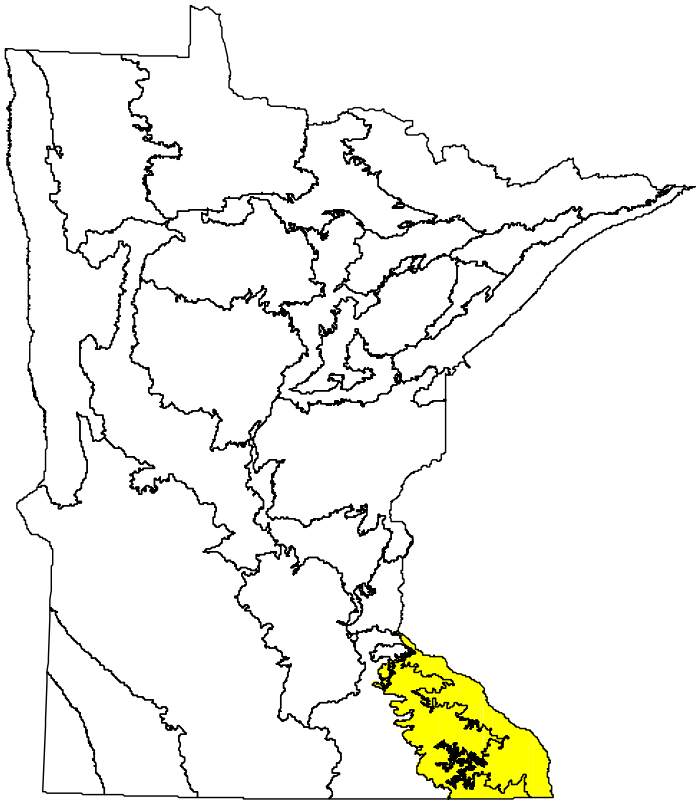
Blufflands/Rochester Plateau

Subsection Forest Resource Management Plan

Three-Year Stand Selection Extension Results

- Final -



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This document is on the Internet at http://www.dnr.state.mn.us/forestry/subsection/blufflands/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.

Blufflands/Rochester Plateau Subsection Forest Resource Management Plan

Three-Year Stand Selection Extension

Public Review Document

Abstract: This document summarizes the results of an extension of the Blufflands/Rochester Plateau original seven-year stand selection list by another three years using the direction and treatment levels established in the Blufflands/Rochester Plateau Strategic Direction Document (DNR, May 2002). The complete list of stands selected to be examined for treatment over the extend three-year period (i.e., FY2010-2012) is also provided.

Blufflands/Rochester Plateau 3-Year Extension Team Members

The following DNR personnel were assigned as member of the DNR team charged with developing the Three-Year Stand Selection Extension of the Blufflands/ Rochester Plateau Subsection Forest Resource Management Plan:

- Jon Cole – White Water WMA Manager
- Don Nelson – Rochester Area Wildlife Manager
- Mark Wurdeman – Central Region Forestry Staff
- Doug Rau – Rochester Area Forest Supervisor (Team Leader)
- Mike Wachholz – Lake City Area Program Forester
- Hannah Texler – Central Region Ecological Resources Staff

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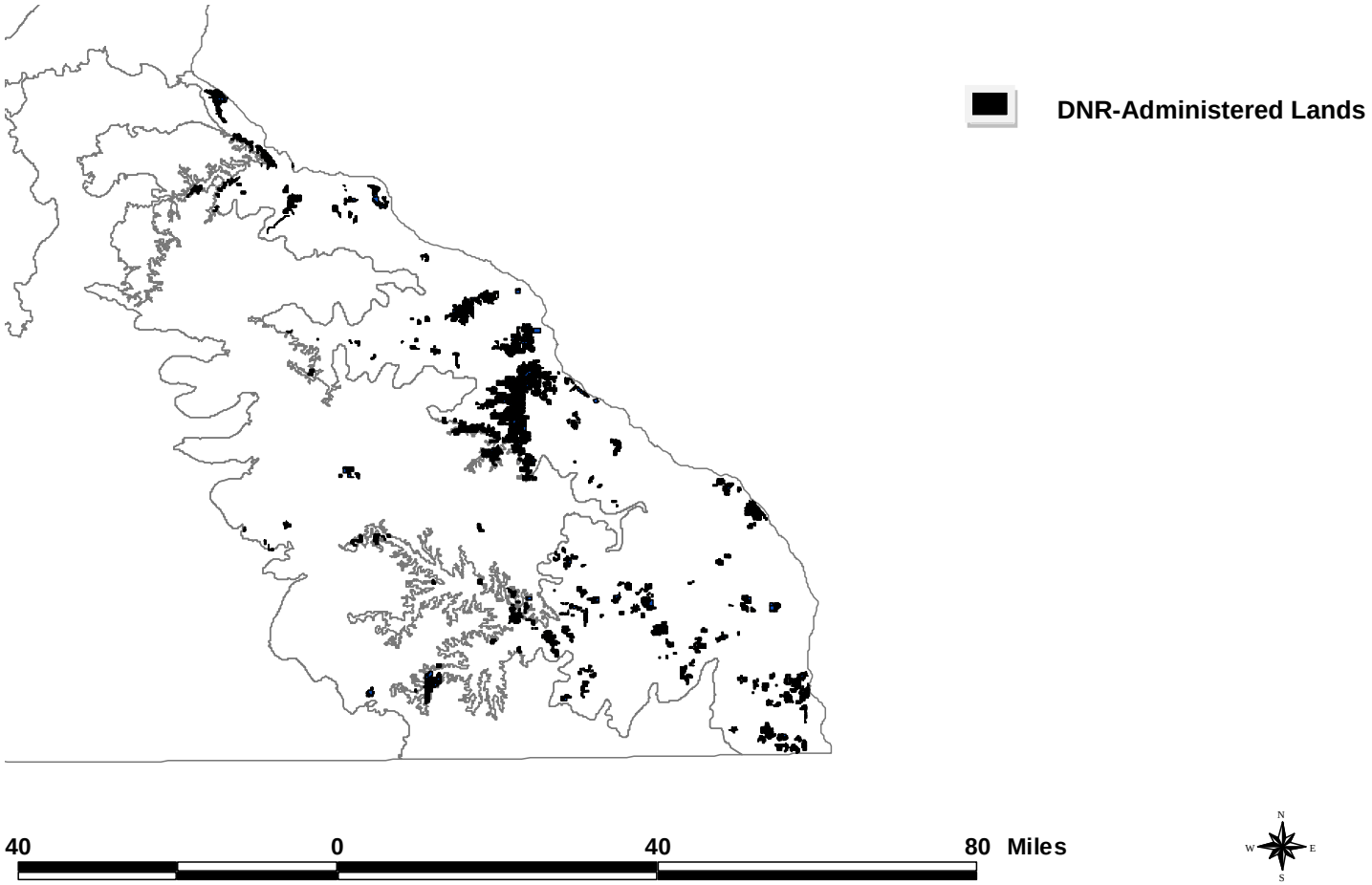

Chapter 1. Introduction

1.1 Scope of Subsection Forest Resource Management Plan (SFRMP)

A SFRMP is a DNR plan for vegetation management on forestlands administered by the DNR Divisions of Forestry, and Fish and Wildlife, Vegetation management includes actions that affect the composition and structure of forestlands, such as timber harvesting, thinning, prescribed burning, and reforestation. The geographic area covered by these plans is defined by Ecological Classification System (ECS) subsections. In response to growing public interest in DNR timber management planning, the DNR SFRMP process was developed to provide a more standardized, formal process and opportunities for increased public involvement. In addition, it is based at the subsection level of the DNR's ecological classification system (ECS) rather than DNR administrative areas as in the past (i.e., DNR Forestry Area boundaries). The SFRMPs do consider the condition and management of forest lands not owned by the DNR, but only propose forest management direction and actions for DNR lands.

1.2 What Is an ECS Subsection?

The Minnesota Department of Natural Resources (DNR) developed an ecological 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 down in the ECS hierarchy. There are 17 forested subsections in the state, with an average size of 1 million to 3 million acres.

1.3 Background

On May 29, 2002 the DNR Commissioner approved the DNR Blufflands/Rochester Plateau Subsection Forest Resource Management Plan (SFRMP). This officially completed a process that began in 2000. Following review of input from two previous public review opportunities, the DNR began implementation of the plan's strategic direction in FY2003 (i.e., July 1, 2002 – June 30, 2003).

The Blufflands/Rochester Plateau SFRMP was developed by an interdisciplinary DNR team (i.e., including staff from DNR Divisions of Forestry, Fish and Wildlife, and Ecological Resources), made available for public review and comment, and approved by division and department leadership. The completed plan directs vegetation management on approximately 58,000 acres of forest lands administered by the DNR Divisions of Forestry, and Fish and Wildlife (about 2% of the total land area and 12% of the forest land in the two subsections).

The final plan includes:

- Long-term strategic goals, strategies, and desired future forest conditions (as revised based on previous public review)
- Summaries of the 7-year stand selection process, the results of which have been used to implement the long-term strategic direction (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.
- DNR responses to comments received during previous public review.

The Blufflands/Rochester Plateau SFRMP is available on-line at http://files.dnr.state.mn.us/forestry/subsection/blufflands/sfrmp_Blufflands_RochesterPlateau_%20plan.pdf).

Being one of the first group of SFRMPs undertaken by the Department, one of the key products of the planning effort was a seven-year (vs. ten-year current standard) stand examination list. Realizing that FY2009 represented the last year of the original seven-year stand examination list and that department SFRMP resources were fully committed to getting the first round of SFRMPs done in other parts of the state, DNR leadership directed staff to select an additional three years of stands for examination using the existing plan assumptions, criteria, and desired future forest conditions.

Chapter 2. Three-Year Stand Selection Extension

2.1 Criteria Used to Identify Potential Stands for the Three-year Extension List

The Blufflands/Rochester Plateau SFRMP identified criteria to identify a pool of stands from which stands were selected to be examined for potential treatment over the original seven-year planning period. These criteria are contained on page 30 and 31 of the final plan and are provided in Appendix D. As part of the three-year stand selection 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 seven-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 also recognizing that a full plan revision process would begin relatively soon (i.e., projected to start in January 2010) and that a more thorough review and possible revision of stand selection criteria would take place at that time.

In terms of the desired number of acres to select from this pool of stands resulting from the stand selection criteria, the original plan only established a clear target for the oak cover type (i.e., 884 acres, see pages 17 and 32 of the final plan). For other cover types, a decision was made to used the annualized stand examination acres resulting from the seven-year stand selection as the **target** acres for the three-year extension (see table 1.1 below).

Table 2.1 Three-Year Stand Selection Criteria

		Selection Pool Criteria				
Cover Type	Cover Type Acres	Age	SI	Slope	Annual Target for 3-Year Extension	Total Acres to Select for 3-Year Extension
Ash	607.2	>60	>40		5	15
Willow[2]	339.2	>50	>45			
Lowland Hardwoods	8582.6	>41	>40		341	1023
Aspen	1139.3	>50			50	150
Birch	425.8	>60			30	90
Cottonwood	744.5	>60	>45			
Northern Hardwoods	4021.2	>60	>40		134	402
Walnut	1491.3	>65			25	75
Oak	33984.3	>80 & <91	>55	3	884	2652
		>90 & < 121	>55			
		>120	>55			
Central Hardwoods	3959.4	>85			105	315
White pine	1643.9	>15			150	450
Red pine	562	>15			50	150
Jack pine	86.2	>15			1	3
Scotch pine	45.8	>15			14	42
White spruce	109.7	>60			3	9
Red cedar	234.8	All			78	235

[1] A synopsis and summary tables and charts of available implementation information is provided in Appendix C.

[2] Any stands selected from the Willow and Cottonwood pools will contribute towards the annual stand selection target for Lowland Hardwoods (341 acres).

2.2 Intermediate Treatments

The Extension team reviewed opportunities for additional intermediate treatments. The stand selection criteria already include all pine stands (i.e., red, white, jack and scotch) over 15 years old. In addition, lowland hardwoods and northern hardwoods are to be managed as uneven-aged types. Stand selection criteria for these two types include all stands greater than 41 years old on better sites (i.e., > 40 site index). Additional opportunities for thinning (for even or uneven-aged management) are limited or unadvisable in other types (e.g., oak, central hardwoods, aspen) due to aggressive competitors and steep slopes (e.g., oak and central hardwood types). There may be some opportunities for group selection or shelterwood harvests in some oak/central hardwoods types on more level topography. However, this would occur in mature stands on a case-by-case basis for appropriate stands in the pool developed by the current stand selection criteria. There may be opportunities for some pre-commercial thinning in younger oak stands, but given the priority in regenerating older oak stands and addressing the backlog of stands from the seven-year list, this would be a low priority during the three-year extension.

2.3 High Biodiversity Areas

During the development of the Blufflands/ Rochester Plateau SFRMP (DNR 2002), DNR forest stands within 13 high biodiversity areas (HBA) were reserved from treatment pending completion of area-specific management plans. Management plans for seven of the 13 HBAs have been completed and are available at www.dnr.state.mn.us/forestry/subsection. For the three-year extension, stands within the six HBAs without completed management plans where excluded from stand selection. Those areas with completed plans were included n the stand selection pool, following management direction contained in the HBA plan.

2.4 Status of Original Seven-Year List

In preparation for the three-year extension effort, DNR staff reviewed the entire original seven-year stand 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 fall of 2007, which was during the first half of the state fiscal year 2008. A portion of the stands from the original seven-year stand list had not yet been field visited. The majority of those were on Wildlife-administered lands. These remaining stands were identified as a “backlog” from the original seven-year list and kept separate from the additional three 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 three-years, but whether harvest actions would occur would depend on availability of development funds in the future, especially on Wildlife- administered lands.

Chapter 3. Three-Year Stand Selection Results

Over the next three years every stand on the list will be field visited to determine the actual type of management, if any, to be conducted on it. Stands have been selected on the basis of the DNR’s inventory database and a certain degree of field knowledge of individual stands. However, the exact condition of each stand truly will not be known until the field visits are made.

The range of decisions about each stand’s possible management include:

- Update the inventory database to reflect current field conditions but propose no active management. This will often be the decision for High Risk Low Value stands that are naturally succeeding to a desired new cover type. It will also be applied to stands where active management is not desired or feasible.
- 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 stand list extension.

Table 3.1 shows the distribution of the selected stands by cover type by DNR Forestry Area within the subsections. Figure 3.1 shows the location of the DNR Forestry Area boundaries relative to the Blufflands and Rochester Plateau subsections.

Table 3.1 Selected Three-Year Stand Acres by Cover Type by Area Office (timberland[1])

Cover Type	Lake City	Rochester	Total
Lowland Hardwoods	140	406	546
Aspen	31	38	69
Birch	21	15	36
Cottonwood	130		130
Northern Hardwoods	7	323	330
Walnut	14	49	63
Oak	603	2021	2,624
Central Hardwoods	76	148	224
White Pine	151	222	373
Red Pine	11	67	78
Jack Pine		80	80
Scotch Pine	5	8	13
White Spruce	10	50	60
Total Selected Acres	1,199	3,427	4,626
Total DNR Timberland Acres in Subsections	16,950	41,046	57,996
% Selected Acres of Subsection Acres	7.1%	8.3%	8.0%

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

Figure 3.1 DNR Forestry Areas in the Blufflands & Rochester Plateau Subsections

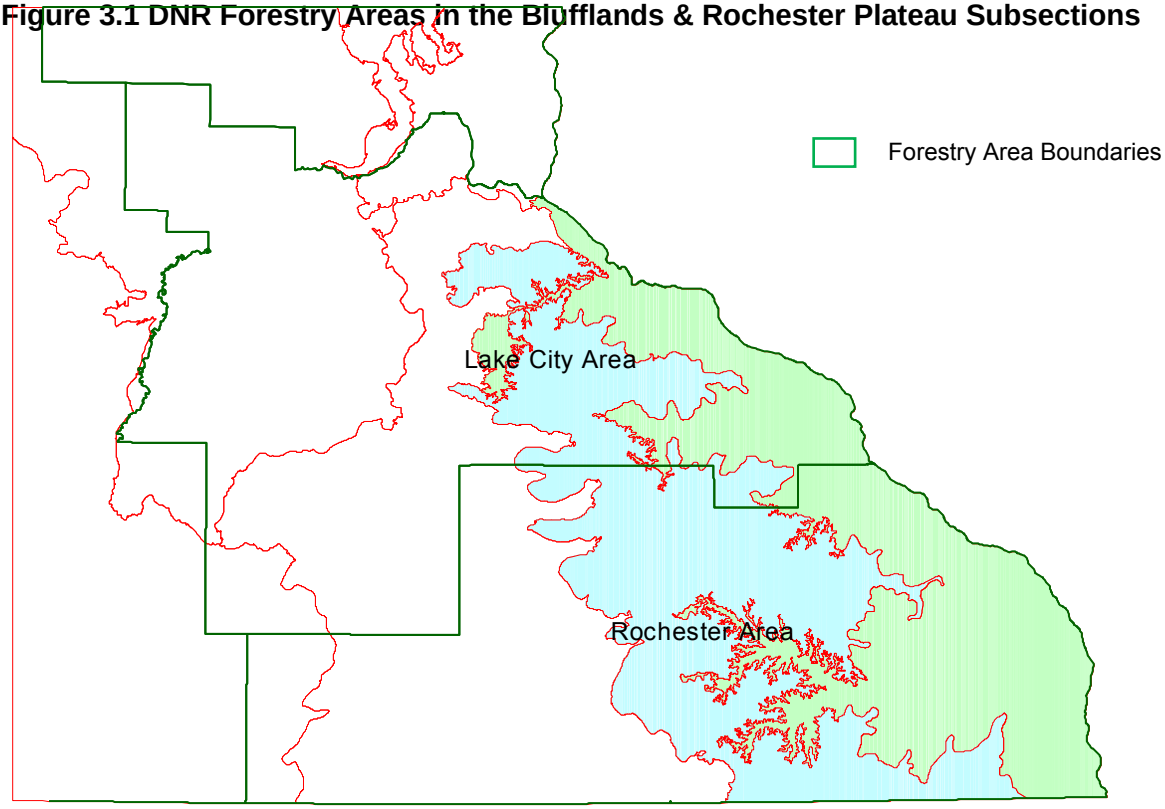

Table 3.2 summarizes the generalized annual treatments for each forest cover type under the proposed three-year stand list extension.

Table 3.2 Summary of Annual Treatments by Cover Type from Proposed Three-Year Stand List Extension

Cover Type	Harvest Acres[1]	Thin Acres[2]	Field Visit Acres[3]	Total Acres
Lowland Hardwoods	277	63	206	546
Aspen	31		38	69
Birch	36			36
Cottonwood	46	21	63	130
Northern Hardwoods	126	170	34	330
Walnut		63		63
Oak	2255	225	144	2624
Central Hardwoods	40	78	107	225
White Pine		373		373
Red Pine		77		77
Jack Pine		80		80
Scotch Pine		13		13
White Spruce		60		60
Total	2,811	1,223	592	4,626

[1]Management actions include even-aged harvest, seed tree harvest, shelterwood harvest, and uneven-aged harvest.
[2]Management actions include thinning and management for understory.
[3]Management action includes on-site visit for an assessment to determine management direction.

Table 3.3 Selected Three-Year Stand Acres by Cover Type by Primary Administrator

Cover Type	Forestry	Wildlife	Total
Lowland Hardwoods	265	281	546
Aspen	69		69
Birch	36		36
Cottonwood	130		130
Northern Hardwoods	122	208	330
Walnut	14	49	63
Oak	1801	823	2,624
Central Hardwoods	147	78	225
White Pine	350	23	373
Red Pine	53	24	77
Jack Pine		80	80
Scotch Pine	13		13
White Spruce	28	32	60
Total Selected Acres	3,028	1,598	4,626
Total DNR Timberland Acres by Administrator	38,019	19,976	57,995
% Selected Acres of Administrator Acres	8.0%	8.0%	8.0%

Appendix A. Three-year Stand List

The following table identifies the stands selected for the Blufflands/Rochester Plateau SFRMP three-year stand selection list extension. The data fields are as follows:

- Area: The subsection has two primary DNR Forestry area offices – Lake City, and Rochester.
- 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 t10104w1290198 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 & Wildlife (i.e., Section of Wildlife)
- Cover type: The forest cover type assigned to the stand.
- Age: Current age of the stand as of 2008.
- Acres: Stand acres identified to be reviewed for potential treatment (total stand acres may be 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 a subsequent field visit. See glossary for definitions.

Table A.1 Complete Stand List for Three-year Extension

Area	Location	Administrator	Cover Type	Age	Acres	Preliminary Prescription
Rochester	t10104w1290198	Forestry	White pine	17	14	Thinning
Rochester	t10105w1130089	Forestry	Central hardwoods	89	70	Field visit
Rochester	t10105w1130090	Forestry	Aspen	62	38	Field visit
Rochester	t10204w1220141	Forestry	White spruce	45	9	Thinning
Rochester	t10204w1220161	Forestry	Red pine	44	14	Thinning
Rochester	t10204w1260252	Forestry	White spruce	36	9	Thinning
Rochester	t10204w1270183	Forestry	Red pine	44	8	Thinning
Rochester	t10205w1150110	Forestry	White pine	39	2	Thinning
Rochester	t10208w1190066	Forestry	Lowland hardwoods	42	43	Thinning
Rochester	t10208w1190067	Forestry	Oak	119	58	Thinning
Rochester	t10208w1190069	Forestry	Northern hardwoods	61	53	Thinning
Rochester	t10209w1260002	Wildlife	Red pine	40	5	Thinning
Rochester	t10211w1060001	Forestry	Scotch pine	44	8	Thinning
Rochester	t10305w1190063	Forestry	Oak	125	37	Even-age harvest
Rochester	t10305w1190064	Forestry	Oak	82	17	Even-age harvest
Rochester	t10305w1190068	Forestry	Oak	126	6	Even-age harvest
Rochester	t10306w1220193	Forestry	White pine	19	3	Thinning
Rochester	t10306w1240031	Forestry	Oak	125	13	Even-age harvest
Rochester	t10306w1240034	Forestry	Oak	126	4	Even-age harvest
Rochester	t10306w1280068	Forestry	White pine	18	6	Thinning
Rochester	t10306w1280125	Forestry	White pine	17	4	Thinning
Rochester	t10307w1040179	Wildlife	Oak	98	11	Even-age harvest

Area	Location	Administrator	Cover Type	Age	Acres	Preliminary Prescription
Rochester	t10307w1110082	Forestry	Oak	125	23	Even-age harvest
Rochester	t10307w1110159	Forestry	Oak	99	126	Even-age harvest
Rochester	t10307w1120173	Forestry	Oak	99	118	Even-age harvest
Rochester	t10307w1130109	Forestry	Northern hardwoods	48	13	Thinning
Rochester	t10307w1140168	Forestry	Northern hardwoods	48	4	Thinning
Rochester	t10307w1150112	Forestry	Oak	99	64	Even-age harvest
Rochester	t10307w1150124	Forestry	Oak	64	36	Even-age harvest
Rochester	t10307w1150125	Forestry	Oak	113	9	Even-age harvest
Rochester	t10309w1160021	Forestry	Red pine	19	3	Thinning
Rochester	t10309w1160128	Forestry	White pine	20	19	Thinning
Rochester	t10309w1160176	Forestry	White pine	19	6	Thinning
Rochester	t10309w1160177	Forestry	White pine	19	3	Thinning
Rochester	t10309w1340170	Forestry	White pine	19	9	Thinning
Rochester	t10404w1310022	Wildlife	Northern hardwoods	61	23	Thinning
Rochester	t10404w1310023	Wildlife	Northern hardwoods	61	47	Thinning
Rochester	t10404w1320016	Wildlife	Lowland hardwoods	48	13	Thinning
Rochester	t10404w1320017	Wildlife	Northern hardwoods	69	8	Thinning
Rochester	t10404w1320018	Wildlife	Northern hardwoods	75	12	Thinning
Rochester	t10404w1320020	Wildlife	Lowland hardwoods	70	3	Thinning
Rochester	t10405w1270111	Wildlife	Lowland hardwoods	74	10	Even-age harvest
Rochester	t10405w1270112	Wildlife	Northern hardwoods	75	8	Even-age harvest
Rochester	t10405w1270113	Wildlife	Northern hardwoods	100	14	Even-age harvest
Rochester	t10405w1270114	Wildlife	Lowland hardwoods	74	13	Even-age harvest
Rochester	t10405w1270120	Wildlife	Northern hardwoods	68	32	Even-age harvest
Rochester	t10405w1270121	Wildlife	Northern hardwoods	78	54	Even-age harvest
Rochester	t10405w1270122	Wildlife	Northern hardwoods	85	11	Even-age harvest
Rochester	t10405w1340083	Forestry	White pine	30	10	Thinning
Rochester	t10407w1210041	Forestry	Oak	133	45	Even-age harvest
Rochester	t10407w1210051	Forestry	Lowland hardwoods	96	6	Even-age harvest
Rochester	t10407w1270175	Forestry	Oak	71	33	Shelterwood harvest
Rochester	t10407w1280228	Forestry	Oak	71	117	Shelterwood harvest
Rochester	t10407w1280230	Forestry	Oak	71	3	Shelterwood harvest
Rochester	t10407w1290249	Wildlife	Central hardwoods	0	0	Even-age harvest
Rochester	t10407w1320248	Wildlife	Oak	0	0	Even-age harvest
Rochester	t10407w1320250	Wildlife	Northern hardwoods	0	0	Even-age harvest
Rochester	t10408w1130019	Forestry	Red pine	64	18	Thinning
Rochester	t10409w1300046	Forestry	Oak	131	16	Even-age harvest
Rochester	t10409w1310056	Forestry	Oak	131	3	Even-age harvest
Rochester	t10410w1070047	Forestry	Oak	121	59	Even-age harvest
Rochester	t10410w1070048	Forestry	Lowland hardwoods	59	6	Even-age harvest
Rochester	t10410w1340085	Forestry	Lowland hardwoods	46	12	Even-age harvest
Rochester	t10410w1340093	Forestry	Oak	123	19	Field visit
Rochester	t10410w1350035	Forestry	White pine	103	15	Thinning

Area	Location	Administrator	Cover Type	Age	Acres	Preliminary Prescription
Rochester	t10410w1350039	Forestry	Lowland hardwoods	46	26	Even-age harvest
Rochester	t10410w1350079	Forestry	Lowland hardwoods	46	26	Even-age harvest
Rochester	t10410w1350090	Forestry	Oak	123	32	Field visit
Rochester	t10410w1360029	Forestry	Oak	130	16	Even-age harvest
Rochester	t10410w1360034	Forestry	Oak	137	4	Even-age harvest
Rochester	t10410w1360037	Forestry	Oak	124	17	Even-age harvest
Rochester	t10411w1120006	Forestry	Oak	121	62	Even-age harvest
Rochester	t10506w1360041	Forestry	White pine	22	11	Thinning
Rochester	t10506w1360047	Forestry	White pine	19	45	Thinning
Rochester	t10509w1350055	Forestry	White pine	25	7	Thinning
Rochester	t10513w1170001	Forestry	Lowland hardwoods	14	4	Even-age harvest
Rochester	t10513w1170002	Forestry	Oak	93	36	Even-age harvest
Rochester	t10513w1170003	Forestry	Northern hardwoods	61	6	Thinning
Rochester	t10513w1200010	Forestry	Northern hardwoods	78	5	Thinning
Rochester	t10515w1010009	Wildlife	Lowland hardwoods	45	99	Even-age harvest
Rochester	t10605w1180013	Forestry	Birch	65	15	Even-age harvest
Rochester	t10605w1180139	Forestry	Oak	74	40	Even-age harvest
Rochester	t10605w1180151	Forestry	Oak	97	28	Thinning
Rochester	t10605w1190176	Forestry	Oak	80	27	Thinning
Rochester	t10613w1040003	Wildlife	Red pine	29	7	Thinning
Rochester	t10708w1130031	Forestry	White pine	24	4	Thinning
Rochester	t10708w1240047	Forestry	White pine	24	9	Thinning
Rochester	t10710w1100161	Wildlife	Central hardwoods	86	26	Thinning
Rochester	t10710w1100202	Wildlife	Central hardwoods	71	9	Thinning
Rochester	t10710w1140280	Wildlife	Lowland hardwoods	56	4	Thinning
Rochester	t10710w1140463	Wildlife	Walnut	66	45	Thinning
Rochester	t10710w1140465	Wildlife	White pine	58	17	Thinning
Rochester	t10710w1160236	Wildlife	Oak	117	13	Even-age harvest
Rochester	t10710w1160239	Wildlife	Oak	102	22	Even-age harvest
Rochester	t10711w1030030	Wildlife	Oak	68	55	Even-age harvest
Rochester	t10711w1040004	Wildlife	White spruce	44	9	Thinning
Rochester	t10711w1090001	Wildlife	Oak	96	89	Even-age harvest
Rochester	t10713w1320011	Wildlife	Red pine	44	3	Thinning
Rochester	t10809w1040034	Forestry	White pine	17	9	Thinning
Rochester	t10809w1040051	Forestry	Oak	121	28	Even-age harvest
Rochester	t10809w1040093	Forestry	White pine	17	9	Thinning
Rochester	t10809w1040352	Forestry	Oak	126	76	Even-age harvest
Rochester	t10809w1040406	Forestry	White pine	17	9	Thinning
Rochester	t10809w1040409	Forestry	Oak	134	28	Even-age harvest
Rochester	t10809w1060071	Wildlife	Oak	141	28	Even-age harvest
Rochester	t10809w1080109	Forestry	White pine	22	5	Thinning
Rochester	t10809w1160243	Forestry	Northern hardwoods	62	28	Field visit
Rochester	t10809w1170248	Forestry	Northern hardwoods	70	7	Field visit

Area	Location	Administrator	Cover Type	Age	Acres	Preliminary Prescription
Rochester	t10809w1170496	Forestry	White pine	37	2	Thinning
Rochester	t10809w1180247	Forestry	Oak	139	62	Even-age harvest
Rochester	t10810w1010081	Wildlife	Oak	122	10	Even-age harvest
Rochester	t10810w1020080	Wildlife	Oak	122	12	Even-age harvest
Rochester	t10810w1020085	Wildlife	Lowland hardwoods	71	8	Field visit
Rochester	t10810w1030045	Wildlife	Lowland hardwoods	71	62	Field visit
Rochester	t10810w1030058	Wildlife	Oak	96	6	Even-age harvest
Rochester	t10810w1030082	Wildlife	Lowland hardwoods	71	21	Field visit
Rochester	t10810w1030089	Wildlife	Oak	123	14	Even-age harvest
Rochester	t10810w1040051	Wildlife	Oak	96	47	Even-age harvest
Rochester	t10810w1040091	Wildlife	Oak	123	12	Even-age harvest
Rochester	t10810w1100096	Wildlife	Lowland hardwoods	58	17	Field visit
Rochester	t10810w1100098	Wildlife	Lowland hardwoods	71	20	Field visit
Rochester	t10810w1100105	Wildlife	White spruce	55	12	Thinning
Rochester	t10810w1100116	Wildlife	Oak	123	105	Even-age harvest
Rochester	t10810w1110097	Wildlife	Lowland hardwoods	58	11	Field visit
Rochester	t10810w1110108	Wildlife	Oak	122	13	Even-age harvest
Rochester	t10810w1120107	Wildlife	Oak	122	91	Even-age harvest
Rochester	t10810w1120114	Wildlife	Oak	122	12	Even-age harvest
Rochester	t10810w1130214	Wildlife	Jack pine	74	11	Thinning
Rochester	t10810w1130219	Wildlife	Oak	105	29	Even-age harvest
Rochester	t10810w1140201	Wildlife	Jack pine	74	69	Thinning
Rochester	t10810w1160200	Wildlife	Central hardwoods	109	9	Thinning
Rochester	t10810w1160565	Wildlife	Central hardwoods	109	34	Thinning
Rochester	t10810w1230315	Wildlife	Red pine	51	5	Thinning
Rochester	t10810w1230323	Wildlife	White pine	44	6	Thinning
Rochester	t10810w1230330	Wildlife	Red pine	44	3	Thinning
Rochester	t10810w1260400	Wildlife	White spruce	48	7	Thinning
Rochester	t10810w1260409	Wildlife	White spruce	48	3	Thinning
Rochester	t10810w1340474	Wildlife	Oak	125	112	Thinning
Rochester	t10810w1350553	Wildlife	Oak	113	4	Even-age harvest
Rochester	t10810w1360451	Wildlife	Oak	137	79	Even-age harvest
Rochester	t10810w1360528	Wildlife	Walnut	76	4	Thinning
Lake City	t10909w1300061	Forestry	White pine	33	1	Thinning
Lake City	t10909w1300062	Forestry	White pine	33	3	Thinning
Lake City	t10909w1320056	Forestry	White pine	17	9	Thinning
Lake City	t10909w1320119	Forestry	White pine	16	5	Thinning
Lake City	t10909w1320127	Forestry	White pine	19	2	Thinning
Lake City	t10909w1330121	Forestry	White pine	19	19	Thinning
Lake City	t10910w1030323	Forestry	Northern hardwoods	62	7	Even-age harvest
Lake City	t10910w1030327	Forestry	Aspen	52	13	Even-age harvest
Lake City	t10910w1030329	Forestry	Oak	101	8	Even-age harvest
Lake City	t10910w1030331	Forestry	Lowland hardwoods	47	5	Even-age harvest

Area	Location	Administrator	Cover Type	Age	Acres	Preliminary Prescription
Lake City	t10910w1100044	Forestry	Lowland hardwoods	48	25	Even-age harvest
Lake City	t10910w1100048	Forestry	Oak	100	8	Even-age harvest
Lake City	t10910w1100089	Forestry	Red pine	39	3	Thinning
Lake City	t10910w1140184	Forestry	Oak	110	6	Even-age harvest
Lake City	t10910w1140369	Forestry	White pine	24	12	Thinning
Lake City	t10910w1140382	Forestry	White pine	17	3	Thinning
Lake City	t10910w1140388	Forestry	White pine	20	12	Thinning
Lake City	t10910w1140450	Forestry	Oak	107	8	Even-age harvest
Lake City	t10910w1140473	Forestry	Scotch pine	16	5	Thinning
Lake City	t10910w1150481	Forestry	White pine	16	9	Thinning
Lake City	t10910w1150483	Forestry	White pine	33	0	Thinning
Lake City	t10910w1250212	Forestry	Oak	100	12	Even-age harvest
Lake City	t10910w1250244	Wildlife	Oak	95	23	Even-age harvest
Lake City	t10910w1260218	Forestry	White pine	19	3	Thinning
Lake City	t10910w1260296	Forestry	White pine	30	2	Thinning
Lake City	t10910w1360261	Wildlife	Oak	91	31	Even-age harvest
Lake City	t10912w1130128	Forestry	White pine	19	8	Thinning
Lake City	t10912w1130130	Forestry	White pine	18	3	Thinning
Lake City	t10913w1080061	Forestry	White pine	42	1	Thinning
Lake City	t10913w1080062	Forestry	White pine	42	1	Thinning
Lake City	t10913w1080063	Forestry	White pine	42	2	Thinning
Lake City	t10913w1080064	Forestry	Red pine	42	8	Thinning
Lake City	t11010w1070023	Forestry	White pine	46	22	Thinning
Lake City	t11010w1080028	Forestry	Central hardwoods	79	37	Even-age harvest
Lake City	t11010w1170083	Forestry	White spruce	28	3	Thinning
Lake City	t11010w1180075	Forestry	Oak	105	82	Even-age harvest
Lake City	t11011w1120014	Forestry	Oak	80	69	Even-age harvest
Lake City	t11011w1120030	Forestry	Oak	88	40	Even-age harvest
Lake City	t11011w1130032	Forestry	Lowland hardwoods	67	26	Field visit
Lake City	t11011w1130038	Forestry	Lowland hardwoods	61	2	Field visit
Lake City	t11011w1140037	Forestry	Lowland hardwoods	67	38	Field visit
Lake City	t11011w1140078	Forestry	Walnut	71	14	Thinning
Lake City	t11011w1140087	Forestry	Oak	116	26	Even-age harvest
Lake City	t11011w1150074	Forestry	Cottonwood	62	26	Shelterwood harvest
Lake City	t11011w1210156	Forestry	White pine	29	2	Thinning
Lake City	t11011w1220104	Forestry	Cottonwood	66	21	Shelterwood harvest
Lake City	t11011w1220107	Forestry	Cottonwood	66	63	Field visit
Lake City	t11011w1220124	Forestry	Oak	116	52	Field visit
Lake City	t11011w1230101	Forestry	Oak	110	5	Even-age harvest
Lake City	t11011w1230146	Forestry	Oak	110	41	Field visit
Lake City	t11011w1260181	Forestry	Cottonwood	66	21	Thinning
Lake City	t11011w1270241	Forestry	Aspen	52	4	Even-age harvest
Lake City	t11011w1340254	Forestry	Oak	98	48	Even-age harvest

Area	Location	Administrator	Cover Type	Age	Acres	Preliminary Prescription
Lake City	t11213w1070015	Wildlife	Oak	109	6	Even-age harvest
Lake City	t11214w1070004	Forestry	Birch	63	15	Even-age harvest
Lake City	t11214w1070007	Forestry	Oak	92	7	Even-age harvest
Lake City	t11214w1070012	Forestry	Oak	91	15	Even-age harvest
Lake City	t11214w1070084	Forestry	White pine	17	8	Thinning
Lake City	t11214w1130096	Forestry	Lowland hardwoods	48	8	Even-age harvest
Lake City	t11214w1180036	Forestry	Central hardwoods	55	37	Field visit
Lake City	t11214w1240072	Forestry	Lowland hardwoods	69	18	Even-age harvest
Lake City	t11214w1240073	Forestry	Central hardwoods	87	3	Even-age harvest
Lake City	t11214w1240074	Forestry	Lowland hardwoods	69	18	Even-age harvest
Lake City	t11215w1010025	Forestry	Aspen	52	7	Even-age harvest
Lake City	t11215w1020022	Forestry	Birch	57	6	Even-age harvest
Lake City	t11215w1020023	Forestry	Aspen	52	7	Even-age harvest
Lake City	t11215w1120040	Forestry	White pine	20	6	Thinning
Lake City	t11215w1120043	Forestry	White pine	18	3	Thinning
Lake City	t11215w1120049	Forestry	White pine	38	5	Thinning
Lake City	t11215w1130108	Forestry	White pine	20	2	Thinning
Lake City	t11215w1130115	Forestry	White spruce	35	2	Thinning
Lake City	t11215w1240136	Forestry	White pine	39	0	Thinning
Lake City	t11216w1010016	Forestry	Oak	105	40	Even-age harvest
Lake City	t11216w1060048	Forestry	White pine	16	6	Thinning
Lake City	t11216w1060050	Forestry	Oak	94	3	Even-age harvest
Lake City	t11217w1010044	Forestry	Oak	94	2	Even-age harvest
Lake City	t11217w1010063	Forestry	Oak	101	4	Even-age harvest
Lake City	t11217w1010064	Forestry	Oak	103	6	Even-age harvest
Lake City	t11315w1070115	Forestry	White spruce	16	5	Thinning
Lake City	t11315w1160101	Forestry	White pine	16	3	Thinning
Lake City	t11316w1340062	Forestry	Oak	127	5	Even-age harvest
Lake City	t11316w1350055	Forestry	Oak	98	56	Even-age harvest

Appendix B. Three-year Stand List with White Pine

The following two tables identify the stands selected for the Blufflands/Rochester Plateau three-year stand list extension 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.

The data fields are as follows:

- Area: The subsection has two primary DNR Forestry area offices – Lake City, and Rochester.
- 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 t10104w1290198 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 & Wildlife (i.e., Section of Wildlife)
- Cover type: The forest cover type assigned to the stand.
- Age: Current age of the stand as of 2008.
- Acres: Stand acres identified to be reviewed for potential treatment (total stand acres may be 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 a subsequent field visit. See glossary for definitions.

Table B.1 Stands Selected that are White Pine Type

Area	Location	Administrator	Cover Type	Age	Acres	Preliminary Prescription
Rochester	t10104w1290198	Forestry	White pine	17	14	Thinning
Rochester	t10205w1150110	Forestry	White pine	39	2	Thinning
Rochester	t10306w1220193	Forestry	White pine	19	3	Thinning
Rochester	t10306w1280068	Forestry	White pine	18	6	Thinning
Rochester	t10306w1280125	Forestry	White pine	17	4	Thinning
Rochester	t10309w1160128	Forestry	White pine	20	19	Thinning
Rochester	t10309w1160176	Forestry	White pine	19	6	Thinning
Rochester	t10309w1160177	Forestry	White pine	19	3	Thinning
Rochester	t10309w1340170	Forestry	White pine	19	9	Thinning
Rochester	t10405w1340083	Forestry	White pine	30	10	Thinning
Rochester	t10410w1350035	Forestry	White pine	103	15	Thinning
Rochester	t10506w1360041	Forestry	White pine	22	11	Thinning
Rochester	t10506w1360047	Forestry	White pine	19	45	Thinning
Rochester	t10509w1350055	Forestry	White pine	25	7	Thinning
Rochester	t10708w1130031	Forestry	White pine	24	4	Thinning
Rochester	t10708w1240047	Forestry	White pine	24	9	Thinning
Rochester	t10710w1140465	Wildlife	White pine	58	17	Thinning
Rochester	t10809w1040034	Forestry	White pine	17	9	Thinning
Rochester	t10809w1040093	Forestry	White pine	17	9	Thinning

Area	Location	Administrator	Cover Type	Age	Acres	Preliminary Prescription
Rochester	t10809w1040406	Forestry	White pine	17	9	Thinning
Rochester	t10809w1080109	Forestry	White pine	22	5	Thinning
Rochester	t10809w1170496	Forestry	White pine	37	2	Thinning
Rochester	t10810w1230323	Wildlife	White pine	44	6	Thinning
Lake City	t10909w1300061	Forestry	White pine	33	1	Thinning
Lake City	t10909w1300062	Forestry	White pine	33	3	Thinning
Lake City	t10909w1320056	Forestry	White pine	17	9	Thinning
Lake City	t10909w1320119	Forestry	White pine	16	5	Thinning
Lake City	t10909w1320127	Forestry	White pine	19	2	Thinning
Lake City	t10909w1330121	Forestry	White pine	19	19	Thinning
Lake City	t10910w1140369	Forestry	White pine	24	12	Thinning
Lake City	t10910w1140382	Forestry	White pine	17	3	Thinning
Lake City	t10910w1140388	Forestry	White pine	20	12	Thinning
Lake City	t10910w1150481	Forestry	White pine	16	9	Thinning
Lake City	t10910w1150483	Forestry	White pine	33	0	Thinning
Lake City	t10910w1260218	Forestry	White pine	19	3	Thinning
Lake City	t10910w1260296	Forestry	White pine	30	2	Thinning
Lake City	t10912w1130128	Forestry	White pine	19	8	Thinning
Lake City	t10912w1130130	Forestry	White pine	18	3	Thinning
Lake City	t10913w1080061	Forestry	White pine	42	1	Thinning
Lake City	t10913w1080062	Forestry	White pine	42	1	Thinning
Lake City	t10913w1080063	Forestry	White pine	42	2	Thinning
Lake City	t11010w1070023	Forestry	White pine	46	22	Thinning
Lake City	t11011w1210156	Forestry	White pine	29	2	Thinning
Lake City	t11214w1070084	Forestry	White pine	17	8	Thinning
Lake City	t11215w1120040	Forestry	White pine	20	6	Thinning
Lake City	t11215w1120043	Forestry	White pine	18	3	Thinning
Lake City	t11215w1120049	Forestry	White pine	38	5	Thinning
Lake City	t11215w1130108	Forestry	White pine	20	2	Thinning
Lake City	t11215w1240136	Forestry	White pine	39	0	Thinning
Lake City	t11216w1060048	Forestry	White pine	16	6	Thinning
Lake City	t11315w1160101	Forestry	White pine	16	3	Thinning

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

Area	Location	Administrator	Cover Type	Age	Acres	Preliminary Prescription
Rochester	t10209w1260002	Wildlife	Red pine	40	5	Thinning
Rochester	t10810w1100098	Wildlife	Lowland hardwoods	71	20	Field visit

Appendix C. Implementation & Monitoring Data

Table C.1 Comparison of Forest Inventory Information (2001-2008)

Blufflands/Rochester Plateau Cover Type Acres Comparison[1]					
Cover Type	**2001**	**2008 DFFC**	**2008**	**% DFFC**	**Long-Term DFFC**
Ash	536	600	607	101%	Constant
Willow	383	400	339	85%	Constant
Lowland Hardwoods	8,431	8,200	8,583	105%	Fight to Retain
Aspen	1,025	1,000	1,139	114%	Maintain or Increase
Birch	463	450	426	95%	Small Decrease
Cottonwood	729	775	745	96%	Constant
Northern Hardwoods	2,484	6,100	4,021	66%	Minimize Increase
Walnut	1,306	1,300	1,491	115%	Maintain or Increase
Oak	35,374	31,500	33,984	108%	Minimize Loss
Central Hardwoods	4,410	4,830	3,959	82%	Minimize Increase
White Pine	1,514	1,600	1,644	103%	Increase
Red Pine	569	575	562	98%	Decrease
Jack Pine	151	150	86	57%	Constant
Scotch Pine	110	30	46	153%	Decrease
Ponderosa Pine	0		5		n/a
White Spruce	92	90	110	122%	Decrease
Norway Spruce	0		5		n/a
Upland Larch	3	6	5	82%	Eliminate
Tamarack	4	4	3	63%	Constant
White Cedar	0		1		n/a
Red Cedar	222	200	235	117%	Retain where desirable
Total	57,806	57,810	57,996	100%	Constant or Increase

1 - CSA Timberland cover types on lands where Forestry or Wildlife are the primary administrator, excluding old growth

Figure C.1 Oak Timberlands Age Class

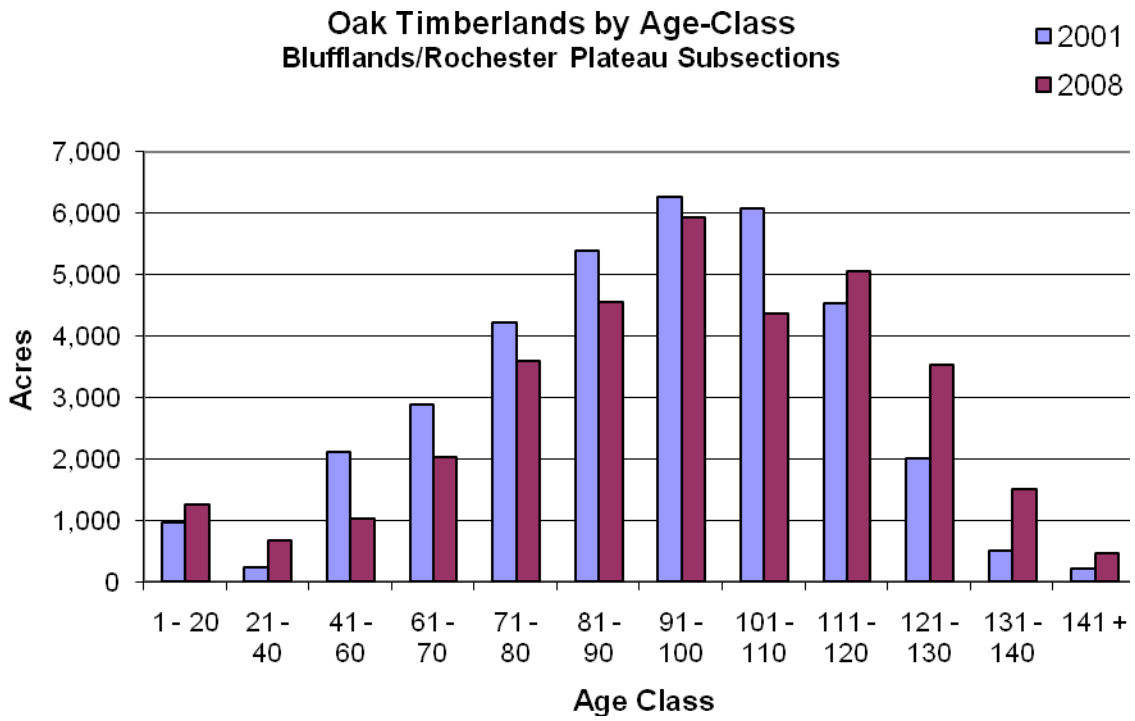

Figure C.2 Lowland Hardwoods Timberlands by Age Class

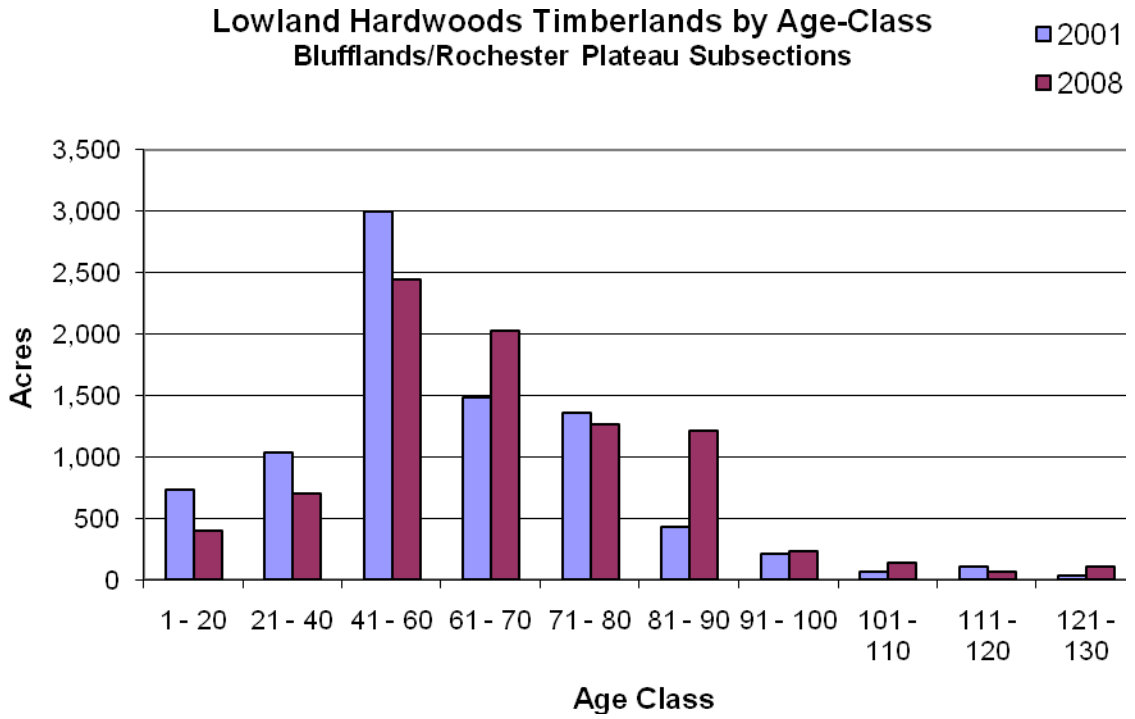

Figure C.3 Northern Hardwoods Timberlands by Age Class

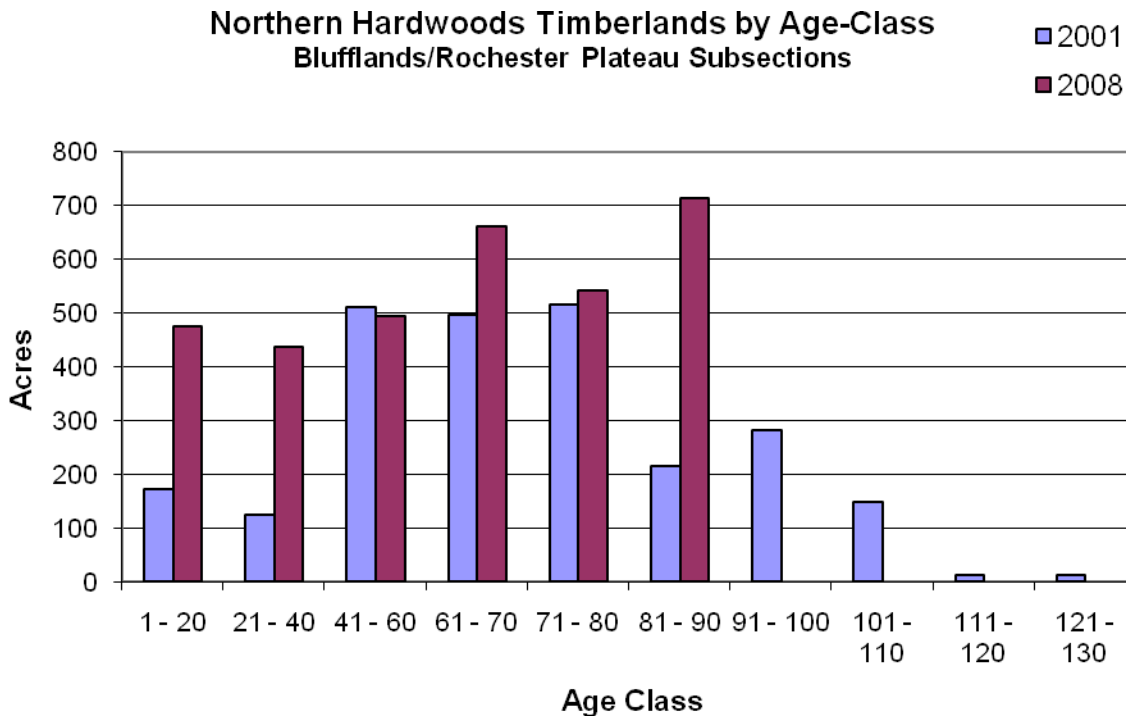

Figure C.4 Central Hardwoods Timberlands by Age Class

Table C.2 Annual Stand Exam List Summary for SE Areas FY2002-FY2007

A	B	C	D
Cover Type	**Total SFRMP Acres Selected**	**Total Annual Stand Exam List (ASEL) Acres**	**ASEL % of SFRMP [C÷B]**
Ash	32	47	147%
Lowland hardwoods	2,387	993	42%
Aspen	347	224	65%
Birch	210	140	67%
Northern hardwoods	938	926	99%
Walnut	174	161	93%
Oak	6,146	6,560	107%
Central hardwoods	737	610	83%
White pine	1,060	275	26%
Red pine	359	129	36%
Jack pine	6	0	0%
Scotch pine	98	75	77%
White spruce	18	7	39%
Offsite oak	95	69	73%
Red cedar	153	34	22%
Lowland brush	0	45	
Upland brush	0	20	
Agricultural	0	10	
Total	**12,760**	**10,325**	**81%**
Adjustment for Anticipated Alterations[1]	**11,527**		**90%**

[1] The Blufflands/Rochester Plateau SFRMP identified acres by cover type, then subtracted an overall estimate of acres that would result in alterations, rather than timber sales.

Appendix D. Stand Selection Criteria from Blufflands/Rochester Plateau SFRMP

Excerpted from Pages 30-31 of the final Blufflands/Rochester Plateau SFRMP (DNR, May 2002).

Stands will be identified based on a Cooperative Stand Assessment (CSA) dataset for the Blufflands/Rochester Plateau. Stands within the CSA dataset that do not meet the criteria below may be selected based local resource manager knowledge.

Cover Type (Cover Type Number in CSA):
The entire acreage identified based on the criteria will not be treated. The additional acres are necessary to ensure flexibility in assigning a silvicultural treatment given the particular site and ecological conditions.

Ash (1) - The CSA was queried for all ash stands with a site index over 40 and new age greater than 60.

Willow (6) - The CSA was queried for all willow stands with a site index over 45 and new age greater than 50.

Lowland Hardwoods (9) - The CSA was queried for all lowland hardwood stands with a site index over 40 and new age greater than 41. This cover type consists of cover types with varying rotation ages, thus a relatively young new age was used.

Aspen (12)- The CSA was queried for all aspen stands with a new age greater than 50.

Birch (13)- The CSA was queried for all birch stands with a new age greater than 60.

Cottonwood (15)- The CSA was queried for all cottonwood stands with a site index greater than 45 and a new age greater than 60. This amounted to 380 acres out of the 729 cottonwood acres in the CSA database.

Northern Hardwood (20)- The CSA was queried for all northern hardwood stands with a site index greater than 40 and a new age greater than 60.

Walnut (25)- The CSA was queried for all walnut stands with a new age greater than 65.

Oak (30)- The CSA was queried for all oak stands with a new age between 80 and 90, site index greater than 55, and steep slope. Then, the CSA was queried for all oak stands with a new age between 91 and 120 and site index greater than 55. Finally, the CSA was queried for all oak stands with a new age greater than or equal to 121 and site index greater than 55.

Central Hardwood (40)- The CSA was queried for all central hardwood stands with a new age greater than 85.

White Pine* (51) -All stands managed according to ERF guideline. This guideline allows for thinning to protect and improve the development of existing white pine regeneration. Thus, the CSA was queried for all white pine stands with a new age greater than 15.

Norway Pine* (52) - The CSA was queried for all norway pine stands with a new age greater than 15.

Jack Pine* (53) - The CSA was queried for all jack pine stands with a new age greater than 15.

Scotch Pine* (54) - The CSA was queried for all scotch pine stands with a new age greater than 15.

White spruce (61) - The CSA was queried for all white spruce stands with a new age greater than 60.

Upland Larch (70) - No acres of the upland larch cover type will be reviewed for treatment.

Tamarack (72) - No acres of the tamarack cover type will be reviewed for treatment.

Red Cedar (81) - All of the 226 acres of the red cedar cover type will be reviewed for treatment based on wildlife and ecological values.

Other Criteria to Develop Pool of Stands from which Stand Selection will Occur:

1. Partial harvests- high value single tree selection/thinning of northern hardwoods (e.g., walnut, oak, cherry, and other species) greater than 60 years old, specialty markets, and all pine species greater than 20 years old.
2. Heart rot-stands identified with 20 percent heart rot present or 10 percent mortality should be reviewed.
3. Oak wilt-if oak wilt is identified in CSA, or based on local knowledge, it will be considered for treatment (i.e., harvest, timber stand improvement, etc.).

Other Considerations During Stand Selection:

1. Multiple clear cut harvested sites may be adjacent to another if there is a 10 year age difference between them because a canopy is established in 10 years, thus reducing the amount of edge created.
2. Partial and selective harvests may be adjacent to each other.
3. Clear cuts of the same age must have a buffer of vegetation between them as determined by the local manager.
4. Local manager must have the authority to adjust the actual area for harvest within the selected stand.
5. It may be determined during stand selection that a stand is in a stage of ecological succession for conversion of the stand to Central Hardwoods or Northern Hardwoods. If this potential is great the stand will be managed for conversion to a different cover type.
6. Silvicultural characteristics of the site(soils, moisture, fertility, aspect, competition, etc.)
7. Local wildlife populations that are in need of mast and woody habitat.
8. High insect and disease damage potential of the stand.
9. Potential markets for the forest products.
10. The depth of current scientific and local knowledge of cultivation available to the local manager.
11. Stands in which regeneration of desirable species (i.e., commercial species) occurs may be held over until the next planning period, whereas stands with undesirable species (e.g., box elder, elm, etc.) will be considered for treatment.

Target Harvest Levels to Move Toward DFFC's:

Oak - In order to minimize the conversion of oak to northern hardwoods and move toward the desired age class structure a short term goal is necessary for this planning period. Specifically, the annual harvest acreage for the oak cover type will be doubled to 884 acres. This will expediate the process toward even age classes. Emphasis will be made to harvest acres from the normal rotation ages of the 80-100 age classes annually. Additional emphasis will be placed in the 101-120 and greater than 120 age classes annually**.**

* All pine stands (i.e., white, Norway, jack, and scotch) with a new age greater than 15 were selected and will be considered for thinning opportunities in order to address overstocking of trees in pine stands.

Appendix E. Glossary

This glossary contains commonly accepted definitions for words used in forestry and natural resource management. Several that apply to sensitive topics were expressly referenced in the report. Recommended changes, deletions, or additions to terms are not listed.

Acre: An area of land containing 43,560 square feet, roughly the size of a football field, or a square that is 208 feet on a side. A “forty” of land contains 40 acres and a “section” of land contains 640 acres.

Age class: An interval, commonly 10 years, into which the age range of trees or forest stands is divided for classification or use.

Age-class distribution: The proportionate amount of various age classes of a forest or forest cover type within a defined geographic area (e.g., ecological classification system subsection).

All aged: An uneven-aged stand that represents all ages or age classes from seedlings to mature trees.

Annual stand examination list: A 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.

Artificial regeneration: Renewal of a forest stand by planting seedlings or sowing seeds.

Assessment: A compilation of information about the trends and conditions related to natural and socio-economic resources and factors. The initial round of SFRMPs will focus primarily on trends and conditions of forest resources. Standard core assessment information sources and products have been defined.

Basal area: The cross-sectional area of a tree taken at the base of the tree (i.e., measured at 4.5 feet above the ground). Basal area is often used to measure and describe the density of trees within an geographic area using an estimate of the sum of the basal area of all trees cross-sectional expressed per unit of land area (e.g., basal area per acre).

Biodiversity (biological diversity): The variety and abundance of species, their genetic composition, and the communities and landscapes in which they occur, including the ecological structures, functions, and processes occurring at all of these levels.

Clear-cut: 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.

Clear-cut with reserves: Same as clear-cut, but leave trees in clumps, strips, or islands occupy a minimum of 5% of the clear-cut harvest unit, or greater than 5 leave trees per acre are left scattered throughout the site.

Coarse filter: The 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 will be met, and their populations will remain viable on the landscape.

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.

Connectivity: An element of spatial patterning where patches of vegetation such as, forest types, native plant communities or wildlife habitats, are connected to allow the flow of organisms and processes between them.

Conversion: A change through forest management from one tree species to another within a forest stand or site.

Cooperative stand assessment (CSA): The forest stand mapping and information system used by the Minnesota Department of Natural Resources to inventory the approximately five million acres (7,800 square miles) owned and administered by the state. The spatial information and stand attributes are now maintained in the Forest Inventory Module (FIM).

Cord: A pile of wood four feet high, four feet wide, and eight feet long, measuring 128 cubic feet, including bark and air space. Actual volume of solid wood may vary from 60 to 100 feet cubic feet, depending on size of individual pieces and how tight the wood is stacked. In the lake states, pulpwood cords are usually four feet x four feet x 100 feet and contain 133 cubic feet. Pulpwood volume of standing trees is estimated in cords. For example, a 10-inch DBH tree, which is 70 feet tall, is about 0.20 cords; or five trees of this size would equal one cord of wood.

Corridor: A defined tract of land connecting two or more areas of similar habitat type through which wildlife species can travel.

Cover type: Expressed as the tree species having the greatest presence (i.e., in terms of volume for older stands or number of trees for younger stands) in a forest stand. A stand where the major species is aspen would be called an aspen cover type.

Cover-type distribution: The location and/or proportionate representation of cover types in a forest or a given geographic area.

Critical habitat: Habitat or habitat elements that must be present and properly functioning to assure the continued existence of the species in question.

Crop tree: Any tree selected or retained to be a component of a future commercial harvest.

Cruise: (v) A survey of forest land to locate timber and estimate its quantity by species, products, size, quality, or other characteristics. (n) An estimate derived from such a survey.

Cubic foot: A wood volume measurement containing 1,728 cubic inches, such as a piece of wood measuring one foot on a side. A cubic foot of wood contains approximately six to 10 usable board feet of wood. A cord of wood equals 128 cubic feet.

Desired future forest composition (DFFC): Broad vision of landscape vegetation conditions in the long-term future. For the purposes of the initial round of subsection planning, DFFCs will focus on future desired forest composition looking ahead 50 years. DFFCs may include aspects like 1) the amount of various forest cover types within the subsection, 2) age-class distribution of forest cover types, 3) the geographic distribution of these across the subsection and the related level of management for even-aged forest, 4) extended rotation forest, etc.

Disturbance: Any event, either natural or human induced, that alters 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 succession forests commonly depend on and develop first following disturbance events (e.g., fire, windstorms, or timber harvest). Examples of *early successional forest* tree species are aspen, paper birch, and jack pine. Each stage of succession provides different benefits for a variety of species.

Ecological classification system (ECS): A method to identify, describe, and map units of land with different capabilities to support natural resources. This is done by integrating climatic, geologic, hydrologic, topographic, soil, and vegetation data. (See Appendix A.)

Ecological integrity: The degree, in general, 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.

Element occurrence (EO): An area of land and/or water where a rare feature (plant, animal, natural community, geologic feature, animal aggregation) is, or was present. An Element Occurrence Rank

provides a succinct assessment of estimated viability or probability of persistence (based on condition, size, and landscape context) of occurrences of a given element. An *Element Occurrence Record* is the locational and supporting data associated with a particular *Element Occurrence*. *Element Occurrence Records* for the state of Minnesota are managed as part of the rare features database by the Natural Heritage and Nongame Research Program. *(Draft definition 3/24/2004, adapted from Biotics EO Standards: Chapter 2)*

Endangered species: A plant or animal species that is threatened with extinction throughout all or a significant portion of its range in Minnesota.

Even-aged: A forest stand composed of trees of primarily the same age or age class. A stand is considered even-aged if the difference in age between the youngest and oldest trees does not exceed 20 percent of the rotation age (e.g., for a stand with a rotation age of 50 years, the difference in age between the youngest and oldest trees should be 10 years).

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.

Forest Inventory Module (FIM): The FIM provides a database and application through which field foresters can maintain an integrated and centralized inventory of the forests on publicly owned lands managed by the Division of Forestry and other divisions. In the field, foresters collect raw plot and tree data. Those data are summarized in stand-level data that are linked to a spatial representation of stand boundaries. Part of the DNR's **FOR**estry **I**nformation **S**ys**T**em (FORIST).

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. Forest management includes management for aesthetics, fish, recreation, urban values, water, wilderness, wildlife, wood products, and other forest resource values.

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.

Fragmentation: Breaking up of large and contiguous ecosystems into patches separated from each other by different ecosystem types. Breaking up a contiguous or homogeneous natural habitat through

conversion to different vegetation types, age classes, or uses. *Forest fragmentation* occurs in landscapes with distinct contrasts between land uses, such as between wood lots 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 clear-cutting if it is converted to another type, such as an aspen-dominated forest.

Fully-stocked stand: A forest stand in which all growing space is effectively occupied but having ample space for development of the crop trees.

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.

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.

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.

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 the 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.

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.

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").

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.

Managed acres: Timberland acres that are available for timber management purposes.

Management pool: In this plan, the acres available for timber management purposes.

Mast: Nuts, seeds, catkins, flower buds, and fruits of woody plants that provide food for wildlife.

Marketable timber: Merchantable timber that is accessible now.

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.

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.

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 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 (NPC): A group of native plants that interact with each other and with their environment in ways not greatly altered by modern human activity or by introduced organisms. These groups of native plants form recognizable units, such as an oak forest, prairie, or marsh, that tend to reoccur over space and time. Native plant communities are classified and described by physiognomy, hydrology, landforms, soils, and natural disturbance regimes (e.g., wildfires, windstorms, normal flood cycles).

Natural disturbances: Disruption of existing conditions by natural events such as wildfires, windstorms, drought, flooding, insects, and disease. May range in scale from one tree to thousands of acres.

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

Nonforest 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.

Normal rotation age: For even-aged managed cover types, the rotation age set by the SFRMP team for nonERF timberland acres. It is based on the culmination of mean annual increment (CMAI), other available data related to forest productivity that also considers wood quality, and local knowledge.

Old-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 Guidelines (1994).

Old forest: A forest stand of any particular forest cover type 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.

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.

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 to 12 inches diameter at breast height are used.

Pure forest or stand: An area or stand composed principally of one species, conventionally at least 80 percent based on numbers, basal areas, or volumes.

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.*** Species listed as federally endangered, threatened, or as candidates for federal listing; all species state listed as endangered, threatened, or special concern. Several rare species are also tracked currently have no legal status but need further monitoring to determine their status.
- ***Rare animals.*** Species listed as federally endangered or threatened (except the gray wolf) are tracked, as well as all birds, small mammals, reptiles, amphibians, mussels, and butterflies listed as state endangered, threatened, or of special concern.
- ***Natural communities***. 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 Program, 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.

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).

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

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 which 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.

Sapling: A tree that is1 to 5 inches in diameter at breast height.

Sawlog: A log large enough to produce lumber or other products that can be sawed. Its size and quality vary with the utilization practices of the region.

Sawtimber: Trees that yield logs suitable in size and quality for the production of lumber.

Scarify: To break up the forest floor and topsoil preparatory to natural regeneration or direct seeding.

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 or low light levels caused by shading from surrounding vegetation. Shade tolerant species can grow in low light conditions, 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.

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 nonutilized 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 their normal environment, to support plant growth.

Stand: A contiguous group of trees similar in age, species composition, and structure, and growing on a site of similar quality, to be a distinguishable forest unit. A forest is comprised of many stands. A ***pure stand*** is composed of essentially a single species, such as a red pine plantation. A ***mixed stand*** is composed of a mixture of species, such as a northern hardwood stand consisting of maple, birch, basswood, and oak. An ***even-aged stand*** is one in which all of the trees present are essentially the same age, usually within 10 years of age for aspen and jack pine stands. An ***uneven-aged stand*** is one in which a variety of ages and sizes of trees are growing together on a uniform site, such as a northern hardwood stand with three or more age classes.

Stand age: In the DNR's forest inventory, the average age of the main species within a stand.

Stand density: The quantity of trees per unit area. Density usually is evaluated in terms of basal area, numbers of trees, volume, or percent crown cover.

Stand examination list: DNR forest stands to be considered for treatment (e.g., harvest, thinning, regeneration, prescribed burning, reinventory, etc.) over the planning period based on established criteria (e.g., rotation age, site index, basal area, desired future cover-type composition, etc.). These stands will be assigned preliminary prescriptions and most will receive the prescribed treatment. However, based on field appraisal visit, prescriptions may change for some stands because of new information on the stand or its condition.

Stand selection criteria: Criteria used to help identify stands to be treated as determined by the subsection team. Criteria will likely be based on 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.

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 partiallystocked. A measure of the proportion of an area actually occupied by trees.

Strategic planning: A process to plan for desired future states. Includes aspects of a plan or planning process that provide statements and guides for future direction. The geographic, programmatic, and policy focus can range from very broad and general to more specific in providing tiers/levels of direction. Strategic planning is usually long term (i.e., at least five years, often longer). It 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.

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 to 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.

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.

Thermal cover: Habitat component (e.g., conifer stands such as white cedar, balsam fir, and jack pine) that provides wildlife protection from the cold in the winter and heat in the summer. Vegetative cover used by animals against the weather.

Thinning: A silvicultural treatment made to reduce the density of trees within a forest stand primarily to improve growth, enhance forest health, or recover potential mortality. **Row thinning** is where selected rows are harvested, usually the first thinning, which provides equipment operating room for future selective thinnings. **Selective thinning** is where individual trees are marked or specified (e.g., by diameter, spacing, or quality) for harvest. **Commercial thinning** is thinning after the trees are of merchantable size for timber markets. **Pre-commercial thinning** is done before the trees reach merchantable size, usually done in overstocked (very high stems per acre) stands to provide more growing space for crop trees that will be harvested in future years.

Threatened species: A plant or animal species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range in Minnesota.

Timberland: 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 the cover type. It does not include very low productivity sites such as those classified as stagnant spruce, tamarack, and cedar, offsite aspen, or nonforest land.

Timber productivity: The quantity and quality of timber produced on a site. The rate at which timber volume is produced per unit area over a period of time (e.g., cords per acre per year). The relative capacity of a site to sustain a level of timber production over time.

Timber stand improvement (TSI): A practice in which the quality of a residual forest stand is improved by removing less desirable trees and large shrubs to achieve the desired stocking of the best quality trees or to improve the reproduction, composition, structure, condition, and volume growth of a stand.

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

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

Underplant: The planting of seedlings under an existing canopy or overstory.

Understocked: A stand of trees so widely spaced that even with full growth potential realized, crown closure will not occur.

Understory: The shorter vegetation (shrubs, seedlings, saplings, small trees) within a forest stand that forms a layer between the overstory and the herbaceous plants of the forest floor.

Uneven-aged stand: A stand of trees of a variety of ages and sizes growing together on a uniform site. A stand of trees with three or more distinct age classes.

Uneven-aged management: Forest management that results in forest stands comprised of intermingling trees or small groups having three or more distinct age classes. Best suited for shade-tolerant species.

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 over time 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, extended rotation forests, riparian areas, desired future forest composition, visually sensitive travel corridors, etc., all of which are intended to address wildlife habitat, biodiversity, aesthetic, and other concerns. Prescriptions assigned to stands reflect decisions based on these multiple considerations and are broader than decisions relative to final harvest (e.g., ERF designation, uneven-aged management, thinning, regeneration, underplanting, prescribed burning, etc.).

Viable populations: The number of individuals of a species sufficient to ensure the long-term existence of the species in natural, self-sustaining populations that are adequately distributed throughout their range.

Volume: The amount of wood in a tree or stand according to some unit of measurement (board feet, cubic feet, cords), or some standard of use (pulpwood, sawtimber, etc.).

Well-stocked: The situation in which a forest stand contains trees spaced widely enough to prevent competition yet closely enough to utilize the entire site.

Wildlife management area (WMA): Areas established by the Department of Natural Resources, Division 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.