

WOODLAND STEWARDSHIP PLAN

Prepared for:

Liila Forest Products, a wholly owned subsidiary of Rajala
Companies C/O John Rajala
P.O. Box 578 Deer River, MN 56636
Phone: 218/246-8149

Legal Description:

Portions of Sections 28, 29, 30, 31, 32 and 33 of Township 54N
Range 26W all of Itasca County, Minnesota (see attachment for
full legal description)

Stewardship Acres 1659.

Total Parcel Acres 1659.

*Prepared by:

John Rajala-Liila Forest Products
P.O. Box 578 Deer River, MN 56636
218/246-8149

And

Richard Peterson
MN DNR-Forestry
1801 NW 30th St,
Faribault, MN 55021
507-333-2012

April 17, 2007

Fieldwork was conducted during April-November, 2006

Liila Forest Products Stewardship Goals for this Property are:
(John – these are draft only-modify as needed.)

- **To maintain the entire property as a landscape while considering individual stands as part of the whole landscape.**
- **To maintain both the historic cover types and natural species diversity present on the site.**
- **To provide for the biological diversity and ecological systems that support the varied and abundant plant and tree communities and the populations of wildlife.**
- **To conserve the aquatic and riparian characteristics of the property.**
- **To capture and utilize the timber value of the maturing forest**
- **To promote forest health and regeneration**

through use of sound and appropriate silvicultural methods and techniques.

- **Maintain and manage the property in a manner consistent with the Forest Legacy Program goals and conservation easement purposes including the Forest Management Objectives as listed in the conservation easement:**
- **Conservation Easement Purposes (2.2.1 through 2.2.6):**
 1. To protect in perpetuity the Conservation Values of the Protected Property and to prevent any use of the Protected Property that will significantly impair or interfere with the Conservation Values while maintaining a Working Forest.
 2. To encourage the long-term, professional, and sustainable management and production of forest resources through economically and commercially viable sustainable production and harvest of forest resources while minimizing impacts on the Conservation Values.
 3. To encourage the protection of forest resources as set forth in the Forest Management Act, as amended, Minn. Stat. Chapter 89 and the Sustainable Forest Resources Act, as amended, Minn. Stat. Chapter 89A and the Statewide Assessment of Need.
 4. To effect the Forest Legacy Program in accordance with the provisions of Title XII of the Food, Agriculture Conservation and Trade Act of 1990, 16 U.S.C. Section 2103c et seq. and the Statewide Assessment of Need, on the Protected Property, which purposes include protecting environmentally important private forest areas that are threatened by conversion to non-forest uses and promoting forest land protection and other conservation opportunities. This purpose also includes the protection of important scenic, cultural, fish, wildlife and recreational resources, riparian areas and other ecological values.
 5. To provide opportunities for public recreational use and enjoyment in a manner that is consistent with the purposes of this Conservation Easement listed above.
 6. It is the intent of the parties to confine all subsequent management and use of the Protected Property to such activities as are consistent with the Purpose and terms of this Conservation Easement including compatible forest management and timber harvest activities as described herein.
- **Forest Management Objectives**
 1. To use present and future generally accepted knowledge of Native Plant Communities, harvesting techniques, silviculture and principles of forest ecology to enhance, manage, maintain and restore the mesic hardwood and other plant communities on the protected property.
 2. To incorporate the natural succession of Native Plant Communities over time and to adapt to possible changes in climate and moisture regimes.
 3. To encourage the sustainable production of high quality wood fiber from a variety of native tree species, ages and sizes, including consideration of objectives and activities that are economically and logistically feasible to facilitate a reasonable rate of return from the sustainable harvesting, management and regeneration of commercially valuable forest products, with specific emphasis on high quality saw logs and veneer logs.

4. To reasonably and practically emulate the patterns and processes of the dominant natural disturbance agents typical for forest types found in each Native Plant Community.

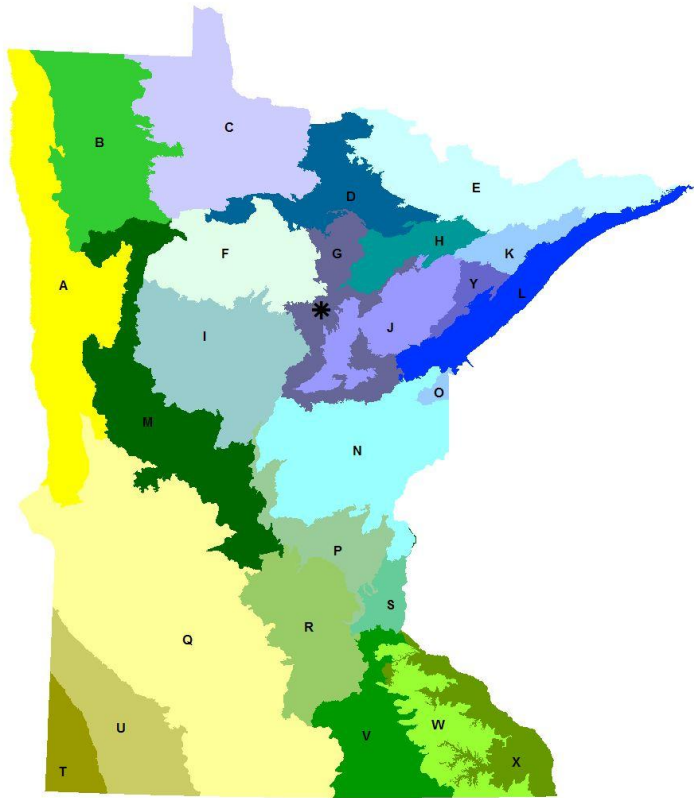
-Landscape Region

Landscape Region: St. Louis Moraines

Your property is located within the St. Louis Moraines ecological landscape region (or subsection) that is described in more detail below.

St. Louis Moraines with project shown with *.

Map 1-Subsection Map



St. Louis Moraines-Sugar Hills Project shown with *

This subsection consists primarily of rolling to steep end moraines, including the Marcell moraine complex in the north; the Sugar Hills in the south; and a small steep portion of the Nashwauk-Warba moraine between the Giant Ridge and the Tamarack Lowlands. At the southern edge of the subsection is an area of ground moraine, the Swatara plain. All these features have calcareous loamy or clayey soils.

Landform

This subsection consists primarily of distinct end moraines, but there is also pitted outwash at the northeast edge and ground moraine at the southern edge; Hobbs and Goebel (19892) treat the end moraines as part of the Sugar Hills moraine association of the Des Moines lobe, and the

Property Description

(see maps)

ground moraine of the Swatara plain as part of the Culver moraine of the same lobe.

Bedrock geology

Glacial drift is relatively thick, ranging from 100-400 feet. Lower Precambrian undivided granites, metavolcanics, and metasedimentary rocks underlie the glacial drift.

Soils

The soils are mostly clay loam and loam soils. Soils are classified as Boralfs, Aqualfs, Hemists, and Psamments, with Boralfs most common.

Climate

Growing season length ranges from 111-131 days. Total annual precipitation ranges from 26-28 inches, and annual snowfall is 48-52 inches. Only 12 to 16 percent of the annual precipitation falls during winter. Extreme minimum temperatures are -45 degrees Fahrenheit or colder.

Hydrology

Potholes and small bogs are common, and lakes are numerous. The moraines and outwash contain more than 100 lakes larger than 160 acres; lakes account for approximately 8 percent of the surface area.

Presettlement vegetation

White pine-red pine forests covered large parts of the steep moraines and parts of the pitted outwash along the eastern edge of the subsection. Aspen-birch forest also grew on the moraines, but was best represented on the outwash, most of which had well to excessively drained sandy soils. Local areas of mixed hardwood-pine forest were found on the moraines, generally near large lakes, where there were possibly better fire protection and less severe spring frost. Some of the best northern hardwood forest, dominated by sugar maple, grew on the moraines near Grand rapids. Conifer swamp and bogs were scattered throughout the subsection, occupying both kettles and linear depressions in the pitted outwash and moraines.

Present vegetation and land use

Almost the entire subsection remains forested, with forest management and recreation as the major land uses. Following logging, the extensive white pine-red pine forests have been replaced by forests of trembling aspen-paper birch. Tourism is the other important land use. There are high-quality examples of several plant communities in this subsection including northern hardwood forest, red pine forest, white pine forest, northern white-cedar swamp, and poor fen.

Natural disturbance

Both fire and windthrow were important disturbances.

Conservation concerns

Property Description

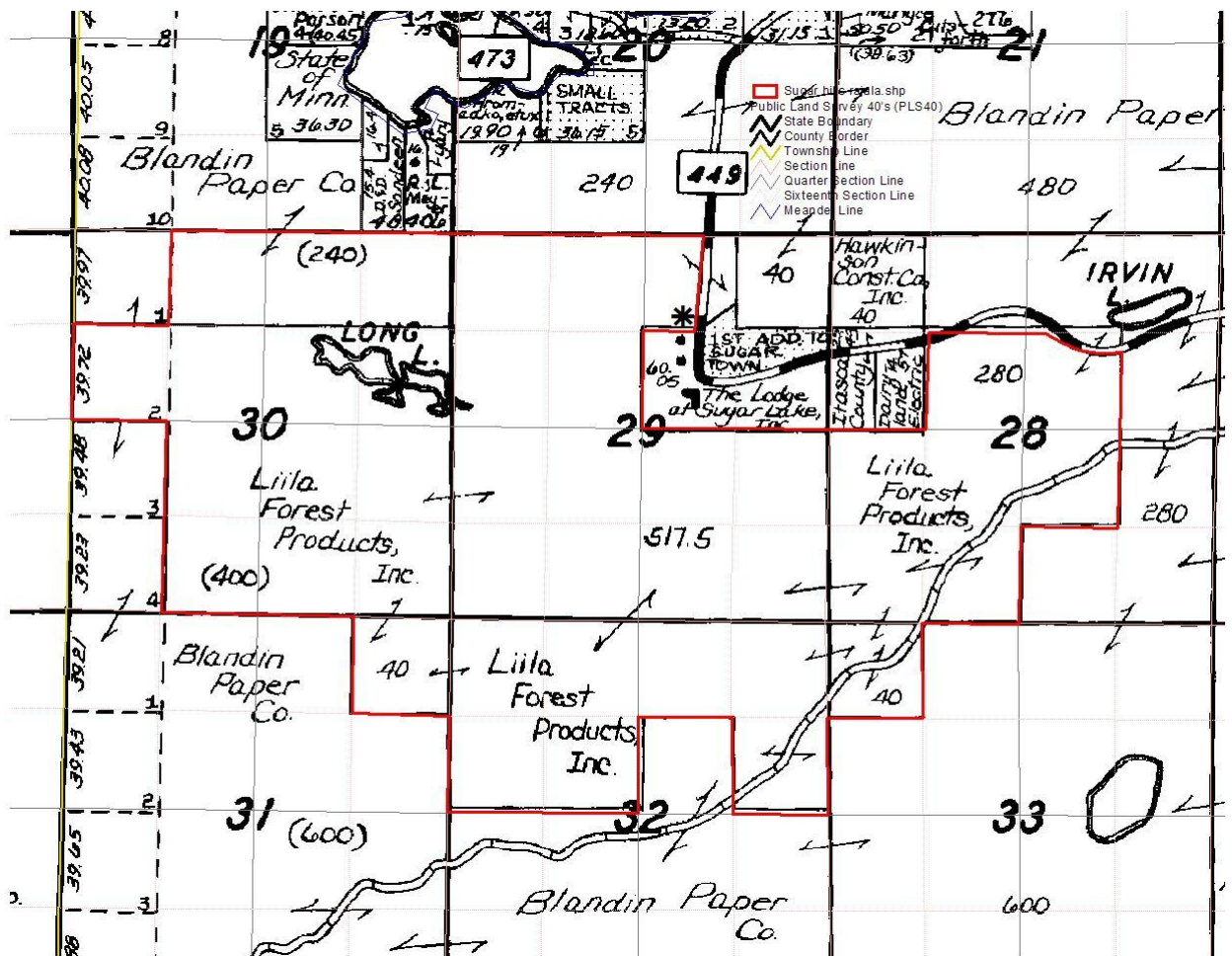
(see maps)

Accelerated timber harvest with resulting fragmentation, loss of mature forests, and simplification of forest communities have been cited as conservation concerns in this subsection.

-INTERACTION WITH NEARBY PROPERTIES:

The Sugar Hills Property is almost surrounded by extensive privately owned commercial forestland. Other smaller tracts are owned by private non-industrial owners and several miles to the west are National Forest Lands. Immediately adjacent to the property and along roads and lakes are small tracts with seasonal and year-round housing. The Sugar Hills Property and the surrounding commercial forests provide a large block of continuous forest managed for forest products and other forest benefits. Much of the surrounding land is used by the public for hunting and other outdoor activities. Trail systems and forest roads allow for public access across and through these properties.

Map 2 Plat Map



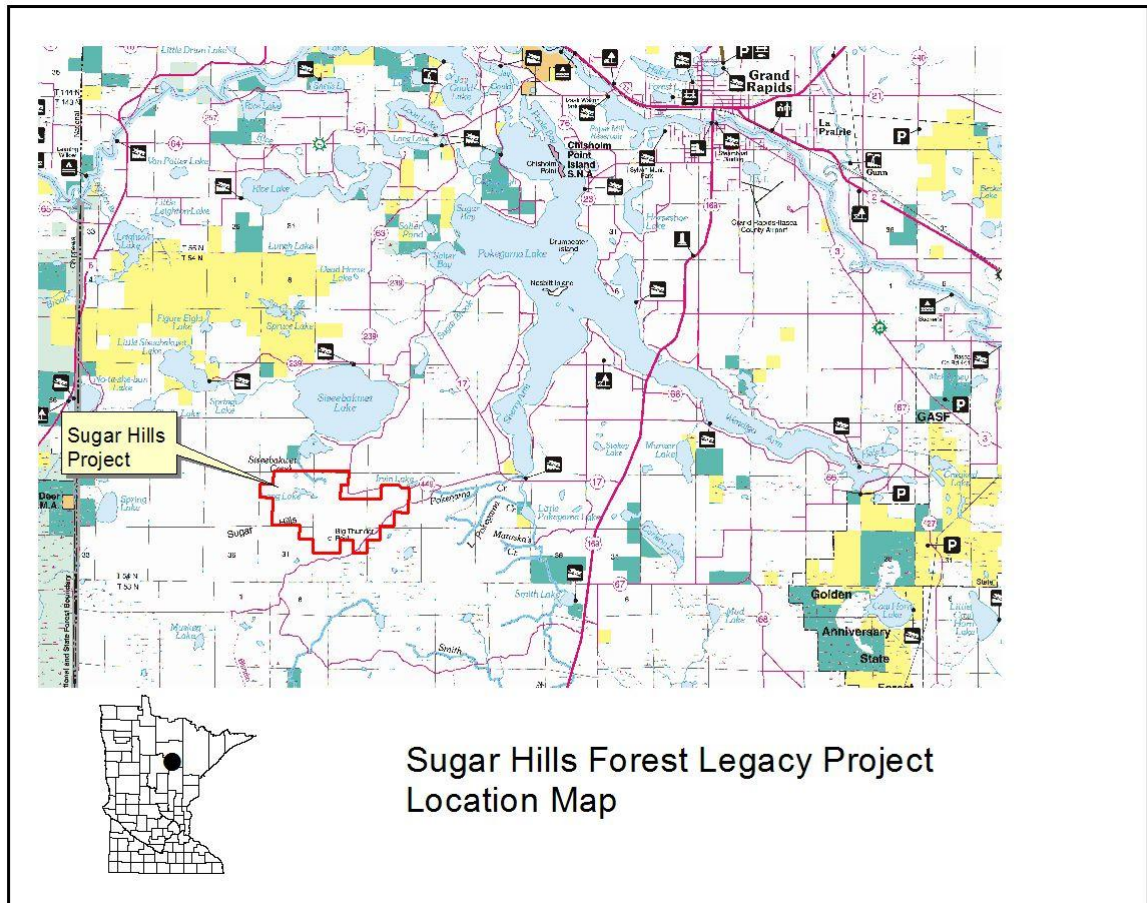
Property Description

(see maps)

-General Property Description:

Location and Access: This property is located approximately 10 miles southwest of Grand Rapids, MN in the southwest corner of Itasca County and is accessed by Itasca County Road # 446 on the north. The owners also have access to the property from the privately owned Shingle Mill Road on the southeast and have established a timber access road system that provides limited access throughout the property.

Map 3 Prim Map-location map



Landscape and Geology: The Sugar Hills Property is located within the Sugar Hills Moraine Complex, which is a series of landforms dominated by end moraine. The important physical characteristics of the Sugar Hills landscape are the rough topography and silt-cap that reduces the probability and severity of forest fire that then allowed for the development of Rich Hardwood Forest, Mesic Boreal Hardwood Forest and Mesic Oak Forest. The Protected Property has rolling to steep irregular topography and numerous small wetlands and bogs. The highest elevations (1752 feet) and steepest slopes are in the southern portion

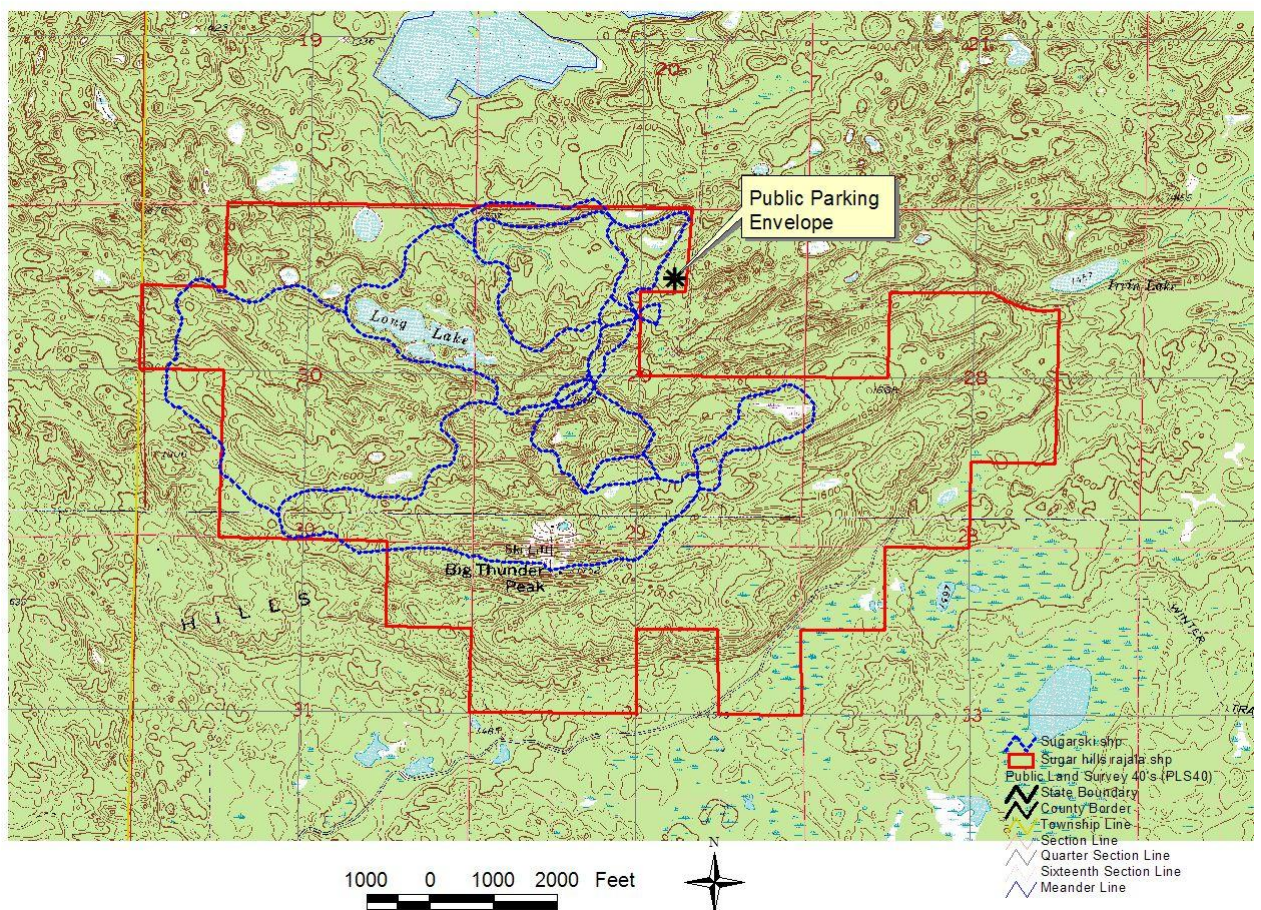
Property Description

(see maps)

of the property. The property gradually drops to an elevation of about 1390 feet at the north edge of the property where a small creek flows northward to Sugar Lake.

The predominant soils type in the uplands is Itasca-Goodland silt loams with lesser amounts of Warba-Menahga complex soils also present. Equipment use should be limited during wet periods to limit the risk for erosion and compaction. In wet areas the two dominant soils are Mooselake and Lupton mucky peats and Borosapristis, both with poor potential to produce timber crops due to poor drainage and general wet conditions.

Map 4 1:24,000 Topographic Map

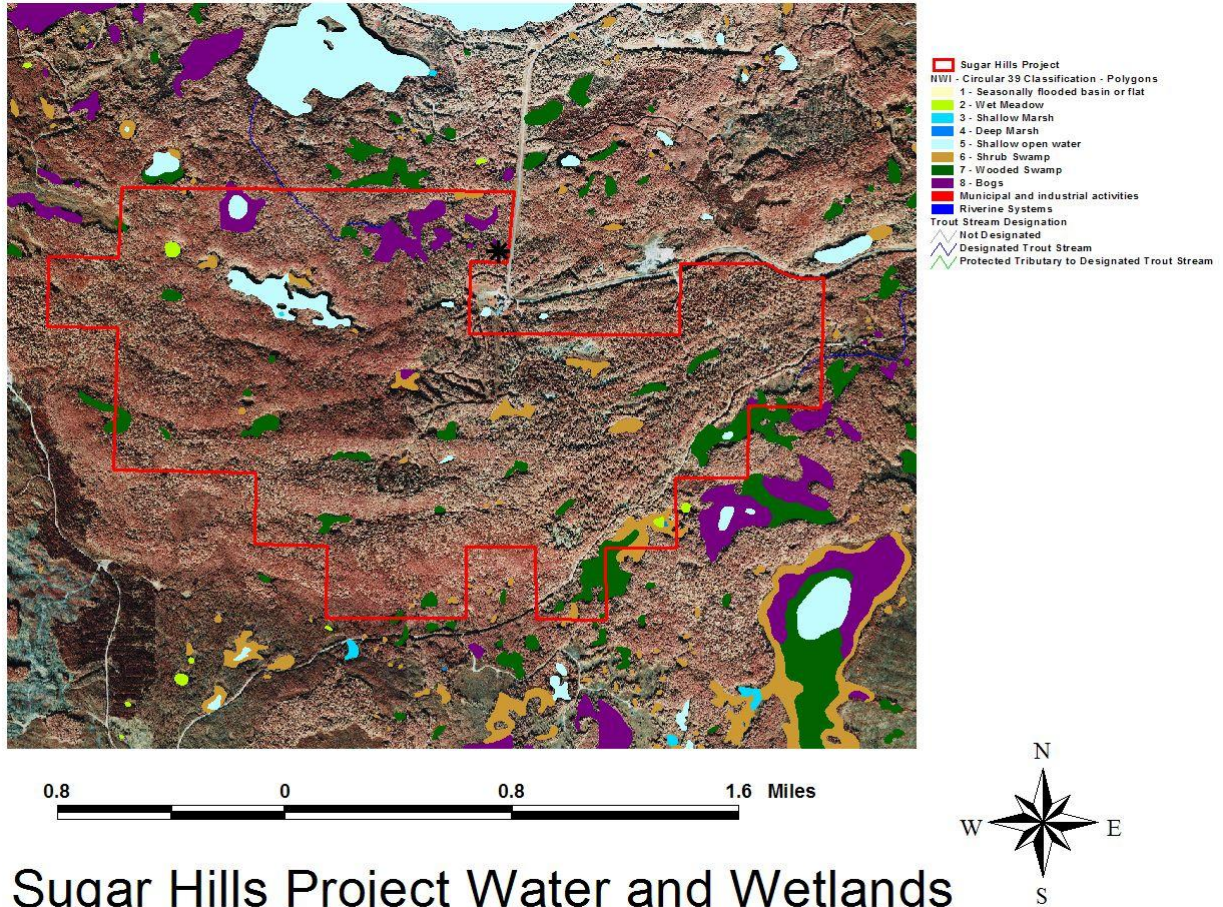


Hydrology: Water features include the two small streams, one flowing northward out of the property and the second flowing east from the easternmost side of the property. Both streams are state designated trout streams. In addition there are several smaller wetlands and bogs on the property. Long Lake, a 26 acre lake in the west central portion of the property, is public water and requires a public water work permit for many activities conducted on or near it.

Map 5 Hydrology map

Property Description

(see maps)



Sugar Hills Project Water and Wetlands

Vegetation: The pre-settlement vegetation was mature Mesic hardwood Forest with some Lowland Hardwood-Conifer Forest. White pine was a common tree in the uplands and tamarack more common in the lowlands. Forest history of the area since settlement includes harvest and wildfires that resulted in the current mix of forest vegetation on the property. The current vegetation is dominated by mesic northern hardwoods comprised mostly of an older age class (80+ years), with smaller areas of aspen, birch, oak, black ash, and small to medium size stands of lowland hardwoods and conifers. Site growth potentials are fair to excellent; stocking levels (tree density) are moderate to high; stands vary from young seedling stands to mature sawlog stands.

Current Use: The current owners have owned portions of the property since about 1992. In 1996, the remainder of the property was purchased. Their principal uses of the property are forest management to produce a mix of wood products, but especially the management for and the production of high quality saw logs. In addition to timber management, the property is also the site of an extensive cross country ski trail system maintained and managed by the Northern Lights Nordic Ski Club and in accordance with a Grant-in-Aid agreement with Itasca County and the State of Minnesota-Department of Natural Resources. There is a short snowmobile spur trail along the southern edge of County Road #446 that connects to a main snowmobile trail just east of the Protected Property. The property is also used for hunting, hiking, biking, scientific and educational activities, and

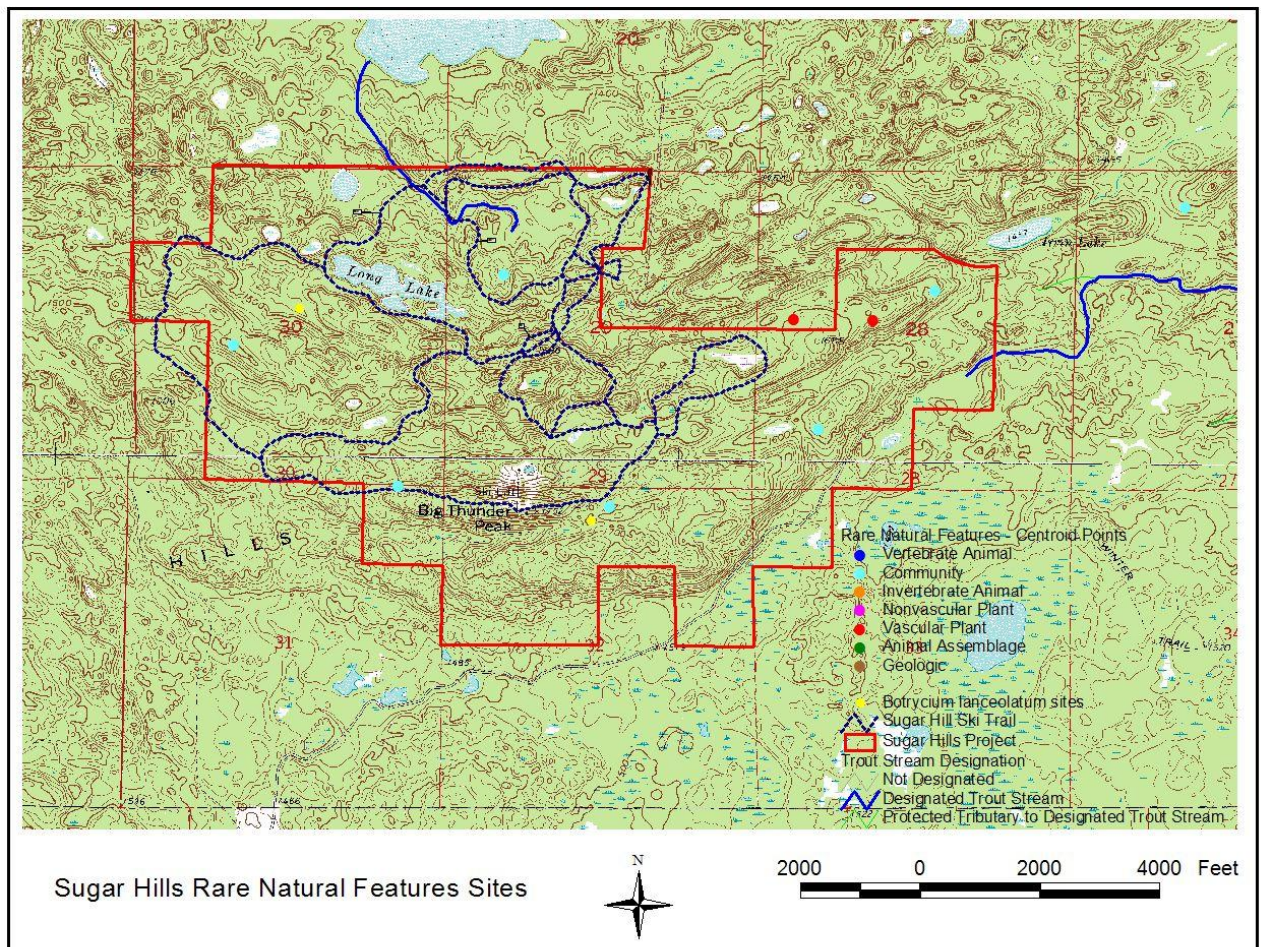
Property Description

(see maps)

similar non-motorized activities. (Map 6 trail map)

Rare Species and Native Plant Communities: The natural heritage database was checked on December 28, 2005 to determine the presence of rare species and native plant communities on the property. The database search indicated that one rare plant has been documented on the property – the necklace spike sedge (*Carex Ormostachya*). It also is found on an adjoining property. In addition, the database lists the occurrence of six native plant communities on the property.

Map 6 Rare Features



Cultural and Historic Features: A review of the cultural/historical features database was conducted on March 23, 2006. This review concluded that there were no cultural or historical features recorded from the Protected Property. There is a report that discusses a group of four depressions in the SE SE Section 31 (outside the Protected Property) that were thought to be the remains of Native American Indian lodges.

Property Description

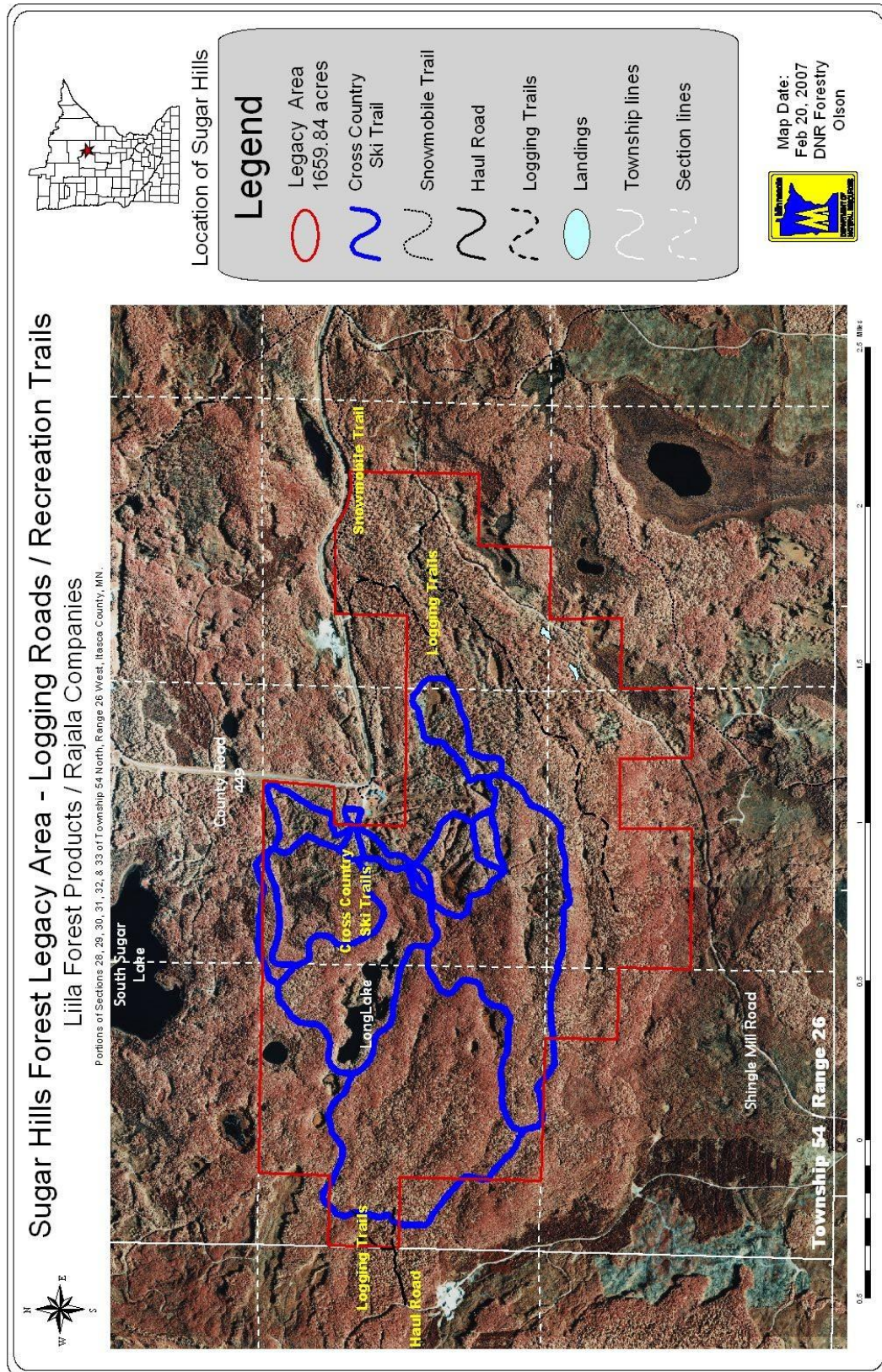
(see maps)

Forest Roads: There is an existing road network on the Protected Property that will be maintained. In addition, there will be new roads added to the road network to access areas that are currently not roaded. New road construction will be minimized and will be restricted to conform to the overall limit of 10% of the property in non-forest areas. The existing forest road network is illustrated in Map 7.

MAP 7 Forest Roads including Haul Roads and Logging Trails.

Property Description

(see maps)



Property Description

(see maps)

Forest Stands: A forest stand inventory was completed in 2006 that resulted in the stand maps and stand information presented below. The current forest types, acreages and other stand information are presented in Table 1 and the Cover type Map (map 8). More detailed stand information is found in Table 2.

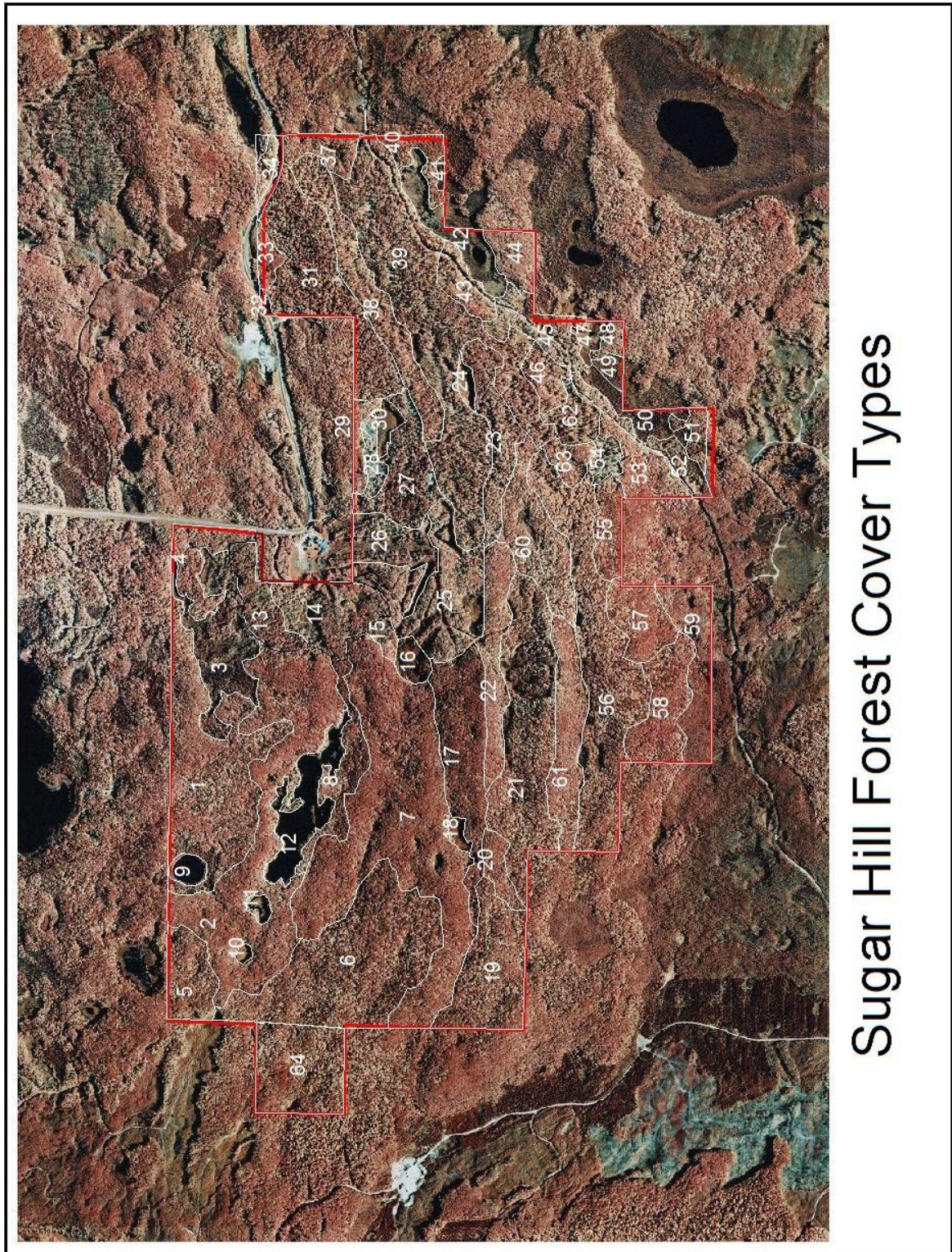
Table 1 Cover Types

Northern Hardwoods	1260
Aspen	98
Birch	71
Oak	97
Road Right of Way	1
Uplands:	1527 acres
Lowland Conifer	55
Wetlands	77
Lowlands:	132 acres

Map 8 Forest Cover Types

Property Description

(see maps)



Sugar Hill Forest Cover Types

Table 2 COVER TYPE TABLE – Sugar Hills

Property Description

(see maps)

COVER TYPE	Stand Strata	PHYS	TOPO	ACRES	AGE	SI	SPECIES	CDS/ ACRE	BDFT /ACRE	BASAL AREA /ACRE	Advanced Regen(1-5")
Northern Hardwood	1-B	Mesic	Rolling	84.45	84	65	Aspen	1.5	1868	12	
	1						P Birch	4.3	3934	29	
	1						Red Maple	2.4	377	11	
	1						Sugar Map	5.5	2767	35	X
	1				78	65	Basswood	2.1	1727	14	
	1						Y Birch	0.2	113	2	
	1				84	73	Red Oak	4.8	1563	25	
	1						White Pine	0.4	523	3	
	1						White Spruce	0.3	100	2	
Totals								21.6	12972	132	
Northern Hardwood	2-C	Mesic	Rolling	111.25			Ash	0.2	185	2	
	2						Aspen	2.9	2920	20	
	2						P Birch	4.7	2501	28	
	2						Red Maple	0.7	0	3	
	2						Sugar Map	2.7	1371	20	X
	2				78	70	Basswood	1.6	1190	11	
	2						Y Birch	0.2	115	2	
	2				84	74	Red Oak	6.4	3503	35	
Totals								19.5	11785	120	
Lowland Conifer	3-O	Hydro mesic	Level	37.93			Ash	1.3	0	15	
	3						P Birch	0.5	283	3	
	3				94	35	Balsam Fir	3.1	0	18	X
	3				99	28	Black Spruce	2.6	0	18	
	3						Tamarack	0.7	0	5	
	3						White Cedar	0.4	0	3	
Totals								8.5	283	60	
ASPEN	4-B			17.69			Aspen	9.8	12144	80	
	4						P Birch	1.5	1346	10	
	4						Red Oak	3.9	1270	20	
Totals								15.2	14760	110	
Cover Type	Stand	Phys	Topo	Acres	Age	SI	SPECIES	Cds/	BDFT/	Basal	Advanced

Property Description

(see maps)

	Strata							Acre	Acre	Area/ Acre	Regen(1-5")
Northern	5-B	Mesic	Rolling	20.08			P Birch	2.9	2692	20	
Hardwood	5						Red Maple	5.3	840	24	
	5				77	57	Sugar Maple	5.6	2815	36	X
	5				64	73	Basswood	0.6	499	4	
	5						Y Birch	0.6	293	4	
	5						Red Oak	4.7	1524	24	
	5						White Pine	0.6	680	4	
Totals								20.3	9343	116	
Northern	6-B	Mesic	Rolling	94.63			Ash	0.2	150	1	
Hardwood	6						Aspen	0.6	759	5	
	6						P Birch	2.2	2019	15	
	6						Red Maple	0.3	44	1	
	6				97	53	Sugar Maple	6.2	3128	40	X
	6				64	73	Basswood	6.8	5456	44	
	6						Y Birch	0.9	458	6	
	6						Red Oak	2.2	714	11	
Totals								19.4	12728	124	
Northern	7-C	Mesic	Rolling	149.08			Ash	0.2	126	1	
Hardwood	7						Aspen	4.1	4149	28	
	7						P Birch	1.6	855	9	
	7						Red Maple	0.9	0	4	
	7						Sugar Maple	3.7	1876	27	X
	7						Basswood	1.2	931	8	
	7				74	69	Red Oak	6.1	3335	34	
	7						White Pine	0.1	179	1	
Totals								18.0	11452	114	
Birch	8-B	Mesic	Rolling	20.23			Aspen	1.2	1518	10	
	8				82	70	P Birch	8.8	8076	60	
	8						Sugar Maple	3.1	1564	20	X
	8						Basswood	1.6	1247	10	
Totals								14.7	12405	100	
Wetland	9	Hydric		4.75							
Wetland	10	Hydric		1.23							
Wetland	11	Hydric		2.76							
Cover Type	Stand Strata	Phys	Topo	Acres	Age	SI	SPECIES	Cds/ Acre	BDFT/ Acre	Basal Area/ Acre	Advanced Regen(1-5")

Property Description

(see maps)

										Acre	
Wetland	12	Hydric		26.01							
Northern	13-B	Mesic	Rolling	17.35			Sugar Maple	2.1	1043	13	
Hardwood	13						Basswood	2.1	1663	13	
	13				84	57	Red Oak	10.5	3387	53	
Totals								14.7	6093	79	
Oak	14-B	Mesic	Rolling	29.57			P Birch	1.5	1346	10	
	14						Sugar Maple	1.6	782	10	X & BFir
	14				86	54	Red Oak	10.8	3493	55	
Totals								13.9	5621	75	
Aspen - Cutover	15-O	Mesic	Rolling	4.38			Aspen				X
Wetland	16	Hydric		6.36							
Aspen/ Birch	17-C	Mesic	Rolling	44.94			Aspen	3.7	3650	25	
	17				70	66	P Birch	10.3	5418	60	
	17						Sugar Maple	2.7	1371	20	
	17						Basswood	2.9	2210	20	
Totals								19.6	12649	125	
Wetland	18	Hydric		2.76							
Northern	19-B	Mesic	Rolling	41.58			P Birch	2.3	2154	16	
Hardwood	19						Sugar Maple	6.9	3441	44	C
	19				78	69	Basswood	10.5	8480	68	
Totals								19.7	14075	128	
Birch	20-C	Mesic	Rolling	8.29	86	64	P Birch	6.8	3612	40	
	20						Sugar Maple	2.7	1371	20	X
Totals								9.5	4983	60	
Northern	21-A	Mesic	Rolling	74.31			P Birch	1.2	411	6	
Hardwood	21				69	58	Sugar Maple	6.6	6030	60	
	21						Basswood	2.2	3016	27	
	21						Y Birch	0.2	0	1	
Totals								10.2	9457	94	
Cover Type	Stand Strata	Phys	Topo	Acres	Age	SI	SPECIES	Cds/ Acre	BDFT/ Acre	Basal Area/ Acre	Advanced Regen(1-5")

Property Description

(see maps)

Northern	22-C	Mesic	Rolling	26.33	59	63	P Birch	5.9	3096	34	
Hardwood	22						BT Aspen	3.8	4479	43	
	22						Sugar Maple	1.9	979	14	X
	22						Basswood	0.4	316	3	
	22						Y Birch	0.4	214	3	X
	22						Red Oak	2.1	1131	11	
Totals								14.5	10215	108	
Northern	23-E	Mesic	Rolling	25.09			Sugar Maple	8.2	968	44	X & Ironwood
Hardwood	23						Basswood	5.3	6510	60	
	23						Y Birch	0.7	290	4	
Totals								14.2	7768	108	
Wetland	24	Hydric		3.35							
Oak	25-O	Mesic	Rolling	50.53			P Birch	3.4	1887	17	
	25						BT Aspen	1.0	210	5	
	25						Sugar Maple	0.6	162	3	X & Ironwood
	25						Basswood	0.5	260	3	
	25				89	51	Red Oak	6.7	3809	43	
Totals								12.2	6328	71	
Northern	26-O	Mesic	Rolling	19.03	45	63	P Birch	2.0	1132	10	X
Hardwood	26						Sugar Maple	0.8	244	5	X
	26						Basswood	0.8	390	5	
	26						Red Oak	1.6	879	10	X
	26						Ironwood	0.4	0	3	
Totals								5.6	2645	33	
Northern	27-E	Mesic	Rolling	27.98			P Birch	1.0	0	7	
Hardwood	27						Sugar Maple	5.0	587	27	X
	27				43	81	Basswood	0.6	723	7	
	27						Y Birch	1.2	483	7	
Totals								7.8	1793	48	
Oak	28-O	Mesic	Rolling	6.32			Red Oak	2.1	1172	13	
Totals								2.1	1172	13	
Cover Type	Stand Strata	Phys	Topo	Acres	Age	SI	SPECIES	Cds/ Acre	BDFT/ Acre	Basal Area/ Acre	Advanced Regen(1-5")
Northern	29--O	Mesic	Rolling	4.99			P Birch	6.8	3773	33	

Property Description

(see maps)

Hardwood	29						Sugar Maple	8.8	2597	53	X
	29				41	65	Basswood	3.3	1558	20	X
	29						Red Oak	1.0	586	7	
Totals								19.9	8514	113	
Wetland	30	Hydric		4.67							
Northern	31-E	Mesic	Rolling	58.42	40	54	P Birch	0.9	0	6	
Hardwood	31						Sugar Maple	6.7	792	36	
	31						Basswood	0.7	868	8	
	31						Red Oak	0.6	200	4	
Totals								8.9	1860	54	
Roadway	32			1.35							
Northern	33-O	Mesic	Rolli	5.28	26	66	Aspen	2.6	560	13	
Hardwood	33						Sugar Maple	1.1	325	7	
	33						Red Oak	3.1	1758	20	
Totals								6.8	2643	40	
Birch	37-F	Mesic	Rolli	11.29	56	61	P Birch	13.0	1991	55	
	37						Sugar Maple	3.5	192	15	
Totals								16.4	2183	70	
Northern	38-O	Mesic	Rolli	38.13			P Birch	3.0	1647	15	
Hardwood	38						Sugar Maple	1.8	531	11	
	38						Basswood	2.4	1133	15	
	38				52	58	Red Oak	4.8	2717	31	
Totals								12.0	7586	91	
Northern	39-E	Mesic	Rolling	126.04			Ash	0.8	457	4	
Hardwood	39						Aspen	0.4	0	2	
	39						P Birch	0.7	0	5	
	39				45	43	Sugar Maple	3.7	440	20	
	39						Basswood	1.6	1963	18	
	39						Y Birch	0.3	138	2	
	39						Red Oak	0.9	286	6	
	39						White Pine	0.2	162	1	
Totals								8.6	3446	57	
Cover Type	Stand Strata	Phys	Topo	Acres	Age	SI	SPECIES	Cds/ Acre	BDFT/ Acre	Basal Area/ Acre	Advanced Regen(1-5")
Northern	40-F	Mesic	Rolling	9.76			P Birch	6.3	965	27	

Property Description

(see maps)

Hardwood	40						Red Maple	1.5	233	7	
	40						Sugar Maple	4.6	256	20	X
	40						Basswood	1.5	740	7	X
	40						Y Birch	1.0	500	7	
	40						White Cedar	5.4	933	27	
Totals								20.3	3628	100	
Wetland	41	Hydric		1.13							
Wetland	42	Hydric		19.77							
Northern	43-O	Mesic	Rolling	11.55			Aspen	0.8	168	4	
Hardwood	43						P Birch	4.1	2264	20	
	43						Sugar Map	4.0	1169	24	
	43						Basswood	2.6	1246	16	
	43				75	61	Red Oak	6.2	3516	40	
Totals								17.7	8363	104	
Oak	44-O	Mesic	Rolling	11.19			P Birch	4.1	2264	20	
	44						Sugar Maple	1.1	325	7	X
	44						Basswood	2.2	1039	13	
	44				74	60	Red Oak	12.4	7032	80	
Totals								19.8	10660	120	
Northern	45-O	Mesic	Rolling	24.24			Ash	0.9	0	10	
Hardwood-	45						P Birch	0.7	377	3	
Thinned	45						Red Maple	1.7	0	10	
	45						Sugar Maple	3.9	1136	23	X
	45				68	66	Basswood	4.9	2337	30	
	45						Red Oak	1.0	586	7	
	45						Balsam Fir	1.2	0	7	X
Totals								14.3	4436	90	
Northern	46-O	Mesic	Rolling	9.94			P Birch	2.7	1509	13	
Hardwood-	46						Balm Gilead	2.0	560	7	
Thinned	46						Sugar Maple	5.5	1623	33	
	46				70	74	Basswood	2.1	1039	13	
	46						Red Oak	3.1	1758	20	
Totals								15.4	6489	86	
Wetland	47	Hydric		4.76							
Cover Type	Stand Strata	Phys	Topo	Acres	Age	SI	SPECIES	Cds/ Acre	BDFT/ Acre	Basal Area/ Acre	Advanced Regen(1-5")
Northern	48-F	Mesic	Rolling	3.48			P Birch	4.7	724	20	

Property Description

(see maps)

Hardwood	48				57	34	Sugar Maple	3.1	171	13	X
	48						Basswood	1.5	740	7	
	48				49	30	Y Birch	2.9	1500	20	
	48						Red Oak	1.4	333	7	
Totals								13.6	3468	67	
Black Spruce	49-O	Hydro-	Level	3.06	53	27	Black Spruce	1.0	0	7	
Totals		mesic						1.0	0	7	
Lowland	50-O	Hydric	Level	13.62			Ash	0.9	0	10	
Conifers	50						Black Spruce	4.4	0	30	
Totals								5.3	0	30	
Northern	51-F	Hydro-	Rolling	6.03			Aspen	3.8	1200	10	
Hardwood	51	mesic			42	66	P Birch	2.4	362	10	
	51						Sugar Maple	16.1	896	70	
Totals								22.3	2458	90	
Aspen	52-O	Mesic	Level	7.47	44	44	Ash	0.6	0	7	
	52						Aspen	1.3	280	7	
	52						Y Birch	1.7	557	7	
Totals								3.6	837	21	
Northern	53-C	Mesic	Rolling	17.03			Sugar Maple	8.1	4113	60	X
Hardwood	53				52	67	Basswood	2.9	2210	20	
Totals								11.0	6323	80	
Northern	54-O	Mesic	Rolling	5.85			Sugar Maple	1.1	325	7	X
Hardwood	54				63	62	Y Birch	1.7	557	7	
Totals								2.8	882	14	
Northern	55-C	Mesic	Rolling	13.07			Sugar Maple	6.8	3428	50	X
Hardwood	55				77	64	Basswood	14.7	11050	100	
	55						Red Oak	5.4	2970	30	
Totals								26.9	17448	180	
Northern	56-A	Mesic	Rolling	84.10	90	66	Sugar Maple	6.6	6030	60	
Hardwood	56						Basswood	5.2	7036	63	
	56						Y Birch	1.0	0	7	
	56						G Ash	0.6	464	4	
Totals								13.4	13530	134	
Cover Type	Stand Strata	Phys	Topo	Acres	Age	SI	SPECIES	Cds/ Acre	BDFT/ Acre	Basal Area/ Acre	Advanced Regen(1-5")
Northern	57-C			19.62			Sugar Maple	2.7	1371	20	
Hardwood	57						Basswood	7.4	5525	50	

Property Description

(see maps)

	57						Red Oak	3.6	1980	20	
Totals								13.7	8876	90	
Northern	58-C	Mesic	Rolling	27.11			P Birch	1.1	602	7	
Hardwood	58						Sugar Maple	8.1	4113	60	X
	58				61	77	Basswood	6.9	5157	47	
	58						Red Oak	6.0	3300	33	
Totals								22.1	13172	147	
Bigtooth	59-O	Mesic	Rolling	23.43			P Birch	0.5	283	3	
Aspen	59				27	78	BT Aspen	5.5	1156	28	
	59						Sugar Maple	0.4	122	3	
	59						G Ash	0.2	261	3	
Totals								6.6	1822	37	
Northern	60-A	Mesic	Rolling	33.17			P Birch	0.6	206	3	
Hardwood	60						Sugar Maple	3.8	3446	34	X
	60				69	62	Basswood	3.3	4444	40	
	60						Y Birch	0.4	0	3	
	60						Red Oak	1.2	595	6	
Totals								9.3	8691	86	
Birch	61-C	Mesic	Rolling	31.36			Aspen	0.6	584	4	
	61				81	63	P Birch	17.8	9391	104	
	61						Sugar Maple	4.9	2468	36	X
	61						Basswood	2.9	2210	20	X
	61						White Pine	0.5	680	4	
Totals								26.7	15333	168	
Northern	62-O	Mesic	Rolling	10.94			P Birch	0.8	453	4	
Hardwood	62				67	73	Basswood	2.0	935	12	
Thinned	62						Red Oak	0.6	352	4	
	62						Ironwood	0.6	0	4	
Totals								4.0	1740	24	
Cover Type	Stand Strata	Phys	Topo	Acres	Age	SI	SPECIES	Cds/ Acre	BDFT/ Acre	Basal Area/ Acre	Advanced Regen(1-5")
Northern	63-A	Mesic	Rolling	7.81			Sugar Map	2.2	2010	20	
Hardwood	63						Yellow Bi	2.9	0	20	
	63						Red Oak	4.1	2084	20	

Property Description

(see maps)

Totals								9.2	4094	60	
NH	64	Mesic	Rolling	39.72							
Other stand info not available for type 64 at this time.											

Forest stands have been further analyzed by grouping stands into strata. Stratified stand information provides a higher degree of accuracy for volume and basal area calculations. Stands were delineated through stereographic interpretation of 1:15,840 color infrared photography. Fifty forested stands were delineated. The stands were placed into one of six strata (designated A,B, C, E, F, and O). Five of the six strata consisted of stands appearing to be relatively similar. One stratum consisted of stands appearing to be relatively heterogeneous.

Map 9 summarizes the stratification groups. Table 3 summarizes timber volumes and basal areas by strata.

Map 9 Forest Strata Map

Property Description

(see maps)

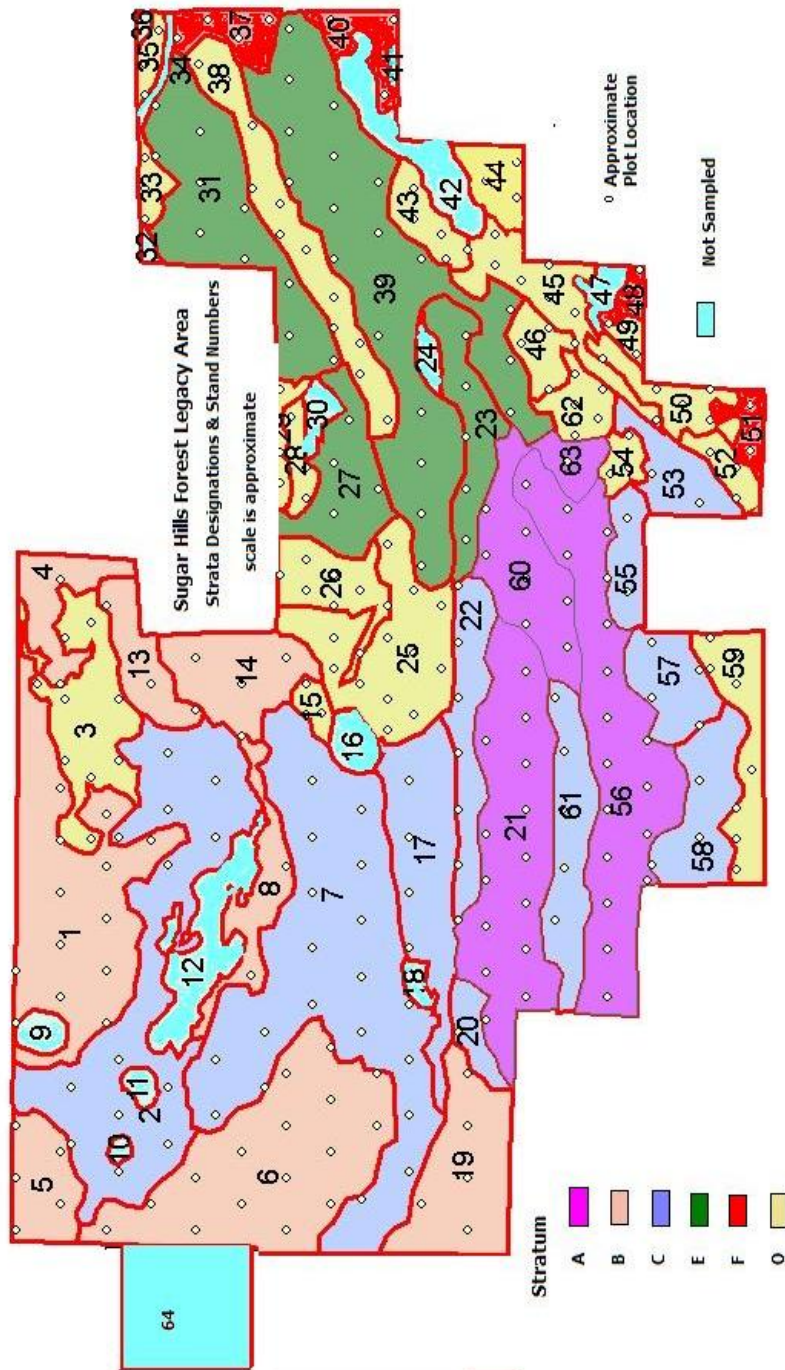


Table 3 Acreage, cord, board feet, and basal area by Stratum

Property Description

(see maps)

Stratum - A	Stands	Acreage	
	21	74.31	
	56	84.1	
	60	33.17	
	63	7.81	
Total		199.39	
Per Acre Estimates for Stratum - Cull Removed			
	Bd.Ft.	Cords	Basal Area
Species			
SMAP	5477.25	5.00	54.5
BASS	4999.50	3.69	45
YBIR	0.00	0.66	4.5
ROAK	156.30	0.31	1.5
ASH	209.00	0.29	2
PBIR	180.00	0.51	2.5
Total	11022.05	10.46	110.00

Stratum - B	Stands	Acreage	
	1	84.45	
	4	17.69	
	5	20.08	
	6	94.63	
	8	20.23	
	13	17.35	
	14	29.57	
	19	41.58	
Total		325.6	
Per Acre Estimates for Stratum - Cull Removed			
	Bd.Ft.	Cords	Basal Area
Species			
ASPEN	1416	1.1	8.4
PBIR	2925	3.2	19.6
SMAP	1295	3.9	32.4
BASS	3606	4.5	26
YBIR	0	0.0	2.8
ROAK	1468	4.5	20.8
ASH	53	0.1	0.4
RMAP	218	1.4	5.6
WPINE	204	0.2	1.2
WSPR	26	0.1	0.4
Total	11210	19.0	117.6

Property Description

(see maps)

Stratum - C	Stands	Acreage
	2	111.25
	7	149.08
	17	44.94
	20	8.29
	22	26.33
	53	17.03
	55	13.07
	57	19.62
	58	27.11
	61	31.36
Total		448.08

Per Acre Estimates for Stratum - Cull Removed	Bd.Ft.	Cords	Basal Area
Species			
ASPEN	1478	1.1	15.33
PBIR	2408	4.6	26.67
SMAP	1685	3.3	27.33
BASS	1989	2.7	18
YBIR	50	0.1	0.67
ROAK	2209	3.8	23.67
ASH	80	0.1	0.67
RMAP	0	0.4	2
WPINE	114	0.1	0.67
B.T.ASPEN	523	0.4	5
Total	10536	16.6	120

Stratum - E	Stands	Acreage
	23	25.09
	27	27.98
	31	58.42
	39	126
Total		237.5

Per Acre Estimates for Stratum - Cull Removed	Bd.Ft.	Cords	Basal Area
Species			
Ash	246	0.4	2.05
Aspen	0	0.2	1.03
PBIR	0	0.7	4.62
SMAP	390	3.6	27.69
BASS	2114	1.7	19.49
YBIR	91	0.2	2.50
ROAK	205	0.7	4.10
Wpine	87	0.1	0.51
Total	3134	7.6	61.99

Property Description

(see maps)

Stratum - F	Stands	Acreage	
		37	11.29
		40	9.76
		48	3.48
		51	6.03
Total		30.56	
Per Acre Estimates for Stratum - Cull			
Removed	Bd.Ft.	Cords	Basal Area
Species			
Aspen	200.4	0.6	1.67
PBIR	1084.4	5.7	31.67
SMAP	218.3	2.4	25.00
RMAP	58.4	0.4	1.67
BASS	369.6	0.8	3.33
YBIR	502.5	1.0	6.67
ROAK	83.5	0.3	1.67
WCED	233.4	1.4	6.67
Total	2751	12.6	78.35

Acreage & Volume for Stands in Stratum O

Stand Number	ACRES	SPECIES	CDS/ ACRE	BDFT /ACRE	BASAL AREA /ACRE
3	37.93	Ash	1.3	0	15
		P Birch	0.5	283	3
		Balsam Fir	3.1	0	18
		Black Spruce	2.6	0	18

Property Description

(see maps)

		Tamarack	0.7	0	5
		White Cedar	0.4	0	3
		Total	8.5	283	60
Stand Number	ACRES	SPECIES	CDS/ ACRE	BDFT /ACRE	BASAL AREA /ACRE
15	4.38	Aspen	0	0	0
		Total	0	0	0
Stand Number	ACRES	SPECIES	CDS/ ACRE	BDFT /ACRE	BASAL AREA /ACRE
25	50.53	P Birch	3.4	1887	17
		BT Aspen	1	210	5
		Sugar Maple	0.6	162	3
		Basswood	0.5	260	3
		Red Oak	6.7	3809	43
		Total	12.2	6328	71
Stand Number	ACRES	SPECIES	CDS/ ACRE	BDFT /ACRE	BASAL AREA /ACRE
26	19.03	P Birch	2	1132	10
		Sugar Maple	0.8	244	5
		Basswood	0.8	390	5
		Red Oak	1.6	879	10
		Ironwood	0.4	0	3
		Total	5.6	2645	33
Stand Number	ACRES	SPECIES	CDS/ ACRE	BDFT /ACRE	BASAL AREA /ACRE
28	6.32	Red Oak	2.1	1172	13
		Total	2.1	1172	13
Stand Number	ACRES	SPECIES	CDS/ ACRE	BDFT /ACRE	BASAL AREA /ACRE
29	4.99	P Birch	6.8	3773	33
		Sugar Maple	8.8	2597	53
		Basswood	3.3	1558	20
		Red Oak	1	586	7

Property Description

(see maps)

		Total	19.9	8514	113
Stand Number	ACRES	SPECIES	CDS/ ACRE	BDFT /ACRE	BASAL AREA /ACRE
33	5.28	Aspen	2.6	560	13
		Sugar Maple	1.1	325	7
		Red Oak	3.1	1758	20
		Total	6.8	2643	40
Stand Number	ACRES	SPECIES	CDS/ ACRE	BDFT /ACRE	BASAL AREA /ACRE
38	38.13	P Birch	3	1647	15
		Sugar Maple	1.8	531	11
		Basswood	2.4	1133	15
		Red Oak	4.8	2717	31
		Total	12	7586	91
Stand Number	ACRES	SPECIES	CDS/ ACRE	BDFT /ACRE	BASAL AREA /ACRE
43	11.55	Aspen	0.8	168	4
		P Birch	4.1	2264	20
		Sugar Map	4	1169	24
		Basswood	2.6	1246	16
		Red Oak	6.2	3516	40
		Total	17.7	8363	104
Stand Number	ACRES	SPECIES	CDS/ ACRE	BDFT /ACRE	BASAL AREA /ACRE
44	11.19	P Birch	4.1	2264	20
		Sugar Maple	1.1	325	7
		Basswood	2.2	1039	13
		Red Oak	12.4	7032	80
		Total	19.8	10660	120
Stand Number	ACRES	SPECIES	CDS/ ACRE	BDFT /ACRE	BASAL AREA /ACRE
45	24.24	Ash	0.9	0	10
		P Birch	0.7	377	3
		Red Maple	1.7	0	10

Property Description

(see maps)

		Sugar Maple	3.9	1136	23
		Basswood	4.9	2337	30
		Red Oak	1	586	7
		Balsam Fir	1.2	0	7
		Total	14.3	4436	90
Stand Number	ACRES	SPECIES	CDS/ ACRE	BDFT /ACRE	BASAL AREA /ACRE
46	9.94	P Birch	2.7	1509	13
		Balm Gilead	2	560	7
		Sugar Maple	5.5	1623	33
		Basswood	2.1	1039	13
		Red Oak	3.1	1758	20
		Total	15.4	6489	86
Stand Number	ACRES	SPECIES	CDS/ ACRE	BDFT /ACRE	BASAL AREA /ACRE
49	3.06	Black Spruce	1	0	7
		Total	1	0	7
Stand Number	ACRES	SPECIES	CDS/ ACRE	BDFT /ACRE	BASAL AREA /ACRE
50	13.62	Ash	0.9	0	10
		Black Spruce	4.4	0	30
		Total	5.3	0	30
Stand Number	ACRES	SPECIES	CDS/ ACRE	BDFT /ACRE	BASAL AREA /ACRE
52	7.47	Ash	0.6	0	7
		Aspen	1.3	280	7
		Y Birch	1.7	557	7
		Total	3.6	837	21
Stand Number	ACRES	SPECIES	CDS/ ACRE	BDFT /ACRE	BASAL AREA /ACRE
54	5.85	Sugar Maple	1.1	325	7
		Y Birch	1.7	557	7
		Total	2.8	882	14

Property Description

(see maps)

Stand Number	ACRES	SPECIES	CDS/ ACRE	BDFT /ACRE	BASAL AREA /ACRE
59	23.43	P Birch	0.5	283	3
		BT Aspen	5.5	1156	28
		Sugar Maple	0.4	122	3
		G Ash	0.2	261	3
		Total	6.6	1822	37
Stand Number	ACRES	SPECIES	CDS/ ACRE	BDFT /ACRE	BASAL AREA /ACRE
62	10.94	P Birch	0.8	453	4
		Basswood	2	935	12
		Red Oak	0.6	352	4
		Ironwood	0.6	0	4
		Total	4	1740	24
Stand Number	ACRES	SPECIES	CDS/ ACRE	BDFT /ACRE	BASAL AREA /ACRE
64	39.72	ASPEN	1416	1.1	8.4
		PBIR	2925	3.2	19.6
		SMAP	1295	3.9	32.4
		BASS	3606	4.5	26
		YBIR	0	0.0	2.8
		ROAK	1468	4.5	20.8
		ASH	53	0.1	0.4
		RMAP	218	1.4	5.6
		WPINE	204	0.2	1.2
		WSPR	26	0.1	0.4
		Total	11210	19.0	117.6

Note: Stand 64 not sampled. Volumes are extrapolated from mean per acre estimates in Stratum B

Native Plant Communities: See Map 10

Native plant communities were mapped following field work during

Property Description

(see maps)

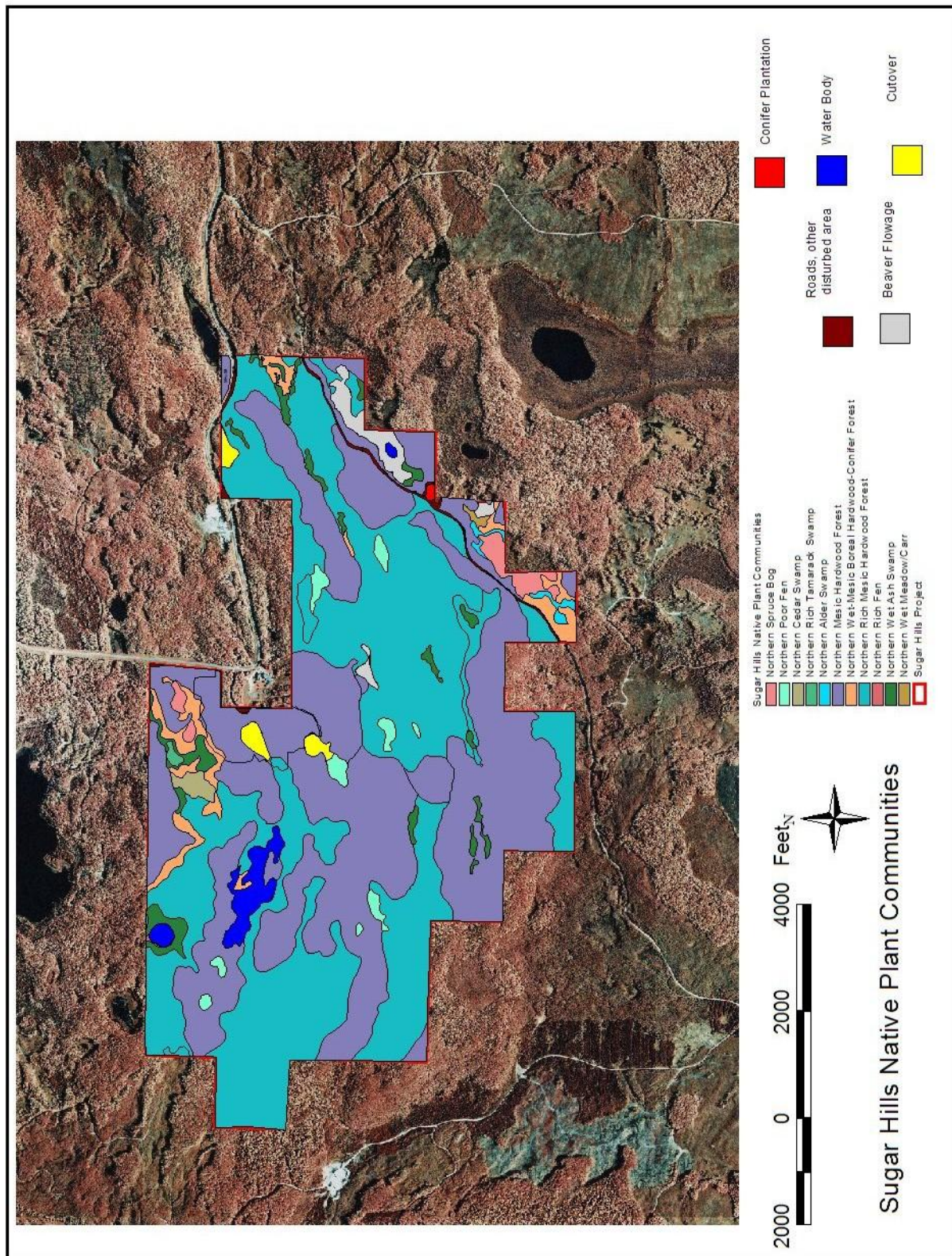
summer of 2006. The following lists each plant community type and acres for each type. Additionally, non-Native Plant Community land types are found at the end of the table along with corresponding acres for each land type.

Type	Native Plant Community	Acres
APn81	Northern Poor Conifer Swamp	17.387
Apn91	Northern Poor Fen	19.505
FPn63	Northern Cedar Swamp	6.697
FPn72	Northern Rich Tamarack Swamp (eastern basin)	1.795
FPn73a	Northern Alder Swamp	5.619
MHn35	Northern Mesic Hardwood Forest	728.992
MHn44	Northern Wet-Mesic Boreal Hardwood-Conifer Forest	46.724
MHn47	Northern Rich Mesic Hardwood Forest	680.947
Opn92	Northern Rich Fen (Basin)	.309
WFn55	Northern Wet Ash Swamp	38.192
WMn82b	Northern Wet Meadow/Carr (Sedge Meadow)	1.743
MHN35/MHn47 complex	Northern Mesic/Northern Rich Mesic Hardwood Forest	39.72
Other than native plant community	71.061 acre in areas classified as other than Native Plant Communities (see below)	
	Water Bodies	25.36
	Cutover Areas	11.56
	Beaver complexes	21.214
	Disturbed land (roads, rights of way, etc)	11.660
	Conifer Plantation	1.267
Total acres all areas		1658.691

Map 10 Native Plant Community Map

Property Description

(see maps)



Forest Management:

Overview: To manage and maintain the native plant communities and manage the easement area as a working forest, a variety of silvicultural treatments will be utilized. The current stands and native plant communities are a result of wind and fire disturbances and logging activities. Silvicultural treatments will utilize the information from the forest cover type inventory native plant community inventory to harvest and thin timber, regenerate native forest communities, improve growth and tree quality, and ensure forest health.

Northern Hardwoods

Current Conditions:

The majority of the easement area is comprised of the northern hardwood cover type. The northern hardwood type is a very diverse cover type on the property with a variable mix in tree species composition. It nearly always contains sugar maple usually mixed with basswood and paper birch as the primary species. In addition, red oak, yellow birch, red maple, quaking aspen, black ash, and bigtooth aspen are often found in the stands. In addition, there are scattered conifers including white pine, white spruce, white cedar and balsam fir. Some stands are dominated by one or two species while other stands have more within-stand diversity. Currently, the patch size of northern hardwoods is large.

Currently most stands are unregulated because they are lacking the size-class stand structure typical of regulated stands. These stands have not been managed for several decades until recently when some thinning and harvesting has occurred. Many of the stands contain poor quality timber, particularly in the sugar maple. Reasons for this include frost cracks, canker damage and poor form.

Cover Type Objective:

1. The objectives for this cover type are to apply silvicultural treatments to harvest timber, improve timber quality, and regenerate desirable species while maintaining forest health, aesthetic quality, wildlife habitat and ecological values of the type. All management systems should focus on the development and selection of high quality crop trees. High quality crop trees are generally:
 - dominant or codominant;
 - low risk; good crown vigor;
 - contain at least one 16 feet butt log;
 - have potential for Grade 2 or better;
 - desirable species;
 - good form;
 - no low forks or high v-shaped forks.
2. The desired goals also include managing for a more diverse stand structure with several age classes and a mix of species in most stands.

3. It is also desirable to maintain or increase the presence of yellow birch, basswood and red oak. The long-term goal is to maintain the current acreage in the northern hardwoods type.
4. Management will be predominantly under uneven-aged management methods that will move the northern hardwood types to a more regulated size-class structure.
5. Some stands, because of current low quality, may need to be managed initially through even-aged methods to move them towards the desired uneven-aged condition.

Management Considerations:

Uneven-aged management

1. Prior to management, determine silvicultural objectives of the stand including target basal area after treatment and desired distribution by size-classes. Utilize the Tree Species Suitability Charts for the Native Plant Community Classification to determine which tree species are best adapted to each site.
2. Conduct an inventory to determine current conditions including size-class distribution.
3. Utilize a combination of single tree selection and group selection methods to achieve silvicultural objectives. Selection cutting methods will be used to harvest mature trees and regenerate replacement trees in the resulting openings.
 - Single tree selection will tend to favor tolerant species such as sugar maple. Single tree selection will generate canopy gaps when large - crowned trees are harvested. Remove all poor quality stems greater than 1" from these gaps. Follow recommended residual stand structures from northern hardwood marking guides and maintain sawtimber, pole and sapling sized trees.
 - Group selection will favor mid-tolerants such as yellow birch, basswood and red oak. Groups of trees should be removed to create medium sized gaps up to 1/2 acre in size. The larger size patches will favor more representation of mid-tolerants in the regeneration class. During group opening creation, thinning and crop tree release will take place throughout the stand.
4. Retain older forest characteristics including: the retention of large old trees in the canopy; retention of snags, downed rotting logs, and potential snags; and the encouragement of coniferous associates including white pine and white spruce.
5. Selective thinning will also be used to open growing space around crop trees and also to improve timber quality by removing poor quality trees and undesirable species. Thinnings will generally be from below and should consider for removal: a) high risk trees; b) low quality, low vigor, cull and suppressed trees; c) trees from overstocked size classes; d) trees infected with cankers.

Even-aged management

1. Some stands will need to be managed using even-aged methods because of current stand conditions or because of the desire to produce a greater

representation of less shade tolerant species such as yellow birch, ashes, oaks, basswood, or white pine. Many of these stands are dominated by low quality trees and will benefit from an even-aged harvest. If less than 40 crop trees per acre are present, consider regenerating the stand through uneven-aged methods.

2. Shelterwood method: Regeneration of stands is usually accomplished using a two-step shelterwood approach. Initial harvesting should leave a high, uniform crown cover of 60-70% in the residual overstory and should be timed to coincide with good seed crops of the desired species. Complete removal of the residual stand is done when the established regeneration is 2-4 feet high (3-5 years after the initial cut).
3. If adequate regeneration of the desired species is present, overstory removal may be used. Clearcut following the site-level guidelines for reserve trees.
4. When thinning in even-aged stands, determine which trees to favor and which to cut by considering: at risk trees; tree quality; vigor; stem form; species; and spacing.
 - In pole size stands, do a full crown release (average 7 feet of growing space for crop trees) of 40-100 crop trees/acre. The thinning should reduce stocking levels to 80% crown cover for trees 5-9" dbh.
 - In sawlog stands, thin to 90% crown cover and thin on 2 sides to remove the most important crown competitors.
5. To convert even-aged unmanaged stands to uneven-aged stands, utilize a combination of crown release, thinning, and creation of canopy gaps.
 - Crown release 40-60 crop trees/acre
 - Apply even-age thinning guidelines in the area between the gaps.
 - Wait 20 years before reentering the stand or until after crown closure has occurred and lower branch mortality occurs in crop trees.

Oaks

Current Conditions:

Oaks occur generally as a component throughout the hardwoods but are also found as nearly pure stands on drier, sunnier sites on southern aspects. The oak type includes mainly northern red oak but also some bur oak. Trees range in size, stem quality, and health. Oaks have the potential in this area to produce good quality sawlogs and veneer logs. Some mortality has occurred in the oaks as a result of two-lined chestnut borer activity and dry weather.

Cover Type Objective:

1. The objectives for this cover type are to maintain or increase the oak cover type and improve tree health and stem quality. Oaks will be managed for sawlog and veneer log production.

Management Considerations:

Even-aged management:

1. Oak is a shade intolerant species and is managed on an even-aged basis. Oaks are a long-lived species and can live to 150-200 years or more.
2. On mesic sites with abundant shade tolerant species in the understory, it may

- be impractical to maintain oak as the main species.
3. Thinning will be most productive when started at age 50 or younger.
 4. Crop trees should be selected from dominant/codominant classes; should not have epicormic branches or dormant buds on the butt log; should be of good vigor and form;
 5. Select from the best quality crop trees on the site; Crop tree quality can vary from site to site.
 6. Thin crop trees on a minimum of two sides; three or four sides are preferred.
 7. Utilize stand stocking tables to determine if thinning should occur.
 8. The preferred method to regenerate oaks is with the shelterwood system to establish advanced regeneration. Advanced regeneration can be supplemented with planted seedlings. Advanced reproduction should be well-distributed and 2-4 feet tall in order to compete with other competition. When advanced regeneration is adequate, remove overstory.

Aspen:

Current Conditions:

Aspen and mixtures of predominantly aspen cover up to 10% of the property as individual aspen stands or as scattered trees and clones throughout. Both quaking aspen and bigtooth aspen are present. Much of the aspen type has been harvested and is regenerating. The remaining stands are mature and will be harvested over the next 5 years. Most will regenerate back to aspen. Individual trees and small clones will be some of the first removed during initial thinning of northern hardwood stands. Removal of these scattered individuals and groups will allow some aspen regeneration to occur.

Cover Type Objective:

1. The objective for this type is to maintain the aspen cover type where it occurs. An alternative is to convert portions of the aspen type to northern hardwoods.
 - The aspen cover type will be managed on an even-aged basis for pulpwood and sawtimber.
 - Stand composition will range from pure stands of aspen to mixed stands of aspen and other hardwoods like oak, maple, birch, and basswood.

Management Considerations:

Retention of Aspen Cover Type

1. Aspen is a shade intolerant species that requires full sunlight to regenerate and the best method for creating conditions for stand replacement is by clearcutting.
2. Reserve trees will be retained to provide structural diversity.
3. The normal rotation age of aspen is 50, with a maximum age of 85.

Cover Type Conversion

1. In some cases, it may be desirable to convert aspen to other cover types. Consider conversion to another type if more than 25% of the stand contains hypoxylon canker.

2. Depending on the site conditions, aspen stands will be converted to northern hardwoods or possibly oak. Mixed conifers and hardwoods are also a possibility. Utilize the Tree Species Suitability Chart to determine which species are desirable for the site.
3. Use partial harvest of overstory to release understory hardwoods and create a hardwood stand.
4. Underplant conifers such as white spruce or white pine to create mixed stands of conifers and hardwoods.

Paper Birch:

Current Conditions:

Paper Birch, like oak, is present throughout the northern hardwood type, but also occurs in nearly pure stands on drier sites.

Cover Type Objective:

1. The objective for this type is to maintain the birch component in mixed stands as well as to maintain areas of birch type.
 - The birch cover type will be managed on an even-aged basis for pulpwood , sawtimber, and veneer products.
 - Stand composition will range from pure stands of birch to mixed stands of birch and other hardwoods like oak, maple, and basswood. Long-lived conifers such as white pine and white spruce may also be part of the mixed birch type.
 - An alternative objective is to convert some of the birch types to other hardwood or hardwood conifer types such as oak or white pine/white spruce.

Management Considerations:

Retention of Paper Birch Cover Type

1. Paper birch is a shade intolerant species that requires full sunlight to regenerate.
2. Birch stands to be maintained in birch cover types will be managed using clearcut with reserves, shelterwood, or seed tree as final harvest method.
3. Birch stands will regenerate naturally from seed and through stump sprouting. Shelterwood and seed tree are generally preferred methods of regeneration.
4. The normal rotation age of birch is 55-65 years with some stands extended to up to 85 years.

Cover Type Conversion

1. In some cases, it may be desirable to convert birch stands to long lived hardwoods or conifers or mixed hardwood/conifer stands.
2. Natural succession on sites where there is an existing high percentage of the desired species can be one option.
3. Underplant long-lived conifers or hardwoods in existing stands where conditions are favorable for those species to become established and grow.

Upland Conifers:

Current Conditions:

Upland conifers include white pine, white spruce, balsam fir, Norway pine and white cedar. Upland conifers are currently a minor component of most hardwood stands. They usually are found as widely scattered individuals that occur as canopy or supercanopy individuals or small groups of trees. There currently are small plantings of Norway pine in the vicinity of the former downhill ski runs and one small stand of planted white spruce.

Cover Type Objective:

1. The objective for this type is to maintain or increase the conifer component in hardwood stands, especially white pine, for timber, wildlife habitat and biodiversity.
 - The upland conifers will be managed on a case-by-case basis for pulpwood , sawtimber, and veneer products.
 - White pine and white spruce are both long lived trees and will function well as reserve trees within these hardwood stands.
 - Stand composition will generally be to manage for mixed stands of conifers and other hardwoods like oak, maple, and basswood.
 - Hardwood sites should not be converted to upland conifers, but most hardwood sites have historically had a greater percentage of upland conifers than currently occurs.
 - The former downhill ski runs could be restored to mixed stands of upland conifers.

Management Considerations:

Retention of Upland Conifers

1. The Tree Species Suitability Chart should be consulted to determine suitable sites to manage for upland conifers.
2. Incidental regeneration of upland conifers will occur throughout the uplands as a result of management activities in the cover type.
3. Underplant suitable species on sites where natural seed sources are absent and regeneration is not occurring.
4. Plant seedlings of white pine, Norway pine, and white spruce in the former downhill ski runs.

Ash/Lowland Hardwoods:

Current Conditions:

The black ash/lowland hardwood type occurs in drainages as well as wet areas of peat, muck or mineral soils. Site productivity varies considerably in these lowland hardwood stands. Other species present include balm of gilead, red maple, paper birch and lowland conifers. Windthrow is a dominant natural disturbance in these stands

resulting in down logs, hummocks and hollows that promote tree seedling establishment.

Cover Type Objective:

1. The objective for this type is to maintain the lowland hardwood type for timber, wildlife habitat and biodiversity. Where small patches of lowland hardwoods occur within the upland hardwood matrix, the goal will be to maintain those patches of lowland hardwoods.

- Black ash is the principal timber species occurring in these types and will be managed for sawlogs and veneer.
- Maintain associated tree species for habitat diversity.
- Retain older forest characteristics by retaining a component of large, old trees, coarse woody debris, and snags.
- Retain large, old trees in canopy for recruitment of future downed logs and snags.
- Encourage multi-layered understory development.

Management Considerations:

Retention of Ash/Lowland Hardwoods

1. Lowland hardwoods can be managed as both even- and uneven-aged stands.
2. For most stands, uneven-aged management is recommended.
3. Avoid altering the hydrology of stands. Stands less than site index 45 should not be managed through harvesting with the main objective of maintaining wildlife habitat and water quality.
4. Group selection and single tree selection are the common prescriptions for lowland conifer timber harvests.
5. Thinning of lowland hardwoods should reduce basal area to 75-90 sq. ft or removal of 1/3 basal area, whichever leaves the most basal area.

Lowland Conifers:

Current Conditions:

Lowland conifer types are variable but generally consist of various mixtures of tamarack and black spruce together with lesser amounts of white cedar, balsam fir, black ash, and balm of gilead. Lowland conifers comprise a small portion of the property. These sites vary from somewhat productive to unproductive. These sites have had limited management but historically white cedar has been harvested from these sites.

Cover Type Objective:

1. The objective for this type is to maintain the current types as lowland conifer for timber, wildlife, biodiversity and water quality benefits.

- Even-aged management will be applied to most lowland conifer types when managing for timber purposes.
- Pulpwood and sawtimber are the preferred products from lowland conifer sites.
- Stands will vary from nearly pure stands of black spruce to mixed stands of lowland conifers and lowland hardwoods.
- Maintain species diversity by retaining secondary species.

- Reserve cedar stands unless white cedar regeneration methods are certain.

Management Considerations:

Retention of Lowland Conifers

1. Lowland conifers will generally be managed by clearcutting with reserves.
2. White cedar is particularly difficult to successfully regenerate after harvesting. Incorporate new management recommendations as they become available for managing and regenerating white cedar.

Proposed Management Activities 2007-2009: Approximately 120 acres are scheduled for harvest and thinning between 2007 and 2009. The majority of this harvest will occur in the Northern Hardwoods and Aspen cover types.

Property Wide

Water, Wetlands and Riparian Areas:

The Sugar Hills Forest Legacy Property contains over one-half mile of State designated trout streams and a State designated wetland basin (Long Lake). In addition, there are numerous shrub swamps, wooded swamps, bogs and wet meadows identified on the National Wetlands Inventory (see maps).

Harvesting activities will occur near the streams, lake, and wetlands but will be managed and protected in accordance with the Minnesota Voluntary Site-level Forest Management Guidelines.

- Riparian Management Zones (RMZs) will be maintained with basal areas ranging from 25-80 FT²/acre depending on size and type of the water body. RMZ widths will also depend on size and type of water body (e.g. trout streams).
- Filter strips will also be implemented to protect and maintain existing ground cover to minimize the sediment entering a water body or wetland.

Maintaining Soil Productivity:

The abundance of fine textured soils of the property increases the frequency of which vehicle travel can result in soil compaction.

General goals:

- Maintain forest soil conditions to favor regeneration, survival, and long-term growth of desired forest species.
- Minimize area occupied by road, trails, and landings.
- Use alternate equipment and operating techniques to avoid or reduce impacts to soils. Harvesting when the soil is frozen or dry can reduce compaction. Soil compaction is not readily altered and effects can persist for decades.

Wildlife Considerations:

Follow site level guidelines to maintain wildlife habitat features and to maintain wildlife populations.

- Leave all snags possible standing in harvest area.
- Retain live leave trees either scattered or in clumps when applying even-aged management. Leave trees in clumps should occupy a minimum of 5% of each clearcut harvest unit. When leaving individual trees, leave 6-12 trees standing per acres. Conifers, mast producing trees, large diameter trees(greater than 18"dbh), active den trees and cavity trees are preferred as live leave trees.
- On non-clearcut sites (including selection or partial cut), leave a minimum of 6 cavity trees, potential cavity trees or snags per acres.
- Other wildlife factors of importance are: the maintenance of vertical structure found in northern hardwoods stands by maintaining multiple layers of vegetation; retention of tree species diversity; retention of large trees, and the maintenance of a variety of age-classes.

Recreation Considerations (See Recreational Management Plan for additional details):

Forest Management and Recreational Trails : The Conservation Easement allows the landowner to utilize the Recreational Trails for Forest Management purposes creating the need to temporarily limit or restrict trail access for Recreational Use in order to protect public safety.

Temporary Trail Closures: Temporary closure not to exceed three months in duration and covering no more than 10% of the Protected Property may occur due to timber harvesting or other forest management purposes. Grantor must notify DNR in writing at least 30 days prior to closure and is responsible for posting those closure areas.

Because the Northern Lights Nordic Ski Club has members who actively use, groom and maintain the Recreational Trails for skiing, it, too will be provided with written notice of closures for as long as this Recreational Management Plan is in effect. The DNR will be responsible for providing this Notice to the Northern Lights Nordic Ski Club. The DNR representative responsible for providing these notices, and the representative of the Northern Lights Nordic Ski Club who will receive these notices is shown on Exhibit C.

Forest Management within the Recreational Trail Buffer Areas) The Buffer management considerations apply only to the ski trail portions of the Recreational Trails.) As further described in the Conservation Easement, Grantor will limit timber management within a buffer area of 50' on each side of the Recreational Trails to protect the trails from wind and sun. Within these buffer areas, Grantor will maintain a minimum basal area of 60 sq ft/acre in uneven aged stands. For even aged forest within these buffer areas, the residual basal area will meet or exceed those in the Forest Management Standards. In areas managed by even-aged management systems, the harvest area must retain live trees on the site as either leave trees in clumps or scattered leave trees. When retaining leave trees in clumps, the clumps must occupy a minimum of 5% of the harvest acreage. When retaining scattered leave trees, the scattered individuals must total an average of 6-12 per acre. With either option, leave trees should be distributed to provide shade and wind protection to the trail surface. To

the extent possible, the Grantor will keep the landings off the trail and out of the buffer areas.

Repair of Recreational Trails: When forestry use of the trails is unavoidable and damage to Recreational Trails occurs, Grantor will restore the Recreational Trails according to the Forest Management Plan. The Forest Management Plan states that the Recreational Trails must be restored accordingly to the existing trail width or to at least a width of 22'. Additionally 1. Slash and rocks will be removed from the Recreational trails; 2. The Recreational Trails, including any clumps or ruts will be smoothed over with a bulldozer blade; 3. Special attention will be paid to "re-crowning the Recreational Trails and not leaving bermed edges; 4. To the extent possible, Grantor will reseed and restore the Recreational Trails to prior condition; 5. DNR will review and approve final trail restoration and repair resulting from logging activity.

Maintenance of the Trails for Skiing: Maintenance of the Trails for skiing is a right of both the Grantor and the State. The Northern Lights Nordic Ski Club may continue to maintain and repair the Recreational Trails for ski use under the grant-in-aid agreement with the State (or county). Motorized vehicles may be used on the Protected Property for Recreational Trail grooming, maintenance or repair. Maintenance and grooming is restricted to a maximum 22' trail width unless otherwise approved by the grantor. The excavation, filling, removal of topsoils or other materials, or changes in topography must be approved prior to commencement of work. The use of non-native plant materials will be strictly limited to approved species.

Trail Modifications, Re-routing of Trails: The current trail system as documented in the property report may not be expanded or extended without the written consent of both Grantor and Grantee. The Recreational Trails cannot be paved or covered with impermeable materials.

Trail Abandonment: If a Recreational Trail ceases to be used, as evidenced by the cessation of its use for a period of five years due to a lack of maintenance and such lack of maintenance results in an unsafe condition, Grantor may, at its option, elect to abandon said Recreational Trail in which event it will no longer be deemed a Recreational Trail for purposes of the Conservation Easement and said abandoned Recreational Trail will be allowed to return to its natural condition.

Aesthetic Considerations:

- Use and apply the appropriate visual sensitivity guidelines along County Road 449.

Archeological, Cultural and Historical Considerations:
None present. Not applicable.

Endangered, Threatened and Special Concern Species:

There is one rare species listed on the property. The lance-leaved grape-fern (*Botrychium lanceolatum*) has been documented to occur on the property. Check with the Division of

Ecological Services prior to doing forest management work in the location of this species.

Non-native species and forest health:

Be alert to the occurrence of non-native species. Some of these non-natives are aggressive invaders that outcompete native trees, shrubs, and herbs. One such shrub is European buckthorn, which is often found in the understory of open woods as well as in open areas. Early detection and treatment with herbicides are the keys to controlling this species.

On a regular basis, annually is often best, review the vigor, health (disease, insect, wind, decline), and overall condition of your property. Consult with area foresters, extension personnel, and forest health specialists if you have specific concerns about the health of your forest. This is also a good time to look for non-native species.

The introduction of non-native species to the easement property is not allowed under the terms of the easement without the written approval of the Grantee (State of Minnesota Department of Natural Resources).

Stewardship Binder References: (for additional information)

<u>Tab</u>	<u>Reference Name</u>
Protection.....	European buckthorn

Trails and Roads:

Trail systems are an important component in wooded properties that are critical for timber management. Your property has the beginnings of a timber access trail system already established. Additionally, there is a well-developed network of cross-country ski trails and a small section of snowmobile trail. As you move ahead with various management activities on your property you may elect to design and construct a more complete timber access trail system. The referenced booklet provides some basic design and construction information. The total acreage in roads, trails, and landings may not exceed 10% of the total property acres, or 159 acres.

Stewardship Binder References: (for additional information)

<u>Tab</u>	<u>Reference Name</u>
Recreation.....	Woodland Trail Construction

FUTURE FOREST STEWARDSHIP PROJECTS

<u>SCHEDULED YEAR</u>	<u>COVER TYPE</u>	<u>PROJECT PRESCRIPTION</u>	<u>ACRES/ UNITS</u>	<u>CHECK IF COMPLETED</u>
Annual	All Types	Annual Forest Health Monitoring		
2007-2008	Asp/NH	Harvest and Thinning	60	
2008-2009	Asp/NH	Harvest and Thinning	60	

For More Cost-Share Information Contact:

Grand Rapids DNR Forestry Office
Office hours are 8:00 to 4:30.

PLEASE RETURN THIS REGISTRATION FORM

Registration entitles you to:

- A. Be eligible for financial assistance (cost-share) programs.
- B. Receive free reference material updates.

*To make a donation and/or to register your plan,
please complete and send this form in the attached
envelope. Thank you.*

I believe in the principles of forest stewardship. As the current owner and steward of the land, I will maintain or enhance the forest ecosystem's natural ability to provide a wide variety of sustainable benefits. By receiving and registering this plan, I am not limiting any of my private property rights. Using this plan as a general guide, I will use, care for, and enjoy this woodland treasure.

Signed: _____ Date: _____

Please make any donation payable to: DNR GIFT FUND
Amount enclosed: \$ _____

NOTE: Plan registration does not require a donation.

--- Comments and suggestions are welcome - Use reverse side ---

Landowner Name: John Rajala
Landowner Address:
P.O. Box 578 Deer River, MN 56636
Telephone #:

Woodland Stewardship Plan acres: 1659
County where woodland is located: Itasca Landowner file #:

Plan Provider's Name: Richard Peterson

Agency or Company providing plan: Division of Forestry

MN Woodland Stewardship Plan - Edition:
DNR-Forestry office number of plan provider - RAN#: 445