4	t13731w1060004	Oak	4 O55	60.4	77	0	0	Clearcut with Reserves	
137	31	6	11	t13731w1060011	Oak	11 O55	40.8	92	0	0	Clearcut with Reserves	
137	31	6	15	t13731w1060015	Norway Pine	15 NP44	6.8	23	0	0	Thinning	
137	31	6	210	t13731w1060210	Aspen	210 A54	11	54	0	0	Clearcut with Reserves	
137	31	7	18	t13731w1070018	Cutover Area	18 COA	12.4	15	0	0	Re-inventory.	
137	31	7	20	t13731w1070020	Oak	20 O54	46	91	0	0	Clearcut with Reserves	
137	31	7	22	t13731w1070022	Norway Pine	22 NP44	6.3	23	0	0	Thinning	
137	31	7	31	t13731w1070031	Aspen	31 A56	18	87	0	0	Clearcut with Reserves	
137	31	7	39	t13731w1070039	Norway Pine	39 NP78	18.5	102	0	0	Clearcut with Reserves	
137	31	7	167	t13731w1070167	Aspen	167 A55	15.7	79	0	0	Clearcut with Reserves	
137	31	16	43	t13731w1160043	Norway Pine	43 NP52	221.8	40	2010	0	Thinning	
137	31	16	61	t13731w1160061	White Spruce	61 WS11	18.3	22	0	0	Thinning	
137	31	16	63	t13731w1160063	White Spruce	63 WS44	16.7	39	0	0	Thinning	
137	31	17	190	t13731w1170190	Aspen	190 A54	43.9	57	0	0	Clearcut with Reserves	
137	31	17	192	t13731w1170192	Aspen	192 A55	1.5	91	0	0	Clearcut with Reserves	
137	31	17	195	t13731w1170195	Aspen	195 A55	1.1	91	0	0	Clearcut with Reserves	
137	31	17	199	t13731w1170199	Aspen	199 A54	23.4	57	0	0	Clearcut with Reserves	
137	31	17	206	t13731w1170206	Aspen	206 A54	1.6	57	0	0	Clearcut with Reserves	
137	31	18	37	t13731w1180037	Aspen	37 A55	69.5	79	0	0	Clearcut with Reserves	
137	31	18	49	t13731w1180049	Birch	49 Bi56	78.5	69	0	0	Clearcut with Reserves	
137	31	18	247	t13731w1180247	Cutover Area	247 COA	7.6	2	0	0	Re-inventory.	INC53
137	31	18	286	t13731w1180286	Cutover Area	286 COA	1.3	1	0	0	Re-inventory.	
137	31	18	287	t13731w1180287	Cutover Area	287 COA	6.8	1	0	0	Re-inventory.	INC53

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
137	31	19	184	t13731w1190184	Norway Pine	184 NP 58	6.7	48	0	0	Thinning	
137	31	19	185	t13731w1190185	Norway Pine	185 NP 58	10.6	43	0	0	Thinning	
137	31	19	222	t13731w1190222	Oak	222 O55	158.6	72	0	0	Clearcut with Reserves	
137	31	19	229	t13731w1190229	Aspen	229 A55	36.8	54	0	0	Clearcut with Reserves	
137	31	20	80	t13731w1200080	Birch	80 Bi45	10.8	76	0	0	Re-inventory.	
137	31	20	82	t13731w1200082	Oak	82 O54	20.7	79	0	0	Clearcut with Reserves	
137	31	20	83	t13731w1200083	Oak	83 O54	2.7	79	0	0	Clearcut with Reserves	
137	31	20	95	t13731w1200095	Oak	95 O56	23.1	76	0	0	Clearcut with Reserves	
137	31	20	225	t13731w1200225	Norway Pine	225 NP69	11.8	102	0	0	Clearcut with Reserves	
137	31	20	228	t13731w1200228	Norway Pine	228 NP69	1.9	102	0	0	Clearcut with Reserves	
137	31	30	180	t13731w1300180	Oak	180 O53	83	85	0	0	Clearcut with Reserves	
137	31	30	291	t13731w1300291	Oak	291 O 57	22.4	77	0	0	On-site Evaluation	
137	31	30	292	t13731w1300292	Aspen	292 A 56	3.6	61	0	0	Re-inventory.	
137	31	30	293	t13731w1300293	Aspen	293 A 56	3.8	61	0	0	Re-inventory.	
137	31	31	137	t13731w1310137	Norway Pine	137 NP21	48.8	36	0	0	Thinning	
137	31	31	141	t13731w1310141	White Spruce	141 WS11	5.6	21	0	0	Thinning	
137	31	31	169	t13731w1310169	Aspen	169 A19	12.3	83	0	0	Re-inventory.	
137	31	31	173	t13731w1310173	Oak	173 O52	8.2	83	0	0	Clearcut with Reserves	
137	31	31	260	t13731w1310260	Oak	260 O57	43.6	77	0	0	Clearcut with Reserves	
137	31	31	261	t13731w1310261	Oak	261 O57	52.9	77	0	0	Clearcut with Reserves	
137	31	36	119	t13731w1360119	Oak	119 O53	21.4	75	0	0.5	Clearcut with Reserves	
137	31	36	131	t13731w1360131	Oak	131 O55	23.4	80	0	0	Clearcut with Reserves	
137	32	12	13	t13732w1120013	Aspen	13 A52	17.6	63	2010	0	Clearcut with Reserves	
137	32	12	14	t13732w1120014	Jack Pine	14 JP55	12.7	59	2010	0	Clearcut with Reserves	
137	32	12	15	t13732w1120015	Aspen	15 A55	4.9	64	2010	0	Clearcut with Reserves	
137	32	12	117	t13732w1120117	Norway Pine	117 NP11	8	16	0	0	Thinning	
137	32	18	23	t13732w1180023	Cutover Area	23 COA	24.3	1	0	1.5	Re-inventory.	seeded tamarac
137	32	25	35	t13732w1250035	Aspen	35 A54	8.3	68	0	0	Clearcut with Reserves	
137	32	25	40	t13732w1250040	Aspen	40 A53	2.6	69	0	0	Clearcut with Reserves	
137	32	25	72	t13732w1250072	Aspen	72 A 56	29	51	0	0	Clearcut with Reserves	
137	32	25	130	t13732w1250130	Aspen	130 A53	2.3	69	0	0	Clearcut with Reserves	
137	32	25	134	t13732w1250134	Aspen	134 A 54	36	52	0	0	Clearcut with Reserves	
137	32	25	145	t13732w1250145	Aspen	145 A 54	7.1	54	0	0	On-site Evaluation	
137	32	25	147	t13732w1250147	Aspen	147 A 53	21	52	0	0	Clearcut with Reserves	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
137	32	26	28	t13732w1260028	Aspen	28 A51	7.7	73	0	0.8	Clearcut with Reserves	
137	32	26	49	t13732w1260049	Aspen	49 A42	9.5	51	0	0	Clearcut with Reserves	
137	32	26	50	t13732w1260050	Aspen	50 A31	18.7	44	0	0	Clearcut with Reserves	
137	32	26	51	t13732w1260051	Aspen	51 A31	2	44	0	0	Clearcut with Reserves	
137	32	26	61	t13732w1260061	Aspen	61 A43	5.9	52	0	0	Clearcut with Reserves	
137	32	26	64	t13732w1260064	Aspen	64 A52	14.1	52	0	0	Clearcut with Reserves	
137	32	26	77	t13732w1260077	Aspen	77 A54	6.9	51	0	0	Clearcut with Reserves	
137	32	28	27	t13732w1280027	Balm of Gilead	27 BG52	17.2	81	2017	0	Clearcut with Reserves	
137	32	28	41	t13732w1280041	Balm of Gilead	41 BG52	19.6	81	2017	0.4	Clearcut with Reserves	
137	32	28	43	t13732w1280043	Aspen	43 A54	119.4	50	2017	0	Clearcut with Reserves	
137	32	28	69	t13732w1280069	White Spruce	69 WS55	38.9	44	0	0	Thinning	
137	32	28	81	t13732w1280081	Norway Pine	81 NP44	7.9	43	0	0	Thinning	
137	32	35	93	t13732w1350093	Aspen	93 A55	44.8	71	0	0.4	Clearcut with Reserves	
137	32	36	115	t13732w1360115	Aspen	115 A55	5.2	71	0	0	Clearcut with Reserves	
138	25	5	16	t13825w1050016	Oak	16 O56	8.9	78	0	0	Clearcut with Reserves	
138	25	5	22	t13825w1050022	Aspen	22 A54	7.3	73	0	0	Clearcut with Reserves	
138	25	16	40	t13825w1160040	Tamarack	40 T42	5.4	123	0	0.5	Clearcut with Reserves	
138	25	16	49	t13825w1160049	Balsam Fir	49 BF42	5.5	79	0	0	Clearcut with Reserves	
138	25	16	50	t13825w1160050	Balsam Fir	50 BF44	26.3	85	0	0	Clearcut with Reserves	
138	25	16	52	t13825w1160052	Balsam Fir	52 BF45	10.1	81	0	0	Clearcut with Reserves	
138	25	16	53	t13825w1160053	Aspen	53 A42	78.3	39	0	0	Clearcut with Reserves	
138	25	16	54	t13825w1160054	Balsam Fir	54 BF57	18.1	65	0	0	Clearcut with Reserves	
138	25	19	58	t13825w1190058	Northern Hardwoods	58 NH54	51.2	73	0	0	Uneven-aged Harvest	
138	25	19	71	t13825w1190071	Northern Hardwoods	71 NH54	22.2	73	0	0	Uneven-aged Harvest	
138	25	19	78	t13825w1190078	Aspen	78 A54	21.3	76	0	0	Clearcut with Reserves	
138	25	19	82	t13825w1190082	Aspen	82 A54	13.1	76	0	0	Clearcut with Reserves	
138	25	19	87	t13825w1190087	Oak	87 O54	20	96	0	0	Clearcut with Reserves	
138	25	20	59	t13825w1200059	Northern Hardwoods	59 NH54	12	73	0	1.3	Uneven-aged Harvest	
138	25	20	63	t13825w1200063	Aspen	63 A53	27.7	61	0	0.7	On-site Evaluation	
138	26	16	19	t13826w1090019	White Spruce	19 WS41	11.4	20	0	0	Thinning	
138	26	16	22	t13826w1160022	Aspen	22 A52	43.8	74	0	0	Clearcut with Reserves	INC51
138	26	16	25	t13826w1160025	Norway Pine	25 NP 43	17.4	22	0	0	Thinning	
138	26	16	27	t13826w1160027	White Pine	27 WP55	3.8	91	0	0.3	Thinning	
138	26	16	32	t13826w1160032	Birch	32 Bi53	16.8	87	0	0	Clearcut with Reserves	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
138	26	16	34	t13826w1160034	White Spruce	34 WS20	8.6	19	0	0	Thinning	
138	26	16	39	t13826w1160039	Norway Pine	39 NP44	3.8	47	0	0	Thinning	
138	26	16	42	t13826w1160042	Norway Pine	42 NP44	7.5	52	0	0	Thinning	
138	26	16	46	t13826w1160046	Norway Pine	46 NP31	75	26	0	0	Thinning	
138	26	26	62	t13826w1260062	Oak	62 O54	17	91	2014	0	Clearcut with Reserves	
138	26	26	64	t13826w1260064	Aspen	64 A54	4.5	65	2014	0	Clearcut with Reserves	
138	27	16	95	t13827w1160095	Aspen	95 A55	16.5	67	0	0	Clearcut with Reserves	
138	27	21	78	t13827w1210078	Norway Pine	78 NP72	1.8	104	0	0	On-site Evaluation	
138	27	21	80	t13827w1210080	Oak	80 O55	6	83	0	0	Clearcut with Reserves	
138	27	21	81	t13827w1210081	Norway Pine	81 NP64	0.7	81	0	0	Thinning	
138	27	21	88	t13827w1210088	Aspen	88 A43	10.4	39	0	0.3	Clearcut with Reserves	
138	28	7	319	t13828w1070319	Norway Pine	319 NP66	5.4	102	0	0	Clearcut with Reserves	
138	28	7	346	t13828w1070346	Norway Pine	346 NP66	2.2	101	0	0	Clearcut with Reserves	
138	28	7	368	t13828w1070368	Norway Pine	368 NP64	7.2	102	0	0	Clearcut with Reserves	
138	28	16	386	t13828w1160386	Aspen	386 A52	21	52	0	0	Clearcut with Reserves	
138	28	16	391	t13828w1160391	Aspen	391 A52	25	52	0	0	Clearcut with Reserves	
138	28	16	522	t13828w1160522	Aspen	522 A52	11	52	0	0	Clearcut with Reserves	
138	29	13	19	t13829w1130019	Aspen	19 A52	18.2	70	0	0.2	Clearcut with Reserves	
138	29	13	81	t13829w1130081	Aspen	81 A19	36.4	32	2018	0	Clearcut with Reserves	
138	29	13	156	t13829w1130156	Aspen	156 A53	30.8	66	0	0	Clearcut with Reserves	
138	29	19	35	t13829w1190035	Tamarack	35 T52	7.5	126	0	0	Clearcut with Reserves	
138	29	19	43	t13829w1190043	Jack Pine	43 JP53	10.3	66	0	0	Clearcut with Reserves	
138	29	19	121	t13829w1190121	Balsam Fir	121 BF55	12	81	0	0.5	Clearcut with Reserves	
138	29	20	37	t13829w1200037	Norway Pine	37 NP44	18	23	0	0	Thinning	
138	29	20	40	t13829w1200040	Balsam Fir	40 BF48	10.2	68	0	0	Clearcut with Reserves	
138	29	20	100	t13829w1200100	Norway Pine	100 NP55	20.1	46	0	0	Thinning	
138	29	28	139	t13829w1280139	Norway Pine	139 NP32	16.8	25	0	0	Thinning	
138	29	28	142	t13829w1280142	Norway Pine	142 NP69	15.5	110	0	0	Shelterwood	
138	29	28	146	t13829w1280146	Norway Pine	146 NP58	6.8	63	0	0	Thinning	
138	29	28	147	t13829w1280147	Jack Pine	147 JP55	12.8	57	0	0	Uneven-aged Harvest	
138	29	28	152	t13829w1280152	Norway Pine	152 NP69	5.6	109	0	0	Shelterwood	
138	29	36	57	t13829w1360057	Aspen	57 A53	2.8	63	0	1.1	Clearcut with Reserves	
138	29	36	59	t13829w1360059	Aspen	59 A52	5.2	60	0	0	Clearcut with Reserves	
138	29	36	60	t13829w1360060	Aspen	60 A42	10.2	62	0	0	Clearcut with Reserves	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area *Brainerd Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
138	30	16	15	t13830w1160015	Oak	15 O41	19.8	75	0	0	Clearcut with Reserves	
138	30	16	41	t13830w1160041	Aspen	41 A41	21.9	51	0	0	Clearcut with Reserves	
138	30	16	42	t13830w1160042	Cutover Area	42 COA	6.5	13	0	0	Re-inventory.	
138	30	16	45	t13830w1160045	Aspen	45 A41	2.8	51	0	0.5	Clearcut with Reserves	
138	31	3	5	t13831w1030005	Birch	5 Bi46	34.4	81	0	0	Clearcut with Reserves	
138	31	3	28	t13831w1030028	Aspen	28 A57	24.6	69	0	0	Clearcut with Reserves	
138	31	4	16	t13831w1040016	Aspen	16 A56	7.6	73	0	0	Clearcut with Reserves	
138	31	4	18	t13831w1040018	Jack Pine	18 JP44	6.4	66	0	0	Clearcut with Reserves	
138	31	4	200	t13831w1040200	Birch	200 Bi46	235.3	72	0	0	Clearcut with Reserves	
138	31	4	201	t13831w1040201	Aspen	201 A17	20.7	62	0	0	Re-inventory.	
138	31	4	236	t13831w1040236	Oak	236 O53	15.8	62	0	0	On-site Evaluation	
138	31	9	66	t13831w1090066	Cutover Area	66 COA	6.8	16	0	0	Re-inventory.	
138	31	9	70	t13831w1090070	Aspen	70 A58	16.9	75	0	0	Clearcut with Reserves	
138	31	9	75	t13831w1090075	Norway Pine	75 NP58	6.9	56	0	0	Thinning	
138	31	9	91	t13831w1090091	White Spruce	91 WS11	32.9	28	0	0	Thinning	
138	31	10	72	t13831w1100072	White Spruce	72 WS 43	23.7	31	0	0	Thinning	
138	31	10	73	t13831w1100073	White Spruce	73 WS 31	13.7	22	0	0	Thinning	
138	31	10	82	t13831w1100082	White Spruce	82 WS 31	7	22	0	0	Thinning	
138	31	16	105	t13831w1160105	White Spruce	105 WS12	40	42	0	0	Thinning	
138	31	16	119	t13831w1160119	Aspen	119 A57	13.5	72	0	0	Clearcut with Reserves	
138	31	16	225	t13831w1160225	White Spruce	225 WS45	12.6	42	0	0	Thinning	
138	31	22	141	t13831w1220141	Norway Pine	141 NP45	5	34	0	0	Thinning	
138	31	36	164	t13831w1360164	Norway Pine	164 NP42	21	30	0	0	Thinning	
138	31	36	165	t13831w1360165	White Spruce	165 WS11	18	16	0	0	Thinning	
138	31	36	172	t13831w1360172	Norway Pine	172 NP41	41.1	39	0	0	Thinning	
138	31	36	177	t13831w1360177	Norway Pine	177 NP11	8.5	27	0	0.1	Thinning	
138	31	36	178	t13831w1360178	Norway Pine	178 NP11	16.6	18	0	0	Thinning	
138	31	36	179	t13831w1360179	Norway Pine	179 NP11	9.9	16	0	0	Thinning	
138	31	36	186	t13831w1360186	Norway Pine	186 NP11	4.6	16	0	0	Thinning	
138	31	36	188	t13831w1360188	Balsam Fir	188 BF42	5.5	60	0	0.4	On-site Evaluation	
138	31	36	190	t13831w1360190	Norway Pine	190 NP11	10.5	22	0	0.3	Thinning	
138	31	36	192	t13831w1360192	Norway Pine	192 NP55	18.2	36	0	0	Thinning	
138	31	36	193	t13831w1360193	Norway Pine	193 NP53	5.6	36	0	0	Thinning	
138	32	36	1	t13832w1360001	Norway Pine	1 NP43	70.2	27	0	0	Thinning	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Brainerd Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
138	32	36	3	t13832w1360003	Norway Pine	3 NP43	12.8	33	0	0	Thinning	
138	32	36	5	t13832w1360005	Norway Pine	5 NP47	17	37	0	0	Thinning	
138	32	36	10	t13832w1360010	Norway Pine	10 NP41	32.8	24	0	0	Thinning	
138	32	36	14	t13832w1360014	Norway Pine	14 NP69	12.7	76	0	0	Thinning	
138	32	36	15	t13832w1360015	Norway Pine	15 NP55	5.3	56	0	0.5	Thinning	
138	32	36	16	t13832w1360016	Norway Pine	16 NP45	4.7	26	0	0	Thinning	
138	32	36	18	t13832w1360018	Norway Pine	18 NP55	22.3	57	0	0	Thinning	
138	32	36	19	t13832w1360019	Norway Pine	19 NP41	37.6	27	0	0	Thinning	
138	32	36	21	t13832w1360021	Norway Pine	21 NP57	17.5	44	0	0	Thinning	
138	32	36	25	t13832w1360025	White Pine	25 WP56	7.3	52	0	0	Thinning	
138	32	36	26	t13832w1360026	Norway Pine	26 NP 69	14.9	75	0	0	Thinning	
139	25	2	26	t13925w1020026	Aspen	26 A55	3.9	72	0	0.2	Clearcut with Reserves	
139	25	2	30	t13925w1020030	Aspen	30 A53	10.9	60	0	0	Clearcut with Reserves	
139	25	2	33	t13925w1020033	Aspen	33 A42	30.5	36	2011	0	Clearcut with Reserves	
139	25	2	35	t13925w1020035	Aspen	35 A52	10	67	2011	0.1	Clearcut with Reserves	
139	25	2	56	t13925w1020056	Aspen	56 A46	3.9	48	0	0	Clearcut with Reserves	
139	25	2	63	t13925w1020063	Aspen	63 A52	9.5	70	0	0	Clearcut with Reserves	
139	25	2	64	t13925w1020064	Norway Pine	64 NP41	70.4	34	0	0	Thinning	
139	25	2	74	t13925w1020074	Oak	74 O53	5.3	72	0	0	Clearcut with Reserves	
139	25	2	102	t13925w1020102	Norway Pine	102 NP43	119.7	34	0	0	Thinning	
139	25	2	327	t13925w1020327	Norway Pine	327 NP43	23.2	34	0	0	Thinning	
139	25	3	21	t13925w1030021	Aspen	21 A56	12	77	0	0	Clearcut with Reserves	
139	25	5	87	t13925w1050087	Birch	87 Bi44	39	63	0	0	Clearcut with Reserves	
139	25	5	107	t13925w1080107	Aspen	107 A55	84.9	63	0	0	Clearcut with Reserves	INC51
139	25	5	112	t13925w1050112	Aspen	112 A43	33.2	43	0	0	Clearcut with Reserves	
139	25	5	253	t13925w1050253	Aspen	253 A55	6.9	63	0	0	Clearcut with Reserves	
139	25	5	321	t13925w1050321	Aspen	321 A54	26.6	68	0	0	Clearcut with Reserves	
139	25	5	341	t13925w1050341	Aspen	341 A 57	71	67	0	0	Clearcut with Reserves	
139	25	6	43	t13925w1060043	Aspen	43 A42	58.4	36	0	0	Clearcut with Reserves	
139	25	6	65	t13925w1060065	Aspen	65 A41	10.3	35	0	0	Clearcut with Reserves	
139	25	6	93	t13925w1060093	Aspen	93 A41	60	37	0	0	Clearcut with Reserves	
139	25	6	310	t13925w1060310	Aspen	310 A31	43.5	36	0	0	Clearcut with Reserves	
139	25	7	316	t13925w1070316	Aspen	316 A56	2.5	67	0	0.1	Re-inventory.	
139	25	8	161	t13925w1080161	Oak	161 O56	29.3	64	0	0	Thinning	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area *Brainerd Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
139	25	8	200	t13925w1080200	Oak	200 O54	23.6	85	0	0	Clearcut with Reserves	
139	25	8	333	t13925w1080333	Aspen	333 A54	5.1	68	0	0	Clearcut with Reserves	
139	25	8	340	t13925w1080340	Aspen	340 A54	1.5	54	0	0	Clearcut with Reserves	
139	25	9	174	t13925w1090174	Aspen	174 A58	6.5	66	0	0	Clearcut with Reserves	
139	25	14	207	t13925w1140207	Aspen	207 A42	52.1	37	0	0	Clearcut with Reserves	
139	25	14	211	t13925w1140211	Oak	211 O46	5.2	83	0	0	Clearcut with Reserves	
139	25	14	214	t13925w1140214	Oak	214 O44	19.7	83	0	0	Clearcut with Reserves	
139	25	15	234	t13925w1150234	Oak	234 O52	6.4	74	0	0	Clearcut with Reserves	
139	25	15	237	t13925w1150237	Oak	237 O57	52.3	74	0	0	Clearcut with Reserves	
139	25	15	242	t13925w1150242	Oak	242 O52	2.8	74	0	0	Clearcut with Reserves	
139	25	36	282	t13925w1360282	Aspen	282 A55	5.1	69	0	0	On-site Evaluation	
139	25	36	291	t13925w1360291	Aspen	291 A52	6.6	57	0	0	On-site Evaluation	
139	25	36	295	t13925w1360295	Balsam Fir	295 BF42	9.5	69	0	0	On-site Evaluation	
139	26	1	4	t13926w1010004	Norway Pine	4 NP45	39.4	39	0	0	Thinning	
139	26	1	7	t13926w1010007	Oak	7 O57	7.8	73	0	0	Clearcut with Reserves	
139	26	1	10	t13926w1010010	Oak	10 O56	19.3	71	0	0	Clearcut with Reserves	
139	26	1	11	t13926w1010011	Oak	11 O56	1.5	71	0	0	Clearcut with Reserves	
139	26	1	26	t13926w1010026	Norway Pine	26 NP42	62.9	40	0	0	Thinning	
139	26	1	32	t13926w1010032	Aspen	32 A42	10.1	38	0	0	Clearcut with Reserves	
139	26	1	43	t13926w1010043	Norway Pine	43 NP42	47.8	39	0	0	Thinning	
139	26	1	249	t13926w1010249	Norway Pine	249 NP46	56.5	39	0	0	Thinning	
139	26	1	250	t13926w1010250	Norway Pine	250 NP46	20.4	41	0	0	Thinning	
139	26	2	222	t13926w1020222	Aspen	222 A56	20.5	67	0	0	Clearcut with Reserves	
139	26	11	64	t13926w1110064	Aspen	64 A56	26.4	67	0	0	Clearcut with Reserves	
139	26	11	65	t13926w1110065	Oak	65 O52	14.4	67	0	0	Clearcut with Reserves	
139	26	12	60	t13926w1120060	Aspen	60 A56	133.5	68	0	0	Clearcut with Reserves	
139	26	12	71	t13926w1120071	Aspen	71 A54	10.5	68	0	0.1	Clearcut with Reserves	
139	26	12	87	t13926w1120087	Aspen	87 A55	42.6	69	0	0	Clearcut with Reserves	
139	26	12	115	t13926w1120115	Aspen	115 A54	4.2	69	0	0	Clearcut with Reserves	
139	26	12	116	t13926w1120116	Aspen	116 A54	3.1	71	0	0	Clearcut with Reserves	
139	26	12	139	t13926w1120139	Birch	139 Bi46	42.3	77	0	0	Clearcut with Reserves	
139	26	12	160	t13926w1120160	Aspen	160 A54	6.8	66	0	0.2	Clearcut with Reserves	
139	26	12	221	t13926w1120221	Aspen	221 A55	5.4	65	0	0	Clearcut with Reserves	
139	26	16	162	t13926w1160162	Aspen	162 A58	9.8	81	0	0	Clearcut with Reserves	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area *Brainerd Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
139	26	16	166	t13926w1160166	Aspen	166 A55	19.4	80	0	0	Clearcut with Reserves	
139	26	16	167	t13926w1160167	Aspen	167 A56	83.8	77	0	0	Clearcut with Reserves	
139	26	16	168	t13926w1160168	Birch	168 Bi56	11.3	81	0	0.4	Clearcut with Reserves	
139	26	16	178	t13926w1160178	Oak	178 O54	14.1	89	0	0	Clearcut with Reserves	
139	26	16	181	t13926w1160181	Norway Pine	181 NP11	18.3	20	0	0	Thinning	
139	26	16	182	t13926w1160182	Norway Pine	182 NP45	12.1	33	0	0	Thinning	
139	26	16	186	t13926w1160186	Oak	186 O54	2.2	89	0	0	Clearcut with Reserves	
139	26	36	189	t13926w1360189	Norway Pine	189 NP45	8.4	57	2010	0	Thinning	
139	26	36	191	t13926w1360191	Norway Pine	191 NP55	3.9	59	2010	0	Thinning	
139	26	36	192	t13926w1360192	Norway Pine	192 NP55	15.6	59	2010	0	Thinning	
139	26	36	200	t13926w1360200	Northern Hardwoods	200 NH43	16.4	67	2010	0	Thinning	
139	26	36	253	t13926w1360253	Norway Pine	253 NP55	9.6	59	2010	0	Thinning	
139	27	16	21	t13927w1160021	Birch	21 Bi42	16	76	0	0	Clearcut with Reserves	
139	27	16	27	t13927w1160027	Norway Pine	27 NP65	3.1	98	0	0	Clearcut with Reserves	
139	27	16	50	t13927w1160050	Birch	50 Bi41	16.6	74	0	0	Clearcut with Reserves	
139	27	36	34	t13927w1360034	Norway Pine	34 NP45	158.8	37	0	0	Thinning	
139	27	36	38	t13927w1360038	Norway Pine	38 NP54	78.8	35	0	0	Thinning	
139	27	36	44	t13927w1360044	Norway Pine	44 NP54	22	69	0	0	Thinning	
139	27	36	46	t13927w1360046	Norway Pine	46 NP51	21.6	86	0	0	Thinning	
139	27	36	49	t13927w1360049	Norway Pine	49 NP68	11.7	104	0	0	Thinning	
139	27	36	51	t13927w1360051	Norway Pine	51 NP57	14.2	68	0	0	Thinning	
139	28	16	21	t13928w1160021	Norway Pine	21 NP21	10.8	24	0	0	Thinning	
139	28	16	35	t13928w1160035	Aspen	35 A44	39.8	34	2015	0	Clearcut with Reserves	
139	28	16	120	t13928w1160120	Aspen	120 A53	84.5	52	2015	0	Clearcut with Reserves	
139	28	36	71	t13928w1360071	White Spruce	71 WS22	20.6	20	0	0	Thinning	
139	28	36	83	t13928w1360083	White Pine	83 WP54	5.7	57	0	0	Thinning	
139	28	36	84	t13928w1360084	Aspen	84 A43	14.1	66	0	0	Clearcut with Reserves	
139	28	36	86	t13928w1360086	Aspen	86 A42	2.7	50	0	0	Clearcut with Reserves	
139	28	36	89	t13928w1360089	Norway Pine	89 NP56	56.7	63	0	0	Thinning	
139	28	36	93	t13928w1360093	White Pine	93 WP54	7.4	57	0	0	Thinning	
139	28	36	121	t13928w1360121	White Pine	121 WP54	54	57	0	0	Thinning	
139	28	36	124	t13928w1360124	Aspen	124 A53	3.4	56	0	0	Clearcut with Reserves	
139	28	36	125	t13928w1360125	Aspen	125 A53	6.3	56	0	0	Clearcut with Reserves	
139	29	12	3	t13929w1120003	Birch	3 Bi44	392.6	72	0	0	Clearcut with Reserves	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area *Brainerd Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
139	29	27	61	t13929w1270061	Norway Pine	61 NP11	9.2	22	2016	0	Thinning	
139	29	27	63	t13929w1270063	Norway Pine	63 NP 31	19.6	17	2016	0	Thinning	
139	29	27	100	t13929w1270100	Norway Pine	100 NP21	3.4	22	2016	0	Thinning	
139	29	27	112	t13929w1270112	White Pine	112 WP 56	7.3	79	2016	0	Thinning	
139	29	33	90	t13929w1330090	Birch	90 Bi45	17.9	79	0	0.3	Clearcut with Reserves	
139	29	36	86	t13929w1360086	Aspen	86 A54	28.1	67	0	0	Clearcut with Reserves	
139	29	36	87	t13929w1360087	Balsam Fir	87 BF53	32.3	50	0	0	Uneven-aged Harvest	
139	29	36	88	t13929w1360088	Norway Pine	88 NP46	10.9	23	0	0	Thinning	
139	30	12	15	t13930w1120015	Norway Pine	15 NP74	10.7	101	0	0	Thinning	
139	30	12	16	t13930w1120016	Aspen	16 A54	40	68	0	0	Clearcut with Reserves	
139	30	12	17	t13930w1120017	Norway Pine	17 NP73	5.3	93	0	0.1	Re-inventory.	
139	30	12	20	t13930w1120020	Norway Pine	20 NP72	5.7	93	0	0	Thinning	
139	30	12	24	t13930w1120024	Birch	24 Bi44	13.1	75	0	0	Uneven-aged Harvest	
139	30	13	38	t13930w1130038	Birch	38 Bi44	11.8	75	0	0	Uneven-aged Harvest	
139	30	13	39	t13930w1130039	Birch	39 Bi44	23	75	0	0.3	Uneven-aged Harvest	
139	30	14	37	t13930w1140037	Norway Pine	37 NP65	9.7	99	0	0.8	Uneven-aged Harvest	
139	30	28	57	t13930w1280057	Tamarack	57 T11	8	23	0	0	Re-inventory.	
139	30	28	58	t13930w1280058	Oak	58 O52	8	98	0	0.3	Re-inventory.	
139	30	36	73	t13930w1360073	Jack Pine	73 JP53	36	58	0	0	Clearcut with Reserves	
139	30	36	75	t13930w1360075	Aspen	75 A 43	4	66	0	0.3	Clearcut with Reserves	
139	30	36	76	t13930w1360076	Aspen	76 A 52	7.8	72	0	0	Clearcut with Reserves	
139	30	36	79	t13930w1360079	Aspen	79 A32	33.3	35	2017	0.3	Clearcut with Reserves	
139	30	36	79	t13930w1360079	Aspen	79 A 44	25.8	33	2017	0	Clearcut with Reserves	
139	30	36	81	t13930w1360081	Aspen	81 A 57	17.5	72	0	0	Clearcut with Reserves	
139	30	36	93	t13930w1360093	Aspen	93 A 53	5.9	85	2017	0	Clearcut with Reserves	
139	31	16	9	t13931w1160009	Birch	9 Bi42	87.6	73	0	0	Clearcut with Reserves	
139	31	16	146	t13931w1160146	Aspen	146 A55	15.7	82	0	0	Re-inventory.	
139	31	18	12	t13931w1180012	Aspen	12 A44	8.5	46	0	0.4	Clearcut with Reserves	
139	31	22	22	t13931w1220022	Aspen	22 A55	14.2	76	0	0.5	Clearcut with Reserves	
139	31	22	37	t13931w1220037	Birch	37 Bi 57	22.6	81	0	0	Clearcut with Reserves	
139	31	22	172	t13931w1220172	Birch	172 Bi 57	14	81	0	0	Clearcut with Reserves	
139	31	24	26	t13931w1240026	Aspen	26 A29	26.4	38	0	0	Re-inventory.	
139	31	24	27	t13931w1240027	Aspen	27 A44	8.9	59	0	0	Clearcut with Reserves	INC53
139	31	26	51	t13931w1260051	Aspen	51 A56	6.4	73	0	0	On-site Evaluation	

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Forestry Area *Brainerd Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
139	31	27	45	t13931w1270045	Aspen	45 A 66	20	78	0	0	Clearcut with Reserves	INC61
139	31	27	75	t13931w1270075	Oak	75 O56	70.7	84	0	0	Thinning	
139	31	27	141	t13931w1220141	Birch	141 Bi47	9	82	0	0	Clearcut with Reserves	
139	31	27	163	t13931w1270163	Unknown	*Unk	15.6	0	0	0	Re-inventory.	
139	31	27	163	t13931w1270163	Birch	163 Bi47	23.1	83	0	0	Clearcut with Reserves	
139	31	28	39	t13931w1280039	Birch	39 Bi48	12.8	79	0	0	Clearcut with Reserves	
139	31	28	50	t13931w1280050	Aspen	50 A58	20.9	80	0	0	Clearcut with Reserves	
139	31	28	53	t13931w1280053	Birch	53 Bi48	14.9	79	0	0	Clearcut with Reserves	
139	31	28	92	t13931w1280092	Birch	92 Bi48	3.6	79	0	0	Clearcut with Reserves	
139	31	28	157	t13931w1280157	White Spruce	157 WS54	15	59	0	0	Clearcut with Reserves	MA1
139	31	28	159	t13931w1280159	Norway Pine	159 NP 58	10.4	35	2016	0	Thinning	
139	31	28	160	t13931w1280160	White Spruce	160 WS43	10	49	0	0	Clearcut with Reserves	
139	31	28	273	t13931w1280273	Norway Pine	273 NP 57	13	56	0	0	Thinning	
139	31	33	120	t13931w1330120	Aspen	120 A56	12.4	81	0	0	Clearcut with Reserves	INC53
139	31	33	275	t13931w1330275	Birch	275 Bi 46	22.3	76	0	0	Clearcut with Reserves	
139	31	33	279	t13931w1330279	Birch	279 Bi 46	12.3	61	0	0	Clearcut with Reserves	
139	31	33	280	t13931w1330280	Birch	280 Bi 46	52.2	61	2013	0	Clearcut with Reserves	
139	31	33	282	t13931w1330282	Birch	282 Bi 46	1.7	61	0	0	Clearcut with Reserves	
139	31	36	88	t13931w1360088	Aspen	88 A56	71.6	77	2010	0	Clearcut with Reserves	
139	31	36	110	t13931w1360110	White Pine	110 WP43	3.9	61	2010	0.2	Thinning	
139	31	36	134	t13931w1360134	Aspen	134 A56	18.9	77	2010	0	Clearcut with Reserves	
140	25	5	619	t14025w1050619	Aspen	619 A55	4.6	69	0	0	On-site Evaluation	
140	25	5	646	t14025w1050646	Aspen	646 A55	36.7	69	0	1.4	Clearcut with Reserves	
140	25	5	669	t14025w1050669	Aspen	669 A55	23.1	69	0	0	Clearcut with Reserves	
140	25	7	624	t14025w1070624	Upland Grass	624 UG	3.8	10	0	0	Re-inventory.	
140	25	7	630	t14025w1070630	White Spruce	630 WS44	4.1	40	0	0	On-site Evaluation	
140	25	7	634	t14025w1070634	White Spruce	634 WS45	3.1	40	0	0	Thinning	
140	25	7	635	t14025w1070635	Norway Pine	635 NP54	15.7	40	0	0	Thinning	
140	25	7	637	t14025w1070637	Norway Pine	637 NP54	7.9	40	0	0	Thinning	
140	25	8		t14025w108000	Unknown	*Unk	6	0	0	0.2	Re-inventory.	
140	25	9	26	t14025w1090026	Aspen	26 A37	42.7	36	0	0	Selective Thinning-Commercial	INC23
140	25	9	44	t14025w1090044	Aspen	44 A54	14.7	63	0	0	On-site Evaluation	
140	25	9	656	t14025w1090656	Aspen	656 A54	9.9	52	0	0	On-site Evaluation	
140	25	15	129	t14025w1150129	Northern Hardwoods	129 NH55	36.5	89	0	0	Thinning	

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Forestry Area *Brainerd Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
140	25	15	611	t14025w1150611	Aspen	611 A54	12.3	77	0	0	Clearcut with Reserves	
140	25	15	667	t14025w1150667	Aspen	667 A54	23.2	77	0	0	Clearcut with Reserves	
140	25	16	132	t14025w1160132	Aspen	132 A56	19.2	57	0	0	Clearcut with Reserves	
140	25	16	145	t14025w1160145	Northern Hardwoods	145 NH55	17.6	85	0	0	Uneven-aged Harvest	
140	25	16	435	t14025w1160435	Aspen	435 A53	49.4	64	0	0	Clearcut with Reserves	
140	25	16	583	t14025w1160583	Aspen	583 A55	26	70	0	0	Clearcut with Reserves	
140	25	16	651	t14025w1160651	Northern Hardwoods	651 NH57	69.6	63	0	0	Uneven-aged Harvest	
140	25	16	653	t14025w1160653	Northern Hardwoods	653 NH57	4.9	63	0	0	Uneven-aged Harvest	
140	25	16	654	t14025w1160654	Oak	654 O56	13.6	71	0	0	Clearcut with Reserves	
140	25	16	655	t14025w1160655	Northern Hardwoods	655 NH56	12	71	0	0	Uneven-aged Harvest	
140	25	16	679	t14025w1160679	Aspen	679 A53	30.1	64	0	0	Clearcut with Reserves	
140	25	18	640	t14025w1180640	Aspen	640 A55	55.6	73	0	0	Clearcut with Reserves	
140	25	18	699	t14025w1180699	Aspen	699 A57	1.8	72	0	0	Clearcut with Reserves	
140	25	19	115	t14025w1190115	Aspen	115 A57	61	72	0	0	Re-inventory.	
140	25	19	152	t14025w1190152	Aspen	152 A57	47.9	72	0	0	Clearcut with Reserves	
140	25	19	189	t14025w1190189	Aspen	189 A55	65.8	70	0	0.6	Clearcut with Reserves	
140	25	20	139	t14025w1200139	Aspen	139 A56	45.7	69	0	0.2	Clearcut with Reserves	
140	25	20	204	t14025w1200204	Aspen	204 A55	7.4	69	0	0	Clearcut with Reserves	
140	25	20	205	t14025w1200205	Aspen	205 A56	75.7	69	0	0	Clearcut with Reserves	
140	25	21	163	t14025w1210163	Aspen	163 A55	63.6	65	0	0	Clearcut with Reserves	
140	25	21	216	t14025w1210216	Aspen	216 A56	11.4	69	0	0	Clearcut with Reserves	
140	25	21	238	t14025w1210238	Aspen	238 A56	3.3	69	0	0	Re-inventory.	
140	25	21	426	t14025w1210426	Aspen	426 A55	16.5	68	0	0	Clearcut with Reserves	
140	25	21	431	t14025w1210431	Aspen	431 A55	22.5	68	0	0	Clearcut with Reserves	
140	25	21	434	t14025w1210434	Aspen	434 A55	14.5	68	0	0	Clearcut with Reserves	
140	25	21	609	t14025w1210609	Aspen	609 A55	4	68	0	0	Re-inventory.	
140	25	21	708	t14025w1210708	Oak	708 O 54	71.1	76	0	0	Clearcut with Reserves	
140	25	22	183	t14025w1210183	Aspen	183 A54	63.7	60	0	0	Clearcut with Reserves	
140	25	22	187	t14025w1220187	Aspen	187 A53	13.1	75	0	0	Clearcut with Reserves	
140	25	22	201	t14025w1220201	Aspen	201 A57	11.4	67	0	0.2	Clearcut with Reserves	
140	25	22	215	t14025w1220215	Ash	215 Ash43	9.5	75	0	0	Thinning	
140	25	22	227	t14025w1220227	Aspen	227 A56	5.7	75	2017	0	Clearcut with Reserves	
140	25	22	228	t14025w1220228	Aspen	228 A28	19.1	33	2017	0	Clearcut with Reserves	
140	25	25	324	t14025w1250324	White Spruce	324 WS54	24.6	82	0	0	Uneven-aged Harvest	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
140	25	25	367	t14025w1250367	Balm of Gilead	367 BG54	9.1	70	0	0	Re-inventory.	
140	25	26	319	t14025w1260319	Aspen	319 A56	20.9	68	0	0	Clearcut with Reserves	
140	25	26	363	t14025w1260363	Balsam Fir	363 BF55	31.5	88	2011	0	Clearcut with Reserves	
140	25	26	557	t14025w1260557	Aspen	557 A58	30	63	0	0	Clearcut with Reserves	
140	25	26	559	t14025w1260559	Aspen	559 A57	45.5	74	0	0	Clearcut with Reserves	
140	25	27	261	t14025w1270261	Aspen	261 A56	93.4	73	0	0	Clearcut with Reserves	
140	25	27	354	t14025w1270354	Northern Hardwoods	354 NH55	4.9	78	0	0	Uneven-aged Harvest	
140	25	27	361	t14025w1270361	Balm of Gilead	361 BG57	8	78	0	0	Clearcut with Reserves	
140	25	27	578	t14025w1270578	Aspen	578 A59	20.6	80	0	0	Clearcut with Reserves	
140	25	27	644	t14025w1270644	Aspen	644 A56	31.7	73	0	0	Clearcut with Reserves	
140	25	27	703	t14025w1270703	Aspen	703 A 56	33	73	0	0	Clearcut with Reserves	
140	25	28	270	t14025w1280270	Oak	270 O56	61.5	77	0	0	On-site Evaluation	
140	25	28	275	t14025w1280275	Northern Hardwoods	275 NH45	26.3	74	0	0	Uneven-aged Harvest	
140	25	28	293	t14025w1280293	Aspen	293 A59	11.4	65	0	0	Clearcut with Reserves	
140	25	28	311	t14025w1280311	Northern Hardwoods	311 NH45	2	74	0	0	Uneven-aged Harvest	
140	25	28	663	t14025w1330663	Aspen	663 A56	6.1	73	0	0	Clearcut with Reserves	
140	25	28	698	t14025w1280698	Aspen	698 A59	6	50	2013	0	Clearcut with Reserves	
140	25	29	246	t14025w1300246	Aspen	246 A55	77.7	65	0	0	Clearcut with Reserves	
140	25	29	279	t14025w1290279	Aspen	279 A55	21.1	62	0	0	Clearcut with Reserves	INC61
140	25	29	285	t14025w1290285	Aspen	285 A55	16.4	72	0	0	Clearcut with Reserves	
140	25	29	304	t14025w1290304	Northern Hardwoods	304 NH53	17.6	74	2017	0	Uneven-aged Harvest	
140	25	30	300	t14025w1300300	Oak	300 O53	39.9	87	0	0	Clearcut with Reserves	
140	25	30	371	t14025w1300371	Aspen	371 A39	17.8	40	0	0	Clearcut with Reserves	
140	25	31	399	t14025w1310399	Norway Pine	399 NP41	50.9	39	0	0	Thinning	
140	25	31	421	t14025w1310421	Norway Pine	421 NP41	80.7	41	0	0	Thinning	
140	25	31	453	t14025w1310453	Norway Pine	453 NP43	10.5	41	0	0.3	Thinning	
140	25	31	469	t14025w1310469	White Spruce	469 WS21	28.2	41	0	0	Thinning	
140	25	31	484	t14025w1310484	Aspen	484 A43	5.9	41	0	0	Thinning	
140	25	31	512	t14025w1310512	White Spruce	512 WS21	9.7	40	0	0	Thinning	INC53
140	25	31	574	t14025w1310574	Aspen	574 A42	19.6	39	0	0	Clearcut with Reserves	
140	25	31	606	t14025w1310606	Aspen	606 A58	15.9	71	0	0	Thinning	
140	25	32	381	t14025w1320381	Norway Pine	381 NP45	9	28	0	0	Thinning	
140	25	32	393	t14025w1320393	Northern Hardwoods	393 NH54	24.2	67	0	0	Uneven-aged Harvest	
140	25	33	696	t14025w1330696	Oak	696 O 53	17.3	71	0	0	On-site Evaluation	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
140	25	34	479	t14025w1340479	Aspen	479 A54	77.6	73	0	0	Clearcut with Reserves	
140	25	34	483	t14025w1340483	Aspen	483 A55	17.7	69	0	0	Clearcut with Reserves	
140	25	35	494	t14025w1350494	Norway Pine	494 NP44	119.5	40	2011	0	Thinning	
140	25	35	537	t14025w1350537	White Spruce	537 WS53	15.1	37	2011	0	Thinning	
140	25	36	507	t14025w1360507	Norway Pine	507 NP62	16.2	96	0	0	Clearcut with Reserves	
140	25	36	539	t14025w1360539	Aspen	539 A53	5.7	65	2011	0	Clearcut with Reserves	
140	26	7	12	t14026w1070012	Oak	12 O56	10.5	85	0	0	Thinning	
140	26	7	15	t14026w1070015	Oak	15 O52	0.8	81	0	0	Thinning	
140	26	7	16	t14026w1070016	Oak	16 O52	5.5	81	0	0	Thinning	
140	26	7	17	t14026w1070017	Oak	17 O55	4.7	66	0	0.2	Thinning	
140	26	7	24	t14026w1070024	Birch	24 Bi47	32.6	65	0	0	Clearcut with Reserves	
140	26	7	25	t14026w1070025	Norway Pine	25 NP59	20	53	0	0	Re-inventory.	
140	26	7	28	t14026w1070028	Norway Pine	28 NP67	5.9	100	0	0	Clearcut with Reserves	
140	26	13	56	t14026w1130056	Aspen	56 A52	17.7	62	0	0	Clearcut with Reserves	
140	26	13	58	t14026w1130058	Aspen	58 A52	1.7	62	0	0	Clearcut with Reserves	
140	26	13	63	t14026w1130063	Aspen	63 A56	20.9	59	0	0	Clearcut with Reserves	
140	26	13	69	t14026w1240069	Oak	69 O57	327	79	0	0	Thinning	
140	26	14	67	t14026w1140067	Aspen	67 A54	11.9	74	0	0	Clearcut with Reserves	
140	26	16	18	t14026w1160018	Norway Pine	18 NP58	35.9	101	0	0	Thinning	
140	26	16	34	t14026w1160034	Northern Hardwoods	34 NH56	171.8	94	0	0	Thinning	
140	26	16	35	t14026w1160035	Norway Pine	35 NP21	15.4	22	0	0.5	Thinning	
140	26	16	48	t14026w1160048	Norway Pine	48 NP59	36.6	101	0	0	Clearcut with Reserves	
140	26	16	257	t14026w1160257	Norway Pine	257 NP68	16	107	0	0.6	Clearcut with Reserves	
140	26	16	263	t14026w1160263	Norway Pine	263 NP64	22.3	101	0	0	On-site Evaluation	
140	26	16	311	t14026w1160311	Norway Pine	311 NP57	10.4	100	0	0	Clearcut with Reserves	
140	26	18	50	t14026w1180050	Norway Pine	50 NP66	6.3	119	0	0	Clearcut with Reserves	
140	26	18	91	t14026w1180091	Norway Pine	91 NP66	2.6	119	0	0	Clearcut with Reserves	
140	26	18	269	t14026w1180269	Aspen	269 A57	38.8	66	0	0	Clearcut with Reserves	
140	26	18	297	t14026w1180297	Aspen	297 A58	60	75	0	0	Clearcut with Reserves	
140	26	23	156	t14026w1230156	Birch	156 Bi55	43.3	77	0	0	Clearcut with Reserves	
140	26	24	106	t14026w1240106	Norway Pine	106 NP56	13.9	74	0	0	Thinning	
140	26	24	109	t14026w1240109	Aspen	109 A57	35.1	62	0	0	Clearcut with Reserves	
140	26	24	114	t14026w1240114	Norway Pine	114 NP56	1.9	74	0	0	Thinning	
140	26	24	140	t14026w1240140	Oak	140 O53	11	82	2015	0	Clearcut with Reserves	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
140	26	24	146	t14026w1240146	Aspen	146 A57	5.4	71	0	0	Clearcut with Reserves	
140	26	24	150	t14026w1240150	Tamarack	150 T52	3.7	148	0	0	Clearcut with Reserves	
140	26	24	159	t14026w1240159	Oak	159 O51	22.4	84	2015	0	Clearcut with Reserves	
140	26	24	308	t14026w1240308	Oak	308 O54	17.9	90	2015	0	Clearcut with Reserves	
140	26	27	168	t14026w1270168	Aspen	168 A16	8.6	24	0	0	Re-inventory.	
140	26	27	175	t14026w1270175	Aspen	175 A58	0.9	57	0	0	Clearcut with Reserves	
140	26	27	177	t14026w1270177	Aspen	177 A53	9.1	62	0	0	Clearcut with Reserves	
140	26	27	178	t14026w1270178	Aspen	178 A58	3.2	57	0	0	Clearcut with Reserves	
140	26	27	181	t14026w1270181	Tamarack	181 T43	8.7	74	0	0.1	Re-inventory.	
140	26	36	6	t13926w1010006	Norway Pine	6 NP 44	48.1	37	0	0	Thinning	
140	26	36	243	t14026w1360243	Norway Pine	243 NP59	8.1	61	0	0.2	Thinning	
140	26	36	248	t14026w1360248	Norway Pine	248 NP42	29.6	39	0	0	Thinning	
140	26	36	265	t14026w1360265	Norway Pine	265 NP59	5.9	63	0	0	Thinning	
140	26	36	282	t14026w1360282	Aspen	282 A56	13.2	70	0	0	Clearcut with Reserves	
140	27	8	97	t14027w1080097	Lowland Hardwoods	97 LH52	2.4	74	0	0.1	Re-inventory.	
140	27	16	12	t14027w1160012	Aspen	12 A44	81.9	37	0	0	Clearcut with Reserves	
140	27	16	31	t14027w1160031	Norway Pine	31 NP21	17.3	27	0	0	Thinning	
140	27	16	36	t14027w1160036	Oak	36 O56	29.7	79	0	0	Clearcut with Reserves	
140	27	16	39	t14027w1160039	Norway Pine	39 NP65	14.4	92	0	0	Thinning	
140	27	36	62	t14027w1360062	Balsam Fir	62 BF41	6.4	48	0	0.2	Re-inventory.	
140	27	36	72	t14027w1360072	Balsam Fir	72 BF44	15.3	59	0	0	Clearcut with Reserves	
140	28	3	1	t14028w1030001	Aspen	1 A29	3.9	16	0	0	Re-inventory.	
140	28	3	1	t14028w1030001	Aspen		2.2	16	0	0	Re-inventory.	
140	28	16	35	t14028w1160035	Aspen	35 A55	5.5	73	0	0	On-site Evaluation	
140	28	16	42	t14028w1160042	Aspen	42 A55	3	49	0	1.3	On-site Evaluation	
140	28	16	151	t14028w1160151	Birch	151 Bi56	14	77	0	0	On-site Evaluation	
140	28	30	117	t14028w1290117	Aspen	117 A65	12.6	94	0	0.4	On-site Evaluation	
140	28	30	121	t14028w1300121	White Pine	121 WP78	6.5	129	0	0	On-site Evaluation	
140	28	30	122	t14028w1300122	White Pine	122 WP74	2.8	106	0	0	On-site Evaluation	
140	28	30	123	t14028w1300123	Aspen	123 A55	20	81	0	0	Uneven-aged Harvest	
140	28	31	144	t14028w1310144	Aspen	144 A55	10	71	0	0	Clearcut with Reserves	
140	28	31	148	t14028w1310148	Northern Hardwoods	148 NH45	21.1	68	0	0	Uneven-aged Harvest	COV51
140	28	31	158	t14028w1310158	Aspen	158 A 55	16.2	69	0	0	Clearcut with Reserves	
140	28	31	159	t14028w1310159	Aspen	159 A 74	14.4	86	0	0	Clearcut with Reserves	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
140	28	36	139	t14028w1360139	Balsam Fir	139 BF54	8	71	0	0	Clearcut with Reserves	
140	29	1	37	t14029w1010037	Northern Hardwoods	37 NH54	9.9	105	0	0	Re-inventory.	
140	29	23	53	t14029w1230053	Aspen	53 A54	16.6	72	0	0	On-site Evaluation	
140	29	23	56	t14029w1230056	Birch	56 Bi53	18.6	72	0	0	Clearcut with Reserves	
140	29	24	24	t14029w1240024	Birch	24 Bi53	9.2	72	2010	0	Clearcut with Reserves	
140	29	36	61	t14029w1360061	Aspen	61 A55	10	64	0	0	Clearcut with Reserves	
140	29	36	77	t14029w1360077	Norway Pine	77 NP 49	12	48	0	0	Thinning	
140	29	36	80	t14029w1360080	Aspen	80 A 56	4	75	0	0	Clearcut with Reserves	
140	29	36	82	t14029w1360082	Balsam Fir	82 BF 45	2	62	2017	0	Thinning	
140	30	16	19	t14030w1160019	Aspen	19 A54	4.5	80	0	0	Re-inventory.	
140	30	16	29	t14030w1160029	Aspen	29 A54	8.2	80	0	0	Re-inventory.	
140	30	16	31	t14030w1160031	Aspen	31 A 57	8.6	85	0	0	Clearcut with Reserves	INC52
140	30	16	36	t14030w1160036	Oak	36 O 55	4	85	0	0	Clearcut with Reserves	
140	30	16	39	t14030w1160039	Aspen	39 A 55	12.6	85	0	0	Re-inventory.	
140	30	16	42	t14030w1160042	Oak	42 O44	23	85	0	0	Clearcut with Reserves	INC51
140	30	16	83	t14030w1160083	Aspen	83 A 59	12.2	85	0	0	Re-inventory.	INC52
140	30	36	68	t14030w1360068	Oak	68 O43	20	73	0	0.8	Clearcut with Reserves	
140	30	36	71	t14030w1360071	Aspen	71 A56	56.6	62	0	0	Clearcut with Reserves	
140	30	36	72	t14030w1360072	Norway Pine	72 NP66	5.8	79	0	0	On-site Evaluation	
140	30	36	75	t14030w1360075	Birch	75 Bi42	33.4	62	0	0	Clearcut with Reserves	
140	30	36	78	t14030w1360078	Aspen	78 A54	20.3	66	0	0	Re-inventory.	
140	30	36	81	t14030w1360081	Aspen	81 A54	13.8	65	0	0.5	Re-inventory.	
140	31	5	5	t14031w1050005	Aspen	5 A54	17.1	75	0	0	On-site Evaluation	
140	31	5	153	t14031w1050153	Aspen	153 A55	35.1	76	0	0	Clearcut with Reserves	
140	31	5	169	t14031w1050169	Birch	169 Bi54	10.5	84	0	0	Re-inventory.	
140	31	7	14	t14031w1070014	Oak	14 O51	28.7	72	2012	0	Clearcut with Reserves	
140	31	7	16	t14031w1070016	Aspen	16 A53	12	69	2012	0	Clearcut with Reserves	
140	31	7	118	t14031w1070118	Birch	118 Bi55	7.4	71	2012	0.1	Clearcut with Reserves	
140	31	7	158	t14031w1070158	Aspen	158 A57	23	74	2012	0	Clearcut with Reserves	
140	31	7	171	t14031w1070171	White Pine	171 WP79	13.5	101	0	0	Uneven-aged Harvest	INC51
140	31	8	10	t14031w1080010	Aspen	10 A57	50	66	0	0	Clearcut with Reserves	
140	31	8	13	t14031w1080013	Jack Pine	13 JP44	17.5	51	0	0.4	Clearcut with Reserves	MA1
140	31	8	17	t14031w1080017	Birch	17 Bi54	17.4	84	0	0	Re-inventory.	
140	31	8	18	t14031w1080018	Birch	18 Bi54	1.9	84	0	0	Re-inventory.	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Brainerd Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
140	31	8	19	t14031w1080019	Birch	19 Bi54	1.3	84	0	0	Re-inventory.	
140	31	14	122	t14031w1140122	Aspen	122 A57	6.1	60	0	0.6	Clearcut with Reserves	
140	31	15	23	t14031w1150023	Oak	23 O53	13.1	76	0	0	Clearcut with Reserves	
140	31	15	119	t14031w1150119	Oak	119 O51	21.5	76	0	0	On-site Evaluation	
140	31	16	30	t14031w1160030	Norway Pine	30 NP12	2.6	24	2014	0	On-site Evaluation	
140	31	16	31	t14031w1160031	Norway Pine	31 NP42	9.5	26	2014	0	Thinning	
140	31	16	34	t14031w1160034	Aspen	34 A52	4.9	66	0	0	Re-inventory.	
140	31	16	35	t14031w1160035	Aspen	35 A54	7.6	76	0	0	On-site Evaluation	
140	31	16	51	t14031w1160051	Balsam Fir	51 BF41	12.6	76	0	0	Clearcut with Reserves	
140	31	17	27	t14031w1170027	Aspen	27 A55	17	77	0	0	Clearcut with Reserves	
140	31	17	38	t14031w1170038	Birch	38 Bi53	25	70	0	0	Clearcut with Reserves	
140	31	17	170	t14031w1170170	Birch	170 Bi53	7.2	70	0	0	Uneven-aged Harvest	
140	31	18	41	t14031w1180041	Birch	41 Bi42	10	74	0	0.5	Uneven-aged Harvest	
140	31	18	42	t14031w1180042	Aspen	42 A55	13.7	65	0	0.3	On-site Evaluation	
140	31	18	48	t14031w1180048	Birch	48 Bi53	24.4	72	0	0	Re-inventory.	
140	31	18	52	t14031w1180052	Cutover Area	52 COA	13	0	0	0	Re-inventory.	COV53
140	31	18	53	t14031w1180053	Norway Pine	53 NP44	16.8	22	2014	0	Thinning	
140	31	18	55	t14031w1180055	White Spruce	55 WS11	16.1	22	0	0	Thinning	
140	31	18	127	t14031w1180127	Norway Pine	127 NP11	7.7	16	0	0.1	Thinning	
140	31	18	146	t14031w1180146	Birch	146 Bi55	7	72	0	0	Clearcut with Reserves	INC53
140	31	18	166	t14031w1180166	Birch	166 Bi55	5	72	0	0	On-site Evaluation	
140	31	23	140	t14031w1230140	Aspen	140 A56	26	65	0	0	Clearcut with Reserves	
140	31	23	179	t14031w1230179	Aspen	179 A 56	3	52	0	0	Re-inventory.	
140	31	26	85	t14031w1260085	Norway Pine	85 NP52	9.6	52	2010	0	On-site Evaluation	INC53
140	31	26	86	t14031w1260086	Jack Pine	86 JP45	3.1	55	2010	0	Clearcut with Reserves	
140	31	26	88	t14031w1260088	Aspen	88 A42	9.1	50	2010	0	Clearcut with Reserves	INC53
140	31	26	123	t14031w1260123	Balsam Fir	123 BF42	5.6	52	2010	0	Clearcut with Reserves	
140	31	34	108	t14031w1340108	Balsam Fir	108 BF54	8.4	70	0	0	On-site Evaluation	
140	31	36	92	t14031w1360092	Jack Pine	92 JP44	10.3	47	0	0.7	Clearcut with Reserves	
140	31	36	95	t14031w1360095	Aspen	95 A44	28.4	56	0	0	Clearcut with Reserves	
140	31	36	100	t14031w1360100	Norway Pine	100 NP43	19.6	26	0	0	Thinning	INC53
140	31	36	104	t14031w1360104	Norway Pine	104 NP11	20.8	16	0	0	Thinning	INC53
140	31	36	107	t14031w1360107	White Spruce	107 WS11	5.7	16	0	0	On-site Evaluation	INC53
140	31	36	109	t14031w1360109	White Spruce	109 WS11	8.1	16	0	0	On-site Evaluation	INC53

Subsection **Pine Moraines & Outwash Plains**

Forestry Area *Brainerd Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
140	31	36	112	t14031w1360112	Ash	112 Ash52	22.2	93	0	0	On-site Evaluation	
140	31	36	113	t14031w1360113	Aspen	113 A43	16.4	54	0	0	Clearcut with Reserves	
140	31	36	114	t14031w1360114	Norway Pine	114 NP64	4	99	0	0.1	Clearcut with Reserves	
140	31	36	159	t14031w1360159	Aspen	159 A54	8.3	58	0	0	Clearcut with Reserves	
140	31	36	160	t14031w1360160	Aspen	160 A54	3.4	58	0	0	Clearcut with Reserves	
140	31	36	161	t14031w1360161	Aspen	161 A54	1.3	58	0	0	Clearcut with Reserves	
140	31	36	162	t14031w1360162	Aspen	162 A54	0.6	58	0	0	Clearcut with Reserves	
141	26	16	42	t14126w1160042	Aspen	42 A55	77.4	70	0	0	Clearcut with Reserves	
141	26	16	45	t14126w1160045	Aspen	45 A44	13.2	71	0	0	Clearcut with Reserves	
141	26	16	49	t14126w1160049	Aspen	49 A52	30.9	78	0	0	On-site Evaluation	
141	26	36	81	t14126w1360081	Tamarack	81 T45	11	126	0	0	On-site Evaluation	
141	26	36	85	t14126w1360085	Tamarack	85 T52	4.9	132	0	0	On-site Evaluation	
141	27	1	35	t14127w1010035	Aspen	35 A42	14	40	0	0.5	Clearcut with Reserves	
141	27	1	43	t14127w1010043	Aspen	43 A42	14.3	40	0	0	Clearcut with Reserves	
141	27	3	168	t14127w1030168	Norway Pine	168 NP12	18.6	10	0	0	Thinning	
141	27	4	28	t14127w1040028	Aspen	28 A54	14.1	48	2017	0	Clearcut with Reserves	
141	27	4	32	t14127w1040032	Aspen	32 A35	6.8	31	2017	0	Clearcut with Reserves	
141	27	6	14	t14127w1060014	Aspen	14 A54	14.1	75	0	0.1	Re-inventory.	
141	27	6	15	t14127w1060015	Aspen	15 A43	15.9	44	0	0.4	On-site Evaluation	
141	27	8	40	t14127w1080040	Aspen	40 A55	8.7	58	0	0	On-site Evaluation	
141	27	8	41	t14127w1080041	Northern Hardwoods	41 NH53	21.6	58	0	0	On-site Evaluation	
141	27	9	48	t14127w1090048	Northern Hardwoods	48 NH54	14.8	118	0	0.4	Thinning	
141	27	9	63	t14127w1090063	Norway Pine	63 NP54	9.6	58	0	0	On-site Evaluation	
141	27	11	58	t14127w1110058	Aspen	58 A17	20.5	33	2017	0	Clearcut with Reserves	
141	27	11	61	t14127w1110061	Aspen	61 A27	28.2	33	2017	0	Clearcut with Reserves	
141	27	15	82	t14127w1150082	Northern Hardwoods	82 NH55	25.7	59	0	0	Thinning	
141	27	15	87	t14127w1150087	Tamarack	87 T41	10.8	81	0	0.4	Seed Tree	
141	27	16	77	t14127w1160077	Northern Hardwoods	77 NH55	84.9	34	0	0	Thinning	
141	27	19	97	t14127w1190097	Northern Hardwoods	97 NH45	33.6	77	0	0	Clearcut with Reserves	
141	27	20	164	t14127w1200164	Northern Hardwoods	164 NH53	9.4	79	0	0.3	Uneven-aged Harvest	INC51
141	27	21	103	t14127w1210103	Ash	103 Ash54	42	82	0	0	On-site Evaluation	
141	27	25	128	t14127w1250128	Norway Pine	128 NP55	18.7	101	0	0	On-site Evaluation	
141	27	25	132	t14127w1250132	Aspen	132 A54	9.7	78	0	0	On-site Evaluation	
141	27	36	162	t14127w1360162	Aspen	162 A54	11.8	75	0	0	Re-inventory.	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area *Brainerd Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
141	28	1	3	t14128w1010003	Oak	3 O56	11.7	78	0	0	Clearcut with Reserves	
141	28	1	4	t14128w1010004	Aspen	4 A56	4	67	0	0.1	Clearcut with Reserves	
141	28	1	5	t14128w1010005	Northern Hardwoods	5 NH55	34.8	74	0	1.1	Clearcut with Reserves	
141	28	1	6	t14128w1010006	Balsam Fir	6 BF45	11	71	0	0	Clearcut with Reserves	
141	28	1	7	t14128w1010007	Tamarack	7 T55	1.7	126	0	0	Clearcut with Reserves	
141	28	7	21	t14128w1070021	Birch	21 Bi55	15.3	77	0	0.6	On-site Evaluation	
141	28	7	24	t14128w1070024	Birch	24 Bi44	20	71	0	0	On-site Evaluation	
141	28	19	85	t14128w1190085	Oak	85 O57	5	81	0	0	Clearcut with Reserves	
141	28	30	62	t14128w1300062	Birch	62 Bi56	7.2	74	0	0.8	Clearcut with Reserves	
141	28	30	64	t14128w1300064	Norway Pine	64 NP68	3.4	107	0	0	Clearcut with Reserves	
141	28	30	67	t14128w1300067	Northern Hardwoods	67 NH55	21.6	82	0	0	Thinning	
141	28	35	70	t14128w1350070	Tamarack	70 T43	17.6	98	0	0	Seed Tree	
141	28	35	71	t14128w1350071	Aspen	71 A55	3.2	77	0	0	Clearcut with Reserves	
141	28	35	72	t14128w1350072	Aspen	72 A58	3.2	74	0	0.2	Clearcut with Reserves	
141	29	1	91	t14129w1010091	Birch	91 Bi56	8.6	96	0	0	On-site Evaluation	
141	29	9	87	t14129w1090087	Aspen	87 A56	24.5	85	0	0	Clearcut with Reserves	
141	29	10	49	t14129w1100049	Oak	49 O53	29.9	89	0	0	On-site Evaluation	
141	29	10	50	t14129w1100050	Oak	50 O56	58.4	86	0	0	On-site Evaluation	
141	29	11	43	t14129w1110043	Aspen	43 A55	7	86	0	0	Clearcut with Reserves	
141	29	13	70	t14129w1130070	Aspen	70 A56	15.5	81	0	0	Clearcut with Reserves	
141	29	13	72	t14129w1130072	Birch	72 Bi55	8.5	83	0	0	Clearcut with Reserves	
141	29	23	67	t14129w1230067	Aspen	67 A53	12.3	82	0	0	Clearcut with Reserves	
141	29	23	68	t14129w1230068	Aspen	68 A56	5.4	79	0	0.2	Clearcut with Reserves	
141	29	25	29	t14129w1250029	Aspen	29 A56	10.3	80	0	0	Clearcut with Reserves	
141	29	25	30	t14129w1250030	Birch	30 Bi55	18.8	79	0	0	Clearcut with Reserves	
141	29	25	31	t14129w1250031	Aspen	31 A54	28.1	49	0	0	Clearcut with Reserves	
141	29	25	115	t14129w1250115	Aspen	115 A58	32.5	81	0	0	Clearcut with Reserves	
141	29	26	24	t14129w1260024	Birch	24 Bi44	9.7	82	0	0.1	Clearcut with Reserves	
141	29	26	25	t14129w1260025	Aspen	25 A54	13	80	0	0	Clearcut with Reserves	
141	29	26	34	t14129w1260034	Oak	34 O53	10.6	80	0	0.1	Clearcut with Reserves	
141	29	26	37	t14129w1260037	Aspen	37 A54	7.4	50	0	0	Clearcut with Reserves	
141	29	36	6	t14129w1360006	Oak	6 O54	10.4	86	0	0	Clearcut with Reserves	
141	30	1	80	t14130w1010080	Birch	80 Bi54	4	83	0	0	On-site Evaluation	
141	30	2	5	t14130w1020005	Balsam Fir	5 BF43	5.4	72	0	0	Clearcut with Reserves	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area *Brainerd Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
141	30	2	8	t14130w1020008	Balsam Fir	8 BF45	17.1	80	0	0	Clearcut with Reserves	
141	30	11	13	t14130w1110013	Aspen	13 A55	3.6	61	0	0	Clearcut with Reserves	
141	30	11	14	t14130w1110014	Norway Pine	14 NP67	8.9	95	0	0	On-site Evaluation	
141	30	16	34	t14130w1160034	Aspen	34 A56	4.4	56	0	0	On-site Evaluation	
141	30	16	35	t14130w1160035	Aspen	35 A56	13.5	55	0	0	On-site Evaluation	
141	30	23	49	t14130w1230049	Oak	49 O54	6.8	73	0	0	Clearcut with Reserves	
141	30	24	17	t14130w1240017	Aspen	17 A58	7.2	68	0	0	Clearcut with Reserves	
141	30	36	63	t14130w1360063	Aspen	63 A58	136.6	72	0	0	Clearcut with Reserves	
141	30	36	70	t14130w1360070	Northern Hardwoods	70 NH57	28.7	72	0	0	Thinning	
141	30	36	78	t14130w1360078	Aspen	78 A57	72.9	74	0	0	Clearcut with Reserves	
141	30	36	86	t14130w1360086	Northern Hardwoods	86 NH54	9.2	67	0	0	Thinning	INC51
141	31	12	21	t14131w1120021	Aspen	21 A54	8.6	86	0	0	Clearcut with Reserves	
141	31	12	24	t14131w1120024	Balsam Fir	24 BF55	11.6	87	0	0.2	Clearcut with Reserves	
141	31	16	4	t14131w1160004	Aspen	4 A57	49.9	80	2011	0	Clearcut with Reserves	INC51
141	31	16	8	t14131w1160008	Aspen	8 A43	11.3	56	0	0	On-site Evaluation	
141	31	16	10	t14131w1160010	Aspen	10 A56	32	82	0	1.1	Clearcut with Reserves	INC52
141	31	16	18	t14131w1160018	Aspen	18 A56	56.5	79	0	0.8	Clearcut with Reserves	
141	31	22	26	t14131w1220026	Norway Pine	26 NP62	7.1	102	0	0	Re-inventory.	
141	31	36	29	t14131w1360029	Aspen	29 A53	10.4	72	0	0	Clearcut with Reserves	
141	31	36	32	t14131w1360032	Aspen	32 A56	26.9	74	0	0.1	Clearcut with Reserves	
141	31	36	34	t14131w1360034	Birch	34 Bi54	46.3	69	0	0	Clearcut with Reserves	
142	27	32	50	t14227w1320050	Northern Hardwoods	50 NH54	18.6	72	2010	0	Thinning	
142	27	32	54	t14227w1320054	Northern Hardwoods	54 NH55	10.3	80	2010	0	Thinning	
142	27	36	90	t14227w1360090	Northern Hardwoods	90 NH55	29.4	94	0	0	Clearcut with Reserves	
142	27	36	122	t14227w1360122	Northern Hardwoods	122 NH56	14.8	74	0	0	Clearcut with Reserves	
142	28	26	28	t14228w1260028	Tamarack	28 T53	23	120	0	0	Clearcut with Reserves	
142	28	33	47	t14228w1330047	Oak	47 O54	23.4	76	0	0.3	Clearcut with Reserves	

Forestry Area *Deer River Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
142	26	30	19	t14226w1300019	Aspen	19 A53	2.1	75	0	0	Clearcut with Reserves	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Detroit Lakes Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
135	38	22	27	t13538w1220027	Oak	27 O62	9.1	102	0	0	On-site Evaluation	
137	37	6	3	t13737w1060003	Aspen	3 A55	12.7	65	0	0	Clearcut with Reserves	
137	38	11	15	t13738w1110015	Northern Hardwoods	15 NH54	8.4	65	0	0	On-site Evaluation	
137	38	14	21	t13738w1140021	Northern Hardwoods	21 NH54	3.8	65	0	0	On-site Evaluation	
137	38	14	26	t13738w1140026	Northern Hardwoods	26 NH54	30.4	65	0	0	Re-inventory.	
138	38	4	1	t13838w1040001	Aspen	1 A55	6.5	56	0	0	Clearcut with Reserves	
138	38	4	3	t13838w1040003	Aspen	3 A44	14.9	52	0	0	Clearcut with Reserves	
138	38	36	6	t13838w1360006	Aspen	6 A56	6.1	81	0	0	Re-inventory.	
138	38	36	7	t13838w1360007	Northern Hardwoods	7 NH55	269.8	76	0	0	Uneven-aged Harvest	
138	38	36	12	t13838w1360012	Tamarack	12 T53	27.3	77	0	0	Re-inventory.	
138	38	36	13	t13838w1360013	Aspen	13 A56	15.2	70	0	0	Clearcut with Reserves	
138	38	36	15	t13838w1360015	Northern Hardwoods	15 NH55	22.3	71	0	0	Uneven-aged Harvest	
138	38	36	17	t13838w1360017	Aspen	17 A56	14.4	70	0	0	Re-inventory.	COV52
138	38	36	18	t13838w1360018	Aspen	18 A55	38	51	0	0	Clearcut with Reserves	
138	38	36	20	t13838w1360020	Aspen	20 A54	23.5	68	0	0	Clearcut with Reserves	
138	38	36	21	t13838w1360021	Aspen	21 A56	6.3	69	0	0	Clearcut with Reserves	
138	39	4	1	t13839w1040001	Agriculture	1 Agr	3.6	25	0	0	On-site Evaluation	COV51
138	39	4	2	t13839w1040002	White Pine	2 WP57	24.3	100	0	0	Uneven-aged Harvest	
138	39	18	5	t13839w1180005	Tamarack	5 T44	8.9	83	0	0	Seed Tree	
138	39	18	7	t13839w1180007	Tamarack	7 T44	26.1	107	0	0	Seed Tree	
138	39	24	11	t13839w1240011	White Pine	11 WP65	9.9	77	0	0	Uneven-aged Harvest	
138	39	24	14	t13839w1240014	Upland Grass	14 UG	4.1	12	0	0	Clearcut with Reserves	COV51
138	39	34	18	t13839w1340018	Oak	18 O52	20	61	0	0	Clearcut with Reserves	INC51
138	39	34	20	t13839w1340020	Aspen	20 A53	17.2	58	0	0	Clearcut with Reserves	
139	38	6	22	t13938w1060022	Oak	22 O56	7	81	0	0	Clearcut with Reserves	
139	38	24	107	t13938w1240107	Aspen	107 A54	30	57	0	0	Clearcut with Reserves	
139	38	24	108	t13938w1240108	Oak	108 O55	28.7	88	0	0	Clearcut with Reserves	
139	38	27	153	t13938w1270153	Aspen	153 A43	7.7	60	0	0	Clearcut with Reserves	
139	38	34	171	t13938w1340171	Aspen	171 A43	4.8	60	0	0	Re-inventory.	
139	39	36	202	t13939w1360202	Aspen	202 A53	33.7	65	0	0	Clearcut with Reserves	
139	39	36	204	t13939w1360204	Aspen	204 A55	18.2	61	0	0	Clearcut with Reserves	
139	39	36	208	t13939w1360208	Aspen	208 A52	14.9	64	0	0	Clearcut with Reserves	
139	40	36	78	t13940w1360078	Oak	78 O57	10.2	92	0	0	Shelterwood	
139	40	36	80	t13940w1360080	Aspen	80 A55	27.8	58	0	0	Clearcut with Reserves	INC51

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Detroit Lakes Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
139	40	36	88	t13940w1360088	Aspen	88 A55	11.2	59	0	0	Clearcut with Reserves	
139	40	36	92	t13940w1360092	Aspen	92 A19	19.4	67	0	0	Re-inventory.	
139	40	36	93	t13940w1360093	Balsam Fir	93 BF52	10.9	98	0	0	Manage for understory	
140	38	4	9	t14038w1040009	Aspen	9 A53	5.3	68	0	0	Clearcut with Reserves	
140	38	4	10	t14038w1040010	Aspen	10 A43	6.3	45	0	0	Clearcut with Reserves	
140	38	4	11	t14038w1040011	Aspen	11 A56	6.9	79	0	0	Manage for understory	
140	38	4	94	t14038w1040094	Oak	94 O57	11.6	74	0	0	Re-inventory.	
140	38	16	32	t14038w1160032	Northern Hardwoods	32 NH56	34	83	0	0	Uneven-aged Harvest	INC51
140	38	16	47	t14038w1160047	Birch	47 Bi45	14.9	72	0	0	Re-inventory.	
140	38	16	56	t14038w1160056	Aspen	56 A43	9.2	48	0	0	Clearcut with Reserves	
140	38	18	27	t14038w1180027	Oak	27 O55	12	87	0	0	Clearcut with Reserves	
140	38	18	33	t14038w1180033	Aspen	33 A54	11.1	82	0	0	Clearcut with Reserves	
140	38	18	39	t14038w1180039	Aspen	39 A55	32.5	80	0	0	Manage for understory	COV20
140	38	18	95	t14038w1180095	Birch	95 Bi17	10.4	77	0	0	Re-inventory.	
140	38	22	58	t14038w1220058	Aspen	58 A56	11.8	65	0	0	Clearcut with Reserves	
140	38	22	65	t14038w1220065	Oak	65 O57	34	82	0	0	Clearcut with Reserves	
140	38	22	90	t14038w1220090	Oak	90 O57	5.5	93	0	0	Clearcut with Reserves	
140	38	26	63	t14038w1260063	Upland Grass	63 UG	2.4	2	0	0	On-site Evaluation	COV51
140	38	26	74	t14038w1260074	Aspen	74 A44	6.8	56	0	0	Clearcut with Reserves	
140	38	32	79	t14038w1320079	Aspen	79 A55	16.4	70	0	0	Clearcut with Reserves	
140	38	36	81	t14038w1360081	Norway Pine	81 NP67	5	99	0	0	Thinning	
140	38	36	83	t14038w1360083	Aspen	83 A54	25.7	53	0	0	Clearcut with Reserves	
140	38	36	85	t14038w1360085	Birch	85 Bi53	4.9	83	0	0	Clearcut with Reserves	
140	39	13	4	t14039w1130004	Oak	4 O58	15	86	0	0	Clearcut with Reserves	
140	39	24	8	t14039w1240008	Northern Hardwoods	8 NH56	32.6	85	0	0	Uneven-aged Harvest	
140	39	24	59	t14039w1240059	Oak	59 O54	5.7	82	0	0	Clearcut with Reserves	
140	39	25	25	t14039w1250025	Lowland Hardwoods	25 LH41	7.8	71	0	0	Seed Tree	COV72
140	39	26	11	t14039w1260011	Aspen	11 A19	16.2	87	0	0	Re-inventory.	
140	39	26	16	t14039w1260016	Tamarack	16 T52	23.6	114	0	0	Seed Tree	
140	39	26	21	t14039w1260021	Aspen	21 A56	17.4	71	0	0	On-site Evaluation	CON2
140	39	36	35	t14039w1360035	Northern Hardwoods	35 NH55	111.7	66	0	0	Uneven-aged Harvest	
140	39	36	36	t14039w1360036	Oak	36 O55	13.7	80	0	0	Clearcut with Reserves	
140	39	36	40	t14039w1360040	Oak	40 O58	53.6	80	0	0	Clearcut with Reserves	
140	39	36	46	t14039w1360046	Aspen	46 A54	21.6	74	0	0	Clearcut with Reserves	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Detroit Lakes Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
140	39	36	55	t14039w1360055	Aspen	55 A66	22.3	84	0	0	Clearcut with Reserves	
141	38	29	1	t14138w1290001	Cutover Area	1 COA	18.1	8	0	0	Re-inventory.	COV72
141	38	30	7	t14138w1300007	Aspen	7 A54	12.3	72	0	0	Clearcut with Reserves	
141	39	7	42	t14139w1070042	Aspen	42 A54	8	81	0	0	Manage for understory	COV20
141	39	30	84	t14139w1300084	Tamarack	84 T41	11.7	136	0	0	Seed Tree	
142	38	1	11	t14238w1010011	Aspen	11 A55	13	77	0	0	Clearcut with Reserves	COV53
142	38	2	30	t14238w1020030	White Spruce	30 WS44	10.8	65	0	0	Thinning	
142	38	2	170	t14238w1020170	Aspen	170 A56	9.2	77	0	0	Clearcut with Reserves	INC61
142	38	3	7	t14238w1030007	Aspen	7 A43	9.3	42	0	0	Clearcut with Reserves	
142	38	3	15	t14238w1030015	Aspen	15 A53	36.2	71	0	0	Clearcut with Reserves	INC61 INC51
142	38	3	22	t14238w1030022	Aspen	22 A42	12.6	45	0	0	On-site Evaluation	
142	38	6	1	t14238w1060001	Norway Pine	1 NP56	15.7	105	0	0	Thinning	
142	38	7	43	t14238w1070043	Aspen	43 A54	10.6	83	0	0	Manage for understory	COV62
142	38	10	34	t14238w1100034	Birch	34 Bi54	8.4	80	0	0	Clearcut with Reserves	
142	38	12	48	t14238w1120048	Aspen	48 A54	25	72	0	0	Clearcut with Reserves	INC51
142	38	12	176	t14238w1120176	White Pine	176 WP55	6.7	65	0	0	Uneven-aged Harvest	
142	38	12	177	t14238w1120177	White Pine	177 WP45	10.8	65	0	0	Uneven-aged Harvest	
142	38	12	178	t14238w1120178	White Pine	178 WP43	18.7	65	0	0	Uneven-aged Harvest	
142	38	13	180	t14238w1130180	Aspen	180 A19	11	71	0	0	Re-inventory.	
142	38	13	181	t14238w1130181	Aspen	181 A19	2.7	71	0	0	Re-inventory.	
142	38	13	182	t14238w1130182	Aspen	182 A19	5.4	71	0	0	Re-inventory.	
142	38	17	62	t14238w1170062	Balsam Fir	62 BF41	15.1	99	0	0	Manage for understory	MA1
142	38	19	96	t14238w1190096	Aspen	96 A54	24.9	81	0	0	Clearcut with Reserves	
142	38	19	104	t14238w1190104	Ash	104 Ash41	42.4	74	0	0	On-site Evaluation	INC72
142	38	19	117	t14238w1190117	Aspen	117 A52	56.9	90	0	0	Manage for understory	MA1
142	38	20	95	t14238w1200095	Aspen	95 A54	7.4	76	0	0	Clearcut with Reserves	
142	38	20	105	t14238w1200105	Aspen	105 A56	7.7	80	0	0	Clearcut with Reserves	
142	38	21	122	t14238w1210122	Norway Pine	122 NP 44	34	39	0	0	Thinning	
142	38	23	84	t14238w1230084	Aspen	84 A41	22.5	31	0	0	Clearcut with Reserves	
142	38	24	160	t14238w1240160	Aspen	160 A56	22.4	85	0	0	Clearcut with Reserves	
142	38	25	132	t14238w1250132	Norway Pine	132 NP12	75	22	0	0	On-site Evaluation	
142	38	25	136	t14238w1250136	White Spruce	136 WS53	21.4	66	0	0	Seed Tree	COV51
142	38	25	137	t14238w1250137	Norway Pine	137 NP32	13.9	24	0	0	On-site Evaluation	
142	38	25	138	t14238w1250138	Aspen	138 A54	7	83	0	0	Clearcut with Reserves	

Subsection Pine Moraines & Outwash Plains

Forestry Area Detroit Lakes Area

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
142	38	25	141	t14238w1250141	Norway Pine	141 NP41	58.2	32	0	0	On-site Evaluation	
142	38	25	144	t14238w1250144	White Spruce	144 WS56	26.7	62	0	0	Seed Tree	COV51
142	38	26	128	t14238w1260128	Oak	128 O53	12.7	97	0	0	Clearcut with Reserves	
142	38	26	130	t14238w1260130	Norway Pine	130 NP66	29.4	81	0	0	Thinning	
142	38	26	133	t14238w1260133	Aspen	133 A54	25.3	83	0	0	Clearcut with Reserves	
142	38	33	153	t14238w1330153	Cutover Area	153 COA	6.4	11	0	0	On-site Evaluation	COV72
142	39	11	18	t14239w1110018	Aspen	18 A55	5.2	82	0	0	Re-inventory.	
142	39	12	60	t14239w1120060	Aspen	60 A57	4	82	0	0	Clearcut with Reserves	
142	39	15	67	t14239w1150067	Oak	67 O56	16.2	80	0	0	Clearcut with Reserves	
142	39	27	98	t14239w1270098	Aspen	98 A19	17.4	68	0	0	Re-inventory.	
142	39	27	101	t14239w1270101	Aspen	101 A56	14.8	73	0	0	Clearcut with Reserves	

Forestry Area Little Falls Area

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
131	31	15	17	t13131w1160017	Aspen	17 A55	5.8	57	0	0	Clearcut with Reserves	
131	31	16	33	t13131w1160033	Aspen	33 A53	11.7	55	0	0	Clearcut with Reserves	
131	31	16	63	t13131w1160063	Aspen	63 A59	45.8	52	0	0	Clearcut with Reserves	
131	31	16	69	t13131w1160069	Aspen	69 A44	11.3	45	0	0	Clearcut with Reserves	
131	31	16	70	t13131w1160070	Aspen	70 A58	34.7	56	0	0	Clearcut with Reserves	CON4
131	31	16	73	t13131w1160073	Aspen	73 A56	1.1	63	2010	0.3	Clearcut with Reserves	
131	32	4	1	t13132w1040001	Northern Hardwoods	1 NH55	9.6	65	0	0	Re-inventory.	
131	32	16	8	t13132w1160008	Oak	8 O55	22.2	81	0	0	Clearcut with Reserves	
131	32	16	23	t13132w1160023	Oak	23 O55	12.1	81	0	0.5	Clearcut with Reserves	
131	32	16	58	t13132w1160058	Oak	58 O55	10.4	81	0	0	Clearcut with Reserves	
131	32	24	81	t13132w1240081	Oak	81 O54	11.7	86	0	0	Uneven-aged Harvest	
131	32	24	85	t13132w1240085	Oak	85 O56	7.1	92	0	0.5	Uneven-aged Harvest	
131	32	24	86	t13132w1240086	Oak	86 O54	13	88	0	0.5	Uneven-aged Harvest	
131	32	25	67	t13132w1250067	Aspen	67 A55	74.9	67	0	0	Clearcut with Reserves	
131	32	36	47	t13132w1360047	Oak	47 O53	17	79	0	0	Clearcut with Reserves	
131	32	36	49	t13132w1360049	Oak	49 O53	12.1	79	0	0	Clearcut with Reserves	
131	32	36	55	t13132w1360055	Aspen	55 A53	14	64	0	0	Clearcut with Reserves	
132	31	6	42	t13231w1060042	Oak	42 O55	2.6	79	0	0	On-site Evaluation	
132	31	6	43	t13231w1060043	Aspen	43 A54	1.4	61	0	0	On-site Evaluation	

Subsection Pine Moraines & Outwash Plains

Forestry Area Little Falls Area

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
132	31	11	46	t13231w1110046	Oak	46 O55	22.7	93	0	0	On-site Evaluation	
132	31	11	53	t13231w1110053	Oak	53 O55	6	87	0	0	On-site Evaluation	
132	31	14	31	t13231w1140031	White Pine	31 WP22	1.1	26	0	0	On-site Evaluation	
132	31	14	33	t13231w1140033	White Pine	33 WP22	1.2	26	0	0	On-site Evaluation	
132	31	14	57	t13231w1140057	White Pine	57 WP41	0.9	38	0	0	On-site Evaluation	
132	31	14	60	t13231w1140060	White Pine	60 WP41	10.8	38	0	0	On-site Evaluation	
132	31	14	67	t13231w1140067	White Pine	67 WP55	4.8	85	0	0	Thinning	
132	32	2	7	t13232w1020007	Offsite Oak - SI <= 39	7 OX41	20	92	0	0	Shelterwood	INC51
132	32	2	9	t13232w1020009	White Pine	9 WP12	5.2	11	2010	0	Shelterwood	
132	32	16	79	t13232w1160079	Northern Hardwoods	79 NH52	32.6	91	0	0	On-site Evaluation	INC61
132	32	16	81	t13232w1160081	Aspen	81 A56	4.2	59	0	0.2	Clearcut with Reserves	
132	32	36	61	t13232w1360061	Oak	61 O53	5.2	83	0	0	Clearcut with Reserves	
132	32	36	69	t13232w1360069	Oak	69 O53	3.5	83	0	0	Clearcut with Reserves	
132	32	36	70	t13232w1360070	Oak	70 O53	10	93	0	0	Clearcut with Reserves	
132	32	36	72	t13232w1360072	Oak	72 O53	12.2	83	0	0.5	Clearcut with Reserves	
132	32	36	88	t13232w1360088	White Pine	88 WP54	6.6	47	0	0	On-site Evaluation	
132	32	36	92	t13232w1360092	Oak	92 O53	30	73	0	0.5	Clearcut with Reserves	
133	31	36	106	t13331w1360106	Tamarack	106 T53	70	104	0	0	Clearcut with Reserves	PAT2
133	31	36	108	t13331w1360108	Tamarack	108 T41	5.7	109	0	0.5	Clearcut with Reserves	
133	31	36	113	t13331w1360113	Tamarack	113 T51	81	92	0	0	Clearcut with Reserves	PAT2
133	32	35	101	t13332w1350101	Oak	101 O53	24.4	74	0	0	Shelterwood	INC51
133	32	36	90	t13332w1360090	Aspen	90 A53	44.7	51	0	0	On-site Evaluation	
133	32	36	91	t13332w1360091	Oak	91 O53	23.2	84	0	0	Shelterwood	INC51
133	32	36	98	t13332w1360098	Oak	98 O42	9.2	71	0	0.2	Shelterwood	INC51
133	32	36	103	t13332w1360103	Oak	103 O53	10.3	74	0	0	Shelterwood	INC51
133	32	36	107	t13332w1350107	White Pine	107 WP12	16	11	2010	0	Shelterwood	

Forestry Area Park Rapids Area

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
135	33	1	191	t13533w1010191	Offsite Oak - SI <= 39	191 OX42	3.9	97	0	0	Clearcut with Reserves	COV53
135	33	1	205	t13533w1010205	Aspen	205 A42	7	45	0	0	Clearcut with Reserves	COV53
135	33	1	207	t13533w1010207	Aspen	207 A42	7.4	45	0	0	Clearcut with Reserves	COV53
135	33	1	208	t13533w1010208	Upland Grass	208 UG	5.4	15	0	0	On-site Evaluation	COV53

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
135	33	4	12	t13533w1040012	Norway Pine	12 NP42	4.9	27	0	0	Thinning	
135	33	4	14	t13533w1040014	Norway Pine	14 NP42	8.9	49	0	0	Thinning	
135	33	4	21	t13533w1040021	Upland Grass	21 UG	2.2	6	0	0	On-site Evaluation	COV53
135	33	4	24	t13533w1040024	Norway Pine	24 NP42	49.4	39	0	0	Thinning	
135	33	4	31	t13533w1040031	Norway Pine	31 NP43	11.1	52	0	0	Thinning	
135	33	4	34	t13533w1040034	Aspen	34 A43	12.1	46	0	0	Clearcut with Reserves	
135	33	4	36	t13533w1040036	Aspen	36 A43	2.7	46	0	0	Clearcut with Reserves	
135	33	4	40	t13533w1040040	Norway Pine	40 NP43	6.7	50	0	0	Thinning	
135	33	4	50	t13533w1040050	Norway Pine	50 NP42	14.5	21	0	0	Thinning	
135	33	4	51	t13533w1040051	Norway Pine	51 NP11	7.9	17	0	0	Thinning	
135	33	4	52	t13533w1040052	Cutover Area	52 COA	31	1	0	0	Re-inventory.	COV53
135	33	4	56	t13533w1040056	Tamarack	56 T43	13.7	105	0	0	Clearcut with Reserves	
135	33	4	57	t13533w1040057	Aspen	57 A54	7.5	54	0	0	Re-inventory.	
135	33	4	57	t13533w1040057	Aspen	57 A54	7.5	54	0	0	Re-inventory.	
135	33	4	59	t13533w1040059	Aspen	59 A41	9	53	0	0	On-site Evaluation	
135	33	4	60	t13533w1040060	Norway Pine	60 NP42	3.5	21	0	0	Thinning	
135	33	4	179	t13533w1040179	Jack Pine	179 JP44	28.6	51	0	0	Clearcut with Reserves	MA1 CON6
135	33	5	2	t13533w1059002	Norway Pine	9002 NP11	0.7	22	0	0	Thinning	
135	33	5	4	t13533w1059004	Norway Pine	9004 NP11	4.4	22	0	0	Thinning	
135	33	5	27	t13533w1050027	Norway Pine	27 NP11	5.1	19	0	0	Thinning	
135	33	5	28	t13533w1050028	Norway Pine	28 NP11	9.2	19	0	0	Thinning	
135	33	5	180	t13533w1050180	Norway Pine	180 NP43	28.3	36	0	0	Thinning	
135	33	5	181	t13533w1050181	Aspen	181 A43	37.8	51	0	0	Clearcut with Reserves	
135	33	6	3	t13533w1060003	Norway Pine	3 NP12	5.7	23	0	0	Thinning	
135	33	6	23	t13533w1060023	Norway Pine	23 NP12	6.3	23	0	0	Thinning	
135	33	6	25	t13533w1060025	Aspen	25 A43	11	57	0	0	Clearcut with Reserves	COV53
135	33	7	63	t13533w1070063	Jack Pine	63 JP42	3.2	44	0	0	Clearcut with Reserves	
135	33	7	64	t13533w1070064	Aspen	64 A42	4.9	44	0	0	Clearcut with Reserves	
135	33	7	74	t13533w1070074	Jack Pine	74 JP43	5.2	50	0	0	Clearcut with Reserves	
135	33	7	76	t13533w1070076	Aspen	76 A53	7.3	60	0	0	Clearcut with Reserves	
135	33	7	80	t13533w1070080	Upland Brush	80 UB	4.6	17	0	0	On-site Evaluation	COV53
135	33	7	85	t13533w1070085	Aspen	85 A42	8	53	0	0	Clearcut with Reserves	
135	33	7	86	t13533w1070086	Jack Pine	86 JP43	2.7	47	0	0	Clearcut with Reserves	
135	33	7	88	t13533w1070088	Aspen	88 A43	2.5	53	0	0	Clearcut with Reserves	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
135	33	7	101	t13533w1070101	Aspen	101 A43	2.3	53	0	0	Clearcut with Reserves	
135	33	7	114	t13533w1070114	Aspen	114 A43	7.9	53	0	0	Clearcut with Reserves	
135	33	7	215	t13533w1070215	Aspen	215 A43	4.8	53	0	0	Clearcut with Reserves	
135	33	7	216	t13533w1070216	Aspen	216 A43	2.3	53	0	0	Clearcut with Reserves	
135	33	8	5	t13533w1089005	Cutover Area	9005 COA	2.4	2	0	0	On-site Evaluation	COV53
135	33	8	82	t13533w1080082	Upland Grass	82 UG	3.4	16	0	0	On-site Evaluation	COV53
135	33	8	84	t13533w1080084	Upland Grass	84 UG	4.3	16	0	0	On-site Evaluation	COV53
135	33	8	118	t13533w1080118	Upland Grass	118 UG	3.2	16	0	0	On-site Evaluation	COV53
135	33	9	10	t13533w1099010	Jack Pine	9010 JP43	53	50	0	0	Clearcut with Reserves	MA1 CON6
135	33	9	65	t13533w1090065	Aspen	65 A43	36.5	52	0	0	Clearcut with Reserves	INC53
135	33	9	66	t13533w1090066	Cutover Area	66 COA	22	17	0	0	Re-inventory.	COV53
135	33	9	67	t13533w1090067	Aspen	67 A42	28	55	0	0	Re-inventory.	
135	33	9	92	t13533w1090092	Norway Pine	92 NP11	20.8	3	0	0	On-site Evaluation	COV53
135	33	9	109	t13533w1090109	Aspen	109 A41	1.9	52	0	0	Clearcut with Reserves	
135	33	9	111	t13533w1090111	Cutover Area	111 COA	22.9	3	0	0	On-site Evaluation	COV53
135	33	9	122	t13533w1090122	Aspen	122 A43	12.7	51	0	0	Clearcut with Reserves	
135	33	9	123	t13533w1160123	Norway Pine	123 NP44	8.8	28	0	0	Thinning	
135	33	9	9001	t13533w1099001	Cutover Area	9001 COA	15.1	2	0	0	On-site Evaluation	COV53
135	33	10	75	t13533w1100075	Aspen	75 A42	12.4	50	0	0	Clearcut with Reserves	
135	33	10	91	t13533w1100091	Aspen	91 A41	9.1	48	0	0	Clearcut with Reserves	
135	33	10	95	t13533w1100095	Aspen	95 A41	8.9	52	0	0	Clearcut with Reserves	
135	33	10	102	t13533w1100102	Aspen	102 A41	1.4	48	0	0	Clearcut with Reserves	
135	33	10	108	t13533w1100108	Upland Grass	108 UG	2.9	6	0	0	On-site Evaluation	COV53
135	33	16	128	t13533w1160128	Jack Pine	128 JP44	10.7	55	0	0	Clearcut with Reserves	
135	33	16	129	t13533w1160129	Norway Pine	129 NP41	9.4	39	0	0	Thinning	
135	33	16	132	t13533w1160132	Aspen	132 A43	12.6	48	2010	0	Clearcut with Reserves	COV53
135	33	16	133	t13533w1160133	Aspen	133 A42	5.9	50	2010	0	Clearcut with Reserves	COV53
135	33	16	142	t13533w1160142	Aspen	142 A43	3.2	50	0	0	Clearcut with Reserves	
135	33	16	144	t13533w1160144	Aspen	144 A42	10.9	46	0	0	Clearcut with Reserves	
135	33	25	155	t13533w1250155	Offsite Oak - SI <= 39	155 OX31	4.9	50	0	0	Clearcut with Reserves	COV53
135	33	25	160	t13533w1250160	Upland Grass	160 UG	7.5	17	0	0	On-site Evaluation	COV53
135	33	36	172	t13533w1360172	Upland Grass	172 UG	2.5	27	0	0	On-site Evaluation	COV53
135	33	36	176	t13533w1360176	Offsite Oak - SI <= 39	176 OX52	11	91	0	0	Clearcut with Reserves	COV52
136	33	16	5	t13633w1160005	Cutover Area	5 COA	4.3	6	0	0	Re-inventory.	COV53

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
136	33	16	21	t13633w1160021	Cutover Area	21 COA	9.1	6	0	0	On-site Evaluation	COV53
136	33	16	22	t13633w1160022	Oak	22 O53	12.1	57	0	0	On-site Evaluation	COV53
136	33	16	190	t13633w1160190	Upland Grass	190 UG	6.1	15	0	0	Re-inventory.	COV53
136	33	17	8	t13633w1170008	Aspen	8 A45	40.2	52	0	0	Clearcut with Reserves	COV53
136	33	17	197	t13633w1170197	Aspen	197 A43	8.5	46	0	0	Clearcut with Reserves	COV53
136	33	20	24	t13633w1210024	Jack Pine	24 JP42	81.1	58	0	0	Clearcut with Reserves	
136	33	20	40	t13633w1200040	Jack Pine	40 JP53	18.5	59	0	0	Clearcut with Reserves	
136	33	21	29	t13633w1210029	Jack Pine	29 JP42	1.1	58	0	0	Clearcut with Reserves	
136	33	21	30	t13633w1210030	Jack Pine	30 JP44	69.9	62	0	0	Re-inventory.	MA1
136	33	21	34	t13633w1210034	Upland Brush	34 UB	3.4	17	0	0	Re-inventory.	COV53
136	33	21	37	t13633w1210037	Jack Pine	37 JP42	3.1	58	0	0	Clearcut with Reserves	
136	33	29	41	t13633w1290041	Jack Pine	41 JP42	3.9	58	0	0	Clearcut with Reserves	
136	33	29	43	t13633w1290043	Jack Pine	43 JP44	18.1	59	0	0	Clearcut with Reserves	CON6
136	33	29	47	t13633w1290047	Jack Pine	47 JP43	35.9	57	0	0	Clearcut with Reserves	CON6
136	33	29	48	t13633w1290048	Norway Pine	48 NP11	6.2	18	0	0	Thinning	
136	33	29	54	t13633w1290054	Norway Pine	54 NP11	3.7	18	0	0	Thinning	
136	33	31	57	t13633w1310057	Cutover Area	57 COA	11.6	1	0	0	Re-inventory.	COV53
136	33	31	58	t13633w1310058	Norway Pine	58 NP41	17.4	24	0	0	Thinning	
136	33	31	60	t13633w1310060	Cutover Area	60 COA	27.5	1	0	0	Re-inventory.	COV53
136	33	31	68	t13633w1310068	Aspen	68 A43	10.9	48	0	0	Clearcut with Reserves	
136	33	31	74	t13633w1310074	Cutover Area	74 COA	3.8	1	0	0	Re-inventory.	COV53
136	33	31	76	t13633w1310076	Norway Pine	76 NP11	6.5	17	0	0	Thinning	
136	33	31	93	t13633w1310093	Norway Pine	93 NP11	4.6	15	0	0	Thinning	
136	33	31	95	t13633w1310095	Norway Pine	95 NP44	8.4	34	0	0	Thinning	
136	33	31	109	t13633w1310109	Aspen	109 A44	6.6	46	0	0	Clearcut with Reserves	
136	33	31	111	t13633w1310111	White Spruce	111 WS31	46.5	24	0	0	Thinning	
136	33	31	136	t13633w1310136	Aspen	136 A42	7.8	43	0	0	Clearcut with Reserves	
136	33	31	141	t13633w1310141	Aspen	141 A41	35.9	43	0	0	Clearcut with Reserves	
136	33	31	156	t13633w1310156	Aspen	156 A43	7.3	46	0	0	Clearcut with Reserves	
136	33	31	165	t13633w1310165	Jack Pine	165 JP44	6.9	58	0	0	Clearcut with Reserves	
136	33	31	179	t13633w1310179	Aspen	179 A41	2.4	43	0	0	Clearcut with Reserves	
136	33	31	213	t13633w1310213	Cutover Area	213 COA	2	1	0	0	Re-inventory.	COV53
136	33	31	217	t13633w1310217	Cutover Area	217 COA	1.8	1	0	0	Re-inventory.	COV53
136	33	32	116	t13633w1320116	Jack Pine	116 JP43	24.4	55	0	0	Clearcut with Reserves	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
136	33	32	123	t13633w1320123	Jack Pine	123 JP42	9.1	57	0	0	Clearcut with Reserves	
136	33	32	133	t13633w1320133	Norway Pine	133 NP12	16.1	24	0	0	Thinning	
136	33	32	162	t13633w1320162	Jack Pine	162 JP43	17	55	0	0	Clearcut with Reserves	CON6
136	33	32	168	t13633w1320168	Norway Pine	168 NP42	3.4	33	0	0	Thinning	
136	33	32	169	t13633w1320169	Jack Pine	169 JP42	6.9	61	0	0	Clearcut with Reserves	
136	33	32	180	t13633w1320180	Norway Pine	180 NP11	2	22	0	0	Thinning	
136	33	32	209	t13633w1320209	Jack Pine	209 JP43	5.4	55	0	0	Clearcut with Reserves	
136	33	33	64	t13633w1330064	Norway Pine	64 NP43	11.8	23	0	0	Thinning	
136	33	33	99	t13633w1330099	Norway Pine	99 NP31	5.8	22	0	0	Thinning	
136	33	33	103	t13633w1330103	Upland Grass	103 UG	2.2	3	0	0	On-site Evaluation	COV53
136	33	33	154	t13633w1330154	Norway Pine	154 NP42	6.6	23	0	0	Thinning	
136	33	33	155	t13633w1330155	Norway Pine	155 NP52	7.9	65	0	0	Thinning	
136	33	33	158	t13633w1330158	Norway Pine	158 NP11	7.7	19	0	0	Thinning	
136	33	33	161	t13633w1330161	Aspen	161 A41	6.2	49	0	0	Clearcut with Reserves	
136	33	33	174	t13633w1330174	Norway Pine	174 NP42	6.6	23	0	0	Thinning	
136	33	33	177	t13633w1330177	Upland Grass	177 UG	3.8	3	0	0	On-site Evaluation	COV53
136	33	33	184	t13633w1330184	Norway Pine	184 NP52	10.8	55	0	0	Thinning	
136	33	33	205	t13633w1330205	Upland Grass	205 UG	2	3	0	0	On-site Evaluation	COV53
136	33	33	221	t13633w1330221	Aspen	221 A 43	19	53	0	0	Clearcut with Reserves	
136	33	34	148	t13633w1340148	Norway Pine	148 NP42	5.1	22	0	0	Thinning	
136	33	34	164	t13633w1340164	Jack Pine	164 JP52	11.6	55	0	0	Clearcut with Reserves	
136	33	34	171	t13633w1340171	Upland Grass	171 UG	2.4	2	0	0	On-site Evaluation	COV53
136	33	34	173	t13633w1340173	Norway Pine	173 NP43	10.7	23	0	0	Thinning	
136	33	36	70	t13633w1360070	Norway Pine	70 NP 45	2.5	42	0	0	Thinning	
136	33	36	75	t13633w1360075	Cutover Area	75 COA	18	1	0	0	Re-inventory.	COV53
136	33	36	77	t13633w1360077	Norway Pine	77 NP42	25.9	24	0	0	Thinning	CON2
136	33	36	78	t13633w1360078	Norway Pine	78 NP42	14.1	27	0	0	Thinning	
136	33	36	96	t13633w1360096	Jack Pine	96 JP42	15.1	56	0	0	Clearcut with Reserves	
136	33	36	107	t13633w1360107	Norway Pine	107 NP42	45	29	0	0	Thinning	
136	33	36	127	t13633w1360127	Aspen	127 A51	5.5	52	0	0	Clearcut with Reserves	
136	33	36	130	t13633w1360130	Norway Pine	130 NP42	8.6	27	0	0	Thinning	
136	33	36	132	t13633w1360132	Jack Pine	132 JP42	22.5	56	0	0	Clearcut with Reserves	
136	33	36	135	t13633w1360135	Norway Pine	135 NP43	23.7	29	0	0	Thinning	CON2
136	33	36	144	t13633w1360144	Cutover Area	144 COA	15.8	1	0	0	Re-inventory.	COV53

Subsection **Pine Moraines & Outwash Plains**

Forestry Area *Park Rapids Area*

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
136	33	36	163	t13633w1360163	Norway Pine	163 NP42	17.9	26	0	0	Thinning	
136	33	36	181	t13633w1360181	Jack Pine	181 JP41	7.1	55	0	0	Clearcut with Reserves	
136	33	36	182	t13633w1360182	Norway Pine	182 NP41	8.7	39	0	0	Thinning	
136	33	36	185	t13633w1360185	Jack Pine	185 JP41	1.5	55	0	0	Clearcut with Reserves	
136	33	36	208	t13633w1360208	Norway Pine	208 NP53	11.6	56	0	0	Thinning	
136	33	36	211	t13633w1360211	Cutover Area	211 COA	7.5	1	0	0	Re-inventory.	COV53
136	34	14	67	t13634w1140067	Jack Pine	67 JP42	19.6	58	0	0	Clearcut with Reserves	
136	34	23	59	t13634w1230059	Upland Brush	59 UB	14.5	15	0	0	Re-inventory.	COV53
136	34	25	4	t13634w1250004	Aspen	4 A44	5.1	44	0	0	Clearcut with Reserves	
136	34	25	6	t13634w1250006	Aspen	6 A42	5.4	46	0	0	Clearcut with Reserves	
136	34	25	7	t13634w1250007	Offsite Oak - SI <= 39	7 OX51	7.6	72	0	0	Clearcut with Reserves	COV53
136	34	25	10	t13634w1250010	Aspen	10 A42	6.2	48	0	0	Clearcut with Reserves	
136	34	25	13	t13634w1250013	Upland Brush	13 UB	9.3	16	0	0	Re-inventory.	COV53
136	34	25	15	t13634w1250015	Oak	15 O52	6	79	0	0	On-site Evaluation	COV53
136	34	25	18	t13634w1250018	Aspen	18 A42	18	47	0	0	Clearcut with Reserves	
136	34	26	3	t13634w1260003	Upland Grass	3 UG	3.6	16	0	0	Re-inventory.	COV53
136	34	26	14	t13634w1260014	Upland Grass	14 UG	1.8	16	0	0	Re-inventory.	COV53
136	34	27	21	t13634w1270021	Cutover Area	21 COA	18.2	3	0	0	Re-inventory.	
136	34	27	23	t13634w1270023	White Spruce	23 WS11	13.3	20	0	0	Thinning	
136	34	27	27	t13634w1270027	Norway Pine	27 NP55	11.9	75	0	0	Thinning	
136	34	27	75	t13634w1270075	Cutover Area	75 COA	5.8	3	0	0	Re-inventory.	
136	34	36	28	t13634w1250028	Aspen	28 A43	37.6	49	0	0	Clearcut with Reserves	
136	34	36	37	t13634w1360037	Norway Pine	37 NP43	11.8	32	0	0	Thinning	
136	34	36	39	t13634w1360039	Cutover Area	39 COA	5.6	2	0	0	Re-inventory.	COV53
136	34	36	42	t13634w1360042	Norway Pine	42 NP43	4.4	33	0	0	Thinning	
136	34	36	47	t13634w1360047	Jack Pine	47 JP41	6.4	55	0	0	Clearcut with Reserves	
136	34	36	48	t13634w1360048	White Spruce	48 WS11	8.3	22	0	0	Thinning	
136	34	36	76	t13634w1360076	Upland Grass	76 UG	1.6	2	0	0	Re-inventory.	COV53
136	35	17	15	t13635w1170015	White Spruce	15 WS11	2.2	10	0	0	Thinning	
136	35	17	38	t13635w1170038	Agriculture	38 Agr	13.5	10	0	0	Re-inventory.	
136	35	24	52	t13635w1240052	Oak	52 O53	14	77	0	0	Clearcut with Reserves	
137	33	3	58	t13733w1030058	Aspen	58 A54	11.2	58	0	0	Clearcut with Reserves	
137	33	3	59	t13733w1030059	Upland Brush	59 UB	23.4	15	0	0	On-site Evaluation	COV53
137	33	3	60	t13733w1030060	Jack Pine	60 JP45	39.3	52	0	0	Clearcut with Reserves	MA1

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
137	33	3	61	t13733w1030061	Jack Pine	61 JP45	14.8	52	0	0	Clearcut with Reserves	
137	33	5	31	t13733w1050031	Balm of Gilead	31 BG52	6	56	0	0	Re-inventory.	
137	33	6	7	t13733w1060007	Jack Pine	7 JP43	1.6	56	0	0	Clearcut with Reserves	
137	34	2	4	t13734w1020004	Norway Pine	4 NP11	16.5	17	0	0	Thinning	
137	34	3	71	t13734w1030071	Norway Pine	71 NP54	2.1	84	0	0	Thinning	CON5
137	34	3	87	t13734w1030087	Norway Pine	87 NP54	4	84	0	0	Thinning	CON5
137	34	6	88	t13734w1060088	Upland Grass	88 UG	3.2	5	0	0	On-site Evaluation	COV53
137	34	6	93	t13734w1060093	Norway Pine	93 NP56	19.9	77	0	0	Thinning	MA1
137	34	7	95	t13734w1070095	Norway Pine	95 NP56	43.5	77	0	0	Thinning	MA1
137	34	7	98	t13734w1070098	Norway Pine	98 NP54	3.8	77	0	0	On-site Evaluation	
137	34	7	102	t13734w1070102	Upland Grass	102 UG	0.7	10	0	0	On-site Evaluation	COV53
137	34	7	103	t13734w1070103	Upland Brush	103 UB	7.6	5	0	0	On-site Evaluation	COV53
137	34	8	9	t13734w1080009	Norway Pine	9 NP55	4.3	85	0	0	Thinning	
137	34	8	12	t13734w1080012	Norway Pine	12 NP41	8.5	24	0	0	Thinning	
137	34	10	64	t13734w1100064	Oak	64 O21	9.6	12	0	0	On-site Evaluation	COV53
137	34	10	69	t13734w1100069	Norway Pine	69 NP54	2.3	84	0	0	Thinning	CON5
137	34	10	70	t13734w1100070	Upland Grass	70 UG	7.4	16	0	0	Re-inventory.	COV53
137	34	10	78	t13734w1100078	Cutover Area	78 COA	15.8	3	0	0	Re-inventory.	COV53
137	34	10	79	t13734w1100079	Jack Pine	79 JP43	24.9	61	0	0	Clearcut with Reserves	
137	34	16	13	t13734w1160013	Cutover Area	13 COA	6.9	1	0	0	Re-inventory.	COV52
137	34	16	17	t13734w1160017	Cutover Area	17 COA	5	1	0	0	Re-inventory.	COV52
137	34	16	18	t13734w1160018	Norway Pine	18 NP55	23.5	74	0	0	Thinning	
137	34	16	19	t13734w1160019	Cutover Area	19 COA	12.5	1	0	0	Re-inventory.	COV52
137	34	16	24	t13734w1160024	Cutover Area	24 COA	6.6	17	0	0	Re-inventory.	COV12
137	34	16	26	t13734w1160026	Upland Grass	26 UG	2.3	6	0	0	On-site Evaluation	COV53
137	34	16	27	t13734w1160027	Cutover Area	27 COA	2.9	1	0	0	Re-inventory.	COV12
137	34	26	40	t13734w1260040	Aspen	40 A42	4.2	54	0	0	Re-inventory.	
137	34	34	44	t13734w1340044	Aspen	44 A52	8.7	62	0	0	Clearcut with Reserves	
137	34	36	48	t13734w1360048	Cutover Area	48 COA	7.8	8	0	0	Re-inventory.	
137	34	36	54	t13734w1360054	Norway Pine	54 NP11	10.3	15	0	0	Thinning	
137	35	2	7	t13735w1020007	Tamarack	7 T46	6.9	117	0	0	Clearcut with Reserves	
137	35	4	4	t13735w1040004	Norway Pine	4 NP55	5.5	75	0	0	Thinning	
137	35	12	17	t13735w1120017	White Spruce	17 WS11	20.1	3	0	0	Thinning	
137	35	12	20	t13735w1120020	White Spruce	20 WS11	2	3	0	0	Thinning	

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Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
137	35	16	23	t13735w1160023	White Pine	23 WP63	15.5	81	0	0	On-site Evaluation	
137	35	20	29	t13735w1200029	Aspen	29 A54	14.2	68	0	0	On-site Evaluation	INC61
137	35	20	30	t13735w1200030	Norway Pine	30 NP57	5	90	0	0	Thinning	
137	35	24	42	t13735w1240042	Upland Grass	42 UG	3.7	13	0	0	On-site Evaluation	COV53
137	35	24	44	t13735w1240044	Ash	44 Ash53	2.5	73	0	0	Manage for understory	COV72
137	35	24	45	t13735w1240045	Ash	45 Ash53	1.6	73	0	0	Manage for understory	COV72
138	33	2	30	t13833w1020030	Norway Pine	30 NP31	11.4	17	0	0	Thinning	
138	33	2	45	t13833w1020045	Offsite Oak - SI <= 39	45 OX11	4.1	28	0	0	Clearcut with Reserves	COV53
138	33	2	48	t13833w1020048	Norway Pine	48 NP42	10	54	0	0	Thinning	
138	33	2	65	t13833w1020065	Cutover Area	65 COA	21	1	0	0	Re-inventory.	COV53
138	33	2	68	t13833w1020068	Norway Pine	68 NP31	4	16	0	0	Thinning	
138	33	2	72	t13833w1020072	Cutover Area	72 COA	20.8	1	0	0	Re-inventory.	COV52
138	33	2	631	t13833w1020631	Cutover Area	631 COA	1.4	1	0	0	Re-inventory.	COV53
138	33	3	29	t13833w1030029	Norway Pine	29 NP42	13.6	21	0	0	Thinning	
138	33	3	49	t13833w1030049	Norway Pine	49 NP12	45	23	0	0	Thinning	
138	33	3	57	t13833w1030057	Aspen	57 A42	11.4	59	0	0	Clearcut with Reserves	
138	33	3	574	t13833w1030574	Jack Pine	574 JP44	15.3	55	0	0	Clearcut with Reserves	
138	33	4	21	t13833w1040021	Jack Pine	21 JP52	10	60	0	0	Clearcut with Reserves	
138	33	4	26	t13833w1040026	Norway Pine	26 NP43	55.1	43	0	0	Thinning	
138	33	4	40	t13833w1040040	Jack Pine	40 JP44	7.6	50	0	0	Re-inventory.	MA1
138	33	6	2	t13833w1060002	Norway Pine	2 NP42	24.1	43	0	0	Thinning	
138	33	6	10	t13833w1060010	Jack Pine	10 JP44	13.5	59	0	0	Clearcut with Reserves	
138	33	6	12	t13833w1060012	Norway Pine	12 NP12	10.3	24	0	0	Thinning	
138	33	6	13	t13833w1060013	Jack Pine	13 JP52	8.2	64	0	0	Clearcut with Reserves	
138	33	6	17	t13833w1060017	Aspen	17 A53	10.6	63	0	0	Clearcut with Reserves	COV53
138	33	6	18	t13833w1060018	Norway Pine	18 NP42	11.1	43	0	0	Thinning	
138	33	6	22	t13833w1060022	Upland Grass	22 UG	1.9	6	0	0	On-site Evaluation	COV53
138	33	6	23	t13833w1060023	Norway Pine	23 NP12	9.2	24	0	0	Thinning	
138	33	6	24	t13833w1060024	Upland Brush	24 UB	2.8	1	0	0	On-site Evaluation	COV53
138	33	6	566	t13833w1060566	Upland Grass	566 UG	2.3	6	0	0	On-site Evaluation	COV53
138	33	7	79	t13833w1070079	Jack Pine	79 JP53	21.2	57	0	0	Clearcut with Reserves	
138	33	7	100	t13833w1070100	White Spruce	100 WS12	4.8	25	0	0	Thinning	
138	33	7	105	t13833w1070105	White Spruce	105 WS12	9.3	24	0	0	Thinning	
138	33	7	108	t13833w1070108	Aspen	108 A41	3.7	41	0	0	Clearcut with Reserves	

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Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
138	33	7	109	t13833w1070109	Norway Pine	109 NP32	80.5	24	0	0	Thinning	
138	33	7	147	t13833w1070147	Aspen	147 A43	3.9	61	0	0	Clearcut with Reserves	
138	33	8	75	t13833w1080075	Norway Pine	75 NP41	27.4	24	0	0	Thinning	
138	33	9	80	t13833w1090080	Norway Pine	80 NP43	9.1	38	0	0	Thinning	
138	33	9	83	t13833w1090083	Norway Pine	83 NP31	28	26	0	0	Thinning	
138	33	9	103	t13833w1090103	Norway Pine	103 NP41	80.4	26	0	0	Thinning	
138	33	10	114	t13833w1100114	Jack Pine	114 JP42	4.5	61	0	0	Clearcut with Reserves	
138	33	10	115	t13833w1100115	Norway Pine	115 NP43	65	29	0	0	Thinning	
138	33	10	116	t13833w1100116	Cutover Area	116 COA	3	2	0	0	Re-inventory.	COV53
138	33	10	117	t13833w1100117	Cutover Area	117 COA	10.2	1	0	0	Re-inventory.	COV53
138	33	10	118	t13833w1100118	Norway Pine	118 NP43	22.4	29	0	0	Thinning	
138	33	10	121	t13833w1100121	Aspen	121 A41	10.6	57	0	0	Clearcut with Reserves	
138	33	10	126	t13833w1100126	Aspen	126 A41	53.6	57	0	0	Clearcut with Reserves	
138	33	10	128	t13833w1100128	Norway Pine	128 NP42	6.7	42	0	0	Thinning	
138	33	10	129	t13833w1100129	Aspen	129 A43	3.1	52	0	0	Clearcut with Reserves	
138	33	10	144	t13833w1100144	Norway Pine	144 NP43	10.4	29	0	0	Thinning	
138	33	10	146	t13833w1100146	Norway Pine	146 NP42	2.4	42	0	0	Thinning	
138	33	10	148	t13833w1100148	White Spruce	148 WS11	4.5	17	0	0	Thinning	
138	33	10	623	t13833w1100623	Jack Pine	623 JP43	5	51	0	0	Clearcut with Reserves	MA1
138	33	10	624	t13833w1100624	Aspen	624 A43	2.5	52	0	0	Clearcut with Reserves	COV53
138	33	11	91	t13833w1120091	White Spruce	91 WS12	39.6	26	0	0	Thinning	
138	33	11	110	t13833w1110110	Aspen	110 A54	14.7	53	0	0	Clearcut with Reserves	
138	33	11	119	t13833w1110119	Norway Pine	119 NP44	9.4	50	0	0	Thinning	
138	33	11	142	t13833w1110142	Norway Pine	142 NP44	5.7	48	0	0	Thinning	
138	33	11	143	t13833w1110143	Norway Pine	143 NP43	25	25	0	0	Thinning	
138	33	11	460	t13833w1110460	Norway Pine	460 NP44	27.1	25	0	0	Thinning	
138	33	12	92	t13833w1120092	Norway Pine	92 NP44	26.3	25	0	0	Thinning	
138	33	13	149	t13833w1130149	Norway Pine	149 NP43	67.2	25	0	0	Thinning	
138	33	13	173	t13833w1130173	Upland Grass	173 UG	5.2	17	0	0	On-site Evaluation	COV53
138	33	14	156	t13833w1140156	Aspen	156 A43	12.4	57	0	0	Clearcut with Reserves	
138	33	14	165	t13833w1140165	Upland Grass	165 UG	3.5	18	0	0	On-site Evaluation	COV53
138	33	14	198	t13833w1140198	Norway Pine	198 NP41	16.4	25	0	0	Thinning	
138	33	14	258	t13833w1140258	Norway Pine	258 NP44	5.1	29	0	0	Thinning	
138	33	14	259	t13833w1140259	Norway Pine	259 NP41	23	25	0	0	Thinning	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
138	33	14	477	t13833w1140477	Upland Grass	477 UG	12.1	15	0	0	On-site Evaluation	COV53
138	33	14	478	t13833w1140478	Upland Grass	478 UG	15.5	15	0	0	On-site Evaluation	COV53
138	33	14	479	t13833w1140479	Upland Grass	479 UG	2.3	15	0	0	On-site Evaluation	COV53
138	33	14	480	t13833w1140480	Upland Grass	480 UG	1.3	15	0	0	On-site Evaluation	COV53
138	33	14	481	t13833w1140481	Upland Grass	481 UG	2.1	15	0	0	On-site Evaluation	COV53
138	33	14	482	t13833w1140482	Upland Grass	482 UG	1.5	15	0	0	On-site Evaluation	COV53
138	33	14	487	t13833w1140487	Upland Brush	487 UB	1.7	15	0	0	On-site Evaluation	COV53
138	33	14	491	t13833w1140491	Upland Grass	491 UG	3.8	15	0	0	On-site Evaluation	COV53
138	33	14	571	t13833w1140571	Upland Brush	571 UB	1.9	3	0	0	On-site Evaluation	COV53
138	33	14	572	t13833w1140572	Upland Brush	572 UB	11.2	3	0	0	On-site Evaluation	COV53
138	33	14	600	t13833w1140600	Upland Grass	600 UG	1	15	0	0	On-site Evaluation	COV53
138	33	15	150	t13833w1100150	Cutover Area	150 COA	11.9	1	0	0	Re-inventory.	COV53
138	33	15	232	t13833w1150232	Norway Pine	232 NP11	6.6	23	0	0	Thinning	
138	33	15	236	t13833w1150236	Norway Pine	236 NP42	2.2	42	0	0	Thinning	
138	33	15	453	t13833w1150453	Cutover Area	453 COA	18.1	1	0	0	Re-inventory.	COV53
138	33	15	468	t13833w1150468	Aspen	468 A42	7.4	54	0	0	Clearcut with Reserves	
138	33	15	473	t13833w1150473	Jack Pine	473 JP43	8.7	56	0	0	Clearcut with Reserves	
138	33	15	474	t13833w1150474	Upland Grass	474 UG	12.8	15	0	0	On-site Evaluation	COV53
138	33	15	586	t13833w1150586	Jack Pine	586 JP43	1.1	56	0	0	Clearcut with Reserves	
138	33	15	608	t13833w1150608	Jack Pine	608 JP43	5.2	56	0	0	Clearcut with Reserves	
138	33	15	615	t13833w1150615	White Spruce	615 WS11	6	21	0	0	Thinning	
138	33	15	622	t13833w1150622	Cutover Area	622 COA	37.4	1	0	0	Re-inventory.	COV53
138	33	15	634	t13833w1150634	Cutover Area	634 COA	9.3	1	0	0	Re-inventory.	COV53
138	33	16	123	t13833w1160123	Aspen	123 A53	2.7	58	0	0	Clearcut with Reserves	
138	33	16	152	t13833w1160152	Norway Pine	152 NP12	8.5	2	0	0	On-site Evaluation	COV53
138	33	16	153	t13833w1160153	Norway Pine	153 NP43	38.6	29	0	0	Thinning	
138	33	16	155	t13833w1160155	Aspen	155 A51	6.8	57	0	0	Clearcut with Reserves	
138	33	16	162	t13833w1160162	Norway Pine	162 NP41	2.9	24	0	0	Thinning	
138	33	16	168	t13833w1160168	Cutover Area	168 COA	22	1	0	0	Re-inventory.	COV53
138	33	16	171	t13833w1160171	Jack Pine	171 JP43	5.8	57	0	0	Clearcut with Reserves	
138	33	16	178	t13833w1160178	Norway Pine	178 NP12	10.7	2	0	0	On-site Evaluation	COV53
138	33	16	181	t13833w1160181	Cutover Area	181 COA	9.4	1	0	0	Re-inventory.	COV53
138	33	16	188	t13833w1160188	Norway Pine	188 NP43	10.2	28	0	0	Thinning	
138	33	16	189	t13833w1160189	Aspen	189 A42	10.9	36	0	0	Clearcut with Reserves	COV53

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
138	33	16	194	t13833w1160194	White Spruce	194 WS12	6.3	25	0	0	Thinning	
138	33	16	195	t13833w1160195	Cutover Area	195 COA	10	1	0	0	Re-inventory.	COV53
138	33	16	201	t13833w1160201	Norway Pine	201 NP11	10.2	16	0	0	Thinning	
138	33	16	204	t13833w1160204	White Spruce	204 WS13	5.3	2	0	0	Thinning	
138	33	16	215	t13833w1160215	Norway Pine	215 NP12	45.7	4	0	0	On-site Evaluation	COV53
138	33	16	243	t13833w1160243	Jack Pine	243 JP45	9.5	55	0	0	Clearcut with Reserves	
138	33	16	582	t13833w1160582	Norway Pine	582 NP12	11.8	4	0	0	On-site Evaluation	COV53
138	33	17	212	t13833w1170212	Cutover Area	212 COA	10.4	1	0	0	Re-inventory.	COV12
138	33	17	221	t13833w1170221	Norway Pine	221 NP42	3.8	39	0	0	Thinning	
138	33	17	226	t13833w1170226	Norway Pine	226 NP42	29.2	43	0	0	Thinning	
138	33	17	233	t13833w1170233	Cutover Area	233 COA	3.9	1	0	0	Re-inventory.	COV12
138	33	17	242	t13833w1170242	Cutover Area	242 COA	10.7	1	0	0	Re-inventory.	COV12
138	33	17	247	t13833w1170247	Norway Pine	247 NP42	10.9	42	0	0	Thinning	
138	33	17	611	t13833w1170611	Upland Grass	611 UG	5.1	2	0	0	Re-inventory.	COV53
138	33	17	612	t13833w1170612	Cutover Area	612 COA	1.9	2	0	0	Re-inventory.	COV12
138	33	18	174	t13833w1180174	Norway Pine	174 NP11	7.7	22	0	0	Thinning	CON2
138	33	18	193	t13833w1180193	Jack Pine	193 JP44	7.6	56	0	0	Clearcut with Reserves	
138	33	18	216	t13833w1180216	Cutover Area	216 COA	22	1	0	0	Re-inventory.	COV53
138	33	18	217	t13833w1180217	Norway Pine	217 NP42	20.1	26	0	0	Thinning	
138	33	18	244	t13833w1180244	Norway Pine	244 NP41	26.5	26	0	0	Thinning	
138	33	18	637	t13833w1180637	Cutover Area	637 COA	6.8	1	0	0	Re-inventory.	COV53
138	33	19	265	t13833w1190265	Cutover Area	265 COA	25.9	1	0	0	Re-inventory.	COV53
138	33	19	266	t13833w1190266	Norway Pine	266 NP41	15.3	24	0	0	Thinning	
138	33	19	291	t13833w1190291	Jack Pine	291 JP45	28.8	56	0	0	Clearcut with Reserves	
138	33	19	293	t13833w1190293	Upland Brush	293 UB	2.8	31	0	0	On-site Evaluation	COV53
138	33	19	294	t13833w1190294	Norway Pine	294 NP41	4.9	24	0	0	Thinning	
138	33	19	312	t13833w1190312	Jack Pine	312 JP42	20.8	58	0	0	Clearcut with Reserves	
138	33	19	616	t13833w1190616	White Spruce	616 WS11	8.2	24	0	0	Thinning	
138	33	20	270	t13833w1200270	Norway Pine	270 NP42	6.8	22	0	0	Thinning	
138	33	20	286	t13833w1200286	Norway Pine	286 NP42	3.2	45	0	0	Thinning	
138	33	20	315	t13833w1200315	Jack Pine	315 JP43	5	58	0	0	Clearcut with Reserves	
138	33	20	316	t13833w1200316	Norway Pine	316 NP12	27.3	23	0	0	Thinning	
138	33	20	324	t13833w1200324	Norway Pine	324 NP42	51.9	24	0	0	Thinning	
138	33	21	276	t13833w1210276	Norway Pine	276 NP43	41.3	28	0	0	Thinning	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
138	33	21	298	t13833w1210298	Norway Pine	298 NP31	18.6	24	0	0	Thinning	
138	33	22	302	t13833w1220302	White Spruce	302 WS12	9.2	26	0	0	Thinning	
138	33	22	319	t13833w1220319	Norway Pine	319 NP43	15.4	28	0	0	Thinning	
138	33	22	327	t13833w1220327	White Spruce	327 WS12	4.4	26	0	0	Thinning	
138	33	22	338	t13833w1220338	White Spruce	338 WS12	16.2	24	0	0	Thinning	
138	33	22	339	t13833w1220339	Norway Pine	339 NP43	1.7	28	0	0	Thinning	
138	33	22	347	t13833w1220347	Jack Pine	347 JP42	3.4	62	0	0	Clearcut with Reserves	
138	33	22	560	t13833w1220560	White Spruce	560 WS12	17	4	0	0	Thinning	
138	33	22	562	t13833w1220562	White Spruce	562 WS12	7.6	4	0	0	Thinning	
138	33	22	587	t13833w1220587	White Spruce	587 WS11	4	3	0	0	Thinning	
138	33	22	592	t13833w1220592	White Spruce	592 WS11	4	3	0	0	Thinning	
138	33	23	287	t13833w1220287	Norway Pine	287 NP43	25.2	25	0	0	Thinning	
138	33	23	311	t13833w1230311	Norway Pine	311 NP12	7.4	26	0	0	Thinning	
138	33	23	343	t13833w1230343	Norway Pine	343 NP12	6.4	26	0	0	Thinning	
138	33	26	402	t13833w1260402	Norway Pine	402 NP55	19.3	73	0	0	Thinning	
138	33	26	406	t13833w1260406	Aspen	406 A44	3.8	51	0	0	Re-inventory.	
138	33	26	414	t13833w1260414	Aspen	414 A53	10.4	60	0	0	Re-inventory.	
138	33	27	350	t13833w1270350	Norway Pine	350 NP12	44	26	0	0	Thinning	
138	33	27	388	t13833w1270388	Norway Pine	388 NP11	5.7	23	0	0	Thinning	
138	33	28	376	t13833w1280376	Aspen	376 A52	22.7	55	0	0	Clearcut with Reserves	
138	33	28	381	t13833w1280381	White Spruce	381 WS21	5.5	25	0	0	Thinning	
138	33	28	593	t13833w1280593	Jack Pine	593 JP44	6	61	0	0	Clearcut with Reserves	
138	33	28	594	t13833w1280594	Jack Pine	594 JP44	17.8	61	0	0	Clearcut with Reserves	
138	33	29	351	t13833w1290351	Norway Pine	351 NP12	6.8	4	0	0	On-site Evaluation	COV53
138	33	29	352	t13833w1290352	Norway Pine	352 NP41	145.2	24	0	0	Thinning	
138	33	29	373	t13833w1290373	White Spruce	373 WS12	11.5	25	0	0	Thinning	
138	33	29	378	t13833w1290378	Aspen	378 A41	15.5	55	0	0	Clearcut with Reserves	
138	33	29	379	t13833w1290379	Aspen	379 A42	21.1	53	0	0	Clearcut with Reserves	
138	33	29	387	t13833w1290387	White Spruce	387 WS12	25.2	25	0	0	Thinning	
138	33	29	392	t13833w1290392	Jack Pine	392 JP44	45.2	47	2010	0	Clearcut with Reserves	
138	33	29	393	t13833w1290393	Aspen	393 A41	11	63	0	0	Clearcut with Reserves	
138	33	29	394	t13833w1290394	Jack Pine	394 JP42	5.8	55	0	0	Clearcut with Reserves	
138	33	29	396	t13833w1290396	Norway Pine	396 NP11	8	23	0	0	Thinning	
138	33	29	398	t13833w1290398	Norway Pine	398 NP11	10	21	0	0	Thinning	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
138	33	29	400	t13833w1290400	White Spruce	400 WS12	3.9	25	0	0	Thinning	
138	33	29	408	t13833w1290408	Jack Pine	408 JP43	2.7	59	0	0	Clearcut with Reserves	
138	33	29	409	t13833w1290409	Aspen	409 A43	5.9	57	2010	0	Clearcut with Reserves	COV53
138	33	29	412	t13833w1290412	Jack Pine	412 JP42	4.6	56	0	0	Clearcut with Reserves	
138	33	29	567	t13833w1290567	Norway Pine	567 NP12	60.4	4	0	0	On-site Evaluation	COV53
138	33	30	375	t13833w1300375	Upland Brush	375 UB	6.9	2	0	0	On-site Evaluation	COV53
138	33	34	451	t13833w1340451	Jack Pine	451 JP41	4	55	0	0	Clearcut with Reserves	
138	33	35	420	t13833w1350420	Aspen	420 A52	3.6	55	0	0	Clearcut with Reserves	
138	33	35	422	t13833w1350422	Aspen	422 A42	37.8	50	0	0	Clearcut with Reserves	COV53
138	33	35	424	t13833w1350424	Aspen	424 A32	7.2	35	0	0	Clearcut with Reserves	COV53
138	33	35	432	t13833w1350432	Norway Pine	432 NP42	7	42	0	0	Thinning	
138	33	35	440	t13833w1350440	Norway Pine	440 NP11	9.1	22	0	0	Thinning	
138	33	35	441	t13833w1350441	White Pine	441 WP11	10.3	22	0	0	Thinning	
138	33	35	443	t13833w1350443	White Spruce	443 WS11	12.9	22	0	0	Thinning	
138	33	35	447	t13833w1350447	Norway Pine	447 NP12	8.3	25	0	0	Thinning	
138	33	35	449	t13833w1350449	Aspen	449 A41	7.6	43	0	0	Clearcut with Reserves	
138	33	36	427	t13833w1360427	White Spruce	427 WS12	14.2	16	0	0	Thinning	
138	33	36	428	t13833w1360428	White Spruce	428 WS12	13.4	16	0	0	Thinning	
138	33	36	433	t13833w1360433	White Spruce	433 WS12	25.7	2	0	0	Thinning	
138	33	36	446	t13833w1360446	Upland Grass	446 UG	14.2	28	0	0	On-site Evaluation	COV53
138	33	36	538	t13833w1360538	White Spruce	538 WS12	44.5	16	0	0	Thinning	
138	33	36	540	t13833w1360540	White Spruce	540 WS12	4.3	2	0	0	Thinning	
138	34	1	1	t13834w1010001	Oak	1 O43	13.5	75	0	0	Clearcut with Reserves	COV53
138	34	1	2	t13834w1010002	Norway Pine	2 NP43	13.2	26	0	0	Thinning	
138	34	1	8	t13834w1010008	Offsite Oak - SI <= 39	8 OX42	13.3	110	0	0	Manage for understory	COV51
138	34	1	11	t13834w1010011	Norway Pine	11 NP41	7.3	41	0	0	Thinning	
138	34	1	13	t13834w1010013	Norway Pine	13 NP43	1.7	41	0	0	Thinning	
138	34	1	14	t13834w1010014	Norway Pine	14 NP12	21.5	26	0	0	Thinning	
138	34	1	24	t13834w1010024	Norway Pine	24 NP11	6.2	16	0	0	Thinning	
138	34	1	28	t13834w1010028	Aspen	28 A45	31.2	62	0	0	Clearcut with Reserves	COV53
138	34	1	33	t13834w1010033	Norway Pine	33 NP12	8.9	26	0	0	Thinning	
138	34	1	330	t13834w1010330	Aspen	330 A43	4.5	71	0	0	Clearcut with Reserves	
138	34	1	331	t13834w1010331	Aspen	331 A43	2	71	0	0	Clearcut with Reserves	
138	34	1	388	t13834w1010388	Norway Pine	388 NP41	9.2	33	0	0	Thinning	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
138	34	2	37	t13834w1020037	Aspen	37 A52	10.8	95	0	0	Manage for understory	COV51, CON2
138	34	2	46	t13834w1020046	Aspen	46 A44	17.3	70	0	0	Clearcut with Reserves	COV51
138	34	2	53	t13834w1020053	Jack Pine	53 JP53	5.5	58	0	0	Clearcut with Reserves	
138	34	2	56	t13834w1020056	Norway Pine	56 NP43	3	47	0	0	Thinning	CON2
138	34	3	40	t13834w1030040	Norway Pine	40 NP11	10.9	24	0	0	Thinning	
138	34	3	43	t13834w1030043	White Spruce	43 WS12	10.6	22	0	0	Thinning	
138	34	3	409	t13834w1030409	Upland Grass	409 UG	2.2	2	0	0	On-site Evaluation	COV53
138	34	10	59	t13834w1100059	Aspen	59 A23	35.8	37	0	0	Clearcut with Reserves	INC53
138	34	10	61	t13834w1100061	Norway Pine	61 NP44	35.9	36	0	0	Thinning	
138	34	10	68	t13834w1100068	Norway Pine	68 NP11	19.9	23	0	0	Thinning	
138	34	10	77	t13834w1100077	Norway Pine	77 NP32	13	34	0	0	Thinning	
138	34	10	83	t13834w1100083	Aspen	83 A23	35.1	36	0	0	Clearcut with Reserves	INC53
138	34	10	84	t13834w1100084	Aspen	84 A42	3.9	41	0	0	Clearcut with Reserves	
138	34	10	88	t13834w1100088	Aspen	88 A52	20.5	50	0	0	On-site Evaluation	INC53
138	34	10	93	t13834w1100093	Aspen	93 A33	5.3	36	0	0	Clearcut with Reserves	INC53
138	34	10	322	t13834w1100322	Norway Pine	322 NP43	13.3	31	0	0	Thinning	
138	34	10	404	t13834w1100404	Norway Pine	404 NP44	2.8	36	0	0	Thinning	
138	34	11	65	t13834w1110065	Norway Pine	65 NP41	72.4	25	0	0	Thinning	CON2
138	34	11	95	t13834w1110095	White Spruce	95 WS12	28.3	26	0	0	Thinning	
138	34	12	74	t13834w1120074	White Spruce	74 WS11	7.1	19	0	0	Thinning	
138	34	12	75	t13834w1120075	Norway Pine	75 NP11	9.4	19	0	0	Thinning	
138	34	12	81	t13834w1120081	Norway Pine	81 NP13	16.8	23	0	0	Thinning	
138	34	12	89	t13834w1120089	Aspen	89 A53	9.6	59	0	0	Clearcut with Reserves	COV53
138	34	12	90	t13834w1120090	Offsite Oak - SI <= 39	90 OX12	7.1	21	0	0	Clearcut with Reserves	COV53
138	34	12	99	t13834w1120099	Norway Pine	99 NP13	8.7	24	0	0	Thinning	
138	34	12	104	t13834w1120104	Aspen	104 A44	6.5	53	0	0	Clearcut with Reserves	COV53
138	34	12	386	t13834w1120386	Aspen	386 A45	13.5	62	0	0	Clearcut with Reserves	COV53
138	34	13	172	t13834w1130172	Cutover Area	172 COA	25.7	1	0	0	Re-inventory.	COV53
138	34	13	176	t13834w1130176	Norway Pine	176 NP53	17	56	0	0	Thinning	
138	34	13	187	t13834w1130187	Aspen	187 A45	15.2	54	0	0	Clearcut with Reserves	COV53
138	34	13	368	t13834w1130368	Jack Pine	368 JP44	13.8	56	0	0	Clearcut with Reserves	
138	34	13	406	t13834w1130406	Cutover Area	406 COA	8	1	0	0	Re-inventory.	COV53
138	34	13	421	t13834w1130421	Norway Pine	421 NP 51	13.7	56	0	0	Re-inventory.	INC51
138	34	14	60	t13834w1140060	Norway Pine	60 NP 62	4.9	89	0	0	Thinning	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Park Rapids Area***

Township	*Range*	*Section*	*Stand*	*Location ID*	*Management Cover Type*	*Stand Label*	*Acres*	*Age*	*Stand Exam Year*	*New Access Miles*	*Preliminary Prescription*	*Management Objectives*
138	34	14	136	t13834w1140136	Norway Pine	136 NP44	2.6	54	0	0	Thinning	
138	34	14	146	t13834w1140146	Aspen	146 A46	4.1	57	0	0	Clearcut with Reserves	COV53
138	34	14	151	t13834w1140151	Aspen	151 A42	10.2	57	0	0	Clearcut with Reserves	COV53
138	34	14	170	t13834w1140170	Cutover Area	170 COA	17.9	1	0	0	Re-inventory.	COV53
138	34	14	171	t13834w1140171	Cutover Area	171 COA	6	1	0	0	Re-inventory.	COV52
138	34	14	186	t13834w1140186	Jack Pine	186 JP42	8	57	0	0	Clearcut with Reserves	MA1
138	34	14	199	t13834w1140199	Aspen	199 A44	5.9	58	0	0	Clearcut with Reserves	COV53
138	34	14	302	t13834w1140302	Cutover Area	302 COA	25	1	0	0	Re-inventory.	COV52
138	34	14	420	t13834w1140420	Norway Pine	420 NP 46	8.5	41	0	0	Thinning	
138	34	15	120	t13834w1150120	Jack Pine	120 JP44	12.8	59	0	0	Clearcut with Reserves	
138	34	15	128	t13834w1150128	Norway Pine	128 NP42	48.4	24	0	0	Thinning	
138	34	15	130	t13834w1150130	Oak	130 O42	7.3	85	0	0	Clearcut with Reserves	
138	34	15	142	t13834w1150142	Aspen	142 A41	2.8	41	0	0	Clearcut with Reserves	COV53
138	34	15	145	t13834w1150145	Norway Pine	145 NP42	30.8	42	0	0	Thinning	
138	34	15	157	t13834w1150157	White Spruce	157 WS11	4.4	24	0	0	Thinning	
138	34	15	168	t13834w1150168	Norway Pine	168 NP42	20.2	40	0	0	Thinning	
138	34	15	189	t13834w1150189	Norway Pine	189 NP44	17.1	24	0	0	Thinning	
138	34	15	324	t13834w1150324	Norway Pine	324 NP43	13.1	24	0	0	Thinning	
138	34	15	381	t13834w1150381	Jack Pine	381 JP44	6.6	59	0	0	Clearcut with Reserves	
138	34	15	395	t13834w1150395	Jack Pine	395 JP44	21.9	59	0	0	Clearcut with Reserves	
138	34	16	106	t13834w1160106	Norway Pine	106 NP11	7	23	0	0	Thinning	
138	34	16	107	t13834w1160107	Aspen	107 A44	30.6	58	0	0	Clearcut with Reserves	
138	34	16	110	t13834w1160110	White Spruce	110 WS11	13.8	21	0	0	Thinning	
138	34	16	117	t13834w1160117	Norway Pine	117 NP11	10.5	21	0	0	Thinning	
138	34	16	137	t13834w1160137	Norway Pine	137 NP42	1.7	43	0	0	Thinning	
138	34	16	140	t13834w1160140	Norway Pine	140 NP42	17.4	43	0	0	Thinning	
138	34	16	153	t13834w1160153	White Spruce	153 WS11	18.2	25	0	0	Thinning	
138	34	16	155	t13834w1160155	Norway Pine	155 NP32	33.9	36	0	0	Thinning	
138	34	16	179	t13834w1160179	Norway Pine	179 NP42	8.1	41	0	0	Thinning	
138	34	16	396	t13834w1160396	Norway Pine	396 NP43	25.6	36	0	0	Thinning	
138	34	23	194	t13834w1230194	Aspen	194 A45	35.2	55	0	0	Clearcut with Reserves	OV52 INC51 INC
138	34	23	204	t13834w1230204	Cutover Area	204 COA	7.3	1	0	0	Re-inventory.	COV52
138	34	23	214	t13834w1230214	Norway Pine	214 NP54	21.5	89	0	0	Thinning	
138	34	23	340	t13834w1230340	Norway Pine	340 NP11	13.8	15	0	0	Thinning	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
138	34	23	390	t13834w1230390	Cutover Area	390 COA	12	1	0	0	Re-inventory.	COV52
138	34	24	206	t13834w1240206	Ash	206 Ash42	32.4	98	0	0	Manage for understory	INC72
138	34	24	209	t13834w1240209	Upland Grass	209 UG	3	17	0	0	On-site Evaluation	COV53
138	34	24	216	t13834w1250216	White Spruce	216 WS12	40.4	23	0	0	Thinning	
138	34	24	223	t13834w1240223	Norway Pine	223 NP11	6.2	21	0	0	Thinning	
138	34	24	348	t13834w1230348	Jack Pine	348 JP44	27.8	58	0	0	Clearcut with Reserves	
138	34	24	355	t13834w1240355	Jack Pine	355 JP44	7.5	60	0	0	Clearcut with Reserves	
138	34	24	398	t13834w1240398	Jack Pine	398 JP44	6.3	62	0	0	Clearcut with Reserves	
138	34	24	412	t13834w1240412	Ash	412 Ash42	34.6	98	0	0	Manage for understory	INC72
138	34	25	226	t13834w1250226	White Spruce	226 WS11	14.3	22	0	0	Thinning	
138	34	25	229	t13834w1250229	Norway Pine	229 NP11	66.6	22	0	0	Thinning	
138	34	25	230	t13834w1250230	Aspen	230 A24	17	36	0	0	Clearcut with Reserves	COV53
138	34	25	231	t13834w1250231	Aspen	231 A54	9.9	64	0	0	Clearcut with Reserves	COV53
138	34	25	233	t13834w1250233	Norway Pine	233 NP12	4.1	21	0	0	Thinning	
138	34	25	235	t13834w1250235	Cutover Area	235 COA	9.3	3	0	0	Re-inventory.	COV53
138	34	25	248	t13834w1250248	White Spruce	248 WS11	12.9	23	0	0	Thinning	
138	34	25	262	t13834w1250262	Norway Pine	262 NP11	17.4	17	0	0	Thinning	
138	34	25	373	t13834w1250373	Jack Pine	373 JP45	3.6	62	0	0	Manage for understory	
138	34	25	403	t13834w1250403	Jack Pine	403 JP45	7.2	62	0	0	Manage for understory	
138	34	26	400	t13834w1260400	Cutover Area	400 COA	3.2	3	0	0	Re-inventory.	
138	34	26	401	t13834w1260401	Cutover Area	401 COA	6.9	3	0	0	Re-inventory.	
138	34	35	265	t13834w1350265	Norway Pine	265 NP42	6	36	0	0	Thinning	
138	34	35	274	t13834w1350274	Norway Pine	274 NP63	4.7	88	0	0	Thinning	
138	34	35	296	t13834w1350296	Norway Pine	296 NP53	4.3	80	0	0	Thinning	
138	34	35	304	t13834w1350304	Norway Pine	304 NP54	26	85	0	0	Thinning	
138	34	35	306	t13834w1350306	White Spruce	306 WS11	7.6	18	0	0	Thinning	
138	34	35	308	t13834w1350308	Norway Pine	308 NP11	30.2	18	0	0	Thinning	
138	34	35	314	t13834w1350314	Norway Pine	314 NP31	15	17	0	0	Thinning	CON2
138	34	35	356	t13834w1350356	White Spruce	356 WS11	9.3	18	0	0	Thinning	
138	34	36	275	t13834w1360275	White Spruce	275 WS11	50.8	25	0	0	Thinning	
138	34	36	279	t13834w1360279	White Pine	279 WP11	27.7	25	0	0	Thinning	INC53
138	34	36	300	t13834w1360300	Norway Pine	300 NP44	3	49	0	0	Thinning	
138	34	36	311	t13834w1360311	Upland Grass	311 UG	4.6	2	0	0	On-site Evaluation	COV53
138	34	36	312	t13834w1360312	Norway Pine	312 NP42	33.8	25	0	0	Thinning	

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Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
138	34	36	318	t13834w1360318	Norway Pine	318 NP42	6.2	42	0	0	Thinning	
138	34	36	341	t13834w1360341	Norway Pine	341 NP11	16.1	15	0	0	Thinning	CON2
138	35	8	1	t13835w1080001	Cutover Area	1 COA	2.9	6	0	0	On-site Evaluation	COV53
138	35	8	4	t13835w1080004	Cutover Area	4 COA	18	1	0	0	Re-inventory.	
138	35	8	5	t13835w1080005	Norway Pine	5 NP12	7.6	23	0	0	Thinning	
138	35	20	8	t13835w1200008	Jack Pine	8 JP42	10.4	59	0	0	Clearcut with Reserves	
138	35	20	9	t13835w1200009	Norway Pine	9 NP11	11.6	15	0	0	Thinning	
138	35	20	10	t13835w1200010	Aspen	10 A42	4.7	46	0	0	Re-inventory.	
138	35	20	15	t13835w1200015	Aspen	15 A55	3.3	56	0	0	Re-inventory.	
138	35	36	1	t13835w1369001	Norway Pine	9001 NP43	6.9	27	0	0	Thinning	
138	35	36	24	t13835w1360024	Norway Pine	24 NP42	52.5	26	0	0	Thinning	
138	35	36	29	t13835w1360029	Norway Pine	29 NP62	6.8	78	0	0	Thinning	
138	35	36	34	t13835w1360034	Norway Pine	34 NP43	13.3	27	0	0	Thinning	
138	35	36	42	t13835w1360042	Norway Pine	42 NP42	8.4	23	0	0	Thinning	
138	35	36	47	t13835w1360047	Norway Pine	47 NP54	9.2	79	0	0	Thinning	
138	35	36	48	t13835w1360048	Norway Pine	48 NP31	20	15	0	0	Thinning	
138	35	36	51	t13835w1360051	Norway Pine	51 NP42	8.7	22	0	0	Thinning	
138	37	25	33	t13837w1250033	Aspen	33 A43	6.5	51	0	0	Clearcut with Reserves	
138	37	25	34	t13837w1250034	Norway Pine	34 NP21	6.4	22	0	0	Thinning	
138	37	25	35	t13837w1250035	Aspen	35 A44	16.5	58	0	0	Clearcut with Reserves	
138	37	36	43	t13837w1360043	Aspen	43 A42	19.5	41	0	0	Clearcut with Reserves	
138	37	36	46	t13837w1360046	Aspen	46 A44	33.6	54	0	0	Clearcut with Reserves	
138	37	36	48	t13837w1360048	Upland Grass	48 UG	8.8	15	0	0	Re-inventory.	
138	37	36	49	t13837w1360049	Oak	49 O54	7.3	94	0	0	Clearcut with Reserves	
138	37	36	50	t13837w1360050	Norway Pine	50 NP11	7.5	22	0	0	Thinning	
138	37	36	51	t13837w1360051	Norway Pine	51 NP21	31.7	22	0	0	Thinning	
138	37	36	52	t13837w1360052	Upland Brush	52 UB	9.7	15	0	0	Re-inventory.	
138	37	36	53	t13837w1360053	Oak	53 O55	22.1	121	0	0	Clearcut with Reserves	
138	37	36	54	t13837w1360054	Aspen	54 A56	30.9	66	0	0	Clearcut with Reserves	
138	37	36	55	t13837w1360055	Aspen	55 A56	12.5	66	0	0	Clearcut with Reserves	
138	37	36	58	t13837w1360058	Northern Hardwoods	58 NH45	24.2	76	0	0	Thinning	MA1
138	37	36	59	t13837w1360059	Oak	59 O54	13.8	93	0	0	Clearcut with Reserves	
138	37	36	60	t13837w1360060	Norway Pine	60 NP11	13.1	17	0	0	Thinning	
139	32	6	4	t13932w1060004	Jack Pine	4 JP55	6	62	0	0	Clearcut with Reserves	MA1

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Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
139	32	6	5	t13932w1060005	Tamarack	5 T52	6.6	84	0	0	Clearcut with Reserves	MA1
139	32	6	8	t13932w1060008	Cutover Area	8 COA	19.8	3	0	0	Re-inventory.	COV52
139	32	9	12	t13932w1090012	Norway Pine	12 NP11	5.2	15	0	0	Thinning	
139	32	9	13	t13932w1090013	Norway Pine	13 NP59	4.5	67	0	0	Thinning	
139	32	9	17	t13932w1090017	Norway Pine	17 NP58	9.1	65	0	0	Thinning	
139	32	9	18	t13932w1090018	Cutover Area	18 COA	29.3	2	0	0	Re-inventory.	COV53
139	32	9	25	t13932w1090025	Norway Pine	25 NP12	29	26	0	0	Thinning	
139	32	9	28	t13932w1090028	Norway Pine	28 NP11	20.9	16	0	0	Thinning	
139	32	9	40	t13932w1090040	Norway Pine	40 NP55	6.5	64	0	0	Thinning	
139	32	9	42	t13932w1090042	White Pine	42 WP55	3.8	67	0	0	Thinning	
139	32	9	44	t13932w1090044	White Pine	44 WP46	2.4	68	0	0	Thinning	
139	32	9	46	t13932w1090046	Norway Pine	46 NP54	16.2	65	0	0	Thinning	
139	32	9	49	t13932w1090049	Norway Pine	49 NP13	11.3	22	0	0	Thinning	
139	32	9	161	t13932w1090161	Norway Pine	161 NP55	4.7	75	0	0	Thinning	
139	32	9	167	t13932w1090167	Norway Pine	167 NP55	1.7	65	0	0	Thinning	
139	32	9	168	t13932w1090168	Norway Pine	168 NP59	7	64	0	0	Thinning	
139	32	10	37	t13932w1100037	Norway Pine	37 NP13	4.9	24	0	0	Thinning	
139	32	10	164	t13932w1100164	Norway Pine	164 NP52	13	79	0	0	Thinning	
139	32	10	166	t13932w1100166	Cutover Area	166 COA	17.3	1	0	0	Re-inventory.	COV53
139	32	16	54	t13932w1160054	White Spruce	54 WS12	32	3	0	0	Thinning	
139	32	16	55	t13932w1160055	Norway Pine	55 NP21	17	39	0	0	Clearcut with Reserves	
139	32	16	62	t13932w1160062	Cutover Area	62 COA	10.1	2	0	0	Re-inventory.	MNT1
139	32	16	63	t13932w1160063	Norway Pine	63 NP42	5.5	33	0	0	Clearcut with Reserves	
139	32	16	67	t13932w1160067	Cutover Area	67 COA	23	35	0	0	On-site Evaluation	COV12
139	32	16	71	t13932w1160071	Aspen	71 A44	7.9	54	0	0	Clearcut with Reserves	
139	32	16	74	t13932w1160074	Aspen	74 A43	7.3	50	0	0	Clearcut with Reserves	
139	32	16	75	t13932w1160075	Norway Pine	75 NP11	5	16	0	0	Clearcut with Reserves	
139	32	16	142	t13932w1160142	Cutover Area	142 COA	19.9	65	0	0	Re-inventory.	COV61
139	32	16	158	t13932w1160158	Norway Pine	158 NP59	2	61	0	0	Clearcut with Reserves	
139	32	18	155	t13932w1180155	Cutover Area	155 COA	38.6	73	0	0	Re-inventory.	COV52
139	32	21	148	t13932w1210148	Upland Grass	148 UG	5.5	15	0	0	On-site Evaluation	COV53
139	32	21	149	t13932w1210149	Upland Grass	149 UG	6	15	0	0	On-site Evaluation	COV53
139	32	22	81	t13932w1220081	White Spruce	81 WS46	17.1	40	2014	0	Thinning	
139	32	22	84	t13932w1220084	Aspen	84 A42	6.6	52	0	0	Clearcut with Reserves	

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Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
139	32	22	87	t13932w1220087	Norway Pine	87 NP56	5.6	46	2014	0	Thinning	
139	32	22	91	t13932w1220091	Aspen	91 A52	7.3	80	0	0	Clearcut with Reserves	
139	32	22	92	t13932w1220092	Aspen	92 A42	3.9	51	0	0	Clearcut with Reserves	
139	32	22	93	t13932w1220093	White Spruce	93 WS46	8.3	40	2014	0	Thinning	
139	32	22	95	t13932w1220095	Aspen	95 A51	3.3	63	0	0	Clearcut with Reserves	
139	32	22	97	t13932w1220097	Norway Pine	97 NP56	4.5	44	2014	0	Thinning	
139	32	22	98	t13932w1220098	Aspen	98 A42	14.6	50	0	0	Clearcut with Reserves	
139	32	22	99	t13932w1220099	Aspen	99 A43	3.7	50	0	0	Clearcut with Reserves	
139	32	26	109	t13932w1260109	Aspen	109 A 56	29	61	0	0	Clearcut with Reserves	
139	32	26	113	t13932w1260113	Jack Pine	113 JP 57	5.9	64	0	0	Clearcut with Reserves	
139	32	36	116	t13932w1360116	Aspen	116 A56	6	60	0	0	Clearcut with Reserves	INC52
139	32	36	117	t13932w1360117	Aspen	117 A45	6.3	53	0	0	Clearcut with Reserves	INC52
139	32	36	118	t13932w1360118	White Spruce	118 WS12	15.5	22	0	0	Thinning	
139	32	36	120	t13932w1360120	Norway Pine	120 NP56	8.8	47	0	0	Thinning	
139	32	36	121	t13932w1360121	Norway Pine	121 NP15	16.8	22	0	0	Thinning	
139	32	36	123	t13932w1360123	Aspen	123 A55	28.1	57	0	0	Clearcut with Reserves	
139	32	36	165	t13932w1360165	Norway Pine	165 NP55	3	44	0	0	Thinning	
139	33	2	6	t13933w1020006	Aspen	6 A43	16.7	75	0	0	Clearcut with Reserves	COV52
139	33	2	18	t13933w1020018	Jack Pine	18 JP43	27.3	72	0	0	Clearcut with Reserves	
139	33	2	21	t13933w1020021	Norway Pine	21 NP12	9.1	17	0	0	Thinning	
139	33	2	24	t13933w1020024	Tamarack	24 T61	5.7	118	0	0	Clearcut with Reserves	
139	33	12	36	t13933w1120036	Jack Pine	36 JP 56	31.2	69	0	0	Clearcut with Reserves	
139	33	12	37	t13933w1120037	Norway Pine	37 NP 31	11.2	16	0	0	Thinning	
139	33	15	45	t13933w1150045	Jack Pine	45 JP56	10.6	73	0	0	Clearcut with Reserves	
139	33	15	48	t13933w1150048	Jack Pine	48 JP53	3.8	55	0	0	Clearcut with Reserves	
139	33	15	58	t13933w1220058	Jack Pine	58 JP 55	22.5	63	0	0	On-site Evaluation	
139	33	15	61	t13933w1150061	Aspen	61 A54	3.7	59	0	0	Clearcut with Reserves	
139	33	15	230	t13933w1150230	Jack Pine	230 JP11	5.1	8	0	0	On-site Evaluation	
139	33	15	231	t13933w1150231	Jack Pine	231 JP11	4.9	8	0	0	On-site Evaluation	
139	33	15	263	t13933w1150263	Cutover Area	263 COA	8.9	1	0	0	Re-inventory.	COV53
139	33	21	55	t13933w1210055	Aspen	55 A54	60	59	0	0	Clearcut with Reserves	
139	33	21	77	t13933w1210077	Aspen	77 A43	17.4	53	0	0	Clearcut with Reserves	
139	33	21	115	t13933w1210115	Offsite Oak - SI <= 39	115 OX16	8.2	28	0	0	Clearcut with Reserves	COV53
139	33	22	73	t13933w1220073	White Spruce	73 WS12	9.7	13	0	0	Thinning	

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Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
139	33	22	75	t13933w1220075	Jack Pine	75 JP54	0	62	0	0	Clearcut with Reserves	
139	33	22	91	t13933w1220091	Northern Hardwoods	91 NH55	25	76	0	0	Thinning	MA1
139	33	22	110	t13933w1220110	Birch	110 Bi45	35.6	74	0	0	Clearcut with Reserves	
139	33	22	227	t13933w1220227	Aspen	227 A55	9.5	67	0	0	Clearcut with Reserves	CON7
139	33	22	265	t13933w1220265	White Pine	265 WP 54	14.7	79	0	0	On-site Evaluation	
139	33	23	83	t13933w1230083	Cutover Area	83 COA	12.4	45	0	0	Re-inventory.	
139	33	23	83	t13933w1230083	Jack Pine		5.6	60	0	0	Clearcut with Reserves	
139	33	23	97	t13933w1230097	Aspen	97 A55	9.1	56	0	0	On-site Evaluation	
139	33	23	111	t13933w1230111	Jack Pine	111 JP54	49.5	78	0	0	Clearcut with Reserves	
139	33	23	239	t13933w1230239	Jack Pine	239 JP10	8.5	10	0	0	Re-inventory.	
139	33	23	252	t13933w1230252	White Spruce	252 WS11	25.6	4	0	0	Thinning	
139	33	23	254	t13933w1230254	White Spruce	254 WS11	10.5	5	0	0	Thinning	
139	33	23	256	t13933w1220256	Jack Pine	256 JP44	26.9	61	0	0	Clearcut with Reserves	
139	33	23	257	t13933w1230257	Jack Pine	257 JP44	6.5	61	0	0	Clearcut with Reserves	
139	33	23	258	t13933w1230258	Jack Pine	258 JP 53	20.1	75	0	0	Clearcut with Reserves	
139	33	23	262	t13933w1230262	Jack Pine	262 JP46	3.5	60	0	0	Clearcut with Reserves	
139	33	24	90	t13933w1240090	Upland Grass	90 UG	7	17	0	0	Re-inventory.	COV53
139	33	28	123	t13933w1280123	Birch	123 Bi44	34.7	84	0	0	Clearcut with Reserves	
139	33	28	127	t13933w1280127	Offsite Oak - SI <= 39	127 OX26	5.2	32	0	0	Clearcut with Reserves	COV53
139	33	28	132	t13933w1280132	Upland Grass	132 UG	14.9	17	0	0	On-site Evaluation	COV53
139	33	28	133	t13933w1280133	Oak	133 O41	24.2	73	0	0	Clearcut with Reserves	
139	33	29	109	t13933w1280109	Oak	109 O53	60	92	0	0	Clearcut with Reserves	COV53
139	33	29	120	t13933w1290120	Jack Pine	120 JP54	5.2	82	0	0	Manage for understory	RIP1
139	33	32	136	t13933w1290136	Oak	136 O43	20	88	0	0	Clearcut with Reserves	COV53
139	33	32	142	t13933w1320142	Oak	142 O42	9.5	72	0	0	Clearcut with Reserves	
139	33	32	157	t13933w1320157	Aspen	157 A56	10	58	0	0	Clearcut with Reserves	
139	33	32	176	t13933w1320176	Aspen	176 A55	30	50	0	0	Clearcut with Reserves	COV53
139	33	33	146	t13933w1330146	Aspen	146 A42	9.6	65	0	0	Clearcut with Reserves	COV53
139	33	33	148	t13933w1330148	Aspen	148 A53	30.4	59	0	0	Clearcut with Reserves	COV53
139	33	33	166	t13933w1330166	Upland Grass	166 UG	8.1	17	0	0	On-site Evaluation	COV53
139	33	33	172	t13933w1330172	Agriculture	172 Agr	11.2	15	0	0	On-site Evaluation	COV53
139	33	33	175	t13933w1330175	Upland Grass	175 UG	4.3	17	0	0	On-site Evaluation	COV53
139	33	33	186	t13933w1330186	Oak	186 O42	10	75	0	0	Clearcut with Reserves	COV53
139	33	33	187	t13933w1330187	Upland Grass	187 UG	10.5	17	0	0	On-site Evaluation	COV53

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
139	33	33	195	t13933w1330195	Jack Pine	195 JP52	7.6	88	0	0	Clearcut with Reserves	CON2
139	33	33	210	t13933w1330210	Balsam Fir	210 BF41	4	71	0	0	On-site Evaluation	
139	33	34	192	t13933w1340192	Cutover Area	192 COA	11.4	42	0	0	Re-inventory.	COV53
139	33	36	154	t13933w1360154	Jack Pine	154 JP43	10.2	57	0	0	Clearcut with Reserves	
139	33	36	156	t13933w1360156	Jack Pine	156 JP42	4.6	62	0	0	Clearcut with Reserves	
139	33	36	163	t13933w1360163	Jack Pine	163 JP43	21.1	60	0	0	Clearcut with Reserves	
139	33	36	173	t13933w1360173	Jack Pine	173 JP44	9.7	61	0	0	Clearcut with Reserves	
139	33	36	196	t13933w1360196	Aspen	196 A54	10	56	0	0	Clearcut with Reserves	
139	33	36	198	t13933w1360198	Aspen	198 A41	15.3	50	0	0	Clearcut with Reserves	
139	33	36	201	t13933w1360201	Jack Pine	201 JP44	6.1	65	0	0	Clearcut with Reserves	
139	33	36	204	t13933w1360204	Aspen	204 A54	24.3	42	0	0	Clearcut with Reserves	INC53
139	34	19	31	t13934w1190031	Aspen	31 A43	9.1	62	0	0	Clearcut with Reserves	
139	34	19	32	t13934w1190032	Jack Pine	32 JP56	22.7	63	0	0	Clearcut with Reserves	
139	34	30	2	t13934w1300002	Aspen	2 A54	14.7	62	0	0	Clearcut with Reserves	COV53
139	34	30	3	t13934w1300003	Jack Pine	3 JP54	8	64	0	0	Clearcut with Reserves	
139	34	30	8	t13934w1300008	Jack Pine	8 JP56	8.4	66	0	0	Clearcut with Reserves	
139	34	30	9	t13934w1300009	Aspen	9 A44	5.9	68	0	0	Clearcut with Reserves	
139	35	6	2	t13935w1060002	Jack Pine	2 JP44	11.2	64	0	0	Clearcut with Reserves	
139	35	14	3	t13935w1140003	Upland Grass	3 UG	6.1	17	0	0	On-site Evaluation	COV53
139	35	24	7	t13935w1240007	Oak	7 O42	17.9	74	0	0	Clearcut with Reserves	
139	35	24	10	t13935w1240010	Tamarack	10 T55	6.2	114	0	0	Manage for understory	
139	35	31	251	t13935w1310251	Jack Pine	251 JP53	15.1	63	0	0	Re-inventory.	COV53
139	35	31	252	t13935w1310252	Upland Grass	252 UG	5.5	9	0	0	On-site Evaluation	COV53
139	35	36	12	t13935w1360012	Aspen	12 A32	2.9	42	0	0	Clearcut with Reserves	INC53
139	35	36	13	t13935w1360013	Aspen	13 A32	7.4	42	0	0	Clearcut with Reserves	INC53
139	35	36	31	t13935w1360031	Norway Pine	31 NP11	8.8	22	0	0	Thinning	
139	35	36	32	t13935w1360032	Jack Pine	32 JP55	3.2	87	0	0	Clearcut with Reserves	
139	35	36	33	t13935w1360033	Aspen	33 A56	4.5	67	0	0	Clearcut with Reserves	INC53
139	35	36	39	t13935w1360039	Norway Pine	39 NP11	11.1	22	0	0	Thinning	
139	35	36	42	t13935w1360042	Jack Pine	42 JP45	11.6	72	0	0	Clearcut with Reserves	
139	35	36	44	t13935w1360044	Norway Pine	44 NP11	12.7	22	0	0	Thinning	
139	35	36	47	t13935w1360047	White Spruce	47 WS 12	21.7	2	0	0	Thinning	
139	35	36	48	t13935w1360048	Jack Pine	48 JP44	5.7	62	0	0	Clearcut with Reserves	
139	36	6	12	t13936w1060012	Balsam Fir	12 BF43	22.8	73	0	0	Clearcut with Reserves	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
139	36	6	22	t13936w1060022	Aspen	22 A45	7.1	55	0	0	Clearcut with Reserves	
139	36	7	25	t13936w1070025	Aspen	25 A44	8.7	57	0	0	Clearcut with Reserves	
139	36	7	31	t13936w1070031	Upland Grass	31 UG	3.4	15	0	0	Re-inventory.	
139	36	7	32	t13936w1070032	Aspen	32 A56	4.3	73	0	0	Clearcut with Reserves	
139	36	7	34	t13936w1070034	Aspen	34 A54	52.7	69	0	0	Clearcut with Reserves	
139	36	7	38	t13936w1070038	Lowland Hardwoods	38 LH42	12.3	70	0	0	Clearcut with Reserves	INC72
139	36	7	66	t13936w1070066	Upland Grass	66 UG	20.3	17	0	0	On-site Evaluation	
139	36	7	79	t13936w1070079	Upland Grass	79 UG	10.8	25	0	0	Re-inventory.	
139	36	7	81	t13936w1070081	Aspen	81 A44	5	55	0	0	Clearcut with Reserves	
139	36	18	46	t13936w1180046	Aspen	46 A56	58	84	0	0	Clearcut with Reserves	
139	36	18	63	t13936w1180063	Industrial Develop	63 DEV	8	17	0	0	Re-inventory.	
139	36	20	57	t13936w1200057	White Spruce	57 WS11	29.7	16	0	0	Thinning	
139	36	20	62	t13936w1200062	White Spruce	62 WS11	7.2	16	0	0	Thinning	
139	36	24	84	t13936w1240084	Jack Pine	84 JP55	35	67	0	0	Clearcut with Reserves	
139	37	1	27	t13937w1010027	Ash	27 Ash42	10	74	0	0	Manage for understory	INC72
139	37	1	31	t13937w1010031	Ash	31 Ash42	2.7	74	0	0	Manage for understory	INC72
139	37	1	34	t13937w1010034	Norway Pine	34 NP21	25.1	26	0	0	Thinning	
139	37	1	38	t13937w1010038	Aspen	38 A42	3.4	47	0	0	Clearcut with Reserves	COV53
139	37	1	47	t13937w1010047	Aspen	47 A52	20.4	68	0	0	Clearcut with Reserves	
139	37	1	49	t13937w1010049	Norway Pine	49 NP51	7.3	97	0	0	Clearcut with Reserves	COV53
139	37	1	52	t13937w1010052	Aspen	52 A41	15.5	41	0	0	Clearcut with Reserves	
139	37	1	61	t13937w1010061	Norway Pine	61 NP62	3.7	98	0	0	Clearcut with Reserves	COV53
139	37	1	62	t13937w1010062	Upland Brush	62 UB	4.1	15	0	0	Re-inventory.	
139	37	1	70	t13937w1010070	Aspen	70 A53	15.6	70	0	0	Clearcut with Reserves	COV53
139	37	1	74	t13937w1010074	Norway Pine	74 NP21	7.3	22	0	0	Thinning	
139	37	1	123	t13937w1010123	White Spruce	123 WS21	26.9	26	0	0	Thinning	
139	37	2	1	t13937w1020001	Aspen	1 A58	24.8	72	0	0	Clearcut with Reserves	
139	37	2	3	t13937w1020003	Norway Pine	3 NP23	5.9	17	0	0	Thinning	
139	37	2	5	t13937w1020005	Cutover Area	5 COA	21	69	0	0	Re-inventory.	COV52
139	37	2	14	t13937w1020014	Norway Pine	14 NP11	20.4	22	0	0	Thinning	
139	37	2	24	t13937w1020024	Jack Pine	24 JP57	12.8	65	0	0	Clearcut with Reserves	
139	37	2	26	t13937w1020026	Norway Pine	26 NP51	3.5	57	0	0	Thinning	
139	37	2	30	t13937w1020030	Cutover Area	30 COA	29.2	3	0	0	Re-inventory.	COV52
139	37	2	33	t13937w1020033	Balsam Fir	33 BF54	9.7	55	0	0	Clearcut with Reserves	COV53

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
139	37	2	37	t13937w1020037	Norway Pine	37 NP13	20.4	19	0	0	Thinning	
139	37	2	45	t13937w1020045	Jack Pine	45 JP58	10.5	83	0	0	Clearcut with Reserves	
139	37	3	8	t13937w1030008	Aspen	8 A53	7.6	70	0	0	Clearcut with Reserves	COV53
139	37	3	9	t13937w1030009	Aspen	9 A55	13.6	73	0	0	Clearcut with Reserves	
139	37	3	12	t13937w1030012	Northern Hardwoods	12 NH57	9.4	80	0	0	Uneven-aged Harvest	
139	37	3	23	t13937w1030023	Northern Hardwoods	23 NH58	29.2	97	0	0	Uneven-aged Harvest	
139	37	3	66	t13937w1030066	Northern Hardwoods	66 NH56	9.8	80	0	0	Uneven-aged Harvest	
139	37	3	309	t13937w1030309	Aspen	309 A57	14.5	84	0	0	Clearcut with Reserves	
139	37	4	71	t13937w1040071	Birch	71 Bi55	2.3	85	0	0	Clearcut with Reserves	
139	37	4	284	t13937w1040284	Birch	284 Bi55	9.4	85	0	0	Clearcut with Reserves	
139	37	8	78	t13937w1080078	Aspen	78 A54	18.5	58	0	0	Clearcut with Reserves	
139	37	9	83	t13937w1090083	Norway Pine	83 NP21	19.1	29	0	0	Thinning	
139	37	9	92	t13937w1090092	Northern Hardwoods	92 NH56	16.9	93	0	0	Uneven-aged Harvest	
139	37	9	96	t13937w1090096	Aspen	96 A57	43.6	78	0	0	Clearcut with Reserves	
139	37	9	127	t13937w1090127	Northern Hardwoods	127 NH54	15.6	85	0	0	Uneven-aged Harvest	
139	37	9	128	t13937w1090128	Norway Pine	128 NP21	11.9	29	0	0	Thinning	
139	37	9	324	t13937w1090324	Aspen	324 A57	16.4	78	0	0	Clearcut with Reserves	
139	37	10	79	t13937w1100079	Aspen	79 A59	28.1	72	0	0	Clearcut with Reserves	
139	37	10	89	t13937w1100089	Aspen	89 A59	2.4	72	0	0	Clearcut with Reserves	
139	37	10	91	t13937w1100091	Northern Hardwoods	91 NH54	6.3	105	0	0	Thinning	MA1
139	37	10	95	t13937w1100095	Northern Hardwoods	95 NH53	10	73	0	0	Thinning	MA1
139	37	10	107	t13937w1100107	Northern Hardwoods	107 NH58	31.4	94	0	0	Uneven-aged Harvest	
139	37	10	134	t13937w1100134	Aspen	134 A56	3.3	73	0	0	Clearcut with Reserves	
139	37	10	142	t13937w1100142	Norway Pine	142 NP59	18	90	0	0	Thinning	
139	37	10	158	t13937w1100158	Aspen	158 A58	27.4	73	0	0	Clearcut with Reserves	INC51
139	37	10	302	t13937w1100302	Aspen	302 A59	30.3	75	0	0	Clearcut with Reserves	
139	37	11	106	t13937w1110106	Northern Hardwoods	106 NH55	8.6	84	0	0	Thinning	MA1
139	37	11	108	t13937w1110108	Aspen	108 A55	27.5	60	0	0	Clearcut with Reserves	
139	37	11	121	t13937w1110121	Aspen	121 A53	8.2	53	0	0	Clearcut with Reserves	
139	37	12	82	t13937w1120082	Cutover Area	82 COA	19.9	0	0	0	Re-inventory.	
139	37	12	84	t13937w1120084	Aspen	84 A54	90.7	71	0	0	Clearcut with Reserves	
139	37	12	88	t13937w1120088	Norway Pine	88 NP11	5.8	20	0	0	Thinning	
139	37	12	94	t13937w1120094	Norway Pine	94 NP13	11.1	19	0	0	Thinning	
139	37	12	97	t13937w1120097	Norway Pine	97 NP55	6.6	88	0	0	Thinning	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
139	37	12	99	t13937w1120099	Aspen	99 A42	4.3	46	0	0	Clearcut with Reserves	
139	37	12	105	t13937w1120105	Aspen	105 A53	64.4	65	0	0	Clearcut with Reserves	
139	37	12	110	t13937w1120110	Norway Pine	110 NP11	5.2	18	0	0	Thinning	
139	37	12	116	t13937w1120116	Norway Pine	116 NP21	6.5	21	0	0	Thinning	
139	37	12	122	t13937w1120122	Lowland Grass	122 LG	11.4	25	0	0	Re-inventory.	
139	37	12	151	t13937w1120151	Northern Hardwoods	151 NH56	64.5	94	0	0	Thinning	MA1
139	37	12	166	t13937w1120166	Aspen	166 A58	9.2	73	0	0	Clearcut with Reserves	INC51
139	37	12	167	t13937w1120167	Jack Pine	167 JP44	5.6	62	0	0	Clearcut with Reserves	
139	37	12	301	t13937w1120301	Aspen	301 A54	12	71	0	0	Clearcut with Reserves	
139	37	12	322	t13937w1120322	Aspen	322 A54	50.3	71	0	0	Clearcut with Reserves	
139	37	13	164	t13937w1130164	Norway Pine	164 NP58	50.7	89	0	0	Thinning	
139	37	13	177	t13937w1130177	Aspen	177 A55	1.6	69	0	0	Clearcut with Reserves	
139	37	13	193	t13937w1130193	Aspen	193 A54	38	59	0	0	Clearcut with Reserves	
139	37	13	237	t13937w1140237	Aspen	237 A56	32.2	69	0	0	Clearcut with Reserves	
139	37	13	275	t13937w1130275	Norway Pine	275 NP11	18.7	23	0	0	Thinning	
139	37	13	316	t13937w1130316	Aspen	316 A55	30.8	69	0	0	Clearcut with Reserves	
139	37	13	321	t13937w1130321	Aspen	321 A55	55.6	56	0	0	Clearcut with Reserves	
139	37	13	326	t13937w1130326	Aspen	326 A56	18.4	69	0	0	Clearcut with Reserves	
139	37	14	207	t13937w1140207	Aspen	207 A56	15.5	73	0	0	Clearcut with Reserves	
139	37	14	211	t13937w1140211	Aspen	211 A58	9.5	75	0	0	Clearcut with Reserves	
139	37	15	181	t13937w1150181	Aspen	181 A55	8.5	58	0	0	Clearcut with Reserves	
139	37	15	224	t13937w1150224	Aspen	224 A53	52	73	0	0	Clearcut with Reserves	
139	37	15	227	t13937w1150227	Birch	227 Bi54	25.8	95	0	0	Clearcut with Reserves	
139	37	15	241	t13937w1150241	Tamarack	241 T52	11.5	126	0	0	Clearcut with Reserves	
139	37	15	259	t13937w1150259	Aspen	259 A55	4.5	76	0	0	Clearcut with Reserves	INC51
139	37	15	268	t13937w1150268	Birch	268 Bi44	10.7	83	0	0	Clearcut with Reserves	
139	37	15	333	t13937w1150333	Aspen	333 A54	19.5	67	0	0	Clearcut with Reserves	
139	37	16	191	t13937w1160191	Northern Hardwoods	191 NH54	32.6	110	0	0	Thinning	MA1
139	37	16	219	t13937w1160219	Northern Hardwoods	219 NH57	4.9	89	0	0	Thinning	MA1
139	37	16	291	t13937w1160291	Northern Hardwoods	291 NH56	4.4	100	0	0	Thinning	MA1
139	37	17	178	t13937w1170178	Northern Hardwoods	178 NH56	14	119	0	0	Thinning	MA1
139	37	17	195	t13937w1170195	Aspen	195 A55	58.2	84	0	0	Clearcut with Reserves	
139	37	17	231	t13937w1170231	Cutover Area	231 COA	7.8	4	0	0	Re-inventory.	COV12
139	37	17	251	t13937w1170251	Oak	251 O58	4.4	97	0	0	Clearcut with Reserves	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
139	37	17	266	t13937w1170266	Oak	266 O56	4.6	100	0	0	Clearcut with Reserves	
139	37	36	277	t13937w1360277	Aspen	277 A54	11.5	69	0	0	Clearcut with Reserves	
139	37	36	279	t13937w1360279	Northern Hardwoods	279 NH62	4.2	84	0	0	Clearcut with Reserves	INC51
139	37	36	282	t13937w1360282	Aspen	282 A59	8.2	75	0	0	Clearcut with Reserves	
139	37	36	283	t13937w1360283	Aspen	283 A55	16.8	68	0	0	Clearcut with Reserves	INC51
140	32	36	22	t14032w1360022	Cutover Area	22 COA	78.3	2	0	0	Re-inventory.	COV52
140	32	36	23	t14032w1360023	Norway Pine	23 NP11	27.8	19	0	0	Thinning	
140	32	36	25	t14032w1360025	White Spruce	25 WS11	22.5	22	0	0	Thinning	INC53
140	32	36	27	t14032w1360027	Norway Pine	27 NP11	13.4	23	0	0	Thinning	
140	32	36	30	t14032w1360030	Norway Pine	30 NP11	31.2	19	0	0	Thinning	
140	32	36	31	t14032w1360031	Aspen	31 A51	13.2	69	0	0	Clearcut with Reserves	
140	32	36	34	t14032w1360034	Norway Pine	34 NP11	49.8	19	0	0	Thinning	
140	32	36	41	t14032w1360041	Norway Pine	41 NP11	13.7	19	0	0	Thinning	
140	32	36	49	t14032w1360049	Cutover Area	49 COA	26.2	182	0	0	Re-inventory.	COV12
140	32	36	54	t14032w1360054	Norway Pine	54 NP44	3.2	37	0	0	Thinning	
140	32	36	55	t14032w1360055	Cutover Area	55 COA	21.9	2	0	0	Re-inventory.	COV53
140	33	16	8	t14033w1160008	Aspen	8 A56	8.3	62	0	0	Clearcut with Reserves	COV53
140	33	26	11	t14033w1260011	Aspen	11 A43	17.8	43	0	0	Clearcut with Reserves	COV52 INC53
140	33	26	14	t14033w1260014	Aspen	14 A47	14.2	56	0	0	Clearcut with Reserves	COV53
140	33	26	16	t14033w1260016	Aspen	16 A44	6.3	48	0	0	Clearcut with Reserves	COV53
140	33	34	51	t14033w1340051	Jack Pine	51 JP 43	28.9	59	0	0	Clearcut with Reserves	
140	33	36	21	t14033w1360021	Cutover Area	21 COA	27.4	73	0	0	Re-inventory.	COV52
140	33	36	23	t14033w1360023	Norway Pine	23 NP59	5.3	63	0	0	Thinning	
140	33	36	28	t14033w1360028	Norway Pine	28 NP64	5.4	85	0	0	Thinning	
140	33	36	35	t14033w1360035	Cutover Area	35 COA	3	73	0	0	Re-inventory.	COV53
140	33	36	36	t14033w1360036	Norway Pine	36 NP59	49.4	64	0	0	Thinning	CON2
140	33	36	37	t14033w1360037	Norway Pine	37 NP43	43.1	46	0	0	Thinning	CON2
140	33	36	46	t14033w1360046	Cutover Area	46 COA	21.3	73	0	0	Re-inventory.	COV52
140	33	36	52	t14033w1360052	Balsam Fir	52 BF43	25.6	73	0	0	Clearcut with Reserves	
140	33	36	54	t14033w1360054	Aspen	54 A56	54.7	69	0	0	Clearcut with Reserves	COV53
140	33	36	60	t14033w1360060	Norway Pine	60 NP45	8.9	42	0	0	Thinning	
140	33	36	62	t14033w1360062	Norway Pine	62 NP74	28	85	0	0	Thinning	
140	33	36	64	t14033w1360064	Balsam Fir	64 BF54	4.3	73	0	0	Clearcut with Reserves	
140	33	36	66	t14033w1360066	Norway Pine	66 NP59	3.6	63	0	0	Thinning	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
140	33	36	67	t14033w1360067	Cutover Area	67 COA	0	73	0	0	Re-inventory.	COV53
140	35	36	5	t14035w1360005	Norway Pine	5 NP12	12.2	16	0	0	Thinning	
140	36	16	22	t14036w1160022	Norway Pine	22 NP11	17.5	16	0	0	Thinning	
140	36	16	23	t14036w1160023	Aspen	23 A56	8.2	66	0	0	Clearcut with Reserves	COV53
140	36	28	49	t14036w1280049	Jack Pine	49 JP55	9.7	56	0	0	Clearcut with Reserves	
140	36	28	53	t14036w1280053	Cutover Area	53 COA	11.3	13	0	0	Re-inventory.	COV53
140	36	31	65	t14036w1310065	Balsam Fir	65 BF55	5	72	0	0	Clearcut with Reserves	
140	36	31	68	t14036w1310068	Tamarack	68 T45	12.3	134	0	0	Clearcut with Reserves	
140	36	31	71	t14036w1310071	Ash	71 Ash43	74.2	90	0	0	Uneven-aged Harvest	
140	36	31	77	t14036w1310077	Norway Pine	77 NP 57	5.6	23	0	0	Thinning	
140	36	31	81	t14036w1310081	Balsam Fir	81 BF44	30	54	0	0	Clearcut with Reserves	
140	36	36	83	t14036w1360083	Offsite Oak - SI <= 39	83 OX41	16.5	56	0	0	Clearcut with Reserves	COV53
140	36	36	84	t14036w1360084	Agriculture	84 Agr	6.3	25	0	0	On-site Evaluation	COV53
140	37	6	11	t14037w1060011	Tamarack	11 T43	5	109	0	0	Clearcut with Reserves	
140	37	7	54	t14037w1070054	Ash	54 Ash44	5.1	99	0	0	Uneven-aged Harvest	
140	37	7	568	t14037w1070568	Tamarack	568 T 42	7	123	0	0	Clearcut with Reserves	
140	37	7	569	t14037w1070569	Tamarack	569 T 42	6.1	123	0	0	Clearcut with Reserves	
140	37	8	18	t14037w1090018	Ash	18 Ash52	16	99	0	0	Clearcut with Reserves	CON1
140	37	8	49	t14037w1080049	Aspen	49 A43	5.9	65	0	0	Clearcut with Reserves	
140	37	8	52	t14037w1080052	Aspen	52 A53	5	69	0	0	Clearcut with Reserves	
140	37	8	79	t14037w1080079	Tamarack	79 T43	51.4	139	0	0	Clearcut with Reserves	
140	37	8	90	t14037w1170090	Tamarack	90 T41	129.5	101	0	0	Clearcut with Reserves	
140	37	8	95	t14037w1170095	Aspen	95 A55	138.2	63	0	0	Clearcut with Reserves	
140	37	8	537	t14037w1080537	Tamarack	537 T42	31	123	0	0	Clearcut with Reserves	
140	37	8	539	t14037w1080539	Cutover Area	539 COA	12.4	7	0	0	Re-inventory.	COV72
140	37	8	544	t14037w1080544	Cutover Area	544 COA	13.8	7	0	0	Re-inventory.	COV72
140	37	8	545	t14037w1080545	Cutover Area	545 COA	6.5	7	0	0	Re-inventory.	COV72
140	37	8	546	t14037w1080546	Tamarack	546 T42	6.3	123	0	0	Clearcut with Reserves	CON1
140	37	8	547	t14037w1080547	Tamarack	547 T42	62.9	123	0	0	Clearcut with Reserves	CON1
140	37	8	555	t14037w1080555	Tamarack	555 T42	107.2	123	0	0	Clearcut with Reserves	
140	37	8	556	t14037w1080556	Cutover Area	556 COA	20.4	4	0	0	Re-inventory.	COV72
140	37	9	39	t14037w1090039	Aspen	39 A44	11	68	0	0	Clearcut with Reserves	
140	37	9	40	t14037w1090040	Jack Pine	40 JP53	5	66	0	0	Clearcut with Reserves	
140	37	9	47	t14037w1090047	Aspen	47 A53	8.7	63	0	0	Clearcut with Reserves	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
140	37	9	65	t14037w1090065	Norway Pine	65 NP12	6	17	0	0	Thinning	
140	37	9	74	t14037w1090074	Aspen	74 A54	14.3	70	0	0	Clearcut with Reserves	
140	37	9	76	t14037w1090076	Jack Pine	76 JP54	4.2	67	0	0	Clearcut with Reserves	
140	37	15	102	t14037w1150102	Norway Pine	102 NP54	7.4	88	0	0	Thinning	
140	37	15	111	t14037w1150111	Norway Pine	111 NP43	12.3	36	0	0	Thinning	
140	37	15	113	t14037w1150113	Oak	113 O54	3.6	87	0	0	Clearcut with Reserves	
140	37	15	125	t14037w1150125	Jack Pine	125 JP56	11.3	87	0	0	Clearcut with Reserves	
140	37	15	130	t14037w1150130	Norway Pine	130 NP52	7.2	40	0	0	Thinning	
140	37	15	134	t14037w1150134	Norway Pine	134 NP11	4.8	18	0	0	Thinning	
140	37	15	142	t14037w1150142	Norway Pine	142 NP11	9.1	18	0	0	Thinning	
140	37	15	143	t14037w1150143	Birch	143 Bi43	11.5	81	0	0	Clearcut with Reserves	
140	37	15	157	t14037w1150157	Oak	157 O56	5.2	100	0	0	Clearcut with Reserves	
140	37	15	174	t14037w1150174	Jack Pine	174 JP43	3	57	0	0	Clearcut with Reserves	
140	37	15	185	t14037w1150185	Jack Pine	185 JP54	5.6	77	0	0	Clearcut with Reserves	
140	37	15	494	t14037w1150494	Aspen	494 A56	15.1	72	0	0	Clearcut with Reserves	
140	37	15	558	t14037w1150558	Norway Pine	558 NP54	2.8	88	0	0	Thinning	
140	37	16	109	t14037w1160109	Cutover Area	109 COA	12.8	89	0	0	Re-inventory.	COV52
140	37	16	121	t14037w1160121	Cutover Area	121 COA	10.8	89	0	0	Re-inventory.	COV52
140	37	16	126	t14037w1160126	Norway Pine	126 NP11	22.1	18	0	0	Thinning	
140	37	16	154	t14037w1160154	Norway Pine	154 NP11	7.1	18	0	0	Thinning	
140	37	16	161	t14037w1160161	Aspen	161 A59	5.6	88	0	0	Clearcut with Reserves	
140	37	16	192	t14037w1160192	Norway Pine	192 NP21	3.5	26	0	0	Thinning	
140	37	16	564	t14037w1160564	Jack Pine	564 JP55	15	92	0	0	Clearcut with Reserves	
140	37	17	184	t14037w1170184	Birch	184 Bi52	3.8	90	0	0	Clearcut with Reserves	
140	37	17	488	t14037w1170488	Northern Hardwoods	488 NH43	35.1	86	0	0	Uneven-aged Harvest	
140	37	17	490	t14037w1170490	Aspen	490 A56	80	84	0	0	Clearcut with Reserves	
140	37	17	552	t14037w1170552	Aspen	552 A56	44.4	84	0	0	Clearcut with Reserves	CON2
140	37	18	165	t14037w1180165	Aspen	165 A56	22.5	64	0	0	Clearcut with Reserves	
140	37	19	191	t14037w1190191	Aspen	191 A55	27.6	63	0	0	Clearcut with Reserves	
140	37	19	194	t14037w1190194	Aspen	194 A56	20.9	64	0	0	Clearcut with Reserves	
140	37	19	206	t14037w1190206	Aspen	206 A54	15.4	77	0	0	Clearcut with Reserves	
140	37	19	209	t14037w1190209	Norway Pine	209 NP21	58.8	31	0	0	Thinning	
140	37	19	260	t14037w1190260	Norway Pine	260 NP21	21.4	26	0	0	Thinning	
140	37	19	281	t14037w1190281	Norway Pine	281 NP21	36.3	31	0	0	Thinning	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
140	37	20	199	t14037w1200199	Ash	199 Ash54	28.2	108	0	0	Uneven-aged Harvest	
140	37	20	211	t14037w1200211	Norway Pine	211 NP41	11.1	37	0	0	Thinning	
140	37	20	226	t14037w1200226	Aspen	226 A55	12	70	0	0	Clearcut with Reserves	
140	37	20	263	t14037w1200263	Norway Pine	263 NP21	24.6	26	0	0	Thinning	
140	37	20	300	t14037w1200300	Aspen	300 A55	21.7	78	0	0	Clearcut with Reserves	
140	37	20	496	t14037w1200496	Aspen	496 A56	90.2	84	0	0	Clearcut with Reserves	
140	37	20	512	t14037w1200512	Aspen	512 A57	5.9	71	0	0	Clearcut with Reserves	COV53
140	37	21	238	t14037w1210238	Norway Pine	238 NP59	7.1	88	0	0	Thinning	
140	37	21	269	t14037w1210269	Norway Pine	269 NP59	7.4	88	0	0	Thinning	
140	37	21	273	t14037w1210273	Norway Pine	273 NP41	4.2	26	0	0	Thinning	
140	37	21	304	t14037w1200304	Norway Pine	304 NP55	9	88	0	0	Thinning	
140	37	21	500	t14037w1210500	Norway Pine	500 NP21	91.5	26	0	0	Thinning	
140	37	21	501	t14037w1210501	Aspen	501 A65	8	81	0	0	Clearcut with Reserves	
140	37	21	524	t14037w1210524	Norway Pine	524 NP55	5	87	0	0	Thinning	
140	37	21	527	t14037w1210527	Aspen	527 A42	27.1	42	0	0	Clearcut with Reserves	
140	37	21	533	t14037w1210533	Norway Pine	533 NP59	29.4	88	0	0	Thinning	
140	37	21	535	t14037w1210535	Aspen	535 A56	32.8	86	0	0	Clearcut with Reserves	
140	37	22	221	t14037w1220221	Norway Pine	221 NP45	10.8	44	0	0	Thinning	
140	37	22	222	t14037w1220222	White Spruce	222 WS31	10.1	37	0	0	Thinning	
140	37	22	227	t14037w1220227	Northern Hardwoods	227 NH53	16.8	87	0	0	Clearcut with Reserves	INC51
140	37	22	234	t14037w1220234	Aspen	234 A44	20.5	48	0	0	Clearcut with Reserves	
140	37	22	246	t14037w1220246	Norway Pine	246 NP11	18.8	17	0	0	Thinning	
140	37	22	256	t14037w1220256	Balsam Fir	256 BF55	7	58	0	0	Clearcut with Reserves	COV53
140	37	22	274	t14037w1220274	Cutover Area	274 COA	14.3	9	0	0	Re-inventory.	COV52
140	37	22	305	t14037w1220305	Aspen	305 A45	11	65	0	0	Clearcut with Reserves	INC51
140	37	22	525	t14037w1220525	Norway Pine	525 NP11	9.6	19	0	0	Thinning	
140	37	23	252	t14037w1230252	Aspen	252 A43	11.7	52	0	0	Clearcut with Reserves	
140	37	23	254	t14037w1230254	Aspen	254 A43	21.7	52	0	0	Clearcut with Reserves	
140	37	23	268	t14037w1230268	Jack Pine	268 JP53	3.9	73	0	0	Clearcut with Reserves	
140	37	23	278	t14037w1230278	Jack Pine	278 JP54	5.4	86	0	0	Clearcut with Reserves	
140	37	23	287	t14037w1230287	Jack Pine	287 JP54	4.1	86	0	0	Clearcut with Reserves	
140	37	23	288	t14037w1230288	Norway Pine	288 NP11	15.7	15	0	0	Thinning	
140	37	23	308	t14037w1230308	Aspen	308 A53	9.1	56	0	0	Clearcut with Reserves	
140	37	23	309	t14037w1230309	Balsam Fir	309 BF44	14	86	0	0	Clearcut with Reserves	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
140	37	24	295	t14037w1240295	Norway Pine	295 NP22	8.1	28	0	0	Thinning	
140	37	24	296	t14037w1240296	Norway Pine	296 NP56	8.8	78	0	0	Thinning	
140	37	24	298	t14037w1240298	Norway Pine	298 NP22	28.9	28	0	0	Thinning	
140	37	24	315	t14037w1240315	Aspen	315 A44	5.3	52	0	0	Clearcut with Reserves	INC51
140	37	25	336	t14037w1250336	Aspen	336 A44	17.4	52	0	0	Clearcut with Reserves	INC51
140	37	25	339	t14037w1250339	White Pine	339 WP53	4.8	76	0	0	Thinning	
140	37	26	362	t14037w1260362	Aspen	362 A56	6.9	58	0	0	Clearcut with Reserves	COV52
140	37	26	366	t14037w1260366	Aspen	366 A56	8.2	56	0	0	Clearcut with Reserves	COV52
140	37	26	372	t14037w1260372	Aspen	372 A54	6.9	71	0	0	Clearcut with Reserves	
140	37	26	382	t14037w1260382	Tamarack	382 T52	3.3	133	0	0	Clearcut with Reserves	
140	37	26	390	t14037w1260390	Aspen	390 A54	12.6	71	0	0	Clearcut with Reserves	
140	37	26	392	t14037w1260392	Tamarack	392 T52	9.8	133	0	0	Clearcut with Reserves	
140	37	26	407	t14037w1260407	Aspen	407 A54	5.5	74	0	0	Clearcut with Reserves	INC51
140	37	26	417	t14037w1260417	Aspen	417 A44	10.6	51	0	0	Clearcut with Reserves	
140	37	26	418	t14037w1260418	Aspen	418 A54	7.1	71	0	0	Clearcut with Reserves	INC51
140	37	27	360	t14037w1270360	Balsam Fir	360 BF44	12.7	68	0	0	Clearcut with Reserves	
140	37	27	391	t14037w1270391	Aspen	391 A53	19.2	67	0	0	Clearcut with Reserves	INC51
140	37	27	393	t14037w1270393	Aspen	393 A43	8.9	48	0	0	Clearcut with Reserves	INC51
140	37	27	408	t14037w1270408	Aspen	408 A54	10.8	74	0	0	Clearcut with Reserves	INC51
140	37	27	411	t14037w1270411	Aspen	411 A55	11.6	75	0	0	Clearcut with Reserves	COV53
140	37	27	413	t14037w1270413	Aspen	413 A55	10.2	80	0	0	Clearcut with Reserves	
140	37	27	422	t14037w1270422	Aspen	422 A55	18.4	75	0	0	Clearcut with Reserves	COV53
140	37	28	343	t14037w1280343	Aspen	343 A54	15.1	79	0	0	Clearcut with Reserves	
140	37	28	353	t14037w1280353	Balsam Fir	353 BF44	9.5	68	0	0	Clearcut with Reserves	
140	37	28	356	t14037w1280356	Aspen	356 A54	11.5	79	0	0	Clearcut with Reserves	
140	37	28	357	t14037w1280357	Aspen	357 A42	4.9	45	0	0	Clearcut with Reserves	
140	37	28	358	t14037w1280358	Aspen	358 A54	7.7	84	0	0	Clearcut with Reserves	
140	37	28	359	t14037w1280359	Aspen	359 A54	6.1	84	0	0	Clearcut with Reserves	
140	37	28	367	t14037w1280367	Aspen	367 A54	12.2	79	0	0	Clearcut with Reserves	
140	37	28	380	t14037w1280380	Upland Grass	380 UG	9.2	16	0	0	Re-inventory.	
140	37	28	420	t14037w1280420	Norway Pine	420 NP56	5	87	0	0	Thinning	
140	37	29	400	t14037w1290400	Birch	400 Bi43	9.8	82	0	0	Clearcut with Reserves	
140	37	30	381	t14037w1300381	Jack Pine	381 JP55	15.9	60	0	0	Clearcut with Reserves	
140	37	34	429	t14037w1340429	Aspen	429 A56	14	76	0	0	Clearcut with Reserves	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
140	37	34	437	t14037w1340437	Norway Pine	437 NP45	5.5	29	0	0	Thinning	
140	37	35	432	t14037w1350432	Balsam Fir	432 BF43	17.4	63	0	0	Clearcut with Reserves	
140	37	35	441	t14037w1350441	Aspen	441 A45	20.2	60	0	0	Clearcut with Reserves	
140	37	35	446	t14037w1350446	Aspen	446 A56	5.4	77	0	0	Clearcut with Reserves	
140	37	35	455	t14037w1350455	Aspen	455 A63	6.3	77	0	0	Clearcut with Reserves	
140	37	35	465	t14037w1350465	Norway Pine	465 NP51	3.8	69	0	0	Thinning	
140	37	35	471	t14037w1350471	Aspen	471 A56	38.9	76	0	0	Clearcut with Reserves	
140	37	35	474	t14037w1350474	Aspen	474 A57	18.8	79	0	0	Clearcut with Reserves	
140	37	35	475	t14037w1350475	Norway Pine	475 NP41	4.7	37	0	0	Thinning	
140	37	35	475	t14037w1350475	Norway Pine	475 NP41	4.7	37	0	0	Thinning	
140	37	35	478	t14037w1350478	Norway Pine	478 NP11	16.5	24	0	0	Thinning	
140	37	35	479	t14037w1350479	Norway Pine	479 NP55	15	78	0	0	Thinning	
141	32	2	172	t14132w1020172	Aspen	172 A54	9.5	74	0	0	Clearcut with Reserves	
141	32	3	33	t14132w1030033	Norway Pine	33 NP42	40.6	27	0	0	Thinning	
141	32	3	40	t14132w1030040	Norway Pine	40 NP41	5.5	68	0	0	Thinning	
141	32	3	41	t14132w1030041	Norway Pine	41 NP54	4	65	0	0	Thinning	
141	32	3	63	t14132w1030063	Norway Pine	63 NP54	13.6	63	0	0	Thinning	
141	32	3	69	t14132w1030069	Norway Pine	69 NP55	8.8	63	0	0	Thinning	
141	32	3	72	t14132w1030072	Norway Pine	72 NP46	6.5	68	0	0	Thinning	
141	32	3	142	t14132w1030142	Aspen	142 A56	20.1	75	0	0	Clearcut with Reserves	
141	32	3	143	t14132w1030143	Aspen	143 A56	13.2	75	0	0	Clearcut with Reserves	
141	32	4	50	t14132w1040050	Aspen	50 A53	9	80	0	0	Clearcut with Reserves	
141	32	4	53	t14132w1040053	Oak	53 O55	13.2	79	0	0	Clearcut with Reserves	
141	32	4	73	t14132w1040073	White Spruce	73 WS57	8.7	50	0	0	Thinning	
141	32	5	157	t14132w1050157	Aspen	157 A53	3.7	67	0	0	Clearcut with Reserves	
141	32	6	1	t14132w1060001	Aspen	1 A56	31.3	66	0	0	Clearcut with Reserves	COV51
141	32	6	2	t14132w1060002	Aspen	2 A56	14.4	58	0	0	Re-inventory.	
141	32	6	25	t14132w1060025	Aspen	25 A44	24.6	66	0	0	Manage for understory	COV51
141	32	6	27	t14132w1060027	Aspen	27 A56	11	79	0	0	Manage for understory	COV51
141	32	6	184	t14132w1060184	Aspen	184 A56	19.9	66	0	0	Clearcut with Reserves	COV51
141	32	7	98	t14132w1070098	Aspen	98 A52	5	58	0	0	Clearcut with Reserves	
141	32	7	181	t14132w1070181	Aspen	181 A55	24.6	76	0	0	Clearcut with Reserves	COV51
141	32	8	80	t14132w1080080	White Pine	80 WP43	9.9	87	0	0	Thinning	
141	32	8	81	t14132w1080081	White Spruce	81 WS43	4.9	51	0	0	Thinning	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
141	32	8	87	t14132w1080087	White Spruce	87 WS41	13.8	46	0	0	Clearcut with Reserves	
141	32	8	88	t14132w1080088	Aspen	88 A52	18.8	54	0	0	Clearcut with Reserves	
141	32	8	89	t14132w1080089	Aspen	89 A42	28.5	45	0	0	Clearcut with Reserves	
141	32	8	91	t14132w1080091	White Pine	91 WP53	16	50	0	0	Thinning	
141	32	8	96	t14132w1080096	Aspen	96 A54	23.8	54	0	0	Clearcut with Reserves	
141	32	8	99	t14132w1080099	Aspen	99 A54	16.8	64	0	0	Clearcut with Reserves	
141	32	8	102	t14132w1080102	Aspen	102 A53	9.6	65	0	0	Clearcut with Reserves	
141	32	8	104	t14132w1080104	Jack Pine	104 JP53	9.8	71	0	0	Clearcut with Reserves	
141	32	8	137	t14132w1080137	Aspen	137 A56	4.1	71	0	0	Clearcut with Reserves	
141	32	8	159	t14132w1080159	Aspen	159 A53	5.6	67	0	0	Clearcut with Reserves	
141	32	8	160	t14132w1080160	White Spruce	160 WS42	4.6	49	0	0	Thinning	
141	32	8	174	t14132w1080174	Aspen	174 A55	6.7	76	0	0	Clearcut with Reserves	COV51
141	32	8	175	t14132w1080175	Aspen	175 A55	8.7	76	0	0	Clearcut with Reserves	COV51
141	32	14	117	t14132w1140117	Jack Pine	117 JP51	5.8	57	0	0	Clearcut with Reserves	
141	32	16	112	t14132w1160112	Upland Grass	112 UG	5.5	17	0	0	Re-inventory.	
141	32	16	147	t14132w1160147	Aspen	147 A55	7.7	63	0	0	Manage for understory	COV51
141	33	1	12	t14133w1019012	Aspen	9012 A57	6.7	75	0	0	Manage for understory	COV51
141	33	1	17	t14133w1010017	Norway Pine	17 NP11	68.8	22	0	0	Thinning	
141	33	1	56	t14133w1010056	Aspen	56 A54	11.9	67	0	0	Manage for understory	COV51
141	33	1	142	t14133w1010142	Aspen	142 A57	10	75	0	0	Manage for understory	COV51
141	33	1	146	t14133w1010146	Aspen	146 A57	8.4	75	0	0	Manage for understory	COV51
141	33	1	151	t14133w1010151	Aspen	151 A57	41.6	75	0	0	Manage for understory	COV51
141	33	2	13	t14133w1020013	Aspen	13 A55	59.5	70	0	0	Clearcut with Reserves	COV51
141	33	2	14	t14133w1020014	Aspen	14 A57	51.2	75	0	0	Manage for understory	COV51
141	33	2	15	t14133w1020015	Aspen	15 A54	5.2	61	0	0	Clearcut with Reserves	COV51
141	33	3	5	t14133w1030005	Norway Pine	5 NP11	36	18	0	0	Thinning	
141	33	3	7	t14133w1030007	White Spruce	7 WS 12	5.8	2	0	0	Thinning	
141	33	3	8	t14133w1030008	Aspen	8 A45	13.8	63	0	0	Clearcut with Reserves	COV51
141	33	3	9	t14133w1030009	Jack Pine	9 JP43	17.4	69	0	0	Clearcut with Reserves	
141	33	3	11	t14133w1030011	Aspen	11 A54	9.6	73	0	0	Clearcut with Reserves	
141	33	3	32	t14133w1030032	Aspen	32 A54	8	81	0	0	Clearcut with Reserves	COV52
141	33	3	149	t14133w1030149	Aspen	149 A45	13.1	63	0	0	Clearcut with Reserves	COV51
141	33	4	1	t14133w1040001	Aspen	1 A53	8.8	69	0	0	Clearcut with Reserves	
141	33	4	4	t14133w1040004	Norway Pine	4 NP11	31.8	18	0	0	Thinning	

Subsection **Pine Moraines & Outwash Plains**

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
141	33	4	33	t14133w1040033	Aspen	33 A51	7	81	0	0	Manage for understory	COV51
141	33	4	37	t14133w1040037	Aspen	37 A56	3.2	75	0	0	Clearcut with Reserves	
141	33	4	46	t14133w1040046	Aspen	46 A53	33.4	69	0	0	Clearcut with Reserves	
141	33	4	60	t14133w1040060	Aspen	60 A55	17.8	74	0	0	Clearcut with Reserves	
141	33	9	49	t14133w1090049	Aspen	49 A 54	25	71	0	0	Clearcut with Reserves	INC51
141	33	10	71	t14133w1100071	Aspen	71 A57	8.9	72	0	0	Clearcut with Reserves	
141	33	10	72	t14133w1100072	Norway Pine	72 NP11	21.4	19	0	0	Thinning	
141	33	10	73	t14133w1100073	Norway Pine	73 NP11	30.5	19	0	0	Thinning	
141	33	10	76	t14133w1100076	Aspen	76 A56	36.1	65	0	0	Clearcut with Reserves	
141	33	10	83	t14133w1100083	Aspen	83 A54	30.2	69	0	0	Clearcut with Reserves	
141	33	10	101	t14133w1100101	Aspen	101 A52	12.5	65	0	0	Clearcut with Reserves	
141	33	10	145	t14133w1100145	Aspen	145 A56	22.2	65	0	0	Clearcut with Reserves	
141	33	11	80	t14133w1110080	Jack Pine	80 JP51	11.1	72	0	0	Manage for understory	
141	33	11	85	t14133w1110085	Aspen	85 A55	48.1	60	0	0	Re-inventory.	
141	33	11	89	t14133w1110089	Aspen	89 A53	8.7	58	0	0	Re-inventory.	
141	33	11	91	t14133w1110091	Aspen	91 A58	3.6	68	0	0	Re-inventory.	
141	33	11	98	t14133w1110098	Jack Pine	98 JP54	5.3	76	0	0	Clearcut with Reserves	
141	33	11	102	t14133w1110102	Aspen	102 A55	3.8	64	0	0	Clearcut with Reserves	
141	33	11	127	t14133w1110127	Aspen	127 A55	4.5	60	0	0	Clearcut with Reserves	
141	33	16	8	t14133w1169008	Aspen	9008 A54	4.2	83	0	0	Manage for understory	COV51
141	33	16	111	t14133w1160111	Aspen	111 A54	133	69	0	0	Clearcut with Reserves	COV51, CON2
141	34	16	2	t14134w1160002	Norway Pine	2 NP15	17.9	25	0	0	Thinning	
141	34	16	8	t14134w1160008	Jack Pine	8 JP52	26.3	68	0	0	Clearcut with Reserves	
141	34	16	10	t14134w1160010	Norway Pine	10 NP11	16.1	18	0	0	Thinning	
141	34	16	11	t14134w1160011	Birch	11 Bi52	15.4	82	0	0	Clearcut with Reserves	
141	34	16	19	t14134w1160019	Norway Pine	19 NP11	14	18	0	0	Thinning	
141	34	16	22	t14134w1160022	Jack Pine	22 JP53	7.6	69	0	0	Clearcut with Reserves	
141	34	16	24	t14134w1160024	Aspen	24 A54	10	78	0	0	Clearcut with Reserves	
141	34	36	29	t14134w1360029	Aspen	29 A57	22.2	78	0	0	Manage for understory	COV51
141	34	36	36	t14134w1360036	Norway Pine	36 NP43	6.1	44	0	0	Thinning	
141	34	36	38	t14134w1360038	Jack Pine	38 JP53	15.3	77	0	0	Clearcut with Reserves	
141	35	16	22	t14135w1160022	Aspen	22 A55	41.5	60	0	0	Manage for understory	INC61
141	35	16	26	t14135w1160026	Jack Pine	26 JP56	10.6	62	0	0	Re-inventory.	
141	35	16	27	t14135w1160027	Aspen	27 A42	4.7	68	0	0	Clearcut with Reserves	INC61

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
141	35	16	29	t14135w1160029	White Spruce	29 WS11	5.4	18	0	0	Thinning	
141	35	16	30	t14135w1160030	Norway Pine	30 NP11	23.9	18	0	0	Thinning	
141	35	16	35	t14135w1160035	Aspen	35 A55	61.7	76	2010	0	Clearcut with Reserves ? Sprouting	COV51
141	35	16	37	t14135w1160037	Upland Grass	37 UG	5.2	17	0	0	On-site Evaluation	COV53
141	35	16	40	t14135w1160040	Norway Pine	40 NP59	29.8	71	0	0	Thinning	
141	35	16	41	t14135w1160041	Upland Grass	41 UG	13.5	17	0	0	On-site Evaluation	COV53
141	35	16	45	t14135w1160045	Jack Pine	45 JP53	4.7	62	0	0	Clearcut with Reserves	
141	35	16	46	t14135w1160046	Tamarack	46 T43	13.6	164	0	0	Clearcut with Reserves	
141	35	16	48	t14135w1160048	Jack Pine	48 JP53	7.8	58	0	0	Clearcut with Reserves	
141	35	16	50	t14135w1160050	Upland Grass	50 UG	6.4	17	0	0	Re-inventory.	COV52 INC51
141	35	16	51	t14135w1160051	Tamarack	51 T53	16.1	133	0	0	Clearcut with Reserves	
141	35	16	53	t14135w1160053	Aspen	53 A55	17.9	72	0	0	Clearcut with Reserves	INC61
141	36	1	15	t14136w1010015	Aspen	15 A55	8.4	76	0	0	Clearcut with Reserves	
141	36	1	33	t14136w1010033	Jack Pine	33 JP54	6.9	61	0	0	Clearcut with Reserves	
141	36	1	579	t14136w1010579	Aspen	579 A55	1.9	76	0	0	Clearcut with Reserves	
141	36	1	580	t14136w1010580	Aspen	580 A55	1.1	76	0	0	Clearcut with Reserves	
141	36	1	581	t14136w1010581	Norway Pine	581 NP11	49.2	19	0	0	Thinning	
141	36	2	585	t14136w1020585	Upland Brush	585 UB	4	27	0	0	Re-inventory.	COV53
141	36	2	591	t14136w1020591	Upland Brush	591 UB	4.9	14	0	0	Re-inventory.	COV53
141	36	2	594	t14136w1020594	Aspen	594 A53	6.4	70	0	0	Clearcut with Reserves	COV53
141	36	2	595	t14136w1020595	Jack Pine	595 JP46	3.5	64	0	0	Clearcut with Reserves	
141	36	6	3	t14136w1060003	Jack Pine	3 JP56	3.1	62	0	0	Clearcut with Reserves	
141	36	6	9	t14136w1060009	Aspen	9 A55	22	74	0	0	Clearcut with Reserves	
141	36	6	16	t14136w1060016	Aspen	16 A53	7.9	64	0	0	Clearcut with Reserves	
141	36	6	41	t14136w1060041	Aspen	41 A58	5.4	73	0	0	Clearcut with Reserves	
141	36	7	52	t14136w1070052	Jack Pine	52 JP54	13.6	74	0	0	Clearcut with Reserves	
141	36	8	59	t14136w1080059	Aspen	59 A43	24.3	54	0	0	Clearcut with Reserves	
141	36	8	71	t14136w1080071	Jack Pine	71 JP55	8.8	62	0	0	Clearcut with Reserves	
141	36	9	54	t14136w1090054	Aspen	54 A53	8.5	58	0	0	Clearcut with Reserves	
141	36	9	57	t14136w1090057	Aspen	57 A54	16.3	74	0	0	Clearcut with Reserves	
141	36	9	73	t14136w1090073	Aspen	73 A54	2.1	74	0	0	Clearcut with Reserves	
141	36	15	83	t14136w1150083	Jack Pine	83 JP55	52.1	63	0	0	Clearcut with Reserves	
141	36	15	107	t14136w1150107	Aspen	107 A55	11.2	68	0	0	Clearcut with Reserves	
141	36	15	122	t14136w1150122	Balsam Fir	122 BF53	59.3	74	0	0	Clearcut with Reserves	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
141	36	15	139	t14136w1150139	Aspen	139 A57	26	77	0	0	Clearcut with Reserves	INC61
141	36	15	151	t14136w1150151	Ash	151 Ash54	25.9	111	0	0	Uneven-aged Harvest	
141	36	15	863	t14136w1150863	Aspen	863 A57	24.7	76	0	0	Clearcut with Reserves	
141	36	15	864	t14136w1150864	Aspen	864 A57	6.8	76	0	0	Clearcut with Reserves	
141	36	16	82	t13937w1120082	Cutover Area	82 COA	19.9	0	0	0	Re-inventory.	
141	36	16	102	t14136w1160102	Norway Pine	102 NP56	19.1	63	0	0	Thinning	
141	36	16	102	t14136w1160102	Norway Pine	102 NP56	19.1	63	0	0	Thinning	
141	36	16	110	t14136w1160110	Norway Pine	110 NP56	3.5	60	0	0	Thinning	
141	36	16	135	t14136w1160135	Aspen	135 A54	6.6	70	0	0	Clearcut with Reserves	
141	36	16	144	t14136w1160144	Norway Pine	144 NP11	13.6	19	0	0	Thinning	
141	36	16	153	t14136w1160153	Aspen	153 A43	12.4	69	0	0	Clearcut with Reserves	
141	36	16	158	t14136w1160158	Norway Pine	158 NP44	5.2	40	0	0	Thinning	
141	36	16	161	t14136w1160161	Norway Pine	161 NP59	16.7	59	0	0	Thinning	
141	36	16	169	t14136w1160169	White Spruce	169 WS12	27.4	2	0	0	Thinning	
141	36	16	183	t14136w1160183	Aspen	183 A55	9.6	79	0	0	Clearcut with Reserves	COV53
141	36	16	222	t14136w1160222	Aspen	222 A54	36.1	74	0	0	Clearcut with Reserves	
141	36	16	609	t14136w1160609	Aspen	609 A54	11.1	79	0	0	Clearcut with Reserves	COV52
141	36	16	610	t14136w1160610	Tamarack	610 T42	4.6	101	0	0	Clearcut with Reserves	
141	36	16	847	t14136w1160847	Norway Pine	847 NP59	4.9	59	0	0	Thinning	
141	36	17	82	t14136w1170082	Balsam Fir	82 BF54	9.5	70	0	0	Clearcut with Reserves	
141	36	17	99	t14136w1170099	Jack Pine	99 JP47	14.4	64	0	0	Clearcut with Reserves	
141	36	17	112	t14136w1170112	Aspen	112 A53	2.9	76	0	0	Clearcut with Reserves	
141	36	17	118	t14136w1170118	Jack Pine	118 JP56	11.2	67	0	0	Clearcut with Reserves	
141	36	17	130	t14136w1170130	Aspen	130 A53	11.9	76	0	0	Clearcut with Reserves	
141	36	17	614	t14136w1170614	Norway Pine	614 NP21	15.6	23	0	0	Thinning	
141	36	17	618	t14136w1170618	Norway Pine	618 NP21	12.2	23	0	0	Thinning	
141	36	17	848	t14136w1170848	Aspen	848 A55	11.7	72	0	0	Clearcut with Reserves	
141	36	18	121	t14136w1180121	Balsam Fir	121 BF44	6.5	57	0	0	Clearcut with Reserves	
141	36	18	125	t14136w1180125	Norway Pine	125 NP56	29.4	88	0	0	Thinning	
141	36	18	168	t14136w1180168	Norway Pine	168 NP13	10.7	28	0	0	Thinning	
141	36	18	187	t14136w1180187	Aspen	187 A54	42	72	0	0	Clearcut with Reserves	COV53
141	36	19	209	t14136w1190209	Aspen	209 A56	45.5	75	0	0	Clearcut with Reserves	INC52
141	36	19	214	t14136w1190214	Jack Pine	214 JP57	10.3	77	0	0	Clearcut with Reserves	
141	36	19	293	t14136w1190293	Cutover Area	293 COA	44.3	2	0	0	Re-inventory.	COV52

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Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
141	36	19	295	t14136w1190295	Norway Pine	295 NP54	18.4	87	0	0	Thinning	
141	36	19	311	t14136w1190311	Tamarack	311 T54	9.1	112	0	0	Clearcut with Reserves	
141	36	19	627	t14136w1190627	Norway Pine	627 NP21	4.6	25	2010	0	Thinning	
141	36	19	692	t14136w1190692	Norway Pine	692 NP22	32.2	24	2010	0	Thinning	
141	36	20	7	t14136w1200007	Cutover Area	7 COA	12.5	1	0	0	Re-inventory.	COV52
141	36	20	250	t14136w1200250	Jack Pine	250 JP54	25	67	0	0	Clearcut with Reserves	
141	36	20	306	t14136w1200306	Jack Pine	306 JP54	12.9	65	0	0	Clearcut with Reserves	
141	36	20	315	t14136w1200315	Jack Pine	315 JP55	9.2	63	0	0	Clearcut with Reserves	
141	36	20	541	t14136w1200541	White Spruce	541 WS11	24	14	0	0	Thinning	
141	36	20	628	t14136w1200628	Norway Pine	628 NP21	18.4	24	2010	0	Thinning	
141	36	20	631	t14136w1200631	Norway Pine	631 NP21	22.9	25	2012	0	Thinning	
141	36	20	694	t14136w1200694	Norway Pine	694 NP21	35.9	26	2010	0	Thinning	
141	36	20	834	t14136w1200834	Aspen	834 A55	15.7	73	0	0	Clearcut with Reserves	
141	36	20	857	t14136w1200857	Aspen	857 A54	21.5	75	0	0	Clearcut with Reserves	
141	36	20	859	t14136w1200859	Aspen	859 A55	10.6	68	0	0	Clearcut with Reserves	
141	36	20	861	t14136w1200861	Aspen	861 A55	4.4	68	0	0	Clearcut with Reserves	
141	36	21	246	t14136w1210246	Tamarack	246 T42	13.7	139	0	0	Clearcut with Reserves	
141	36	21	303	t14136w1210303	Norway Pine	303 NP64	7	90	0	0	Thinning	
141	36	21	633	t14136w1210633	Jack Pine	633 JP53	2.3	62	0	0	Clearcut with Reserves	
141	36	21	636	t14136w1210636	Norway Pine	636 NP21	23.2	26	2012	0	Thinning	
141	36	21	802	t14136w1210802	White Spruce	802 WS21	30.3	26	2010	0	Thinning	
141	36	21	854	t14136w1210854	Cutover Area	854 COA	4.4	2	0	0	Re-inventory.	COV53
141	36	21	855	t14136w1210855	Cutover Area	855 COA	1.2	2	0	0	Re-inventory.	COV53
141	36	21	858	t14136w1210858	Aspen	858 A54	15.1	74	0	0	Clearcut with Reserves	
141	36	22	211	t14136w1220211	Aspen	211 A54	7.2	61	0	0	Clearcut with Reserves	
141	36	22	215	t14136w1220215	Ash	215 Ash42	12.7	93	0	0	Manage for understory	INC72
141	36	22	226	t14136w1210226	Aspen	226 A56	25.1	67	0	0	Clearcut with Reserves	
141	36	22	276	t14136w1220276	Cutover Area	276 COA	8.1	2	0	0	Re-inventory.	COV61
141	36	22	560	t14136w1220560	Aspen	560 A57	5.9	80	0	0	Clearcut with Reserves	
141	36	22	865	t14136w1220865	Aspen	865 A57	19.4	76	0	0	Clearcut with Reserves	
141	36	23	238	t14136w1230238	Aspen	238 A55	17.9	81	0	0	Clearcut with Reserves	
141	36	23	264	t14136w1230264	Jack Pine	264 JP55	36.7	82	0	0	Clearcut with Reserves	
141	36	24	268	t14136w1240268	Norway Pine	268 NP 56	8.6	35	0	0	Thinning	
141	36	24	273	t14136w1240273	White Spruce	273 WS45	12.5	39	0	0	Thinning	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
141	36	25	351	t14136w1250351	White Spruce	351 WS54	99.1	43	0	0	Thinning	
141	36	25	354	t14136w1250354	Norway Pine	354 NP56	45.2	38	0	0	Thinning	
141	36	25	376	t14136w1250376	Norway Pine	376 NP52	37.5	41	0	0	Thinning	
141	36	25	552	t14136w1250552	Norway Pine	552 NP55	38.4	41	2012	0	Thinning	
141	36	25	867	t14136w1250867	White Spruce	867 WS 54	26.7	43	0	0	Thinning	
141	36	26	346	t14136w1260346	Aspen	346 A53	31.5	68	0	0	Clearcut with Reserves	INC61
141	36	26	424	t14136w1260424	Aspen	424 A54	8.8	64	0	0	Clearcut with Reserves	
141	36	26	437	t14136w1260437	Tamarack	437 T41	18.8	142	0	0	Clearcut with Reserves	
141	36	26	460	t14136w1260460	Norway Pine	460 NP41	12.8	31	0	0	Thinning	
141	36	26	699	t14136w1260699	Jack Pine	699 JP43	17.8	59	0	0	Clearcut with Reserves	
141	36	27	340	t14136w1270340	Norway Pine	340 NP22	20.5	29	0	0	Thinning	
141	36	27	345	t14136w1270345	Norway Pine	345 NP55	3.7	79	0	0	Thinning	
141	36	27	362	t14136w1270362	Cutover Area	362 COA	17.4	2	0	0	Re-inventory.	COV52
141	36	27	364	t14136w1270364	Norway Pine	364 NP22	9.5	27	0	0	Thinning	
141	36	27	384	t14136w1270384	Ash	384 Ash43	22.9	88	0	0	Uneven-aged Harvest	
141	36	27	421	t14136w1260421	Balsam Fir	421 BF41	21.7	68	0	0	Clearcut with Reserves	
141	36	27	655	t14136w1270655	Norway Pine	655 NP22	24.8	28	0	0	Thinning	
141	36	27	823	t14136w1270823	Cutover Area	823 COA	16.2	15	0	0	Re-inventory.	
141	36	28	344	t14136w1280344	Jack Pine	344 JP53	7.2	79	0	0	Clearcut with Reserves	
141	36	28	367	t14136w1280367	Norway Pine	367 NP23	9.2	26	0	0	Thinning	
141	36	28	391	t14136w1280391	Norway Pine	391 NP32	6.9	30	0	0	Thinning	
141	36	28	397	t14136w1280397	Norway Pine	397 NP54	15.7	24	0	0	Thinning	
141	36	28	416	t14136w1280416	Aspen	416 A56	14.2	74	0	0	Clearcut with Reserves	
141	36	28	436	t14136w1280436	Norway Pine	436 NP12	41.7	17	0	0	Thinning	
141	36	28	656	t14136w1280656	Norway Pine	656 NP11	27.2	27	0	0	Thinning	
141	36	28	824	t14136w1280824	Aspen	824 A57	6.6	83	0	0	Clearcut with Reserves	
141	36	29	329	t14136w1290329	Jack Pine	329 JP54	45.6	63	0	0	Clearcut with Reserves	
141	36	29	363	t14136w1290363	Cutover Area	363 COA	21	68	0	0	Re-inventory.	COV52
141	36	29	409	t14136w1290409	Norway Pine	409 NP12	7.2	22	0	0	Thinning	
141	36	29	442	t14136w1290442	Norway Pine	442 NP11	9.5	22	0	0	Thinning	
141	36	29	451	t14136w1290451	Aspen	451 A54	3.2	74	0	0	Clearcut with Reserves	
141	36	29	830	t14136w1290830	Aspen	830 A56	7.1	72	0	0	Clearcut with Reserves	
141	36	29	831	t14136w1290831	White Spruce	831 WS12	37.8	5	0	0	Thinning	
141	36	29	844	t14136w1290844	Aspen	844 A56	31.3	72	0	0	Clearcut with Reserves	

Subsection **Pine Moraines & Outwash Plains**

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
141	36	30	394	t14136w1300394	Ash	394 Ash43	18.9	77	0	0	Manage for understory	INC72
141	36	30	411	t14136w1300411	Ash	411 Ash43	2.4	77	0	0	Manage for understory	INC72
141	36	30	415	t14136w1300415	Ash	415 Ash43	2.2	77	0	0	Manage for understory	INC72
141	36	30	663	t14136w1300663	Norway Pine	663 NP22	59.7	25	2010	0	Thinning	
141	36	30	841	t14136w1300841	Aspen	841 A 56	8.9	64	0	0	Clearcut with Reserves	
141	36	33	494	t14136w1330494	Norway Pine	494 NP54	4.9	102	0	0	Clearcut with Reserves	
141	36	33	504	t14136w1330504	Jack Pine	504 JP53	11.2	73	0	0	Clearcut with Reserves	
141	36	33	518	t14136w1330518	Norway Pine	518 NP11	29.5	17	0	0	Thinning	
141	36	33	667	t14136w1330667	Norway Pine	667 NP11	35.4	16	0	0	Thinning	
141	36	33	669	t14136w1330669	Norway Pine	669 NP21	56.2	25	0	0	Thinning	
141	36	33	670	t14136w1330670	Norway Pine	670 NP22	43	28	0	0	Thinning	
141	36	33	836	t14136w1330836	Norway Pine	836 NP53	5.8	55	0	0	Thinning	
141	36	33	839	t14136w1330839	Norway Pine	839 NP31	20.7	26	0	0	Thinning	
141	36	34	489	t14136w1340489	Norway Pine	489 NP55	3.8	71	0	0	Thinning	
141	36	34	492	t14136w1340492	Cutover Area	492 COA	14.9	4	0	0	Re-inventory.	COV52
141	36	34	510	t14136w1340510	Aspen	510 A54	11.6	62	0	0	Clearcut with Reserves	
141	36	34	544	t14136w1340544	Norway Pine	544 NP11	7.1	16	0	0	Thinning	
141	36	34	561	t14136w1340561	Aspen	561 A43	40.2	60	0	0	Clearcut with Reserves	COV53
141	36	34	671	t14136w1340671	White Spruce	671 WS21	51.2	28	0	0	Thinning	
141	36	35	472	t14136w1350472	Jack Pine	472 JP55	12.2	67	0	0	Clearcut with Reserves	
141	36	35	546	t14136w1350546	Norway Pine	546 NP55	20.9	85	0	0	Thinning	
141	36	35	559	t14136w1350559	Norway Pine	559 NP55	9.1	87	0	0	Thinning	
141	36	35	803	t14136w1350803	Norway Pine	803 NP11	6.8	16	0	0	Thinning	
141	36	36	484	t14136w1360484	Norway Pine	484 NP54	81.9	40	0	0	Thinning	
141	36	36	488	t14136w1360488	Norway Pine	488 NP21	2	23	0	0	Thinning	
141	36	36	512	t14136w1360512	White Spruce	512 WS43	32.3	44	0	0	Thinning	
141	36	36	523	t14136w1360523	Norway Pine	523 NP41	94.8	34	0	0	Thinning	
141	36	36	527	t14136w1360527	Jack Pine	527 JP53	16.2	75	0	0	Clearcut with Reserves	
141	36	36	690	t14136w1360690	Norway Pine	690 NP42	2.4	38	0	0	Thinning	
141	36	36	701	t14136w1360701	Norway Pine	701 NP21	33.2	23	0	0	Thinning	
141	37	1	6	t14137w1010006	Jack Pine	6 JP46	9.1	65	0	0	Clearcut with Reserves	
141	37	1	20	t14137w1010020	Aspen	20 A53	12.1	66	0	0	Clearcut with Reserves	COV53, CON2
141	37	1	21	t14137w1010021	Jack Pine	21 JP44	38.3	60	0	0	Clearcut with Reserves	
141	37	1	27	t14137w1120027	Aspen	27 A56	27.5	80	0	0	Clearcut with Reserves	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
141	37	1	164	t14137w1010164	Norway Pine	164 NP11	62.7	20	0	0	Thinning	
141	37	11	39	t14137w1110039	Jack Pine	39 JP53	27.9	67	0	0	Clearcut with Reserves	
141	37	11	41	t14137w1110041	Aspen	41 A54	9.2	65	0	0	On-site Evaluation	
141	37	11	54	t14137w1110054	Offsite Oak - SI <= 39	54 OX41	5.5	60	0	0	Clearcut with Reserves	COV53
141	37	12	42	t14137w1120042	Jack Pine	42 JP42	7.8	65	0	0	Clearcut with Reserves	
141	37	12	46	t14137w1120046	Cutover Area	46 COA	15.8	2	0	0	Re-inventory.	COV52
141	37	12	63	t14137w1120063	Norway Pine	63 NP12	12.3	19	0	0	Thinning	
141	37	12	68	t14137w1120068	Jack Pine	68 JP53	12.9	61	0	0	Clearcut with Reserves	
141	37	13	70	t14137w1130070	Jack Pine	70 JP44	34.2	64	0	0	Clearcut with Reserves	
141	37	13	79	t14137w1130079	Jack Pine	79 JP44	2.4	64	0	0	Clearcut with Reserves	
141	37	24	85	t14137w1240085	Balsam Fir	85 BF65	12	117	0	0	Re-inventory.	
141	37	24	86	t14137w1240086	Aspen	86 A53	14.3	62	0	0	Clearcut with Reserves	COV53
141	37	24	91	t14137w1240091	Norway Pine	91 NP66	29.7	79	0	0	Thinning	
141	37	24	92	t14137w1240092	Norway Pine	92 NP55	16.4	69	0	0	Thinning	
141	37	24	103	t14137w1240103	Jack Pine	103 JP43	13	62	0	0	Clearcut with Reserves	
141	37	24	180	t14137w1240180	Norway Pine	180 NP11	22.6	21	0	0	Thinning	
141	37	24	181	t14137w1240181	Norway Pine	181 NP41	27.2	26	0	0	Thinning	
141	37	25	115	t14137w1250115	Jack Pine	115 JP57	20.7	73	0	0	Clearcut with Reserves	
141	37	25	132	t14137w1250132	Aspen	132 A55	15.8	62	0	0	Clearcut with Reserves	
141	37	25	133	t14137w1250133	Aspen	133 A56	12	63	0	0	Clearcut with Reserves	
141	37	25	139	t14137w1250139	Jack Pine	139 JP52	8	80	0	0	Clearcut with Reserves	
142	32	3	51	t14232w1030051	White Spruce	51 WS11	54.7	15	0	0	Thinning	
142	32	3	79	t14232w1030079	White Spruce	79 WS11	13.4	20	0	0	Thinning	
142	32	4	36	t14232w1040036	Oak	36 O53	100.8	82	0	0	Clearcut with Reserves	
142	32	4	50	t14232w1040050	Aspen	50 A54	12.7	88	0	0	Clearcut with Reserves	
142	32	4	745	t14232w1030745	Aspen	745 A56	4.3	80	0	0	Clearcut with Reserves	
142	32	4	746	t14232w1040746	Aspen	746 A56	3	80	0	0	Clearcut with Reserves	
142	32	5	83	t14232w1050083	Aspen	83 A42	7.6	43	0	0	Clearcut with Reserves	
142	32	6	33	t14232w1060033	Aspen	33 A41	6	47	0	0	Clearcut with Reserves	
142	32	6	41	t14232w1060041	Aspen	41 A46	6	59	0	0	Clearcut with Reserves	COV73
142	32	6	64	t14232w1060064	Aspen	64 A54	36.5	67	0	0	Clearcut with Reserves	
142	32	6	65	t14232w1060065	White Spruce	65 WS42	6.7	40	0	0	Thinning	
142	32	6	72	t14232w1060072	Aspen	72 A44	10.9	54	0	0	Clearcut with Reserves	COV53
142	32	7	54	t14232w1070054	Aspen	54 A56	43.2	86	0	0	Clearcut with Reserves	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
142	32	7	81	t14232w1070081	Aspen	81 A42	405.1	41	0	0	Clearcut with Reserves	
142	32	7	93	t14232w1070093	Aspen	93 A55	3.5	87	0	0	Clearcut with Reserves	
142	32	7	117	t14232w1070117	White Spruce	117 WS43	21.6	48	0	0	Thinning	
142	32	7	121	t14232w1070121	White Spruce	121 WS12	5.6	19	0	0	Thinning	
142	32	7	760	t14232w1070760	Aspen	760 A55	4.1	87	0	0	Clearcut with Reserves	
142	32	8	67	t14232w1070067	Aspen	67 A42	147.7	43	0	0	Clearcut with Reserves	
142	32	8	132	t14232w1080132	Aspen	132 A57	2.9	81	0	0	Clearcut with Reserves	
142	32	8	143	t14232w1080143	Aspen	143 A58	16	82	0	0	Clearcut with Reserves	
142	32	8	174	t14232w1080174	Aspen	174 A42	1.1	41	0	0	Clearcut with Reserves	
142	32	8	178	t14232w1080178	Aspen	178 A42	2.3	41	0	0	Clearcut with Reserves	
142	32	8	706	t14232w1080706	Aspen	706 A57	20.3	81	0	0	Clearcut with Reserves	
142	32	8	741	t14232w1080741	Aspen	741 A57	42.4	81	0	0	Clearcut with Reserves	
142	32	9	92	t14232w1090092	Oak	92 O54	37.2	84	0	0	Clearcut with Reserves	
142	32	9	126	t14232w1090126	Aspen	126 A43	14.4	46	0	0	Clearcut with Reserves	
142	32	9	131	t14232w1090131	Oak	131 O53	7	89	0	0	Clearcut with Reserves	
142	32	9	136	t14232w1090136	Aspen	136 A46	9.3	79	0	0	Clearcut with Reserves	
142	32	9	148	t14232w1090148	Oak	148 O54	4.3	85	0	0	Clearcut with Reserves	
142	32	9	744	t14232w1160744	Aspen	744 A54	37	60	0	0	Clearcut with Reserves	
142	32	10	99	t14232w1100099	White Spruce	99 WS11	4.1	18	0	0	Thinning	
142	32	10	115	t14232w1100115	Aspen	115 A41	23.4	45	0	0	Clearcut with Reserves	
142	32	10	120	t14232w1100120	Aspen	120 A42	90.3	44	0	0	Clearcut with Reserves	
142	32	10	139	t14232w1100139	Oak	139 O54	2.1	82	0	0	Clearcut with Reserves	
142	32	10	740	t14232w1100740	Aspen	740 A41	54.3	43	0	0	Clearcut with Reserves	
142	32	10	821	t14232w1100821	Oak	821 O 54	111.6	82	0	0	Clearcut with Reserves	CON7
142	32	11	102	t14232w1110102	Northern Hardwoods	102 NH56	12	110	0	0	Clearcut with Reserves	INC51, CON2
142	32	11	105	t14232w1110105	Aspen	105 A44	34	58	0	0	Clearcut with Reserves	
142	32	11	111	t14232w1110111	Balsam Fir	111 BF56	9.3	95	0	0	Manage for understory	COV73, CON2
142	32	11	112	t14232w1110112	Balm of Gilead	112 BG44	9.3	71	0	0	Manage for understory	INC73 CON2
142	32	11	123	t14232w1110123	Balsam Fir	123 BF42	10.7	81	0	0	Clearcut with Reserves	
142	32	11	149	t14232w1110149	Aspen	149 A41	124	43	0	0	Clearcut with Reserves	
142	32	12	142	t14232w1120142	Aspen	142 A58	3.1	85	0	0	Clearcut with Reserves	
142	32	12	146	t14232w1120146	Aspen	146 A59	17	84	0	0	Clearcut with Reserves	
142	32	12	147	t14232w1120147	Aspen	147 A59	50	85	0	0	Clearcut with Reserves	CON2
142	32	12	150	t14232w1120150	Aspen	150 A58	7.7	85	0	0	Clearcut with Reserves	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
142	32	12	175	t14232w1120175	Aspen	175 A57	4.7	85	0	0	Clearcut with Reserves	
142	32	12	187	t14232w1120187	Aspen	187 A57	10	83	0	0	Clearcut with Reserves	CON2
142	32	13	212	t14232w1130212	Balsam Fir	212 BF47	7.4	78	0	0	Clearcut with Reserves	
142	32	13	223	t14232w1130223	White Spruce	223 WS64	3.2	77	0	0	Clearcut with Reserves	CON2
142	32	13	224	t14232w1130224	Norway Pine	224 NP11	26.1	21	0	0	Thinning	CON2
142	32	13	235	t14232w1130235	Norway Pine	235 NP12	10.2	21	0	0	Thinning	
142	32	13	265	t14232w1240265	Norway Pine	265 NP64	17.2	90	0	0	Thinning	CON2
142	32	13	275	t14232w1130275	Aspen	275 A42	28.9	44	0	0	Clearcut with Reserves	
142	32	13	284	t14232w1130284	Norway Pine	284 NP11	34.8	18	0	0	Thinning	
142	32	13	778	t14232w1130778	Aspen	778 A58	14.2	80	0	0	Clearcut with Reserves	CON2
142	32	13	799	t14232w1130799	Cutover Area	799 COA	2.7	2	0	0	Re-inventory.	COV53
142	32	13	800	t14232w1130800	Cutover Area	800 COA	2.9	2	0	0	Re-inventory.	COV53
142	32	14	184	t14232w1140184	Aspen	184 A52	112.9	80	0	0	Clearcut with Reserves	CON2
142	32	14	197	t14232w1140197	Aspen	197 A57	29.4	70	0	0	Clearcut with Reserves	
142	32	14	219	t14232w1140219	Aspen	219 A53	16.5	82	0	0	Clearcut with Reserves	CON2
142	32	14	234	t14232w1140234	Oak	234 O56	21.6	97	0	0	Clearcut with Reserves	
142	32	14	250	t14232w1140250	Aspen		7.8	75	0	0	Clearcut with Reserves	
142	32	14	257	t14232w1140257	Oak	257 O56	44.8	102	0	0	Clearcut with Reserves	
142	32	14	635	t14232w1140635	Aspen	635 A55	25.5	65	0	0	Clearcut with Reserves	
142	32	14	711	t14232w1140711	Aspen	711 A55	19.4	78	0	0	Clearcut with Reserves	CON2
142	32	14	753	t14232w1140753	Aspen	753 A55	16.7	65	0	0	Clearcut with Reserves	
142	32	14	823	t14232w1140823	Aspen	823 A 58	16.1	80	0	0	Clearcut with Reserves	
142	32	15	221	t14232w1150221	Jack Pine	221 JP59	3.3	85	0	0	Clearcut with Reserves	
142	32	15	230	t14232w1150230	Aspen	230 A57	16.4	77	0	0	Clearcut with Reserves	
142	32	15	253	t14232w1150253	Aspen	253 A41	63.5	42	0	0	Clearcut with Reserves	
142	32	15	272	t14232w1150272	Aspen	272 A52	15.6	74	0	0	Clearcut with Reserves	
142	32	15	292	t14232w1150292	Aspen	292 A42	17.1	69	0	0	Clearcut with Reserves	
142	32	15	574	t14232w1150574	Aspen	574 A42	51	41	0	0	Clearcut with Reserves	
142	32	15	667	t14232w1150667	Aspen	667 A57	3.9	80	0	0	Clearcut with Reserves	
142	32	16	196	t14232w1160196	Oak	196 O53	7.8	83	0	0	Clearcut with Reserves	
142	32	16	203	t14232w1160203	Aspen	203 A42	23.2	45	0	0	Clearcut with Reserves	
142	32	16	279	t14232w1160279	Aspen	279 A53	27.5	81	0	0	Clearcut with Reserves	
142	32	16	280	t14232w1160280	Norway Pine	280 NP25	24	27	0	0	Thinning	
142	32	16	754	t14232w1160754	Aspen	754 A55	40.2	73	0	0	Clearcut with Reserves	

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
142	32	17	159	t14232w1170159	Aspen	159 A59	27.2	82	0	0	Clearcut with Reserves	
142	32	17	217	t14232w1170217	Birch	217 Bi44	34.4	86	0	0	Clearcut with Reserves	
142	32	17	274	t14232w1170274	Aspen	274 A59	11.3	80	0	0	Clearcut with Reserves	
142	32	18	152	t14232w1070152	Aspen	152 A54	39.1	68	0	0	Clearcut with Reserves	
142	32	18	206	t14232w1180206	Aspen	206 A41	112	45	0	0	Clearcut with Reserves	
142	32	18	256	t14232w1180256	Oak	256 O53	34	89	0	0	Clearcut with Reserves	
142	32	18	271	t14232w1180271	Aspen	271 A42	23.1	42	0	0	Clearcut with Reserves	
142	32	19	598	t14232w1190598	Aspen	598 A 57	6.2	85	0	0	Clearcut with Reserves	
142	32	19	806	t14232w1190806	Aspen	806 A56	7.3	86	0	0	Clearcut with Reserves	
142	32	20	680	t14232w1200680	Northern Hardwoods	680 NH52	36.3	78	0	0	Thinning	MA1
142	32	20	682	t14232w1200682	Aspen	682 A58	4.8	89	0	0	Clearcut with Reserves	
142	32	21	298	t14232w1210298	Norway Pine	298 NP12	15.8	19	0	0	Thinning	
142	32	21	330	t14232w1210330	Aspen	330 A58	25.3	87	0	0	Clearcut with Reserves	
142	32	21	339	t14232w1210339	Aspen	339 A42	66.6	45	0	0	Clearcut with Reserves	
142	32	21	727	t14232w1210727	Oak	727 O55	11.3	90	0	0	Clearcut with Reserves	
142	32	22	296	t14232w1220296	Aspen	296 A56	26.3	83	0	0	Clearcut with Reserves	COV53
142	32	22	303	t14232w1220303	Norway Pine	303 NP21	28.8	19	0	0	Thinning	
142	32	22	349	t14232w1220349	Aspen	349 A41	13.5	43	0	0	Clearcut with Reserves	
142	32	22	703	t14232w1220703	Cutover Area	703 COA	9.1	2	0	0	Re-inventory.	COV52
142	32	22	801	t14232w1220801	Jack Pine	801 JP55	9.5	83	0	0	Clearcut with Reserves	
142	32	23	337	t14232w1230337	Aspen	337 A51	16.8	81	0	0	Clearcut with Reserves	
142	32	23	366	t14232w1230366	Aspen	366 A43	14.6	82	0	0	Clearcut with Reserves	
142	32	23	723	t14232w1230723	White Spruce	723 WS13	22.1	2	0	0	Thinning	
142	32	23	822	t14232w1230822	Aspen	822 A 58	13.5	80	0	0	Clearcut with Reserves	
142	32	24	317	t14232w1240317	Aspen	317 A41	27.9	46	0	0	Clearcut with Reserves	
142	32	24	332	t14232w1240332	Aspen	332 A41	18.1	44	0	0	Clearcut with Reserves	
142	32	24	354	t14232w1240354	Aspen	354 A41	31.5	42	0	0	Clearcut with Reserves	
142	32	24	622	t14232w1240622	Aspen	622 A58	4.7	80	0	0	Clearcut with Reserves	
142	32	24	625	t14232w1240625	White Spruce	625 WS41	32.7	2	0	0	Thinning	
142	32	24	700	t14232w1240700	White Spruce	700 WS41	23.7	2	0	0	Thinning	
142	32	24	734	t14232w1240734	Aspen	734 A42	75	44	0	0	Clearcut with Reserves	
142	32	24	798	t14232w1240798	Cutover Area	798 COA	16.6	2	0	0	Re-inventory.	COV52
142	32	25	387	t14232w1250387	Norway Pine	387 NP11	21.3	20	0	0	Thinning	
142	32	25	411	t14232w1250411	Birch	411 Bi42	4.2	84	0	0	Clearcut with Reserves	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
142	32	25	413	t14232w1250413	Aspen	413 A44	8	76	0	0	Clearcut with Reserves	
142	32	25	425	t14232w1250425	Norway Pine	425 NP11	20.4	20	0	0	Thinning	
142	32	25	440	t14232w1250440	Norway Pine	440 NP22	68.4	26	0	0	Thinning	
142	32	25	639	t14232w1250639	Aspen	639 A44	9.8	76	0	0	Clearcut with Reserves	
142	32	25	677	t14232w1260677	Aspen	677 A56	13.7	80	0	0	Clearcut with Reserves	
142	32	25	714	t14232w1250714	Aspen	714 A56	5.3	80	0	0	Clearcut with Reserves	
142	32	26	406	t14232w1260406	Aspen	406 A42	4.2	42	0	0	Clearcut with Reserves	
142	32	26	424	t14232w1260424	Aspen	424 A45	31.8	75	0	0	Clearcut with Reserves	
142	32	26	432	t14232w1260432	Aspen	432 A51	3.4	82	0	0	Clearcut with Reserves	
142	32	26	773	t14232w1260773	Aspen	773 A56	18.4	80	0	0	Clearcut with Reserves	
142	32	27	401	t14232w1270401	Northern Hardwoods	401 NH54	45.4	88	0	0	Uneven-aged Harvest	
142	32	27	405	t14232w1270405	Norway Pine	405 NP24	74	28	0	0	Thinning	
142	32	27	439	t14232w1270439	Aspen	439 A52	8.6	83	0	0	Clearcut with Reserves	
142	32	27	777	t14232w1270777	Aspen	777 A56	41.1	67	0	0	Clearcut with Reserves	
142	32	28	393	t14232w1280393	Aspen	393 A41	23.9	47	0	0	Clearcut with Reserves	
142	32	28	402	t14232w1280402	Northern Hardwoods	402 NH54	53.3	89	0	0	Uneven-aged Harvest	
142	32	28	415	t14232w1280415	Aspen	415 A45	9	80	0	0	Clearcut with Reserves	
142	32	28	416	t14232w1280416	Aspen	416 A41	11.9	42	0	0	Clearcut with Reserves	
142	32	28	451	t14232w1280451	Aspen	451 A54	14.4	77	0	0	Clearcut with Reserves	
142	32	28	654	t14232w1280654	Aspen	654 A56	18.6	80	0	0	Clearcut with Reserves	
142	32	28	797	t14232w1280797	Aspen	797 A55	17.9	83	0	0	Clearcut with Reserves	
142	32	29	358	t14232w1200358	Aspen		3.5	45	0	0	Clearcut with Reserves	
142	32	29	372	t14232w1290372	Aspen	372 A42	289.4	43	0	0	Clearcut with Reserves	
142	32	29	377	t14232w1290377	Northern Hardwoods	377 NH43	35.2	79	0	0	Uneven-aged Harvest	
142	32	29	426	t14232w1290426	Northern Hardwoods	426 NH52	11.4	83	0	0	Clearcut with Reserves	INC51
142	32	29	442	t14232w1290442	Aspen	442 A41	89.2	42	0	0	On-site Evaluation	
142	32	29	444	t14232w1290444	Aspen	444 A41	10.3	41	0	0	Clearcut with Reserves	
142	32	29	796	t14232w1290796	Aspen	796 A55	13.2	83	0	0	Clearcut with Reserves	
142	32	29	812	t14232w1290812	Northern Hardwoods	812 NH54	5.9	77	0	0	Uneven-aged Harvest	
142	32	30	452	t14232w1300452	Aspen	452 A55	2.4	86	0	0	Clearcut with Reserves	
142	32	30	816	t14232w1300816	Aspen	816 A54	3.6	83	0	0	Clearcut with Reserves	
142	32	30	817	t14232w1300817	White Spruce	817 WS12	21.2	4	0	0	Thinning	
142	32	30	818	t14232w1300818	White Spruce	818 WS12	11.6	2	0	0	Thinning	
142	32	31	462	t14232w1310462	Aspen	462 A54	22.2	82	0	0	Clearcut with Reserves	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
142	32	31	464	t14232w1310464	Aspen	464 A58	61.2	84	0	0	Clearcut with Reserves	INC51
142	32	31	473	t14232w1310473	White Spruce	473 WS11	10.8	12	0	0	Thinning	
142	32	31	503	t14232w1310503	Jack Pine	503 JP46	9.5	80	0	0	Clearcut with Reserves	
142	32	31	511	t14232w1310511	Aspen	511 A42	14.9	80	0	0	Clearcut with Reserves	INC51
142	32	31	516	t14232w1310516	Jack Pine	516 JP55	4.7	79	0	0	Clearcut with Reserves	
142	32	31	567	t14232w1310567	Jack Pine	567 JP56	4.6	78	0	0	Clearcut with Reserves	
142	32	31	647	t14232w1310647	Aspen	647 A58	25.1	84	0	0	Clearcut with Reserves	COV51
142	32	31	658	t14232w1310658	White Spruce	658 WS11	12	12	0	0	Thinning	
142	32	31	792	t14232w1310792	Aspen	792 A58	22.6	84	0	0	Clearcut with Reserves	INC51
142	32	31	793	t14232w1310793	Aspen	793 A58	30.2	84	0	0	Clearcut with Reserves	INC51
142	32	31	805	t14232w1310805	White Spruce	805 WS22	3.9	10	0	0	Thinning	
142	32	32	469	t14232w1320469	White Spruce	469 WS57	18.3	66	0	0	Thinning	MNT1
142	32	32	488	t14232w1320488	Norway Pine	488 NP11	16.7	20	0	0	Thinning	
142	32	32	520	t14232w1320520	Norway Pine	520 NP43	8.9	75	0	0	Thinning	
142	32	32	521	t14232w1320521	Norway Pine	521 NP11	10.3	20	0	0	Thinning	
142	32	32	554	t14232w1320554	White Pine	554 WP55	11.6	86	0	0	Thinning	
142	32	32	820	t14232w1290820	Aspen	820 A 58	17.7	84	0	0	Clearcut with Reserves	
142	32	33	433	t14232w1330433	Aspen	433 A58	35.3	81	0	0	Clearcut with Reserves	
142	32	33	446	t14232w1330446	Aspen	446 A41	69.4	44	0	0	Clearcut with Reserves	
142	32	33	795	t14232w1330795	Aspen	795 A55	57.7	83	0	0	Clearcut with Reserves	INC51
142	32	34	482	t14232w1340482	Norway Pine	482 NP11	9.7	20	0	0	Thinning	
142	32	34	515	t14232w1340515	Norway Pine	515 NP58	8	65	0	0	Thinning	
142	32	34	524	t14232w1340524	Tamarack	524 T41	3.5	105	0	0	Clearcut with Reserves	
142	32	34	572	t14232w1340572	Norway Pine	572 NP58	14.7	59	0	0	Thinning	
142	32	34	653	t14232w1340653	Aspen	653 A56	7.5	78	0	0	Clearcut with Reserves	
142	32	34	695	t14232w1340695	Aspen	695 A53	10.3	78	0	0	Clearcut with Reserves	
142	32	35	476	t14232w1350476	Norway Pine	476 NP11	30.2	21	0	0	Thinning	
142	32	35	495	t14232w1350495	Birch	495 Bi44	6.8	81	0	0	Clearcut with Reserves	
142	32	35	514	t14232w1350514	Aspen	514 A56	2.1	78	0	0	Clearcut with Reserves	
142	32	35	556	t14232w1350556	Aspen	556 A54	4.8	84	0	0	Clearcut with Reserves	
142	32	35	557	t14232w1350557	Norway Pine	557 NP11	40.2	18	0	0	Thinning	
142	32	35	581	t14232w1350581	Birch	581 Bi42	13.4	81	0	0	Clearcut with Reserves	
142	32	36	487	t14232w1360487	Norway Pine	487 NP11	12.5	23	0	0	Thinning	
142	32	36	489	t14232w1360489	Oak	489 O55	20	88	0	0	Clearcut with Reserves	

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Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
142	32	36	496	t14232w1360496	Aspen	496 A55	7.7	78	0	0	Clearcut with Reserves	
142	32	36	571	t14232w1360571	Oak	571 O54	17.3	89	0	0	Clearcut with Reserves	
142	33	1	39	t14233w1010039	Aspen	39 A43	1.7	88	0	0	Clearcut with Reserves	
142	33	1	54	t14233w1010054	Oak	54 O55	31.4	81	0	0	Clearcut with Reserves	
142	33	1	78	t14233w1010078	Aspen	78 A42	85.9	41	0	0	Clearcut with Reserves	
142	33	1	98	t14233w1010098	Oak	98 O54	19.6	80	0	0	Clearcut with Reserves	
142	33	1	110	t14233w1010110	White Spruce	110 WS42	38.5	40	0	0	Thinning	
142	33	3	86	t14233w1030086	Norway Pine	86 NP11	57.5	24	0	0	Thinning	
142	33	3	452	t14233w1030452	White Spruce	452 WS11	18.7	24	0	0	Thinning	
142	33	3	692	t14233w1030692	Aspen	692 A57	5	79	0	0	Clearcut with Reserves	
142	33	5	41	t14233w1050041	Birch	41 Bi43	8.9	84	0	0	Clearcut with Reserves	
142	33	5	99	t14233w1050099	Norway Pine	99 NP12	63.1	25	0	0	Thinning	
142	33	5	453	t14233w1050453	White Spruce	453 WS11	12.3	24	0	0	Thinning	
142	33	7	122	t14233w1070122	Aspen	122 A56	9.2	77	0	0	Clearcut with Reserves	
142	33	7	171	t14233w1070171	Aspen	171 A53	5.6	80	0	0	Clearcut with Reserves	
142	33	8	89	t14233w1080089	Norway Pine	89 NP11	48.7	24	0	0	Thinning	
142	33	8	114	t14233w1080114	Aspen	114 A43	6.4	74	0	0	Clearcut with Reserves	
142	33	8	147	t14233w1080147	Aspen	147 A55	4.9	80	0	0	Clearcut with Reserves	
142	33	8	597	t14233w1080597	Aspen	597 A55	4	75	0	0	Clearcut with Reserves	
142	33	8	681	t14233w1070681	Aspen	681 A55	51.7	75	0	0	Clearcut with Reserves	
142	33	8	724	t14233w1080724	Aspen	724 A55	16.2	75	0	0	Clearcut with Reserves	
142	33	9	162	t14233w1090162	Aspen	162 A53	11.8	61	0	0	Clearcut with Reserves	
142	33	9	451	t14233w1090451	Norway Pine	451 NP11	18.1	25	0	0	Thinning	
142	33	9	783	t14233w1150783	Aspen	783 A56	16.4	82	0	0	Clearcut with Reserves	
142	33	10	595	t14233w1100595	White Spruce	595 WS12	16.2	5	0	0	Thinning	
142	33	11	168	t14233w1110168	White Spruce	168 WS11	25.8	5	0	0	Thinning	
142	33	11	182	t14233w1110182	Oak	182 O56	34.5	74	0	0	Clearcut with Reserves	
142	33	11	684	t14233w1110684	Aspen	684 A57	24.1	83	0	0	Clearcut with Reserves	
142	33	12	127	t14233w1120127	Aspen	127 A42	116.7	40	0	0	Clearcut with Reserves	
142	33	12	131	t14233w1120131	Aspen	131 A55	6.3	75	0	0	Clearcut with Reserves	
142	33	12	507	t14233w1120507	Aspen	507 A56	5.3	80	0	0	Clearcut with Reserves	
142	33	12	774	t14233w1120774	Aspen	774 A58	3.5	80	0	0	Clearcut with Reserves	
142	33	13	777	t14233w1130777	Aspen	777 A47	23.5	78	0	0	Clearcut with Reserves	
142	33	14	208	t14233w1140208	White Spruce	208 WS11	17.9	17	0	0	Thinning	

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Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
142	33	14	220	t14233w1140220	White Spruce	220 WS11	10.8	17	0	0	Thinning	
142	33	14	223	t14233w1140223	White Spruce	223 WS11	10.7	17	0	0	Thinning	
142	33	14	255	t14233w1140255	Norway Pine	255 NP11	22.8	19	0	0	Thinning	
142	33	14	292	t14233w1140292	White Spruce	292 WS22	15.9	26	0	0	Thinning	
142	33	15	233	t14233w1150233	Oak	233 O53	3.5	89	0	0	Clearcut with Reserves	
142	33	15	289	t14233w1150289	White Spruce	289 WS41	4.8	45	0	0	Thinning	
142	33	16	219	t14233w1160219	Aspen	219 A42	16.6	45	0	0	Clearcut with Reserves	
142	33	16	245	t14233w1160245	Aspen	245 A42	13.8	45	0	0	Clearcut with Reserves	
142	33	16	818	t14233w1160818	Aspen	818 A56	31.2	85	0	0	Clearcut with Reserves	
142	33	17	191	t14233w1170191	White Spruce	191 WS59	7.6	47	0	0	Thinning	
142	33	17	218	t14233w1170218	Aspen	218 A41	14.3	45	0	0	Clearcut with Reserves	COV53
142	33	17	234	t14233w1170234	Aspen	234 A42	9.5	46	0	0	Clearcut with Reserves	COV53
142	33	17	257	t14233w1170257	Aspen	257 A46	4.9	78	0	0	Clearcut with Reserves	
142	33	17	277	t14233w1170277	Aspen	277 A43	8.9	71	0	0	Clearcut with Reserves	COV53
142	33	18	260	t14233w1180260	Norway Pine	260 NP12	17.1	21	0	0	Thinning	
142	33	18	523	t14233w1180523	Aspen	523 A55	28.7	75	0	0	Clearcut with Reserves	
142	33	18	605	t14233w1180605	Aspen	605 A47	17.5	71	0	0	Clearcut with Reserves	
142	33	18	637	t14233w1180637	Aspen	637 A55	10.6	75	0	0	Clearcut with Reserves	
142	33	21	752	t14233w1210752	Aspen	752 A56	17.9	82	0	0	Clearcut with Reserves	
142	33	22	298	t14233w1220298	Aspen	298 A43	3.8	54	0	0	Clearcut with Reserves	
142	33	22	315	t14233w1220315	Aspen	315 A47	6.1	74	0	0	Clearcut with Reserves	
142	33	22	340	t14233w1220340	Aspen	340 A55	7	85	0	0	Clearcut with Reserves	INC51
142	33	22	669	t14233w1220669	Aspen	669 A56	8.8	82	0	0	Clearcut with Reserves	
142	33	22	778	t14233w1220778	Aspen	778 A56	16.4	85	0	0	Clearcut with Reserves	
142	33	23	612	t14233w1230612	Aspen	612 A56	6.9	82	0	0	Clearcut with Reserves	
142	33	23	745	t14233w1240745	Aspen	745 A56	11.3	82	0	0	Clearcut with Reserves	
142	33	23	784	t14233w1230784	Oak	784 O55	11.1	94	0	0	Clearcut with Reserves	
142	33	24	311	t14233w1240311	Oak	311 O55	9.5	92	0	0	Clearcut with Reserves	
142	33	24	324	t14233w1240324	Aspen	324 A42	12.8	66	0	0	Clearcut with Reserves	
142	33	25	545	t14233w1160545	Aspen		14.8	82	0	0	Clearcut with Reserves	
142	33	25	569	t14233w1250569	Aspen	569 A46	18.6	81	0	0	Clearcut with Reserves	
142	33	25	783	t14232w1250783	White Spruce	783 WS12	5.2	2	0	0	Thinning	
142	33	25	821	t14233w1260821	Aspen	821 A 56	49.4	82	0	0	Clearcut with Reserves	
142	33	26	352	t14233w1260352	Aspen	352 A23	52	39	0	0	On-site Evaluation	

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Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
142	33	26	364	t14233w1260364	Norway Pine	364 NP55	5.2	53	0	0	Thinning	
142	33	26	370	t14233w1260370	Norway Pine	370 NP11	33.3	24	0	0	Thinning	
142	33	27	365	t14233w1270365	Aspen	365 A54	15.9	74	0	0	Clearcut with Reserves	
142	33	27	380	t14233w1270380	Oak	380 O43	22.7	85	0	0	Clearcut with Reserves	
142	33	27	557	t14233w1270557	Aspen	557 A56	6.5	82	0	0	Clearcut with Reserves	
142	33	27	785	t14233w1270785	Aspen	785 A56	68.4	82	0	0	Clearcut with Reserves	
142	33	28	558	t14233w1280558	White Spruce	558 WS11	35.9	12	0	0	Thinning	
142	33	28	559	t14233w1280559	Aspen	559 A47	38.6	81	0	0	Clearcut with Reserves	
142	33	33	407	t14233w1330407	Jack Pine	407 JP41	4	57	0	0	Clearcut with Reserves	
142	33	33	418	t14233w1330418	Jack Pine	418 JP42	7.6	58	0	0	Clearcut with Reserves	
142	33	33	423	t14233w1330423	Aspen	423 A44	24.7	75	0	0	Re-inventory.	COV53
142	33	33	563	t14233w1330563	Aspen	563 A55	5.9	81	0	0	Clearcut with Reserves	
142	33	34	3	t14133w1349003	White Spruce	)003 WS 12	2.1	2	0	0	Thinning	
142	33	34	396	t14233w1340396	Norway Pine	396 NP56	3.9	71	0	0	Thinning	
142	33	34	401	t14233w1340401	Norway Pine	401 NP54	54.8	24	0	0	Thinning	
142	33	34	419	t14233w1340419	Norway Pine	419 NP12	26.1	25	0	0	Thinning	
142	33	34	435	t14233w1340435	Aspen	435 A45	23	72	0	0	Clearcut with Reserves	
142	33	34	436	t14233w1340436	White Spruce	436 WS 11	12.2	5	0	0	Thinning	
142	33	34	581	t14233w1340581	Aspen	581 A44	51.2	85	0	0	Clearcut with Reserves	COV51
142	33	34	665	t14233w1340665	Aspen	665 A56	11.6	82	0	0	Clearcut with Reserves	
142	33	34	764	t14233w1340764	Aspen	764 A44	8.7	85	0	0	Clearcut with Reserves	
142	33	34	765	t14233w1340765	White Spruce	765 WS 11	8	2	0	0	Thinning	
142	33	34	775	t14233w1340775	Norway Pine	775 NP53	4.9	78	0	0	Thinning	
142	33	35	412	t14233w1350412	Oak	412 O42	13.9	83	0	0	Clearcut with Reserves	
142	33	35	424	t14233w1350424	Norway Pine	424 NP11	8.7	21	0	0	Thinning	
142	33	35	430	t14233w1350430	Aspen	430 A46	24.1	81	0	0	Clearcut with Reserves	
142	33	35	702	t14233w1350702	Aspen	702 A56	6.6	82	0	0	Clearcut with Reserves	
142	33	35	788	t14233w1350788	Aspen	788 A46	10.9	81	0	0	Clearcut with Reserves	
142	33	35	806	t14233w1350806	Aspen	806 A56	28	82	0	0	Clearcut with Reserves	COV51
142	33	35	807	t14233w1350807	Aspen	807 A56	26.6	82	0	0	Re-inventory.	
142	33	35	809	t14233w1350809	Aspen	809 A56	29	82	0	0	Clearcut with Reserves	
142	33	36	406	t14233w1360406	Jack Pine	406 JP44	6.8	82	0	0	Clearcut with Reserves	
142	33	36	408	t14233w1360408	Oak	408 O53	8.6	83	0	0	Clearcut with Reserves	
142	33	36	428	t14233w1350428	Aspen	428 A46	146	81	0	0	Clearcut with Reserves	INC51

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Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
142	33	36	444	t14233w1360444	Jack Pine	444 JP45	4.7	81	0	0	Clearcut with Reserves	
142	33	36	660	t14233w1360660	Aspen	660 A46	16.9	81	0	0	Clearcut with Reserves	
142	33	36	815	t14233w1360815	Aspen	815 A46	33.8	81	0	0	Clearcut with Reserves	
142	33	36	816	t14233w1360816	Aspen	816 A46	15.1	81	0	0	Clearcut with Reserves	
142	33	36	822	t14233w1360822	Aspen	822 A 46	9.3	81	0	0	Clearcut with Reserves	
142	34	16	2	t14234w1160002	Norway Pine	2 NP64	6	133	0	0	Clearcut with Reserves	
142	34	16	3	t14234w1160003	Aspen	3 A42	9.7	64	0	0	Clearcut with Reserves	
142	34	16	4	t14234w1160004	White Spruce	4 WS11	13.1	2	0	0	Thinning	
142	34	16	11	t14234w1160011	Aspen	11 A58	77.7	85	0	0	Clearcut with Reserves	
142	34	16	12	t14234w1160012	Aspen	12 A43	25.4	61	0	0	Re-inventory.	
142	34	16	16	t14234w1160016	Aspen	16 A24	19.6	34	2016	0	Clearcut with Reserves	
142	34	16	21	t14234w1160021	Aspen	21 A54	5.1	73	2016	0	Clearcut with Reserves	
142	34	16	59	t14234w1160059	Aspen	59 A56	5.1	95	0	0	Clearcut with Reserves	
142	34	36	22	t14234w1360022	Aspen	22 A55	32.4	76	0	0	Clearcut with Reserves	INC52
142	34	36	23	t14234w1360023	Aspen	23 A55	40	87	0	0	Clearcut with Reserves	
142	34	36	39	t14234w1360039	Aspen	39 A56	9.6	77	0	0	Clearcut with Reserves	INC51
142	34	36	43	t14234w1360043	Aspen	43 A44	9.7	83	0	0	Clearcut with Reserves	
142	35	16	4	t14235w1160004	Aspen	4 A44	13.7	51	0	0	Clearcut with Reserves	
142	35	16	5	t14235w1160005	Aspen	5 A43	7.4	54	0	0	Clearcut with Reserves	
142	35	16	7	t14235w1160007	Aspen	7 A56	34.8	69	0	0	Clearcut with Reserves	
142	35	16	9	t14235w1160009	Jack Pine	9 JP52	5.3	81	0	0	Clearcut with Reserves	
142	35	16	10	t14235w1160010	Jack Pine	10 JP54	11.1	72	0	0	Clearcut with Reserves	
142	35	16	17	t14235w1160017	Northern Hardwoods	17 NH53	4.7	105	0	0	Thinning	MA1
142	35	16	20	t14235w1160020	Aspen	20 A43	19.1	51	0	0	Clearcut with Reserves	
142	35	16	21	t14235w1160021	Aspen	21 A53	12.9	75	0	0	Clearcut with Reserves	
142	35	16	64	t14235w1160064	Northern Hardwoods	64 NH55	13.2	102	0	0	Uneven-aged Harvest	
142	35	16	65	t14235w1160065	Aspen	65 A56	3.2	69	0	0	Clearcut with Reserves	
142	35	16	67	t14235w1160067	Aspen	67 A56	11.2	69	0	0	Clearcut with Reserves	
142	35	16	68	t14235w1160068	Aspen	68 A56	26.6	69	0	0	Clearcut with Reserves	
142	35	36	27	t14235w1360027	Aspen	27 A56	10.7	69	0	0	Clearcut with Reserves	INC61
142	35	36	34	t14235w1360034	Jack Pine	34 JP53	3.3	62	0	0	Manage for understory	
142	35	36	50	t14235w1360050	Aspen	50 A56	10.4	84	0	0	Clearcut with Reserves	
142	35	36	62	t14235w1360062	Oak	62 O41	20.5	88	0	0	Clearcut with Reserves	
142	36	7	13	t14236w1070013	Tamarack	13 T44	8.3	106	0	0	Clearcut with Reserves	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
142	36	7	22	t14236w1070022	Balsam Fir	22 BF43	22.3	63	0	0	Clearcut with Reserves	
142	36	9	3	t14236w1090003	Oak	3 O55	7.7	84	0	0	Clearcut with Reserves	
142	36	12	6	t14236w1120006	Balsam Fir	6 BF46	14	60	0	0	Clearcut with Reserves	
142	36	12	7	t14236w1120007	Aspen	7 A56	13.4	74	0	0	Clearcut with Reserves	
142	36	12	9	t14236w1120009	Balsam Fir	9 BF44	17.7	66	0	0	Clearcut with Reserves	
142	36	12	11	t14236w1120011	Balsam Fir	11 BF43	15.8	104	0	0	Clearcut with Reserves	
142	36	12	20	t14236w1120020	Norway Pine	20 NP57	9.7	102	0	0	Clearcut with Reserves	
142	36	12	25	t14236w1120025	Tamarack	25 T43	14.6	109	0	0	Clearcut with Reserves	
142	36	16	48	t14236w1160048	Northern Hardwoods	48 NH56	29.3	96	0	0	Uneven-aged Harvest	
142	36	16	49	t14236w1160049	Balsam Fir	49 BF42	13.4	75	0	0	Clearcut with Reserves	
142	36	16	53	t14236w1160053	Balsam Fir	53 BF44	15.3	68	0	0	Clearcut with Reserves	
142	36	16	55	t14236w1160055	White Spruce	55 WS11	14.7	16	0	0	Thinning	
142	36	16	58	t14236w1160058	Northern Hardwoods	58 NH55	8.7	102	0	0	Uneven-aged Harvest	
142	36	16	66	t14236w1160066	Balsam Fir	66 BF46	23.8	63	0	0	Clearcut with Reserves	COV61
142	36	16	69	t14236w1160069	Aspen	69 A55	6.9	75	0	0	Clearcut with Reserves	
142	36	16	70	t14236w1160070	Northern Hardwoods	70 NH55	7.2	100	0	0	Uneven-aged Harvest	
142	36	18	43	t14236w1180043	Balsam Fir	43 BF46	4.5	65	0	0	Clearcut with Reserves	
142	36	20	85	t14236w1200085	Jack Pine	85 JP44	19.3	65	0	0	Clearcut with Reserves	
142	36	21	96	t14236w1210096	Aspen	96 A53	6.2	77	0	0	Re-inventory.	
142	36	24	77	t14236w1240077	Aspen	77 A55	22.4	62	0	0	Clearcut with Reserves	COV61
142	36	24	83	t14236w1240083	Jack Pine	83 JP47	5.2	63	0	0	Clearcut with Reserves	
142	36	34	109	t14236w1340109	White Spruce	109 WS41	6.5	59	0	0	Thinning	
142	36	34	110	t14236w1340110	Aspen	110 A46	33.4	55	0	0	Clearcut with Reserves	
142	36	34	124	t14236w1340124	Balsam Fir	124 BF42	9	48	0	0	Clearcut with Reserves	
142	36	34	127	t14236w1340127	Balsam Fir	127 BF27	13.1	59	0	0	Clearcut with Reserves	
142	36	34	149	t14236w1340149	Balsam Fir	149 BF43	20.1	65	0	0	Clearcut with Reserves	
142	36	34	150	t14236w1340150	Balsam Fir	150 BF42	25	72	0	0	Manage for understory	CON2
142	36	34	152	t14236w1340152	Balsam Fir	152 BF21	6.5	47	0	0	Manage for understory	
142	36	35	114	t14236w1350114	Jack Pine	114 JP56	36.2	72	0	0	Clearcut with Reserves	CON6
142	36	35	131	t14236w1350131	Aspen	131 A53	4.6	76	0	0	Clearcut with Reserves	CON6
142	36	35	140	t14236w1350140	Jack Pine	140 JP56	6.3	79	0	0	Clearcut with Reserves	CON6
142	36	35	141	t14236w1350141	Jack Pine	141 JP44	11.3	63	0	0	Clearcut with Reserves	CON6
142	36	35	151	t14236w1350151	Balsam Fir	151 BF44	26.4	56	0	0	Clearcut with Reserves	
142	36	36	98	t14236w1360098	Balsam Fir	98 BF42	7.5	74	0	0	Clearcut with Reserves	CON2

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
142	36	36	104	t14236w1360104	Balsam Fir	104 BF43	9.8	69	0	0	Clearcut with Reserves	CON2
142	36	36	105	t14236w1360105	Norway Pine	105 NP11	10.7	22	2014	0	Thinning	
142	36	36	106	t14236w1360106	Norway Pine	106 NP56	7.6	103	2014	0	Clearcut with Reserves	
142	36	36	108	t14236w1360108	Norway Pine	108 NP51	5.3	55	2014	0	Thinning	
142	36	36	129	t14236w1360129	Aspen	129 A54	50.1	75	0	0	Clearcut with Reserves	CON2
142	36	36	136	t14236w1360136	Jack Pine	136 JP54	5.6	100	0	0	Clearcut with Reserves	CON6
142	36	36	154	t14236w1360154	Aspen	154 A54	38.5	72	0	0	Clearcut with Reserves	MA1, CON2
142	36	36	161	t14236w1360161	Norway Pine	161 NP11	36.3	22	2014	0	Thinning	
142	37	1	291	t14237w1010291	Norway Pine	291 NP11	19.6	22	0	0	Thinning	
142	37	1	309	t14237w1010309	White Spruce	309 WS52	5.2	54	0	0	Re-inventory.	
142	37	2	50	t14237w1020050	Norway Pine	50 NP46	3.4	64	0	0	Thinning	
142	37	3	24	t14237w1030024	Norway Pine	24 NP59	9.1	61	0	0	Thinning	
142	37	3	29	t14237w1030029	Norway Pine	29 NP47	2.9	61	0	0	Thinning	
142	37	3	31	t14237w1030031	Aspen	31 A59	15.8	81	0	0	Re-inventory.	INC53
142	37	3	314	t14237w1030314	White Spruce	314 WS11	12.4	2	0	0	Thinning	
142	37	5	45	t14237w1050045	Aspen	45 A54	16.2	87	0	0	Clearcut with Reserves	
142	37	5	62	t14237w1050062	Norway Pine	62 NP64	17.3	86	0	0	Thinning	
142	37	5	252	t14237w1050252	Norway Pine	252 NP47	15.5	38	0	0	Thinning	
142	37	6	317	t14237w1060317	Cutover Area	317 COA	4.5	98	0	0	Re-inventory.	
142	37	7	86	t14237w1070086	Norway Pine	86 NP58	21.7	75	0	0	Thinning	
142	37	7	111	t14237w1070111	Cutover Area	111 COA	28.8	75	0	0	Re-inventory.	
142	37	8	47	t14237w1080047	Norway Pine	47 NP45	3	63	0	0	Thinning	
142	37	8	134	t14237w1080134	Norway Pine	134 NP55	27	63	0	0	Thinning	
142	37	8	135	t14237w1080135	Norway Pine	135 NP56	14.6	87	0	0	Thinning	
142	37	8	136	t14237w1080136	White Spruce	136 WS 11	35	2	0	0	Thinning	
142	37	9	92	t14237w1090092	Cutover Area	92 COA	25.9	2	0	0	Re-inventory.	COV61
142	37	9	110	t14237w1090110	Norway Pine	110 NP12	19.9	15	0	0	Thinning	
142	37	9	124	t14237w1090124	Norway Pine	124 NP11	15.2	15	0	0	Thinning	
142	37	9	300	t14237w1090300	Norway Pine	300 NP11	17.1	15	0	0	Thinning	
142	37	11	102	t14237w1110102	Tamarack	102 T43	5.6	111	0	0	Clearcut with Reserves	MA1
142	37	11	108	t14237w1110108	Norway Pine	108 NP59	6	62	0	0	Thinning	
142	37	12	84	t14237w1120084	Tamarack	84 T42	6.1	118	0	0	Clearcut with Reserves	
142	37	12	143	t14237w1120143	Balsam Fir	143 BF43	3.6	54	0	0	Clearcut with Reserves	
142	37	13	140	t14237w1130140	Tamarack	140 T43	72.3	120	0	0	Clearcut with Reserves	

Subsection **Pine Moraines & Outwash Plains**

Forestry Area ***Park Rapids Area***

Township	Range	Section	Stand	Location ID	Management Cover Type	Stand Label	Acres	Age	Stand Exam Year	New Access Miles	Preliminary Prescription	Management Objectives
142	37	14	153	t14237w1140153	Oak	153 O57	5.5	83	0	0	Clearcut with Reserves	
142	37	14	176	t14237w1140176	Aspen	176 A56	6.4	87	0	0	Re-inventory.	
142	37	14	178	t14237w1140178	White Spruce	178 WS 12	10.4	2	0	0	Thinning	
142	37	14	180	t14237w1140180	Aspen	180 A55	6.5	77	0	0	Clearcut with Reserves	INC52
142	37	19	205	t14237w1190205	Norway Pine	205 NP11	26	15	0	0	Thinning	
142	37	22	208	t14237w1220208	Aspen	208 A54	22.7	81	0	0	Clearcut with Reserves	
142	37	22	219	t14237w1220219	Aspen	219 A53	10.5	78	0	0	Clearcut with Reserves	COV53
142	37	22	275	t14237w1220275	Norway Pine	275 NP11	49.3	23	0	0	Thinning	
142	37	24	188	t14237w1240188	Tamarack	188 T46	12.4	113	0	0	Clearcut with Reserves	
142	37	24	191	t14237w1240191	Norway Pine	191 NP54	12.1	102	0	0	Clearcut with Reserves	
142	37	24	195	t14237w1240195	Aspen	195 A46	6.8	56	0	0	Clearcut with Reserves	
142	37	24	214	t14237w1240214	Aspen	214 A55	10.1	74	0	0	Clearcut with Reserves	
142	37	26	224	t14237w1260224	Balsam Fir	224 BF23	30	42	0	0	Re-inventory.	
142	37	26	225	t14237w1260225	Oak	225 O54	16.2	122	0	0	Clearcut with Reserves	
142	37	26	229	t14237w1260229	Aspen	229 A57	45.2	87	0	0	Clearcut with Reserves	CON2
142	37	27	221	t14237w1270221	Norway Pine	221 NP54	20.2	68	0	0	Thinning	
142	37	27	232	t14237w1270232	Aspen	232 A54	13.7	70	0	0	Clearcut with Reserves	
142	37	32	244	t14237w1320244	Aspen	244 A54	37.2	67	0	0	Clearcut with Reserves	
142	37	32	245	t14237w1320245	Offsite Oak - SI <= 39	245 OX41	7.9	71	0	0	Clearcut with Reserves	COV53
142	37	33	240	t14237w1330240	Aspen	240 A54	22.8	60	0	0	Clearcut with Reserves	
142	37	33	241	t14237w1330241	Offsite Oak - SI <= 39	241 OX32	8.8	57	0	0	Clearcut with Reserves	COV53
142	37	33	242	t14237w1330242	Norway Pine	242 NP56	21	67	0	0	Thinning	
142	37	33	249	t14237w1330249	Norway Pine	249 NP55	26.8	67	0	0	Thinning	
142	37	33	250	t14237w1330250	Jack Pine	250 JP42	32	66	0	0	Clearcut with Reserves	

APPENDIX V

Glossary

Access route: A temporary access or permanent road connecting the most remote parts of the forest to existing public roads. Forest roads provide access to forestlands for timber management, fish and wildlife habitat improvement, fire control, and a variety of recreational activities. Also, see *Forest road*.

Acre: An area of land containing 43,560 square feet, roughly the size of a football field, or a square that is 208 feet on a side. A "forty" of land contains 40 acres and a "section" of land contains 640 acres.

Age class: An interval, commonly 10 years, into which the age range of trees or forest stands is divided for classification or use.

Age-class distribution: The proportionate amount of various age classes of a forest or forest cover type within a defined geographic area (e.g., ecological classification system subsection).

All-aged: Describes an uneven-aged stand that represents all ages or age classes from seedlings to mature trees.

Animal aggregations: A concentration of animals (of rare or common species or a mixture of rare and common) that occurs during part or all the species life cycle, such that when these animals are in these aggregations, they are highly vulnerable to disturbance. Examples are colonial water bird nesting sites, bat hibernacula, and mussel beds.

Annual stand examination list: List of stands to be considered for treatment in a particular year that was selected from the 10-year stand examination list. Treatment may include harvest, thinning, regeneration, prescribed burning, re-inventory, etc.

Annual work plan: The annual work responsibilities at the area (i.e., Division of Forestry administrative boundary) documented for the fiscal year.

Area forest resource management plan (AFRMP): Successor to timber management planning (TMP), recognizing that TMP discussions and decisions affected or included a lot more than the decision to harvest. This should not be confused with the comprehensive FRMPs developed for a number of areas in the mid-to late-1980s.

Artificial regeneration: Renewal of a forest stand by planting seedlings or sowing seeds.

Assessment: A compilation of information about the trends and conditions related to natural and socio-economic resources and factors. The initial round of SFRMPs will focus primarily on trends and conditions of forest resources. Standard core assessment information sources and products have been defined.

Basal area: The cross-sectional area of a tree taken at the base of the tree (i.e., measured at 4.5 feet above the ground). Basal area is often used to measure and describe the density of trees within an geographic area using an estimate of the sum of the basal area of all trees cross-sectional expressed per unit of land area (e.g., basal area per acre).

Biodiversity (biological diversity): The variety and abundance of species, their genetic composition, and the communities and landscapes in which they occur, including the ecological structures, functions, and processes occurring at all of these levels.

Biodiversity Significance: The relative value, in terms of size, condition and quality, of native biological diversity for a given area of land or water. *(Adapted from: Guidelines for MCBS Statewide Biodiversity Significance Rank):* The Minnesota County Biological Survey uses a statewide ranking system to evaluate and communicate the biodiversity significance of surveyed areas (MCBS sites) to natural resource professional, state and local government officials, and the public. MCBS sites are ranked according to several factors, including the quality and types of *Element Occurrences*, the size and quality of native plant communities, and the size and condition of the landscape within the Site. Areas are ranked as *Outstanding, High, Moderate, or Below the Minimum Threshold* for statewide biodiversity significance. (*Draft definition 3/24/2004*)

> ***Outstanding Sites:*** Those containing the best occurrences of the rarest species, the most outstanding examples of the rarest native plant communities, and/or the largest, most intact functional landscapes present in the state.
> ***High Sites:*** Those containing the Abest of the rest@, such as sites with very good quality occurrences of the rarest species, high quality examples of the rarest native plant communities, and/or important functional landscapes.
> ***Moderate Sites:*** Those containing significant occurrences of rare species, and/or moderately disturbed native plant communities and landscapes that have a strong potential for recovery.
> ***Sites Below the Minimum Threshold:*** Those lacking significant populations of rare species and/or natural features that meet MCBS minimum standards for size and condition. These include areas of conservation value at the local level, such as habitat for native plants and animals, corridors for animal movements, buffers surrounding higher quality natural areas, and open space areas.

Board foot: A unit of measuring wood volumes equaling 144 cubic inches. A board foot is commonly used to measure and express the amount of wood in a tree, sawlog, veneer log, or individual piece of lumber. For example, a 16-inch diameter at breast height (DBH) standing tree that is 80 feet tall, contains approximately 250 board feet of wood and a tree with a 30-inch DBH and 80 feet tall contains about 1000 board feet or one metric board foot (MBF). A piece of lumber one cubic foot (1 foot x 1 foot x 1 inch) contains one board foot of lumber.

Browse: (n) Portions of woody plants including twigs, shoots, and leaves used as food by such animals like deer and rabbits. (v) To feed on leaves, young shoots, and other vegetation.
Carr: Deciduous woodland or scrub on a permanently wet, organic soil. A carr develops from a bog, fen or swamp.

Clearcut: The removal of all or most trees during harvest to permit the re-establishment of an even-aged forest. A harvest method used to regenerate shade-intolerant species, such as aspen and jack pine.

Coarse filter: Management of lands from a local to landscape scale that addresses the needs of all or most species, communities, environments, and ecological processes. In using a coarse filter approach (Hunter, 1990), it assumes that a broad range of habitats encompassing the needs of most species needs will be met, and their populations will remain viable on the landscape.
Coarse woody debris: Stumps and fallen tree trunks or limbs of more than 6-inch diameter at the large end.

Cohort: a group of trees developing after a single disturbance, commonly consisting of trees of similar age.

Collaboration: A group in which members identify with the group and seriously consider the group's overall charge. Group members assume collective responsibility for outcomes, are interdependent, and have a joint ownership of decisions.

Common forest inventory: Also, known as CCSA (Common Cooperative Stand Assessment). Forest inventory stand data compiled by the Minnesota Interagency Information Cooperative from public agencies including the Minnesota DNR, Superior and Chippewa National Forests, and county land departments (2001). The common format contains the common attributes found in the state, federal, and counties forest inventories.

Competition: The struggle between trees to obtain sunlight, nutrients, water and growing space. Every part of the tree, from the roots to the crown, competes for space and food.

Comprehensive DNR subsection plans: Address Minnesota Department of Natural Resources (DNR) programs and activities within the subsection. Involves programs and activities of multiple DNR divisions, not just the Division of Forestry.

Comprehensive Division of Forestry SFRMPs: Address other aspects of forest resource management on DNR Forestry lands (e.g., recreation, land acquisition/sales, fire management, private forest management).

Connectivity: An element of spatial patterning where patches of vegetation such as, forest types, native plant communities or wildlife habitats, are connected to allow the flow of organisms and processes between them.

Conversion: A change through forest management from one tree species to another within a forest stand or site.

Cooperative stand assessment (CSA): The forest stand mapping and information system used by the Minnesota Department of Natural Resources to inventory the approximately five million acres (7,800 square miles) owned and administered by the state. The spatial information and stand attributes are now maintained in the Forest Inventory Module (FIM).

Cord: A pile of wood four feet high, four feet wide, and eight feet long, measuring 128 cubic feet, including bark and air space. Actual volume of solid wood may vary from 60 to 100 feet cubic feet, depending on size of individual pieces and how tight the wood is stacked. In the lake states, pulpwood cords are usually four feet x four feet x 100 feet and contain 133 cubic feet. Pulpwood volume of standing trees is estimated in cords. For example, a 10-inch DBH tree, which is 70 feet tall, is about 0.20 cords; or five trees of this size would equal one cord of wood.

Corridor: A defined tract of land connecting two or more areas of similar habitat type through which wildlife species can travel.

Cover type: Expressed as the tree species having the greatest presence (i.e., in terms of volume for older stands or number of trees for younger stands) in a forest stand. A stand where the major species is aspen would be called an aspen cover type.

Cover type distribution: The location and/or proportionate representation of cover types in a forest or a given geographic area.

Critical habitat: habitat or habitat elements that must be present and properly functioning to assure the continued existence of the species in question.

Crop tree: any tree selected or retained to be a component of a future commercial harvest.

Cruise: (v) A survey of forestland to locate timber and estimate its quantity by species, products, size, quality, or other characteristics. (n) An estimate derived from such a survey.

Cubic foot: A wood volume measurement containing 1,728 cubic inches, such as a piece of wood measuring one foot on a side. A cubic foot of wood contains approximately six to 10 usable board feet of wood. A cord of wood equals 128 cubic feet.

Cultural resource: An archaeological site, cemetery, historic structure, historic area, or traditional use area that is of cultural or scientific value.

Desired future forest composition (DFFC): Broad vision of landscape vegetation conditions in the long-term future. For the purposes of the initial round of subsection planning, DFFCs will focus on future desired forest composition looking ahead 50 years. DFFCs may include aspects like 1) the amount of various forest cover types within the subsection, 2) age-class distribution of forest cover types, 3) the geographic distribution of these across the subsection, and the related level of management for even-aged forest, 4) extended rotation forest, etc.

Disturbance: Any event, either natural or human induced, that alter the structure, composition, or functions of an ecosystem. Examples include forest fires, insect infestation, windstorms, and timber harvesting.

Disturbance regime: Natural or human-caused pattern of periodic disturbances, such as fire, wind, insect infestations, or timber harvest.

Dominant trees: Trees that are in the upper layer of the forest canopy, larger than the average trees in the stand.

Early Successional Forest: The forest community that develops immediately following a removal or destruction of vegetation in an area. Plant succession is the progression of plants from bare ground (e.g., after a forest fire or timber harvest) to mature forest consisting primarily of long-lived species such as sugar maple and white pine. Succession consists of a gradual change of plant and animal communities over time. Early successional forests commonly depend on and develop first following disturbance events (e.g., fire, windstorms, or timber harvest). Examples of *early successional forest* tree species are aspen, paper birch, and jack pine. Each stage of succession provides different benefits for a variety of species.

Ecological classification system (ECS): A method to identify, describe, and map units of land with different capabilities to support natural resources. This is done by integrating climatic, geologic, hydrologic, topographic, soil, and vegetation data. (See Appendix A.)

Ecological evaluation: A concise report containing descriptions of the significant natural features of a site, such as the flora, fauna, rare features, geology, soils, and any other factors that provide interpretation of the site's history, present state, and biodiversity significance. Management and protection recommendations are often included in these reports. Evaluations are produced by the Minnesota County Biological Survey (MCBS) at the completion of MCBS work in a given county or ecological classification system (ECS) subsection, and are generally reserved for those sites with the highest biodiversity significance in a geographic region, regardless of ownership.

Ecological integrity: In general, ecological integrity refers to the degree to which the elements of biodiversity and the processes that link them together and sustain the entire system are complete and capable of performing desired functions. Exact definitions of integrity are relative and may differ depending on the type of ecosystem being described.

Ecologically important lowland conifers (EILC): includes stands of black spruce, tamarack, and cedar, including stagnant lowland conifer stands, that are examples of high quality native plant communities (NPCs) that are representative of lowland conifer NPCs found in the subsections. The designated EILC stands will be reserved from treatment during this 10-year planning period. Future management/designation of these stands is yet to be determined.

Ecosystem based management: The collaborative process of sustaining the integrity of ecosystems through partnerships and interdisciplinary teamwork. Ecosystem based management seeks to sustain ecological health while meeting social and economic needs.

Element Occurrence (EO): An area of land and/or water where a rare feature (plant, animal, natural community, geologic feature, animal aggregation) is, or was present. An Element Occurrence Rank provides a succinct assessment of estimated viability or probability of persistence (based on condition, size, and landscape context) of occurrences of a given Element. An *Element Occurrence Record* is the locational and supporting data associated with a particular *Element Occurrence*. *Element Occurrence Records* for the State of Minnesota are managed as part of the rare features database by the Natural Heritage and Nongame Research Program. *(Draft definition 3/24/2004, Adapted from Biotics EO Standards: Chapter 2)*

Endangered species: A plant or animal species that is threatened with extinction throughout all or a significant portion of its range in Minnesota.

Even-aged: A forest stand composed of trees of primarily the same age or age class. A stand is considered even-aged if the difference in age between the youngest and oldest trees does not exceed 20 percent of the rotation age (e.g., for a stand with a rotation age of 50 years, the difference in age between the youngest and oldest trees should be 10 years).

Evenflow: Providing a relatively consistent amount of timber (or other products) in successive management periods.

Exotic species: Any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem, and whose introduction does or is likely to cause economic or environmental harm or harm to human health.

Extended rotation forests (ERF): Forest stands for which the harvest age is extended beyond the normal or economic harvest age. ERF provides larger trees, old forest wildlife habitat, and other nontimber values. Additional detail regarding management of ERF on DNR-administered lands is contained in the DNR Extended Rotation Forest Guidelines (1994). ***Prescribed ERF*** is the cover type acreage designated for management as ERF. Stands designated as ERF will be held beyond the recommended normal rotation (harvest) age out to the established ERF rotation age(s). A stand of any age can be prescribed as ERF. ***Effective ERF*** is defined as the portion of the prescribed ERF acreage that is actually over the normal rotation age for the cover type at any one time.

Extirpated: The species is no longer found in this portion of its historical range.

Fen: Peatlands that receive water both from precipitation and ground water, which has percolated through mineral soil, are classified as *fens*. The water supply in a fen is only slightly acidic or nearly neutral, and it carries minerals and other nutrient content. Fens look like watery meadows, with sedges, reeds, grass-like plants, occasional shrubs, and scattered, stunted trees.

Fine filter: Management that focuses on the welfare of a single or only a few species rather than the broader habitat or ecosystem. For example, individual nests, colonies, and habitats are emphasized. A *fine filter* approach (Hunter, 1990) considers the specific habitat needs of selected individual species that may not be met by the broader coarse filter approach.

Forest inventory and analysis (FIA): A statewide forest survey of timber lands jointly conducted by the Minnesota Department of Natural Resources and the U.S. Department of Agriculture—Forest Service that periodically, through a system of permanent plots, assesses the current status of, and monitors recent trends in, forest area, volume, growth, and removals.

Forest Inventory Module (FIM): The FIM provides a database and application through which field foresters can maintain an integrated and centralized inventory of the forests on publicly owned lands managed by the Division of Forestry and other divisions. In the field, foresters collect raw plot and tree data. Those data are summarized in stand-level data that are linked to a spatial representation of stand boundaries. Part of the DNR's **FOR**estry **I**nformation **S**ys**T**em (FORIST).

Forestland: Consists of all lands included in the forest inventory from aspen and pine cover types to stagnant conifers, muskeg, lowland brush, and lakes.

Forest management: The practical application of biological, physical, quantitative, managerial, economic, social, and policy principles to the regeneration, management, utilization, and conservation of forests to meet specified goals and objectives while maintaining the productivity of the forest. Note: forest management includes management for aesthetics, fish, recreation, urban values, water, wilderness, wildlife, wood products, and other forest resource values. From: The Dictionary of Forestry. 1998. The Society of American Foresters. J.A. Helms, ed.

Forest road: A temporary or permanent road connecting the remote parts of the forest to existing public roads. Forest roads provide access to public land for timber management, fish and wildlife habitat improvement, fire control, and a variety of recreational activities. The Division of Forestry has three classifications for roads and access routes:

> **System roads** - These roads are the major roads in the forest that provide forest management access, recreational access and may be connected to the state, county, or township public road systems. These roads are used at least on a weekly basis and often used on a daily basis. The roads should be graveled and maintained to allow travel by highway vehicles, and road bonding money can be used to fund construction and reconstruction of these types of roads. The level and frequency of maintenance will be at the discretion of the Area Forester and as budgets allow.
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> **Minimum maintenance roads** - These roads are used for forest management access on an intermittent, as-need basis. Recreational users may use them, but the roads are not promoted or maintained for recreation. The roads will be open to all motorized vehicles but not maintained to the level where low clearance licensed highway vehicles can travel routinely on them. The roads will be graded and graveled as needed for forest management purposes. Major damage such as culvert washouts or other conditions that may pose a safety hazard to the public will be repaired as reported and budgets allow.

Temporary access – If the access route does not fit into one of the first two options, the access route has to be abandoned and the site reclaimed so that evidence of a travel route is minimized. The level of effort to effectively abandon temporary accesses will vary from site to site depending on location of the access (e.g., swamp/winter vs. upland route), remoteness, and existing recreational use pressures.

Forest stand: A group of trees occupying a given area and sufficiently uniform in species composition, age, structure, site quality, and condition so as to be distinguishable from the forest on adjoining areas.

FORIST: The **FOR**estry **I**nformation **S**ys**T**em (FORIST) is a collection of integrated spatial applications and datasets supporting day-to-day operations across the Division of Forestry. The first two parts of the system are in operation: Forest Inventory Module (FIM) and Silviculture and Roads Module (SRM). A Timber Sales Module is scheduled to be operational in 2006.

Fragmentation: Breaking up of large and contiguous ecosystems into patches separated from each other by different ecosystem types. Breaking up a contiguous or homogeneous natural habitat through conversion to different vegetation types, age classes, or uses. ***Forest fragmentation*** occurs in landscapes with distinct contrasts between land uses, such as between woodlots and farms. ***Habitat fragmentation*** occurs where a contiguous or homogeneous forest area of a similar cover type and age is broken up into smaller dissimilar units. For example, a conifer-dominated forest (or portion of it) is fragmented by clearcutting if it is converted to another type, such as an aspen-dominated forest.

Fully stocked stand: A forest stand in which all the growing space is effectively occupied but having ample space for development of the crop trees.

Game Species: In this plan, *game* species include those terrestrial species that are hunted and trapped.

Gap: the space occurring in forest stands due to individual tree or groups of trees mortality or blowdown. *Gap management* uses timber harvest methods to emulate this type of forest spatial pattern.

Geographic information system (GIS): Computer software used to manipulate, analyze, and visually display inventory and other data and prepare maps of the same data.

Group selection: A process of harvesting patches of selected trees to create openings in the forest canopy and to encourage reproduction of uneven-aged stands.

Growth stage: Growth stages of native plant communities as presented in the *Field Guide to the Native Plant Communities of Minnesota: The Laurentian Mixed Forest Province* are periods of stand maturation where the mixture of trees in the canopy is stable. Growth stages are separated by periods of transition where tree mortality is high and different among the species, usually involving the death of early successional species and replacement by shade-tolerant species or longer-lived species.

Habitat: An area in which a specific plant or animal normally lives, grows and reproduces; the area that provides a plant or animal with adequate food, water, shelter and living space.

Herbivory: Plant communities resulting from the browsing and grazing of wildlife. A plant-animal interaction whereby an organism eats some or all of a plant and the plant responds immediately (stress, decline or death) or over time (evolutionary adaptation). Herbivory occurs both above and below ground. As defined for the issues concerned with herbivory in the plan; the influence by dominant herbivores on forest composition, structure, forest dynamics and spatial patterns. Dominant herbivores include beaver, deer, moose, hares, rabbits, small mammals, and forest tent caterpillars.

High quality native plant community: A community that has experienced relatively little human disturbance, has few exotic species, and supports the appropriate mix of native plant species for that community. A high quality native plant community may be unique or have a limited occurrence in the subsection, have a known association with rare species, or an exemplary representative of the native plant community diversity prior to European settlement.

High-risk, low-volume (HRLV): HRLV stands are identified based on one or more of the following: 1) stands coded as high risk in CSA forest inventory, 2) significant insect or disease damage to the main species in the stand, 3) stands over normal rotation age at time of survey with total stand volume eight cords per acre (low volume), 4) or very old stand, e.g., aspen over 80 years old.

Intensive management: Intensity of management refers to the degree of disturbance associated with silvicultural treatments. In this plan, references to it range from less intensive to more intensive management. Examples of more intensive management are: 1) Site preparation techniques such as rock-raking that disrupts the soil profile and leaves coarse woody debris in piles; 2) broadcast herbicide use that eliminates or dramatically reduces herbaceous plant and shrub diversity; 3) Conversions of mixed forest stands through clearcutting and/or site preparation that result in the establishment of a more simplified monotypic stand such as mostly pure aspen regeneration or high-density pine plantations. Examples where more intensive management may be needed are: to regenerate a site successfully to a desired species, control of insect or disease problems, and wildlife habitat management (e.g., maintenance of wildlife openings).

Intermediate cut: The removal of immature trees from the forest sometime between establishment and major harvest with the primary objective of improving the quality of the remaining forest stand.

Issue: 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 Department of Natural Resources (DNR)—Divisions of Forestry and Wildlife. Relevant issues will likely be defined by current, anticipated, or desired resource conditions and trends, threats to resources, and vegetation management opportunities. The key factor in determining the importance of issues for SFRMP is whether vegetation management issues can address the issue in whole or substantial part on DNR-administered lands.

Landform: Any physical, recognizable form or feature of the earth's surface, having a characteristic shape, and produced by natural causes. Examples of major landforms are plains, plateaus, and mountains. Examples of minor landforms are hills, valleys, slopes, eskers, and dunes. Together, landforms make up the surface configuration of the earth. The "landform" concept involves both empirical description of a terrain (land-surface form) class and interpretation of genetic factors ("natural causes"). (An Ecological Land Classification Framework for the United States. 1984. p. 40)

Landscape: A general term referring to geographic areas that are usually based on some sort of natural feature or combination of natural features. They can range in scale from very large to very small. Examples include watersheds (from large to small), the many levels of the Ecological Classification System (ECS), and Minnesota Forest Resources Council (MFRC) regional landscapes. The issue being addressed usually defines the type and size of landscape to be used.

Landscape region: A geographic region that is defined by similar landforms, soils, climatic factors, and potential native vegetation. The landscape region used for this planning effort is the subsection level of the Ecological Classification System.

Land Type Association: Divisions within Subsections that are delineated using glacial landforms, bedrock types, topographic roughness lake and stream distributions, wetland patterns, depth to the groundwater table, soil parent material, and pre-European settlement vegetation.

Landscape study area (LSA): A large geographic area identified by the Minnesota County Biological Survey (MCBS) as a core area for the MCBS survey process in northern Minnesota. The LSA is intended to represent some of the landscapes within an ecological subsection (a unit in Minnesota's Ecological Classification System). A LSA 1) generally captures the range of environmental gradients and ecological conditions found in large landscapes, 2) generally encompasses the range of native plant community complexes which exhibit repeatable patterns at the landform or ecological landtype association (LTA) scale, 3) exhibits the potential for intact landscape-level processes to occur, 4) contains representative native plant communities functioning under relatively undisturbed conditions, and 5) often contains habitat for rare species. An LSA area is typically thousands of acres and contains two to several MCBS sites. An LSA may encompass portions of one or more ecological landtype associations (LTAs) and lie in more than one county. LSAs are identified prior to MCBS field surveys and boundaries are modified during the survey process. At the completion of the MCBS surveys, an LSA becomes a macrosite, two or more sites, or a combination of macrosites and sites. In some cases an LSA is eliminated from further survey consideration during the MCBS survey process.

Leave trees: Live trees selected to remain on a site to provide present and future benefits, such as shelter, resting sites, cavities, perches, nest sites, foraging sites, mast, and coarse woody debris.

Legacy patch: An area within a harvest unit that is excluded from harvest; this area is representative of the site and is to maintain a source area for recolonization, gene pool maintenance, and establishment of microhabitats for organisms that can persist in small patches of mature forest.

Macrosite: A large area, generally thousands of acres, containing two or more sites that have some geographical and ecological connection relevant to conservation planning. MCBS sites within a macrosite are generally close to one another but are not necessarily contiguous. Thus, macrosites may contain some disturbed areas. In northern Minnesota, MCBS macrosites correspond to the final (post field-evaluation) boundaries of LSAs. (Areas less than 2000 acres formerly labeled "preserve designs " are also macrosites).

Managed acres: Timberland acres that are available for timber management purposes.

Management pool: In this plan, the acres available for timber management purposes.

Marketable timber: Merchantable timber that is accessible now.

Mast: Nuts, seeds, catkins, flower buds, and fruits of woody plants that provide food for wildlife.

Mature tree: A tree that has reached the desired size or age for its intended use. Size or age will vary considerably depending on the species and the intended use.

Maximum rotation age: In this plan, the maximum age at which a forest cover type will retain its biological ability to regenerate to the same cover type and remain commercially viable as a marketable timber sale.

Mean annual increment (MAI): Average annual growth of a stand up to a particular age. It is calculated by dividing yield at that age by the age itself (e.g., the mean annual increment for a stand at age 50 with 25 cords per acre total volume: 25) 50 years = 0.5 cords per year).

Merchantable timber: Trees or stands having the size, quality, and condition suitable for marketing under a given economic condition, even if not immediately accessible for logging.

Mesic: Moderately moist.

MCBS Sites: Areas of land identified by Minnesota County Biological Survey (MCBS) staff, ranging from tens to thousands of acres in size, selected for survey because they are likely to contain relatively undisturbed native plant communities, large populations and/or concentrations of rare species, and/or critical animal habitat. The MCBS site provides a geographic framework for recording and storing data and compiling descriptive summaries.

Minnesota forest resources plan (MFRP): Statewide DNR strategic forest resources plan. Includes statewide vision, mission, preferred future, goals, strategies and objectives. For each of the division's programs, it includes goals, statewide direction, and major strategies and objectives.

Minnesota TAXA: Minnesota Taxonomy Database maintained by the Division of Ecological Services.

Minnesota Wildlife Resource Assessment Project (MNWRAP): A wildlife species database and related information system that provides the overall data management, framework, analysis functions, and long-term support for statewide, landscape, and site-level wildlife resource assessment efforts. It will cover the total spectrum of wildlife diversity and habitat associations in Minnesota.

Mixed forest or stand: A forest or stand composed of two or more prominent species.

Mixed forest conditions: In this plan, refers to vegetative composition and structure that is moving toward the mix and relative proportion (e.g., dominated by, common, occasional, or scattered) of species found in the native plant community for that site. Tree species mix and proportion depends not only on the targeted growth stage (based on the rotation age for the desired cover type) but also species found in older growth stages.

Mortality: Death or destruction of forest trees as a result of competition, disease, insect damage, drought, wind, fire, or other factors.

Multi-aged stand: A stand with two or more age classes.

Multiple use: Using and managing a forested area to provide more than one benefit simultaneously. Common uses may include wildlife, timber, recreation, and water.

Native plant community: A group of native plants that interact with each other and with their environment in ways not greatly altered by modern human activity or by introduced organisms. These groups of native plants form recognizable units, such as an oak forest, prairie, or marsh, that tend to reoccur over space and time. Native plant communities are classified and described by physiognomy, hydrology, landforms, soils, and natural disturbance regimes (e.g., wild fires, wind storms, normal flood cycles).

Natural Area: An area of land, with significant native biodiversity, where a primary goal is to protect, enhance or restore ecological processes and Native Plant Community composition and structure. An MCBS s*ite* of Outstanding or High biodiversity significance is often recommended for nomination as a natural area. For these MCBS sites, an MCBS *Ecological Evaluation* is written to characterize the ecological significance of the MCBS site as a whole and to serve as a guide for conservation action by the various landowners. MCBS sites (or portions of MCBS sites) that are recommended as natural areas may be identified by the landowner or land management agency for conservation activities such as designation as a (city, county, state, private) park, non-motorized recreation area, scientific and natural area, reserve, special vegetation management (e.g., natural disturbance based forest management for maintenance of mature growth stage), etc. (*Draft definition 3/24/2004*)

Natural Area Registry (NAR) Agreement: a memorandum of understanding between the Ecological Services Division and another governmental unit. The other governmental unit can be Division of Forestry, Wildlife, or Parks, depending on who the land administrator is for the parcel in question. It can also be city, county, tribal, or federal government. The NAR generally identifies the site, explains its significance, sets a proposed management direction, and states that before any management contrary to that direction occurs, the parties will get together and talk about it first. It is not a binding agreement. Examples of NAR's: an old-growth yellow birch stand in Crosby-Manitou State Park; the South Fowl Lake cliff community on Division of Forestry land in Cook County; and a ramshead orchid site on Hubbard County land.

Natural disturbances: Disruption of existing conditions by natural events such as wildfires, windstorms, drought, flooding, insects, and disease. May range in scale from one tree to thousands of acres.

Natural regeneration: The growth of new trees from one of the following ways: (a) from seeds naturally dropped from trees or carried by wind or animals, (b) from seeds stored on the forest floor, or (c) from stumps that sprout or roots that sucker.

Natural spatial patterns: refers to the size, shape, and arrangement of patches in forested landscapes as determined primarily by natural disturbance and physical factors.

Non-forestland: Land that has never supported forests, and land formerly forested where use for timber management is precluded by development for other uses such as crops, improved pasture, residential areas, city parks, improved roads, and power line clearings.

Nongame species: In this plan, *nongame species* include amphibians, reptiles, and those mammal and bird species that are not hunted or trapped.

Nontimber forest products: Nontimber Forest Products, also known as special forest products, can be categorized into five general areas: foods, herbs, medicinals, decoratives and specialty items. Special forest products might include berries, mushrooms, boughs, bark, Christmas trees, lycopodium, rose hips and blossoms, diamond willow, birch tops, highbush cranberries, burls, conks, Laborador tea, seedlings, cones, nuts, aromatic oils, extractives.

Normal rotation age: For even-aged managed cover types, the rotation age set by the SFRMP Team for non-ERF timberland acres. It is based on the culmination of mean annual increment (CMAI), other available data related to forest productivity that also considers wood quality, and local knowledge.

Old forest: A forest stand of any particular forest cover type is considered old forest whenever its age exceeds the normal rotation age established by the landscape team for that cover type. In this plan, it does not include designated old-growth, state park lands, etc.

Old forest conditions: forest that has the age and structural conditions typically found in mature to very old forests, such as large diameter trees, large snags, downed logs, mixed species composition, and greater structural diversity. These older forest conditions typically develop at stand ages greater than the normal rotation ages identified for even-aged managed forest cover types.

Old forest management complex: Represents an area of land, made up of several to many stands that are managed for old-growth, special management zone (SMZ), and extended rotation forest (ERF) in the vicinity of designated old-growth stands.

Old-growth forests: Forests defined by age, structural characteristics, and relative lack of human disturbance. These forests are essentially free from catastrophic disturbances, contain old trees (generally over 120 years old), large snags, and downed trees. Additional details on the management of old-growth forests on DNR-administered lands are contained in *Old-Growth Forests Guidelines* (1994) and amendments.

Operational planning: What specifically will happen. The specific actions (i.e., projects, programs, etc.) that will be taken to move toward the desired future established by the various sources of strategic direction. Examples include stand examination lists, road projects, recreational trail/facilities projects, staffing, annual work plan targets, etc. Operational planning is also referred to as tactical planning.

Overmature: A tree or even-aged stand that has reached an age where it is declining in vigor and health and reaching the end of its natural life span resulting in a reduced commercial value because of size, age, decay, and other factors.

Overstocked: The situation in which trees are so closely spaced that they are competing for resources, resulting in less than full growth potential for individual trees.

Overstory: The canopy in a stand of trees.

Partial cut: A cutting or harvest of trees where only some of the trees in a stand are removed.

Patch: An area of forest that is relatively homogenous in structure, primarily in height and stand density, and differs from the surrounding forest. It may be one stand or a group of stands.

Plantation: A stand composed primarily of trees established by planting or artificial seeding.

Prescribed burn: To deliberately burn wildlands (e.g., forests, prairie or savanna) in either their natural or modified state and under specified conditions within a predetermined area to meet management objectives for the site. A fire ignited under known conditions of fuel, weather, and topography to achieve specific objectives.

Prescription: A planned treatment (clear-cut, selective harvest, thin, reforest, reserve, etc.) designed to change current stand structure to one that meets management goals. A written statement that specify the practices to be implemented in a forest stand to meet management objectives. These specifications reflect the desired future condition at the site and landscape level and incorporate knowledge of the special attributes of the site.

Pulpwood: Wood cut or prepared primarily for manufacture into wood pulp or chips, for subsequent manufacture into paper, fiber board, or chip board. Generally, trees five to 12 inches diameter at breast height are used.

Pure forest or stand is defined as composed principally of one species, conventionally at least 80 percent based on numbers, basal areas, or volumes.

Range of natural variation (RNV): Refers to the expected range of conditions (ecosystem structure and composition) to be found under naturally functioning ecosystem processes (natural climatic fluctuations and disturbance cycles such as fire and windstorms). RNV provides a benchmark (range of reference conditions) to compare with current and potential future ecosystem conditions.

Rare Features Database is maintained by the Natural Heritage and Nongame Research Program and is comprised of locational records of the following features:

> **Rare plants.** Rare plants tracked are all species that are listed as Federally endangered, threatened or as candidates for Federal listing; all species that are State listed as endangered, threatened or special concern. Several rare species are also tracked which currently have no legal status but need further monitoring to determine their status.
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> **Rare animals.** All animal species that are listed as Federally endangered or threatened (except the gray wolf) are tracked, as well as all birds, small mammals, reptiles, amphibians, mussels, and butterflies that are listed as State endangered, threatened or special concern.
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> **Natural communities**. Natural communities are functional units of landscape that are characterized and defined by their most prominent habitat features - a combination of vegetation, hydrology, landform, soil, and natural disturbance cycles. Although natural communities have no legal protection in Minnesota, the Natural Heritage and Nongame Research Program and the Minnesota County Biological Survey have evaluated and ranked community types according to their relative rarity and endangerment throughout their range. Locations of high quality examples are tracked in the Rare Features Database.
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> **Geologic features**. Noteworthy examples of geologic features throughout Minnesota are tracked if they are unique or rare, extraordinarily well preserved, widely documented, highly representative of a certain period of geologic history, or very useful in regional geologic correlation.

Animal aggregations. Certain types of animal aggregations, such as nesting colonies of waterbirds (herons, egrets, grebes, gulls and terns), bat hibernacula, prairie chicken booming grounds, and winter bald eagle roosts are tracked regardless of the legal status of the species that comprise them. The tendency to aggregate makes these species vulnerable because a single catastrophic event could result in the loss of many individuals.

Rare species: A plant or animal species that is designated as ***endangered, threatened*****,** or a species of ***special concern*** by the state of Minnesota (this includes all species designated as endangered or threatened at the federal level), or an uncommon species that does not (yet) have an official designation, but whose distribution and abundance need to be better understood.

Refuge/refugia: Area(s) where plants and animals can persist through a wind and/or fire event.

Regeneration: The act of renewing tree cover by establishing young trees naturally (e.g., stump sprouts, root suckers, natural seeding) or artificially (e.g., tree planting, seeding).

Regional landscapes (MFRC): The Minnesota Forest Resources Council (MFRC) established eight regional landscapes covering Minnesota based on ecological, socio-economic, and administrative factors. These landscapes were established to undertake landscape based planning and coordination across all forest ownerships. The subsections included in this plan are in the Northeast Landscape Region.

Release: Freeing a tree, or group of trees, from competition that is overtopping or closely surrounding them.

Releve': Vegetation survey plot data.

Research natural area (RNA): Areas within National Forests that the U.S. Forest Service has designated to be permanently protected and maintained in natural condition (e.g., unique ecosystems or ecological features, rare or sensitive species of plants and animals and their habitat, and high-quality examples of widespread ecosystems).

Reserved forestland: Forestland withdrawn from timber utilization through statute, administrative regulation, or designation.

Riparian area The area of land and water forming a transition from aquatic to terrestrial ecosystems along streams, lakes, and open water wetlands.

Riparian management zone (RMZ): That portion of the riparian area where site conditions and landowner objectives are used to determine management activities that address riparian resource needs. It is the area where riparian guidelines apply.

Rotation age: The period of years between when a forest stand (i.e., primarily even-aged) is established (i.e., regeneration) and when it receives its final harvest. This time period is an administrative decision based on economics, site condition, growth rates, and other factors.

Salvage cut: A harvest made to remove trees killed or damaged by fire, wind, insects, disease, or other injurious agents. The purpose of salvage cuts is to use available wood fiber before further deterioration occurs to recover value that otherwise would be lost.

Sanitation cut: A cutting made to remove trees killed or injured by fire, insects, disease, or other injurious agents (and sometimes trees susceptible to such injuries), for the purpose of preventing the spread of insects or disease.

Sapling: A tree that is one to five inches in diameter at breast height.

Sawlog: A log large enough to produce lumber or other products that can be sawed. Its size and quality vary with the utilization practices of the region.

Sawtimber: Trees that yield logs suitable in size and quality for the production of lumber.

Scarify: To break up the forest floor and topsoil preparatory to natural regeneration or direct seeding.

Scientific and natural area (SNA): Areas established by the Minnesota Department of Natural Resources, Division of Ecological Services, to preserve natural features and rare resources of exceptional scientific and educational value.

Seedbed: The soil or forest floor on which seed falls.

Seed tree: Any tree that bears seed; specifically, a tree left standing to provide the seed for natural regeneration.

Selective harvest: Removal of single scattered trees or small groups of trees at relatively short intervals. The continuous establishment of reproduction is encouraged and an all-aged stand is maintained. A management option used for shade-tolerant species.

Shade tolerance: Relative ability of a tree species to reproduce and grow under shade. The capacity to withstand low light intensities caused by shading from surrounding vegetation. Tolerant species tolerate shade, while intolerant species require full sunlight.

Shelterwood harvest: A harvest cutting in which trees on the harvest area are removed in a series of two or more cuttings to allow the establishment and early growth of new seedlings under partial shade and protection of older trees. Produces an even-aged forest.

Silviculture: The art and science of establishing, growing, and tending stands of trees. The theory and practice of controlling the establishment, composition, growth, and quality of forest stands to achieve certain desired conditions or management objectives.

Silviculture and Roads Module (SRM): The SRM provides a database and application through which field foresters can record planned and actual forest development prescriptions (e.g., site preparation, tree planting projects, timber harvest, road maintenance, etc.) and follow-up surveys. SRM supports the geographic description of the extent of a development project separate from FIM stand boundaries. A variety of maps and other reports can be generated by the development system. SRM will also produce maps and reports that roll up forestry area data to the regional or statewide level. Part of the DNR's **FOR**estry **I**nformation **S**ys**T**em (FORIST).

Site index (SI) : A species-specific measure of actual or potential forest productivity or site quality, expressed in terms of the average height of dominant trees at specific key ages, usually 50 years in the eastern U.S.

Site preparation: Treatment of a site (e.g., hand or mechanical clearing, prescribed burning, or herbicide application), to prepare it for planting or seeding and to enhance the success of regeneration.

Site productivity: The relative capacity of a site to sustain a production level over time. The rate at which biomass is produced per unit area. For example, cords per acre growth of timber.

Size class: A category of trees based on diameter class. The DNR's forest inventory has size classes such as Size Class *1* = 0 - 0.9 inch diameter; *2* = 1 - 2.9 inches diameter; *3* = 3 – 4.9 inches; *4* = 5 – 8.9 inches; *5* = 9 – 14.9 inches, etc. Also, size class may be referred to as seedling, sapling, pole timber, and saw timber.

Slash: The non-utilized and generally unmarketable accumulation of woody material in the forest, such as limbs, tops, cull logs, and stumps, that remain in the forest as residue after timber harvesting.

Snag: A standing dead tree.

Soil productivity: The capacity of soils, in its normal environment, to support plant growth.

Special concern species: A plant or animal species that is extremely uncommon in Minnesota, or has a unique or highly specific habitat requirements, and deserves careful monitoring. Species on the periphery of their ranges may be included in this category, as well as species that were once threatened or endangered but now have increasing, or stable and protected, populations.

Special management zone (SMZ): a buffer immediately surrounding designated old-growth forest stands. It is intended to minimize edge effects and windthrow damage to old-growth stands. Minimum width is 330-feet from the edge of the old-growth stand. Timber harvest is allowed in the SMZ, but there are limitations on how much can be clearcut at any given time.

Stand: a contiguous group of trees similar in age, species composition, and structure, and growing on a site of similar quality, to be a distinguishable forest unit. A forest is comprised of many stands. A ***pure stand*** is composed of essentially a single species, such as a red pine plantation. A ***mixed stand*** is composed of a mixture of species, such as a northern hardwood stand consisting of maple, birch, basswood, and oak. An ***even-aged stand*** is one in which all of the trees present are essentially the same age, usually within 10 years of age for aspen and jack pine stands. An ***uneven-aged stand*** is one in which a variety of ages and sizes of trees are growing together on a uniform site, such as a northern hardwood stand with three or more age classes.

Stand age: In the DNR's forest inventory, the average age of the main species within a stand.

Stand density: The quantity of trees per unit area. Density usually is evaluated in terms of basal area, numbers of trees, volume, or percent crown cover.

Stand examination list: DNR forest stands to be considered for treatment (e.g., harvest, thinning, regeneration, prescribed burning, reinventory, etc.) over the planning period based on established criteria (e.g., rotation age, site index, basal area, desired future cover type composition, etc.). These stands will be assigned preliminary prescriptions and most will receive the prescribed treatment. However, based on field appraisal visit, prescriptions may change for some stands because of new information on the stand or its condition.

Stand selection criteria: Criteria used to help identify stands to be treated as determined by the subsection team. Criteria will likely be based on include rotation ages, site index, basal area, cover type composition, understory composition, location, etc. Factors considered in developing stand selection criteria will include 1) desired forest composition goals, 2) timber growth and harvesting, 3) old-growth forests, 4) extended and normal rotation forests, 5) riparian areas, 6) wildlife habitat, 7) age and cover type distributions, 8) regeneration, 9) thinning and 10) prescribed burning needs, and 11) etc.

State forest road: Any permanent road constructed, maintained, or administered by the Minnesota Department of Natural Resources for the purposes of accessing or traversing state forestlands.

Stocking: An indication of the number of trees in a stand as compared to the desirable number for best growth and management, such as well stocked, overstocked, and partially stocked. A measure of the proportion of an area actually occupied by trees.

Strategic planning: A process to plan for desired future states. Includes aspects of a plan or planning process that provide statements and guides for future direction. The geographic, programmatic, and policy focus can range from very broad and general to more specific in providing tiers/levels of direction. Strategic planning is usually long-term (i.e., at least five years, often longer). Usually includes an assessment of current trends and conditions (e.g., social, natural resource, etc.), opportunities and threats; identification of key issues; and the resulting development of goals (e.g., desired future conditions), strategies, and objectives. Vision and mission statements may also be included.

Stumpage: The value of a tree as it stands in the forest uncut. Uncut trees standing in the forest.

Stumpage price: The value that a timber appraiser assigns to standing trees or the price a logger or other purchaser is willing to pay for timber as it is in the forest.

Subsection: A subsection is one level within the Ecological Classification System (ECS). From largest to smallest in terms of geographic area, the ECS is comprised of the following levels: Province --> Section --> **Subsection** --> Land Type Association --> Land Type --> Land Type Phase. Subsections areas are generally one to four million acres in Minnesota, with the average being 2.25 million acres. Seventeen subsections are scheduled for the SFRMP process.

Subsection forest resource management plan (SFRMP): A Department of Natural Reousrces (DNR) plan for vegetation management on forestlands administered by DNR Divisions of Forestry and Wildlife that uses ECS subsections as the basic unit of delineation. Initial focus will be to identify forest stands and road access needs for the duration of the 10-year plan. There is potential to be more comprehensive in the future.

Succession: The natural replacement, over time, of one plant community with another.

Sucker: A shoot arising from below ground level from a root. Aspen regenerates from suckers.

Suppressed: The condition of a tree characterized by low growth rate and low vigor due to competition from overtopping trees or shrubs.

Sustainability: Protecting and restoring the natural environment, while enhancing economic opportunity and community well-being. Sustainability addresses three related elements: the environment, the economy, and the community. The goal is to maintain all three elements in a healthy state indefinitely. Meeting the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainable treatment level: A treatment level (e.g., harvest acres per year) that can be sustained over time at a given intensity of management without damaging the forest resource base or compromising the ability of future generations to meet their own needs. Treatment levels may need to be varied above and/or below the sustainable treatment level until the desired age-class structure or stocking level is reached.

Tactical planning: See operational planning.

Temporary access: A temporary access route for short-term use that will not be needed for foreseeable future forest management activities. It is usually a short, temporary, dead-end access route.

Thermal cover: Habitat component (e.g., conifer stands such as white cedar, balsam fir, and jack pine) that provides wildlife protection from the cold in the winter and heat in the summer. Vegetative cover used by animals against the weather.

Thinning: A silvicultural treatment made to reduce the density of trees within a forest stand primarily to improve growth, enhance forest health, or recover potential mortality. ***Row thinning*** is where selected rows are harvested, usually the first thinning, which provides equipment operating room for future selective thinnings. ***Selective thinning*** is where individual trees are marked or specified (e.g., by diameter, spacing, or quality) for harvest. ***Commercial thinning*** is thinning after the trees are of merchantable size for timber markets. ***Pre-commercial thinning*** is done before the trees reach merchantable size, usually done in overstocked (very high stems per acre) stands to provide more growing space for crop trees that will be harvested in future years.

Threatened species: A plant or animal species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range in Minnesota.

Timberland: Forestland capable of producing timber of a marketable size and volume at the normal harvest age for the cover type. It does not include lands withdrawn from timber utilization by statute (e.g., Boundary Waters Canoe Area Wilderness) or administrative regulation such as designated old-growth forest and state parks. On state forestlands this includes stands that can produce at least three cords per acre of merchantable timber at the normal harvest age for that cover type. It does not include very low productivity sites such as those classified as stagnant spruce, tamarack, and cedar, offsite aspen, or non-forestland.

Timber management plan: If used with the SFRMP process, a timber management plan means the same thing as the vegetation management plan described below.

Timber management planning (TMP): Successor to the TMP information system (TMPIS). Recognizes the entire timber management planning process as being more than just the computerized system. Incorporates GIS technology and an interactive process with other resource managers.

Timber management planning information system (TMPIS): Circa mid-1980s. Original computerized system for developing 10-year stand treatment prescriptions by area.

Timber productivity: The quantity and quality of timber produced on a site. The rate at which timber volume is produced per unit area over a period of time (e.g., cords per acre per year). The relative capacity of a site to sustain a level of timber production over time.

Timber stand improvement (TSI): A practice in which the quality of a residual forest stand is improved by removing less desirable trees and large shrubs to achieve the desired stocking of the best quality trees or to improve the reproduction, composition, structure, condition, and volume growth of a stand.

Tolerant: A plant cable of becoming established and growing beneath overtopping vegetation. A tree or seedling capable of growing in shaded conditions.

Two-aged stand: a stand with trees of two distinct age classes separated in age by more than 20 percent of the rotation age.

Underplant: The planting of seedlings under an existing canopy or overstory.

Understocked: A stand of trees so widely spaced that even with full growth potential realized, crown closure will not occur.

Understory: The shorter vegetation (shrubs, seedlings, saplings, small trees) within a forest stand that forms a layer between the overstory and the herbaceous plants of the forest floor.

Uneven-aged management: Forest management that results in forest stands comprised of intermingling trees or small groups that have three or more distinct age classes. Best suited for shade tolerant species.

Uneven-aged stand: A stand of trees of a variety of ages and sizes growing together on a uniform site. A stand of trees having three or more distinct age classes.
Variable density: Thinning or planting in a clumped or dispersed pattern so that tree spacing more closely replicates patterns after natural disturbance (e.g., use gap management, vary the residual density within a stand when thinning, or plant seedlings at various densities within a plantation).

Variable retention: a harvest system based on the retention of structural elements or biological legacies (e.g., retain tree species and diameters present at older growth stages, snags, large downed logs, etc.) from the harvested stand for integration into the new stand to achieve various ecological objectives. ***Aggregate retention*** retains these structural elements in small patches or clumps within the harvest unit. ***Dispersed retention*** retains these structural elements as individual trees scattered throughout the harvest unit.

Vegetation growth stage: The vegetative condition of an ecosystem resulting from natural succession and natural disturbance, expressed as vegetative composition, structure and years since disturbance. The vegetation growth stage describes both the successional changes (i.e., the change in the presence of different tree species over time) and developmental changes (i.e., the change in stand structure overtime due to the regeneration, growth, and mortality of trees). Vegetation growth stages express themselves along the successional pathways for a particular ecosystem depending on the type and level of natural disturbance that has occurred. Forest tree and other vegetation composition, habitat features, and wildlife species use change with the various growth stages.

Vegetation management plan: In the process of developing the 10-year stand examination list, many decisions and considerations go beyond identifying what timber will be cut (i.e., broader than timber management). This includes designation of old-growth forests, extended rotation forests, ecologically important lowland conifers, patches, special management areas, visually sensitive travel corridors, etc., all of which are intended to address wildlife habitat, biodiversity, aesthetic, and other concerns. Prescriptions assigned to stands reflect decisions based on these multiple considerations and are broader than decisions relative to final harvest (e.g., ERF designation, uneven-aged management, thinning, regeneration, underplanting, prescribed burning, etc.).

Viable populations: The number of individuals of a species sufficient to ensure the long-term existence of the species in natural, self-sustaining populations that are adequately distributed throughout their range.

Volume: The amount of wood in a tree or stand according to some unit of measurement (board feet, cubic feet, cords), or some standard of use (pulpwood, sawtimber, etc.).

Well stocked: The situation in which a forest stand contains trees spaced widely enough to prevent competition yet closely enough to utilize the entire site.
Wildlife management area (WMA): Areas established by the Department of Natural Resources, Section of Wildlife, to manage, preserve and restore natural communities, perpetuate wildlife populations, and provide recreational and educational opportunities.

Windthrow: A tree pushed over by the wind. Windthrows are more common among shallow-rooted species.

APPENDIX W

Acronyms

AFRMP	Area Forest Resource Management Plan
BT	Bearing Tree
CMAI	Culmination of Mean Annual Increment
CMT	Commissioner's Management Team
CP	Chippewa Plains
CPPM	Chippewa Plains/Pine Moraines and Outwash Plains
CSA	Cooperative Stand Assessment
CWCS	Comprehensive Wildlife Conservation Strategy
DBH	Diameter at Breast Height
DFC	Desired Future Condition
DFFC	Desired Future Forest Composition
DMT	Division Management Team
DNR	Department of Natural Resources
DOQ	Digital Orthophoto Quadrangle
DRG	Digital Raster Graphics
ECS	Ecological Classification System
EILC	Ecologically Important Lowland Conifers
ELCP	Ecological Land Classification Program
ERF	Extended Rotation Forestry
ETS	Endangered, Threatened, or Special Concern
FIA	Forest Inventory and Analysis
FIM	Forest Inventory Module
FORIST	Forest Information System
FRIT	Forest Resource Issues Team
FTC	Forest Tent Caterpillar
FY	Fiscal Year
GAP	Gap Analysis Program
GEIS	Generic Environmental Impact Statement
GIS	Geographic Information System
GM	Gypsy Moth
HRLV	High Risk/Low Volume
HWDs	Hardwoods
LSA	Landscape Study Area
LSL	Laminated Strand Lumber
LTA	Land Type Association
MACLC	Minnesota Association of County Land Commissioners
MAI	Mean Annual Increment
MBF	Thousand Board Feet
MCBS	Minnesota County Biological Survey
MFRC	Minnesota Forest Resources Council
MFRP	Minnesota Forest Resources Plan
MnTAXA	Minnesota Taxonomy Database
MnWRAP	Minnesota Wildlife Resource Assessment Project
NAPP	National Aerial Photography Program

NAR	Natural Area Registry Agreement
NCFES	North Central Forest Experiment Station
NHIS	Natural Heritage Information System
NHNRP	Natural Heritage & Nongame Research Program
NPC	Native Plant Community
NRCS	Natural Resource Conservation Service
OFMC	Old Forest Management Complex
OHV	Off-Highway Vehicles
OSB	Oriented Strand Board
PM	Pine Moraines and Outwash Plains
RMT	Regional Management Team
RMZ	Riparian Management Zone
RNAs	Research Natural Areas
RNV	Range of Natural Variability
SFRMP	Subsection Forest Resource Management Plan
SGCN	Species in Greatest Conservation Need
SI	Site Index
SMC	Special Management Complex
SMZ	Special Management Area
SNA	Scientific and Natural Area
SNN	Shipstead-Newton-Nolan Act
SONAR	Statement of Need and Reasonableness
SPP	Species
SRM	Silviculture and Roads Module
TMP	Timber Management Plan
TMPIS	Timber Management Plan Information System
TNC	The Nature Conservancy
WMA	Wildlife Management Area

APPENDIX X

Response to Public Comments from *CP-PMOP SFRMP Draft Plan*

1.1 Background

A public comment period for the Chippewa Plains / Pine Moraines and Outwash Plains Draft SFRMP started on August 25, 2008 and ended October 10, 2008. Comments were accepted via letter, email, or fax (a list of individuals and organizations that submitted comments is found at the end of this Appendix). The Comments submitted are grouped into forest management issues as organized in the Draft CP-PMOP SFRMP. Each Comment below is recited from the submitted comments. The complete correspondence is available by contacting the Department. For each Comment, a Response is provided followed by supporting General Direction Statements and Strategies taken from the CP-PMOP SFRMP. These statements are included to further clarify the Department's direction and policy concerning the specific Comment offered. Where appropriate, Action resulting from the Comment is also identified.

1.2 Issue Specific Comments

Comments relating to the Issue of <u>Age Classes:</u>

1. ***SFRMP restricts timber availability via a variety of constraints placed on the modeling process (including misapplication of extended rotation forestry).***

2. ***The DNR needs to identify which constraints have the greatest impact on timber outputs and work to minimize impacts of these constraints.***

Response:

The Department perceives these two issues as primarily timber volume questions from the Minnesota Forests Industries and the Minnesota Timber Producers Association (MFI/TPA). From these Comments it is perceived that the constraints and model used by MFI/TPA results in different volume projections than identified in the CP-PMOP SFRMP. The Department's response to these Comments centers on clarifications on volume, both in acres and cords, as projected in the CP-PMOP SFRMP. The acres and cords resulting from the MFI/TPA model are compared with acres and cords as projected in the CP-PMOP SFRMP using two methods of projecting volumes: the historical Department method based on selected acres and associated FIM data, and projections resulting from applying the Walters-Ek volume estimating method.

MFI/TPA Effective ERF model projects the volume by cords resulting from the 10-Year Stand Exam List as included in the CP-PMOP SFRMP at an annual average of 136,862 cords. When all prescriptions are considered (Partial Cut, Field Visits etc.), the CP-PMOP SFRMP projected cords resulting from harvests of the 10-Year Stand Exam List are at an annual average ranging from 104,259 to 134,132 (see Table 3.9e, page 3.66 of the Final Plan). The higher projection results from application of the Walters-Ek volume-estimating model. Total annual cords, as projected by MFI/TPA, compared to cords projected under the Walters-Ek method are very consistent, 136,000 compared to 134,000 cords (see Table 3.9e on page 3.66).

MFI/TPA's model projects the total acreage to be harvested to be 9.409 acres under Maximum Timber Scenario and 6,140 acres under MFI Effective ERF Scenario (annual average over the 10-year planning period). These acreage projections are then compared with the even aged acreage projection of 4,800 average annual acres taken from the CP-PMOP SFRMP. The 4,800 acre projection does not consider stands with prescriptions of Partial Cut or Field Visit. As shown on Table 3.9d, (page 3.64) considering all prescriptions (Even Aged Harvest, Partial Cut and Field Visit) the CP-PMOP SFRMP projects total acres to be to 9,288 (Final Plan, very near the MFI Maximum Timber Scenario of 9,409 acres). Although the total acres are similar, the volumes differ greatly between the MFI/TPA estimate and DNR's estimates (FIM based method) due in large part to very different assumptions made about volumes from those acres (e.g.,

MFI/TPA assumes clear-cut harvest of cover types DNR manages primarily via uneven-age management, such as northern & lowland hardwoods, white pine; MFI also assumes full volumes from all stands, while DNR assumes reduced volumes from stands receiving a "field visit" preliminary prescription).

Identified below is a revised Table 3.9f taken from the Final CP-PMOP SFRMP and shows that the total average annual harvest in cords resulting from the CP-PMOP SFRMP will range from 104,259 to 134,132 cords compared with the MFI Effective ERF scenario of 136,862. The high CP-PMOP SFRMP projection is derived from application of the Walters-Ek yield equations in estimating timber volume and is presumably the same or similar to the yield equations applied by MFI/TPA. There is not significant difference between CP-PMOP SFRMP and the MFI/TPA projections.

Table 3.9f Summary Estimated CP-PMOP Annual Treatment (cords) Compared With Past Area Volumes (cords)

Cover types	Past Area Volumes[2] 1995 – 2004	Projected Annual Treatment[1] 2009 – 2017 Dept FIM-based	Walters-Ek
Even-aged			
Aspen/BG	64,090	53,270	69,823
Birch	6,555	4,302	6,386
Jack Pine	10,708	6,445	8,288
Balsam Fir	4,410	2,290	2,926
Tamarack	3,780	7,510	8,081
BLS both site indexes	1,699	2,287	3,444
Oak both site indexes	4,191	8,617	12,382
Red (Norway) Pine	4,867	11,112	13,566
White Spruce	941	3,027	1,790
Cedar	194		
Uneven-aged			
NH	3,238	3,830	5,224
Ash / Llhw	---	967	1,352
White Pine	232	601	871
Total	**104,905**	**104,295**	**134,132**

[1] 10-year planned volumes divided equally over plan years
[2] annual average of volume sold over the 10 year period
[3] includes scotch pine acres

To summarize, specific key inputs to the MFI/TPA model that are different than inputs used in the CP-PMOP treatment models will result in different outcomes. Specifically the following differences are noted:

- Available timberland acres appear to be substantially different (i.e., greater) (e.g., aspen/BG 8% higher, jack pine nearly 25% higher)
- The current age class distributions used were substantially different, with MFI/TPA assuming substantial additional acres in mature age classes.
- Assumed harvest volumes per acre were substantially higher than used by DNR (e.g., aspen/BG at 25 cords/acre vs.19 cords/acre; jack pine at 20 cords/acres vs. 17 cords/acre)
- MFI/TPA model appears to assume even-aged harvests in types DNR is managing primarily through uneven-aged systems (e.g., hardwoods, white pine).

- MFI/TPA model assumes full volume in all stands, while DNR reduces volume estimates for stands assigned a preliminary prescription of "field visit."

With all of the modeling discrepancies and differences, it is difficult to filter out all of the "noise" to allow apples to apples comparisons. However, even with the additional acres (and mature acres) assumed in the MFI/TPA model, DNR's annual acres being visited for potential final regeneration harvest is about the same as in the MFI/TPA ERF model (i.e., 6,174 vs. 6, 147) and total DNR annual acres being examined is more than the MFI/TPA maximum timber model (i.e., 9,489 vs. 9,409).

Concerning the Comment referencing misapplication of ERF, all SFRMP teams receive and are required to follow the same direction on application of the *DNR's ERF Guidelines*. The *1994 DNR ERF Guidelines* remains the primary policy document guiding ERF, but has been supplemented by several Commissioner's Office or FRIT memos and guidance documents intended to clarify the application and operational implementation of the *ERF Guideline*. None of the supplemental guidance is viewed as substantially altering the scope or intent of the original *Guidelines*, but rather were provided to facilitate the implementation of the *Guideline* in a more efficient and effective manner.

Rotation ages by cover type noted in the *1994 ERF Guidelines* are provided as a recommended average. The *Guidelines* suggested a minimum of 10 percent Prescribed ERF as a qualified target acknowledging that this minimum figure will vary in different landscapes across the state. In some cases, the *Guidelines* indicate that it may be appropriate to manage more than 50 percent of the timberlands as Prescribed ERF to achieve desired future condition goals (e.g., effective ERF goals.

In establishing ERF percentages, the CP-PMOP SFRMP Prescribed ERF and Effective ERF strategies resulted from:

- the need to provide for a sustainable and adequate acreage of old forest on the landscape over time, including modeling the expected availability of old forest into the future;
- the need to specifically identify which areas will be managed to provide old forest conditions to plan in advance when stands should be harvested;
- the desire to continue to manage ERF stands for forest products;
- the desire to designate areas as ERF to assure that regeneration to desired cover types is not jeopardized when they are harvested at a later age;
- the desire to prescribe/designate ERF in specific areas, such as in old forest management complexes and riparian areas.

It is important to note that the identification of ERF on Department administered lands does not remove timberlands from forest production. Designation of a timber stand to be managed as ERF specifically requires that forest management, including final regeneration timber harvest, occur on these stands.

The Department finds that the intent of extended rotation forests as established in the *1994 ERF Guidelines* and additional guidance have been appropriately applied in the CP-PMOP SFRMP.

Action resulting from the Comment:
Final CP-PMOP SFRMP is revised and clarifies that Table 3.9d and Table 3.9e states that the projected cords include estimates resulting from all prescriptions tagged on the 10-Year Stand Exam List.

3. An analysis of the economic impacts of the constraints should additionally be provided. The plan did not properly assess the impacts of these constraints to regional economies and timber productivity and production.

Response:

The Department considers this Comment to be a question relating to volume and whether the CP-PMOP SFRMP appropriately identifies the volume (either in acres or cords) as should be expected from the inventory. As stated above the volume differences in both acres and cords is not significant between the MFI/TPA projections (Effective ERF Scenario) and those contained in Table 3.9f, page 3.67 of the CP-PMOP SFRMP (Walters-Ek method). Table 3.9f projects the volume in cords using the traditional Department method of estimating volume from acres and FIM data and also projects the anticipated volume using the Walters-Ek yield equation applied to the suite of selected stands. It is the Department's understanding that the yield tables employed in the REMSOFT forest modeling software used by MFI/TPA is similar to Walters-Ek yield equations, but not identical.

That table shows that implementation of the CP-PMOP SFRMP results in total annual timber volumes of 134,132 cords (Walters-Ek) compared with MFI's projection of 136,832 cords for the Effective ERF Scenario.

Although the differences in projected timber volumes (Walters-Ek method) is not significant, the differences may be significant when compared to MFI/TPA's modeling that applies different assumptions about ERF and rotation ages than used in the CP-PMOP SFRMP. The Department notes that by statute, policy, and directive many goals are required to be taken into consideration in addition to producing wood products. Given the Department's long-term perspective and the requirement to accommodate multiple forest users, the Department must implement multiple forest management objectives for both the near and long term. The CP-PMOP SFRMP has considered such issues as rotation ages, ERF, and harvest levels to increase timber productivity in the CP-PMOP subsections, but must balance this with the need to consider effects on wildlife habitat, recreational values, ecological, cultural resources and sustainability.

Treatment levels resulting from modeled inputs used by MFI/TPA that are different from those used in the CP-PMOP SFRMP would produce different outcomes. Inputs such as rotation ages and the amount of prescribed ERF are factors that differ between MFI/TPA modeling and the inputs used in the CP-PMOP SFRMP treatment level spreadsheets. The Prescribed ERF levels shown on Table 3.1d (page 3.12 of the CP-PMOP SFRMP) are necessary to achieve the desired Effective ERF for each cover type. As shown in the Chapter 4 tables of *Treatment Summary by Decade* for each cover type, the Effective ERF falls below 10% for various decades for various cover types. The 10% Effective ERF was identified as a starting discussion point from which effective ERF goals would be developed since, based on previous ERF discussions and debates, this is usually considered to be a critical threshold based on the habitat needs of associated wildlife species.

A stable supply of timber is one of the many factors that were considered as treatment levels were developed. Other factors considered were: existing age-class imbalances for even-aged cover types; amount of acres over rotation age; representation of old and young forest; cover type conversion goals; and uneven-aged management and thinning.

A sustainable supply of quality timber resources is one of the CP-PMOP SFRMP plan goals. Strategies and specific cover type management recommendations are identified in the CP-PMOP SFRMP to increase productivity and to promote higher quality timber. The demand for resources from the CP and PMOP subsections to supply the forest products industries, and the jobs these industries provide are considered in establishing treatment levels and are vital to local and state economies. The Department is charged with balancing these economic objectives with other objectives such as maintaining forest composition, old-forest habitats, and within-stand diversity. To adequately address the concerns of all users of Department administered lands the CP-PMOP

SFRMP balances objectives that maximize timber quality and productivity with the forest resource objectives of other users. In some instances Department lands may not be managed for maximum timber production in an effort to accommodate other management objectives as outlined in the CP-PMOP SFRMP.

The *Sustainable Forest Resources Management Act* established a process by which broad landscape level goals including fostering economic productivity through timber products would be established and implemented by all public and private forest land managers. The broad goals of the *Act* considered the widest range of forest management objectives practicable. The CP-PMOP SFRMP DFFCs are consistent with the broad landscape level directions established in the *MFRC's North Central Landscape Plan.* The CP-PMOP SFRMP considered a wide range of forest management issues that have potential to impact local and statewide economies, game species, habitat, and recreation when determining the DFFCs and overall goals of the CP-PMOP SFRMP.

The forests of the CP and PMOP subsections are vitally important to both the forest products and tourism industries, and when balanced appropriately the demands from these two industries are compatible. Forest management for only timber production impacts other economic development strategies such as tourism, optimum wildlife habitat that supports hunting, recreational and residential development and business growth. The positive economic impacts from these industries is difficult to measure and quantify for inclusion in the CP-PMOP SFRMP. The CP-PMOP SFRMP identifies strategies and vegetation management efforts to achieve optimum timber production while reducing these impacts through the use of the site-level forest management guidelines and proper timber sale design. Timber harvests are designed to balance maximum volumes while minimizing impacts on aesthetics, water quality, rare plant communities and wildlife, and cultural resources.

The constraints as referred to in the Comment are interpreted to mean the inputs used to model the CP-PMOP SFRMP treatment levels. The primary inputs that have lead to the treatment levels recommended in the CP-PMOP SFRMP can be reviewed in Chapter 3 and Chapter 4. Of particular interest are the Stand Selection Criteria identified for each cover type as outlined in Chapter 4.

The constraints also are interpreted to include stands that are removed from consideration for timber harvest by statute, rule or existing Department policy. This includes state parks, SNAs, DNR-designated old growth, and designated EILC (although identification of EILC does not reduce timber harvest in affected lowland conifer types for the 10-year planning period). In addition, by policy (*DNR White Pine Management Policy*), white pine on DNR timberlands (i.e., not otherwise reserved) is to be managed as extended rotation forest and other strategies as described in the policy. These strategies do not reserve white pine from harvest, but limit harvests in the white pine cover type to thinning, selective harvest, shelterwood or seed tree harvest. The CP-PMOP SFRMP must incorporate all adopted statute, policy and directives guiding forest vegetation management on state timberlands.

To the remaining inventory, treatment levels were determined based on the DFFCs, Strategies and guidelines as developed by the Department including rotation ages and extended rotation forests.

The treatment levels, as projected in the CP-PMOP SFRMP for the plan implementation period propose essentially equal or higher harvest levels than historical levels from the period of 1995 to 2004. Historical annual average (1995 to 2004) was 104,905 cords with the projected (2009 to 2018) annual average volume ranging from 104,259 to 134,132 cords per year. In terms of the historical volumes, it should be noted that the traditional Department method of estimating cords from acres proves to be a conservative estimate. Actual resulting sales volumes increase from the cords estimated (meaning the acres that are estimated to result in 104,259 cords will likely result in higher actual volumes harvested.

While individual SFRMPs are not intended to prepare subsection specific cost analysis, DNR has examined the effects of various levels of prescribed ERF and rotation ages on potential harvest volumes. DNR ERF modeling indicates that using 20% prescribed ERF and the MFI/TPA suggested rotation ages increases estimated long-term annual harvest acreage and volume by 5-6%. This is consistent with similar statewide analyses (i.e., million cord analysis). At the same time, however, long-term old forest amounts would drop to 5-8%.

Representative GDS from the CP-PMOP SFRMP:

Forest resources will continue to represent multiple age classes, distributed across the landscape.

4. The SFRMP management plan recommends an overall ERF application of 37 percent. This proposal is approximately two times greater than what the MN GEIS modeled of 20 percent

Response:

Table 3.1d (page 3.12) identifies the Prescribed and Effective ERF percent goals and acres by individual cover type. This Table mistakenly can be interpreted to mean that for all cover types, 37% be applied as the amount of ERF on the landscape. This 37% figure actually refers only to Prescribed ERF for the tamarack cover type to achieve an Effective ERF in tamarack of 14%. In addition to the amount of prescribed ERF other factors must be considered when evaluating potential implications for long-term timber harvest volumes. Birch, for example has a desired effective ERF goal of 12.5% (dramatically lower than the current 89% above normal rotation age). But since the normal rotation age (i.e., 50 years) is so close to the maximum rotation age (i.e., 65 years, less than the average minimum extended rotation age recommended in the *DNR ERF Guideline* for birch), the amount of prescribed ERF needed is 55%. If birch had a longer maximum rotation age, the amount of prescribed ERF needed to achieve 12.5% effective ERF would be lower, but the average ERF and overall harvest age would be greater. Similarly, Aspen/BG has a desired effective ERF goal of 13.5% (significantly lower than the current 28% beyond normal rotation age), but requires only 30% prescribed ERF to achieve this (with a weighted normal rotation age of 41.5 and a weighted maximum rotation age of 76.5).

Current levels of timberland beyond normal rotation age in many of the cover types (i.e., those managed primarily via even-aged systems) further clouds and reduces the impacts of prescribed and effective ERF levels on potential timber harvest volumes over the immediate 10-year period. Over 35% of these timberlands are currently beyond normal rotation age. A more significant factor and consideration in proposed treatment levels in the first 10-year period is the desire to improve current age-class distributions and move towards the desired, more balanced age-class distribution.

The percentage of state timberlands managed as extended rotation forests was provided by a Statewide ERF Workgroup**.** As such, the amount of ERF, to be applied to the landscape was provided to the CP-PMOP SFRMP team as an input to help determine desired treatment levels. The Effective ERF for all cover types managed primarily via even-aged systems is shown on Table 3.1d (page 3.12 of the CP-PMOP SFRMP) and ranges from 10 to 25 percent, with an overall average of about 15%.

GEIS did not identify 20% (Prescribed ERF) as a recommended or correct amount of ERF needed, but rather was used as a reasonable model assumption of what might be applied by the state and USFS. . This is a rough modeling assumption used to project changes in forest age-class distributions over the 50-year modeling horizon. Twenty-percent was not intended to be the "correct" or "target amount" of ERF, but rather a reasonable assumption of what might eventually be managed as ERF on state and federal lands, noting that the DNR *ERF Guideline* was not yet completed when the GEIS was developed. The GEIS did not conclude that 20% ERF was adequate, and in fact still identified numerous potential significant impacts with this and other second model run assumptions in place. When 20% prescribed ERF is applied, the long-term

effective ERF levels on DNR timberlands drop to 5-8% for most types. This is significantly below the 10% "effective" ERF level that, based on ongoing SFRMP ERF discussions, appears to be a critical threshold for wildlife habitat (i.e., in general, there are substantial habitat concerns if effective ERF falls below 10%).

Representative Strategies from the CP-PMOP SFRMP:

4. Designate ERF stands in the amounts and percentages prescribed by the Statewide ERF Work Group.

5. Distribute ERF stands across the landscape consistent with ERF policy.

6. Prescribe ERF stands across all age classes to maintain a constant supply of effective ERF.

123. Achieve a declining age-class structure in ERF stands from normal rotation age through maximum rotation age.

Action resulting from the Comment:

Table 3.1d is revised in the Final CP-PMOP SFRMP to clarify that 37% refers only to Prescribed ERF in the tamarack cover type.

5. MFI recommends that the DNR implement ERF guidelines as modeled in the GEIS and as per the DNR guideline recommendations

Response:

This Comment suggests that the average recommended normal rotation ages and extended rotation ages contained in the *1994 ERF Guideline* be used in the CP-PMOP SFRMP without review or evaluation. The Department has not proposed that the average recommended rotation ages in the *1994 ERF Guideline* be followed everywhere in the state. The normal rotation ages and maximum rotation ages used in the CP-PMOP SFRMP were developed by the subsection Rotation Age Workgroup. This Workgroup developed the normal and maximum ages based on local timber productivity information, culmination of Mean Annual Increment (MAI) in particular with consideration of Periodic Annual Increment (PAI), together with local knowledge of site productivity and stand conditions. Since the inception of the DNR *ERF Guidelines*, the Department has consistently provided that relevant local data and field experience should be considered to establish appropriate normal rotation ages Department forest management planning (i.e., first in Area timber management plans, now in SFRMPs.

Representative Strategies from the CP-PMOP SFRMP:

4. Designate ERF stands in the amounts and percentages prescribed by the Statewide ERF Work Group.

5. Distribute ERF stands across the landscape consistent with ERF policy.

6. Prescribe ERF stands across all age classes to maintain a constant supply of effective ERF.

123. Achieve a declining age-class structure in ERF stands from normal rotation age through maximum rotation age.

6. ***At the current harvest levels Minnesota's forests will continue to increase in age. The significance of providing ERF at current harvest levels is highly questionable***

Response:
As shown in the tables in Chapter 4 identifying *Treatment Summary by Decade* by cover type, the average age of treated acres on DNR lands falls for each decade over the 50 year period for all cover types except red pine (all decades) and white spruce (in later decades). The average treatment age increases for red pine and white spruce reflects the lack of older age classes for these types (i.e., many acres of planted forests in these types, many originating over the past 40-50 years) and the CP-PMOP SFRMP DFFC of maintaining more, older longer-lived conifers on the landscape. As noted elsewhere, there are currently over 35% of even-aged forest types beyond normal rotation age, with a goal of reducing that to about 15% over time. DNR forest lands in these subsections will be getting younger, assuming timber markets remain viable.

One of the primary DFFCs is to maintain a sustainable harvest level and a sustainable amount of ERF. The sustained level of harvest and ERF is accomplished by establishing a balanced age class distribution in each even-aged cover type. One goal of the CP-PMOP SFRMP is to maintain at least 10% of each cover type as Effective ERF each decade, (i.e. between normal rotation and maximum rotation age). Maximum rotation is the age at which a harvest will yield a marketable product, and the stand still has the capability of regenerating to the same cover type. As shown in Chapter 4 tables outlining the *Treatment Summary by Decade,* due to the current age-class distribution, several cover types did not achieve the desired goal of 10% Effective ERF for each decade.

Under multiple use directives, including the *Sustainable Forest Resources Management Act*, a broad range of forest users must be accommodated as forest vegetative management is applied to state timberlands.

Representative Strategies from the CP-PMOP SFRMP:

6. Prescribe ERF stands across all age classes to maintain a constant supply of effective ERF.

123. Achieve a declining age-class structure in ERF stands from normal rotation age through maximum rotation age.

Action resulting from the Comment:
Chapter 4, *Cover Type Management Recommendations*, has been revised to clarify that the average age of treated acres falls for all cover types except red pine and white spruce.

7. ***the SFRMP proposes to manage 30 percent of its aspen forestlands to a rotation age that will have high mortality rates and low productivity***

Response:
Rotation ages were provided as inputs into the CP-PMOP SFRMP treatment model spreadsheets. The normal rotation ages provided evaluated several factors among them applying the peak of MAI, applying PAI and field knowledge to produce rotation ages as identified on Table 3.1c (page 3.11of the CP-PMOP SFRMP). The amount of aspen/BG type beyond normal rotation age is expected to drop from the current 28% to 16% by the end of the first 10-year planning period, with the long-term goal being 13.5%.

The rotation ages, as provided, used the peak of MAI to determine normal rotation age so harvesting occurs when average growth starts to decline. By harvesting a stand at this time, rather than waiting until later in the life cycle, high productivity of timber values is maintained for a particular site. MAI measures are based on stand volume estimates usually derived from outside

diameter measurements taken at breast height and tree height. MAI from FIA data is based on net volume (gross growth minus defect/decay/mortality). Normal-rotation acres will be managed using rotation ages considering MAI.

In addition to rotation ages, ERF percentages will influence the overall ages by cover type. Direction for addressing ERF stands in SFRMPs comes from the *1994 DNR Extended Rotation Forest Guideline* and additional process direction provided to SFRMP teams (Revised *Process for Addressing ERF in SFRMP, February 11, 2002*).

As provided in the *1994 ERF Guideline,* a portion of all cover types will be managed as extended rotation forests. ERF targets applied to the CP-PMOP SFRMP were supplied by the Statewide ERF Workgroup. As stated in the CP-PMOP SFRMP, to achieve the long-term Effective ERF goal of 13.5% in aspen amount of the aspen type that needs to be identified across all age-classes to be managed to an extended rotation age (i.e., Prescribed ERF, the tool DNR uses to assure that the Effective ERF goal is achieved/sustained) is 30%. With multiple harvest ages between the normal rotation age and maximum rotation age, DNR staff will work to schedule harvest of individual ERF stands so that mortality and productivity losses are minimized.

It is important to note that the overall weighted rotation age for aspen/BG is projected to be about 50 years, with 70% of the aspen/BG type being managed to an average normal rotation age of 41.5 years. Some portion of the aspen/BG ERF stands will be managed to a maximum rotation age of roughly 75 years, which will result in some loss of timber quality via decay and mortality. However, these are the characteristics that make such older forests attractive and necessary habitat for certain suites of wildlife species.

Prescribed ERF is the cover type acreage designated for management as ERF. Stands prescribed as ERF will be held beyond the recommended normal rotation age out to the maximum rotation age. It should be noted that prescribed ERF stands can be of any age class. The amount of prescribed ERF by cover type was determined by modeling to provide the desired amount of effective ERF by cover type.

In the CP and PMOP subsections, the goal is to maintain approximately 15% of the even-aged managed timberlands as effective ERF. Considering the current age class distribution, approximately 35% must be prescribed ERF. The DNR's ERF process requires designation of a percentage of managed timberlands as prescribed ERF (ERF stands are not reserved from harvest treatments). While it is correct that 30% of aspen acres in the CP-PMOP SFRMP are designated as prescribed ERF, a significant portion of those acres will be younger than the normal rotation age at all times. The amount of prescribed ERF that is over normal rotation age is the effective ERF. In the CP-PMOP SFRMP the effective ERF goal of aspen/balm of Gilead is 13.5%. To meet the overall long-term goal of 13.5% effective ERF, 30% of the aspen/balm of Gilead acres needed to be designated as prescribed ERF.

Using aspen as an example, the average age of treated acres will drop from 73 years to 50 years during the 10 year plan implementation period. For all cover types the net result of implementation of the CP-PMOP SFRMP will be a reduction of the amount of acres over the normal rotation age from what currently exists in the subsections. Priority has been given to placing stands on the 10-Year Stand Exam List that are over normal rotation ages.

Representative Strategies from the CP-PMOP SFRMP:

158. Implement efforts to salvage usable timber stumpage from damaged stands in a timely manner to minimize losses due to decay and staining.

8. The SFRMP should disclose the costs of exceeding the intent of ERF management

Response:
The application of the DNR ERF Guideline in the CP-PMOP SFRMP is consistent with how DNR has interpreted and applied the 1994 Guidelines (and subsequent guidance documents) since they were adopted. Specifically, this means directing staff to adjust rotation ages based on local timber productivity data and establish ERF amounts based on landscape-specific conditions and goals.

Although effective ERF may appear high in the early decades of the 50 year period, these levels are a product primarily of the current age class distribution of various cover types and the goal to achieve a balanced age class distribution for even aged managed cover types at some point during the 50 year planning period. Some cover types will require several rotations based on their current age-class structure and rotation ages.

The *Sustainable Forest Resources Management Act* directs the Department to manage for sustainability of all forests, including older forests. The purpose of ERF management is to provide age diversity in all forest types across the landscape for a multitude of forest benefits. ERF is a tool to provide old-forest conditions while not withdrawing acres of forest from timber production.

The percentage of timberland identified as prescribed ERF was based on a goal to have a certain amount of the forest (i.e., ranging from 10-15% for most types) beyond the identified normal rotation age (i.e., effective ERF) at any point in time in the future once the cover type's desired age-class distribution is achieved.

The policy and directives outlining the responsibilities to reflect ERF in SFRMPs is established in the *1994 ERF Guidelines* and subsequent guidance documents. The ERF ages established in the CP-PMOP SFRMP are consistent and were approved as an interim step in development of the CP-PMOP SFRMP. The Plan reflects the ERF policy of the Department. While individual SFRMPs are not intended to prepare subsection specific cost analysis, DNR has examined the effects of various levels of prescribed ERF and rotation ages on potential harvest volumes. DNR ERF modeling indicates that using 20% prescribed ERF and MFI/TPA suggested rotation ages increases estimated long-term annual harvest acreage and volume by 5-6%. This is consistent with similar statewide analyses (i.e., million cord analysis). At the same time, however, long-term old forest amounts would drop to 5-8%.

Representative Strategies from the CP-PMOP SFRMP:

4. Designate ERF stands in the amounts and percentages prescribed by the Statewide ERF Work Group.

5. Distribute ERF stands across the landscape consistent with ERF policy.

6. Prescribe ERF stands across all age classes to maintain a constant supply of effective ERF.

Comments relating to the Issue of <u>Timber Quality and Quantity</u>

9. The DNR should consider a management strategy that recognizes the overmature jack pine and harvest these areas prior to further decline of timber volume and value

Response:
Regarding the jack pine cover type, given the number of older stands present on the landscape, the merchantable age (30 years), normal rotation age (40 years) and maximum rotation age (65 years), the CP-PMOP SFRMP represents a reasonable approach to targeting stands most in

need of treatment. The desire to improve productivity by quickly harvesting all older stands must be balanced with the need to provide a more or less even flow of timber products over time by balancing age classes.

In selecting stands to be included in the CP-PMOP SFRMP, a *Stand Scoring System* was employed which gives priority to stands that are beyond their normal rotation age (See Appendix K, *Stand Scoring System*). Within the inventory, the oldest jack pine stands received the highest scores indicating these stands were recommended as priority stands for treatment. Chapter 4, *Jack Pine Cover Type Management Recommendations* advises that the "emphasis is on treating the oldest age-classes to minimize loss of fiber to tree mortality. Very few stands should be allowed to go untreated beyond the maximum rotation age."

In addition to the jack pine stand selection criteria found in Chapter 4 and in the *Stand Scoring System*, the CP-PMOP SFRMP has identified several stand level Strategies designed to harvest stands impacted by infestations and diseases. Historically, as infestations, disease, and events have impacted cover types in general or particular stands, the Department has responded with efforts to offer salvage sales to capture the volume, before decay or loss, as much as possible.

Summarizing, the management strategies used for all cover types to identify stands at the optimum age and avoid allowing cover types to overmature includes: applying rotation ages as an input into the treatment level spreadsheets to establish subsection treatment levels; applying stand selection criteria to all cover type inventories; applying a stand scoring system to give higher priority to the oldest stands; and responding to events through timber salvage sales.

Representative GDS from the CP-PMOP SFRMP:

Forests will be managed to increase overall timber productivity.

Representative Strategy from the CP-PMOP SFRMP:

158. Implement efforts to salvage usable timber stumpage from damaged stands in a timely manner to minimize losses due to decay and staining.

10. The SFRMP needs to review the management prescriptions for this covertype (jack pine). A scenario that captures timber value and volume prior to mortality should be implemented.

Response:

Historically in some Forestry Areas within the CP and PMOP subsections, jack pine was managed at a treatment age of 60 years. Experience has shown that with this age some stands succumb to diseases and windthrow with subsequent loss of harvest volume. As part of the SFRMP planning process, subsection planning teams are provided with latitude to establish rotation ages reflecting local conditions and past experience. In the CP-PMOP SFRMP the normal rotation age for jack pine has been lowered from the historical 60 years to 40 years in an effort to treat and harvest before diseases and windthrow affected volume. Treatment levels identified in the CP-PMOP SFRMP for jack pine reflect the lowered normal rotation age of 40 years in both the Chippewa Plains and in the Pine Moraines and Outwash Plains subsections.

Further as previously stated, a *Stand Scoring System* (Appendix K, CP-PMOP SFRMP) was employed in selecting stands to be placed on the 10-Year Stand Exam List. That *Stand Scoring System* gave priority and placed higher scores on older jack pine stands.

The strategy employed then in the CP-PMOP SFRMP is to reduce the normal rotation age from 60 years to 40 years and to place a higher priority on treating older stands. A strategy specific to jack pine to avoid decline of timber volume is outlined in Chapter 4 *Jack Pine Cover Type Management Recommendations* (page 4.57). This management strategy recognizes budworm as a limiting factor and provides several recommendations including salvage and pre-salvage

management. As stated, the Department has a long history of implementing salvage sales in response to disease and events that may affect harvest volumes.

Representative Strategies from the CP-PMOP SFRMP:

157. Evaluate large-scale (i.e., hundreds to thousands of acres) and small-scale (i.e., tens of acres) disturbance events to determine appropriate action.

158. Implement efforts to salvage usable timber stumpage from damaged stands in a timely manner to minimize losses due to decay and staining.

Action resulting from Comment:
Chapter 4, *Jack Pine Management Recommendations* (page 4.52) has been revised to emphasize that the normal rotation age for jack pine is lower in the CP-PMOP SFRMP than used in the past and that all older jack pine stands received a higher priority score to be placed on the 10-Year Stand Exam List.

11. SFRMP did not adequately consider the impacts of the constraints placed on timber management.

Response:
For purposes of responding to this Comment, constraints means rotation ages, ERF, designation of old growth, EILC and designation of OFMCs. Directives to accommodate all of these factors (constraints) have been adopted by the Department with requirements to reflect these in SFRMPs. In recommending treatment levels, the CP-PMOP SFRMP does not exceed any of these directives. The CP-PMOP SFRMP identifies the primary statutes, policy, guidelines and directives in place, which guided development of the CP-PMOP SFRMP (page 3.1). The more significant directives are discussed below:

The 1994 DNR *Old-Growth Forest Guideline* was developed via a stakeholder involvement process that led to consensus on old-growth forest goals by forest type by Ecological Classification System (ECS) subsection for DNR lands. Following the completion of the *Guideline*, the DNR undertook and completed an old-growth nomination, evaluation and designation process for DNR lands.

The 1994 DNR *Extended Rotation Forest (ERF) Guideline* was developed through a public and stakeholder input process. The primary purpose of the *ERF Guideline* is to provide adequate acres of forest cover types older than their normal rotation ages to provide for species and ecological processes that require older forest characteristics. During the SFRMP planning process, the *ERF Guideline* is to be applied to landscapes by designating specific forest stands for ERF management.

The statewide *ERF Guideline* establishes a starting point that 10 percent of the DNR Forestry- and Wildlife-administered timberlands within a subsection be managed as ERF. The CP-PMOP SFRMP goals were to maintain at least 10% ERF by cover type. Determining the amount of DNR timberlands to be managed as ERF within each subsection involves many considerations including wildlife habitat needs, visual and riparian corridors, and implications for timber production (both quantity and quality).

Normal rotation ages are established for each cover type managed primarily under even-aged silvicultural systems within the subsection based on site-quality characteristics related primarily to timber production (e.g., site index, growth rates, soils, insect and diseases, etc.). Maximum rotation ages for these cover types are also established based on the maximum age at which a stand will remain commercially viable as a marketable timber sale and retain its biological ability to regenerate to the same cover type.

The Department uses a variety of written vehicles (e.g., policies, guidelines, recommendations, memos, operational orders, agreements) to communicate vegetative management policy direction to all Department staff. These policy directions cover the broadest range of issues practical including: forest productivity, old-growth management, ecologically important lowland conifers, coordination among all Divisions, site-level mitigation, rare habitats and species, and extended rotation forest management. All of these plans, guidelines and processes are required to be considered and have been used to develop the CP-PMOP SFRMP. The CP-PMOP SFRMP must reflect statute and adopted Department policy. These directives may be viewed as constraints to timber production, but are required to be considered in SFRMPs.

Representative Strategies from the CP-PMOP SFRMP:

4. Designate ERF stands in the amounts and percentages prescribed by the Statewide ERF Work Group.

10. Manage designated old-growth stands and OFMCs according to individual OFMC plans and DNR *Old Growth Management Guidelines*.

124. Designate lowland conifer old growth from EILC stands and return undesignated stands to the harvest pool.

12. plan does not adequately address forest productivity. The SFRMP has failed to develop an active management strategy that would harvest overmature stands within the next 10 years.

Response:

In establishing and calculating treatment levels for each even aged managed cover types, the CP-PMOP SFRMP employs a Department developed spreadsheet model which takes into consideration all appropriate factors, leading to calculation of sustainable treatment levels. Factors included: DFFCs, cover type conversions, FIM inventory data, and, normal and extended rotation ages. Key factors applied to the spreadsheet model were identification of normal and maximum ages. Applying these factors to the FIM inventory allowed identification of a target of normal and mature aged stands from which stand selection occurred. Field staff and Team members were heavily involved in refining and finalizing treatment levels with the model so stand cover types were not lost due to age while maintaining old forest and balancing age classes. As stated above, a *Stand Scoring System* was also implemented to identify priorities of normal rotation and ERF stands for inclusion on the 10-Year Stand Exam List.

In addition to the spreadsheet model to establish cover type treatment targets, stand selection criteria developed for the CP-PMOP SFRMP specifically included consideration of stands that were near or over their rotation ages. Older stands were identified and given priority for treatment. For each of the cover types managed as even aged, Stand Selection Criteria identified that stands at or near normal age be given priority for selection onto the 10-Year Stand Exam List (see Chapter 4, *Cover Type Management Recommendations*, *Stand Selection Criteria).* For all even aged managed cover types, the *Stand Selection Criteria* identifies that the pool of stands to be considered includes all stands not reserved from harvest by statute or adopted policy; not designated to be managed as ERF; and near normal harvest rotation age.

To assist in identifying highest priority stands for treatment, Appendix K of the CP-PMOP SFRMP identifies a *Stand Scoring System.* The *Stand Scoring System* scored all stands over or within 10 years of their maximum rotation age. These stands were required to be placed on the 10-Year Stand Exam List. Further the *Scoring System* provided specific priority to stands that were over or within 10 years of normal rotation age, if any acres were selected in that age class.

To achieve forest productivity, the CP-PMOP SFRMP takes into consideration the conflicting demands of a multiple-use forest. Increasing industrial demands on forested lands provides

reason to manage acres for timber productivity. The CP-PMOP SFRMP identifies several strategies designed to maintain a particular site's timber productivity and growth rate at a high levels including: maintaining soil productivity; support research that maximizes timber productivity; improve stocking and stand composition; and, match tree species to the site characteristics, considering the wide range of factors that affect growth.

To address the concerns of all users of these subsections, the Department is precluded from management where the sole objective is to maximize timber productivity on state lands. Some lands will be managed for less timber productivity in order to address other management objectives such as ERF to maintain old-forest habitats.

Representative GDS from the CP-PMOP SFRMP:

Forests will be managed to increase overall timber productivity.

Representative Strategies from the CP-PMOP SFRMP:

72. Maintain the highest soil productivity possible by favoring regeneration and growth of native vegetation and trees using the MFRC *Voluntary Site-level Forest Management Guidelines*.

98. Increase the productivity and maintain the health of even-aged cover types.

102. Maintain the productivity of forest soils to favor regeneration and growth of native vegetation and trees.

136. Support research that maximizes timber productivity (e.g., optimal stocking levels, mixed species management, treatment timing) without impacting wildlife and plant species.

137. Apply management techniques to improve stocking and stand composition on general forestry lands.

Action resulting from Comment:

Chapter 4, *Cover Type Management Recommendations* of the Final CP-PMOP SFRMP has been revised to emphasize that the adopted Stand Selection Criteria resulted in identification of older stands based on rotation ages and maximum ages for purposes of inclusion on the 10-Year Stand Exam List. Further, Chapter 4 is revised to reference the *Stand Scoring System* and how the *System* prioritized stands based on age and designation (normal or ERF).

Comments relating to the Issue of <u>Forest Composition</u>:

13. recommends that old forest complexes not be incorporated in the SFRMP. ERF application should be used to provide for older forests.

Response:

The CP-PMOP SFRMP process does not include new directives to reserve timberlands from management. All timberlands permanently reserved from timber harvest or forest management are identified though other processes external to SFRMP (e.g., DNR old growth, SNA designation). In comprehensively managing forest vegetation, all past directives must be accommodated and taken into consideration as SFRMPs are prepared.

OFMCs are not new or unique to the CP-PMOP SFRMP. The history and concept of establishing old growth or old forest complexes/communities is first identified the *1994 DNR Old Growth Guideline,* the *1995 Addendum to the Old Growth Guideline*, *1994 GEIS Mitigation Strategies*

(i.e., connected OG with corridors of ERF), and the *2002 Report DNR's Old-Growth Forests Guideline Implementation Result.*

Identifying OFMCs is an effort to place prescribed ERF (i.e., to provide a matrix of stands managed to older ages around stands designated as old growth) and is required by Department policy. In the CP-PMOP SFRMP, ERF stands were identified adjacent to designated old growth. These designations (together with the 330 foot OG special management zone discussed below) were termed OFMCs (see Appendix D, *Process Used to Determine Old Forest Management Complexes*).

Designation of OFMCs does not increase the amount of ERF planned for the subsections (i.e., they are not in addition to the established ERF targets for a subsection). OFMCs are simply locational boundaries within which ERF can be placed on the landscape in an effort to achieve multiple goals (protecting the attributes of old growth while creating patches of older aged forests. OFMCs are comprised of designated old growth stands and stands surrounding the designated old growth stands that will be managed as ERF. ERFstands within the OFMC will be harvested with special guidelines within 330-foot special management zone of the old growth stand.

OFMCs were originally intended to be identified by Forestry Areas following completion of the OG designation process. However if not already completed, designation of OFMCs became part of the preparation steps for SFRMP (i.e., identifying OFMCs to aid in achieving some of the subsection's ERF targets).

Representative Strategies from the CP-PMOP SFRMP:

10. Continue to prescribe ERF stands adjacent to old growth to create OFMCs consistent with DNR OFMC policy.

11. Prescribe ERF stands in steep areas, inaccessible terrain, riparian areas, habitat areas, travel corridors, visual corridors to achieve desired old forest attributes consistent with DNR OFMC policy.

Action resulting from Comment:
Chapter 3 (page 3.15) of the Final CP-PMOP SFRMP has been revised to clarify that old forest management complexes were required under policy directives prior to development of the CP-PMOP SFRMP. OFMCs were included as part of the CP-PMOP SFRMP, but were required independent of the SFRMP process.

14. The DNR again fails to provide the rationale of reserving timberlands as EILC. The DNR needs to identify the importance of these areas, such as, which species will benefit.

Response:
The rationale for identifying and reserving ecologically important lowland conifer (EILC) in the CP-PMOP SFRMP is that in designating old growth stands through the *1994 DNR Old Growth Guidelines* process no old growth lowland conifer was included. The Department has directed staff to identify ecologically important lowland conifer (EILC) stands and reserve them from harvest until old growth lowland conifers are defined and incorporated in the *DNR Old-Growth Forest Guideline*. Acres of EILC are not removed from the commercial timberland base for the purposes of identifying desired treatment levels. Stands within EILC sites are reserved from harvest for the 10-year period, thus shifting the desired level of harvesting during that time period to other lowland conifer stands outside these identified EILC stands.

The designation of old-growth and future old-growth forest on DNR administered lands follows the process established by the DNR old-growth forest committee and documented in the *1994 Old-*

Growth Forest Guidelines and subsequent *Amendments Nos. 1-6*. Currently, the old-growth designation process does not address lowland conifer old growth in terms of acreage goals. However, the DNR old-growth forest committee identified the need to amend the *Guidelines* in the future to address old growth lowland conifers. Future old-growth guideline amendments will provide direction on lowland conifers as an old-growth type.
By Commissioner directive, SFRMP planning processes are to identify EILC and to defer these stands from treatment during the SFRMP plan implementation period. Stands deferred as EILC will be reviewed for continued protection at the beginning of the next cycle of subsection planning based on the old-growth forest *Guidelines* or other guidelines in place at that time.

The process for identifying the pool of stands as EILC and the method to establish acre goals for EILC to be deferred during the SFRMP implementation period is documented in the *SFRMP Guidebook* under Incorporating Rare Feature Information in SFRMP (May 6, 2002). According to *Guidebook* direction, Ecological Services staff is responsible to develop a pool of preliminary stands based primarily on the following criteria:

- Stands with CSA inventory types of BSL, SX, WC, CX, T, and TX
- Stands that appear to have not previously been harvested, generally with a CSA stand age > 100 years
- Stands located away from roads, ditches, and utility corridors
- Stands identified by MCBS/NHNRP that have an A or B rank as a native plant communities
- Stands that contain special landforms (e.g., ovoid islands).

Stands selected as EILC sites should be examples of high-quality native plant communities, represent the range of lowland conifer native plant communities found in the subsection, and be distributed in a representative fashion across the LTAs in the subsection (e.g., if a particular lowland conifer community type is found mostly in certain LTAs, then most of the acres of that type chosen as EILC should be in those LTAs). In designating specific stands as EILC wildlife species that will benefit include among others great gray owl, hawk owl, Connecticut Warbler, spruce grouse, northern bog lemming, and wintering yards for white-tailed deer.

The deferred EILC stands will be reviewed for continued protection at the beginning of the next cycle of SFRMP planning for these subsections or sooner if an amendment to DNR old-growth forests guideline regarding lowland conifers provides other direction. Lowland conifer cover type treatment acre calculations and treatment levels will be reviewed during the next 10-year planning process and adjusted as appropriate (see Appendix F, *Ecologically Important Lowland Conifers: Stand Designation Process*).

Action resulting from Comment
Chapter 3 of the Final CP-PMOP SFRMP (page 3.54) has been revised to clarify the process and intent of establishing EILC, and the species that benefit from identifying EILC habitat.

15. field surveys be conducted for threatened, endangered, and sensitive species on stands prior to assignment of final treatment

Response:
As the 10-Year Stand Exam List, Area Annual Stand Exam Lists and Stand Silvicultural Prescription Worksheets are prepared, DNR staff use all available information relative to threatened, endangered and sensitive species and consider this information as vegetation management decisions are made. Information on the distribution, abundance, and ecology of rare species, their habitats, and other rare features gathered by the DNR (Minnesota County Biological Survey and Natural Heritage and Nongame Research Program) provides much of the basis for determining the status of rare features in the state. The DNR acknowledges its

leadership role in advocating for maintaining habitat of rare features throughout the state, regardless of ownership, and in protecting and providing habitat for rare and threatened species on state lands (*Directions 2000, The Strategic Plan*).

Element occurrence information is maintained on the Natural Heritage data system that can be accessed by DNR personnel. These recorded locations are kept up-to-date, and are continually added to as data are received from qualified observers and from the County Biological Survey efforts. Appendix O, *Areas of High or Outstanding Biodiversity within the CP-PMOP* identifies where surveys have been completed and acreages of identified sites. Appendix J identifies *Native Plant Communities* and their S-Ranks as found in the CP and PMOP subsections. Where occurrences are known, forest management will incorporate best management practices for the species in question, consistent with the applicable state and federal laws.

At the time of preparation of the Draft CP-PMOP SFRMP, published MCBS sites of biodiversity significance were completed for two counties within the CP-PMOP subsections: Morrison and Mahnomen. Within these two counties exist 29 sites ranked as High or Outstanding Biodiversity. Of these 29 sites, six are located at least partially within state forest boundaries and were available as the CP-PMOP Plan and 10-Year Stand Exam List was prepared. In addition the 10-Year Stand Exam List was reviewed by Ecological Resources staff against other known but not yet published locations of biodiversity sites. The CP-PMOP team considered this review, and the resulting stand comments were incorporated into the 10-Year Stand Exam List Implementation Dataset. This information is available to field staff as stands are site visited and management objectives determined. MCBS information will be considered as Area Annual Plan Lists or Annual Plan Additions are prepared, and also as *Silvicultural Prescription Worksheets* are prepared. Further, up to the time of the actual timber sale, any new information can be incorporated into sale regulations for that particular stand.

Over the implementation period of this Plan new information and research will become available. All new information will be used as much as possible to guide future stand management decisions. Since completion of the Draft CP-PMOP SFRMP, Otter Tail and Todd counties' MCBS Surveys have been completed. As Area Annual Plan Exam Lists are prepared that affect these two counties, these newly completed MCBS Surveys will be consulted.

To ensure that all resources are used to identify threatened, endangered, and sensitive species as Annual Stand Exam Lists are selected, a primary coordination tool used between Divisions is the *Interdisciplinary Forest Management Coordination Framework,* December 2007. The purpose of the *Framework* is to ensure effective coordination between the Divisions of Forestry, Fish and Wildlife, and Ecological Resources to improve decision-making and achieve sustainable forest management. The *Framework* applies primarily to planning and implementing forestry and fish and wildlife management practices on land administered by the divisions of Forestry, and Fish and Wildlife.

The process of selecting each Area's Annual Stand Exam List includes participation by Wildlife and Ecological Resources staff. One purpose of their involvement is to identify stands that may contain threatened, endangered and sensitive species. If such species are known or have potential to be found on the stand, a joint site visit among Wildlife, Ecological Resources and Forestry staff can be implemented. Following the joint site visit, if such species are found on the stand, they will be taken into consideration as the final treatment is determined. This information is recorded on the *Stand Silvicultural Prescription Worksheet* as shown in Appendix E of the CP-PMOP SFRMP.

The Department has designated four hundred-forty plants and animals as endangered, threatened and species of special concern. All species are part of the natural forest ecosystem and contribute to its healthy functioning. Where these species are known to occur, their presence will be taken into consideration as stand prescriptions are implemented. Forestry staff is directed

to consult all relevant background information concerning a stand before site visits are undertaken. The purpose of this background review is to determine if there is potential for a stand to contain threatened, endangered or sensitive species.

The Department is committed to forestry management consistent with the ecological classification system and in utilizing native plant communities as significant factors to determine appropriate stand management. The *Stand Silviculture Prescription Worksheet*, is the required field decision management tool to be used by all foresters. For each stand site visited, the *Worksheet* requires the forester to assess the stand's characteristics in terms of ecological classification, land type association, and, native plant community as stand management objectives and specific prescriptions are implemented. If threatened endangered or sensitive species of plants or animals are detected, such occurrences will be considered and reflected in stand management objectives and prescriptions.

Representative GDS from the CP-PMOP SFRMP:

Forest management will continue to implement measures to sustain or enhance existing biodiversity.

Representative Strategies from the CP-PMOP SFRMP:

41. Document and manage known locations of NPCs with a statewide rank of Critically Imperiled (S1), or Imperiled (S2) and other plant communities that are rare in the landscape to maintain their ecological integrity.

112. Give consideration to within stand occurrences of species that are endangered, threatened, or of special concern**.**

114. Consider Natural Heritage Program data and other rare species information during development and implementation of both the 10-Year Stand Exam List and Annual Stand Exam Lists.

115. Enhance habitat while completing land treatments by using practices and procedures outlined in the DNR *Forestry-Wildlife Habitat Management Guidelines* and the DNR's *Interdisciplinary Forest Management Coordination Policy*.

149. Consult the Natural Heritage database (including the rare features database) prior to prescribing or implementing forest management activities.

Action resulting from this Comment:

The Final CP-PMOP SFRMP has been revised (page 3.73) to clarify that three levels of review for sensitive species are implemented: as part of 10 year stand exam list; as part of Area Annual Stand Exam list; and, as part of Stand Silvicultural Prescription Worksheet.

16. (The Leech Lake Band offers) to accompany DNR on site visits as final treatment prescriptions are developed

Response:

The Department is committed to and encourages cooperation and coordination with adjacent landowners and other land managers such as the Leech Lake Band of Ojibwe. To implement this coordination the Department has specifically requested review of the CP-PMOP SFRMP from the Leech Lake Band. In addition, as Area Annual Stand Exam Lists are prepared and submitted for public review, comments from all adjacent landowners and land managers is requested. As those Annual Stand Exam Lists are publicly reviewed, if specific stands are of interest to the Band, comments can be submitted and will be taken into consideration by the appropriate Forestry Area before the Annual Stand Exam List is adopted. Review of stand exam lists and dialogue at this level is most effective to share concerns or comments concerning individual stand

management. Following evaluation of comments resulting from public review of an Area Annual Stand Exam List, if specific stands are viewed as unique, posing special and significant management challenges, joint site visits with the Leech Lake Band can be arranged.

Representative Strategies from the CP-PMOP SFRMP:

38. Protect significant plant communities as they are identified.

140. Invite comment from, and coordinate with adjacent landowners.

Comments relating to the Issue of <u>Riparian and Aquatic Areas:</u>

17. more attention should be given to the impact of forest management practices on coldwater fisheries

18. it is essential to think in terms of the entire watershed and not just the riparian zone

Response:

Forestry management practices adjacent to all water bodies is guided by the *MFRC Site Level Guidelines* and are considered a mandatory set of *Guidelines* for Department staff. Designated trout streams (coldwater fisheries) are given special consideration in the *Guidelines* to ensure minimal impact to the water body.

In additional to implementing the *Site-Level Guidelines* several landscape-level actions identified the CP-PMOP SFRMP support appropriate riparian zone management. Many of the acres and stands identified for old growth, extended rotation, and special wildlife management areas fall within riparian zones. These designations will tend to minimize the impacts or further constrain active timber management within the identified acres or stands.

Landscape-level management of riparian zones and watersheds is complicated by the fractured ownership pattern found within the CP and PMOP subsections. It is noted that the Department manages only approximately 13% of the two subsections. While site-level coordination between landowners will continue to occur, the required level of coordination to effect larger-scale management poses a challenge and is implemented through the MFRC landscape level planning process. Most forest land managers implement the MFRC Voluntary Site Level Guidelines.

In addressing forest management landscape level impacts on water quality, the CP-PMOP SFRMP specifically identified a General Direction Statement in an effort to ensure that management activities across the landscape were taken into consideration. The GDS that describes the Department's goal is stated below. The purpose of this GDS is to recognize that individual stand management may have limited impacts on water quality, but taken together may result in cumulative impacts. This GDS establishes the direction that cumulative impacts on aquatic resources will be considered as individual stand management decisions are made.

As noted in Chapter 3 of the CP-PMOP SFRMP, Department staff from all DNR Divisions are part of the process to identify stands on the 10-Year Stand Exam List, as well as when Forestry Area Annual Stand Exam Lists are prepared. This coordination is implemented through the *Interdisciplinary Forest Management Coordination Framework*, the formal process by which all Divisions are advised of planned forest management activities, including selection of specific stands to be site visited for possible treatment. All Divisions view improving water quality as a primary objective as forest vegetation management is implemented. As evidence of the commitment to understanding vegetation management and relationship to water quality, the Department has increased capabilities in areas such as Clean Water Initiatives.

The CP-PMOP SFRMP will adhere to the MFRC's site-level guidelines, which are mandatory on state land. The objectives of MFRC riparian guidelines are to protect water quality, forest productivity, and bank stability as vegetation management is implemented. The *Guidelines* allow

for flexibility in identifying the appropriate riparian management zone (RMZ) width for a particular site as determined by site-level conditions and management goals. Based on on-site conditions, the RMZ and subsequently the vegetation management within the RMZ can include all lands where vegetation management may have an impact on the water body. The *Guidelines* identify the characteristics of water bodies and the range of management practices to be implemented to protect water quality.

Representative GDS from the CP-PMOP SFRMP:

The management and administration of state land will minimize negative cumulative impacts on aquatic resources.

Representative Strategies from the CP-PMOP SFRMP:

54. Continue to implement all MFRC *Voluntary Site-level Forest Management Guidelines* directing forest management practices that pose potential impacts to surface waters.

55. Collect baseline ecological data on surface water quality across the subsection.

56. Implement ongoing surface water quality monitoring.

57. Coordinate and cooperate with other landowners and water resource managers to establish guidelines that determine and minimize cumulative impacts.

58. Implement site level surface water quality monitoring on water that may be impacted by logging activities when there is cause for concern

Action resulting from Comment:

The Final CP-PMOP SFRMP has been revised (page 3.36) to add discussion concerning how overall forest management can have impacts on water quality. In particular Department commitments to Clean Water Initiatives have been identified.

Comments relating to the Issue of <u>Managing Impacts</u>:

19. (Comment asks) why DNR did not address ash and emerald ash borer in the plan?
20. do not follow management strategies that increase the ash component on the landscape.

Response:

Chapter 4, *Cover Type Management Recommendations* (page 4.21) identifies emerald ash borer as a special concern for ash management in these subsections, The CP-PMOP SFRMP advises that because emerald ash borer will eventually be found in Minnesota, the following recommendations be implemented: continue harvest activities in the higher site index black ash stands; choose harvest methods that favor regeneration of species other than ash; avoid harvesting in low site index ash stands; and, be prepared to accept the loss of the sites due to high water tables if the ash die due to emerald ash borer infestation.

Resources that will be employed by field staff to identify, monitor and respond to damage from emerald ash borer includes the DNR invasive species web site; *Field Guide to the Native Plant Communities of Minnesota - The Laurentian Mixed Forest Province,* Ecological Classification System, Minnesota County Biological Survey; Natural Heritage and Nongame Research Program; and, the Forest Health Monitoring Program.

Concerning strategies that do not increase the ash cover type, the CP-PMOP SFRMP recommends that the total acres of ash / lowland hardwoods be reduced over the 10 and 50 year plan implementation periods. For the 10-year implementation period, ash / lowland hardwoods will be reduced a total of 4% with conversion to tamarack and cedar. Over the 50-year period the

CP-PMOP SFRMP identifies that the total acreage will be reduced by 11% with conversions to tamarack and cedar.

Further the CP-PMOP SFRMP identifies that efforts to salvage timber damaged from disturbances or disease will be undertaken in an effort to limit further damage in adjacent stands. Recent efforts by the Department include restrictions that limit transporting unapproved firewood onto state administered lands and certifying firewood vendors.

The CP-PMOP SFRMP identifies that the overall management strategy of ash / lowland hardwoods is to: reduce the acreage of this cover type; convert a percentage of this cover type to cedar and tamarack; continue to harvest high site index ash stands; recognize the restrictions on movement of firewood that are designed to control emerald ash borer; to monitor for emerald ash borer infestations; and, to take salvage actions.

Representative GDS from the CP-PMOP SFRMP:

Damage to forests from exotic species will be minimized.

Representative Strategies from the CP-PMOP SFRMP:

153. Identify, document and monitor exotic species populations (e.g. gypsy moth, garlic mustard, common buckthorn, emerald ash borer, and earthworms) as part of the *Forest Health Monitoring Program* on state-managed lands.

154. Contain and reduce impacts caused by exotic species using proven techniques.

155. Manage the impact of exotic species using techniques such as aggressive containment or seasonal timing.

Action resulting from Comment:

The Final CP-PMOP SFRMP Chapter 3, (page 3.76) has been revised to emphasize that the Department has developed a program to certify firewood vendors; enforcing statutes that bans all firewood on state lands unless it is approved wood; and, requiring that firewood not be transported more than 100 miles to a state recreation facility, in an effort to curtail movement of wood potentially infested with emerald ash borer.

Comments relating to <u>Diversity and Complexity</u> and <u>Cultural Resources</u>:

21. LLDRM opposes forestry practices on the LLR that may reduce stand diversity and, consequently, tribally important species.

Response:

One of the primary goals of the CP-PMOP SFRMP is to maintain and improve within-stand diversity. Within stand diversity can be identified as a stand management objective for any growth stage. As stand management is implemented, methods identified in the CP-PMOP SFRMP to meet within-stand composition goals includes use of the *Ecological Land Classification System*, developed by the Department. This *System* guides land managers in determining the suitability of a stand for particular management objectives and treatments. For example, land managers would use soil and vegetation characteristics described in the *Ecological Classification System* keys and other published tools to determine the suitability of a particular aspen stand for conifer growth. Diversity within a stand requires careful thought and knowledge about the native plant communities that occur on the landscape. The *ECS System* identifies particular species expected to be found in a given stand, information which can be used as part of stand management to further maintaining stand diversity.

Further, maintaining inclusions of certain species is a strategy that Department staff will use to help maintain or improve stand diversity. Additional strategies that encourage and maintain stand diversity are identified in the CP-PMOP SFRMP and will be considered (depending on the site) as stand management objectives and treatments are implemented. Examples include: MFRC site-level guidelines to reserve legacy patches, leave trees, snags, and coarse woody debris; implementing harvest techniques that encourage diversity (e.g., selective, group selection, shelterwood harvesting); applying varying stocking levels and distribution; and use of prescribed fire.

DFFC from the CP-PMOP SFRMP:

All silvicultural prescriptions for uneven aged management cover types will ensure that all tree sizes, ages and species present in the stand at the time of the site level visit will be well represented following the stand treatment

Representative GDSs from the CP-PMOP SFRMP:

Diversity of plant species within stands will be maintained or increased.

Representations of all growth stages with vertical and horizontal structural diversity will be distributed across the landscape.

Representative Strategies from the CP-PMOP SFRMP:

73. Utilize harvest systems, methods and sale regulations (e.g., process at stump) that protect advanced regeneration and maintain or improve the patterns, diversity and composition of forest vegetation present in the stand prior to harvest.

74. Preserve legacy patches and inclusions in stands for seed sources and native plant diversity, as well as to favor regeneration and seeding of native vegetation.

75. Establish and manage plantations to more closely resemble naturally occurring stands by planting a variety of tree species using variable-density thinning techniques, preserving existing natural vegetation, and preserving advanced regeneration**.**

76. Develop methods to measure and monitor the within-stand diversity of plant species, and provide ongoing education and training on these techniques and methods.

22. document how the MNDNR will prevent further degradation of the understory plant communities of pine forests found on TCPs (traditional cultural properties) valued by Ojibwe people.

Response:

The CP-PMOP SFRMP identifies several Strategies specifically designed to support and maintain stand diversity including the understory. The *Stand Silvicultural Prescription Worksheet* to be completed as each stand is site visited includes specific review and assessment of the stand's understory to determine if understory communities are present that should be taken into consideration as management objectives and treatments are prescribed for the stand. Identification of Native Plant Communities (NPCs) is a consideration as the *Stand Silviculture Prescription Worksheet* is prepared. When known, NPC information will be used to prepare the stand management objectives and prescriptions.

The CP-PMOP SFRMP recites intermediate silvicultural treatments prescribed to stands designed to manipulate the forest canopy to influence the amount of light and moisture available at the forest floor. Thinning prescriptions that allow significant light will stimulate the herb and shrub regeneration, the development of an understory, and layering in transition and mature

stands. Variable density techniques may be prescribed during the planning of timber sales and/or forest development activities. Harvest (clearcut or thinning) and planting (or seeding) would be accomplished in a pattern (clumped or dispersed) that more closely replicates patterns created after natural disturbance that encourages understory plant communities.

Maintaining the understory is a specific strategy to be implemented in appropriate stands. Documenting how these strategies are implemented is managed through completion of the *Stand Silvicultural Prescription Worksheet* for each stand site visited. Information from the *Worksheets* will be used to prepare periodic CP-PMOP SFRMP Monitoring Reports. These Reports will assess whether on-the-ground actions are consistent with the directions in the CP-PMOP SFRMP and whether these actions are having the desired effect.

Documentation of whether the directions and strategies identified in the CP-PMOP SFRMP are being implemented will be developed and evaluated as part of the formal monitoring of the CP-PMOP SFRMP as discussed in Chapter 5, Monitoring.

Representative GDS from the CP-PMOP SFRMP:

Forest management activities will protect cultural resources on state administered lands.

Representative Strategies from the CP-PMOP SFRMP:

73. Utilize harvest systems, methods and sale regulations (e.g., process at stump) that protect advanced regeneration and maintain or improve the patterns, diversity and composition of forest vegetation present in the stand prior to harvest.

74. Establish and manage plantations to more closely resemble naturally occurring stands by planting a variety of tree species using variable-density thinning techniques, preserving existing natural vegetation, and preserving advanced regeneration.

86. Provide growing conditions (i.e., sunlight, periodic fire, etc.) that will encourage species diversity in the ground, shrub and sub-canopy layers.

129. Manage selected forest stands for non-timber forest products.

132. Apply knowledge of existing traditional gathering areas of non-timber forest products when managing other forest resources.

133. Identify managers with local expertise in managing non-timber products and utilize their knowledge when managing non-timber forest products at the landscape and statewide levels.

144. Share data on known cultural sites and consider impacts to these sites as silvicultural treatments are applied.

145. Increase cultural resource training for field staff, stress the importance of preserving cultural resources, and encourage the reporting of new sites.

23. The LLBO suggests that the MNDNR deepen its commitment to implement the goals of the North-Central Landscape by not further creating or maintaining plantation structure on the LLR.

Response: Consistency with the MFRC's *North Central Landscape Region Plan's* desired future conditions as identified below can be found throughout the GDSs, DFFCs and Strategies of the CP-PMOP SFRMP:

1. There will be an increased component of red, white and jack pine, cedar, tamarack, spruce and fir.
2. The forest will have a range of species, patch sizes, and classes that more closely resemble natural patterns and functions within this landscape.
3. The amount of forest land and timberland will not decrease using FIA definitions for timberland and forest land. Large blocks of contiguous forest land that have minimal inclusion of conflicting land uses will be created and/or retained for natural resource and ecological benefits, and to minimize land use conflicts (hereafter referred to as "natural resource emphasis areas").
4. In large blocks of contiguous forest land retain critical natural shoreline on lakes for scenic, wildlife, water quality, and other natural resource values.

Concerning the comment on not creating plantation structures, a primary DFFC of the CP-PMOP SFRMP is to implement management that reflects natural disturbances. Plantations will be managed to more closely resemble natural stands by promoting species mixture, accepting lower and higher stocking levels, and applying limited use of prescribed fire. However, when commercially thinning established plantations, some appearance of rows may be necessary in order to allow equipment access. Species and age diversity will be retained when possible.

The Department is required by statute to reforest harvested sites and is committed to doing so in a cost efficient and effective manner. Of the acres of state land harvested each year, approximately two-thirds is naturally regenerated (e.g., via root suckering, stump sprouts, natural seeding) and one-third is artificially regenerated. The knowledge and ability to successfully regenerate shade-intolerant early successional conifers naturally has not been widely tested in Minnesota and as such is evolving. The Department recognizes the importance of maintaining and managing natural forest stands in order to fulfill its obligations to all forest resources and Minnesota citizens. Through the development and implementation of an Ecological Classification System (ECS) and subsequent management interpretations, the Department will increase the number of conifer sites that are regenerated through means other than planting seedlings.

Further, to aid in minimizing plantation structures, the silvicultural techniques and practices as identified in the CP-PMOP SFRMP are more varied and inclusive than past Department practices. For example, specific management recommendations from Chapter 4 of the CP-PMOP SFRMP state that as red pine stands age, they should be managed to diversify within-stand species composition and increase within-stand structure to maintain or improve site productivity, wildlife habitat, and biodiversity.

Thinning in normal rotation and ERF stands will maintain (especially in natural origin stands) or increase within-stand diversity (especially ERF), while retaining red pine as the main cover type by the following methods:

a. Reserve from harvest individual trees or patches of other species appropriate to the site, where possible.
b. Consider creating or maintaining variable densities within stands when thinning.
c. Protect advanced regeneration of desirable understory species, where possible.
d. Higher stand densities (basal area) are recommended along stand edges exposed to wind and along high visual quality corridors, such as major roads and lakes.
e. Consider underplanting tolerant species, where seed sources or advance regeneration for these are lacking. For species suggestions, refer to the natural history section for the pertinent native plant community in the Field Guide to Native Plant Communities of *Minnesota.*
f. Provide for six cavity trees, potential cavity trees, or snags per acre as recommended in the MFRC *Voluntary Site-level Forest Management Guidelines*: Timber Harvest p.36 and TSI p. 7).

As one tool designed to increase conifers on the landscape, the CP-PMOP SFRMP has identified specific areas, based on soils and historical vegetation patterns, where pine are likely an appropriate cover type. These areas have been identified as *Potential Pine Woodlands Areas*, (Appendix R of the CP-PMOP SFRMP). Management suggestions for potential pine woodland areas includes promoting natural regeneration through seed tree and small gap harvests for non-serotinous jack pine, conduct brush and sod control when necessary, manage for prairie grasses and forbs (ground layer) in appropriate NPCs, and use prescribed burning (understory and light slash burns) when appropriate.

One purpose of identifying potential pine woodland areas is to foster stands where natural regeneration of pine has more likelihood of success. Management toward a pine woodland complex specifically avoids pine plantation characteristics.

Representative GDS from the CP-PMOP SFRMP:

Diversity of plant species within stands will be maintained or increased**.**

Representative Strategies from the CP-PMOP SFRMP:

20. Consider with the *MFRC North Central Landscape Region Plan* forest composition goals and objectives.

43. Implement the MFRC *Voluntary Site-level Forest Management Guidelines.*

75. Establish and manage plantations to more closely resemble naturally occurring stands by planting a variety of tree species using variable-density thinning techniques, preserving existing natural vegetation, and preserving advanced regeneration.

76. Develop methods to measure and monitor the within-stand diversity of plant species, and provide ongoing education and training on these techniques and methods.

111. Establish and manage plantations to more closely resemble naturally occurring stands by planting diverse tree species, preserving existing natural vegetation, and preserving advanced regeneration by using variable density thinning techniques, varying stem density, and using less intense methods.

Comments relating to the Issue of <u>Sustainable Harvest:</u>

***24. MNDNR should modify its management on the LLR so that final harvests are not conducted in mature pine stands. Secure wood by thinning pine stands at younger ages and then allowing various tree species to develop in the understory*.**

Response:

The majority of treatments in all age classes of pine stands will be intermediate treatments with the stand management objective of maintaining mature pine stands out to their normal and maximum rotation ages. Given the multiple use policy of striving to balance ecological values and local economies, it is very difficult, as a policy, to eliminate final harvests in mature pine stands.

It should be noted that little upland pine within the Leech Lake Reservation is under state management. Of the pine acreage under state management, the following recommendations are identified in Chapter 4, *Cover Type Management Recommendations* that address this comment.

Thinning will be used to reduce stand density to increase future tree growth, quality, and vigor, and to obtain the desired composition of the stand. Additional recommendations include:

a. Normal rotation stand thinnings will occur in merchantable stands at approximately 10-year intervals, depending on site quality.
b. Older stands may have longer intervals between thinnings to compensate for slower growth rates and to facilitate the growth of desirable understory species.
c. Variable density thinning or other techniques will be incorporated to meet ERF or other objectives. Examples are: 1) thin 20 percent of the stand to 60 BA, 60 percent to 90 BA, and skip thinning in 20 percent to encourage within-stand diversity.
d. Large gaps (~3 ac) may be produced during early thinnings in mixed red pine/jack pine stands to encourage jack pine seeding, thereby ensuring that the species is not eliminated from the stand during later thinnings or due to early mortality.

Further, specific to white pine, the Department is following the recommendations of the White Pine Regeneration Strategies Work Group. White pine harvest policy on state lands is as follows: (1) When harvesting in the pine cover types, restrict white pine harvesting to thinnings, selective harvests (e.g., removal of diseased and defective trees), or shelterwood harvest. This type of harvesting will maintain an older white pine component in the pine stands while promoting white pine regeneration and age-class diversity of white pine within these stands. (2) When harvesting in other forest cover types that contain white pine, retain adequate seed-producing white pine and carry out treatments (e.g., scarification of the soil by mechanized disturbance or prescribed burning and leaving a partial overstory) to increase white pine natural regeneration. Elimination of white pine from other cover types will not be permitted. (3) Reserve the better white pine that occur as scattered individuals or in small groups for their seed-producing, aesthetic, wildlife, and ecological benefits. (4) Manage all white pine under ERF guidelines to increase the acreage and distribution of older white pine stands and trees on the landscape. With these *Guidelines*, white pine harvesting on state timberlands is very limited. Much of the white pine harvest in recent years has been due to salvage of blown-down and damaged trees from windstorms or salvage of disease-infected (e.g., white pine blister rust) trees.

Thinning of white pine is a recommended management strategy to promote white pine regeneration and increase growth rates. Dense shade from trees and shrubs greatly reduces growth of seedlings and eventually kills them. Reducing stand density down to about 50 percent crown closure (approximately 60 BA or less) allows enough sunlight to reach the forest floor to promote growth and survival of the white pine seedlings. The partial overstory also reduces the risk of white pine blister rust infection and white pine weevil damage. Thinning also allows the remaining trees to grow larger at a faster rate.

Due to the less than desired current acreage in older age-classes, no final harvest is planned in the white pine cover type during the implementation period for the CP-PMOP SFRMP. In subsequent planning periods final harvest in the white pine cover type may occur but is recommended only after a stand reaches 180 to 240 years old.

Thinning in stands will maintain or increase within-stand diversity, while retaining white pine as the main cover type. For example, the younger white pine stands may have a larger component of aspen and birch, while older stands (90+ years) may increase in white spruce and cedar with smaller amounts of aspen, birch, and balsam fir. Red pine may be present throughout the life of the stand. The following methods should be considered:

a. Consider creating or maintaining variable densities within stands when thinning ranging from unthinned areas to heavily thinned or group-selected areas within a stand.
b. Protect advanced regeneration of desirable understory species, where possible.
c. Higher stand densities (BA) are recommended along stand edges exposed to wind and along high visual quality corridors, such as major roads and lakes. Older (90+ years) white pine stands will be managed primarily for a multi-aged stand structure using even-aged management techniques. The move toward a multi-aged structure will be

accomplished through thinning and shelterwood harvests. A goal is to mimic light to high intensity surface fires and partial crown fires that historically occurred.

During thinning or shelterwood harvests, from 90 years old to final harvest, retain at least 25 percent of the largest white pine present, and manage out to the ERF age of 180 - 240 years. The goal is to retain a significant number of the largest cohorts out to the final harvest age, while creating or maintaining a multi-aged white pine stand.

Every third entry should be a group selection harvest, with goal of establishing a new age-class of white pine within the stand. The long-term goal is to create stands with layered age-classes (two or more). Timing of the first group selection harvest will depend on seed production and stand condition (age, density, and distribution of white pine).

Although eliminating final harvest in mature pine stands is not consistent with the Department's multiple use directives, as identified above, many Strategies and management recommendations are included in the CP-PMOP SFRMP that give preference to thinning pine stands, maintaining all white pine as ERF and manage pine stands for understory.

DFFC from the CP-PMOP SFRMP

The Plan will move these subsections toward more conifer cover type acreage in upland areas. Cover type increases over the next 10 years will occur in jack pine 38%, white pine 23%, red pine 17% (50-year).

Representative Strategies from the CP-PMOP SFRMP:

73. Utilize harvest systems, methods and sale regulations (e.g., process at stump) that protect advanced regeneration and maintain or improve the patterns, diversity and composition of forest vegetation present in the stand prior to harvest.

74. Preserve legacy patches and inclusions in stands for seed sources and native plant diversity, as well as to favor regeneration and seeding of native vegetation.

75. Establish and manage plantations to more closely resemble naturally occurring stands by planting a variety of tree species using variable-density thinning techniques, preserving existing natural vegetation, and preserving advanced regeneration.

77. Use intermediate treatments to provide age diversity and vertical/horizontal structure in the young forest, transition and mature forest growth stages.

79. Design final harvest projects in a way that will transmit a legacy of age diversity, and vertical/horizontal structure.

93. Maintain conifers as a component of deciduous cover types where suitable to the site.

108. Retain conifers and protect conifer regeneration in clumps or strips to provide thermal cover, food, nesting cover, and structural attributes beneficial to wildlife.

111. Establish and manage plantations to more closely resemble naturally occurring stands by planting diverse tree species, preserving existing natural vegetation, and preserving advanced regeneration by using variable density thinning techniques, varying stem density, and using less intense methods

Comments relating to the Issue of <u>Rare Species / Features:</u>

25. (Leech Lake Band recommends that) state-designated species of greatest conservation need (SGCNs) be managed as described in the MNDNR's Tomorrow's Habitat for the Wild and Rare: An Action Plan for Minnesota Wildlife Comprehensive Wildlife Conservation Strategy

Response:

The SFRMP process incorporates biodiversity considerations in planning for forest systems on DNR lands. The Ecological Resources Division has provided ecological information pertinent to managing for biodiversity within the two subsections (e.g. *Tomorrow's Habitat for the Wild and Rare: Minnesota's Comprehensive Wildlife Conservation Strategy; An Action Plan for Minnesota Wildlife, 2006;* Minnesota County Biological Survey data; Natural Heritage information; and, Scientific and Natural Area biodiversity management techniques experience). SFRMP direction in addressing issues and developing GDSs, Strategies, DFFCs, and the 10-Year Stand Exam List and New Access Needs List reflect vegetative management to maintain biodiversity.

A number of wildlife species that are known to occur within the CP-PMOP are identified as Species of Greatest Conservation Need (SGCN)(see Appendix L *Terrestrial, Vertebrates Species List*). These SGCN are identified in *Tomorrow's Habitat for the Wild and Rare, An Action Plan for Minnesota Wildlife, 2006*. Key habitats for SGCN have been identified statewide with five found in the CP-PMOP. These key habitats are upland shrub/woodland (jack pine woodland), upland coniferous forest in CP, upland coniferous forest (red-white pine) in PMOP, non-forested wetlands, and headwater to large rivers. Foresters will consider these unique resources as stand prescriptions are implemented.

SGCN are taken into consideration as vegetation management is practiced in the CP and PMOP subsections through the following processes. *Tomorrow's Habitat for the Wild and Rare* is specifically identified as background material to be considered as the 10-Year Stand Exam List is prepared and also as Annual Stand Exam Lists are prepared by Forestry Areas. In preparing these stand exam lists, the *Interdisciplinary Forest Management Coordination Framework* is implemented which provides for review of proposed stand exam lists by Ecological Resources and Wildlife staff. Joint site visits are implemented if rare or sensitive species are known or thought to occur in the stand area. Further, as site visits are made a *Stand Silvicultural Prescription Worksheet* is prepared which requires the forester to assess and note any occurrences of rare, unique, threatened species for consideration as management objectives and treatment prescriptions are identified. Finally the periodic CP-PMOP SFRMP Monitoring reports specifically requires that issues related to stand management relative to rare and sensitive species be monitored.

Representative GDS from the CP-PMOP SFRMP:

Adequate landscape-level habitat and habitat components will be maintained for wildlife and plant species found within these two subsections.

Representative Strategies from the CP-PMOP SFRMP:

112. Give consideration to within stand occurrences of species that are endangered, threatened, or of special concern.

Comments relating to <u>Other Statutes:</u>

26. (LLB) concerned that monitoring actions proposed in the CP-PMOP SFRMP will not adequately answer whether landscape-scale goals are being met.

Response:

Chapter 5, Monitoring of the CP-PMOP SFRMP identifies the importance, process and responsibilities of monitoring the implementation of the CP-PMOP SFRMP. Beyond the department's desire to monitor the effectiveness of SFRMP planning efforts, maintaining forest certification also requires an effective, ongoing plan implementation monitoring program.

As the CP-PMOP SFRMP is implemented, monitoring of forest management activities is critical to determine if the goals of the Plan are being achieved Listed below are the reviews and tracking of stand treatments and the landscape-level monitoring that will be used to monitor the implementation of CP-PMOP SFRMP:

- Annual Stand Exam list review among Divisions of DNR
- Stand Treatments and Site level Monitoring
- Landscape level Plan Implementation Monitoring

To monitor landscape-level forest management by the Department against the goals of the CP-PMOP SFRMP, two types of monitoring questions will be addressed:

1. Implementation Monitoring, which determines whether the management actions are being implemented as written in the CP-PMOP Plan, meaning:

2. Effectiveness Monitoring, which determines the appropriateness or effectiveness of specific management actions designed and implemented to accomplish specific objectives identified in the CP-PMOP Plan, meaning:

The CP-PMOP Planning Team through the CORE group is responsible to implement and oversee periodic monitoring of the CP-PMOP SFRMP. Chapter 5 *Monitoring* of the CP-PMOP SFRMP identifies data sources, staff responsibilities and timeframes for completing monitoring reports. Of primary importance is to record and compile the information necessary to allow meaningful monitoring to be completed. The CP-PMOP SFRMP Table 5.1 (page 5.6) identifies a broad range of Monitoring Questions, Indicators, Data Sources, Report Frequency and overall Priority to support the CP-PMOP SFRMP monitoring responsibility. Specific monitoring questions are posed that, as answered through analysis of SRM information, will provide direction as to whether the broad landscape goals of the CP-PMOP SFRMP are being addressed.

Representative Strategies from the CP-PMOP SFRMP:

36. Develop a methodology to measure growth stages, within-stand age diversity, plant species diversity and vertical/horizontal structure and use this methodology to quantify and monitor changes.

42. Identify stands with known locations of Critically Imperiled (S1) or Imperiled (S2) NPCs and monitor those stands during Annual Stand Exam List review.

75. Develop methods to measure and monitor the within-stand diversity of plant species, and provide ongoing education and training on these techniques and methods.

80. Develop a methodology for measuring growth stages, within stand age diversity, plant species diversity, and vertical/horizontal structure, and use this methodology to quantify and monitor changes.

1.3 List of organizations and individuals that submitted Comments on the Draft CP-PMOP SFRMP
The following individuals / organizations have submitted comments on *the Draft Chippewa Plains / Pine Moraines and Outwash Plains Subsection Forest Resources Management Plan* dated July 2008:

1. Dr. Steven Katovich, USDA, Forest Service, dated August 27, 2008
2. Steven Young, Headwaters Chapter of Trout Unlimited, dated September 22, 2008
3. Bruce Johnson, Leech Lake Band of Ojibwe, Division of Resource Management, dated October 10, 2008
4. Roy Higgins, Minnesota Timber Products Association, dated October 10, 2008
5. Tim J. O'Hara, Minnesota Forest Products Industry, dated October 10, 2008