

2 Stand Selection Results

2.1 Introduction

Based on the stand selection criteria included in Chapter 4, Cover Type Management Recommendations, of the Strategic Direction Document and the general direction statements, DFFC goals, and strategies included in Chapter 3 of the Strategic Direction Document, stands were selected for field examinations and possible treatment during the 10-year planning period. Appendix A, 10-Year Stand Selection Project Directions, provides details on the stand selection process.

Appendix E, 10-Year Stand Examination List by Subsection and Location, includes a list of stands by subsection, location, cover type, treatment acres, and preliminary prescription. Appendix F, Stands with a White Pine Component on the 10-Year Stand Examination List, lists the stands selected for treatment that have a white pine component. The DNR's State Forest Land White Pine Management Policy will be followed in the treatment of these stands.

2.2 Stand Examinations

Over the 10-year planning period it is planned that every stand on the stand examination list will be field visited to determine the actual type of management, if any, to be conducted on it. Stands have been selected based on stand data in the DNR's forest inventory database and field staff's knowledge of individual stands. However, the current condition of stands and the actual prescription to apply will not be known until the field visits (stand examinations) are made.

The range of decisions about each stand's management include:

1. Appraise the stand for a timber sale.
2. Defer treatment of the stand to a future year.
3. Update the stand's forest inventory data to reflect current conditions without prescribing a management action at this time.
4. Manage for the understory regeneration without harvesting at this time.
5. Prescribe forest development work (e.g., site preparation and tree planting).
6. Prescribe timber stand improvement (tsi) to enhance stand vigor, diversity, or productivity.

2.3 Maps

The following maps provide the locations of stands selected for stand examinations and possible treatment during the 10-year plan. See Page 2.5 or Appendix B for prescription definitions. The maps are included in Appendix G–J.

1. *Appendix G: Stands Identified for Treatment by Generalized Cover Type.* A set of three maps shows the locations of stands selected for field examinations and possible treatment by generalized cover type.
2. *Appendix H: Stands Identified for Treatment by Preliminary Prescriptions.* A set of three maps shows the locations of stands selected for field examinations and possible treatment by preliminary prescription.

3. *Appendix I: Patches Greater Than 250 Acres and Stand Prescriptions.* A set of three maps shows the locations of designated patches greater than 250 acres within the subsections and the stands selected for treatment by location and preliminary prescription. Patch management recommendations were considered during the stand selection process. For example, stand selections considered maintaining or increasing patch size.
4. *Appendix J: MCBS Sites of Biodiversity Significance and Stand Prescriptions.* A set of three maps shows the locations of MCBS sites of statewide biodiversity significance within the subsections and the stands selected for treatment within these sites by type of preliminary prescription.

Note: The maps have been reduced and printed in grayscale in this document. It is recommended that these maps be viewed at a larger scale and in color. The colored maps and this report can be viewed at <http://www.dnr.state.mn.us/forestry/subsection/northshorearea/index.html>, are available in CD format, and may be viewed at the open houses that will be held for public review.

2.4 Stand Evaluations

When stand examinations are completed, information (e.g., DFFC goals, strategies, recommendations, and guidelines) from the Strategic Direction Document and the ArcView shapefile for the SFRMP will be considered in evaluating the stands and making final prescriptions. For example, the strategies recommended in GDS-1E of the Strategic Direction Document regarding management of state lands within MCBS sites of statewide biodiversity significance will be considered when managing stands within these sites. For many stands, the SFRMP shapefile database includes preliminary management objectives, comments about stand management, identification of special management areas, requests for a joint visit, and so on. See Appendix N, SFRMP Codes (revised), on pages 4.23–4.31 of this document for the types of information included in the SFRMP database. This information will be provided to assigned field staff prior to the field visit for a stand examination. If forestry staff proposes management that is significantly different than the preliminary prescription, interdisciplinary team recommendations, preliminary management objectives, or input from other divisions (division comments), the appropriate field staff from other divisions will be notified for input. For example, if the appraiser prescribes a clearcut harvest final prescription when the interdisciplinary team recommendation was an uneven-aged harvest (group or single-tree selection) prescription, appropriate staff from other divisions will be contacted.

During the SFRMP development, some stands have been identified for joint site visits by wildlife, fisheries, or ecological services staff. Joint site visits allow DNR field staff to achieve mutual agreement that considers the characteristics unique to individual stands and issues of concern in the field based on the goals and objectives for the stand and the surrounding landscape as recommended in the plan. Stands identified for joint site visits are indicated as such on annual stand examination lists and appraiser stand reports. Results of joint site visits are documented and the document is filed in the timber sale permit file.

2.5 Public Review of Stand Examination Lists

The entire 10-year stand examination list is available for public review in this step of the SFRMP process (Appendix E or at <http://www.dnr.state.mn.us/maps/forestview/index.html>). The stands will be available for public review again as they are included in annual harvest plans (i.e., by stand examination year). New stands added during a year are included in the annual plan additions public review process. For details on the public review processes, see <http://www.dnr.state.mn.us/forestry/harvesting/plans.html>.

2.6 Cover Type Acres Summary

Based on the stand selection criteria developed in the Strategic Direction Document, a stand selection pool of 77,200 acres was identified. From this pool, 52,562 acres were selected for stand examinations and possible treatment during the 10-year planning period. Table 2.1 summarizes the stand examination acres by cover type and subsection. Approximately 2.5 percent of the DNR's managed acres in these subsections will be evaluated for treatment per year during the 10-year period. This evaluation/treatment level is higher per year in this first decade because of the current age-class imbalances and the large acreage of high-risk, low-volume (HRLV) stands identified in the plan. Using the treatment level for *even-aged* managed cover types as an example, about 31,000 acres will be evaluated for treatment in the first decade while the long-term goal is to treat 20,000 acres per decade. The estimate for Decade 2 is 19,000 acres. See Table 3.9h in the Strategic Direction Document for more information.

Table 2.1: 10-Year Summary: Cover Type Stand Examination Acres by Subsection

Cover Type	North Shore Highlands	Toimi Uplands	Laurentian Uplands	Total Acres
Ash	129	97	0	226
Lowland Hardwoods	9	0	0	9
Aspen	8267	2436	2089	12792
Balm of Gilead	559	0	0	559
Paper Birch	6834	604	1476	8914
Northern Hardwoods	3683	9	15	3707
White Pine	440	296	202	938
Red Pine	3810	1332	1052	6194
Jack Pine	180	41	273	494
White Spruce	6510	975	1717	9202
Balsam Fir	3031	352	853	4236
Black Spruce Upland	291	106	389	786
Black Spruce Lowland	1270	339	2113	3722
Tamarack	513	106	130	749
White Cedar	34	0	0	34
Total Acres Selected in the 10-Year Plan	35560	6693	10309	52562
Total DNR Managed Acres in Subsection	136068	22762	47868	206697
Percent of Managed Acres Selected for Stand Examinations during the 10-year Plan	26%	29%	22%	25%

2.7 Preliminary Prescriptions Summary

Based on the stand selection criteria developed in the Strategic Direction Document, query- or criteria-based preliminary prescriptions are assigned to stands selected for treatment. (For example: if the cover type is birch, the stand is not ERF, the stand age is greater than 54 years, and the site index is less than 60, then the stand is assigned a general prescription of “harvest” and is included in the stand selection pool. If the stand is selected from this pool for a stand examination during the 10-year plan, a preliminary prescription of “Clearcut with Reserves” is assigned.) After a field examination of the stand is completed, a more specific prescription may be assigned. All stands assigned with an “on-site visit” preliminary prescription will have a specific treatment method prescription assigned, treatment deferred to a future year, or forest inventory data updated, after the stand examination is completed. Table 2.2 provides a summary

by subsection of the preliminary prescriptions. Table 2.3 provides a more detailed summary by cover type, prescription, and subsection. Appendix E, 10-Year Stand Examination List by

Subsection and Location, includes the preliminary prescription for each of the stands selected for treatment in the 10-year plan. Following are the definitions for the preliminary prescriptions used in SFRMP planning:

Prescription Definitions

Even-aged Harvest Methods: General category for harvest methods designed to regenerate a stand with a single age class. The result is a stand of trees containing a single age class in which the range of tree ages is usually less than 20 percent of the rotation age. These methods are best suited for management of shade-intolerant species, such as aspen, birch, and jack pine.

- **Clearcut with Reserves:** Removal, or felling, in a single cutting, of essentially all trees in the stand, except leave trees are reserved. Leave trees may be left in clumps, strips, or islands and they occupy a minimum of 5 percent of the clearcut harvest unit, or more than five leave trees are left scattered throughout the harvested site.
- **Seed Tree:** An even-aged regeneration method in which an area is clearcut except that certain trees, called seed trees, are left standing singly or in groups for the purpose of providing seed to restock the cleared area. Seed trees may be removed after regeneration is established.
- **Shelterwood:** A method of regenerating an even-aged stand by a series of partial cuttings, resembling thinnings, that extends over a small fraction of the rotation and provides protected seedbeds for regeneration. The sequence of treatments can include three distinct types of cuttings: a) an optional preparatory cut to enhance seed production, b) an establishment cut to prepare the seedbed and create a new age class, and c) a final removal cut to release established regeneration. The final removal cut may retain leave or reserve trees.

Uneven-aged Harvest Methods: Methods of regenerating a stand and maintaining an uneven-aged structure by removing some trees in all size classes either singly, in small groups, or in strips. The result is a stand of trees of three or more distinct age classes, either intimately mixed or in small groups. These methods are best suited for management of shade-tolerant species, such as northern hardwoods.

- **Group Selection:** A method of regenerating uneven-aged stands in which trees are removed, and new age classes are established, in small groups. The maximum width of the groups is approximately twice the height of the mature trees. This method is also known as gap management.
- **Single Tree Selection:** A method of creating new age classes in uneven-aged stands in which individual trees of all size classes are removed more or less uniformly throughout the stand to achieve a desired stand structure.

Intermediate Treatment: Any treatment or tending designed to enhance growth, quality, vigor, and composition of the stand after establishment or regeneration and prior to final harvest.

- **Thinning:** A treatment made to reduce the density of trees within a forest stand primarily to improve growth, enhance forest health, or recover potential mortality. *Commercial thinning* is a thinning harvest after the trees are of merchantable size for timber markets. *Row or strip thinning* is harvest of selected rows or strips, usually used during the initial thinning, providing equipment operating room for future selective thinnings. *Selective thinning* is harvest of marked or specified individual trees (e.g., by diameter, spacing, or quality).

Decorative Tree Harvest: Selective harvest of small trees or tree tops for decorative use, such as Christmas trees and winter greenery. Decorative tree harvest is primarily done in the stagnant spruce cover type.

High-Risk, Low-Volume (HRLV): When the SFRMP identifies a stand as High-Risk, Low-Volume (HRLV), the stand must undergo a field visit to determine the detailed management prescription (e.g., clearcut with reserves, group selection, no action, etc.). Some examples of HRLV stand treatments are: if the management decision is to harvest, determine harvest method, appraise, and sell on a timber sale; manage for an adequately stocked regenerating species; regenerate through the use of forest development practices such as site preparation and planting; defer the treatment to a future year; or reinventory to correct or update the stand data. Stands given an HRLV prescription have one or more of the following characteristics: 1) coded as high risk in the forest inventory, 2) significant insect or disease damage to the main species, 3) over rotation age at time of survey with total stand volume less than 8 cords per acre (i.e., low volume), or 4) over the recommended maximum rotation age for the cover type (e.g., aspen over 85 years old). HRLV also includes stands referred to as a low-density stand pool, which includes stands with very low stocking or volume per acre. The Field Visit Decision Tree (Appendix E in the Strategic Direction Document) provides guidance on how stands with this prescription should be treated.

On-Site Visit: The stand needs a field visit to accurately determine stand condition in order to make a management prescription.

See Appendix B, Prescription Codes and Definitions, for the full list of harvest prescriptions used by the DNR.

Table 2.2: 10-Year Summary: Preliminary Prescription Acres by Subsection

Preliminary Prescription	North Shore Highlands	Toimi Uplands	Laurentian Uplands	Total Acres
Clearcut with Reserves	6674	2750	3454	12878
Seed Tree	0	0	6	6
Shelterwood	11	0	0	11
Group or Single-Tree Selection	6473	342	577	7392
Thinning ¹	8040	2341	2245	12626
Decorative Tree Harvest	218	0	0	218
High-Risk, Low-Volume (HRLV) ¹	14082	1223	4027	19332
On-Site Visit ¹	62	37	0	99
Total Acres	35560	6693	10309	52562

¹It is estimated that 50 percent or fewer of the stands with preliminary prescriptions of thinning, HRLV, or on-site visit will meet harvest criteria when the stand examination is completed.

Table 2.3: 10-Year Summary: Preliminary Prescription Acres by Cover Type and Subsection

Cover Type	Preliminary Prescription	North Shore Highlands	Toimi Uplands	Laurentian Uplands	Total Acres
Ash	Group/Single-Tree Selection	129	97	0	226
Lowland Hardwoods	Group/Single-Tree Selection	9	0	0	9
Aspen	Clearcut with Reserves	3703	1923	1256	6882
Aspen	Group/Single-Tree Selection	29	0	0	29
Aspen	Thinning ¹	10	0	0	10
Aspen	On-Site Visit ¹	28	19	0	47
Aspen	High-Risk, Low-Volume ¹	4497	494	833	5824
<i>Aspen</i>	<i>Total</i>	8267	2436	2089	12792
Balm of Gilead	Clearcut with Reserves	57	0	0	57
Balm of Gilead	High-Risk, Low-Volume ¹	502	0	0	502
<i>Balm of Gilead</i>	<i>Total</i>	559	0	0	559
Paper Birch	Clearcut with Reserves	1043	302	355	1700
Paper Birch	High-Risk, Low-Volume ¹	5791	302	1121	7214
<i>Paper Birch</i>	<i>Total</i>	6834	604	1476	8914
Northern Hardwoods	Group/Single-Tree Selection	3683	9	15	3707
White Pine	Thinning ¹	440	296	202	938
Red Pine	Thinning ¹	3810	1332	1052	6194

Table 2.3 Continued

Cover Type	Preliminary Prescription	North Shore Highlands	Toimi Uplands	Laurentian Uplands	Total Acres
Jack Pine	Clearcut with Reserves	135	20	102	257
Jack Pine	Thinning ¹	4	0	0	4
Jack Pine	On-Site Visit ¹	0	18	0	18
Jack Pine	High-Risk, Low-Volume ¹	41	3	171	215
<i>Jack Pine</i>	<i>Total</i>	<i>180</i>	<i>41</i>	<i>273</i>	<i>494</i>
White Spruce	Group/Single Tree Selection	2622	237	562	3421
White Spruce	Thinning ¹	3777	713	991	5481
White Spruce	High-Risk, Low-Volume ¹	111	25	164	300
<i>White Spruce</i>	<i>Total</i>	<i>6510</i>	<i>975</i>	<i>1717</i>	<i>9202</i>
Balsam Fir	Clearcut with Reserves	584	92	142	818
Balsam Fir	Shelterwood	11	0	0	11
Balsam Fir	High-Risk, Low-Volume ¹	2436	260	711	3407
<i>Balsam Fir</i>	<i>Total</i>	<i>3031</i>	<i>352</i>	<i>853</i>	<i>4236</i>
Black Spruce Upland	Clearcut with Reserves	88	98	166	352
Black Spruce Upland	High-Risk, Low-Volume ¹	203	8	223	434
<i>Black Spruce Upland</i>	<i>Total</i>	<i>291</i>	<i>106</i>	<i>389</i>	<i>786</i>
Black Spruce Lowland	Clearcut with Reserves	688	254	1352	2294
Black Spruce Lowland	Decorative Trees	214	0	0	214
Black Spruce Lowland	High-Risk, Low-Volume ¹	368	85	761	1214
<i>Black Spruce Lowland</i>	<i>Total</i>	<i>1270</i>	<i>339</i>	<i>2113</i>	<i>3722</i>
Tamarack	Clearcut with Reserves	375	62	81	518
Tamarack	Seed Tree	0	0	6	6
Tamarack	Decorative Trees	4	0	0	4
Tamarack	High-Risk, Low-Volume ¹	134	44	43	221
<i>Tamarack</i>	<i>Total</i>	<i>513</i>	<i>106</i>	<i>130</i>	<i>749</i>
White Cedar		34	0	0	34
	Total	35560	6693	10309	52562

¹ It is estimated that 50 percent or fewer of the stands with preliminary prescriptions of thinning, HRLV, or on-site visit will meet harvest criteria when the stand examination is completed.

2.8 Stand Age Summary

Tables 2.4 and 2.5 show the average stand age by cover type at the time of stand selection (2004) for stands selected for treatment during the 10-year management plan.

Table 2.4: 10-Year Summary: Average Age of Stands Selected for Treatment for Cover Types Managed Primarily by Even-Aged Harvest Methods

Cover Type	Rotation Age Type ¹	SFRMP Rotation Ages	North Shore Highlands	Toimi Uplands	Laurentian Uplands	All Three Subsections Average
Aspen	NRF	50–55	76	68	80	76
	ERF	65–85	80	69	84	80
Balm of Gilead	NRF	50–55	80	0	0	80
	ERF	65–85	80	0	0	80
Paper Birch	NRF	55–65	85	83	86	85
	ERF	75–85	84	82	90	85
Jack Pine	NRF	60	64	71	91	80
	ERF	70–80	75	0	105	94
Balsam Fir	NRF	50	74	71	78	74
	ERF	60–75	77	75	83	79
Black Spruce Upland	NRF	70	84	87	92	88
	ERF	90–100	108	0	90	95
Black Spruce Lowland	NRF	85–120	108	114	116	113
	ERF	105–180	107	121	110	111
Tamarack	NRF	85–100	93	95	91	93
	ERF	105–150	127	105	97	109

¹NRF, normal rotation forest; ERF, extended rotation forest

Table 2.5: 10-Year Summary: Average Age of Stands Selected for Treatment for Cover Types Managed Primarily by Selective and Thinning Harvest Methods

Cover Type	Rotation Age Type ¹	SFRMP Rotation Ages ²	North Shore Highlands	Toimi Uplands	Laurentian Uplands	All Three Subsections Average
Ash	NRF	NA	107	91	0	100
	ERF	NA	0	0	0	0
Lowland Hardwoods	NRF	NA	57	0	0	57
	ERF	NA	0	0	0	0
Northern Hardwoods	NRF	NA	86	79	102	86
	ERF	NA	97	0	0	97
White Pine	NRF	180	0	0	94	94
	ERF	180–240	94	82	119	98
Red Pine	NRF	120	31	32	32	31
	ERF	200–240	35	64	48	45
White Spruce	NRF	75	32	35	26	31
	ERF	100–120	50	60	35	49

¹NRF, normal rotation forest; ERF, extended rotation forest

²NA, final harvest rotation ages (NRF and ERF) are not established for these cover types because they are primarily managed on an uneven-aged management (selective harvest) basis.

2.9 Stand Selection Summary by Subsection, Forestry Area, and Cover Type

Tables 2.6–2.8 summarize by subsection the average annual stand examination acres by cover type for each forestry area. In these tables, the total 10-year stand examination acres selected have been divided evenly over the 10-year period. Forestry areas may deviate from the average acres on a year-to-year basis, especially when there is a small annual acreage for a cover type. For example, the Cloquet Area has 7 acres per year (70 acres, 10-year total) of stand examinations in the northern hardwoods cover type in the North Shore Highlands Subsection. The stand examinations for this cover type in the 10-year plan are scheduled as follows: 1 stand of 30 acres in 2005, 1 stand of 32 acres in 2008, and 2 stands totaling 8 acres in 2010.

Table 2.6: North Shore Highlands: Annual Stand Examination Acres by Forestry Area

Cover Type	Two Harbors Area	Cloquet Area	Total Acres
Ash	6	7	13
Lowland Hardwoods	0	1	1
Aspen	710	116	826
Balm of Gilead	54	2	56
Paper Birch	620	63	683
Northern Hardwoods	361	7	368
White Pine	21	23	44
Red Pine	251	130	381
Jack Pine	18	1	19
White Spruce	605	46	651
Balsam Fir	217	86	303
Black Spruce Upland	29	0	29
Black Spruce Lowland	67	60	127
Tamarack	6	45	51
White Cedar	3	0	3
Total Annual Acres	2968	587	3555

Table 2.7: Toimi Uplands: Annual Stand Examination Acres by Forestry Area

Cover Type	Two Harbors Area	Cloquet Area	Hibbing Area	Total Acres
Ash	0	10	0	10
Lowland Hardwoods	0	0	0	0
Aspen	88	89	66	243
Balm of Gilead	0	0	0	0
Paper Birch	31	28	1	60
Northern Hardwoods	0	1	0	1
White Pine	0	30	0	30
Red Pine	0	130	4	134
Jack Pine	0	0	4	4
White Spruce	21	76	0	97
Balsam Fir	6	24	5	35
Black Spruce Upland	11	0	0	11
Black Spruce Lowland	5	18	11	34
Tamarack	0	8	3	11
White Cedar	0	0	0	0
Total Annual Acres	162	414	94	670

Table 2.8: Laurentian Uplands: Annual Stand Examination Acres by Forestry Area

Cover Type	Two Harbors	Tower	Hibbing	Total Acres
Ash	0	0	0	0
Lowland Hardwoods	0	0	0	0
Aspen	110	39	60	209
Balm of Gilead	0	0	0	0
Paper Birch	119	11	17	147
Northern Hardwoods	2	0	0	2
White Pine	20	0	0	20
Red Pine	99	6	0	105
Jack Pine	16	11	0	27
White Spruce	172	0	0	172
Balsam Fir	74	8	3	85
Black Spruce Upland	26	10	3	39
Black Spruce Lowland	164	41	6	211
Tamarack	3	10	0	13
White Cedar	0	0	0	0
Total Annual Acres	805	136	89	1030

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