Mille Lacs Uplands

and

Glacial Lake Superior Plain

Subsection Forest Resources Management Plan

3-Year Plan Extension Document

Minnesota
DEPARTMENT OF
NATURAL RESOURCES

Division of Forestry Planning Document

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This document is on the Internet at http://www.dnr.state.mn.us/forestry/subsection/millelacs/index.html
Information about the Division of Forestry Subsection Forest Resource Management Plan (SFRMP) process can be found at www.dnr.state.mn.us/forestry/subsection/millelacs/final_plan/index.html

Mille Lacs Uplands and Glacial Lake Superior Plain

Subsection Forest Resource Management Plan
Three-Year Extension

Abstract

This document summarizes the results of an extension of the Mille Lacs Uplands original 7-year stand selection list by another 3 years, using the direction and treatment levels established in the Mille Lacs Uplands Subsection Forest Resources Management Plan (DNR, February 2003). The plan extension proposes the examination of 23,382 additional acres, with an estimated volume of 115,700 cords. This is consistent with treatment levels in the 7-year plan i.e., 7,534 acres/year. The complete list of stands selected to be examined for treatment over the 3-year extension period (2012-2014) is also provided.

This document and the 3-year stand examination list can be viewed at:*http://www.dnr.state.mn.us/forestry/subsection/millelacs/index.html*

Mille Lacs Uplands Three-Year Extension Team Members

These Minnesota Department of Natural Resources (DNR) personnel were assigned as members of the team charged with developing a three year plan extension for the Mille Lacs Uplands Subsection Resource Management Plan:

- Doug Tillma – DNR Northeast Region Timber Program Forester (Forestry Division)
- Tim Quincer – DNR Northeast Region Forest-Wildlife Coordinator (Wildlife Section, Fish and Wildlife Division)
- Bruce Carlson – DNR Northeast Region Plant Ecologist (Ecological Resources Division)
- Lynn Sue Mizner – DNR Forest Planner (Forestry Division)
- Jeremy Fauskee – DNR Sandstone Area Timber Program Forester (Forestry Division)
- Daren Wysocki – DNR Aitkin Area Assistant Area Manager (Forestry Division)
- Rich Staffon – DNR Cloquet Area Wildlife Manager (Wildlife Section, Fish and Wildlife Division)
- Dave Kanz – DNR Aitkin Area Assistant Wildlife Manager (Wildlife Section, Fish and Wildlife Division)

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Chapter 1 Introduction

1.1 Scope of Subsection Forest Resources Management Plans

A Subsection Forest Resources Management Plan (SFRMP) is a DNR plan for vegetation management on forestlands administered by the Minnesota Department of Natural Resources (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. In response to growing public interest in DNR timber management, the DNR SFRMP planning process was developed to provide a more standardized, formal process with opportunities for increased public involvement. The geographic area covered by this plan extension is defined by Ecological Classification System (ECS) subsections, rather than DNR Forestry Area boundaries. The SFRMPs do consider the condition and management of forest lands not owned by the DNR, but proposes forest management direction and actions for DNR managed lands only.

1.2 What is an Ecosystem Classification Subsection?

The DNR has adopted an Ecosystem Classification System (ECS) as a tool to help identify, describe, and map ecosystems. ECS units are defined by climatic, geologic, hydrologic, topographic, soil, and vegetation data. The ECS divides the state into six levels of ecological units, each level nested together within the next higher level. In Minnesota, subsections are the third level in the ECS hierarchy. There are 17 forested subsections in the state, ranging in size from 1 to 3 million acres. The working boundaries used to prepare SFRMPs vary slightly from the boundaries of ECS subsections to be consistent with actual Forestry Area administrative boundaries.

1.3 Background: Mille Lacs Uplands SFRMP and 3-Year Extension

On May 3, 2007 the DNR Commissioner Mark Holsten approved the Mille Lacs Uplands (MLU) Subsection Forest Resources Management Plan. This officially completed the planning process that began in 2001. Although formally adopted in 2007, actual completion of the MLU SFRMP Strategic Directions and Seven-Year Stand Exam List occurred in 2003 following two public and stakeholder review opportunities. Official implementation of the plan's strategic direction began in FY2005 (i.e., July 1, 2004).

The original MLU SFRMP identifies:

- Long-term strategic goals, strategies, and desired future forest conditions;

- Criteria used to identify forest stands for examination (i.e., stands selected to be field reviewed, and potentially treated, based on criteria consistent with the long-term strategic goals);
- The complete 7-year list of stands selected for field review and potential treatment; and
- DNR responses to comments received during public review opportunities.

The MLU SFRMP was among the first of the subsection plans to be undertaken by the Department. This planning process began in 2001. At that time the standard was to prepare a 7-year stand examination list (in contrast to the current ten-year list). A 3-year extension to the original MLU 7-year stand exam List is needed to bring the MLU plan into line with the current 10-year planning timeframe for SFRMPs. This will make the MLU plan consistent with others around the State. Bringing the MLU plan into a ten year cycle (FY 2005 through FY 2014) will allow for a smooth transition to completing the second generation of MLU SFRMP (FY 2015 through 2024).

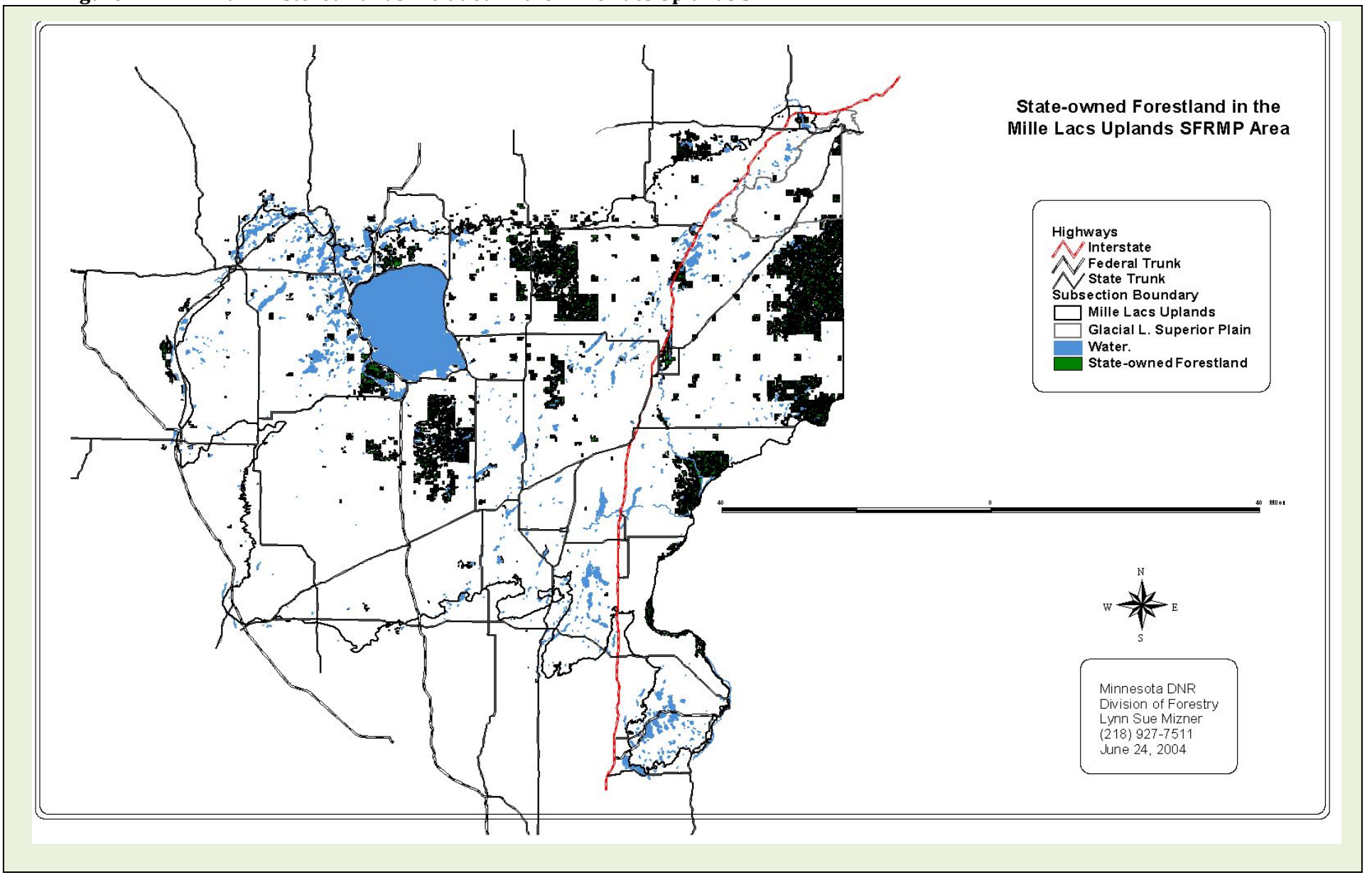
This 3-Year extension is viewed as continuing the overall policies, goals, DFFCs and directions of the MLU SFRMP, formally adopted in 2004.

Three emergent issues were identified and discussed i.e., Emerald Ash Borer (EAB), and the draft management guidelines the Division of Forestry will be using to address that pest; DNR's High Conservation Value Forest (HCVF) initiative, and the need to tag stands that are in HCVF; and the issue of European buckthorn, and the need to pre-treat some buckthorn-infested stands prior to harvest. Only the EAB guidelines resulted in an initial change to stand selection criteria. The other two issues resulted in stands being tagged for joint site visits with Eco-Waters and Fish and Wildlife in some cases.

Appropriate area Forestry, Wildlife, and Fisheries personnel, and area Ecological Resources representatives have were invited to participate in the area-level 3-year extension stand selection meetings. Forestry Areas represented in the planning area are:

- Cloquet (Region-Area Number "RAN" 251)
- Aitkin (RAN 232)
- Little Falls (RAN 312)
- Cambridge (RAN 351)
- Sandstone (RAN 244)

Figure 1.1 DNR-Administered Lands Included in the Mille Lacs Uplands SFRMP



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Chapter 2 Mille Lacs Uplands 3-Year Extension

2.1 Criteria Used to Identify Potential Stands for the 3-Year Extension List

The Mille Lacs Uplands SFRMP identified criteria to use in selecting a pool of stands from which stands were selected to be examined for potential treatment over the original 7-year planning period. Those criteria are listed on pages 4.34 – 4.37 of the MLU SFRMP http://www.dnr.state.mn.us/forestry/subsection/millelacs/index.html As part of the 3-year extension, the extension team reviewed the criteria and available implementation data[1] to determine if there was any obvious and immediate need to revise the original stand selection criteria for the extension effort. While there were some changes in forest condition and the status of implementation of the original 7-year stand list that varied from what was projected, the team agreed that there was no overwhelming need to substantially change the stand selection criteria for the extension effort. This decision was made in light of the fact that a more thorough review and possible revision of stand selection criteria would take place in 2012 when the full plan revision process begins. One exception was that additional ash acres were selected, consistent with the Ash Management Guidelines being developed by the Department, and adopted by the Division of Forestry.[2]

[1] A synopsis and summary tables and charts of available implementation information, is provided in Appendix C.
[2] Minnesota DNR-Forestry: ASH MANAGEMENT GUIDELINES
http://files.dnr.state.mn.us/forestry/ecssilviculture/policies/guidelinesManagingAshMinnesotaForestryLands-100723.pdf

Table 2.1 Three-Year Stand Selection Criteria

Cover Type		Cover Type Acres	Selection Pool Criteria				Annual Target For 3-Year Extension	Acres Selected For 3-Year Extension
			Age	SI	BA	DBH		
Ash/Lowland Hardwoods		19,454.6		>44	>99	>7	432	**1,906**
Aspen/BAM[1]		105,122.6	>59				2,177	**6,665**
Birch[2]		8,210.2	>70				419	**1,271**
Northern & Cent Hdwds[3]		38,734.7	>69		<120		2,293	**6,921**
Northern & Cent Hdwds (thin)					>119			
Oak[4]		28,969.7	>69		<120		1,203	**3,635**
Oak (thin)[5]					>119			
White Pine (thin)[6]		671.1			>119		2	**37**
Norway Pine (thin)[7]		7,507.7			>119		184	**1,805**
Jack Pine[8]		1,353.9	>60				130	**184**
White Spruce (thin)[9]		2,652.7	>29		>119		0	**0**
Balsam Fir[10]		2,624.9	>79				122	**357**
Black SpruceERF[11]		11,540.3	>179	<30			132	**393**
Black Spruce Non-ERF[12]			>119	<30				
TamarackERF[13]		11,324	>149	<40			121	**208**
Tamarack Non-ERF[14]			>99	<40				

[1]Also if Condition = 1 (stand classified as "high risk" for substantial volume loss, or will not survive more than 5 years without harvest); or Percent Mortality >1 (a main species of any age had 11% or greater mortality); or Percent Affected >2 (a main species of any age had damage by any agent of 26% or greater)

[2]Also if Condition = 1, or Percent Mortality >1, or Main Species Damage = 30

[3]Also if Survey Year <2005 for low volume harvest (clear cut)

[4]Also if Survey Year <2005 for low volume harvest

[5]Also if Main Species Damage >50 and Main Species Damage <62 and Percent Affected >3

[6]Also if Condition=1, or Main Species Damage=16 and Percent Mortality>1, or Main Species Damage =17 and Percent Mortality >1, or Percent Affected >1

[7]Also if Survey Year <2005

[8]Also if Condition=1, or Percent Mortality >1, or Age >34 and ERF=1

[9]Also Condition=1

[10]Also if Age >59 and Percent Mortality >1, or Condition = 1
[11]Also if SI <40 and SI >29 and Age >149, or SI >39 and age>79, or Main Species Damage = 23 and Percent Affected >2
[12]Also if SI <40 and SI >29 and Age > 99, or SI >39 and Age >59, or Main Species Damage = 23 and Percent Affected >2
[13]Also if Condition = 1, or SI >39 and Age >99
[14]Also if SI >39 and Age >59, or Condition = 1

2.2 Intermediate Treatments

The extension team reviewed opportunities for additional intermediate treatments in hardwood forest types. Lowland hardwoods and northern hardwoods are managed as uneven-aged types, except for some older stands with low (<120) basal area. Stand selection criteria for thinning for these two types include all other stands with basal area greater than 99 sq. ft. for ash/lowland hardwoods, >119 sq. ft. for northern and central hardwoods, and oak.

Red and white pine were selected for thinning according to traditional guidelines related to stand health and basal area greater than 119 sq. ft. White spruce stands over 29 years with at least 119 sq. ft. of basal area were also tagged for thinning.

Ash and lowland hardwoods cover types selection criteria were reviewed in light of the recent direction from the Division of Forestry to respond to the invasive exotic species, Emerald Ash Borer. Per the new Draft Ash Management Guidelines, the site index break for selection was changed to a minimum of SI 44. More stands were selected than would have been otherwise, and ash stands were tacked on to other sales to increase their merchantability. These high SI stands should provide opportunities for intermediate treatments to reduce the basal area of ash, while still providing retention opportunities in other species as a way of reducing the risk of flooding.

2.3 Status of Original 7-Year List

In preparation for the 3-year extension effort, DNR staff reviewed the entire original 7-year stand examination list to determine which stands had been field visited or scheduled for a field visit at that point in time. This review occurred in the summer o f 2010, which was during the last half of the state fiscal year 2010. A portion of the stands from the original 7-year stand list had not been field visited. These remaining 11,000 acres were identified as a “backlog” from the 7-year list and kept separate from the additional 3 years of stands generated for the stand list extension process. From a workload standpoint, DNR staff felt it would be possible to field visit the stands from the backlog plus the additional 3 years of stands, but whether harvest actions would occur would depend on availability of development funds in the future (especially on Wildlife-administered lands), and in some cases on access and merchantability issues. Targeted overtime has been approved to allow other Forestry Areas to help Sandstone address their backlog of stands.

2.4 Ecologically Important Lowland Conifers

No additional ecologically important lowland conifer (EILC) acres were identified at this time. Location of EILC will be reviewed during development of the next full plan, should lowland conifer old-growth still not be designated.

2.5 Extended Rotation Forest

The MLU 7-year SFRMP was developed before there were consistent statewide recommendations for locating extended rotation forest (ERF) on the landscape. Therefore some locations are not consistent with current policy. Location of ERF will be reviewed during the development of the next full plan; no changes were undertaken during the 3-year extension process.

2.6 Treatment Model Summaries

Team proceeded to develop data inputs into the treatment models. Treatment models were prepared for the following cover types, or groups of cover types:

- Aspen /balm of Gilead
- Birch
- Tamarack
- Jack pine
- Balsam fir

Primary factors guiding stand selection were a desire to (over time):

- Achieve a balanced age class distribution;
- Maintain adequate old forest by cover type (recognizing the Department target to maintain at least 10% old forest on landscape);
- Implement conversion goals; and,
- Minimize harvest fluctuations.

Data input into Microsoft Excel spreadsheet treatment models included:

- Total cover type acres,
- Rotation age for each cover type (normal rotation age and extended rotation age),
- Maximum rotation age, and
- Desired old forest percentage to be maintained for each cover type.

2.7 The 2009 MLU SFRMP Monitoring Report

Following internal guidance (http://files-intranet.dnr.state.mn.us/user_files/2535/sfrmp_monitoringplan_appendices.pdf) developed for monitoring SFRMP implementation, the northeast region SFRMP Core Team convened early in 2009 to review accomplishment data for the Mille Lacs Uplands subsection. They compared accomplishment data for the subsection with the goals identified in the MLU SFRMP. The results of monitoring will help ensure that progress toward the goals and desired future forest conditions in the MLU plan continues; it will be attached as an appendix to the extended plan:

"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."

The Monitoring Report is attached to this plan as Appendix C.

2.7.1 Monitoring Data Limitations

The region Core 4 team reached its conclusions based on a summary of available data which may or may not be consistent with reality. Data sources (e.g., recording of management objectives) varied significantly in the extent to which management objectives accurately represented work that was actually done. Some reports the team needed are not yet able to be summarized by the desired variable (e.g., cover type). In some cases the team used other data sources that are available but are not ideal for the analysis conducted (e.g. before/after FIM comparisons as an indicator of progress on cover type change goals).

The current analysis has shed light on needed changes to the ways forest management data are recorded. In some cases discussions have already started that will lead to improvements. Field personnel are being asked to help make the monitoring process more accurate by reviewing the following conclusions and responding as appropriate with corrections based on local knowledge and data.

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Chapter 3: 3-Year Stand Selection Results

3.1 Three-Year Extension to the Stand Examination List

Annual treatment levels from the original 7-year plan (7,534 acres/year) were used as the starting point for the development of targets for the 3-year extension. Stand selection criteria were applied to the FIM data, resulting in a potential management pool of stands which were then reviewed by forestry areas in the MLU. During the three year planning period, each stand on the list will be field visited. Following the on-site visit, appraisers will determine the most appropriate management for each stand.

Preliminary direction for each stand's management includes:

- Update the inventory database to reflect current field conditions but propose no active management.
- Harvest and convert to new cover type.
- Harvest and regenerate into existing cover type.
- Conduct various timber stand improvements to enhance stand vigor, diversity, ecological characteristics and functions, or productivity.

The following tables provide summaries of the Three-Year Extension Stand Exam List.
Table 3.1.1 shows the distribution of the selected stands by cover type by DNR Forestry area in the Mille Lacs Uplands and Glacial Lake Superior Plain. Figure 3.1 shows the location of DNR Forestry Area boundaries in the subsections.

Table 3.1.1 Acreage Selected by Cover Type and Forestry Area (Timberland[3])

Mille Lacs Uplands SFRMP 3-Year Extension Forestry Area Goals and Selections		RAN/Forestry Area											
Cover Type		Subsection	251/Cloquet		244/Sandstone		232/Aitkin		312/Little Falls		351/Cambridge	
Ash/Lowland Hardwoods	Total acres	19,455	1,189		13,090		1,950		3,150		76	
	Thin pool	5,309	306	5.8%	3,961	74.6%	513	9.7%	486	9.1%	43	0.8%
	Thin goals	1,296	75		967		125		119		10	
	Selected	1,906	260		1,465		97		83		0	
Aspen/BAM	Total acres	105,123	9475		67,770		3,191		24,173		515	
	Harvest pool	14,719	2,223	15.1%	9,304	63.2%	345	2.3%	2,769	18.8%	78	0.5%
	Harvest goals	6,531	986		4,128		153		1,229		35	
	Selected	6,665	917		4,215		161		1,373		0	
Birch	Total acres	8,210	1,895		5,863		162		190		101	
	Harvest pool	3,204	356	11.1%	2,712	84.6%	14	0.4%	49	1.5%	75	2.3%
	Harvest goals	1,257	139		1,064		5		19		29	
	Selected	1,271	155		1,064		5		48		0	
Northern & Cent Hdwds	Total acres	38,735	1,563		21,650		2,393		13,021		186	
	Thin/Harvest pool	14,011	245	1.7%	9,550	68.2%	966	6.9%	3,209	22.9%	40	0.3%
	Harvest goals	6,879	120		4,689		474		1,575		19	
	Selected	6,921	192		4,709		467		1,524		30	
Oak	Total acres	28,970	445		14,225		4,190		10,019		56	
	Thin/Harvest	8,023	127	1.6%	4,014.2	50.0%	1,131.9	14.1%	2,694	33.6%	56	0.7%

[3] Timberland does not include DNR reserved (designated old-growth forest and state parks), or nonproductive forest lands (stagnant spruce, tamarack, and cedar; offsite aspen and oak; not forest lands).

Mille Lacs Uplands SFRMP 3-Year Extension Forestry Area Goals and Selections			RAN/Forestry Area									
Cover Type		Subsection	251/Cloquet		244/Sandstone		232/Aitkin		312/Little Falls		351/Cambridge	
	pool											
	Harvest goals	3,609	57		1,806		509		1,212		25	
	Selected	3,635	80		1,796		518		1,241			
White Pine	Total acres	671	142		273		19		199		39	
	Thin pool	298	64	21.6%	121	40.4%	0		81	27.1%	33	10.9%
	Thin goals	6	None - negligible acres		8		0		2		None - negligible acres	
	Selected	37			28				9			
Norway Pine	Total acres	7,508	438		6,381		371		313		5.	
	Thin pool	1,224	24	2.0%	1,123	91.8%	56	4.6%	21	1.7%	0	
	Thin goals	552	11		506		25		9		0	
	Selected	1,805	0		1,621		52		133		0	
Jack Pine	Total acres	1,354	37		1,237		73		8		0	
	Harvest pool	182	2	0.8%	168	92.7%	12	6.5%	0	0.0%	0	
	Harvest goals	390	None - negligible acres		361		25		0		0	
	Selected	184	0		160		24		0		0	
White Spruce	Total acres	2,653	344		1,817		96		391		5	
	Thin pool	0.0	0		0.0		0.0		0		0	
	Thin goals	0	0		0.0		0.0		0		0	
	Selected											
Balsam Fir	Total acres	2,625	371		2,109		57		89		0	
	Harvest pool	675	67	10.0%	607	90.0%	0.0	0.0%	0	0.0%	0	

Mille Lacs Uplands SFRMP 3-Year Extension Forestry Area Goals and Selections		RAN/Forestry Area											
Cover Type		Subsection	251/Cloquet		244/Sandstone		232/Aitkin		312/Little Falls		351/Cambridge		
	Harvest goals	366	37		329		0		0		0		
	Selected	357	39		317.9						0		
Black Spruce	Total acres	11,540	499		10,000		509		517		16		
	Harvest pool	1,232	111.7	9.1%	1,106	89.8%	14	1.2%	0		0		
	Harvest goals	396	36		355		None - negligible acres		0		0		
	Selected	393	27		366		0		0		0		
Tamarack	Total acres	11,324	204		8,678		1,282		1,079		82		
	Harvest pool	2,524	89	3.5%	2,087	82.7%	255	10.1%	88	3.5%	5	0.2%	
	Harvest goals	364	13		301		37		13		None - negligible acres		
	Selected	208	0		184		24		0		0		
Goal Total		21,646	1,474		14,516		1,355		4,177		119		
Selected Total		23,382	1,671		15,926		1,347		4,410		30		

[Paul Olson: MLU_selection_summary_by_area.xlsx 10-5-2010]

Figure 3.1. DNR Forestry Area Boundaries in the Mille Lacs Uplands and Glacial Lake Superior Plain Subsections

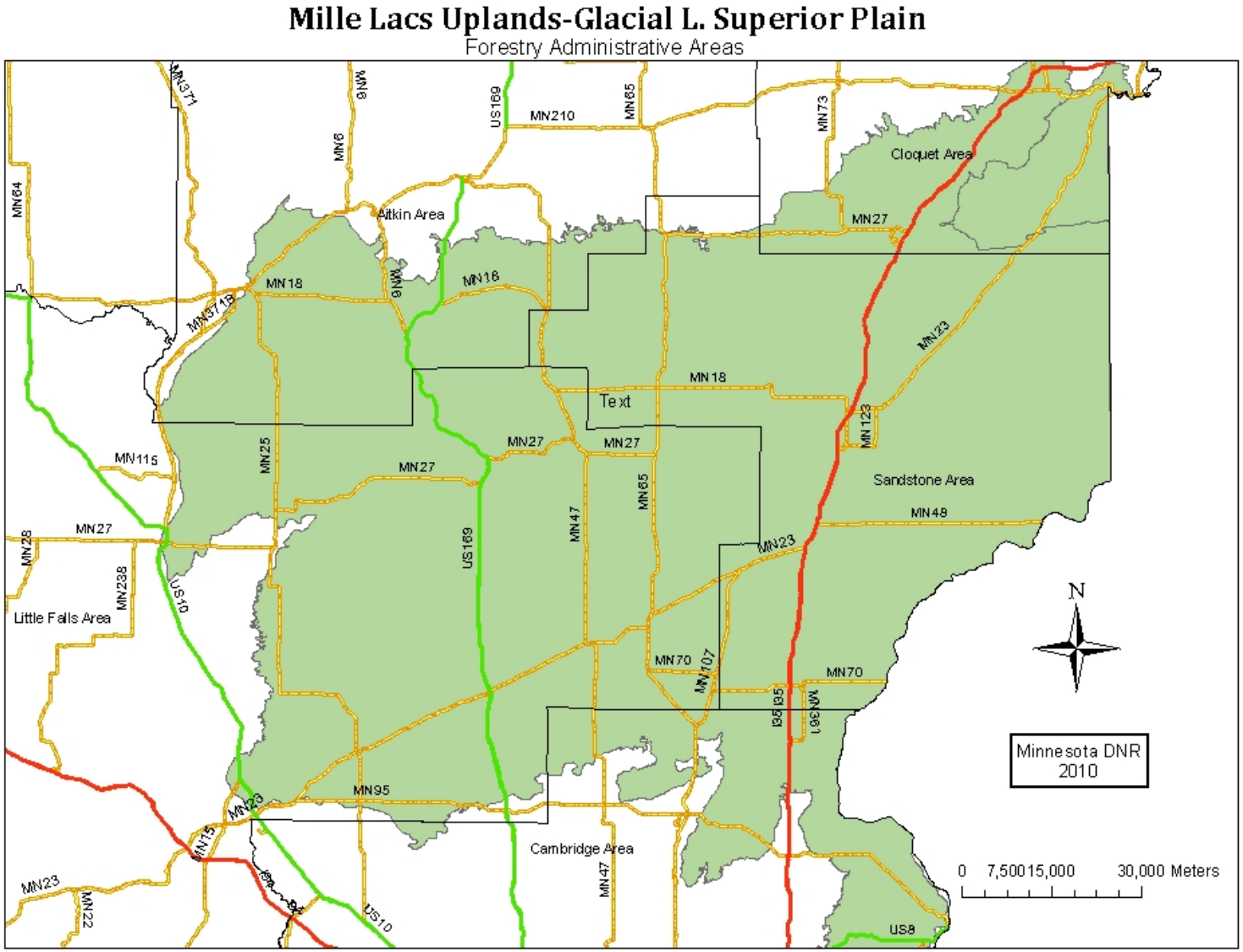

Table 3.1.2. Selected 3-Year Stand Exam Acres by Cover Type by Primary Administrator

Cover Type	Forestry	Wildlife	Total
Ash/Lowland Hardwoods	1,783	122	1,906
Aspen/BG	5,787	879	6,665
Birch	1,265	6	1,271
Northern Hardwoods	5,933	989	6,921
Oak spp	3,165	470	3,635
White pine	29	9	37
Red pine	1,793	12	1,805
Jack pine	184	0	184
Balsam fir	357	0	357
Black spruce	393	0	393
Tamarack	208	0	208
Total Selected Acres	20,897	2,487	23,383
Total DNR Timberland Acres by Administrator	206,290	32,427	238,717
% Selected Acres of Administrator Acres	10	8	10

3.2 New Access Needs

In addition to identifying a three-year stand exam list, the SFRMP process identifies the new access needed to manage the stands on the 3-Year Extension Stand Exam List. Of the stands on the List, 205 stands, or 16 percent required some type of new access designation, permit or construction. The New Access Needs List process identified a need for 23.8 miles of new access to accomplish the forest management goals in the Mille Lacs Uplands and Glacial Lake Superior Plains subsections. These access routes have been classified as 12.9 miles of Resource Management Access Routes and 10.9 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 to the planned access following the stand site visits. Table 3.2.1 identifies additional new access required to manage stands on the 3-year stand exam list.

Table 3.2.1 New Access Needed to Accomplish Planned Management

Forestry Area	Season of Access	Miles of Resource Management Access Route	Miles of Temporary Access Route	Total Miles of New Access
Aitkin (232)	Summer	0.0	0.0	0.0
	Winter	0.0	0.0	0.0
Cloquet (251)	Summer	0.0	5.0	5.0
	Winter	0.0	0.0	0.0
Cambridge (351)	Summer	0.0	0.0	0.0
	Winter	0.0	0.0	0.0
Little Falls (312)	Summer	0.0	0.0	0.0
	Winter	0.0	0.0	0.0
Sandstone (244)	Summer	4.6	0.0	4.6
	Winter	9.2	5.9	15.1
MLU Totals	**Summer**	**4.6**	**5.0**	**9.6**
	Winter	**9.2**	**5.9**	**15.1**

3. 3 Timber Volume Estimate

Planned treatment levels are based on *acres* selected for examination. A Remsoft model was used to convert cover type acres on the stand exam list to estimated timber volume (in cords). This allows a comparison with past volumes harvested.

Table 3.3.1 identifies the estimated volume in cords resulting from implementation of this 3-year extension. The harvest volume estimate (FY2012, FY2013, FY2014) provided in Table 3.3.1 is based on treatment acres, treatment method, and average cords per acre based on forest inventory data and preliminary prescriptions (cords estimated to result from even-aged harvests, partial cut acres and on-site visit cords). The cords estimated represents a culmination of past Division experience as to the volume that can be reasonably anticipated from the various treatment methods cited.

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

1. Forest inventory volumes typically differ from timber appraisal volumes.
2. Stands may have changed since the stand was last inventoried (old stands that are falling apart and/or converting to other types due to storm, fire, forest health issues, flooding damage). These observations are made and recorded under the “on site visit” prescription;

3. Refinement of stand boundaries. On-site visits result in stand boundary adjustments that frequently result a different number acres in the stand;
4. Errors in the previous inventory;
5. Complexity of management decisions go beyond the criteria that are used to identify stands for inclusion in the 3-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 timber stand improvement considerations; and,
6. Management plan (i.e., stand exam) acres represent acres to be treated (not necessarily harvested). Treatment can include harvest, partial harvest; management for understory, inventory alteration, and even a decision to do nothing. Not all planned (i.e., stand exam) acres result in timber sales

Table 3.3.1 Mille Lacs Uplands 3-Year Extension Volume Estimates by Forestry Area

RAN	Forestry Area	Estimated Volume (Cords)
232	Aitkin	14,832
244	Sandstone	225,963
251	Cloquet	27,643
312	Little Falls	78,184
351	Cambridge	337
Total +/- 5%		329,611 – 364,307

[FY2010_millelacs.xls]

Table 3.3.2 Regional Allocation of Timber Volume (Estimated)

Region	3-year Stand exam acres	3-Year Volume offered
Northeast	18,943	268,439
Central	4,440	78,521
Total	**23,383**	329,611 – 364,307

Table 3.3.3 Comparison With Prior Years Timber Harvest Volumes

Average Annual Harvest 2001-2010	Volume (Cords)	Current 3-Year Plan Average Annual Volume	Volume (Cords) +/- 5%
Mille Lacs Uplands	**89,079**	Mille Lacs Uplands	109,915 – 121,485

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Appendix A. Three-Year Stand Exam List

The following table identifies the stands selected for the Mille Lacs Uplands-Glacial Lake Superior Plain three-year extension to the stand examination list . The data fields are as follows:

- **Area:** the subsection has five DNR Forestry area offices – Aitkin, Cambridge, Cloquet, Little Falls, and Sandstone.
- **Location ID:** The location ID is a unique identifier for each stand. The stands are listed in this appendix in ascending numerical order based on the Location ID. Using Location ID t1010w1290198 as an example:
    - T101 = township
    - 04 = range
    - W = range direction
    - 1 = state ownership
    - 29 = section
    - 0198 = stand number
- **Administrator:** Indicates whether the primary administrator of the stand is the Division of Forestry, or the Division of Fish and Wildlife, Wildlife Section.
- **Cover Type:** The forest cover type assigned to the stand.
- **Age:** Current age of the stand as of 2010.
- **Acres:** Stand acres identified to be reviewed for potential treatment (total stand acres may e more).
- **Preliminary Prescription:** The proposed general action to be taken to achieve a desired management objective, based on information available at the time of stand selection. This will be verified or revised based on subsequent field visit. See glossary for definitions.

Table A.1 Complete Stand Exam List for Three-Year Extension

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Cambridge	t03620w1060018	Northern Hdwd	Forestry	95	29.6	Thinning
Little Falls	t03628w1120017	Oak	Wildlife	85	10.3	Thinning
Little Falls	t03628w1120044	Aspen	Wildlife	46	7.4	Even-age harvest
Little Falls	t03628w1120045	Aspen	Wildlife	55	14.9	Even-age harvest
Little Falls	t03628w1120046	Oak	Wildlife	105	6.5	Thinning

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Little Falls	t03628w1120047	Northern Hdwd	Wildlife	75	5.5	Thinning
Little Falls	t03628w1150036	Oak	Wildlife	72	11.4	Thinning
Sandstone	t03820w1240021	Aspen	Forestry	74	26.8	Even-age harvest
Sandstone	t03820w1240033	Northern Hdwd	Forestry	69	11.3	Thinning
Sandstone	t03820w1240040	Northern Hdwd	Forestry	69	5.6	Thinning
Sandstone	t03820w1260047	Red pine	Forestry	20	38.2	Thinning
Sandstone	t03820w1340097	Aspen	Forestry	65	15.8	Even-age harvest
Sandstone	t03822w1100013	Ash	Wildlife	77	99.0	Thinning
Sandstone	t03919w1080186	Lowland Hdwd	Forestry	97	87.2	Thinning
Sandstone	t03919w1180195	Northern Hdwd	Forestry	82	154.6	Thinning
Sandstone	t03919w1200139	Aspen	Forestry	58	7.0	Even-age harvest
Sandstone	t03919w1200144	Aspen	Forestry	58	12.4	Even-age harvest
Sandstone	t03919w1200158	Aspen	Forestry	71	5.6	Even-age harvest
Sandstone	t03919w1200209	Aspen	Forestry	69	14.8	Even-age harvest
Sandstone	t03919w1300166	Aspen	Forestry	63	32.2	Even-age harvest
Sandstone	t03919w1300208	Aspen	Forestry	69	45.5	Even-age harvest
Sandstone	t03919w1310179	Oak	Forestry	78	13.6	Shelterwood
Sandstone	t03919w1310184	Red pine	Forestry	24	2.8	Thinning
Sandstone	t03920w1120099	Aspen	Forestry	63	3.9	Even-age harvest
Sandstone	t03920w1120110	Aspen	Forestry	48	10.9	Even-age harvest
Sandstone	t03920w1130121	Aspen	Forestry	62	9.3	Even-age harvest
Sandstone	t03920w1130137	Aspen	Forestry	63	70.5	Even-age harvest
Sandstone	t03920w1130335	Aspen	Forestry	65	23.3	Even-age harvest
Sandstone	t03920w1140118	Aspen	Forestry	77	17.2	Even-age harvest
Sandstone	t03920w1140139	Aspen	Forestry	70	45.3	Even-age harvest
Sandstone	t03920w1140156	Aspen	Forestry	61	17.3	Even-age harvest
Sandstone	t03920w1240229	Northern Hdwd	Forestry	74	35.0	Thinning
Sandstone	t03920w1240230	Aspen	Forestry	72	10.7	Even-age harvest
Sandstone	t03920w1250234	Northern Hdwd	Forestry	94	43.9	Shelterwood

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Sandstone	t03920w1250241	Northern Hdwd	Forestry	94	2.3	Shelterwood
Sandstone	t03920w1350258	Aspen	Forestry	75	121.1	Even-age harvest
Sandstone	t03920w1360277	Aspen	Forestry	61	11.1	Even-age harvest
Sandstone	t03920w1360282	Aspen	Forestry	68	2.5	Even-age harvest
Sandstone	t03920w1360308	Red pine	Forestry	48	10.2	Thinning
Sandstone	t03920w1360309	Red pine	Forestry	49	6.4	Thinning
Sandstone	t03920w1360315	Red pine	Forestry	63	31.0	Thinning
Sandstone	t03922w1280032	Northern Hdwd	Wildlife	89	13.5	Thinning
Sandstone	t03922w1280035	Northern Hdwd	Wildlife	84	43.7	Thinning
Little Falls	t03925w1020036	Aspen	Wildlife	79	33.8	Even-age harvest
Little Falls	t03925w1020053	Aspen	Wildlife	60	29.0	Even-age harvest
Little Falls	t03925w1060001	Oak	Forestry	68	10.1	Thinning
Little Falls	t03925w1060005	Aspen	Forestry	76	6.6	Even-age harvest
Little Falls	t03925w1060017	Aspen	Forestry	66	17.1	Even-age harvest
Little Falls	t03925w1060043	Aspen	Forestry	58	3.2	Even-age harvest
Little Falls	t03925w1060175	Aspen	Forestry	60	17.4	Even-age harvest
Little Falls	t03925w1060180	Lowland Hdwd	Forestry	94	10.1	Thinning
Little Falls	t03925w1070056	Northern Hdwd	Forestry	65	25.2	Thinning
Little Falls	t03925w1070065	Aspen	Forestry	67	16.4	Even-age harvest
Little Falls	t03925w1070069	Aspen	Forestry	62	14.5	Even-age harvest
Little Falls	t03925w1070179	Northern Hdwd	Forestry	31	3.4	Thinning
Little Falls	t03925w1180072	Aspen	Forestry	60	20.2	Even-age harvest
Little Falls	t03925w1180077	Northern Hdwd	Forestry	66	8.0	Thinning
Little Falls	t03925w1180078	Northern Hdwd	Forestry	45	5.0	Thinning
Little Falls	t03925w1180094	Aspen	Forestry	58	37.4	Even-age harvest
Little Falls	t03925w1180122	Oak	Forestry	45	5.9	Thinning
Little Falls	t03925w1180131	Northern Hdwd	Forestry	68	31.1	Thinning
Little Falls	t03925w1180164	Aspen	Forestry	60	7.1	Even-age harvest
Little Falls	t03925w1180167	Red pine	Forestry	48	1.9	Thinning

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Little Falls	t03925w1180169	Red pine	Forestry	34	5.7	Thinning
Little Falls	t03925w1180170	Red pine	Forestry	34	8.6	Thinning
Little Falls	t03925w1180171	Red pine	Forestry	34	5.3	Thinning
Little Falls	t03925w1180177	Northern Hdwd	Forestry	36	24.5	Thinning
Little Falls	t03925w1190082	Oak	Forestry	16	5.5	Thinning
Little Falls	t03925w1190154	Oak	Forestry	63	27.7	Thinning
Little Falls	t03925w1190156	Northern Hdwd	Forestry	65	33.7	Thinning
Little Falls	t03926w1030010	Northern Hdwd	Forestry	59	20.3	Thinning
Little Falls	t03926w1140284	Aspen	Forestry	67	19.1	Even-age harvest
Sandstone	t04020w1160035	Ash	Forestry	47	13.4	Thinning
Sandstone	t04020w1250092	Aspen	Forestry	64	4.7	Even-age harvest
Sandstone	t04020w1260100	Aspen	Forestry	73	21.3	Even-age harvest
Sandstone	t04020w1260104	Aspen	Forestry	67	33.7	Even-age harvest
Sandstone	t04020w1270091	Aspen	Forestry	69	10.2	Even-age harvest
Sandstone	t04020w1350128	Aspen	Forestry	62	7.2	Even-age harvest
Sandstone	t04020w1350130	Aspen	Forestry	61	27.5	Even-age harvest
Sandstone	t04020w1360137	Aspen	Forestry	64	4.7	Even-age harvest
Sandstone	t04022w1050007	Ash	Wildlife	120	3.6	Thinning
Sandstone	t04022w1050009	Aspen	Wildlife	75	35.7	Even-age harvest
Little Falls	t04025w1090154	Aspen	Wildlife	71	22.9	Even-age harvest
Little Falls	t04025w1090372	Aspen	Wildlife	69	8.2	Even-age harvest
Little Falls	t04025w1090428	Aspen	Wildlife	68	15.8	Even-age harvest
Little Falls	t04025w1160213	Aspen	Forestry	64	35.6	Even-age harvest
Little Falls	t04025w1160370	Aspen	Forestry	64	5.0	Even-age harvest
Little Falls	t04025w1160383	Oak	Forestry	69	29.2	Thinning
Little Falls	t04025w1170243	Oak	Wildlife	71	9.9	Even-age harvest
Little Falls	t04025w1170248	Aspen	Wildlife	64	39.5	Even-age harvest
Little Falls	t04025w1180268	Aspen	Wildlife	60	29.4	Even-age harvest
Little Falls	t04025w1190322	Aspen	Wildlife	65	29.6	Even-age harvest

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Little Falls	t04025w1200070	Aspen	Wildlife	65	10.7	Even-age harvest
Little Falls	t04025w1210082	Aspen	Wildlife	64	32.1	Even-age harvest
Little Falls	t04025w1210101	Oak	Wildlife	65	9.5	Thinning
Little Falls	t04025w1210288	Aspen	Wildlife	63	16.7	Even-age harvest
Little Falls	t04025w1210312	Aspen	Wildlife	65	45.3	Even-age harvest
Little Falls	t04025w1210390	Aspen	Wildlife	66	19.9	Even-age harvest
Little Falls	t04025w1210392	Oak	Wildlife	66	10.0	Thinning
Little Falls	t04025w1310118	Red pine	Forestry	34	6.9	Thinning
Little Falls	t04025w1310349	Oak	Forestry	106	58.8	Even-age harvest
Little Falls	t04025w1310360	Red pine	Forestry	34	9.0	Thinning
Little Falls	t04025w1310361	Aspen	Forestry	77	5.8	Even-age harvest
Little Falls	t04025w1310376	Oak	Forestry	68	9.0	Thinning
Little Falls	t04026w1090105	Northern Hdwd	Wildlife	91	7.8	Thinning
Little Falls	t04026w1100050	Northern Hdwd	Wildlife	82	78.5	Thinning
Little Falls	t04026w1110482	Northern Hdwd	Wildlife	55	45.1	Thinning
Little Falls	t04026w1120453	Aspen	Wildlife	62	84.8	Even-age harvest
Little Falls	t04026w1120456	Northern Hdwd	Wildlife	80	85.2	Thinning
Little Falls	t04026w1130335	Aspen	Wildlife	82	82.9	Even-age harvest
Little Falls	t04026w1130362	Northern Hdwd	Wildlife	86	62.9	Thinning
Little Falls	t04026w1140154	Northern Hdwd	Wildlife	78	7.6	Thinning
Little Falls	t04026w1140331	Northern Hdwd	Wildlife	82	33.1	Thinning
Little Falls	t04026w1140338	Northern Hdwd	Wildlife	77	30.5	Thinning
Little Falls	t04026w1140354	Northern Hdwd	Wildlife	82	18.8	Thinning
Little Falls	t04026w1150153	Northern Hdwd	Wildlife	78	15.5	Thinning
Little Falls	t04026w1160106	Oak	Wildlife	78	15.8	Thinning
Little Falls	t04026w1160108	White pine	Wildlife	47	8.9	Thinning
Little Falls	t04026w1160123	Red pine	Wildlife	52	12.3	Thinning
Little Falls	t04026w1160150	Oak	Wildlife	77	73.5	Thinning
Little Falls	t04026w1210195	Oak	Forestry	75	33.2	Even-age harvest

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Little Falls	t04026w1210209	Northern Hdwd	Forestry	85	97.2	Even-age harvest
Little Falls	t04026w1220236	Northern Hdwd	Forestry	74	9.2	Even-age harvest
Little Falls	t04026w1220378	Oak	Forestry	71	77.9	Even-age harvest
Little Falls	t04026w1220383	Northern Hdwd	Forestry	76	12.4	Thinning
Little Falls	t04026w1230388	Oak	Forestry	75	21.0	Even-age harvest
Little Falls	t04026w1240186	Northern Hdwd	Wildlife	92	13.9	Thinning
Little Falls	t04026w1250412	Northern Hdwd	Forestry	71	48.4	Thinning
Little Falls	t04026w1250487	Aspen	Forestry	47	24.9	Even-age harvest
Little Falls	t04026w1260396	Oak	Forestry	74	30.1	Even-age harvest
Little Falls	t04026w1260397	Oak	Forestry	83	15.6	Even-age harvest
Little Falls	t04026w1260406	Northern Hdwd	Forestry	75	68.6	Thinning
Little Falls	t04026w1260416	Northern Hdwd	Forestry	71	20.8	Thinning
Little Falls	t04026w1270394	Oak	Forestry	78	16.8	Even-age harvest
Little Falls	t04026w1270402	Oak	Forestry	68	53.7	Thinning
Little Falls	t04026w1270403	Oak	Forestry	83	42.9	Even-age harvest
Little Falls	t04026w1280525	Northern Hdwd	Forestry	97	56.2	Thinning
Little Falls	t04026w1290253	Oak	Forestry	65	16.9	Thinning
Little Falls	t04026w1330277	Oak	Forestry	96	91.6	Even-age harvest
Little Falls	t04026w1330312	Northern Hdwd	Forestry	83	24.6	Even-age harvest
Little Falls	t04026w1330465	Oak	Forestry	81	41.7	Thinning
Little Falls	t04026w1340426	Aspen	Forestry	80	10.3	Even-age harvest
Little Falls	t04026w1350278	Northern Hdwd	Forestry	68	9.0	Thinning
Little Falls	t04026w1350288	Northern Hdwd	Forestry	73	18.4	Thinning
Little Falls	t04027w1070072	Oak	Forestry	81	27.1	Even-age harvest
Little Falls	t04027w1070074	Oak	Forestry	82	8.6	Even-age harvest
Little Falls	t04027w1070081	Oak	Forestry	85	25.5	Even-age harvest
Little Falls	t04027w1090025	Oak	Forestry	81	30.2	Even-age harvest
Little Falls	t04027w1090259	Northern Hdwd	Forestry	69	6.9	Thinning
Little Falls	t04027w1180244	Aspen	Forestry	75	10.9	Even-age harvest

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Little Falls	t04027w1180246	Aspen	Forestry	75	44.5	Even-age harvest
Little Falls	t04032w1150016	Oak	Wildlife	69	34.5	Thinning
Little Falls	t04032w1150022	Aspen	Wildlife	78	6.7	Even-age harvest
Sandstone	t04116w1020287	Aspen	Forestry	74	22.2	Even-age harvest
Sandstone	t04116w1030001	Aspen	Forestry	59	62.7	Even-age harvest
Sandstone	t04116w1030316	Oak	Forestry	77	11.2	Thinning
Sandstone	t04116w1050047	White pine	Forestry	108	4.6	Thinning
Sandstone	t04116w1050063	Ash	Forestry	70	83.1	Thinning
Sandstone	t04116w1050186	White pine	Forestry	108	12.1	Thinning
Sandstone	t04116w1050197	Red pine	Forestry	46	28.8	Thinning
Sandstone	t04116w1050294	Aspen	Forestry	70	4.7	Even-age harvest
Sandstone	t04116w1050296	Aspen	Forestry	70	48.3	Even-age harvest
Sandstone	t04116w1070065	Aspen	Forestry	79	21.6	Even-age harvest
Sandstone	t04116w1070118	Birch	Forestry	73	11.0	Even-age harvest
Sandstone	t04116w1070245	Aspen	Forestry	70	4.3	Even-age harvest
Sandstone	t04116w1080301	Aspen	Forestry	70	19.0	Even-age harvest
Sandstone	t04116w1100103	Oak	Forestry	71	21.2	Thinning
Sandstone	t04116w1100248	Aspen	Forestry	59	28.5	Even-age harvest
Sandstone	t04116w1160122	Red pine	Forestry	45	323.6	Thinning
Sandstone	t04116w1180137	Jack pine	Forestry	67	15.2	Even-age harvest
Sandstone	t04116w1180270	Aspen	Forestry	79	100.2	Even-age harvest
Sandstone	t04116w1180271	Aspen	Forestry	60	16.9	Even-age harvest
Sandstone	t04116w1180284	Aspen	Forestry	62	9.3	Even-age harvest
Sandstone	t04116w1180304	Aspen	Forestry	64	10.0	Even-age harvest
Sandstone	t04116w1210183	Oak	Forestry	73	19.4	Shelterwood
Sandstone	t04116w1210259	Oak	Forestry	70	34.2	Shelterwood
Sandstone	t04116w1220312	Aspen	Forestry	61	48.8	Even-age harvest
Sandstone	t04117w1010020	Aspen	Forestry	72	14.7	Even-age harvest
Sandstone	t04117w1010028	Aspen	Forestry	68	11.2	Even-age harvest

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Sandstone	t04117w1110045	Aspen	Forestry	89	4.9	Even-age harvest
Sandstone	t04117w1120017	Aspen	Forestry	56	153.3	Even-age harvest
Sandstone	t04117w1120032	Aspen	Forestry	75	6.0	Even-age harvest
Sandstone	t04117w1120044	Aspen	Forestry	68	9.4	Even-age harvest
Sandstone	t04117w1120054	Aspen	Forestry	68	15.2	Even-age harvest
Sandstone	t04117w1120176	Aspen	Forestry	64	12.1	Even-age harvest
Sandstone	t04117w1130103	Jack pine	Forestry	49	14.8	Even-age harvest
Sandstone	t04117w1130107	Aspen	Forestry	62	35.3	Even-age harvest
Sandstone	t04117w1140080	Aspen	Forestry	72	2.9	Even-age harvest
Sandstone	t04117w1140083	Aspen	Forestry	63	1.1	Even-age harvest
Sandstone	t04117w1140084	Aspen	Forestry	63	15.0	Even-age harvest
Sandstone	t04117w1140088	Red pine	Forestry	46	10.7	Thinning
Sandstone	t04117w1140090	Aspen	Forestry	74	4.1	Even-age harvest
Sandstone	t04117w1140098	Aspen	Forestry	72	5.1	Even-age harvest
Sandstone	t04117w1140161	Oak	Forestry	70	20.3	Shelterwood
Sandstone	t04117w1140162	Oak	Forestry	70	2.3	Shelterwood
Sandstone	t04117w1140193	Aspen	Forestry	72	2.5	Even-age harvest
Sandstone	t04117w1150116	Aspen	Forestry	67	14.1	Even-age harvest
Sandstone	t04117w1150118	Aspen	Forestry	72	4.6	Even-age harvest
Sandstone	t04117w1160068	Northern Hdwd	Forestry	56	31.1	Thinning
Sandstone	t04117w1160091	Northern Hdwd	Forestry	56	18.2	Thinning
Sandstone	t04117w1160191	Northern Hdwd	Forestry	56	12.5	Thinning
Sandstone	t04117w1160192	Aspen	Forestry	63	16.8	Even-age harvest
Sandstone	t04117w1220125	Aspen	Forestry	62	6.0	Even-age harvest
Sandstone	t04117w1220170	Northern Hdwd	Forestry	67	18.0	Thinning
Sandstone	t04119w1160038	Birch	Forestry	66	16.5	Even-age harvest
Sandstone	t04119w1160041	Aspen	Forestry	74	29.1	Even-age harvest
Sandstone	t04119w1160043	Aspen	Forestry	63	15.4	Even-age harvest
Sandstone	t04120w1040026	Lowland Hdwd	Forestry	63	7.4	Thinning

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Little Falls	t04122w1060014	Ash	Forestry	121	3.4	Thinning
Little Falls	t04122w1060049	Ash	Forestry	86	20.4	Thinning
Little Falls	t04122w1060052	Ash	Forestry	90	4.3	Thinning
Little Falls	t04122w1060054	Ash	Forestry	128	14.0	Thinning
Little Falls	t04123w1010010	Aspen	Forestry	61	8.8	Even-age harvest
Little Falls	t04123w1010014	Birch	Forestry	76	12.6	Even-age harvest
Little Falls	t04123w1010023	Ash	Forestry	121	9.8	Thinning
Little Falls	t04123w1010031	Aspen	Forestry	70	64.0	Even-age harvest
Little Falls	t04123w1010046	Birch	Forestry	62	14.5	Even-age harvest
Little Falls	t04123w1010076	Northern Hdwd	Forestry	73	10.1	Thinning
Little Falls	t04124w1060008	Aspen	Forestry	55	12.8	Even-age harvest
Little Falls	t04124w1060009	Oak	Forestry	53	16.5	Thinning
Little Falls	t04125w1050052	Northern Hdwd	Wildlife	85	10.0	Thinning
Little Falls	t04125w1070097	Northern Hdwd	Wildlife	76	29.6	Thinning
Little Falls	t04125w1080667	Northern Hdwd	Wildlife	83	8.6	Thinning
Little Falls	t04125w1170176	Northern Hdwd	Wildlife	72	39.5	Thinning
Little Falls	t04125w1170180	Aspen	Wildlife	74	7.8	Even-age harvest
Little Falls	t04125w1170217	Aspen	Wildlife	82	11.1	Even-age harvest
Little Falls	t04125w1200788	Northern Hdwd	Wildlife	73	7.3	Thinning
Little Falls	t04125w1270319	Aspen	Wildlife	63	28.6	Even-age harvest
Little Falls	t04125w1270335	Aspen	Wildlife	63	17.0	Even-age harvest
Little Falls	t04125w1320461	Aspen	Wildlife	77	16.3	Even-age harvest
Little Falls	t04125w1340864	Northern Hdwd	Wildlife	73	7.9	Thinning
Little Falls	t04125w1350443	Oak	Wildlife	70	45.6	Even-age harvest
Little Falls	t04125w1350570	Northern Hdwd	Wildlife	73	41.5	Thinning
Little Falls	t04125w1350577	Northern Hdwd	Wildlife	73	17.6	Thinning
Little Falls	t04126w1130293	Northern Hdwd	Wildlife	91	12.7	Thinning
Little Falls	t04126w1220091	Northern Hdwd	Wildlife	78	6.3	Even-age harvest
Little Falls	t04126w1230317	Northern Hdwd	Wildlife	51	11.7	Even-age harvest

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Little Falls	t04126w1340280	Northern Hdwd	Wildlife	73	222.8	Thinning
Little Falls	t04126w1350223	Northern Hdwd	Wildlife	73	108.8	Thinning
Little Falls	t04131w1300037	Aspen	Wildlife	73	4.9	Even-age harvest
Little Falls	t04131w1300040	Oak	Wildlife	96	2.0	Thinning
Little Falls	t04131w1300045	Aspen	Wildlife	60	2.4	Even-age harvest
Little Falls	t04131w1300047	Oak	Wildlife	47	2.3	Thinning
Little Falls	t04131w1300048	Aspen	Wildlife	60	3.2	Even-age harvest
Little Falls	t04131w1300049	Aspen	Wildlife	73	2.5	Even-age harvest
Little Falls	t04131w1300050	Aspen	Wildlife	73	4.5	Even-age harvest
Sandstone	t04216w1180010	Northern Hdwd	Forestry	76	14.1	Thinning
Sandstone	t04216w1180023	Northern Hdwd	Forestry	77	71.3	Thinning
Sandstone	t04216w1180024	Northern Hdwd	Forestry	65	49.7	Thinning
Sandstone	t04216w1180031	Northern Hdwd	Forestry	80	42.0	Shelterwood
Sandstone	t04216w1180040	Oak	Forestry	79	45.2	Shelterwood
Sandstone	t04216w1190054	Northern Hdwd	Forestry	82	22.1	Shelterwood
Sandstone	t04216w1190056	Northern Hdwd	Forestry	87	62.5	Thinning
Sandstone	t04216w1190064	Aspen	Forestry	68	5.1	Even-age harvest
Sandstone	t04216w1200229	Aspen	Forestry	68	6.1	Even-age harvest
Sandstone	t04216w1300107	Oak	Forestry	62	4.7	Thinning
Sandstone	t04216w1300198	Northern Hdwd	Forestry	78	4.2	Thinning
Sandstone	t04216w1300199	Northern Hdwd	Forestry	78	11.8	Thinning
Sandstone	t04216w1330137	Northern Hdwd	Forestry	85	5.0	Shelterwood
Sandstone	t04216w1340121	Aspen	Forestry	72	49.9	Even-age harvest
Sandstone	t04216w1340182	Aspen	Forestry	68	19.5	Even-age harvest
Sandstone	t04216w1360111	Red pine	Forestry	60	44.1	Thinning
Sandstone	t04216w1360112	Aspen	Forestry	61	54.1	Even-age harvest
Sandstone	t04216w1360170	Northern Hdwd	Forestry	76	26.6	Shelterwood
Sandstone	t04216w1360237	Northern Hdwd	Forestry	76	7.1	Shelterwood
Sandstone	t04217w1200064	Red pine	Forestry	41	14.9	Thinning

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Sandstone	t04217w1200252	Red pine	Forestry	41	20.7	Thinning
Sandstone	t04217w1220079	Ash	Forestry	90	12.5	Thinning
Sandstone	t04217w1220286	Northern Hdwd	Forestry	88	8.8	Shelterwood
Sandstone	t04217w1250307	Oak	Forestry	73	62.2	Thinning
Sandstone	t04217w1270084	Northern Hdwd	Forestry	66	169.2	Thinning
Sandstone	t04217w1270278	Oak	Forestry	82	72.6	Shelterwood
Sandstone	t04217w1270288	Northern Hdwd	Forestry	59	62.4	Thinning
Sandstone	t04217w1340238	Northern Hdwd	Forestry	77	7.0	Shelterwood
Sandstone	t04217w1350172	Northern Hdwd	Forestry	68	15.9	Thinning
Sandstone	t04217w1350188	Ash	Forestry	79	26.4	Thinning
Sandstone	t04217w1350213	Oak	Forestry	82	20.9	Thinning
Sandstone	t04217w1350222	Aspen	Forestry	73	40.1	Even-age harvest
Sandstone	t04218w1160002	Red pine	Forestry	29	10.5	Thinning
Sandstone	t04218w1160005	Aspen	Forestry	58	29.5	Even-age harvest
Sandstone	t04218w1160010	Red pine	Forestry	24	36.2	Thinning
Sandstone	t04218w1360023	Aspen	Forestry	63	48.7	Even-age harvest
Sandstone	t04220w1360096	Aspen	Forestry	72	18.2	Even-age harvest
Little Falls	t04222w1310077	Aspen	Forestry	61	86.1	Even-age harvest
Little Falls	t04223w1010027	Oak	Forestry	63	54.4	Thinning
Little Falls	t04223w1120029	Oak	Forestry	90	9.9	Even-age harvest
Little Falls	t04223w1120039	Aspen	Forestry	67	21.9	Even-age harvest
Little Falls	t04223w1240115	Aspen	Forestry	74	14.8	Even-age harvest
Little Falls	t04223w1240127	Oak	Wildlife	79	57.3	Even-age harvest
Little Falls	t04223w1240133	Oak	Wildlife	77	13.2	Even-age harvest
Little Falls	t04223w1240134	Oak	Wildlife	79	1.4	Even-age harvest
Little Falls	t04223w1240154	Birch	Wildlife	71	5.8	Even-age harvest
Little Falls	t04223w1240263	Aspen	Forestry	70	18.9	Even-age harvest
Little Falls	t04223w1250152	Aspen	Forestry	61	61.7	Even-age harvest
Little Falls	t04223w1250157	Birch	Forestry	50	14.6	Even-age harvest

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Little Falls	t04223w1250169	Ash	Forestry	137	12.4	Thinning
Little Falls	t04223w1250216	Ash	Forestry	177	8.8	Thinning
Little Falls	t04223w1260143	Aspen	Forestry	63	137.7	Even-age harvest
Little Falls	t04223w1260165	Red pine	Forestry	24	14.0	Thinning
Little Falls	t04223w1360171	Red pine	Forestry	25	11.8	Thinning
Little Falls	t04223w1360172	Red pine	Forestry	19	27.6	Thinning
Little Falls	t04223w1360183	Red pine	Forestry	26	18.3	Thinning
Little Falls	t04223w1360184	Red pine	Forestry	26	11.7	Thinning
Little Falls	t04224w1160005	Aspen	Forestry	76	9.1	Even-age harvest
Little Falls	t04225w1320155	Northern Hdwd	Wildlife	78	2.7	Thinning
Little Falls	t04225w1330108	Oak	Wildlife	78	36.2	Even-age harvest
Little Falls	t04226w1360040	Oak	Wildlife	90	130.8	Thinning
Little Falls	t04227w1260371	Northern Hdwd	Forestry	77	43.1	Thinning
Little Falls	t04227w1290233	Aspen	Forestry	87	13.3	Even-age harvest
Little Falls	t04227w1360384	Northern Hdwd	Forestry	70	16.0	Thinning
Little Falls	t04228w1360045	Oak	Forestry	63	11.2	Thinning
Sandstone	t04316w1070050	Oak	Forestry	74	7.1	Thinning
Sandstone	t04316w1070061	Northern Hdwd	Forestry	75	30.0	Thinning
Sandstone	t04316w1080074	Northern Hdwd	Forestry	68	26.6	Thinning
Sandstone	t04316w1080079	Northern Hdwd	Forestry	78	13.3	Thinning
Sandstone	t04316w1080113	Northern Hdwd	Forestry	78	8.4	Shelterwood
Sandstone	t04316w1080116	Northern Hdwd	Forestry	86	76.2	Shelterwood
Sandstone	t04316w1360098	Aspen	Forestry	80	3.4	Even-age harvest
Sandstone	t04316w1360101	Aspen	Forestry	79	4.7	Even-age harvest
Sandstone	t04316w1360103	Aspen	Forestry	79	13.4	Even-age harvest
Sandstone	t04317w1010022	Aspen	Forestry	65	3.9	Even-age harvest
Sandstone	t04317w1010027	Ash	Forestry	76	4.2	Thinning
Sandstone	t04317w1010034	Northern Hdwd	Forestry	79	22.8	Shelterwood
Sandstone	t04317w1010042	Northern Hdwd	Forestry	73	33.4	Shelterwood

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Sandstone	t04317w1010058	Oak	Forestry	80	46.6	Thinning
Sandstone	t04317w1010215	Ash	Forestry	81	6.1	Thinning
Sandstone	t04317w1020017	Aspen	Forestry	67	23.8	Even-age harvest
Sandstone	t04317w1020028	Northern Hdwd	Forestry	77	19.8	Thinning
Sandstone	t04317w1100095	White pine	Forestry	79	8.4	Thinning
Sandstone	t04317w1110118	Northern Hdwd	Forestry	70	12.3	Thinning
Sandstone	t04317w1110135	Aspen	Forestry	65	81.4	Even-age harvest
Sandstone	t04317w1120137	Northern Hdwd	Forestry	71	7.7	Thinning
Sandstone	t04317w1120147	Aspen	Forestry	70	6.6	Even-age harvest
Sandstone	t04317w1120162	Aspen	Forestry	67	3.7	Even-age harvest
Sandstone	t04317w1150172	Oak	Forestry	75	7.2	Thinning
Sandstone	t04317w1150173	Oak	Forestry	73	10.2	Thinning
Sandstone	t04319w1160035	White pine	Forestry	70	3.3	Thinning
Sandstone	t04320w1080027	Aspen	Forestry	66	21.6	Even-age harvest
Sandstone	t04320w1080033	Red pine	Forestry	112	5.7	Thinning
Sandstone	t04320w1080036	Birch	Forestry	74	21.2	Even-age harvest
Sandstone	t04320w1360175	Aspen	Forestry	71	61.6	Even-age harvest
Sandstone	t04320w1360178	Aspen	Forestry	71	21.4	Even-age harvest
Sandstone	t04321w1340005	Aspen	Forestry	78	75.3	Even-age harvest
Sandstone	t04321w1340018	Aspen	Forestry	75	21.6	Even-age harvest
Sandstone	t04321w1340026	Aspen	Forestry	83	12.5	Even-age harvest
Sandstone	t04321w1340027	Aspen	Forestry	44	13.0	Even-age harvest
Sandstone	t04323w1180056	Aspen	Forestry	83	27.2	Even-age harvest
Sandstone	t04323w1200079	Lowland Hdwd	Forestry	76	21.4	Thinning
Sandstone	t04324w1360032	Lowland Hdwd	Forestry	76	5.9	Thinning
Aitkin	t04328w1360112	Oak	Forestry	67	100.6	Thinning
Aitkin	t04328w1360127	Oak	Forestry	67	24.0	Thinning
Aitkin	t04328w1360128	Oak	Forestry	67	5.3	Thinning
Aitkin	t04328w1360129	Oak	Forestry	67	16.3	Thinning

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Aitkin	t04328w1360131	Aspen	Forestry	59	2.2	Even-age harvest
Aitkin	t04328w1360132	Oak	Forestry	67	1.0	Thinning
Aitkin	t04328w1360134	Oak	Forestry	67	24.1	Thinning
Sandstone	t04415w1190020	Aspen	Forestry	60	42.5	Even-age harvest
Sandstone	t04415w1300022	Aspen	Forestry	57	18.9	Even-age harvest
Sandstone	t04416w1010008	Northern Hdwd	Forestry	140	7.5	Thinning
Sandstone	t04416w1010010	Northern Hdwd	Forestry	70	5.3	Thinning
Sandstone	t04416w1010033	Birch	Forestry	103	39.0	Even-age harvest
Sandstone	t04416w1020005	Northern Hdwd	Forestry	85	30.1	Thinning
Sandstone	t04416w1020006	Northern Hdwd	Forestry	68	21.6	Thinning
Sandstone	t04416w1020070	Balsam fir	Forestry	90	7.0	Even-age harvest
Sandstone	t04416w1020071	Northern Hdwd	Forestry	150	136.2	Thinning
Sandstone	t04416w1020093	Aspen	Forestry	79	2.8	Even-age harvest
Sandstone	t04416w1020108	Northern Hdwd	Forestry	160	19.2	Thinning
Sandstone	t04416w1020716	Aspen	Forestry	79	45.0	Even-age harvest
Sandstone	t04416w1030020	Balsam fir	Forestry	83	15.9	Even-age harvest
Sandstone	t04416w1040042	Birch	Forestry	81	53.9	Even-age harvest
Sandstone	t04416w1060018	Northern Hdwd	Forestry	75	59.1	Thinning
Sandstone	t04416w1060034	Balsam fir	Forestry	85	7.3	Even-age harvest
Sandstone	t04416w1090129	Balsam fir	Forestry	85	7.9	Even-age harvest
Sandstone	t04416w1110112	Northern Hdwd	Forestry	70	39.8	Thinning
Sandstone	t04416w1110121	Northern Hdwd	Forestry	76	55.2	Thinning
Sandstone	t04416w1110208	Northern Hdwd	Forestry	79	14.8	Thinning
Sandstone	t04416w1120168	Birch	Forestry	82	5.7	Even-age harvest
Sandstone	t04416w1120175	Aspen	Forestry	61	5.2	Even-age harvest
Sandstone	t04416w1120180	Birch	Forestry	75	3.8	Even-age harvest
Sandstone	t04416w1120206	Aspen	Forestry	60	4.2	Even-age harvest
Sandstone	t04416w1130199	Northern Hdwd	Forestry	129	277.9	Thinning
Sandstone	t04416w1130274	Northern Hdwd	Forestry	71	17.2	Thinning

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Sandstone	t04416w1130276	Northern Hdwd	Forestry	129	2.5	Thinning
Sandstone	t04416w1130313	Ash	Forestry	111	24.4	Thinning
Sandstone	t04416w1130316	Northern Hdwd	Forestry	93	21.9	Thinning
Sandstone	t04416w1130335	Ash	Forestry	111	2.1	Thinning
Sandstone	t04416w1140269	Northern Hdwd	Forestry	84	6.9	Thinning
Sandstone	t04416w1140290	Northern Hdwd	Forestry	80	6.8	Thinning
Sandstone	t04416w1140326	Northern Hdwd	Forestry	62	9.2	Thinning
Sandstone	t04416w1140739	Northern Hdwd	Forestry	129	63.0	Shelterwood
Sandstone	t04416w1150267	Northern Hdwd	Forestry	101	8.5	Shelterwood
Sandstone	t04416w1160254	Northern Hdwd	Forestry	79	48.2	Thinning
Sandstone	t04416w1160260	Northern Hdwd	Forestry	119	12.3	Thinning
Sandstone	t04416w1170279	Northern Hdwd	Forestry	80	20.7	Thinning
Sandstone	t04416w1170305	Northern Hdwd	Forestry	120	15.4	Thinning
Sandstone	t04416w1170329	Northern Hdwd	Forestry	89	5.0	Shelterwood
Sandstone	t04416w1170332	Aspen	Forestry	83	6.5	Even-age harvest
Sandstone	t04416w1170737	Aspen	Forestry	85	12.2	Even-age harvest
Sandstone	t04416w1180233	Birch	Forestry	81	28.4	Even-age harvest
Sandstone	t04416w1180300	Oak	Forestry	82	21.0	Thinning
Sandstone	t04416w1180330	Ash	Forestry	170	28.7	Thinning
Sandstone	t04416w1180736	Aspen	Forestry	85	42.5	Even-age harvest
Sandstone	t04416w1190358	Ash	Forestry	120	58.1	Thinning
Sandstone	t04416w1190375	Ash	Forestry	150	56.3	Thinning
Sandstone	t04416w1190398	Northern Hdwd	Forestry	58	19.3	Thinning
Sandstone	t04416w1200342	Northern Hdwd	Forestry	120	66.3	Thinning
Sandstone	t04416w1230380	Northern Hdwd	Forestry	78	175.2	Thinning
Sandstone	t04416w1230382	Ash	Forestry	169	28.6	Shelterwood
Sandstone	t04416w1240362	Oak	Forestry	76	71.6	Shelterwood
Sandstone	t04416w1240688	Oak	Forestry	72	4.7	Shelterwood
Sandstone	t04416w1250394	Ash	Forestry	101	140.7	Thinning

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Sandstone	t04416w1250720	Aspen	Forestry	70	5.8	Even-age harvest
Sandstone	t04416w1250721	Aspen	Forestry	47	36.3	Even-age harvest
Sandstone	t04416w1250726	Aspen	Forestry	69	9.8	Even-age harvest
Sandstone	t04416w1260454	Ash	Forestry	101	2.4	Thinning
Sandstone	t04416w1260457	Northern Hdwd	Forestry	64	125.4	Thinning
Sandstone	t04416w1260507	Aspen	Forestry	60	31.1	Even-age harvest
Sandstone	t04416w1260533	Aspen	Forestry	58	17.4	Even-age harvest
Sandstone	t04416w1260536	Red pine	Forestry	55	3.3	Thinning
Sandstone	t04416w1270682	Northern Hdwd	Forestry	84	14.0	Shelterwood
Sandstone	t04416w1280510	Tamarack	Forestry	60	15.6	Even-age harvest
Sandstone	t04416w1280538	Tamarack	Forestry	70	19.8	Even-age harvest
Sandstone	t04416w1300446	Ash	Forestry	170	33.5	Thinning
Sandstone	t04416w1310589	Aspen	Forestry	56	7.0	Even-age harvest
Sandstone	t04416w1310732	Birch	Forestry	63	13.7	Even-age harvest
Sandstone	t04416w1310733	Ash	Forestry	124	36.5	Thinning
Sandstone	t04416w1320564	Ash	Forestry	124	67.5	Thinning
Sandstone	t04416w1320663	Northern Hdwd	Forestry	91	10.5	Thinning
Sandstone	t04416w1330666	Northern Hdwd	Forestry	66	8.4	Thinning
Sandstone	t04416w1340576	Northern Hdwd	Forestry	67	16.1	Thinning
Sandstone	t04416w1350554	Ash	Forestry	146	114.7	Thinning
Sandstone	t04416w1350605	Aspen	Forestry	73	1.6	Even-age harvest
Sandstone	t04416w1350612	Northern Hdwd	Forestry	91	74.3	Thinning
Sandstone	t04416w1350629	Black spruce	Forestry	113	50.2	Even-age harvest
Sandstone	t04416w1350634	Northern Hdwd	Forestry	80	1.8	Thinning
Sandstone	t04416w1350641	Northern Hdwd	Forestry	70	6.0	Thinning
Sandstone	t04416w1350672	Northern Hdwd	Forestry	80	19.1	Thinning
Sandstone	t04416w1360574	Aspen	Forestry	60	10.8	Even-age harvest
Sandstone	t04416w1360587	Northern Hdwd	Forestry	77	52.2	Thinning
Sandstone	t04416w1360623	Black spruce	Forestry	82	5.9	Even-age harvest

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Sandstone	t04416w1360643	Aspen	Forestry	56	30.1	Even-age harvest
Sandstone	t04416w1360647	Ash	Forestry	124	11.1	Thinning
Sandstone	t04417w1010012	Aspen	Forestry	50	8.7	Even-age harvest
Sandstone	t04417w1010027	Aspen	Forestry	58	6.3	Even-age harvest
Sandstone	t04417w1010032	Aspen	Forestry	55	5.3	Even-age harvest
Sandstone	t04417w1020005	Aspen	Forestry	80	3.0	Even-age harvest
Sandstone	t04417w1020020	Balsam fir	Forestry	82	7.7	Even-age harvest
Sandstone	t04417w1020021	Black spruce	Forestry	121	18.2	Even-age harvest
Sandstone	t04417w1050052	Aspen	Forestry	91	34.5	Even-age harvest
Sandstone	t04417w1100069	Ash	Forestry	109	6.0	Thinning
Sandstone	t04417w1110455	Aspen	Forestry	76	6.9	Even-age harvest
Sandstone	t04417w1130488	Oak	Forestry	82	4.6	Thinning
Sandstone	t04417w1160109	Aspen	Forestry	106	10.7	Even-age harvest
Sandstone	t04417w1160126	Red pine	Forestry	29	12.7	Thinning
Sandstone	t04417w1160137	Aspen	Forestry	80	8.9	Even-age harvest
Sandstone	t04417w1200170	Birch	Forestry	77	14.2	Even-age harvest
Sandstone	t04417w1200171	Birch	Forestry	76	46.7	Even-age harvest
Sandstone	t04417w1210232	Birch	Forestry	79	10.1	Even-age harvest
Sandstone	t04417w1230247	Ash	Forestry	119	27.6	Thinning
Sandstone	t04417w1240490	Oak	Forestry	82	8.8	Thinning
Sandstone	t04417w1250288	Ash	Forestry	239	11.8	Thinning
Sandstone	t04417w1250303	Ash	Forestry	140	29.2	Thinning
Sandstone	t04417w1250324	Birch	Forestry	85	6.2	Even-age harvest
Sandstone	t04417w1250325	Ash	Forestry	104	13.9	Thinning
Sandstone	t04417w1250329	Ash	Forestry	145	8.7	Thinning
Sandstone	t04417w1260306	Northern Hdwd	Forestry	102	54.8	Thinning
Sandstone	t04417w1260323	Ash	Forestry	145	24.3	Thinning
Sandstone	t04417w1330517	Aspen	Forestry	75	6.1	Even-age harvest
Sandstone	t04417w1340509	Aspen	Forestry	75	7.0	Even-age harvest

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Sandstone	t04417w1350372	Aspen	Forestry	89	6.8	Even-age harvest
Sandstone	t04417w1350390	Aspen	Forestry	78	3.6	Even-age harvest
Sandstone	t04417w1350405	Aspen	Forestry	69	8.5	Even-age harvest
Sandstone	t04417w1350522	Aspen	Forestry	83	13.3	Even-age harvest
Sandstone	t04417w1360345	Birch	Forestry	89	11.4	Even-age harvest
Sandstone	t04417w1360396	Aspen	Forestry	60	7.8	Even-age harvest
Sandstone	t04417w1360407	Aspen	Forestry	64	4.9	Even-age harvest
Sandstone	t04417w1360419	Aspen	Forestry	61	6.8	Even-age harvest
Sandstone	t04417w1360421	Aspen	Forestry	62	5.6	Even-age harvest
Sandstone	t04418w1160031	Aspen	Forestry	65	8.5	Even-age harvest
Sandstone	t04419w1060012	Red pine	Forestry	50	19.5	Thinning
Sandstone	t04419w1060015	Jack pine	Forestry	19	26.6	Thinning
Sandstone	t04419w1060041	Jack pine	Forestry	77	66.2	Even-age harvest
Sandstone	t04419w1360066	Aspen	Forestry	85	8.5	Even-age harvest
Sandstone	t04419w1360068	Aspen	Forestry	85	50.5	Even-age harvest
Sandstone	t04419w1360069	Birch	Forestry	83	19.7	Even-age harvest
Sandstone	t04420w1080023	Aspen	Forestry	67	17.6	Even-age harvest
Sandstone	t04420w1160026	Aspen	Forestry	76	8.4	Even-age harvest
Sandstone	t04420w1160030	Oak	Forestry	43	28.2	Thinning
Sandstone	t04420w1160031	Oak	Forestry	87	37.7	Thinning
Sandstone	t04420w1200043	Aspen	Forestry	70	35.1	Even-age harvest
Sandstone	t04420w1200048	Balsam fir	Forestry	75	14.2	Even-age harvest
Sandstone	t04420w1200051	Balsam fir	Forestry	92	7.1	Even-age harvest
Sandstone	t04420w1200053	Balsam fir	Forestry	88	4.5	Even-age harvest
Sandstone	t04421w1160018	Aspen	Forestry	68	27.2	Even-age harvest
Sandstone	t04421w1160020	Oak	Forestry	81	20.7	Shelterwood
Sandstone	t04421w1160026	Oak	Forestry	82	17.0	Shelterwood
Sandstone	t04421w1160036	Oak	Forestry	79	52.9	Shelterwood
Sandstone	t04421w1210076	Aspen	Wildlife	73	132.4	Even-age harvest

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Sandstone	t04421w1360055	Northern Hdwd	Forestry	81	33.0	Shelterwood
Sandstone	t04421w1360058	Ash	Forestry	98	6.2	Thinning
Sandstone	t04421w1360060	Aspen	Forestry	69	3.3	Even-age harvest
Sandstone	t04421w1360061	Northern Hdwd	Forestry	78	34.6	Shelterwood
Sandstone	t04421w1360064	Aspen	Forestry	64	19.7	Even-age harvest
Sandstone	t04421w1360065	Aspen	Forestry	83	3.3	Even-age harvest
Sandstone	t04422w1050749	Aspen	Forestry	71	4.7	Even-age harvest
Sandstone	t04422w1060748	Aspen	Forestry	71	5.1	Even-age harvest
Sandstone	t04422w1140224	Northern Hdwd	Forestry	98	45.1	Thinning
Sandstone	t04422w1140253	Northern Hdwd	Forestry	64	1.9	Thinning
Sandstone	t04422w1140271	Northern Hdwd	Forestry	70	4.9	Shelterwood
Sandstone	t04422w1150226	Northern Hdwd	Forestry	74	21.7	Shelterwood
Sandstone	t04422w1150227	Northern Hdwd	Forestry	78	15.3	Shelterwood
Sandstone	t04422w1150284	Northern Hdwd	Forestry	70	101.9	Thinning
Sandstone	t04422w1150291	Northern Hdwd	Forestry	78	81.1	Thinning
Sandstone	t04422w1170248	Aspen	Forestry	62	63.3	Even-age harvest
Sandstone	t04422w1180233	Ash	Forestry	102	54.0	Thinning
Sandstone	t04422w1190404	Northern Hdwd	Forestry	83	59.9	Thinning
Sandstone	t04422w1190416	Northern Hdwd	Forestry	90	11.4	Thinning
Sandstone	t04422w1190427	Oak	Forestry	97	27.3	Thinning
Sandstone	t04422w1190458	Northern Hdwd	Forestry	84	8.1	Thinning
Sandstone	t04422w1190703	Oak	Forestry	90	16.5	Thinning
Sandstone	t04422w1190704	Oak	Forestry	90	29.4	Thinning
Sandstone	t04422w1190705	Northern Hdwd	Forestry	90	26.8	Thinning
Sandstone	t04422w1200419	Oak	Forestry	79	10.1	Thinning
Sandstone	t04422w1200420	Northern Hdwd	Forestry	101	9.4	Thinning
Sandstone	t04422w1200439	Oak	Forestry	100	10.0	Thinning
Sandstone	t04422w1200469	Northern Hdwd	Forestry	69	24.5	Thinning
Sandstone	t04422w1210365	Northern Hdwd	Forestry	78	133.8	Thinning

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Sandstone	t04422w1210746	Oak	Forestry	79	17.6	Thinning
Sandstone	t04422w1220363	Northern Hdwd	Forestry	58	9.8	Thinning
Sandstone	t04422w1240445	Aspen	Forestry	61	11.1	Even-age harvest
Sandstone	t04422w1250543	Aspen	Forestry	5	8.4	Even-age harvest
Sandstone	t04422w1250553	Northern Hdwd	Forestry	75	49.0	Shelterwood
Sandstone	t04422w1250594	Oak	Forestry	74	6.2	Thinning
Sandstone	t04422w1250742	Northern Hdwd	Forestry	75	13.6	Shelterwood
Sandstone	t04422w1250744	Oak	Forestry	80	80.9	Shelterwood
Sandstone	t04422w1270514	Northern Hdwd	Forestry	78	44.0	Thinning
Sandstone	t04422w1270757	Oak	Forestry	75	46.2	Thinning
Sandstone	t04422w1270758	Aspen	Forestry	54	3.2	Even-age harvest
Sandstone	t04422w1290523	Oak	Forestry	81	27.6	Thinning
Sandstone	t04422w1290526	Northern Hdwd	Forestry	75	26.1	Thinning
Sandstone	t04422w1300730	Northern Hdwd	Forestry	90	12.0	Thinning
Sandstone	t04422w1340760	Aspen	Forestry	54	15.7	Even-age harvest
Sandstone	t04422w1350671	Ash	Forestry	80	7.3	Thinning
Sandstone	t04422w1350678	Oak	Forestry	95	12.9	Shelterwood
Sandstone	t04422w1350683	Oak	Forestry	77	16.4	Thinning
Sandstone	t04422w1350692	Oak	Forestry	79	22.2	Shelterwood
Sandstone	t04422w1360626	Oak	Forestry	78	23.6	Thinning
Sandstone	t04422w1360643	Oak	Forestry	71	62.8	Shelterwood
Sandstone	t04422w1360743	Ash	Forestry	124	37.1	Thinning
Sandstone	t04423w1020223	Northern Hdwd	Forestry	82	19.0	Shelterwood
Sandstone	t04423w1110077	Northern Hdwd	Forestry	67	11.5	Thinning
Sandstone	t04423w1110311	Northern Hdwd	Forestry	74	137.8	Thinning
Sandstone	t04423w1110312	Ash	Forestry	118	55.7	Thinning
Sandstone	t04423w1160118	Northern Hdwd	Forestry	67	18.2	Thinning
Sandstone	t04425w1160017	Oak	Forestry	86	28.7	Thinning
Sandstone	t04425w1160021	Ash	Forestry	118	9.2	Thinning

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Sandstone	t04425w1160060	Northern Hdwd	Forestry	88	59.7	Thinning
Sandstone	t04425w1160061	Northern Hdwd	Forestry	77	26.1	Thinning
Sandstone	t04425w1360066	Oak	Forestry	81	35.9	Shelterwood
Sandstone	t04425w1360070	Oak	Forestry	81	31.6	Shelterwood
Sandstone	t04425w1360072	Northern Hdwd	Forestry	88	5.2	Thinning
Sandstone	t04425w1360076	Oak	Forestry	81	13.6	Thinning
Sandstone	t04425w1360077	Northern Hdwd	Forestry	88	4.6	Thinning
Sandstone	t04425w1360081	Northern Hdwd	Forestry	84	7.2	Shelterwood
Sandstone	t04425w1360084	Northern Hdwd	Forestry	87	6.7	Shelterwood
Sandstone	t04425w1360088	Oak	Forestry	76	16.1	Shelterwood
Sandstone	t04425w1360089	Oak	Forestry	84	5.6	Shelterwood
Aitkin	t04429w1160004	Aspen	Forestry	62	34.8	Even-age harvest
Aitkin	t04429w1160006	Ash	Forestry	118	7.7	Thinning
Sandstone	t04515w1060011	Birch	Forestry	83	37.9	Even-age harvest
Sandstone	t04515w1180026	Balsam fir	Forestry	86	20.1	Even-age harvest
Sandstone	t04515w1310048	Aspen	Forestry	71	9.3	Even-age harvest
Sandstone	t04516w1010004	Birch	Forestry	82	101.1	Even-age harvest
Sandstone	t04516w1010031	Birch	Forestry	93	6.7	Even-age harvest
Sandstone	t04516w1010043	Birch	Forestry	83	4.4	Even-age harvest
Sandstone	t04516w1010048	Birch	Forestry	82	4.1	Even-age harvest
Sandstone	t04516w1010065	Ash	Forestry	83	26.3	Thinning
Sandstone	t04516w1010695	Birch	Forestry	80	11.9	Even-age harvest
Sandstone	t04516w1020003	Aspen	Forestry	60	19.4	Even-age harvest
Sandstone	t04516w1020034	Birch	Forestry	86	25.0	Even-age harvest
Sandstone	t04516w1020035	Tamarack	Forestry	102	4.5	Even-age harvest
Sandstone	t04516w1020058	Tamarack	Forestry	127	6.8	Even-age harvest
Sandstone	t04516w1040026	Black spruce	Forestry	91	11.3	Even-age harvest
Sandstone	t04516w1050042	Red pine	Forestry	45	10.1	Thinning
Sandstone	t04516w1050067	Birch	Forestry	2	39.6	Even-age harvest

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Sandstone	t04516w1050087	Black spruce	Forestry	68	22.9	Even-age harvest
Sandstone	t04516w1060027	Aspen	Forestry	74	1.3	Even-age harvest
Sandstone	t04516w1060052	Black spruce	Forestry	123	25.8	Even-age harvest
Sandstone	t04516w1060101	Aspen	Forestry	47	5.6	Even-age harvest
Sandstone	t04516w1060659	Red pine	Forestry	52	9.3	Thinning
Sandstone	t04516w1070175	Birch	Forestry	88	17.9	Even-age harvest
Sandstone	t04516w1070676	Birch	Forestry	88	27.1	Even-age harvest
Sandstone	t04516w1070685	Northern Hdwd	Forestry	122	32.4	Shelterwood
Sandstone	t04516w1070704	Balsam fir	Forestry	75	15.5	Even-age harvest
Sandstone	t04516w1090111	Northern Hdwd	Forestry	75	57.9	Shelterwood
Sandstone	t04516w1090132	Red pine	Forestry	47	115.3	Thinning
Sandstone	t04516w1090152	Birch	Forestry	94	15.2	Even-age harvest
Sandstone	t04516w1090153	Northern Hdwd	Forestry	83	10.6	Shelterwood
Sandstone	t04516w1090713	Northern Hdwd	Forestry	111	35.3	Shelterwood
Sandstone	t04516w1100136	Northern Hdwd	Forestry	98	26.4	Thinning
Sandstone	t04516w1100138	Birch	Forestry	79	11.6	Even-age harvest
Sandstone	t04516w1100150	Northern Hdwd	Forestry	74	7.5	Thinning
Sandstone	t04516w1110124	Aspen	Forestry	71	11.8	Even-age harvest
Sandstone	t04516w1120154	Balsam fir	Forestry	87	11.6	Even-age harvest
Sandstone	t04516w1120162	Birch	Forestry	78	151.9	Even-age harvest
Sandstone	t04516w1120180	Balsam fir	Forestry	80	31.3	Even-age harvest
Sandstone	t04516w1120182	Aspen	Forestry	64	21.2	Even-age harvest
Sandstone	t04516w1130259	Northern Hdwd	Forestry	79	43.9	Thinning
Sandstone	t04516w1130289	Northern Hdwd	Forestry	77	15.4	Thinning
Sandstone	t04516w1140237	Balsam fir	Forestry	103	8.4	Even-age harvest
Sandstone	t04516w1140243	Birch	Forestry	78	4.2	Even-age harvest
Sandstone	t04516w1140256	Balsam fir	Forestry	83	6.2	Even-age harvest
Sandstone	t04516w1140267	Balsam fir	Forestry	82	12.1	Even-age harvest
Sandstone	t04516w1140277	Aspen	Forestry	79	5.0	Even-age harvest

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Sandstone	t04516w1140303	Aspen	Forestry	74	4.2	Even-age harvest
Sandstone	t04516w1140665	Northern Hdwd	Forestry	79	4.4	Thinning
Sandstone	t04516w1160236	Tamarack	Forestry	93	5.8	Even-age harvest
Sandstone	t04516w1160247	Oak	Forestry	80	46.9	Thinning
Sandstone	t04516w1170217	Northern Hdwd	Forestry	82	59.6	Thinning
Sandstone	t04516w1170222	Black spruce	Forestry	77	10.4	Even-age harvest
Sandstone	t04516w1170234	Northern Hdwd	Forestry	103	14.0	Thinning
Sandstone	t04516w1170263	Northern Hdwd	Forestry	69	22.3	Thinning
Sandstone	t04516w1170297	Northern Hdwd	Forestry	78	9.9	Thinning
Sandstone	t04516w1180220	Northern Hdwd	Forestry	78	39.7	Thinning
Sandstone	t04516w1180240	Black spruce	Forestry	126	18.7	Even-age harvest
Sandstone	t04516w1190410	Northern Hdwd	Forestry	115	21.7	Thinning
Sandstone	t04516w1190416	Northern Hdwd	Forestry	115	14.3	Thinning
Sandstone	t04516w1200316	Aspen	Forestry	72	4.0	Even-age harvest
Sandstone	t04516w1220422	Birch	Forestry	82	11.1	Even-age harvest
Sandstone	t04516w1260475	Northern Hdwd	Forestry	81	84.8	Thinning
Sandstone	t04516w1260506	Northern Hdwd	Forestry	73	18.3	Thinning
Sandstone	t04516w1260690	Northern Hdwd	Forestry	73	9.6	Thinning
Sandstone	t04516w1290438	Northern Hdwd	Forestry	64	6.3	Thinning
Sandstone	t04516w1300444	Aspen	Forestry	81	9.0	Even-age harvest
Sandstone	t04516w1310568	Northern Hdwd	Forestry	78	16.8	Shelterwood
Sandstone	t04516w1310572	Balsam fir	Forestry	85	12.1	Even-age harvest
Sandstone	t04516w1320597	Balsam fir	Forestry	91	8.2	Even-age harvest
Sandstone	t04516w1330595	Balsam fir	Forestry	80	26.1	Even-age harvest
Sandstone	t04516w1340535	Birch	Forestry	72	133.2	Even-age harvest
Sandstone	t04516w1350534	Northern Hdwd	Forestry	63	16.6	Thinning
Sandstone	t04516w1350543	Northern Hdwd	Forestry	70	4.0	Shelterwood
Sandstone	t04516w1350611	Northern Hdwd	Forestry	89	10.4	Thinning
Sandstone	t04516w1360596	Aspen	Forestry	85	6.9	Even-age harvest

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Sandstone	t04517w1010004	Aspen	Forestry	74	28.7	Even-age harvest
Sandstone	t04517w1010009	Balsam fir	Forestry	81	41.7	Even-age harvest
Sandstone	t04517w1010010	Aspen	Forestry	66	3.4	Even-age harvest
Sandstone	t04517w1010017	Birch	Forestry	67	69.7	Even-age harvest
Sandstone	t04517w1010026	Red pine	Forestry	22	35.2	Thinning
Sandstone	t04517w1010046	Aspen	Forestry	47	16.1	Even-age harvest
Sandstone	t04517w1010050	Birch	Forestry	68	30.1	Even-age harvest
Sandstone	t04517w1010055	Balsam fir	Forestry	85	4.9	Even-age harvest
Sandstone	t04517w1020005	Birch	Forestry	75	7.9	Even-age harvest
Sandstone	t04517w1020047	Aspen	Forestry	64	12.5	Even-age harvest
Sandstone	t04517w1020474	Aspen	Forestry	67	15.3	Even-age harvest
Sandstone	t04517w1100077	Red pine	Forestry	28	24.7	Thinning
Sandstone	t04517w1100101	Red pine	Forestry	28	37.4	Thinning
Sandstone	t04517w1100109	Red pine	Forestry	28	21.5	Thinning
Sandstone	t04517w1100139	Aspen	Forestry	79	4.6	Even-age harvest
Sandstone	t04517w1100483	Red pine	Forestry	26	14.2	Thinning
Sandstone	t04517w1110085	Red pine	Forestry	56	15.2	Thinning
Sandstone	t04517w1120073	Birch	Forestry	76	15.7	Even-age harvest
Sandstone	t04517w1130198	Red pine	Forestry	31	7.7	Thinning
Sandstone	t04517w1150181	Tamarack	Forestry	73	11.8	Even-age harvest
Sandstone	t04517w1150225	Red pine	Forestry	23	25.4	Thinning
Sandstone	t04517w1150472	Aspen	Forestry	76	25.4	Even-age harvest
Sandstone	t04517w1160152	Red pine	Forestry	58	6.6	Thinning
Sandstone	t04517w1160176	Red pine	Forestry	33	16.5	Thinning
Sandstone	t04517w1160196	Red pine	Forestry	30	11.3	Thinning
Sandstone	t04517w1200513	Aspen	Forestry	71	49.5	Even-age harvest
Sandstone	t04517w1200517	Balsam fir	Forestry	77	5.1	Even-age harvest
Sandstone	t04517w1200519	Balsam fir	Forestry	85	6.6	Even-age harvest
Sandstone	t04517w1200524	Balsam fir	Forestry	84	15.8	Even-age harvest

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Sandstone	t04517w1200525	Birch	Forestry	75	9.6	Even-age harvest
Sandstone	t04517w1210243	Red pine	Forestry	58	58.0	Thinning
Sandstone	t04517w1210262	Aspen	Forestry	51	9.6	Even-age harvest
Sandstone	t04517w1210274	Red pine	Forestry	44	4.3	Thinning
Sandstone	t04517w1210275	Birch	Forestry	77	7.9	Even-age harvest
Sandstone	t04517w1210289	Aspen	Forestry	64	15.1	Even-age harvest
Sandstone	t04517w1210533	Red pine	Forestry	53	12.1	Thinning
Sandstone	t04517w1210536	Red pine	Forestry	50	18.5	Thinning
Sandstone	t04517w1220277	Black spruce	Forestry	122	65.0	Even-age harvest
Sandstone	t04517w1220302	Balsam fir	Forestry	84	7.0	Even-age harvest
Sandstone	t04517w1230297	Aspen	Forestry	71	18.0	Even-age harvest
Sandstone	t04517w1230308	Birch	Forestry	19	7.4	Even-age harvest
Sandstone	t04517w1260312	Aspen	Forestry	20	171.8	Even-age harvest
Sandstone	t04517w1270367	Aspen	Forestry	83	5.3	Even-age harvest
Sandstone	t04517w1290578	Balsam fir	Forestry	79	1.8	Even-age harvest
Sandstone	t04517w1340570	Red pine	Forestry	36	3.7	Thinning
Sandstone	t04517w1350439	Aspen	Forestry	77	153.0	Even-age harvest
Sandstone	t04517w1350469	Aspen	Forestry	86	9.2	Even-age harvest
Sandstone	t04517w1360441	Balsam fir	Forestry	81	7.9	Even-age harvest
Sandstone	t04517w1360446	Aspen	Forestry	73	13.4	Even-age harvest
Sandstone	t04517w1360448	Ash	Forestry	133	57.5	Thinning
Sandstone	t04517w1360455	Northern Hdwd	Forestry	83	5.6	Thinning
Sandstone	t04517w1360456	Balsam fir	Forestry	82	3.9	Even-age harvest
Sandstone	t04517w1360492	Aspen	Forestry	86	42.5	Even-age harvest
Sandstone	t04518w1360064	Aspen	Forestry	76	5.1	Even-age harvest
Sandstone	t04518w1360065	Oak	Forestry	82	4.4	Thinning
Sandstone	t04519w1190001	Red pine	Forestry	70	25.8	Thinning
Sandstone	t04519w1190005	Red pine	Forestry	66	83.9	Thinning
Sandstone	t04519w1190012	Red pine	Forestry	61	25.6	Thinning

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Sandstone	t04519w1190021	Red pine	Forestry	19	4.8	Thinning
Sandstone	t04519w1300025	Red pine	Forestry	51	10.2	Thinning
Sandstone	t04519w1300028	Jack pine	Forestry	56	11.3	Even-age harvest
Sandstone	t04519w1300029	Red pine	Forestry	25	5.5	Thinning
Sandstone	t04519w1300035	Red pine	Forestry	44	8.9	Thinning
Sandstone	t04519w1300036	Red pine	Forestry	107	18.2	Thinning
Sandstone	t04519w1300042	Red pine	Forestry	62	25.9	Thinning
Sandstone	t04519w1300044	Red pine	Forestry	51	5.1	Thinning
Sandstone	t04519w1300050	Jack pine	Forestry	20	26.2	Thinning
Sandstone	t04519w1300051	Red pine	Forestry	20	1.6	Thinning
Sandstone	t04519w1300052	Red pine	Forestry	20	1.1	Thinning
Sandstone	t04519w1300054	Red pine	Forestry	20	2.2	Thinning
Sandstone	t04519w1300115	Red pine	Forestry	51	6.3	Thinning
Sandstone	t04519w1310060	Red pine	Forestry	48	3.3	Thinning
Sandstone	t04519w1310102	Red pine	Forestry	19	11.7	Thinning
Sandstone	t04519w1360058	Red pine	Forestry	52	22.0	Thinning
Sandstone	t04519w1360101	Aspen	Forestry	46	13.9	Even-age harvest
Sandstone	t04519w1360125	Red pine	Forestry	45	5.7	Thinning
Sandstone	t04519w1360126	Red pine	Forestry	47	17.1	Thinning
Sandstone	t04520w1150168	Aspen	Wildlife	79	9.9	Even-age harvest
Sandstone	t04520w1160115	Aspen	Forestry	75	8.5	Even-age harvest
Sandstone	t04520w1160134	Aspen	Forestry	90	17.8	Even-age harvest
Sandstone	t04520w1230026	Red pine	Forestry	44	9.2	Thinning
Sandstone	t04520w1240028	Red pine	Forestry	19	65.4	Thinning
Sandstone	t04520w1240137	Red pine	Forestry	34	2.8	Thinning
Sandstone	t04520w1250030	Red pine	Forestry	69	13.2	Thinning
Sandstone	t04520w1250049	Red pine	Forestry	21	35.5	Thinning
Sandstone	t04520w1350075	Red pine	Forestry	55	48.0	Thinning
Sandstone	t04520w1350077	Red pine	Forestry	49	8.2	Thinning

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Sandstone	t04520w1350093	Red pine	Forestry	18	22.4	Thinning
Sandstone	t04520w1360058	Red pine	Forestry	19	12.6	Thinning
Sandstone	t04520w1360064	Red pine	Forestry	64	11.6	Thinning
Sandstone	t04520w1360084	Red pine	Forestry	30	6.6	Thinning
Sandstone	t04520w1360089	Red pine	Forestry	47	24.6	Thinning
Sandstone	t04520w1360096	Red pine	Forestry	18	5.3	Thinning
Sandstone	t04521w1360001	Oak	Forestry	79	28.0	Shelterwood
Sandstone	t04521w1360002	Oak	Forestry	80	105.2	Shelterwood
Sandstone	t04521w1360003	Oak	Forestry	78	47.8	Thinning
Sandstone	t04522w1040160	Northern Hdwd	Forestry	72	103.6	Shelterwood
Sandstone	t04522w1070177	Aspen	Forestry	73	11.6	Even-age harvest
Sandstone	t04522w1070189	Ash	Forestry	125	15.0	Thinning
Sandstone	t04522w1070192	Aspen	Forestry	75	30.8	Even-age harvest
Sandstone	t04522w1190063	Oak	Forestry	79	35.7	Thinning
Sandstone	t04522w1200147	Northern Hdwd	Forestry	124	7.6	Thinning
Sandstone	t04522w1210055	Aspen	Forestry	63	54.2	Even-age harvest
Sandstone	t04522w1210279	Birch	Forestry	82	10.9	Even-age harvest
Sandstone	t04522w1290303	Oak	Forestry	78	21.0	Thinning
Sandstone	t04522w1300315	Oak	Forestry	86	72.3	Shelterwood
Sandstone	t04522w1310326	Oak	Forestry	78	41.2	Thinning
Sandstone	t04522w1310337	Aspen	Forestry	73	48.7	Even-age harvest
Sandstone	t04522w1310354	Red pine	Forestry	39	3.9	Thinning
Sandstone	t04522w1320112	Aspen	Forestry	62	43.1	Even-age harvest
Sandstone	t04522w1320367	Aspen	Forestry	63	20.4	Even-age harvest
Sandstone	t04522w1320395	Aspen	Forestry	49	10.1	Even-age harvest
Sandstone	t04522w1360332	Ash	Forestry	67	14.4	Thinning
Sandstone	t04523w1060401	Lowland Hdwd	Forestry	77	57.6	Thinning
Sandstone	t04523w1140061	Aspen	Forestry	63	6.0	Even-age harvest
Sandstone	t04523w1150637	Aspen	Forestry	72	3.9	Even-age harvest

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Sandstone	t04523w1180251	Aspen	Forestry	63	85.1	Even-age harvest
Sandstone	t04523w1190262	Aspen	Forestry	76	17.2	Even-age harvest
Sandstone	t04523w1190275	Black spruce	Forestry	102	39.4	Even-age harvest
Sandstone	t04523w1190296	Black spruce	Forestry	102	98.1	Even-age harvest
Sandstone	t04523w1200149	Ash	Forestry	88	24.1	Thinning
Sandstone	t04523w1260353	Aspen	Forestry	82	13.1	Even-age harvest
Sandstone	t04523w1270582	Oak	Forestry	79	17.5	Thinning
Sandstone	t04523w1270631	Aspen	Forestry	67	11.3	Even-age harvest
Sandstone	t04523w1330362	Aspen	Forestry	3	37.1	Even-age harvest
Sandstone	t04523w1340598	Aspen	Forestry	66	25.8	Even-age harvest
Sandstone	t04523w1340610	Aspen	Forestry	67	9.5	Even-age harvest
Sandstone	t04523w1350367	Aspen	Forestry	66	19.0	Even-age harvest
Sandstone	t04523w1350371	Oak	Forestry	74	16.8	Thinning
Sandstone	t04523w1360192	Oak	Forestry	77	6.9	Thinning
Sandstone	t04523w1360378	Aspen	Forestry	77	4.8	Even-age harvest
Sandstone	t04524w1010052	Northern Hdwd	Forestry	81	55.1	Thinning
Sandstone	t04524w1010054	Northern Hdwd	Forestry	82	20.8	Shelterwood
Sandstone	t04524w1010060	Aspen	Forestry	70	7.8	Even-age harvest
Sandstone	t04524w1100009	Oak	Forestry	77	14.5	Thinning
Sandstone	t04524w1130107	Lowland Hdwd	Forestry	72	4.3	Thinning
Sandstone	t04524w1130153	Northern Hdwd	Forestry	66	93.1	Thinning
Sandstone	t04524w1160133	Oak	Forestry	79	130.7	Shelterwood
Sandstone	t04524w1160136	Northern Hdwd	Forestry	82	9.7	Thinning
Sandstone	t04524w1240157	Tamarack	Forestry	128	39.3	Even-age harvest
Sandstone	t04524w1240163	Tamarack	Forestry	150	35.2	Even-age harvest
Aitkin	t04525w1360080	Aspen	Forestry	57	29.8	Even-age harvest
Aitkin	t04526w1050042	Red pine	Forestry	27	23.4	Thinning
Aitkin	t04526w1050071	Red pine	Forestry	31	10.9	Thinning
Aitkin	t04526w1050090	Jack pine	Forestry	42	14.2	Even-age harvest

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Aitkin	t04526w1050196	Jack pine	Forestry	45	9.8	Even-age harvest
Aitkin	t04526w1060049	Red pine	Forestry	27	17.3	Thinning
Aitkin	t04526w1060059	Aspen	Forestry	73	21.1	Even-age harvest
Aitkin	t04526w1160143	Northern Hdwd	Forestry	62	5.7	Thinning
Aitkin	t04526w1160144	Northern Hdwd	Forestry	73	26.3	Shelterwood
Aitkin	t04526w1160149	Northern Hdwd	Forestry	122	57.3	Thinning
Aitkin	t04527w1180053	Northern Hdwd	Forestry	87	55.7	Thinning
Aitkin	t04527w1240166	Oak	Forestry	82	150.3	Thinning
Aitkin	t04527w1240251	Oak	Forestry	108	49.7	Thinning
Aitkin	t04527w1240252	Oak	Forestry	82	5.3	Thinning
Aitkin	t04529w1160005	Aspen	Forestry	68	26.0	Even-age harvest
Aitkin	t04529w1160012	Aspen	Forestry	54	47.2	Even-age harvest
Aitkin	t04529w1160017	Tamarack	Forestry	115	13.1	Even-age harvest
Aitkin	t04529w1160019	Tamarack	Forestry	116	7.4	Even-age harvest
Aitkin	t04529w1160053	Tamarack	Forestry	119	3.6	Even-age harvest
Aitkin	t04529w1360036	Oak	Forestry	92	37.9	Thinning
Aitkin	t04529w1360038	Ash	Forestry	69	7.1	Thinning
Aitkin	t04529w1360058	Oak	Forestry	87	25.2	Thinning
Aitkin	t04529w1360062	Oak	Forestry	77	7.9	Thinning
Cloquet	t04615w1180021	Birch	Forestry	87	18.9	Even-age harvest
Cloquet	t04616w1130025	Northern Hdwd	Forestry	70	23.9	Thinning
Cloquet	t04616w1140018	Birch	Forestry	78	12.8	Even-age harvest
Cloquet	t04616w1140031	Ash	Forestry	100	48.7	Thinning
Cloquet	t04616w1140370	Aspen	Forestry	90	104.1	Even-age harvest
Cloquet	t04616w1240056	Aspen	Forestry	90	58.4	Even-age harvest
Cloquet	t04616w1240061	Birch	Forestry	88	10.6	Even-age harvest
Cloquet	t04616w1240066	Aspen	Forestry	89	17.5	Even-age harvest
Cloquet	t04616w1260115	Ash	Forestry	90	64.1	Thinning
Cloquet	t04616w1270131	Birch	Forestry	81	12.0	Even-age harvest

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Cloquet	t04616w1270143	Birch	Forestry	81	18.4	Even-age harvest
Cloquet	t04616w1270383	Ash	Forestry	117	4.0	Thinning
Cloquet	t04616w1310155	Northern Hdwd	Forestry	76	44.9	Thinning
Cloquet	t04616w1310158	Ash	Forestry	84	4.2	Thinning
Cloquet	t04616w1310201	Oak	Forestry	102	11.4	Thinning
Cloquet	t04616w1310211	Oak	Forestry	94	5.4	Thinning
Cloquet	t04616w1310223	Balsam fir	Forestry	99	1.5	Even-age harvest
Cloquet	t04616w1310263	Northern Hdwd	Forestry	71	9.1	Thinning
Cloquet	t04616w1310407	Balsam fir	Forestry	85	26.8	Even-age harvest
Cloquet	t04616w1320234	Oak	Forestry	79	4.9	Thinning
Cloquet	t04616w1320336	Oak	Forestry	70	40.5	Thinning
Cloquet	t04616w1320337	Oak	Forestry	76	17.3	Thinning
Cloquet	t04616w1330198	Birch	Forestry	86	7.4	Even-age harvest
Cloquet	t04616w1330210	Aspen	Forestry	84	27.9	Even-age harvest
Cloquet	t04616w1330239	Aspen	Forestry	20	101.9	Even-age harvest
Cloquet	t04616w1340166	Aspen	Forestry	83	43.0	Even-age harvest
Cloquet	t04616w1340269	Aspen	Forestry	32	5.8	Even-age harvest
Cloquet	t04616w1340397	Aspen	Forestry	84	8.9	Even-age harvest
Cloquet	t04616w1350191	Aspen	Forestry	67	35.6	Even-age harvest
Cloquet	t04616w1350265	Ash	Forestry	93	11.3	Thinning
Cloquet	t04616w1360434	Northern Hdwd	Forestry	115	48.9	Thinning
Cloquet	t04617w1070090	Aspen	Forestry	63	23.2	Even-age harvest
Cloquet	t04617w1070091	Balsam fir	Forestry	80	7.9	Even-age harvest
Cloquet	t04617w1160027	Black spruce	Forestry	80	27.2	Even-age harvest
Cloquet	t04617w1360056	Northern Hdwd	Forestry	92	44.2	Thinning
Cloquet	t04617w1360064	Northern Hdwd	Forestry	72	5.8	Thinning
Cloquet	t04617w1360070	Balsam fir	Forestry	88	3.1	Even-age harvest
Cloquet	t04617w1360076	Birch	Forestry	79	39.2	Even-age harvest
Cloquet	t04617w1360088	Northern Hdwd	Forestry	84	8.6	Thinning

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Cloquet	t04618w1360001	Aspen	Forestry	64	2.7	Even-age harvest
Cloquet	t04618w1360007	Aspen	Forestry	63	22.3	Even-age harvest
Cloquet	t04618w1360012	Aspen	Forestry	66	6.0	Even-age harvest
Cloquet	t04618w1360013	Aspen	Forestry	51	3.0	Even-age harvest
Cloquet	t04619w1360002	Aspen	Forestry	65	5.1	Even-age harvest
Cloquet	t04619w1360010	Northern Hdwd	Forestry	108	1.7	Thinning
Cloquet	t04620w1160006	Aspen	Forestry	64	14.5	Even-age harvest
Cloquet	t04620w1360031	Ash	Forestry	78	38.9	Thinning
Cloquet	t04621w1130056	Aspen	Forestry	66	16.0	Even-age harvest
Cloquet	t04621w1240057	Aspen	Forestry	60	26.4	Even-age harvest
Sandstone	t04623w1240046	Aspen	Forestry	72	8.6	Even-age harvest
Sandstone	t04623w1340216	Tamarack	Forestry	123	45.4	Even-age harvest
Aitkin	t04624w1320110	Northern Hdwd	Forestry	71	30.9	Thinning
Aitkin	t04624w1320113	Lowland Hdwd	Forestry	112	31.6	Thinning
Aitkin	t04624w1320114	Ash	Forestry	126	8.1	Thinning
Aitkin	t04624w1360100	Northern Hdwd	Forestry	103	224.0	Thinning
Aitkin	t04624w1360117	Northern Hdwd	Forestry	81	66.9	Thinning
Aitkin	t04624w1360118	Ash	Forestry	119	36.9	Thinning
Aitkin	t04624w1360123	Lowland Hdwd	Forestry	116	5.5	Thinning
Aitkin	t04625w1270085	Birch	Forestry	113	4.6	Even-age harvest
Aitkin	t04625w1280064	Oak	Forestry	67	15.5	Thinning
Aitkin	t04629w1160105	Oak	Forestry	65	50.0	Thinning
Aitkin	t04629w1160112	Oak	Forestry	77	2.3	Thinning
Aitkin	t04629w1160137	Oak	Forestry	77	2.4	Thinning
Cloquet	t04716w1300053	Ash	Wildlife	102	19.5	Thinning
Cloquet	t04716w1360068	Aspen	Forestry	61	98.0	Even-age harvest
Cloquet	t04716w1360071	Ash	Forestry	119	14.8	Thinning
Cloquet	t04716w1360131	Aspen	Forestry	74	24.2	Even-age harvest
Cloquet	t04716w1360132	Aspen	Forestry	74	18.4	Even-age harvest

Forestry Area	Location	Cover Type	Administrator	Age	Acres	Preliminary Prescription
Cloquet	t04717w1160010	Birch	Forestry	76	30.5	Even-age harvest
Cloquet	t04717w1160104	Birch	Forestry	76	5.3	Even-age harvest
Cloquet	t04717w1250035	Aspen	Wildlife	83	14.0	Even-age harvest
Cloquet	t04717w1250041	Aspen	Wildlife	72	58.7	Even-age harvest
Cloquet	t04717w1360060	Aspen	Forestry	82	17.1	Even-age harvest
Cloquet	t04717w1360062	Aspen	Forestry	56	35.2	Even-age harvest
Cloquet	t04717w1360064	Aspen	Forestry	71	10.6	Even-age harvest
Cloquet	t04717w1360067	Aspen	Forestry	83	5.3	Even-age harvest
Cloquet	t04717w1360070	Aspen	Forestry	81	4.7	Even-age harvest
Cloquet	t04719w1160009	Aspen	Forestry	53	16.8	Even-age harvest
Cloquet	t04719w1160010	Aspen	Forestry	56	22.0	Even-age harvest
Cloquet	t04719w1160012	Aspen	Forestry	65	9.0	Even-age harvest
Cloquet	t04719w1160014	Ash	Forestry	68	4.4	Thinning
Cloquet	t04719w1160028	Ash	Forestry	91	14.1	Thinning
Cloquet	t04719w1160040	Ash	Forestry	114	7.6	Thinning
Cloquet	t04719w1160045	Northern Hdwd	Forestry	89	5.3	Thinning
Cloquet	t04719w1160046	Aspen	Forestry	71	21.0	Even-age harvest
Cloquet	t04720w1160002	Ash	Forestry	80	28.8	Thinning
Cloquet	t04720w1160003	Balm of Gilead	Forestry	75	39.3	Even-age harvest

Appendix B. Three-Year Stand Exam List with White Pine

The following two tables identify the stands selected for the Mille Lacs Uplands-Glacial Lake Superior Plain three-year extension stand exam list that are either typed in the DNR forest inventory as white pine cover type i.e., white pine is the predominant species by volume) or stands that contain white pine as a secondary species.

Table B.1. Three-Year Stand List with White Pine

The table fields are as follows:

- **Area:** the subsection has five DNR Forestry area offices – Aitkin, Cambridge, Cloquet, Little Falls, and Sandstone.
- **Location ID:** The location ID is a unique identifier for each stand. The stands are listed in this appendix in ascending numerical order based on the Location ID. Using Location ID t1010w1290198 as an example:
    - T101 = township
    - 04 = range
    - W = range direction
    - 1 = state ownership
    - 29 = section
    - 0198 = stand number
- **Administrator:** Indicates whether the primary administrator of the stand is the Division of Forestry, or the Division of Fish and Wildlife, Wildlife Section.
- **Cover Type:** The forest cover type assigned to the stand.
- **Age:** Current age of the stand as of 2010.
- **Acres:** Stand acres identified to be reviewed for potential treatment (total stand acres may e more).
- **Preliminary Prescription:** The proposed general action to be taken to achieve a desired management objective, based on information available at the time of stand selection. This will be verified or revised based on subsequent field visit. See glossary for definitions.

Table B.1 Stands Selected that are White Pine Cover Type

Area	Location	Administrator	Cover Type	Age	Acres	Preliminary Prescription
Little Falls	t04026w1160108	Wildlife	White pine	47	8.9	Thinning
Sandstone	t04116w1050047	Forestry	White pine	108	4.6	Thinning
Sandstone	t04116w1050186	Forestry	White pine	108	12.1	Thinning
Sandstone	t04317w1100095	Forestry	White pine	79	8.4	Thinning
Sandstone	t04319w1160035	Forestry	White pine	70	3.3	Thinning

Table B.2 Stands Selected with White Pine as Secondary Species

Area	Location	Administrator	Cover Type	Age	Acres	Preliminary Prescription
Sandstone	t03919w1080186	Forestry	Lowland Hdwd	97	87.2	Thinning
Little Falls	t03925w1180164	Forestry	Aspen	60	7.1	Even-age harvest
Little Falls	t04026w1160123	Wildlife	Red pine	52	12.3	Thinning
Little Falls	t04026w1330465	Forestry	Oak	81	41.7	Thinning
Sandstone	t04116w1050197	Forestry	Red pine	46	28.8	Thinning
Sandstone	t04116w1050294	Forestry	Aspen	70	4.7	Even-age harvest
Sandstone	t04116w1160122	Forestry	Red pine	45	323.6	Thinning
Sandstone	t04116w1180137	Forestry	Jack pine	67	15.2	Even-age harvest
Sandstone	t04116w1180304	Forestry	Aspen	64	10.0	Even-age harvest
Sandstone	t04116w1210183	Forestry	Oak	73	19.4	Shelterwood
Sandstone	t04117w1010020	Forestry	Aspen	72	14.7	Even-age harvest
Little Falls	t04125w1340864	Wildlife	Northern Hdwd	73	7.9	Thinning
Little Falls	t04125w1350570	Wildlife	Northern Hdwd	73	41.5	Thinning
Little Falls	t04125w1350577	Wildlife	Northern Hdwd	73	17.6	Thinning
Sandstone	t04216w1300107	Forestry	Oak	62	4.7	Thinning
Little Falls	t04223w1260165	Forestry	Red pine	24	14.0	Thinning
Sandstone	t04320w1080033	Forestry	Red pine	112	5.7	Thinning
Sandstone	t04320w1080036	Forestry	Birch	74	21.2	Even-age harvest
Sandstone	t04320w1360175	Forestry	Aspen	71	61.6	Even-age harvest
Sandstone	t04320w1360178	Forestry	Aspen	71	21.4	Even-age harvest
Sandstone	t04416w1240362	Forestry	Oak	76	71.6	Shelterwood
Sandstone	t04416w1360643	Forestry	Aspen	56	30.1	Even-age harvest
Sandstone	t04420w1200051	Forestry	Balsam fir	92	7.1	Even-age harvest
Sandstone	t04420w1200053	Forestry	Balsam fir	88	4.5	Even-age harvest
Sandstone	t04421w1360055	Forestry	Northern Hdwd	81	33.0	Shelterwood
Sandstone	t04422w1190703	Forestry	Oak	90	16.5	Thinning
Sandstone	t04422w1190704	Forestry	Oak	90	29.4	Thinning
Sandstone	t04422w1200439	Forestry	Oak	100	10.0	Thinning

Sandstone	t04516w1020035	Forestry	Tamarack	102	4.5	Even-age harvest
Sandstone	t04517w1010017	Forestry	Birch	67	69.7	Even-age harvest
Sandstone	t04517w1010055	Forestry	Balsam fir	85	4.9	Even-age harvest
Sandstone	t04517w1360448	Forestry	Ash	133	57.5	Thinning
Sandstone	t04519w1300028	Forestry	Jack pine	56	11.3	Even-age harvest
Sandstone	t04519w1300029	Forestry	Red pine	25	5.5	Thinning
Sandstone	t04522w1310354	Forestry	Red pine	39	3.9	Thinning
Sandstone	t04522w1320367	Forestry	Aspen	63	20.4	Even-age harvest
Aitkin	t04526w1050196	Forestry	Jack pine	45	9.8	Even-age harvest
Aitkin	t04529w1160012	Forestry	Aspen	54	47.2	Even-age harvest
Cloquet	t04616w1240056	Forestry	Aspen	90	58.4	Even-age harvest
Cloquet	t04616w1240066	Forestry	Aspen	89	17.5	Even-age harvest
Cloquet	t04617w1160027	Forestry	Black spruce	80	27.2	Even-age harvest

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Appendix C: Implementation and Monitoring Report

The Monitoring Process

Following internal guidance (http://files-intranet.dnr.state.mn.us/user_files/2535/sfrmp_monitoringplan_appendices.pdf) developed for monitoring SFRMP implementation, the Mille Lacs Uplands SFRMP Core Team (consisting of the regional forest planner, regional timber forester, regional ecologist, and regional forest wildlife coordinator) convened early in 2009 to review accomplishment data for the Mille Lacs Uplands subsection. They reviewed accomplishment data for the subsection and compared those data with the goals identified in the MLU SFRMP. Because a three-year extension to the seven-year MLU SFRMP will be developed in FY2010, the monitoring report will help ensure that progress toward the goals and desired future forest conditions in the MLU plan continues; it will be attached as an appendix to the extended plan:

> *"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."*

This draft report has been reviewed by staff from the three divisions charged with implementation of the plan. Responses and comments from area staff on a draft of this report were incorporated in this final monitoring report by the SFRMP core team for the central region.

A Note Regarding Data Limitations

The region Core 4 team reached its conclusions based on a summary of available data; these may or may not be consistent with reality. Data sources (e.g., recording of management objectives) varied significantly in the extent to which management objectives accurately represented work that was actually done. Some reports the team needed are not yet able to be summarized by the desired variable (e.g., cover type). In some cases the team used other data sources that are available but are not ideal for the analysis conducted (e.g. before/after FIM comparisons as an indicator of progress on cover type change goals).

The current analysis has shed light on needed changes to the ways forest management data are recorded. In some cases discussions have already started that will lead to improvements. Field personnel are being asked to help make the monitoring process more accurate by reviewing the following conclusions and responding as appropriate with corrections based on local knowledge and data.

Information Sources, Data, and Data Analysis

A detailed list of information and data sources used in this monitoring review can be found below, along with a list of data comparisons made to determine trends and make summary observations that led to the recommended actions listed in this report. Detailed data used to develop these recommendations will be provided to the forestry and wildlife areas for their perusal.

General Data Sources

1) Final MLU SFRMP
2) FY2005 - FY2009 Annual Stand Exam Lists (ASELs) for MLU subsection (including Glacial Lake Superior Plain)
3) MLU subsection FIM data – 2009
4) MLU SFRMP Assessment
5) MLU SFRMP final "Harvest Strategy" spreadsheet models
6) Timber Sales Report System – reports of timber volumes sold by subsection through FY 2006
7) Silviculture and Roads Module (SRM) Reports:
    - 1a – Planned and Actual Actions by Forestry Region-Area Number (RAN) and SFRMP for FY06 – FY08
    - 1bc – Planned and Actual On-Site Visits (OSVs) by Cover Type and Age Class by RAN and SFRMP for FY06-FY08
    - 3a – Management Objectives by RAN by SFRMP for FY08

Data Comparisons Conducted, With Data Source

- Comparison of Annual Stand Exam Lists (ASELs) by cover type to plan treatment acreage goal (FY05-FY09)
- Comparison of volume sold [from Timber Sales Module (TSM) FY04 through FY06] to plan estimate of available volume
- Comparison of 2004 cover type acreage to 2009 (original FIM planning layer versus 2009 clipped FIM)
- Three-way comparison: Ten-year cover type conversion goals from plan compared to change in FIM from 2004-2009, and use of SRM management objective codes, "convert to" and "increase species" in 2008
- Comparison of DNR timberland acreage over normal rotation age in 2004 (from SFRMP Assessment) to 2009 (projected and actual, including stands under development), and to 2011 plan goal (from SFRMP)
- Comparisons of age class acreage by cover type (several different views, comparing 2006 SFRMP to 2009FIM and projected 2016 – projection applies average change from 2006-2009 to future years)
- FY08 acres by management objective/by RAN for which an OSV was recorded in SRM
- Comparison of acres planned for treatment in ten-year plan to actual ASEL acres (FY07 to FY09), and to acres where a harvest strategy was recorded, by age class
- Comparison of FY06 acreage to FY08 acreage, by cover type comparison of ASEL to SRM planned to SRM actual

- Ten-year plan stand exam list acres by age class by cover type (plan FIM shapefile)
- FY07 to FY09 actions on ASEL stands by cover type by age class
- FY06 to FY08 SRM planned versus accomplished actions by RAN
- FY05 to FY08 SRM planned versus actual OSVs by RAN, cover type, and age class
- FY08 SRM acreage by management objective by RAN
- FY07 –FY08 Forest Development Module (FDM) planned stand exam action/actual actions/cover type plan disposition, by disposition type and acres
- FY07-FY08 Planned OSVs compared to ten-year goals by cover type by RAN

General Trends and Observations:

Table C.1 Comparison of Forest Inventory Information (2004-2010)

Cover Type	2004 Acres*	2010 Acres*	DFFC	DFFC %	Long-Term DFFC[+]
Ash and lowland hdwd	19,332	19,455	19,332	100%	Constant
Aspen and Balm of Gilead	104,506	105,123	99,281	95%	Slight decrease
Birch	9,191	8,210	13,603	148%	Work to increase
Northern and central hdwd	46,064	38,735	46,064	100%	Maintain or slight increase
Oak	22,531	28,970	22,982	102%	Slight increase
White pine	902	671	902	100%	100% increase in wp as a component in other forest types
Red pine	6,841	7,508	6,841	100%	Maintain
Jack pine	2,079	1,354	2,079	100%	Maintain
White spruce	2,912	2,653	2,912	100%	Maintain
Balsam fir	3,408	2,625	3,408	100%	Maintain
Lowland black spruce	11,328	11,540	10,762	95%	Est. 5% conversion to tamarack
Tamarack	10,753	11,324	11,291	105%	Inc. from BSL conversion
Total timberlands	239,847	238,168	239,457		

***Timberland Acres**

[+]Original plan goal

- The average **acreage on FY05-09 Annual Stand Exam Lists (ASELs) has been substantially higher** (1,500 acres/year or 20 percent higher) compared to what was included in the final plan stand list. The most significant differences (as a percentage of planned acres) were:

- Aspen/BG (533 acres/year or 24 percent higher than planned)
- Birch (172 acres/year or 41 percent higher than planned)
- Red pine (220 acres/year or 220 percent higher than planned, mostly thinning)
- Tamarack (86 acres/year or 47 percent higher than planned)
- Northern/central hardwoods (291 acres/year or 13 percent higher than planned)

- The average acreage on the ASELs has been pretty close to what was in the final plan stand list for all Forestry Areas except Sandstone. Sandstone added 5,000 acres of conifer plantation thinning per direction from the Division of Forestry Director. This created a **backlog of stands that were on the plan stand exam list** and have not been examined as of the end of calendar year 2009.

- The average age-class distribution of stands from FY07-FY09 ASELs suggests some **possible over- or under-emphasis in some age-classes** for some types compared to final plan list (hard to have a complete picture since age or age-class not included on ASEL prior to FY07). Some examples include:
  - Aspen is slightly over in most age classes, except slightly under in the 51-60 age class.
  - Birch is substantially over in the 51-60 age class.
  - Jack pine is over in the 61-80 age classes.
  - Balsam fir is substantially over in the 71-80 age class. Given the number of acres involved, this was heavily influenced by one year (i.e., FY08).
  - Lowland black spruce is over in the 100+ age classes, and low in the 80-100 age-classes; low in the 21-40 age classes and over in the 41-50 age class.
  - Tamarack is substantially over in the 71-80 age class. Given the number of acres involved, this was heavily influenced by one year (i.e., FY08).

- The average **volume sold** in the Mille Lacs Uplands SFRMP subsections from FY05-FY06 was 11 percent lower than estimated in the final plan (82,1220 cords vs. 92,370 cords, 10,260 cords lower). During this two-year period, the ASEL acreage averaged over 10,000 acres/year or 2,500 acres higher than planned. This would suggest that acres on the stand exam list aren't being visited and/or acres visited aren't resulting in timber sales when compared to expectations.

Based on comparison of the 2004 FIM data set used in stand selection and the 2009 Mille Lacs Uplands SFRMP clip of FIM, the following are noteworthy:

- Continuing to lose **birch cover type** acres (down over 10 percent since 2004, or 1,015 acres). Ten-year target was to increase birch cover type by 5,000 acres. Birch in the 1-10 age class is higher in 2009, but only about ½ of what was projected for 2016.

- Losing acres of **upland conifers** (i.e., jack pine, white pine, white spruce, balsam fir) all of which had a 10-year target to maintain cover type acres.

- Substantial reductions in 41-60 year old **jack pine**, but not a corresponding increase in 1-10 regeneration class (even with stands "under development" moved to 1-10 year age-class).

- **Balsam fir** 1-10 age class in 2009 is substantially below what was projected for 2016 (even with stands "under development" moved to 1-10 year age-class).

- Appears to be a shift of about 5,000 acres from the **northern hardwoods cover type to the oak cover type**.

- **Tamarack 10-year target to increase the type by 500 acres appears to have been met.**

- **Lowland black spruce** 1-10 age class in 2009 is substantially below what was projected for 2016 (even with stands "under development" moved to 1-10 year age-class).

- The percentage of DNR **timberlands beyond normal rotation age is higher than projected for 2011 for all cover types** examined (those managed primarily via even-aged systems), although the percent beyond NRA is lower than in 2004 for all types, except for lowland and upland black spruce.

Some observations based on first year of management objective reporting (i.e., FY2008), understanding that it is hard to draw conclusions based one year of data:

- Sandstone and Cloquet Areas were most active in assigning management objectives other than "maintain similar stand."

- Plan goals to **increase birch and white pine types are not reflected in FY08 management objectives** (i.e., no acres assigned management objective of converting to these types).

- Of the species identified in the plan for increases (i.e., white pine and other long-lived conifers, white cedar, paper birch, and oak), **oak is the only species for which substantial acres were assigned a management objective to increase**.

- Substantial acres were assigned **management objective to change stand structure to multi- or uneven-aged** (2,142 acres, primarily in Sandstone Area). This was likely reflective of efforts to diversify the structure in currently even-aged northern hardwood and oak stands.

- Substantial acres (805 acres) were assigned management objective to "**maintain large patch," all in the Sandstone Area**.

- Based on FY07-08 SRM reports 1a/1bc, there are slightly (<4 percent) fewer acres entered in SRM as planned stand exam onsite visits (OSVs), and 80 percent of the planned stand exam OSV acres have a recorded accomplishment (i.e., OSV was recorded as complete).

- Based on FY08 stand exam reports (**FY06 and FY07 acres visited appear to be missing substantial acres** compared to SFRMP reports 1a/1bc), about 40 percent of the acres visited resulted in an appraisal for timber sale, 23 percent were altered, and 36 percent were deferred.

General (Subsection-Wide) Recommended Actions:

- **Increase conversion to/regeneration of birch**. Birch will be competitive over aspen in a number of native plant community types, which can be determined by using the tree suitability tables and other ECS information. Examples of NPCs for which this can be the case are FDn43, MHn35, MHn45, and MHc26.

- Examine reasons for **loss of upland conifer types (other than red pine)** and remind field staff of goals to maintain these types, and increase the white pine type. May need to focus more attention on regeneration of these types (e.g., conversion opportunities to compensate for lost acres) and on inventory alterations where there is advance regeneration of the desired cover type and intention to change cover type consistent with plan goals.

- Examine reasons for **shift from northern hardwoods type to oak type an**d provide direction to field staff if this is a problem.

  Remind **field staff of plan goals** to increase long-lived conifer species (including white pine and white cedar) and paper birch within other types.
- Reinforce with staff the **importance of recording management objectives** that capture the intended outcome of stand management prescriptions -- they will be important for future monitoring. Discuss any barriers to timely recording (staff shortages, lack of training, etc.) so that they can be reviewed and addressed.

Area-Specific Recommendations:

Sandstone

- **Consider development plans t**o regenerate **birch** by scarification or planting, depending on site conditions and NPC. **Note:** Staff suggests that original goals considered all ownerships despite DNR lands having a lower % of birch acres and opportunity--suggest looking more closely at birch types on other ownerships, and possibly adjusting future MLU goals to reflect a more realistic opportunity on DNR lands.

- Review reasons for conversions from northern **hardwoods to oak** cover type; are opportunities to enhance and maintain maple/basswood on suitable NPCs being missed? For example, MHn44 and MHn44 might favor red maple. On some MHn46 and MHn35 sites, both maple and basswood might be more competitive than oak spp, and basswood might be more competitive than red oak on MHn47 and MHc47 sites, depending on site conditions.

- Replace lost **jack pine** stands by regenerating new ones on appropriate sites. On some NPCs and some sites e.g., FDc12, FDc23, FDc24, and FDc25, jack pine can be more competitive than red pine. On others e.g., FDn32 and FDn12, jack pine might be a stronger competitor than either red or white pine, and should be favored if NPC, site conditions, and other available ECS information suggests it might be appropriate. **Note:** Sandstone staff is confident that regeneration checks will show jack pine as an increased component in coming years; 187 acres were altered or planted to jack pine from other cover types since 2002. Better seed sources are also being sought for jack pine.

- Consider deferring activities in **red pine** until the next planning period, to allow focus on other plan goals.

- Avoid entries into 51-60 year old **aspen** until other age classes are addressed.

- Consider development plans that reflect goals to **increase white pine** on the landscape. Consider promotion of natural regeneration of white pine on suitable NPCs. Lower deer populations in some areas may allow for more regeneration success than seen in the past. Where deer problems persist, cooperative deer exclosure projects with Wildlife should continue as a way of accomplishing protection of white pine regeneration **Note:** Sandstone has plans to construct exclosures to protect 80-90 acres/year of white pine regeneration; 130 acres of white pine was planted between 2002 and 2009.

- Visit/examine/treat acres that remain in the **backlog of planned OSVs** in the remaining two years of the original 7-year period, and if necessary, into the 3-year stand list extension that needs to be developed.

- Continue to plan for **conversion** of aspen to jack pine, white spruce, and balsam fir on appropriate NPCs – planting white spruce and/or balsam fir could be considered on MHn44 sites if NPC, field conditions, and other ECS information suggest it might be appropriate. Reserving, rather than harvesting, most middle aged spruce-fir in mixed aspen-spruce-fir stands can facilitate faster conversion to spruce-fir. Black spruce can be a good competitor in some NPCs e.g., FDn32, FPn62, 63, 71, and 82, and on APn80 and 81.

- Consider development plans that increase **white cedar** on appropriate sites.

- Remind staff to be diligent in recording planned and actual actions in SRM – they form the basis of future monitoring. Discuss problems related to inability to accomplish desired levels of SRM data with regional management staff so that solutions to the problem might be reached.

Aitkin

- Consider development pla**ns to regenerate birch by scarification or** planting, depending on site conditions and NP**C. Note:** Area timber program staff notes that birch frequently regenerates after upland harvests in the MLU, but aspen suckers outnumber birch sprouts and seedlings many times over. Birch is well suited as a component in MLU plant communities rating "good" or better in 5 of 6 common mesic hardwoods NPCs. If greater percentage of birch is desired, OSVs with mechanical TSI could help achieve this goal, however, it might take up to ten years post-harvest to accomplish this.

- Consider development plans that reflect goals to **increase white pine** on the landscape. Consider promotion of natural regeneration of white pine on suitable NPCs. Lower deer populations in some areas may allow for more regeneration success than seen in the past. Where deer problems persist, cooperative deer exclosure projects with Wildlife should continue as a way of accomplishing protection of white pine regeneration. **Note:** An effort to increase white pine by under planting was taken in the mid to late 1990s. Results have been uneven due to deer browse. Two exclosures have been installed within the MLU to encourage oak and white pine (through planting). This could be continued for more sites depending on funding.

- Improve and enhance **northern hardwood** forests on appropriate sites. **Note:** Aitkin Area has had, and will continue to have a well established hardwood management program. Markets for hardwood pulp that developed have helped in managing and improving these sites.

- Continue to plan for **conversion** of aspen to jack pine, white spruce, and balsam fir on appropriate NPCs– planting white spruce and/or balsam fir could be considered on MHn44 sites if NPC, field conditions, and other ECS information suggest it might be appropriate. Black spruce can be a good competitor in some NPCs e.g., FDn32, FPn62, 63, 71, and 82, and on APn80 and 81. **Note:** Conversion of aspen to jack pine in the Aitkin area could occur on appropriate NPC sites, however, jack pine is near the southern edge of its range (USDA Handbook 654) so conversion must be carefully considered; white spruce is only rated as a good choice on MHn44 (amongst our common NPC classes); balsam fir is also a good choice on MHn44. Better ECS mapping will aid in selection of suitable sites.

- Consider development plans that increase **white cedar** on appropriate sites. **Note:** Exclosures would also be a benefit here. Some small scale planting has occurred and results are modestly surprising.

- Consider development plans that include **planting black spruce** on appropriate sites. **Note:** Local experience is that careful evaluation of planting sites is a must if undertaking this endeavor. This goal should be more fully explored during the plan extension discussion.

- Avoid entries into 51-60 year old **aspen** until other age classes are addressed. **Note:** Aitkin area has made every effort to stay very close to the MLU plan. This could be discussed during stand selection for the three year extension.

- Remind staff to continue to be diligent in **recording planned and actual actions in SRM** – they form the basis of future monitoring. **Note:** Aitkin notes that this is a supervisory function. Reports are available to check data input, not only for actuals, but DFFCs; supervisors should be making sure this happens.

Little Falls

- Consider development plans to regenerate **birch** by scarification or planting depending on site conditions and NPC.

- Consider development plans that reflect goals to **increase white pine** on the landscape. Consider promotion of natural regeneration of white pine on suitable NPCs. Lower deer populations in some areas may allow for more regeneration success than seen in the past. Where deer problems persist, cooperative deer exclosure projects with Wildlife should continue as a way of accomplishing protection of white pine regeneration.

- Consider deferring activities in **red pine** until the next planning period.

- Continue to plan for **conversion** of aspen to jack pine, white spruce, and balsam fir on appropriate NPCs– Planting white spruce and/or balsam fir could be considered on MHn44 sites if NPC, field conditions, and other ECS information suggest it might be appropriate. Reserving rather than harvesting most middle aged spruce-fir in mixed aspen-spruce-fir stands can facilitate faster conversion to spruce-fir. Black spruce can be a good competitor in some NPCs e.g., FDn32, FPn62, 63, 71, and 82, and on APn80 and 81.

- Consider development plans that **increase white cedar** on appropriate sites.

- Consider development plans that include **planting black spruce** on appropriate sites.

- Remind staff to be diligent in **recording planned and actual actions in SRM**– they form the basis of future monitoring.

Brainerd – MLU goals for Brainerd/Baxter will now be included with Aitkin

Cloquet

- Consider development plans to **regenerate birch** by scarification or planting, depending on site conditions and NPC.

- Consider development plans that reflect goals to **increase white pine** on the landscape. Consider promotion of natural regeneration of white pine on suitable NPCs. Lower deer populations in some areas may allow for more regeneration success than seen in the past. Where deer problems persist, cooperative deer exclosure projects with Wildlife should continue as a way of accomplishing protection of white pine regeneration.

- Improve and enhance **northern hardwood** forests on appropriate sites.

- Continue to plan for **conversion** of aspen to jack pine, white spruce, and balsam fir on appropriate NPCs– Planting white spruce and/or balsam fir could be considered on MHn44 sites if NPC, field conditions, and other ECS information suggest it might be appropriate. Reserving rather than harvesting most middle aged spruce-fir in mixed aspen-spruce-fir stands can facilitate faster conversion to spruce-fir. Black spruce can be a good competitor in some NPCs e.g., FDn32, FPn62, 63, 71, and 82, and on APn80 and 81.

- Consider development plans that **increase white cedar** on appropriate sites.

- Consider development plans that include **planting black spruce** on appropriate sites.

- Avoid entries into 51-60 year old **aspen** until other age classes are addressed.

- Remind staff to be diligent in **recording planned and actual actions in SRM**– they form the basis of future monitoring.

Cambridge

- Consider deferring activities in **red pine** until the next planning period.

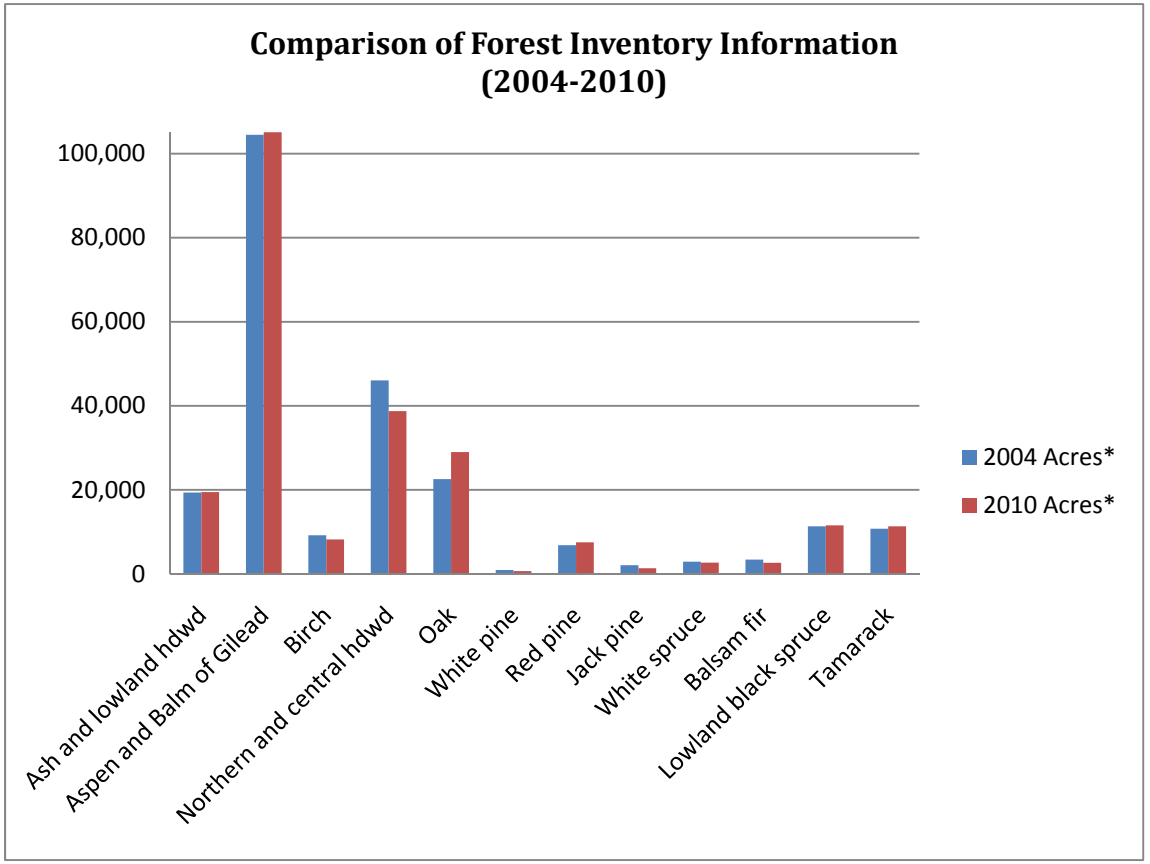
- Consider development plans to **regenerate birch** by scarification or planting, depending on site conditions and NPC.

- Consider development plans that reflect goals to **increase white pine** on the landscape. Consider promotion of natural regeneration of white pine on suitable NPCs. Lower deer populations in some areas may allow for more regeneration success than seen in the past. Where deer problems persist, cooperative deer exclosure projects with Wildlife should continue as a way of accomplishing protection of white pine regeneration.

- Continue to plan for **conversion** of aspen to jack pine, white spruce, and balsam fir on appropriate NPCs– Planting white spruce and/or balsam fir could be considered on MHn44 sites if NPC, field conditions, and other ECS information suggest it might be appropriate. Reserving rather than harvesting most middle aged spruce-fir in mixed aspen-spruce-fir stands can facilitate faster conversion to spruce-fir. Black spruce can be a good competitor in some NPCs e.g., FDn32, FPn62, 63, 71, and 82, and on APn80 and 81.

- Remind staff to be diligent in **recording planned and actual actions in SRM**– they form the basis of future monitoring.

Figure C.1 Comparison of FIM data from 2004-2010 for Major Cover Types



Appendix D. Stand Selection Criteria from Mille Lacs Uplands SFRMP (Original Plan page 75)

Aspen and Balm of Gilead

Condition Class 1 (Those stands that will not survive or will have a substantial volume loss; includes stands which should be treated immediately, i.e. 0-5 years.)
Or
Percent Mortality greater than 10 percent
Or
Percent of trees affected by damage is greater than 25 percent
Or
Current stand age is greater than 59 years

White pine

Condition Class 1 (Those stands that will not survive or will have a substantial volume loss; includes stands which should be treated immediately, i.e. 0-5 years.)
Or
White pine blister rust is present and Stand mortality is greater than 10 percent
Or
Percent of trees affected by damage is greater than 10 percent.
Or
Current basal area is greater than 119 square feet.

Ash

Site Index is greater than 44
And
Current basal area is greater than 99 square feet
And
Diameter at breast height is greater than 7 inches

Lowland hardwoods

Site Index is greater than 44
And
Current basal area is greater than 99 square feet
And
Diameter at breast height is greater than 7 inches

Jack pine

Condition Class 1 (Those stands that will not survive or will have a substantial volume loss; includes stands which should be treated immediately, i.e. 0-5 years.)
Or
Stand mortality is greater than 10 percent
Or
Current age is greater than 60 years
Or
Stand is non-ERF and current age is greater than 39 years.

White spruce

Current age is greater than 29 years
And
Current basal area is greater than 119 square feet
Or
Condition Class is 1 (Those stands that will not survive or will have a substantial volume loss; includes stands which should be treated immediately, i.e. 0-5 years.)

Birch

Birch decline is present
Or
Condition Class is 1 (Those stands that will not survive or will have a substantial volume loss; includes stands which should be treated immediately, i.e. 0-5 years.)
Or
Stand mortality is greater than 10 percent
Or
Stand age is greater than 80 years.

Note: Stands with birch decline are tagged for examination regardless of age or percent affected.

Tamarack

Stand is non-ERF, site index is less than 40 and current age is greater than 99 years
Or
Stand is non-ERF, site index is greater than 39, and current age is greater than 59
Or
Condition Class is 1 (Those stands that will not survive or will have a substantial volume loss; includes stands which should be treated immediately, i.e. 0-5 years.)
Or
Stand is ERF, site index is less than 40, and current age is greater than 149 years
Or
Stand is ERF and site index is greater than 39, and current age is greater than 99 years

Balsam fir

Condition Class is 1 (Those stands that will not survive or will have a substantial volume loss; includes stands which should be treated immediately, i.e. 0-5 years.)
Or
Current stand age is greater than 79 years
Or
Stand mortality is greater than 10 percent and current age is greater than 59 years

BSL

Dwarf mistletoe is present and more than 25 percent of the stand is affected
Or
Stand is non-ERF, site index is less than 30 and current age is greater than 119 years
Or
Stand is ERF, site index is less than 30 and current age is greater than 179 years
Or
Stand is non-ERF, site index is less than 40 and greater than 29 and current age is greater than 99 years
Or
Stand is ERF, site index is less than 40 and greater than 29, and current age is greater than 149
Or
Stand is non-ERF, site index is greater than 39, and current age is greater than 59
Or
Stand is ERF, site index is greater than 39 and current age is greater than 79

Red Pine

Current age is less than 30 years
And
Current basal area is greater than 119 square feet
Or
Current age is greater than 29 years
And
Current basal area is greater than 119 square feet

Northern Hardwoods

Low volume *pool*
Current basal area is less than 120 square feet
And
Current age is greater than 70 years
Thinning pool
Current basal area is greater than 119 square feet

Oak

Stand is non-ERF
And
Stand age is greater than 100 years
And
Site index is greater than 75
And
Diameter at breast height is greater than 24 inches
(no stands met these criteria)

High risk pool for regeneration
Environmental damage is present in the stand (windthrow, drought, stem breakage, fire, flooding, hail damage, open cracks, etc.)
And
More than 50 percent of the stand is affected
Or
Current stand age is greater than 69 years
And
Current basal area is less than 120 square feet
And
Last stand exam was before 2000.
Or
Current basal area is greater than 119 square feet.

Central Hardwoods

Low volume *pool*
Current basal area is less than 129 square feet
And
Current age is greater than 70 years

Thinning pool
Current basal area is greater than 119 square feet.

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Appendix E. 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 forest lands 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.

Advance regeneration: Seedlings or saplings that develop or are present in the understory – *synonym* – advance growth, advance reproduction.

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. In this case, SFRMP Assessment is the first step of the SFRMP process. The initial round of SFRMPs will focus primarily on trends and conditions of forest resources. Standard core SFRMP assessment information sources and products are defined in the *SFRMP Staff Guidebook*.

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 "best 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 county 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, and 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 forest (cover) type 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 5 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 60-100 cubic feet, depending on size of individual pieces and how tight the wood is stacked. In the Lake States, pulpwood cords are usually 4x4x100 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: (verb) A survey of forest land to locate timber and estimate its quantity by species, products, size, quality, or other characteristics; or (noun) 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 1 foot on a side. A cubic foot of wood contains approximately 6-10 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 but are not limited to: 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; and 4) extended rotation forest.

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 SFRMP 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.

Endemic: An *endemic* population is a disease or insect constantly infecting a few plants throughout an area, occurring regularly in a locality or region but in low to moderate severity only.

Epidemic: An *epidemic* population is a disease or insect sporadically infecting a large number of plants in an area and causing considerable loss (e.g., an outbreak of an insect or disease).

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).

Even flow: 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 that 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**y**T**em (FORIST).

Forest land: 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 and 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; 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.

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 became operational in 2006.

Fragmentation: Breaking up of large and contiguous ecosystems into patches separated from each other by different ecosystem types. The breaking up of 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), or 4) 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 (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; or 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.

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 landscape-level processes to occur, 4) contains intact representative native plant communities, 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: Timber land acres that are available for timber management purposes.

Management pool: Stands selected for treatment by the Remsoft harvest scheduling model, with review and adjustment by SFRMP team and field personnel.

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 (MRA): 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 intact 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 Resources.

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 covers the 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 recur 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 park (city, county, state, or private), 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 Resources 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 NARs: 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: Disruptions of existing conditions by natural events such as wildfires, windstorms, drought, flooding, insects, and disease. These may range in scale from one tree to thousands of acres.

Natural regeneration: The growth of new trees from one of the following: (a) seeds naturally dropped from trees or carried by wind or animals, (b) seeds stored on the forest floor, or (c) stumps that sprout or roots that sucker.

Natural spatial patterns: The size, shape, and arrangement of patches in forested landscapes as determined primarily by natural disturbance and physical factors.

Non-forest land: 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, medicinal materials, decorative materials, and other 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 (NRA): For even-aged managed cover types, the rotation age set by the SFRMP Team for non-ERF timber land 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.

Offsite: A tree species growing in a Native Plant Community better suited to a different species or suite of species. Offsite species may also be indicated by a low site index.

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: 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 specifies 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 5-12 inches in 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; and all species that are listed as endangered, threatened or special concern at the state level. Several rare species are also tracked which currently have no legal status but need further monitoring to determine their status.
- ***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 endangered, threatened or special concern at the state level.
- ***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.
- ***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.

Release: Freeing a tree, or group of trees, from competition that is overtopping or closely surrounding it/them.

Relevé: 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). A "c" RNA (cRNA) is a candidate RNA.

Reserved forest land: Forest land 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 1-5 inches in diameter at breast height (DBH).

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): Area established by the Minnesota Department of Natural Resources, Division of Ecological Resources, 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 intensity 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**y**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 about 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 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, 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 forest lands.

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, including aspects of a plan or planning process which 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 1-4 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 forest lands 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.

Timber land: Forest land 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 forest lands 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, cedar, offsite aspen, or non-forest land.

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), this kind of plan recognizes the entire timber management planning process as being more than just the computerized system. TMP incorporates GIS technology and an interactive process with other resource managers (other than Forestry).

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 capable of becoming established and growing beneath overtopping vegetation. A tree or seedling capable of growing in shaded conditions.

Two-aged stand: A forest stand with trees of two distinct age classes separated in age by more than 20 percent of the rotation age.

Underplant: To plant 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 that has 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: Populations with sufficient numbers of individuals 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 areas (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.