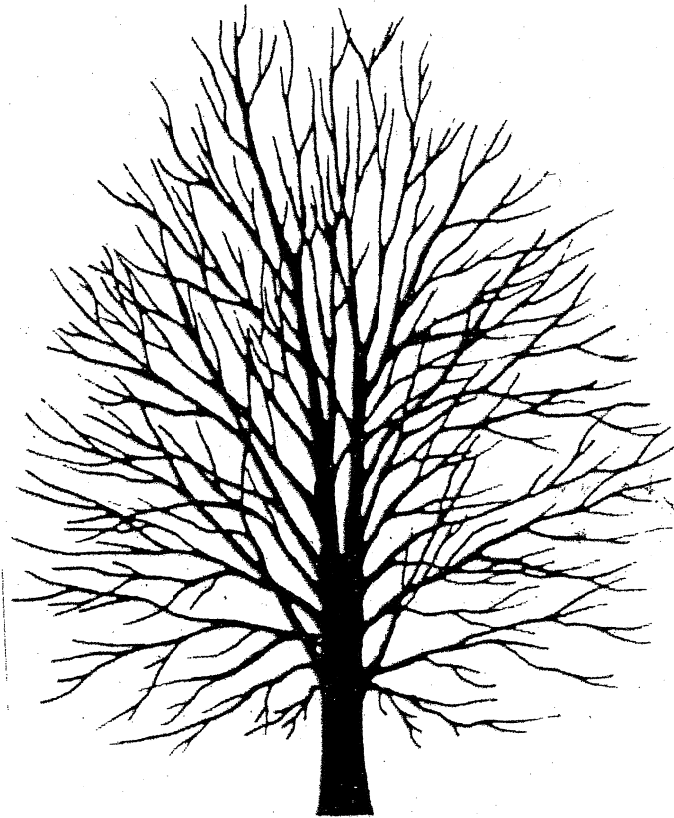


Management Plan
FOR THE
Town of Washington
Forest Lands



PREPARED BY
LIONEL CHUTE & GARRET DUBOIS
1999

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1 OVERVIEW

1.1 Introduction (See Map of Washington's Town Forests)

The Town of Washington currently owns 7 parcels of land greater than 10 acres in size*. Six are forested: the Back Mountain Lot, Barrett Pond Lot, Camp Morgan Lot, Farnsworth Hill Lot, Huntley Mountain Lot and New Road Lot. The seventh, the Old Meadow Lot, is a complex of wetlands that are mostly non-forested. Together, these 7 properties total 720 acres, or 2.3% of all land in the Town of Washington.

During the summer of 1999, a comprehensive inventory of Washington's forestlands was done by Lionel Chute (NH Forester License #317) and Garret Dubois in order to answer the following questions:

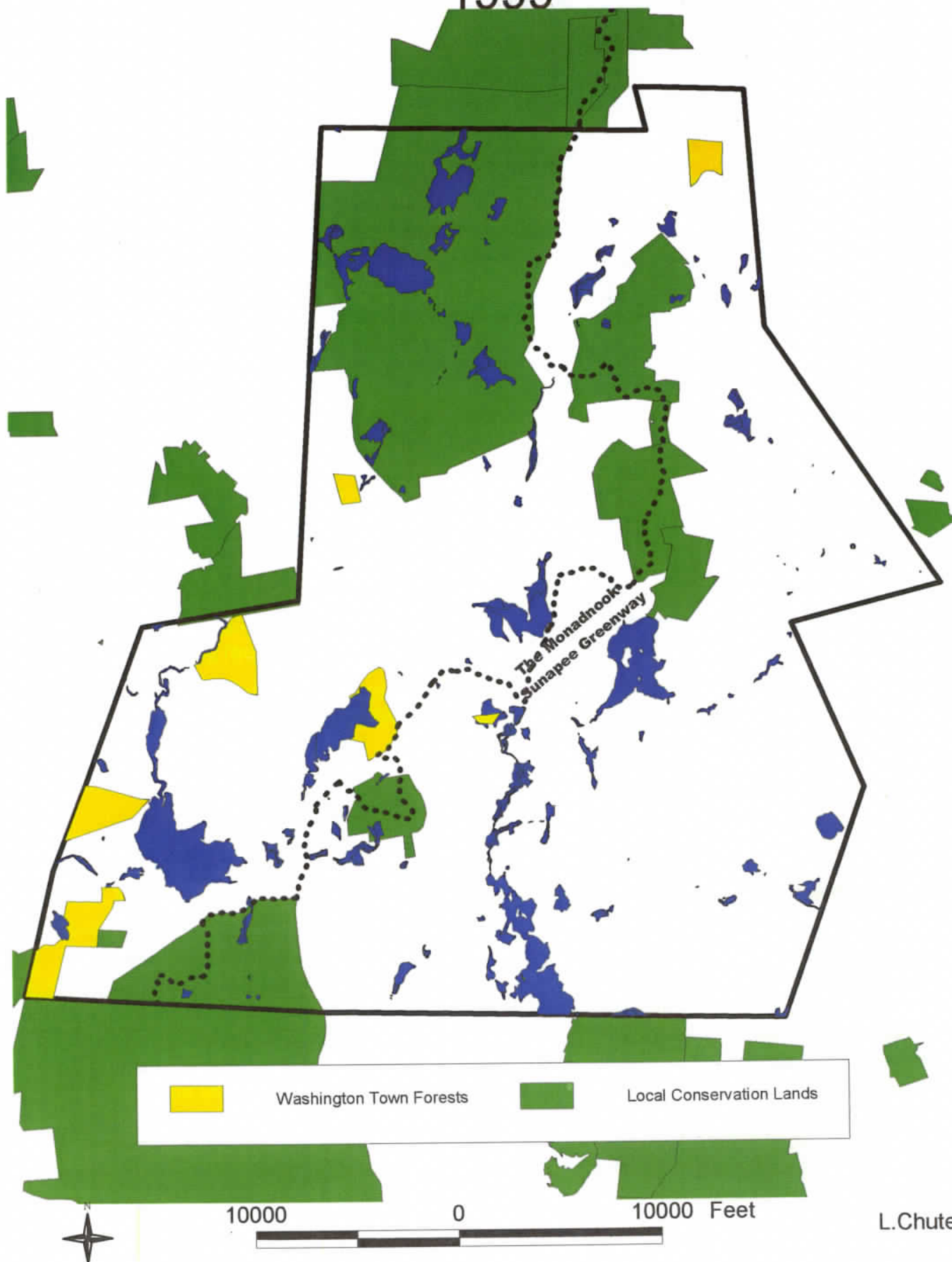
- How did the Ice Storm of 1998 affect the Town Forests?
- How did the Ice Storm of 1998 affect the access roads within Town Forests?
- What is the standing timber volume on these properties?
- Can some timber be harvested now, and if so, what might it be worth?
- Are there parts of these properties that can't be managed for timber products, because the land is too wet, or steep, or rocky?
- Are there parts of these properties that should not be managed for timber products, because the woods are very old or very special?
- What is the outlook for forest management for the next ten years, and beyond?
- Do other public or protected lands abut these forests?
- Are there any rare, endangered or unusual plants growing on these properties?
- What wildlife habitat opportunities are on Town Forest lands?
- How abundant are dead standing trees (snags) on these lands? Are there enough to meet the needs of wildlife?
- What are the soils on these properties? Are they productive soils for growing trees and if so, what kinds of trees would grow the best?

The following plan seeks to answer these questions, and to provide a forest management strategy for Washington's Town Forests.

* The Town land that houses the Highway Department and Transfer Station is also greater than 10 acres, but is not included in this management plan.

The Town Forests of Washington

1999



L.Chute, 1999

1.2 Inventory Methods

All forested lands were inventoried using a standard systematic sampling routine. In other words, grids were drawn on maps of the properties in order to determine the number and location of sample points. Two grid sizes were used: a 400' X 400' grid was used on the Barrett Pond, Farnsworth Hill and Huntley Mountain Road parcels, and a 250' X 250' grid was used for the Back Mountain, Camp Morgan and New Road parcels. The statistical confidence limit goal was to achieve a total sawtimber standard error of less than 20% for the combined properties of each grid size. This goal was met: the total sawtimber standard error was +/-15% for the 3 properties sampled at 400' X 400', and was also +/- 15% for the 3 properties sampled at 250' X 250'. For sawtimber standard errors at both the property and management unit levels, please refer to the Management Unit Summary Table in the Appendix.

At each sample point, a variety of measurements and observations were made, including:

- a profile of forest type, average tree size and density for the canopy, 2nd story, under-story, regeneration layer, shrub layer and ground layer (where applicable).
- a tally of all "in" trees using a 20 basal area factor prism.
- a cut or leave decision for every tallied tree.
- a breakdown of every tallied tree into logical forest products by 8' section (such as veneer, sawlog, pulp, etc.)
- a determination of forest management operability, recorded as "operable", "marginally operable" and "inoperable". If marginally operable or inoperable, the limiting reason was also recorded.
- an observation of any disturbances (such as ice storm damage, logging, fire, etc.) and their severity (recorded as "very slight", "slight", "moderate" or "severe").
- a forest management prescription and priority for treatment ("within one year", in "one to three years", "three to five years", or "greater than five years")

In addition to collecting information at each sample point, a running list of all resident plant species (trees, shrubs, and herbs) was also kept for each property. Plants not known at the time of inventory were sampled and identified at the end of each field day.

Maps of each property were derived from GRANIT's Geographic Information System (GIS) coverage of Conservation Lands for the State of New Hampshire. There is a 13.3-acre difference in total acres between Town Hall deed information and the mapped acres on the GIS coverage. Specifically, the GIS acres are 1.8% greater than the deeded acres obtained from the Town Assessors Office. As no registered surveys or survey maps were available during the inventory, the GIS maps were used despite this discrepancy in acreage. It should be noted, however, that unless surveys are done for these properties, the true acreage of each lot will continue to be both unknown and unknowable. For a property breakdown of acreage differences between the deeded acres and the GIS acres, please refer to the Summary Table of Operable Acres that follows.

Three areas of Town Forest were not inventoried for the following reasons. The Old Meadow Lot was not inventoried as it is a mostly an unforested wetland. However, a brief discussion of this property occurs later in the management plan. The 23-acre section of Camp Morgan (north of Millen Pond Road) was also not inventoried, because it has recently been heavily logged. This section will need 15-20 years before any commercial forest management activities can be considered. An inventory at this time would have been pointless. Finally, an additional 26.5 acres of the Camp Morgan property (that houses the Town School, Lodge, Beach, Ballfield, etc.) was not inventoried, as timber management would conflict with existing uses.

1.3 Summary of Operability

As might be expected, at least a few acres of each property would be difficult (if not impossible) to conduct timber management activities on. The percent of operability for each property ranges from a high of 93% on the New Road Lot to a low of 0% on the Old Meadow Lot (see table below). All told, about 127 acres or 18% of all Town Forests are not operable for timber management purposes. Given Washington's steep and rocky terrain, and the fact that most of these properties were acquired through landowner abandonment, the overall operability of 82% is higher than one might have expected.

Accessibility plays as much of a role in forest management as operability: no matter how operable the land may be, you also have to be able to get there. Fortunately, all Town Forests (with the exception of Barrett Pond) are accessible, with either good internal or abutting roadways. There is an access problem on the Barrett Pond property, which is discussed later in the report (section 3.1.4).

The Ice Storm in January of 1998 dropped limbs and entire trees on nearly all roads in the Town of Washington. During the 1999 Town Forest inventory, however, no access roads were found obstructed by woody debris of any kind.

Summary Table of Operable Acres

<u>Property</u>	<u>Total deeded acres</u>	<u>Total GIS Acres</u>	<u>Total GIS Operable Acreage</u>	<u>% of Property That is Operable</u>	<u>Principle Cause of Inoperable Areas</u>
Back Mountain	65	66.72	48.1	72	Steep and rocky terrain east and south
Barrett Pond	191	195.64	176.57	90	Barrett and Russell Pond drainages, also steep terrain in south-east corner
Camp Morgan	134	118.9	92.43	78	Public Beach, Town School, ball field, etc.
Additional parcel north of Millen Pond Road	23	21.5	(Appeared to be 21.5, but was not sampled)	(Appeared to be 100%, but was not sampled)	
Farnsworth Hill	146	155.89	121.33	78	Ashuelot River floodplain
Huntley Mountain	106	131.75	114.54	87	Steep terrain in north, also wetlands in south and east
New Road	45	32.28	29.88	93	Boulder field west/center of property
Old Meadow	10	10.6	0	0	Wetlands

2BACK MOUNTAIN LOT

2.1 Property Data

2.1.1 Regional Context (See Map #1)

Near to the Bradford Town line, the 65-acre Back Mountain Lot is the Town's only forestland in the northeast part of Washington. Located on the north side of the Old Bradford (or Back Mountain) Road, this property is relatively close to both Pillsbury State Park and Pillsbury's disjunct Max Israel Tract. The Monadnock-Sunapee Greenway is located about a mile west of the property. Currently, this land is very remote, with no houses for several miles in all directions.

2.1.2 Tax and Deed Information

Deed reference: 940/598

Date acquired: 6-13-91

Previous owner: Atkinson-Davis Corp.

Tax information: Tax Map # 02, Lot 003

Assessed value: Land assessed at \$51,400 as of 6-10-98

Current use value: \$4,333

2.1.3 Boundary Line Status

A stone wall marks the entire eastern boundary. A stone wall also marks the western bound at the southern end, but this soon ends with no other indication of bound. The southern bound is the Old Bradford Road. The northern bound is unmarked.

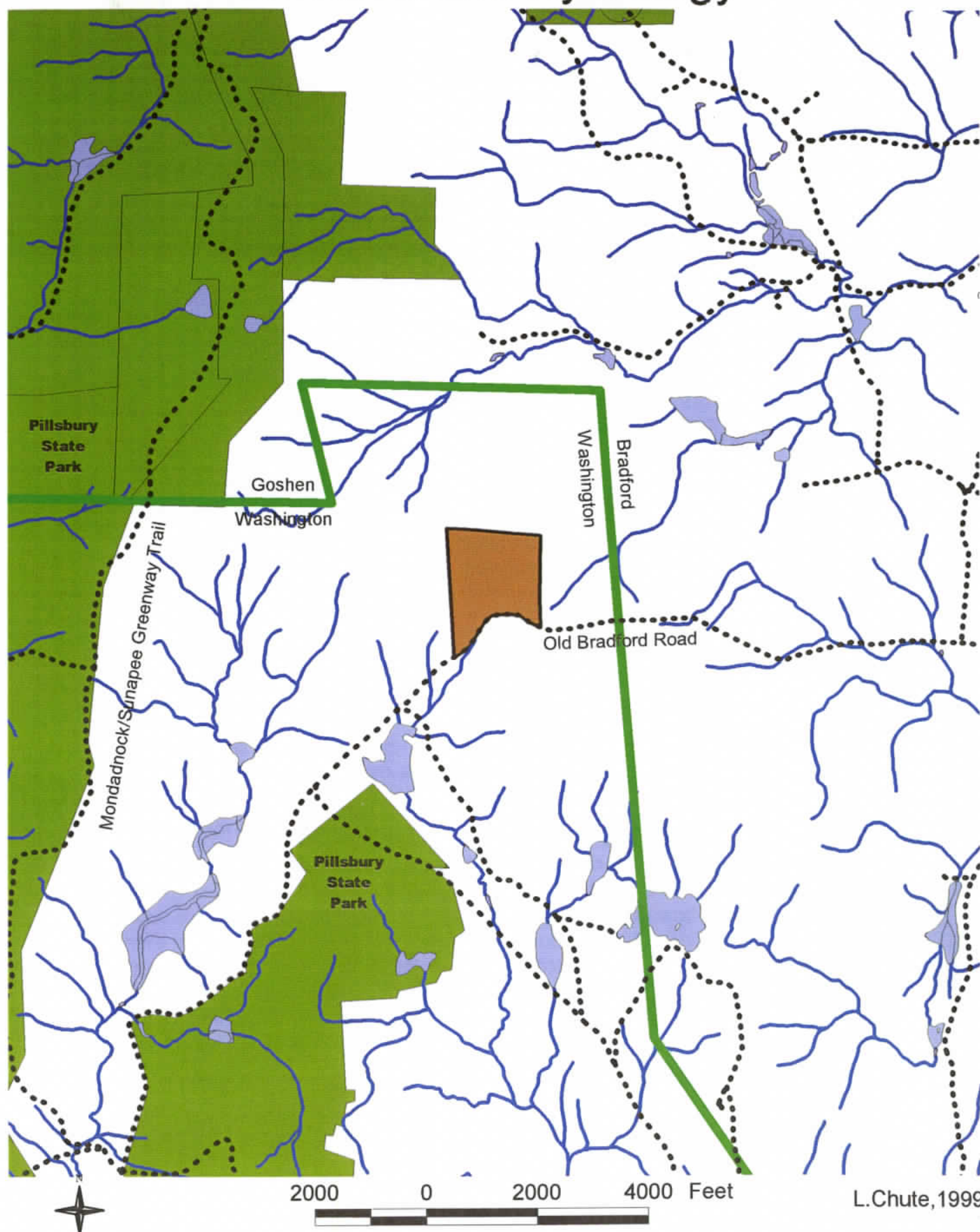
Survey Map: None known.

Property corner markers: The southwest corner is a young blazed and flagged spruce tree on the north side of Old Bradford Road. The southeast corner is the junction of the stonewall and the road, but is unmarked. The northwest and northeast corners were not found.

ACTION ITEM:

The property needs to be surveyed, especially the north line and most of the west line (which are currently unknown).

Back Mountain Lot - Location and Hydrology



2.1.4 Access

Main Road: Old Bradford Road makes up the southern bound of the property. The road is in good shape coming from Half Moon Pond Road, but is currently impassable from the Town of Bradford due to erosion. Timber management activities could only take place on this property in the summer, as the Old Bradford Road is unplowed until Martin Road about 3 miles to the south.

Gate(s): There are no gates on the property.

Property signs: There are no property signs on the property.

Internal Roads: There are no internal roads on the property.

ACTION ITEM:

Consider installing a "Washington Town Forest" sign alongside of Old Bradford Road.

2.1.5 Recreation

Foot Trails: There are no trails on the property.

Other uses: The Old Bradford Road is being used by both ATV's and 4-wheel drive vehicles.

ACTION ITEM:

Consider a hiking trail from the southwest corner to the northeast corner. A nice partial view to the North currently exists on the northeast corner, which is very ledgy and open.

2.1.6 Historical Influences

2.1.6.1 Human

Unknown. The presence of stone walls would suggest human habitation at one time, but no cellar holes were seen and the terrain is quite inhospitable.

2.1.6.2 Non-Human

Evidence of an earlier forest fire was seen on much of the western side of the property (see Disturbance map #2). The cause of the fire is unknown, but a 1955 timber stand sketch map (on file in Town Hall) reads "cut and burned" at the location where many charcoal fragments can still be found. Today, this area has two types of forest stands; stunted red spruce at the highest elevations and pure white birch poles below. The soils are thin and ledgy; perhaps the result of a hot fire that consumed the soil's organic layer.

Significant moose barking of red maple was also seen during the inventory, particularly in the center of the property (see Disturbance map). Moose have systematically stripped the bark from most red maple trees, leaving the other species alone. As red maple is probably the least desirable tree in New Hampshire (from a timber perspective), the inadvertent thinning of red maple from the Back Mountain Lot could be seen as a welcome occurrence.

2.1.7 Impact of the Ice Storm of 1998 (See Map #2)

Ice storm damage was seen mostly on the north end of the property. The northeast corner of the property was by far the worst, with many broken stems and torn-off branches. However, this severe damage was only found on no more than a two-acre area. Given the small size of the damaged area, and the fact that access would be extremely difficult, a salvage cut is not warranted. The most common ice storm damage was in the pure white birch pole stands on the south facing slopes. Here scattered birch stems have been permanently pulled over, with some broken stems as well. Fortunately, these stands were overcrowded, with many more stems growing than the land could support over time. The ice storm served to thin these stands, giving more room to the surviving trees. As salvaging the bent birches would cost more than they would yield (they are still mostly poles), it is best to simply let nature run its course.

2.2 Ecosystem Information

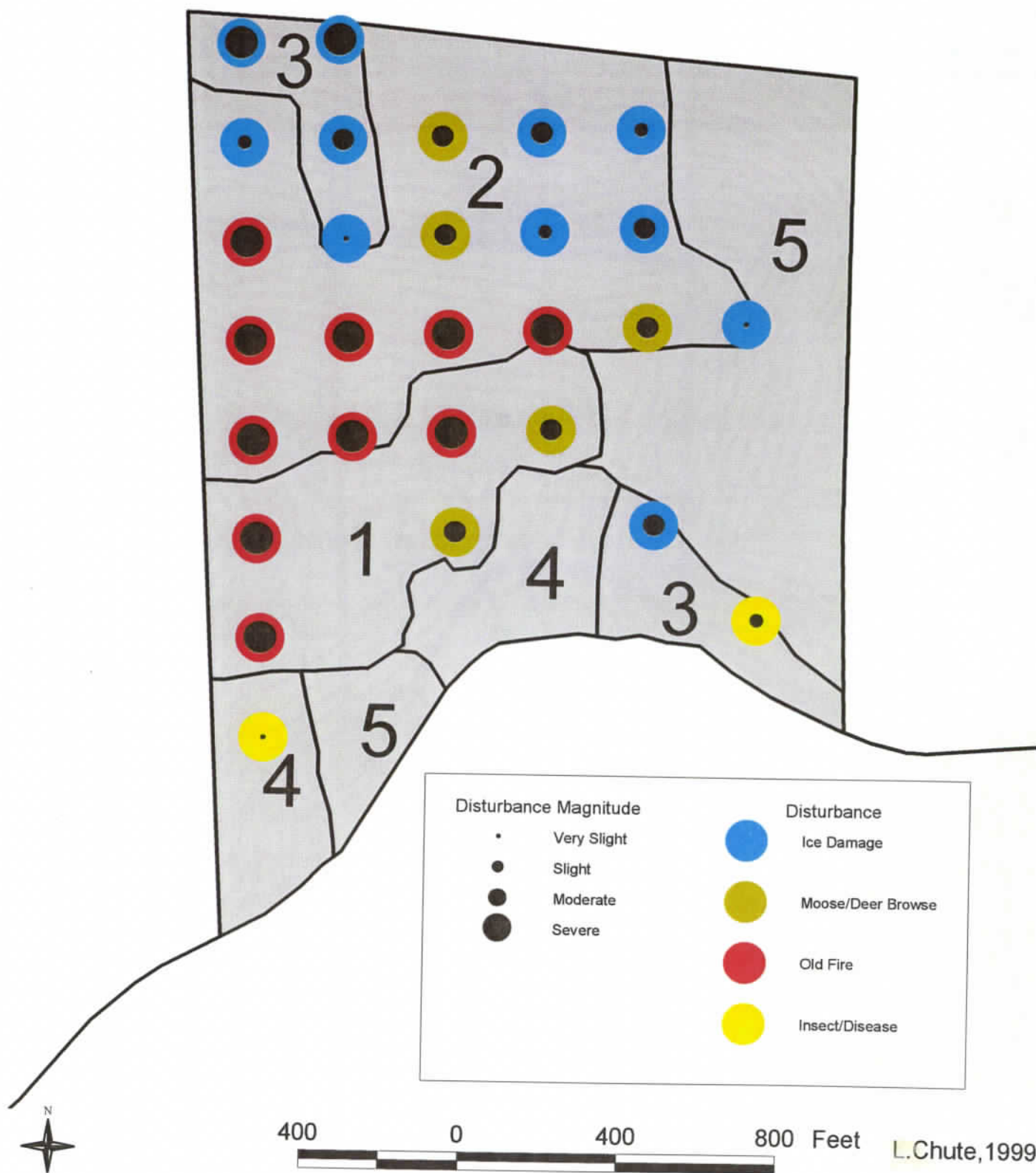
2.2.1 Hydrology (See Map #1)

Wetlands Features: The Back Mountain Lot has relatively little in the way of wetlands. A .25 acre sedge opening was found on the western bound about halfway between the north and south ends. Two intermittent streams were also found, both at the northern end of the property flowing to the north.

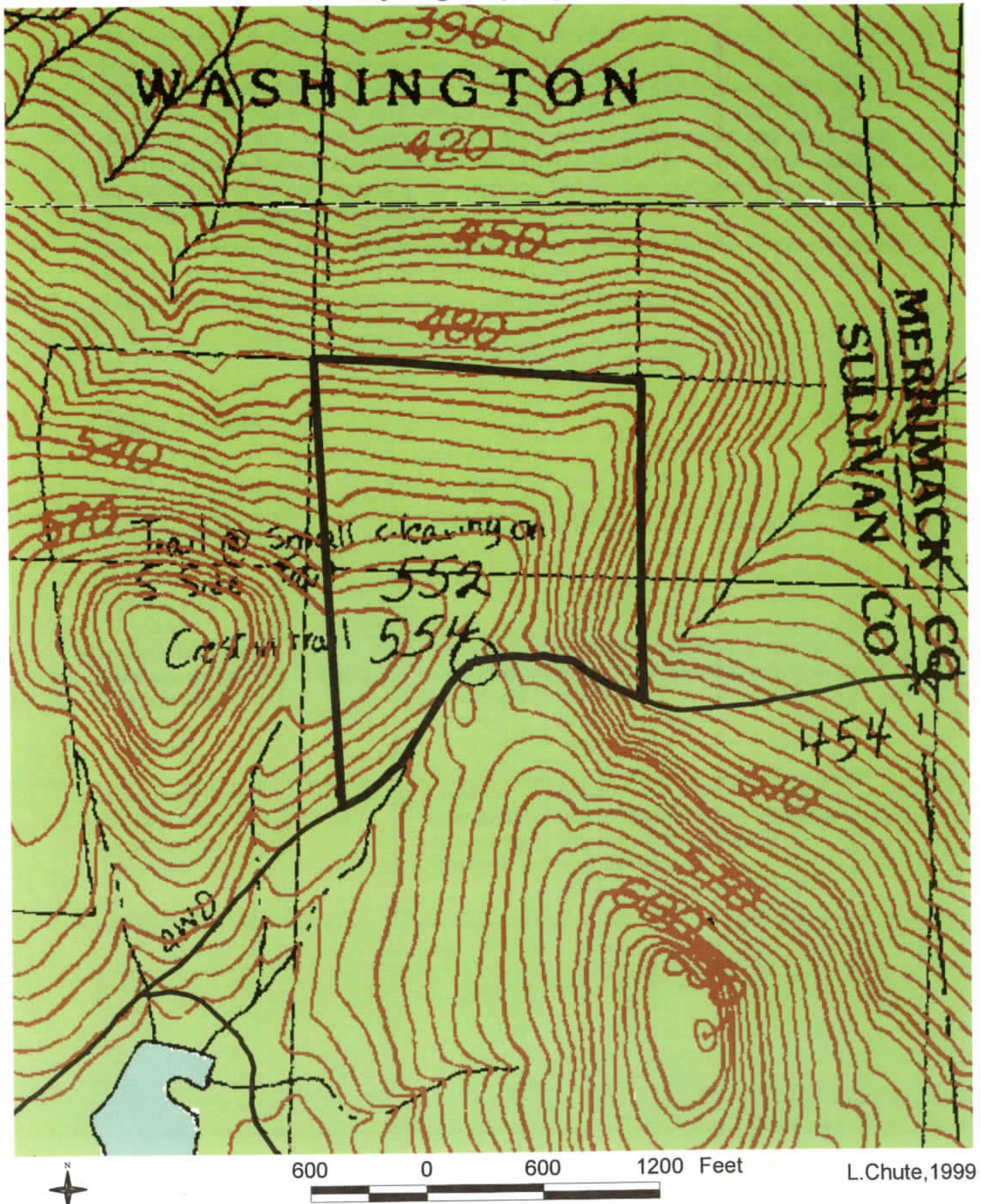
2.2.2 Topography (See Map #3)

Much of this property is steep and ledgy. The highest point is found along the southwest bound, with slopes running both north and east. There is no view from the highest point: views to the north can be had from the northeast corner of the property, where rock outcrops have kept the area open. The eastern side of the property is extremely steep, with cliffs dropping off to the east near the eastern boundary.

Back Mountain Lot - Ice Storm Damage and Other Disturbances



Back Mountain Lot - Topography



2.2.3 Soils (See Table 1 and Map #4)

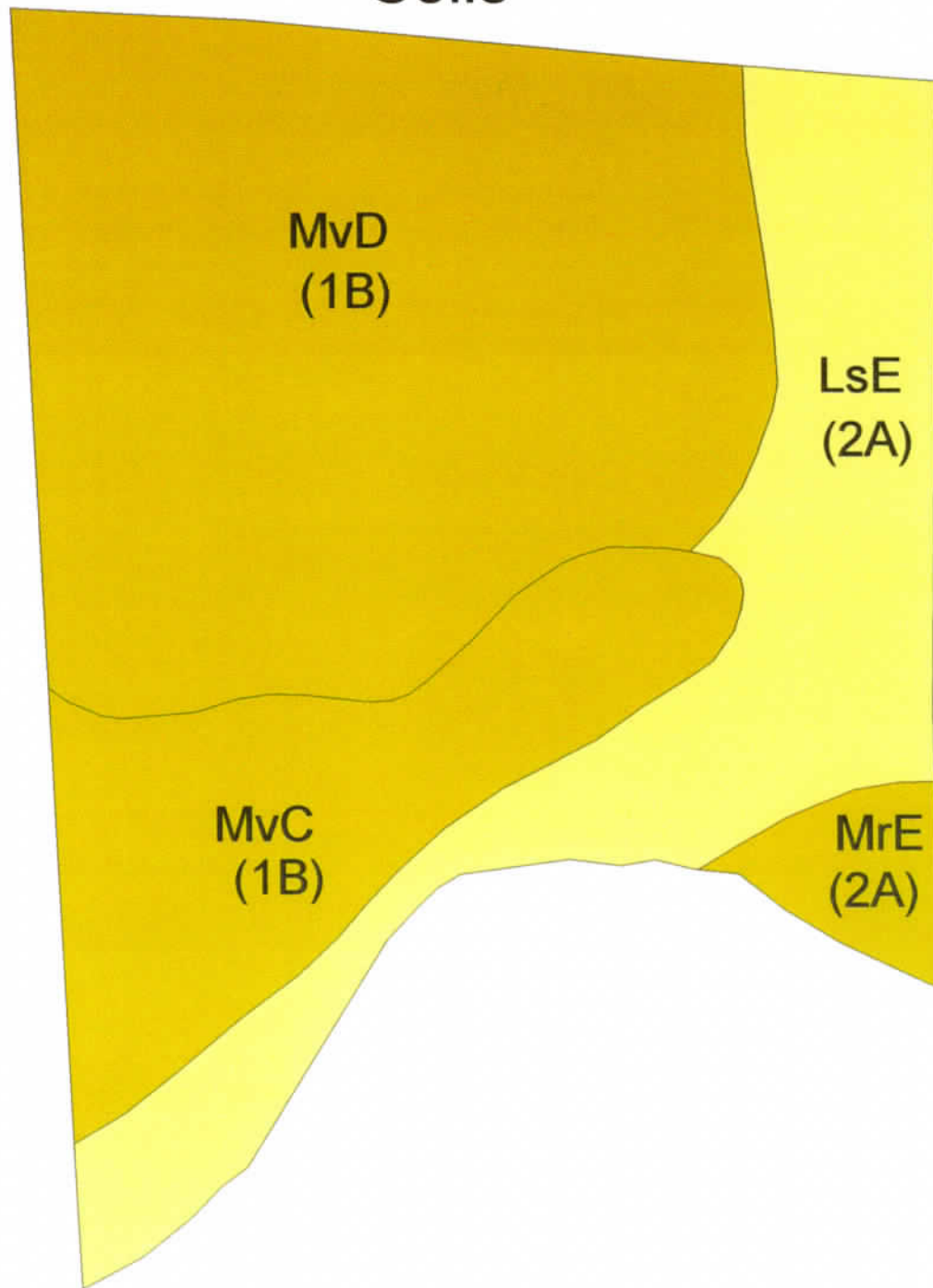
The majority of the Back Mountain Lot is made up of Monadnock/Lyman very stony fine sandy loam. These soils are typically on the dry side, being well to somewhat excessively well drained. The sandy nature of these soils makes them better suited to red oak, white pine, birch and red spruce than other hardwoods such as sugar maple or white ash. While much of these lands are currently supporting white birch and red spruce, there is little to no red oak or white pine at present. There are few limitations to forest management, although the earlier fire may have robbed the site of some of its soil depth and quality.

The other major soil is Lyman/Monadnock rock outcrop, which is found mostly along the very steep eastern side of the property. This soil is physically limited for forest management, and so no timber species are recommended or preferred.

Table 1: Soils

Soil Type	Acreage	Drainage & Slope	Woodland Limitation Ratings
Lyman/Monadnock/ Rock Outcrop Very stony-fine sandy loam LsE	16.5	somewhat excessively to well drained	erosion-----severe use of equipment-----severe seedling mortality-mod./slight windthrow-----severe/ slight
Monadnock/Lyman Very stony fine sandy loam MvC MvD	12.4(C) 33.7(D)	well to somewhat excessively drained	erosion---C slight, D moderate use of equipment--C slight, D moderate seedling mortality-----slight windthrow-----slight
Monadnock/Hermon Extremely stony-fine sandy loam MrE	2.1	well to somewhat excessively drained	erosion----- severe use of equipment----- severe seedling mortality----- slight/severe windthrow-----slight

Back Mountain Lot - Soils



Soil Drainage Classes

	somewhat excessively to well drained
	well to somewhat excessively drained

Important Forest Soil Groups

1B	sandy/loamy; favor red oak, white pine, birch and red spruce
2A	physically limited for forest management



300 0 300 600 Feet

L.Chute, 1999

2.2.4 Wildlife

2.2.4.1 Habitats

The Back Mountain Lot is not diverse in terms of wildlife habitats. Most of the property consists of either young spruce/red maple woods or young birch stands. Some large oaks and sugar maples on the eastern cliffs, however, are important contributors of hard mast. Similarly, occasional mature black cherries near the road in the south of the property provide a source of sweet fruit for many wildlife species. Given the overall youth of this property, time will be needed for habitat diversity to develop.

2.2.4.2 Dead Standing Trees (Snags)

Snags are dead standing trees that are used by wildlife. Ten species of birds excavate cavities in dead or dying trees for nesting and roosting; another 15 birds and 18 mammals use these cavities for nesting, roosting, or denning. The "Good Forestry in the Granite State" guide recommends 6 snags per acre; 4 of which should be greater than 12" in diameter, and at least 1 greater than 18". The following table summarizes the estimate of snag trees per acre per stand on the Back Mountain property:

Table 2: Snags (See map #5, Management Units)

Forest Type	Percent of all trees that are dead(snags)	Total snag Trees/acre	6 snag trees/acre?	4 snags > 12"?	1 snag > 18"?
1	6%	14.6	Yes	No	No
2	13%	29.1	Yes	No	No
3	20%	39.9	Yes	No	No
4	17%	44.4	Yes	Yes	No

The preceding table indicates a shortage of snag trees greater than 12" in diameter in all forest types except 4. None of the stands were observed to contain any snags over 18" in diameter. Fourteen species of wildlife, including wood ducks, mergansers, barred owl, pileated woodpeckers, and fisher require snags that are 18" in diameter or greater. Bear and Gray Fox require cavity trees at least 24" in diameter or greater. As the Back Mountain property continues to age, larger diameter snags are sure to develop as the forest increases in size and age.

ACTION ITEM: Retain snags and cavity trees where possible, especially large diameter ones.

2.2.5 Plant-life

59 plant species were recorded for this property, in addition to the tree species recorded during the prism cruise. Interestingly, at the base of the cliffs on the extreme east side of the property a number of plants were found growing that indicate richness and fertility. Species such as maidenhair fern, zig-zag goldenrod, red elderberry and purple-flowering raspberry were found together, clearly benefiting from their position at the base of the cliffs where nutrients would naturally collect. This was the only example of a mesic rich woods found on any Town property, and should be conserved as the plant community is relatively rare in this part of New Hampshire.

ACTION ITEM:

Periodically monitor the rich woods plant community, to see if additional uncommon species colonize the site over time. As this area is inoperable due to steep cliffs, the usual risk of disturbance through timber harvest will never be a concern.

Table 3: Plants Recorded on the Property During the Inventory

BACK MOUNTAIN LOT

COMMON NAME	SCIENTIFIC NAME
"Lowbush" Blueberry Species	Vaccinium sp
Alternate-leaved Dogwood	Cornus alternifolia
Beaked Hazelnut	Corylus cornuta
Blackberry	Rubus allegheniensis
Bracken Fern	Pteridium aquilinum var. latiusculum
Broad Beech Fern	Phegopteris hexagonoptera
Bunchberry	Cornus canadensis
Bush Honeysuckle	Diervilla lonicera
Canada Mayflower	Maianthemum canadense
Canada Violet	Viola canadensis
Choke Cherry	Prunus virginiana
Christmas Fern	Polystichum acrostichoides
Cinnamon Fern	Osmunda cinnamomea
Enchanter's Nightshade Species	Circaea sp
False Solomon's Seal	Smilacina racemosa
Fringed Bindweed	Polygonum cilinode
Goldenrod Species	Solidago sp
Goldthread	Coptis trifolia var. groenlandica
Hairy Solomon's Seal	Polygonatum pubescens

Hay-scented Fern	<i>Dennstaedtia punctilobula</i>
Helleborine	<i>Epipactis helleborine</i>
Highbush Blueberry	<i>Vaccinium corymbosum</i>
Indian Cucumber-root	<i>Medeola virginiana</i>
Indian Pipes	<i>Monotropa uniflora</i>
Indian Tobacco	<i>Lobelia inflata</i>
Interrupted Fern	<i>Osmunda claytoniana</i>
Juniper (Common)	<i>Juniperus communis</i> var. <i>depressa</i>
Maidenhair Fern	<i>Adiantum pedatum</i>
Marginal Wood Fern	<i>Dryopteris marginalis</i>
Mullein (Common)	<i>Verbascum thapsus</i>
Northern Running Pine	<i>Diphasiastrum complanatum</i>
Northern Water Horehound	<i>Lycopus uniflorus</i>
Northern Wood Sorrel	<i>Oxalis acetosella</i>
Oak Fern	<i>Gymnocarpium dryopteris</i>
Pinedrops	<i>Pterospora andromedea</i>
Pink Lady's-slipper	<i>Cypripedium acaule</i>
Purple Flowering Raspberry	<i>Rubus odoratus</i>
Purple Trillium	<i>Trillium erectum</i>
Red Elderberry	<i>Sambucus racemosa</i> ssp. <i>pubens</i>
Rock Polypody	<i>Polypodium virginianum</i>
Running Clubmoss	<i>Lycopodium clavatum</i>
Serviceberry Species	<i>Amelanchier</i> sp
Shining Clubmoss	<i>Huperzia lucidula</i>
Silvery Spleenwort	<i>Deparia acrostichoides</i>
Skunk Currant	<i>Ribes glandulosum</i>
Small-flowered crowfoot	<i>Ranunculus abortivus</i>
Southern Running Pine	<i>Diphasiastrum digitatum</i>
Speedwell Species	<i>Veronica</i> sp
Spinulose Wood Fern Species	<i>Dryopteris</i> sp.
Spreading Dogbane	<i>Apocynum androsaemifolium</i>
Star-flower	<i>Trientalis borealis</i>
Steeple-bush	<i>Spiraea tomentosa</i>
Stiff Clubmoss	<i>Lycopodium annotinum</i>
Tree Clubmoss	<i>Lycopodium dendroideum</i>
Violet Species	<i>Viola</i> sp

Whorled Wood Aster

Wild Oats

Wild Sarsaparilla

Zigzag Goldenrod

Aster acuminatus

Uvularia sessilifolia

Aralia nudicaulis

Solidago flexicaulis

2.3 Timber Resources

2.3.1 Management Units (See Table 4 and Map #5)

2.3.1.1 Management Unit Descriptions (See Maps #5 and #6)

There are five forest types or management units (MU's) on the Back Mountain Lot:

1) MU 1 is a part of the old fire area, and consists of young red spruce, with slightly taller red maple and white birch. Nearly all of the trees are less than 12" in diameter. These trees are not densely stocked, with some patches of rock outcrop and ledge throughout. Timber management will be difficult in spots due to rocky and ledgy terrain.

2) MU 2 is the largest stand on the property, and consists of young, dense white birch and red maple pole stands. There are some areas of thick striped maple saplings as well. Most of the red maple has been ruined through moose barking, and will eventually die. Some white birch trees have been pulled over through the ice storm, but there are many other birches that will benefit from the "thinning".

3) MU 3 is made up of two small stands at opposite ends of the property (one on the northeast and one on the southwest). Both stands contain some scattered large sawtimber trees, mostly white ash, red maple and white birch. Below these larger trees are smaller poles of the same species, including some occasional beech and red spruce. The northern stand was badly damaged by the ice storm, with many broken branches and pulled-out tops.

4) MU 4 also consists of two stands, both along the southern bound of the property. These are mostly spruce stands of pole and small sawtimber diameters. There are occasional large sawtimber spruces, but they are scattered. Mixed in with the spruce are red maples of mostly small sawtimber diameter (12-14").

5) MU 5 is inoperable due to steep slopes and large jagged rock outcrops. There are some large sugar maples and red oaks, with a mixture of red spruce, red maple and white ash poles and small sawtimber trees.

Table 4: Operable Forest Type Management Units

<u>MU# - Forest Type</u>	<u>Total Acres</u>	<u>Operability Limitations</u>	<u>Basal Area per Acre</u>	<u>Mean Stand Diameter</u>	<u>Total saw timber/acre (bd.ft.)</u>	<u>Cut saw timber/acre (bd.ft.)</u>	<u>Total pulp /acre (cfs.)</u>	<u>Cut pulp /acre (cfs.)</u>
1- SH3C/HS2C	11	some terrain problems	57	6.4	0	0	7.6	0
2- H3B/HS2C	22.5	None	57	7.1	600	211	8.9	0
3- H5D/H3C	7.1	some terrain problems	100	10	4,500	1,689	12.3	2.1
4- S5D/HS4C	7.5	some terrain problems	120	10	7,800	3,300	14.8	7.1

2.3.1.2 Management Unit Prescriptions (See Map #7)

MU1) This stand is young and should be left to grow. A commercial thinning may be possible in 15-20 years.

MU2) Like MU1, this stand needs time and should be left to grow. Future management should consider perpetuating white birch, in which case patch clearcuts would be recommended in 15-25 years.

MU3) MU3 has enough timber volume to recommend a sawlog thinning. Unfortunately, the northern stand of MU3 is very difficult to access, making it a poor candidate for harvest now or in the future. The southern stand, however, is easily accessed and can be cut anytime within the next five years.

MU4) MU4 is also ready for a sawlog thinning, yielding approximately 37,000 board feet of mostly spruce sawtimber. This stand should be managed for spruce, eliminating red maple at every opportunity.

Back Mountain Lot - Management Units



Forest Types

-  SH3C/HS2C
-  H3B/HS2C
-  H5D/H3C
-  S5D/HS4C
-  Inoperable - Slope

Dominant Tree Species

- Red Spruce, Red Maple, White Birch
- White Birch, Red Maple, Striped Maple
- White Ash, Red Maple, White Birch
- Red Spruce, Red Maple
- Red Spruce, Sugar Maple



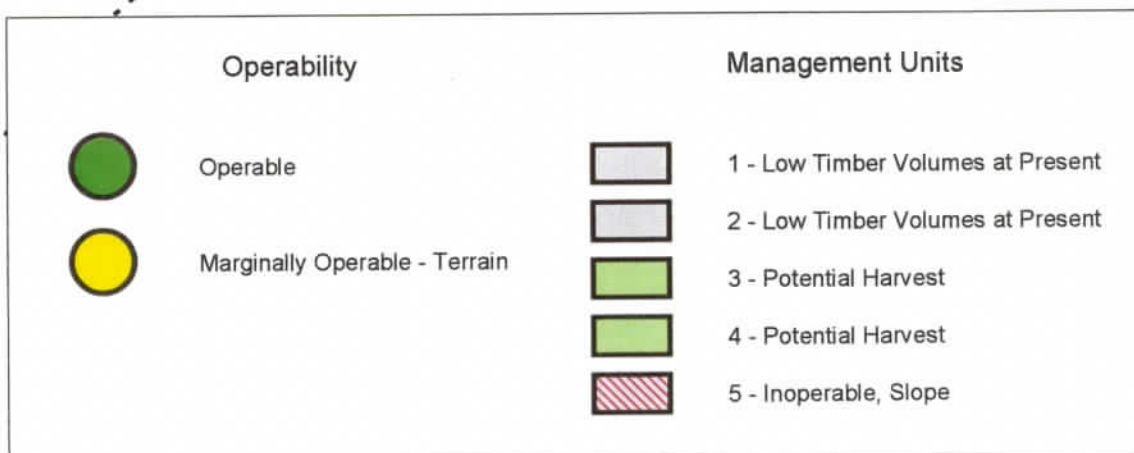
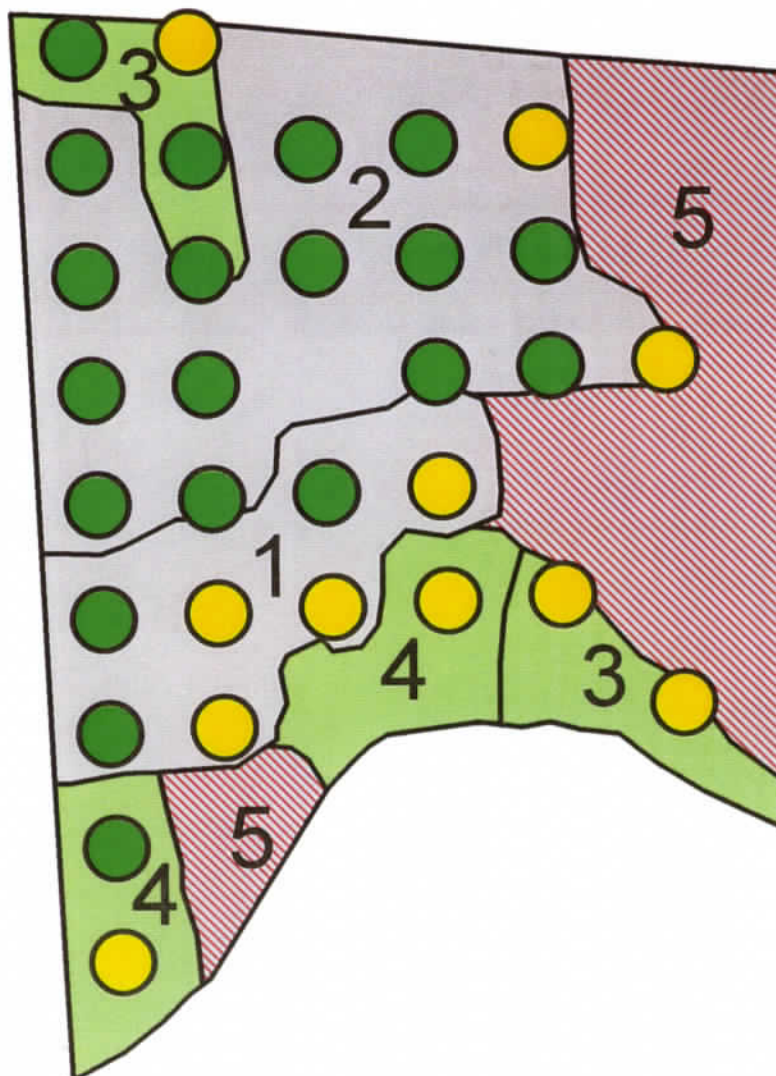
500 0 500 Feet

L.Chute, 199

Table 5: Forest Type Legend

<u>Overstory</u>	<u>/Understory Codes</u>
<i>H =</i>	<i>Majority of trees are hardwood</i>
<i>S =</i>	<i>Majority of trees are softwoods</i>
<u>Diameter</u>	<u>Codes</u>
<i>1 =</i>	<i>Seedlings up to 4.5 feet in height</i>
<i>2 =</i>	<i>Saplings 4.5 feet in height up to 4" in diameter</i>
<i>3 =</i>	<i>Poles 4" to 12" for hardwoods, 4-10" for softwoods</i>
<i>4 =</i>	<i>Small Sawlogs 12" to 16"</i>
<i>5 =</i>	<i>Large Sawlogs 18" in diameter and larger</i>
<u>Crown</u>	<u>Closure</u>
<i>A =</i>	<i>80 to 100% Crown Closure</i>
<i>B =</i>	<i>61 to 80% Crown Closure</i>
<i>C =</i>	<i>31 to 60% Crown Closure</i>
<i>D =</i>	<i>5 to 30% Crown Closure</i>
<i>MSD =</i>	<i>Mean stand diameter, a measure of relative diameter sizes</i>
<i>BA =</i>	<i>Basal Area, a relative measure of stand density or stocking. Desired basal area for hardwoods is 70 square feet per acre; 80 square feet for softwoods, and 90 square feet for white pine. Basal area averages that exceed 30 or more square feet to the acre (for each category) can be thinned back to the desired basal area to maximize stand potential.</i>
<i>Cut Volumes</i>	<i>Cut volumes per acre indicate the amount of sawlogs or pulpwood volumes per acre that are merchantable. The board foot cut volumes should exceed 1,000 BF of sawlogs per acre (or 2 to 4 cords of pulp per acre or a combination of both) in order to be of commercial interest to a logger.</i>

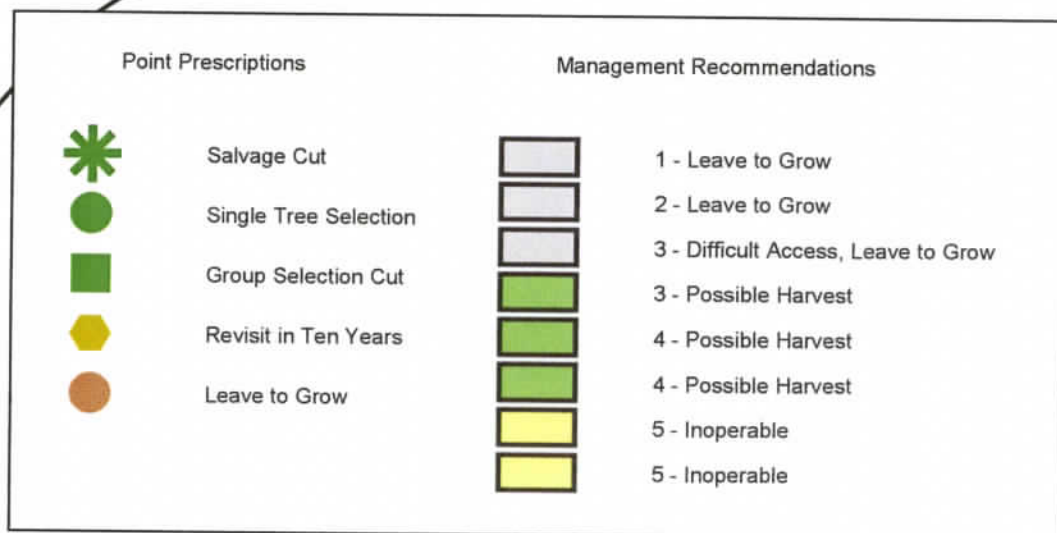
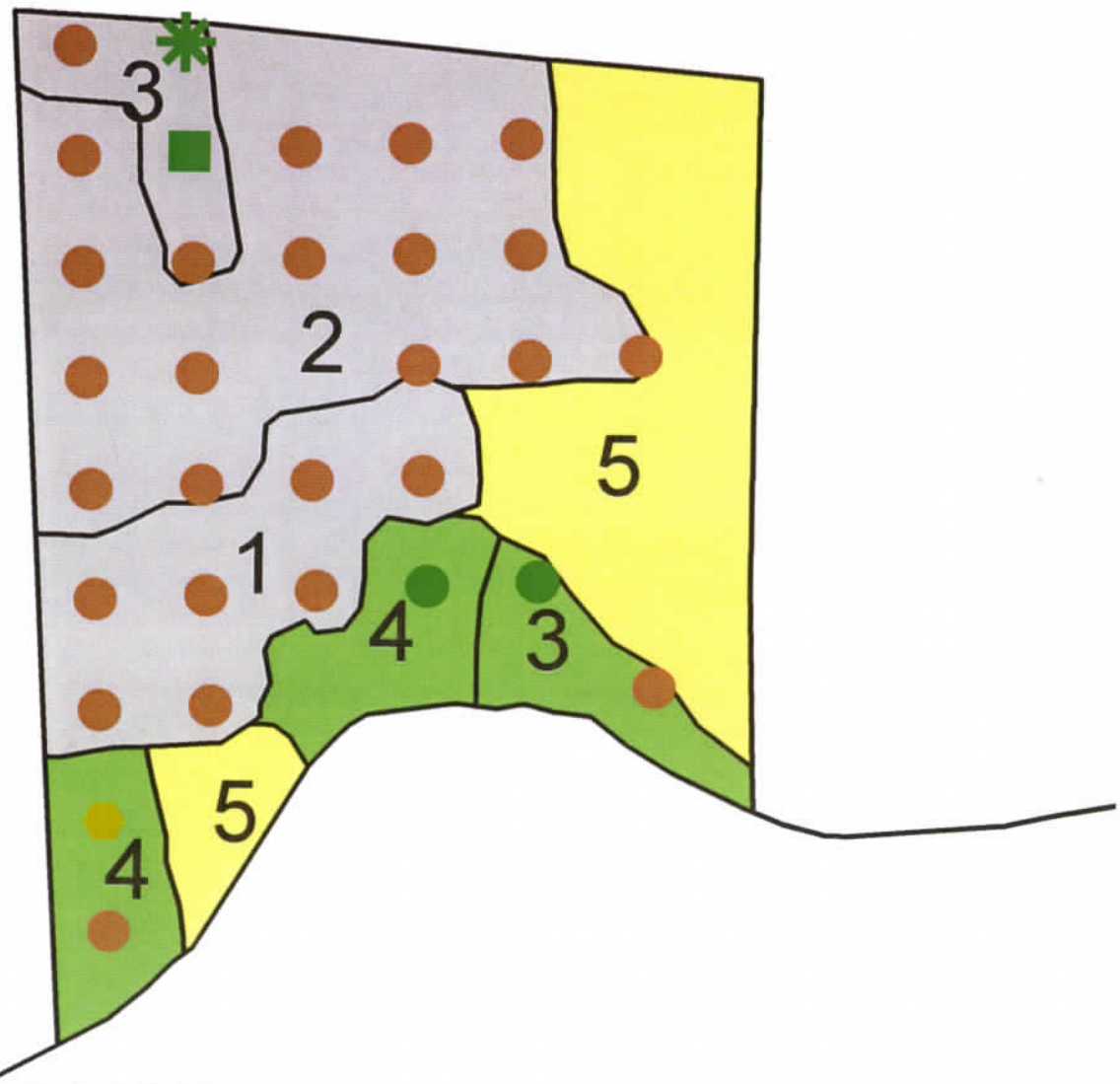
Back Mountain Lot - Operability



500 0 500 Feet

L.Chute, 1999

Back Mountain Lot - Management Recommendations



500 0 500 Feet

L.Chute, 1999

Table 6: Harvest Schedule and Estimated Revenue

BACK MTN. RD.	<u>Management Unit 3</u>		<u>Management Unit 4</u>		<u>Property Total</u>	
PRODUCT	VOLUME	VALUE	VOLUME	VALUE	VOLUME	VALUE
Red Oak saw	6.6	\$1,485	0		6.6	\$1,485
White Ash saw	3.4	\$340	0		3.4	\$340
White Birch saw	2	\$130	0		2	\$130
Black Cherry saw	0		5.6	\$196	5.6	\$196
Red Spruce saw	0		19.1	\$1,433	19.1	\$1,433
TOTAL saw (Mbf)	12	\$1,955	24.7	\$1,629	36.7	\$3,584
TOTAL pulp (cords)	15	\$75	53	\$265	68	\$340
TOTAL all products		\$2,030		\$1,894		\$3,924

A timber sale of MU's 3 and 4 should be conducted in the summer, as Old Bradford Road is unplowed in winter. The inability to access the northern stand of MU3 will reduce the potential revenue of a MU3 harvest to perhaps half of the total, or \$1,000. Nevertheless, an estimated yield of about \$3,000 could be realized by the Town by harvesting the other three accessible stands in MU's 3 and 4. This is a relatively small sale which may make it hard to find an operator, but certainly not impossible.

Harvest Schedule:

2003, or after harvests at the Camp Morgan and Huntley Mountain Road properties.

3 BARRETT POND LOT

3.1 Property Data

3.1.1 Regional Context (See Map # 1)

The Barrett Pond property is the combination of three adjoining tracts; Jeft's Lot in the south, the Barrett Pond Lot in the middle, and the Russell Pond Lot in the north. Together, they make up a deeded area of 191 acres. These lands are important for the conservation of large tracts of open space, as they connect three other conservation lands to each other. To the west, in Marlow, is the 285 acre Orenda-Stickey Wicket Wildlife Sanctuary. To the east is the 25-acre Ashuelot Wildlife Sanctuary, belonging to the NH Audubon Society. To the south, in both Stoddard and Washington, is the 11,000-acre Andorra Forest. All told, a combined conservation area of 6,184 acres is being held together thanks to the Town of Washington's Barrett Pond Property.

3.1.2 Tax and Deed Information

BARRETT POND

Deed reference: Not on file at Town Hall

Date acquired: Not on file at Town Hall

Previous owner: Not on file at Town Hall

Tax information: Map # 18, lot 006

Assessed value: Land assessed at \$15,700 as of 7-10-98

Current use value: \$15,700

BARRETT POND SOUTH

Deed reference: Not on file at Town Hall

Date acquired: Not on file at Town Hall

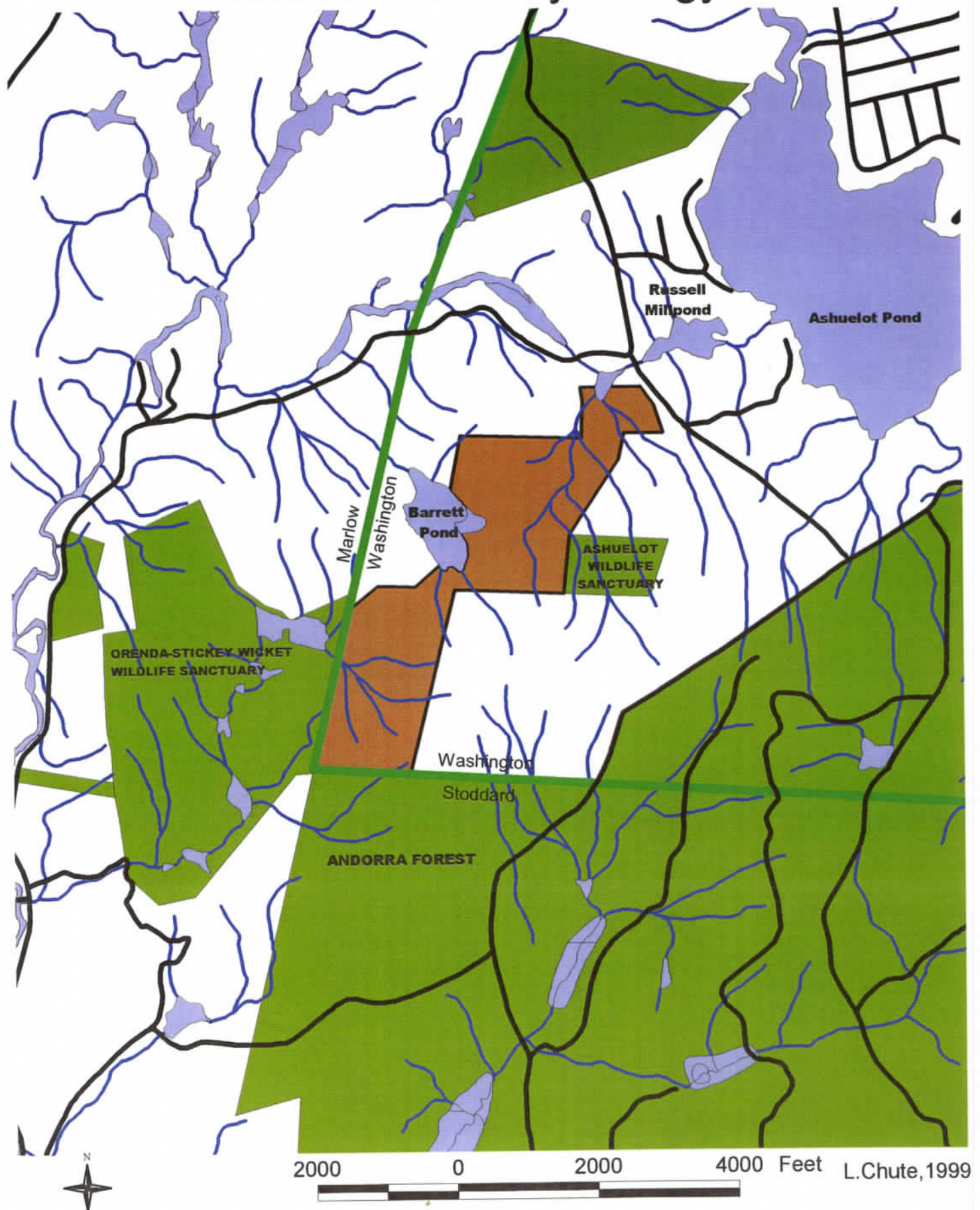
Previous owner: Not on file at Town Hall

Tax information: Map # 18, lot 034

Assessed value: Land assessed at \$28,800 as of 7-10-98

Current use value: \$28,800

Barrett Pond Lots- Location and Hydrology



RUSSELL MILL POND

Deed reference: 973/250

Date acquired: 7-3-92

Previous owner: Lloyd and Jane Banks

Tax information: Map # 18, Lot 007

Assessed value: Land assessed at \$29,400 as of 7-10-98

Current use value: \$29,400

3.1.3 Boundary Line Status

With the exception of the Marlow and Stoddard Town Lines, which serve as eastern and southern bounds, the boundaries of this property are unmarked and largely unknown.

Survey Map: No survey map is known for this property.

Property corner markers: The only property corner that was definitely found for this property was the Washington/Stoddard corner, which is clearly marked.

ACTION ITEM: This property is in critical need of survey. The property map used during the inventory did not “work” on the ground: most bounds could not be located, and distance problems in the Russell Pond area were significant. It would be very unwise for the Town to conduct timber harvests given these problems, as a timber trespass could be the unfortunate result. Further, an ATV trail system by Russell Pond may be encroaching on Town land, but this could not be determined with certainty due to the problems with the map. A portion of timber revenues from another Town Forest harvest can and should be used to pay for a survey of this property, which will prove to be a valuable timber asset to the Town in time.

3.1.4 Access

Main Road: There is no access into this property at present. A right of way is needed from Russell Millpond Road, which is only 125' east of the northeastern-most bound. Once obtained, an internal woods road could gradually be built which would allow for the management of both the “Russell Pond” and “Barrett Pond” sections. Alternatively, access via the Jeft’s Lot section in the south would be more trouble than it is worth, as the closest place a truck could get to the land is 1500'. Furthermore, it is doubtful that access could be achieved from the “Jeft’s Lot” section into the “Barrett” or “Russell Millpond” sections, due to wet soils and steep and rocky terrain. For these reasons, access into the Barrett Pond property should prioritize obtaining a right of way via Russell Millpond Road, as it is easier, closer, and would allow access to more of the entire property.

Gate(s): There are no gates on this property.

Property signs: There are no property signs on this property.

Internal Roads: There are no internal roads within this property.

3.1.5 Recreation

Foot Trails: There are no hiking trails on this property.

Other known uses: A snowmobile trail leads from Russell Millpond to Barrett Pond. The trail also appears to be used by ATV's. A lot of garbage was noticed at the shore of Barrett Pond on this trail.

A variety of old (20 years?) camping equipment was found strewn in the woods on the eastern shore of Barrett Pond (a coffeepot, tin cans, etc.)

A woods road/ATV trail heads south from houses west of Russell Millpond. This trail appears to enter the Barrett Pond property, but the property map was unreliable in this section. Firewood is being removed along this trail. A survey is needed to determine where the bounds are in this section before the extent of trail encroachment can be determined.

ACTION ITEM:

Consider eventually building a hiking trail to the very special pocket of ancient trees in MU2. Future harvests of the "Russell Millpond" and "Barrett Pond" sections will create skid trails that could facilitate foot access as far as the north edge of the "Jeft's Lot" section. From there, a hiking trail could continue to the rough terrain of MU2.

Encourage users of the snowmobile trail to stop littering at the shore of Barrett Pond. Consider installing a sign at this location to that effect.

3.1.6 Historical Influences

3.1.6.1 Human

There are a number of internal stone walls within the property, indicating former agricultural activities. No cellar holes were seen during the inventory, but old fields and apple trees were found in the northern part of the Barrett Pond section.

3.1.6.2 Non-Human

Significant fire evidence was found in the southern "Jeft's Lot" section, including charcoal on the ground and numerous fire-scarred trees (see the disturbance map). The fire scars were seen on nearly every large tree on the mid-southern slopes of Starks Hill (see topography map). Above this elevation, heading up to the eastern bound of the section, no large trees were seen, suggesting that the fire was more intense higher up. A map of the Marlow Fire of 1941 clearly shows it to have burned this area. Fire scars are consistently found on the uphill side of every tree, which would suggest that the fire burned uphill, intensifying as it gained elevation.

Significant moose barking of red maple was also seen on the southern "Jeft's Lot" section, particularly to the west of the old burn (see Disturbance map). Moose have left their tooth marks on many of the area's red maples, from poles up to small diameter sawlogs. Although most of these trees are too large to be killed from the barking, many of the wounds will decay, creating cavity opportunities for wildlife.

3.1.7 Impact of the Ice Storm of 1998 (See Ice Storm Damage Map)

Ice storm damage to the Barrett Pond property was concentrated in the Barrett Pond section and was minimal overall. Of seven sample points that were identified as having ice storm damage, five were recorded as being either very slight or slight. The area of greatest ice damage was on the north facing slopes of Starks Hill, where white birches and red oaks were observed to have broken branches and some broken-out tops. Bent-over white birches were also seen in several clumps adjacent to more land burned in the Marlow fire. If access were not a problem and the moderately damaged areas were larger, a group selection cut to salvage the damaged trees and favor white birch replacement would be desirable. However, these damaged stands are both young, small and difficult to reach, making their treatment an expensive and unnecessary endeavor.

3.2 Ecosystem Information

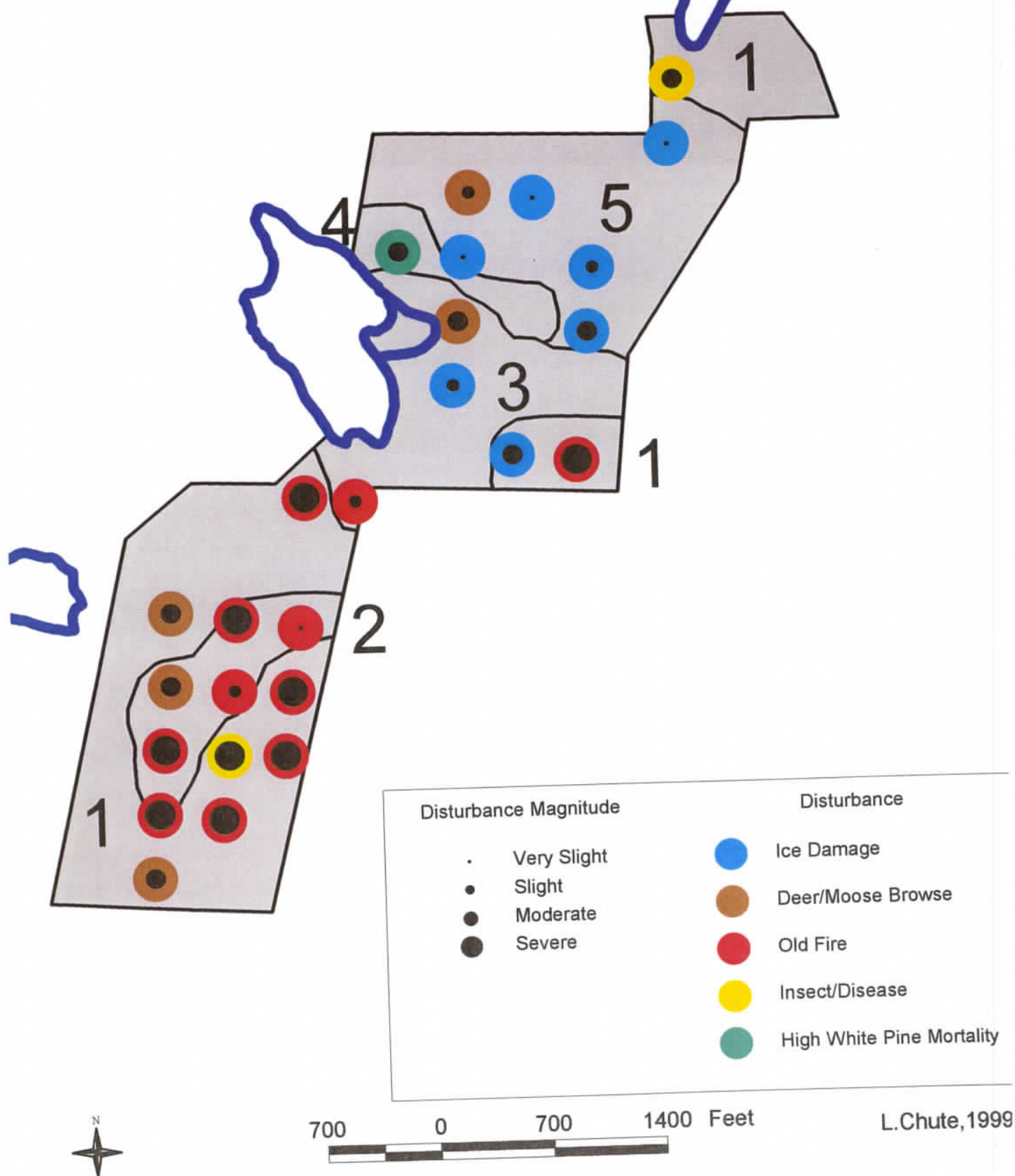
3.2.1 Hydrology (See Map #1)

Wetlands Features: There are many wetlands features on the Barrett pond property. The Town has the entire eastern shore of Barrett Pond, as well as the southern end of Russell Millpond. There are also a series of intermittent and perennial streams flowing across the property, from Starks Hill into Barrett and Russell Mill ponds (and to an unnamed wetland in the Orenda Stickey Wicket Wildlife Sanctuary). These streams are important sources of recharge for these water bodies, and should be protected from siltation during any harvest activities.

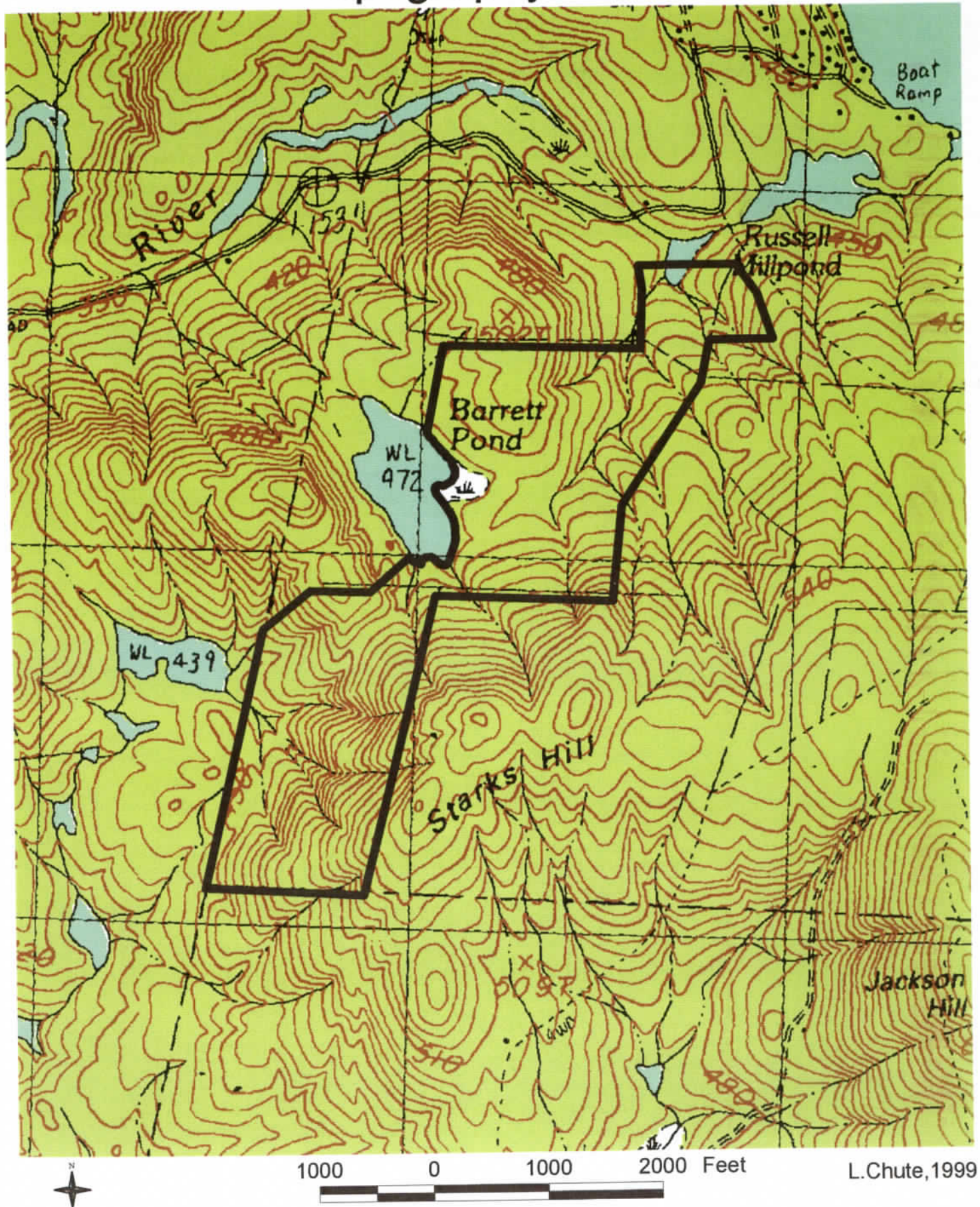
3.2.2 Topography (See Map #3)

The primary topographic feature of the Barrett Pond property is Starks Hill, the summit of which is found just east of the "Jeft's Lot" section. In fact, the "Jeft's Lot" section consists almost entirely of the western slopes of this hill, making it largely inoperable for forest management. The northern edge of the "Jeft's Lot" section is a massive rock outcrop, affording partial views to the north and south. By contrast, the "Barrett Pond" and "Russell Millpond" sections have much less slope, although there is a large boulder field between these sections.

Barrett Pond - Ice Storm Damage and Other Disturbances



Barrett Pond Lot - Topography



3.2.3 Soils (See Map #4)

The “Jeft’s Lot” section is mostly a combination of physically limited Lyman/Monadnock rock outcrop to the east and physically limited Monadnock/Lyman rock outcrop to the north. A smaller area of Monadnock/Herman soils are found to the west, which would support red oak and white pine as the best species to favor.

The “Barrett Pond” section is a mix of different soils, perhaps the best being the Marlow very stony loam found to the east. This soil is well suited for growing sugar maple and other northern hardwood species, as well as red oak. Other good soils include the Peru very stony loam and Monadnock/Hermon extremely stony fine sandy loam soils found in the south and center of this section.

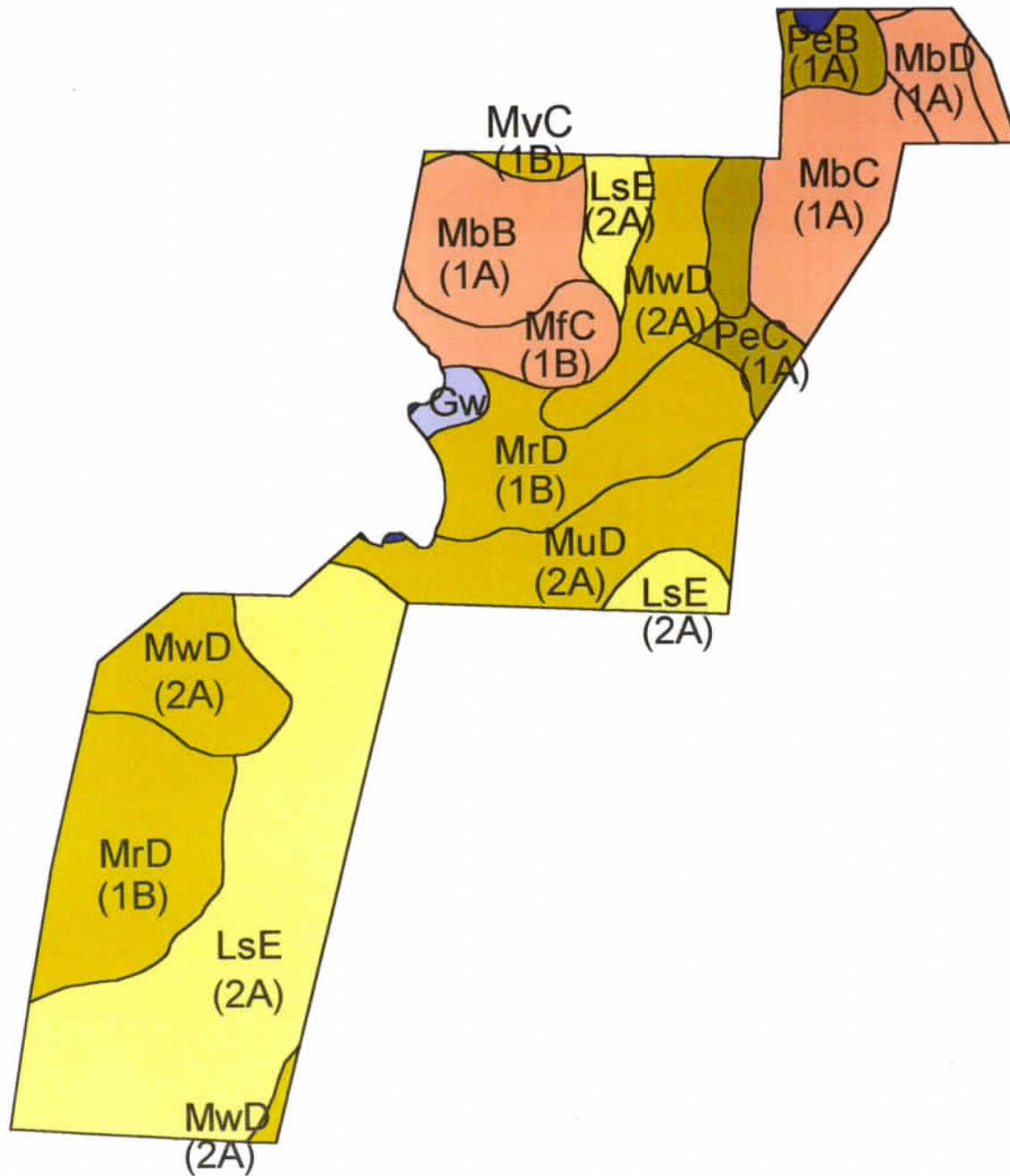
The “Russell Millpond” section consists mostly of Marlow very stony loam, an excellent soil for growing most hardwood species.

Table 1: Soils

Soil Type	Acreage	Drainage & Slope	Woodland Limitation Ratings
Monadnock/Lyman/ Rock Outcrop Very stony-fine sandy loam MwD	22.0	well to somewhat excessively drained	erosion-----moderate use of equipment-----moderate seedling mortality- slight/mod. windthrow----- slight/severe
Monadnock Very stony-fine sandy loam MfC	0.2	well drained	erosion-----slight use of equipment-----slight seedling mortality-----slight windthrow-----slight
Lyman/Monadnock/ Rock Outcrop Very stony-fine sandy loam LsE	58.6	somewhat excessively to well drained	erosion-----severe use of equipment-----severe seedling mortality-mod./slight windthrow-----severe/ slight
Marlow Very stony-loam MbC MbD	1.3(C) 5.2(D)	well drained	erosion---C slight, D moderate use of equipment--C slight, D moderate seedling mortality-----slight windthrow-----moderate
Monadnock/Lyman Very stony-fine sandy loam MvC	1.3	well to somewhat excessively drained	erosion-----slight use of equipment-----slight seedling mortality-slight/mod. windthrow-----slight/severe
Water (greater than 40) Water	0.4	x	erosion-----x use of equipment-----x seedling mortality-----x windthrow-----x
Peru Very stony-loam	7.8(B)	moderately well drained	erosion----- slight use of equipment-----slight

PeB PeC	3.1(C)		seedling mortality-----slight windthrow----- moderate
Monadnock Very stony-fine sandy loam MfC	7.5	well drained	erosion----- slight use of equipment-----slight seedling mortality-----slight windthrow----- slight
Marlow Very stony-loam MbB MbC	13.3(B) 15.6(C)	well drained	erosion----- slight use of equipment-----slight seedling mortality-----slight windthrow-----moderate
Monadnock/Hermon Extremely stony-fine sandy loam MrD	39.6	well to somewhat excessively drained	erosion-----moderate use of equipment---moderate seedling mortality----- slight/severe windthrow-----slight
Greenwood Mucky peat Gw	1.8	very poorly drained	erosion-----slight use of equipment-----severe seedling mortality-----severe windthrow----- severe
Monadnock/Hermon Extremely bouldery- fine sandy loam MuD	16.6	well to somewhat excessively drained	erosion-----moderate use of equipment-----severe seedling mortality----- slight/severe windthrow-----slight

Barrett Pond Lot - Soils



Soil Drainage Classes

	somewhat excessively to well drained
	well to somewhat excessively drained
	well drained
	moderately well drained
	very poorly drained
	water

Important Forest Soil Groups

1A	loamy; favor sugar maple, white ash, birch and red oak
1B	sandy/loamy; favor red oak, white pine, birch and red spruce
2A	physically limited for forest management



700 0 700 1400 Feet



L.Chute, 1999

3.2.4 Wildlife

3.2.4.1 Habitats

Barrett Pond has a variety of habitats for wildlife. Both Barrett Pond and Russell Millpond offer excellent aquatic habitats for amphibians, reptiles and warm water fishes. There is a diversity of forest types and age classes, including old fields with apple trees (used by many wildlife species). Internal streams are also valuable, as are the rock outcrops and boulder fields. Another important asset to wildlife is that the “Jeft’s Lot” section is wedged between two wildlife sanctuaries.

ACTION ITEM:

Consider emphasizing the “Jeft’s Lot” section as a wildlife refuge, to maximize it’s value as a bridge between the Orenda and Audubon Society Wildlife Sanctuaries. Investigate the possibility of monetary compensation by the Orenda group for either an easement or other vehicle that would ensure the use of the “Jeft’s Lot” by wildlife in perpetuity.

3.2.4.2 Dead Standing Trees (Snags)

Snags are dead standing trees that are used by wildlife. Ten species of birds excavate cavities in dead or dying trees for nesting and roosting; another 15 birds and 18 mammals use these cavities for nesting, roosting, or denning. The “Good Forestry in the Granite State” guide recommends 6 snags per acre; 4 of which should be greater than 12” in diameter, and at least 1 greater than 18”. The following table summarizes the estimate of snag trees per acre per stand on the Barrett Pond property:

Table 2: Snags

Forest Type	Percent of all trees that are dead(snags)	Total snag Trees/acre	6 snag trees/acre?	4 snags > 12”?	1 snag > 18”?
1	9%	24.6	Yes	No	No
2	8%	15.7	Yes	No	No
3	14%	53.5	Yes	No	No
4	13%	29.2	Yes	Yes	Yes
5	5%	11.3	Yes	No	No

The preceding table indicates a shortage of snag trees in the larger diameter classes in all forest types but #4. Only stand 4 was found to meet the recommended guideline for snags over 18” in diameter. Given the small size of stand 4, the property would appear to benefit from more large snags in other forest types.

ACTION ITEM: Retain snags and cavity trees where possible, especially large diameter ones.

3.2.5 Plant-life

95 species of plants were recorded during the inventory in addition to the tree species picked up by the timber cruise. No rare or endangered species were found, but the aquatic plants growing in and around Barrett Pond and Russell Millpond may contain some interesting species missed by the inventory.

Table 3: Plants Recorded on the Property During the Inventory

BARRETT POND LOT

COMMON NAME	SCIENTIFIC NAME
"Lowbush" Blueberry Species	Vaccinium sp
Alternate-leaved Dogwood	Cornus alternifolia
American Yew	Taxus canadensis
Arrow-wood	Viburnum dentatum var. lucidum
Aster Species	Aster sp
Beaked Hazelnut	Corylus cornuta
Bedstraw Species	Galium sp.
Black Ash	Fraxinus nigra
Black Huckleberry	Gaylussacia baccata
Bluebead Lily	Clintonia borealis
Bracken Fern	Pteridium aquilinum var. latiusculum
Broad Beech Fern	Phegopteris hexagonoptera
Bunchberry	Cornus canadensis
Bush Honeysuckle	Diervilla lonicera
Canada Mayflower	Maianthemum canadense
Canadian Fly Honeysuckle	Lonicera canadensis
Christmas Fern	Polystichum acrostichoides
Cinnamon Fern	Osmunda cinnamomea
Dewberry Species	Rubus sp
Downy Rattlesnake-plantain	Goodyera pubescens
Dwarf Enchanter's Nightshade	Circaea alpina
Dwarf Raspberry	Rubus pubescens
Early Sweet Blueberry	Vaccinium pallidum
False Solomon's Seal	Smilacina racemosa
Foamflower	Tiarella cordifolia
Fringed Bindweed	Polygonum cilinode
Goldenrod Species	Solidago sp
Goldthread	Coptis trifolia var. groenlandica
Green Wood Orchid	Platanthera clavellata
Ground Cedar	Diphasiastrum tristachyum
Haircap moss Species	Polytrichum sp
Hairy Solomon's Seal	Polygonatum pubescens
Hawthorn Species	Crataegus sp
Hay-scented Fern	Dennstaedtia punctilobula

Hobblebush
Hop Hornbeam
Indian Pipes
Indian Poke
Interrupted Fern
Jack-in-the-Pulpit (Common)
Juniper (Common)

Lady Fern

Larger Blue Flag Iris
Leatherleaf
Male-berry
Maple-leaved Viburnum
Marginal Wood Fern
Marsh Fern

Meadow Horsetail
Meadow-sweet
Mountain Holly
Nannyberry
New York Fern
Northern Wood Sorrel
Oak Fern
Painted Trillium
Panicked Hawkweed
Partridge-berry
Pink Lady's-slipper
Pitcher-plant
Purple Trillium
Red Elderberry

Rock Polypody
Rose Species
Round-leaved Violet
Rubus Species
Running Clubmoss
Sensitive Fern
Serviceberry Species
Sheep Laurel
Shining Clubmoss
Shinleaf (Common)
Sphagnum moss
Spinulose Wood Fern Species
St. John's Wort Species
Star-flower
Steeple-bush
Stiff Clubmoss
Strawberry Species
Swamp Dewberry
Sweet Gale
Tree Clubmoss

Viburnum alnifolium
Ostrya virginiana
Monotropa uniflora
Veratrum viride
Osmunda claytoniana
Arisaema triphyllum
Juniperus communis var.
depressa
Athyrium felix-femina var.
angustum
Iris versicolor
Chamaedaphne calyculata
Lyonia ligustrina
Viburnum acerifolium
Dryopteris marginalis
Thelypteris palustris var.
pubescens
Equisetum pratense
Spiraea alba
Nemopanthus mucronatus
Viburnum lentago
Thelypteris noveboracensis
Oxalis acetosella
Gymnocarpium dryopteris
Trillium undulatum
Hieracium paniculatum
Mitchella repens
Cypripedium acaule
Sarracenia purpurea
Trillium erectum
Sambucus racemosa ssp.
pubens
Polypodium virginianum
Rosa sp
Viola rotundifolia
Rubus sp
Lycopodium clavatum
Onoclea sensibilis
Amelanchier sp
Kalmia angustifolia
Huperzia lucidula
Pyrola elliptica
Sphagnum sp
Dryopteris sp.
Hypericum sp
Trientalis borealis
Spiraea tomentosa
Lycopodium annotinum
Fragaria sp
Rubus hispidus
Myrica gale
Lycopodium dendroideum

Turtlehead
Velvet-leaf Blueberry
Water Pennywort
White Baneberry
Whorled Wood Aster
Wild Lettuce Species
Wild Oats
Wild Raisin

Wild Sarsaparilla
Willow Herb Species
Winterberry Holly
Wintergreen
Yarrow Species
Yellow Loosestrife

Chelone glabra
Vaccinium myrtilloides
Hydrocotyle americana
Actaea alba
Aster acuminatus
Lactuca sp
Uvularia sessilifolia
Viburnum nudum var.
cassinoides
Aralia nudicaulis
Epilobium sp
Ilex verticillata
Gaultheria procumbens
Achillea sp
Lysimachia terrestris

3.3 Timber Resources

3.3.1 Management Units (See Map #5)

3.3.1.1 Management Unit Descriptions (See Maps #5 and #6)

There are five management units (MU's) on the Barrett Pond property:

- 1) MU 1 is the largest forest type on the property, consisting of one stand in each section. MU 1 is made up of scattered white ashes, red maples, sugar maples and white birches of small sawtimber size (12-16"), below which are more abundant pole-sized trees of the same species. Most of the land burned in the Marlow Fire is contained within MU 1. The bulk of MU 1 is found in the "Jeft's Lot" section, and is difficult to operate due to slope and terrain restrictions.
- 2) MU 2 is a small pocket of scattered large sawtimber trees with smaller poles below. The tree species are mostly sugar maple, white ash and red maple, with occasional large yellow birches as well. Most of the large trees have been scarred by the Marlow Fire – some are now hollow as a result. The terrain is both rocky and steep and would be very difficult to operate in.
- 3) MU 3 makes up the southern half of the "Barrett Pond" section, and is distinct in that it contains a sizable amount of red spruce mixed with red maple and black cherry. Trees are mostly pole-sized, with scattered larger stems of small and large sawtimber diameters.
- 4) MU 4 is a small pocket of scattered mature white pine in the center of the "Barrett Pond" section, below which are pole-sized red maples and white birches. The western half of this stand has a large number of dead, large white pines, the cause of which is unknown.
- 5) MU 5 makes up the northern half of the "Barrett Pond" section, and consists of a mixture of red oak, red maple and sugar maple poles with occasional small sawtimber trees. Although currently young, this is a valuable stand that deserves to be cultivated. A large boulder field to the east will pose some operating problems that must be worked around.

Table 4: Operable Forest Type Management Units

<u>MU# - Forest Type</u>	<u>Total Acres</u>	<u>Operability Limitations</u>	<u>Basal Area per Acre</u>	<u>Mean Stand Diameter</u>	<u>Total saw timber/acre (bd.ft.)</u>	<u>Cut saw timber/acre (bd.ft.)</u>	<u>Total pulp /acre (cfs.)</u>	<u>Cut pulp /acre (cfs.)</u>
1- H4D/H3B	76.8	Entire southern section limited by slope and terrain	109	8.6	1,700	500	16.8	0
2- H5D/H3B	17.8	Limited by slope and terrain	137	11	4,400	1,800	18.4	6.0
3- HS5D/HS3B	24.8	None	136	8.2	1,800	0	22	0
4- SH5D/H3B	8.6	None	130	10.4	0	0	13.2	0
5- H4D/H3B	48.6	Partial slope and terrain problems	93	8.9	1,800	400	14.4	0

3.3.1.2 Management Unit Prescriptions (See Map #7)

MU1) This MU needs time to grow; the average diameter is not yet commercial. The stands of MU 1 in the “Russell Millpond” and “Barrett Pond” sections, however, are growing fast and will probably benefit from a thinning in ten years. Access and operability problems in the “Jeft’s Lot “ section make management of this area difficult at best. The “Jeft’s Lot” section should be reserved for wildlife, and the possibility of acquiring money for such reservation should be explored.

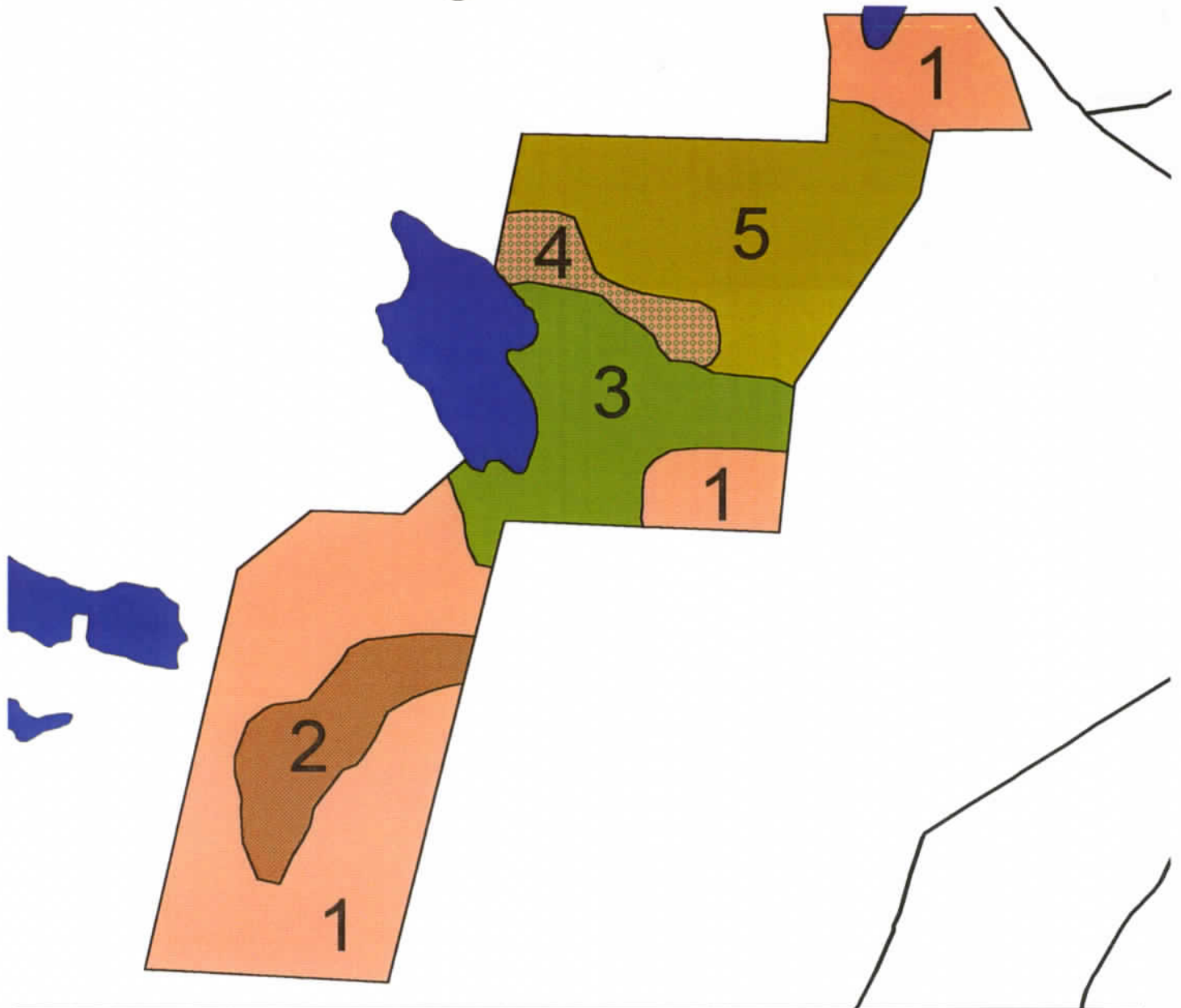
MU2) MU 2 could currently support a commercial harvest were it more accessible and operable. The value of the cut would be low, however, due to the presence of many scarred stems and the added costs from long skidding distances (around \$3,300 for 31,000 bf of sugar maple, white ash and red maple sawtimber). The scattered presence of very large and majestic yellow birches and sugar maples combined with flowing brooks and large boulders makes this MU an excellent candidate for a natural area. A hiking trail designed to show off the best features of this old-growth MU would allow more residents of the Town to enjoy this very special place.

MU3) This management unit needs time to grow into the small sawtimber category. In ten years, however, a commercial thinning would be recommended to improve the stands quality and spacing.

MU4) This small mature pine stand should be left intact until the younger trees below reach commercial proportions. In ten years, however, a shelterwood cut in ten years designed to promote white pine regeneration will prove profitable. By waiting ten years, the younger hardwoods will reach sawtimber sizes. The removal of many of these trees as well as some of the large pines would then be done to promote white pine regeneration, providing good income to the Town in the process.

MU5) This stand should be left to grow, as most stems are still too young to cut. A careful thinning designed to favor red oak and sugar maple could be done in ten years, however, at the same time as the other anticipated harvests in adjacent MU's.

Barrett Pond Lot - Management Units



Forest Types

	H4D/H3B
	H5D/H3B
	HS5D/HS3B
	S5D/H3B
	H4D/H3B
	Inoperable - Barrett and Russell Ponds

Dominant Tree Species

White Ash, Red Maple, Sugar Maple, White Birch
White Ash, Sugar Maple, Red Maple
Red Maple, Red Spruce, Black Cherry
White Pine, Red Maple, White Birch
Red Oak, Red Maple, Sugar Maple
None



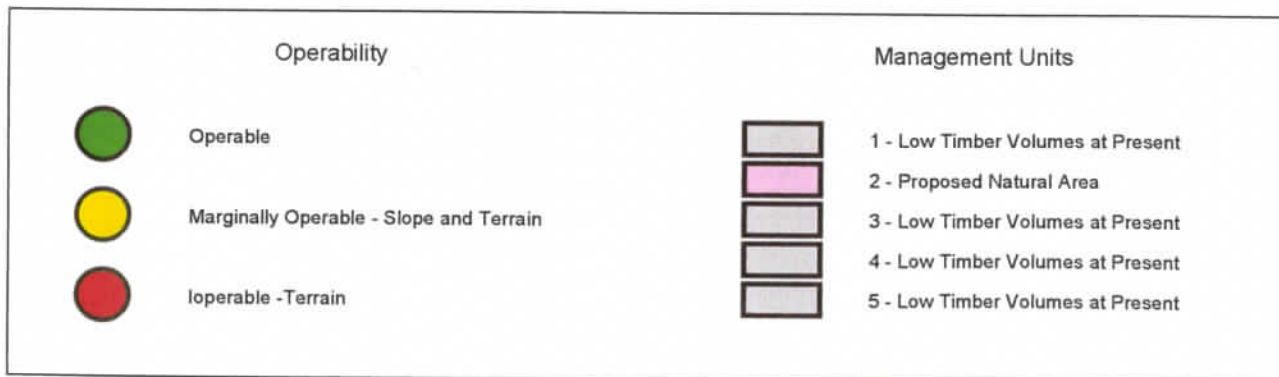
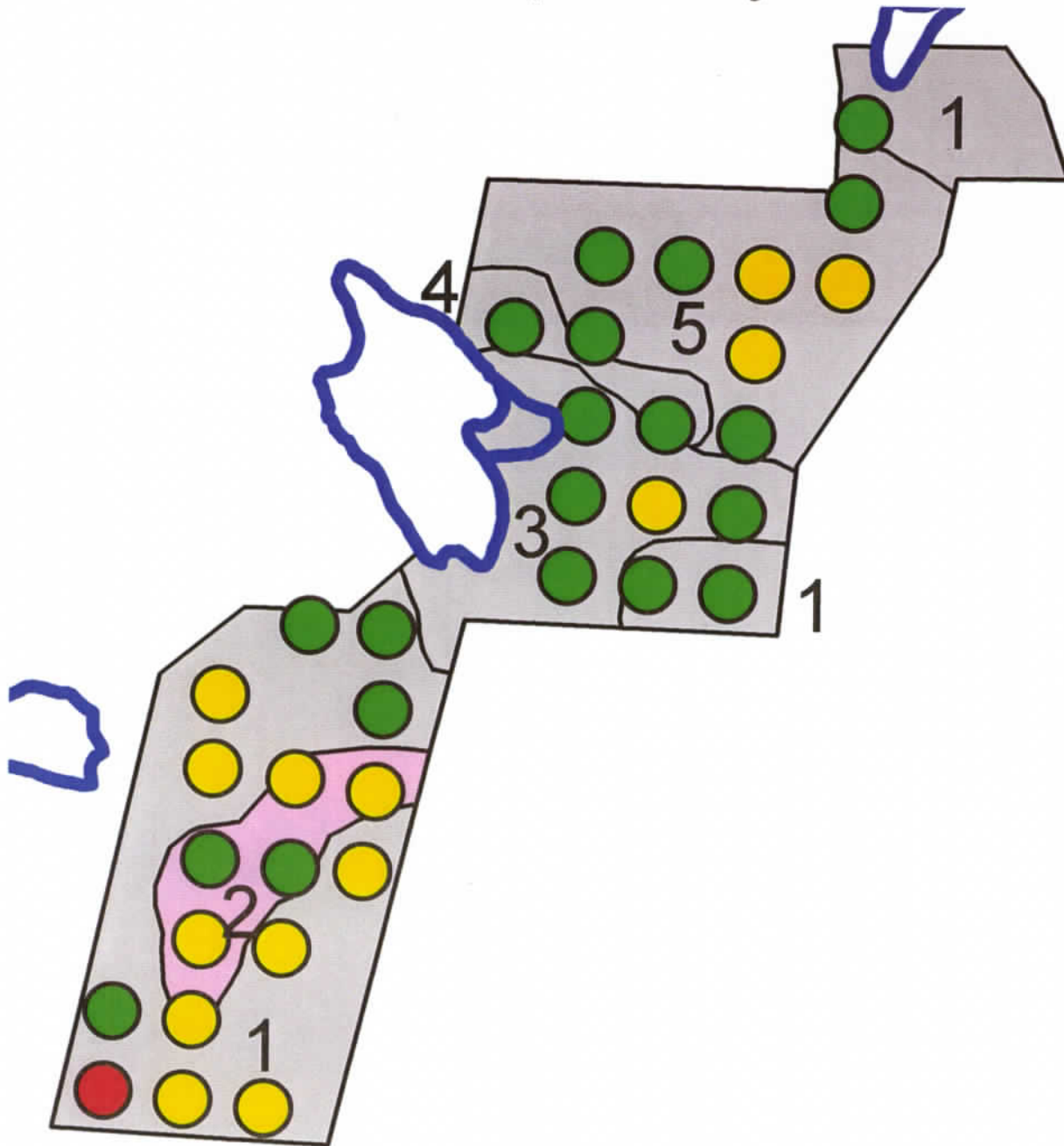
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L.Chute, 1999

Table 5: Forest Type Legend

<u>Overstory</u>	<u>/Understory Codes</u>
<i>H =</i>	<i>Majority of trees are hardwood</i>
<i>S =</i>	<i>Majority of trees are softwoods</i>
<u>Diameter</u>	<u>Codes</u>
<i>1 =</i>	<i>Seedlings up to 4.5 feet in height</i>
<i>2 =</i>	<i>Saplings 4.5 feet in height up to 4" in diameter</i>
<i>3 =</i>	<i>Poles 4" to 12" for hardwoods, 4-10" for softwoods</i>
<i>4 =</i>	<i>Small Sawlogs 12" to 16"</i>
<i>5 =</i>	<i>Large Sawlogs 18" in diameter and larger</i>
<u>Crown</u>	<u>Closure</u>
<i>A =</i>	<i>80 to 100% Crown Closure</i>
<i>B =</i>	<i>61 to 80% Crown Closure</i>
<i>C =</i>	<i>31 to 60% Crown Closure</i>
<i>D =</i>	<i>5 to 30% Crown Closure</i>
<i>MSD =</i>	<i>Mean stand diameter, a measure of relative diameter sizes</i>
<i>BA =</i>	<i>Basal Area, a relative measure of stand density or stocking. Desired basal area for hardwoods is 70 square feet per acre; 80 square feet for softwoods, and 90 square feet for white pine. Basal area averages that exceed 30 or more square feet to the acre (for each category) can be thinned back to the desired basal area to maximize stand potential.</i>
<i>Cut Volumes</i>	<i>Cut volumes per acre indicate the amount of sawlogs or pulpwood volumes per acre that are merchantable. The board foot cut volumes should exceed 1,000 BF of sawlogs per acre (or 2 to 4 cords of pulp per acre or a combination of both) in order to be of commercial interest to a logger.</i>

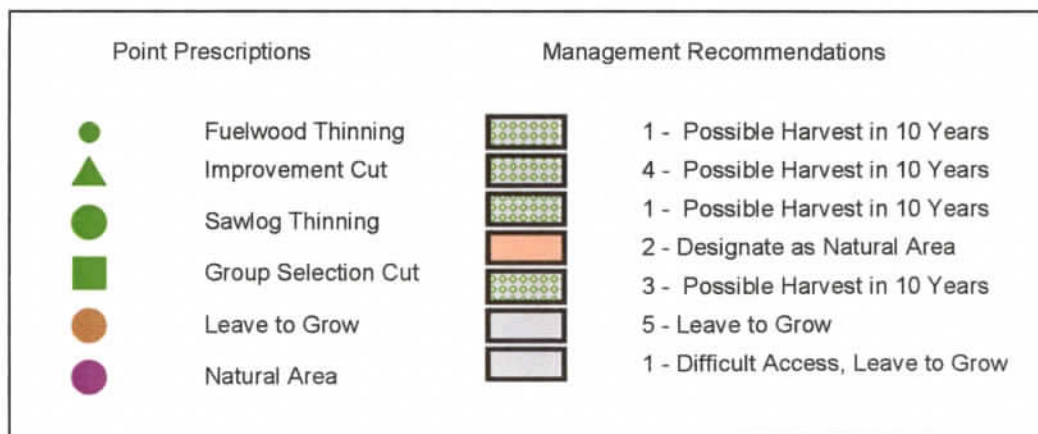
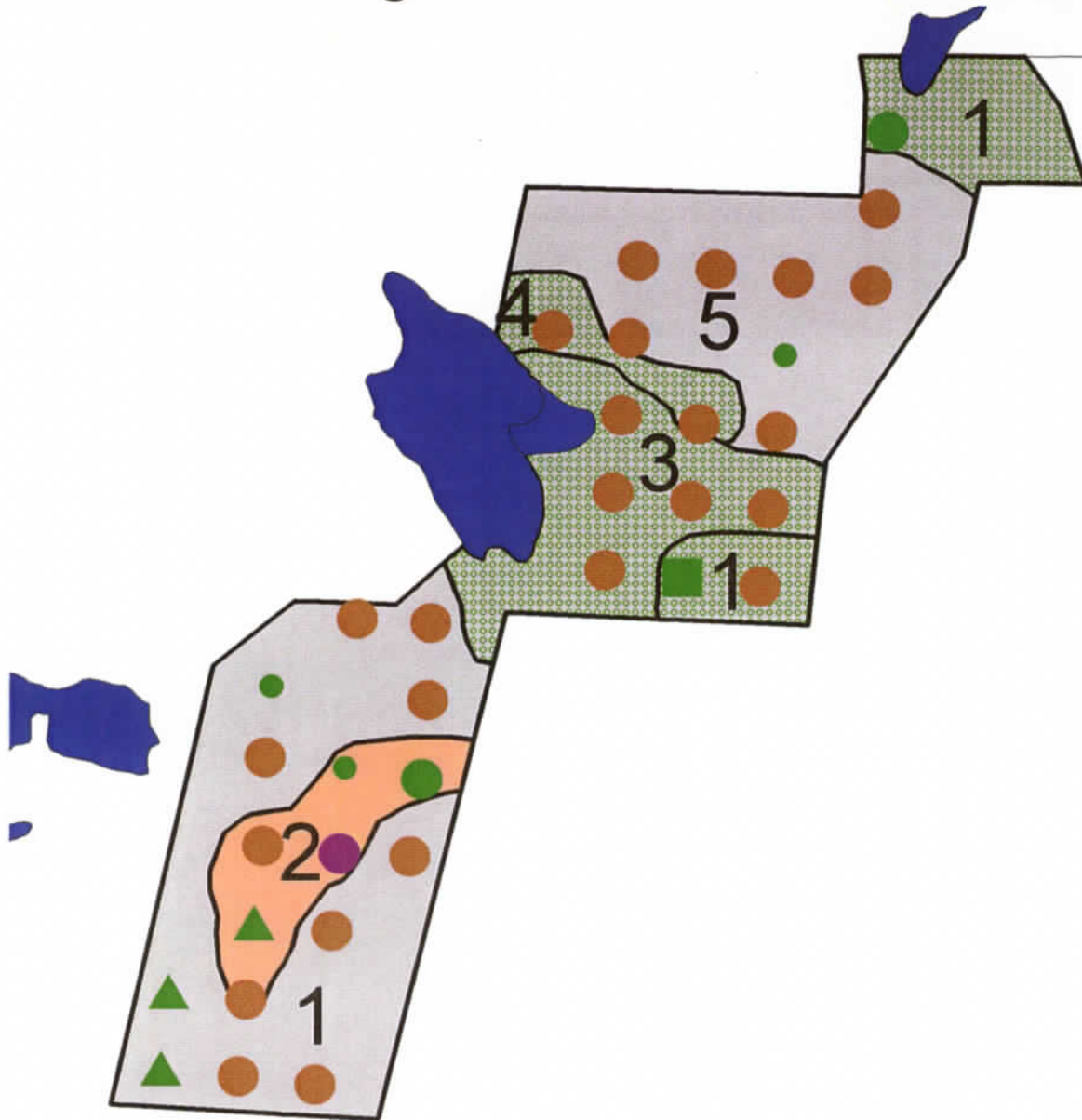
Barrett Pond Lot - Operability



700 0 700 1400 Feet

L.Chute, 1999

Barrett Pond Lot - Management Recommendations



1000 0 1000 Feet

L.Chute, 1999

Table 6: Harvest Schedule and Estimated Revenue

No management units are recommended for harvest on the Barrett Pond property for the next decade. In ten years, however, much of the “Barrett Pond” and “Russell Millpond” sections will be ready for thinnings and improvement cuts. Although this property will not contribute income for the next ten years its long-term value to the Town is very high, as most of the property is well stocked with fast-growing desirable timber species such as red oak, sugar maple, white pine and red spruce.

4CAMP MORGAN

4.1 Property Data

4.1.1 Regional Context (See Map # 1)

Camp Morgan is close to the Clark Robinson Memorial Forest that contains most of Oak Hill. The Camp Morgan property has thousands of feet of unspoiled shoreline surrounding the northern end of Millen Pond. The Town School, Public Beach, Ballfield and Lodge building are all situated on Camp Morgan, in a 26-acre section of the property just south of Millen Pond Road. As these areas are not considered part of the Town Forest lands, they will not be considered in the following description of the Camp Morgan property. There are two areas totaling 131 acres that are currently undeveloped and forested: the 23-acre section just north of Millen Pond Road, and the 108 acres of unbroken forest south of the Town buildings and recreational area. For the purpose of this forest management plan, only these two forested areas of Camp Morgan will be discussed.

4.1.2 Tax and Deed Information

CAMP MORGAN (11-41)

Deed reference: Not on file at Town Hall

Date acquired: Not on file at Town Hall

Previous owner: The Young Men's Christian Association (YMCA)

Tax information: Map # 11, lot 041

Assessed value: Land assessed at \$35,500 as of 6-11-98

Current use value: \$35,500

CAMP MORGAN

Deed reference: Not on file at Town Hall

Date acquired: Not on file at Town Hall

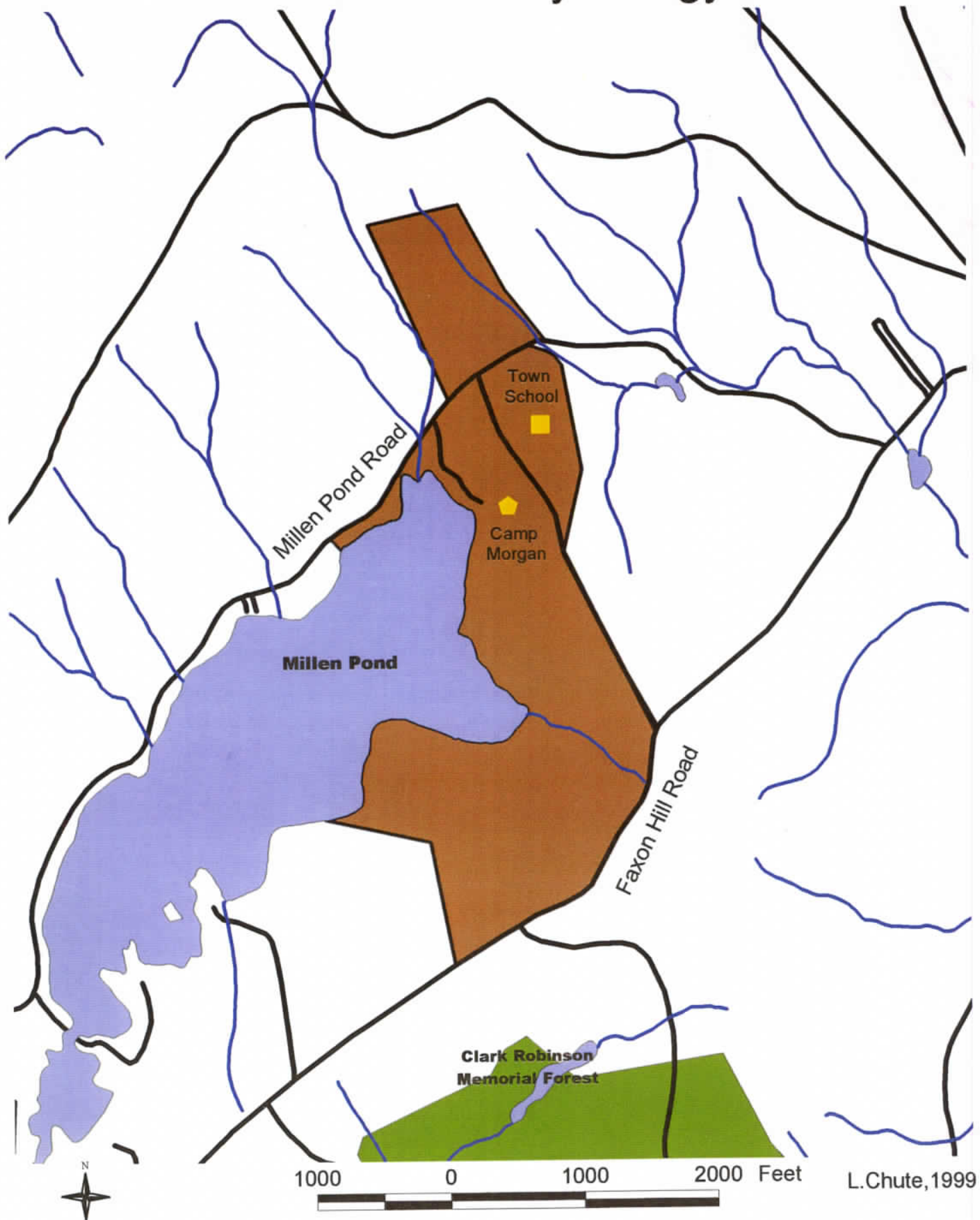
Previous owner: The Young Men's Christian Association (YMCA)

Tax information: Map # 11, lot 067

Assessed value: Land assessed at \$514,200 as of 6-23-98

Current use value: \$514,200

Camp Morgan - Location and Hydrology



4.1.3 Boundary Line Status

Most of the bounds for Camp Morgan are easy to find. The southwestern bound by Faxon Hill Road is a stone wall that runs north toward Millen Pond. The southern bound is Faxon Hill Road. The eastern bound running from south to north is a woods road, then a series of old blazes heading northeasterly away from the woods road. These blazes disappear, however, long before reaching the School building on the left. This eastern bound from the woods road to Millen Pond road is the only segment of camp Morgan bound that needs reconnaissance, and should be done soon before the blazes fade entirely. All bounds north of Millen Pond Road that surround the northern section are unknown, as this piece was not inventoried.

Survey Map: None known.

Property corner markers: The presence of corner markers is unknown, but most bounds do not require them due to larger and more obvious boundaries.

ACTION ITEM: Reconnoiter the bound that runs northwesterly from the woods road. If the line cannot be determined with certainty, have this short segment surveyed and blazed within the next five years to keep the costs down.

4.1.4 Access

Main Road: There are three main roads for this property, providing ample means of access. To the north is the Millen Pond Road. to the south is the Faxon Hill Road. Running along the east bound and then up into the property moving north is the woods road, which ends in a large berm just south of the Camp Morgan Lodge.

Gate(s): There are no gates on this property.

Property signs: There are signs for Camp Morgan, but no signs that read "Washington Town Forest"

Internal Roads: A woods road in good condition leads into the property along the eastern bound from Faxon Hill Road. There is also an internal road on the section north of Millen Pond Road, which runs north and is in good condition.

4.1.5 Recreation

Foot Trails: There is a hiking trail running south along the shore of Millen Pond from the Town Beach to the "Chapel" (a maintained opening in a cove on the shore formerly used by the YMCA). Along this trail can also be found a rope-swing, for plunging into the Pond.

Other uses: This is an important property for snowmobiling. Several snowmobile trails traverse the property, which may also be used by ATV's in the summer. A building near the woods road toward the center of the property is maintained by the Washington Snowriders as their "Handwarming Hut".

ACTION ITEM:

Discuss any plans for forest management of Camp Morgan with the Washington Snowriders, to make sure that their use of the property is not interrupted.

Consider extending the existing hiking trail along the shore of Millen Pond to include a loop through the majestic hemlock and hardwood stands west and south of Chapel Cove (also see section 4.3.1.2).

4.1.6 Historical Influences

4.1.6.1 Human

For many years, the property was owned and operated by the YMCA as a summer camp.

Recent timber harvests have been conducted, primarily at the southern end of the property(see map #2).

4.1.6.2 Non-Human

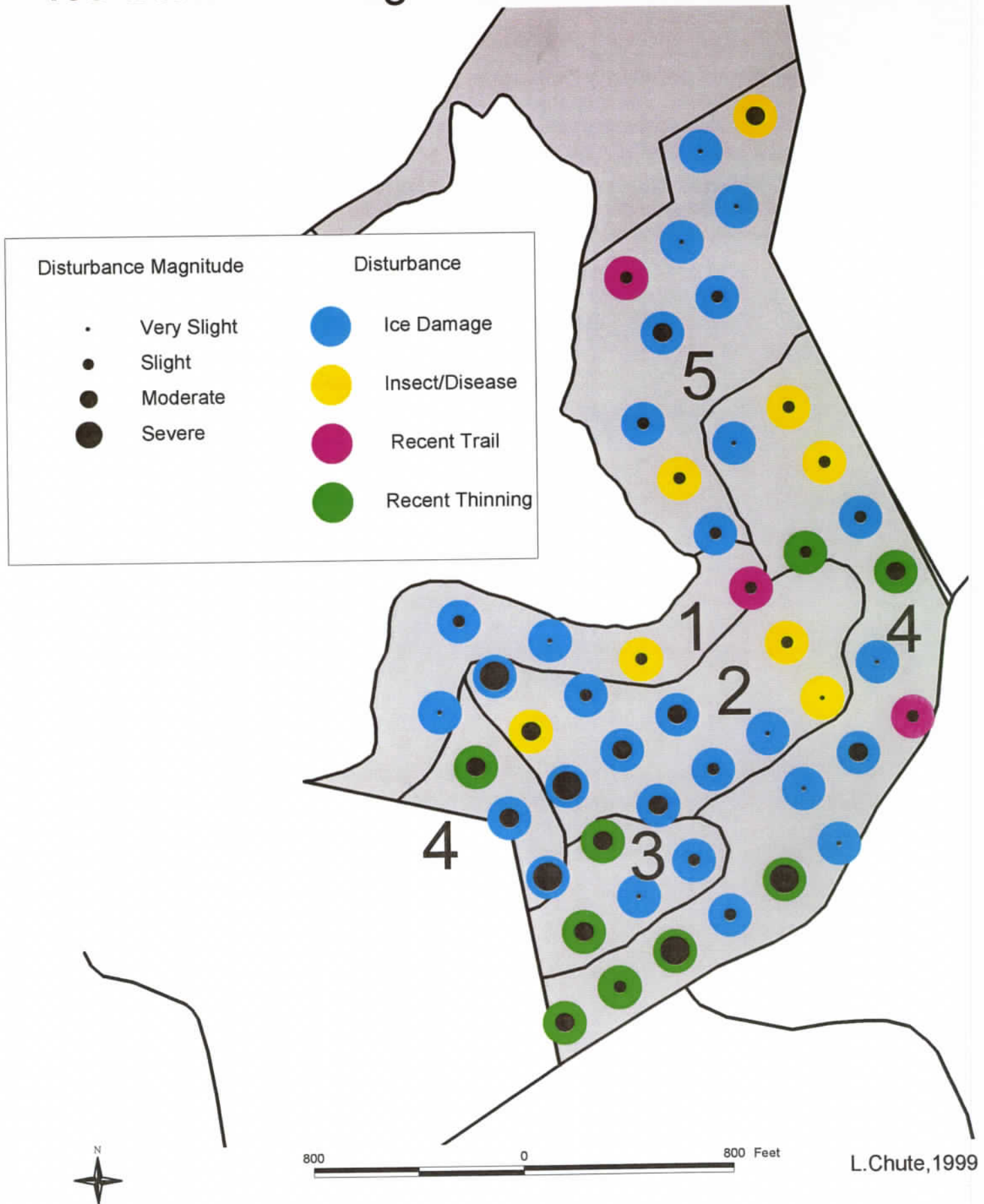
Some insect and disease problems were noticed at Camp Morgan, mostly minor. Beech scale disease (a fungal disease carried by insects) was observed in several locations. This disease is extremely common and there is no practical remedy. Some evidence of sugar maple borer (an insect that bores into sugar maples)was also noticed at one sample point, but the damaged inflicted was minimal. On two sample points in MU4 white pines were observed to be oozing sap from their trunks. The cause of the bleeding is not known without further investigation, but it may signify the need to conduct a salvage cut should many of trees start dying in earnest.

4.1.7 Impact of the Ice Storm of 1998 (See Map #2)

Of all Town Forests, Camp Morgan was the hardest hit by the Ice Storm of 1998. Most of the property was recorded as having some degree of damage, ranging from very slight in the north to severe in the south. The most common damage was some broken branches in the crowns of trees. Areas with more substantial damage included pulled over hardwood saplings and mature striped maples that will not recover, pulled-out tops and broken boles.

The ice storm damage in Mu's 1 and 5 was mostly minor. The majority of trees in these stands will survive and should wall off their wounds successfully. The heavier damage in the western stand of MU4 and the western edge of MU2, however, will result in some significant pockets of tree mortality. A salvage cut of these areas is recommended to recover the timber value of the damaged trees before they decay, preferably no later than the fall of 2000.

Camp Morgan - Ice Storm Damage and Other Disturbances



4.2 Ecosystem Information

4.2.1 Hydrology (See Map #1)

Wetlands Features: There are several wetlands features on this property. The most important feature is Millen Pond, which is an outstanding pond in terms of its water quality. Timber management activities at Camp Morgan must never result in the degradation of Millen Pond's water quality through siltation.

A perennial stream also flows through the Camp Morgan Forest into Millen Pond at Chapel Cove. This stream begins on the property as a wetland near Faxon Hill Road, which currently has a snowmobile trail passing through it.

ACTION ITEM: Consider re-routing the section of snowmobile trail that runs through the wetland, in order to avoid the risk of damaging this wetland as a filter for the stream below. If the trail cannot be moved, consider building a small bridge to protect the wetland from being damaged by ATV use in the summer.

4.2.2 Topography (See Map #3)

Most of Camp Morgan slopes gradually down toward Millen Pond. The areas of greatest slope are found near to the shore of the Pond on the south end of the property.

4.2.3 Soils (See Map #4)

Camp Morgan has the best forest soils for growing hardwoods of all Town Forests. Nearly all of the soils at Camp Morgan are rated 1A; loamy, deep soils that have high levels of organic matter necessary for moisture retention. These soils, are poor for growing white pine, because their ability to hold moisture causes intense competition by hardwoods. Although white pine is currently found on much of Camp Morgan, these stands are naturally converting to high value hardwoods such as sugar maple, white ash and red oak, and white pine regeneration will not compete well on these soils.

Only one spot on the entire forested land of Camp Morgan is not 1A – the wetland area located at the top of the perennial stream by the Faxon Hill Road. This soil, a Pillsbury very stony loam, is poorly drained and best suited for red spruce, balsam fir or hemlock.

Camp Morgan - Topography

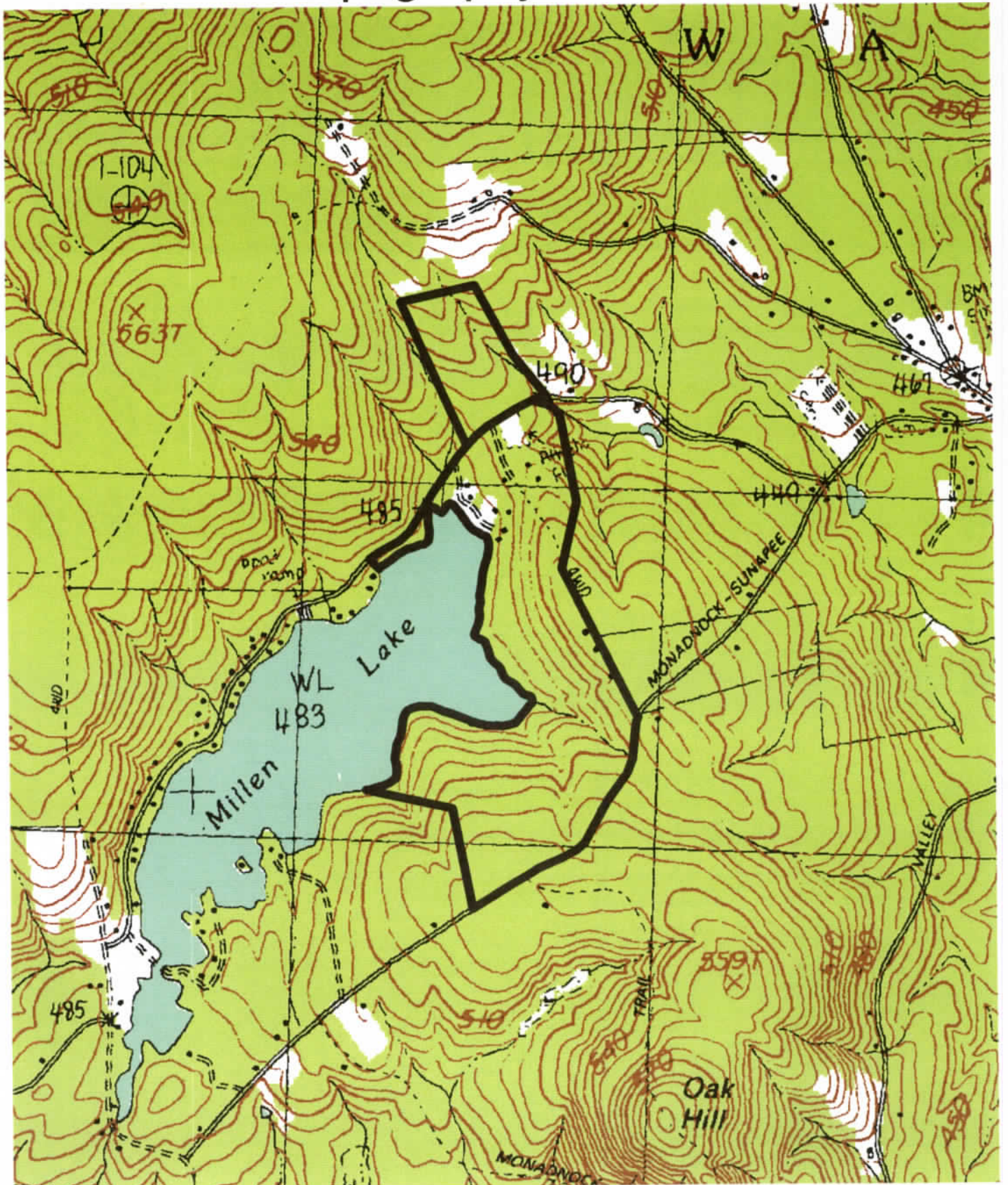
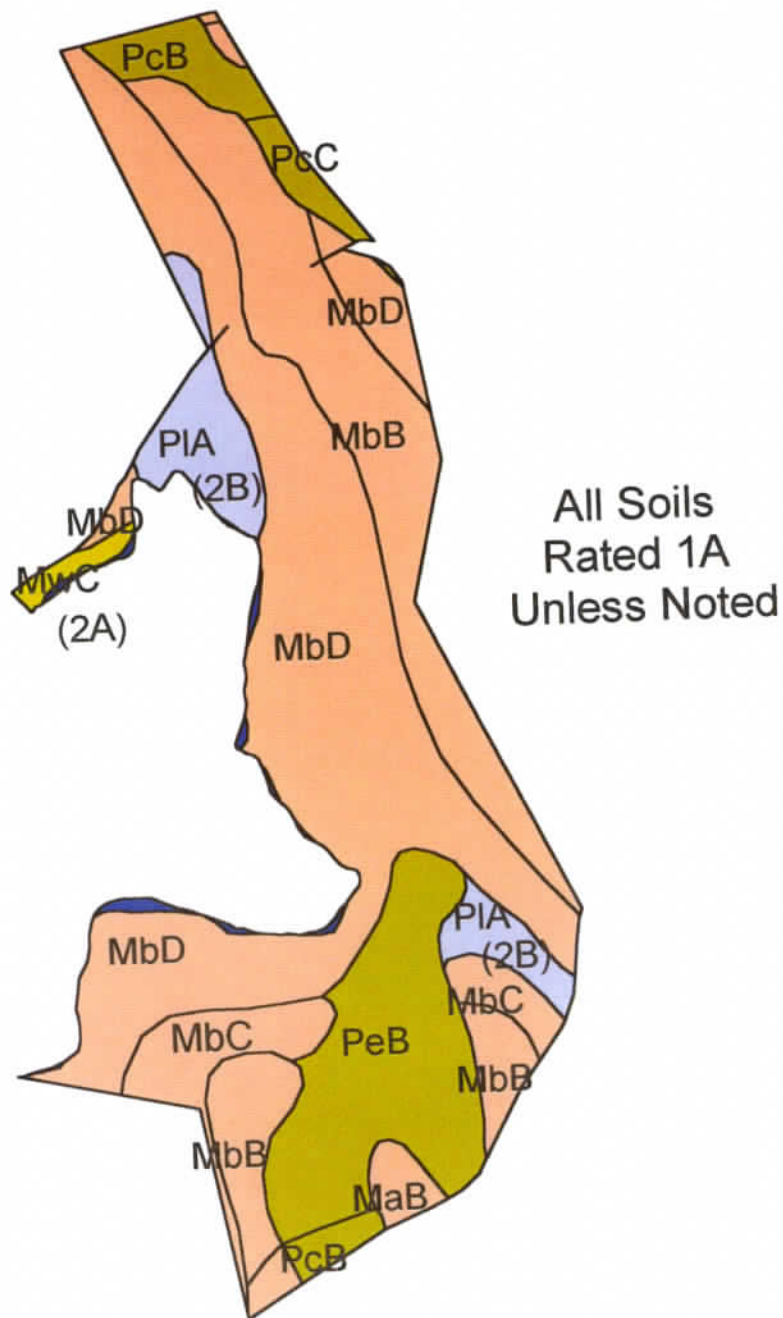


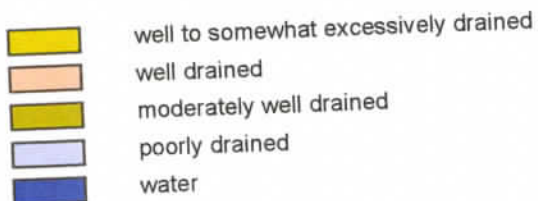
Table 1: Soils

Soil Type	Acreage	Drainage & Slope	Woodland Limitation Ratings
Marlow Very stony-loam MbB MbC MbD	24.3(B) 8.5(C) 50.2(D)	well drained	erosion--B,C slight, D moderate use of equipment--B,C slight, D moderate seedling mortality-----slight windthrow-----moderate
Peru Loam PcB PcC	1.5(B) 0.1(C)	moderately well drained	erosion-----slight use of equipment-----slight seedling mortality-----slight windthrow-----moderate
Pillsbury Very stony-loam PIA	8.6	poorly drained	erosion-----slight use of equipment-----severe seedling mortality-----moderate windthrow-----severe
Monadnock/Lyman/ Rock Outcrop Very stony-fine sandy loam MwC	1.2	well to somewhat excessively drained	erosion-----slight use of equipment-----slight seedling mortality-slight/mod. windthrow-----slight/severe
Peru Very stony loam PeB	20.7	moderately well drained	erosion-----slight use of equipment-----slight seedling mortality-----slight windthrow-----moderate
Marlow Loam MaB	2.8	well drained	erosion-----slight use of equipment-----slight seedling mortality-----slight windthrow-----moderate
Water (greater than 40) Water	1.1	x	erosion-----x use of equipment-----x seedling mortality-----x windthrow-----x

Camp Morgan- Soils



Soil Drainage Classes



Important Forest Soil Groups

- | | |
|----|---|
| 1A | loamy; favor sugar maple, white ash, birch and red oak |
| 2A | physically limited for forest management |
| 2B | limited by poor drainage; favor spruce, fir and hemlock |



4.2.4 Wildlife

4.2.4.1 Habitats

A good variety of wildlife habitats can be found on Camp Morgan. The section north of Millen Pond Road was heavily cut in large patches, promoting raspberries and blackberries and fruiting shrubs. This young, early successional habitat is very good for a number of game and non-game species, including woodcock, rabbits, and a whole host of songbirds. Poplar stands are located just south of the Lodge building. Poplar stands are very important for species such as ruffed grouse and deer, and are getting harder to find in some parts of the state. Other forested stands provide both hardwood and softwood cover and foods. The nearby Pond is both an important water source for wildlife and an aquatic habitat that supports fish-eating birds such as loon and osprey.

4.2.4.2 Dead Standing Trees (Snags)

Snags are dead standing trees that are used by wildlife. Ten species of birds excavate cavities in dead or dying trees for nesting and roosting; another 15 birds and 18 mammals use these cavities for nesting, roosting, or denning. The "Good Forestry in the Granite State" guide recommends 6 snags per acre; 4 of which should be greater than 12" in diameter, and at least 1 greater than 18". The following table summarizes the estimate of snag trees per acre per stand on the Camp Morgan property:

Table 2: Snags

Forest Type	Percent of all trees that are dead(snags)	Total snag Trees/acre	6 snag trees/acre?	4 snags > 12"?	1 snag > 18"?
1	9%	18.6	Yes	Yes	Yes
2	5%	11.9	Yes	Yes	Yes
3	4%	7.5	Yes	Yes	No
4	15%	23.6	Yes	Yes	Yes
5	16%	28	Yes	Yes	Yes

As the table indicates, Camp Morgan provides an excellent supply of snags for wildlife, including snags over 18" in diameter (which are usually in short supply in most forests). Fourteen species of wildlife, including wood ducks, mergansers, barred owl, pileated woodpeckers, and fisher require snags that are 18" in diameter or greater. Bear and Gray Fox require cavity trees at least 24" in diameter or greater. Given its proximity to Millen Pond, the Camp Morgan Forest is an exceptional habitat for animals that require large dead standing trees.

4.2.5 Plant-life

71 species of plants were recorded for Camp Morgan, in addition to the tree species observed during the timber cruise. No rare or endangered species were found, but an uncommon orchid was encountered. A few stems of Round-leaved Orchis (*Platanthera orbiculata*) were found growing in MU2. These orchids should not be picked or otherwise disturbed as they are an important element of botanical diversity on this property.

Table 3: Plants Recorded on the Property During the Inventory

CAMP MORGAN

COMMON NAME	SCIENTIFIC NAME
"Lowbush" Blueberry Species	Vaccinium sp
Alternate Leaved Dogwood	Cornus alternifolia
American Yew	Taxus canadensis
Arrow Leaved Tearthumb	Polygonum sagittatum
Arrow-wood	Viburnum dentatum var. lucidum
Beaked Hazelnut	Corylus cornuta
Beech Fern Species	Thelypteris sp
Bush Honeysuckle	Diervilla lonicera
Canada Fly Honeysuckle	Lonicera canadensis
Canada Mayflower	Maianthemum canadense
Choke Cherry	Prunus virginiana
Christmas Fern	Polystichum acrostichoides
Cinnamon Fern	Osmunda cinnamomea
Dalibarda	Dalibarda repens
False Solomon Seal	Smilacina racemosa
Foamflower	Tiarella cordifolia
Goldthread	Coptis trifolia var. groenlandica
Hairy Solomon Seal	Polygonatum pubescens
Hay-scented Fern	Dennstaedtia punctilobula
Helleborine	Epipactis helleborine
Hobblebush	Viburnum alnifolium
Indian Cucumber Root	Medeola virginiana
Indian Pipes	Monotropa uniflora
Interrupted Fern	Osmunda claytoniana
Jack In The Pulpit	Arisaema triphyllum
June Pink	Rhododendron prinophyllum
Lady Fern	Athyrium felix-femina var. angustum
Large Leaved Aster	Aster macrophyllus
Mad-dog Skullcap	Scutellaria lateriflora
Maple-leaved Viburnum	Viburnum acerifolium
Meadow-sweet	Spiraea alba

Mountain Holly
Mountain Maple
Nannyberry
New York Fern
Northern Water Horehound
Oak Fern
Painted Trillium
Partridge-berry
Pink Lady's-slipper
Red Chokeberry
Red Elderberry

Rock Polypody
Rose Twisted Stalk

Round-leaved Orchid
Round-leaved Violet
Running Pine
Sensitive Fern
Serviceberry Species
Sheep Laurel
Shining Club Moss
Speckled Alder
Spinulose Wood Fern
Species
Spreading Dogbane
Star-flower
Stiff Clubmoss
Swamp Dewberry
Trailing Arbutus
Tree Clubmoss
Water Pennywort
White Baneberry
White Wood Aster
Whorled Wood Aster
Wild Lettuce Species
Wild Oats
Wild Raisin

Wild Sarsaparilla
Winterberry Holly
Wintergreen
Witchhazel
Wood Sorrel Species

Nemopanthus mucronatus
Acer spicatum
Viburnum lentago
Thelypteris noveboracensis
Lycopus uniflorus
Gymnocarpium dryopteris
Trillium undulatum
Mitchella repens
Cypripedium acaule
Aronia arbutifolia
Sambucus racemosa ssp.
pubens
Polypodium virginianum
Streptopus roseus var.
perspectus
Platanthera orbiculata
Viola rotundifolia
Lycopodium complanatum
Onoclea sensibilis
Amelanchier sp
Kalmia angustifolia
Huperzia lucidula
Alnus incana var. americana
Dryopteris campyloptera,
carthusiana, or intermedia
Apocynum androsaemifolium
Trientalis borealis
Lycopodium annotinum
Rubus hispidus
Epigaea repens
Lycopodium dendroideum
Hydrocotyle americana
Actaea alba
Aster divaricatus
Aster acuminatus
Lactuca sp
Uvularia sessilifolia
Viburnum nudum var.
cassinoides
Aralia nudicaulis
Ilex verticillata
Gaultheria procumbens
Hamamelis virginiana
Oxalis sp

4.3 Timber Resources

4.3.1 Management Units (See Map #5)

4.3.1.1 Management Unit Descriptions (See Maps #5 and #6)

There are five management units on the Camp Morgan Forest:

- 1) MU 1 is an exemplary stand of mature hemlock forest growing along the shore of Millen Pond. Other tree species include red maple, yellow birch and red spruce, ranging in size from poles to large sawtimber. This MU is a very uncommon example of an old growth hemlock forest, and should never be cut.
- 2) MU 2 is an exemplary stand of mature white ash, sugar maple, red oak and beech, growing just south and uphill of MU1. A small clump of towering white pines are also here, which will be excellent nesting trees for bald eagles should their numbers continue to increase. Containing some marvelous specimens of very old and large hardwoods, and a diversity of herbaceous plants that includes the round-leaved orchis, this MU is a very uncommon example of a mature hardwood forest that will only become more rare as time goes by. With the exception of the western edge (which should be salvaged along with MU4), the majority of this MU should never be cut.
- 3) MU 3 is a mature stand of white pine, red spruce and red maple found on the eastern end of the property. While there are many large sawtimber-sized stems in the canopy of this stand, there are also many hardwood poles that includes species such as sugar maple and black cherry.
- 4) MU 4 consists of two mature stands of white pine, with occasional mature white ash and red maple mixed in. These stands are largely stagnating, with dense hardwood regeneration waiting for an opportunity to reclaim the canopy. Given the moist and fertile nature of these soils, the presence of abundant white pine must be the result of old-field succession, as hardwoods would normally comprise the bulk of such forests.
- 5) MU 5 is a patchy stand of scattered mature red maple, birch, sugar maple and beech, with poles of the same species growing below.

Table 4: Operable Forest Type Management Units

<u>MU# - Forest Type</u>	<u>Total Acres</u>	<u>Operability Limitations</u>	<u>Basal Area per Acre</u>	<u>Mean Stand Diameter</u>	<u>Total saw timber/acre (bd.ft.)</u>	<u>Cut saw timber/acre (bd.ft.)</u>	<u>Total pulp /acre (cfs.)</u>	<u>Cut pulp /acre (cfs.)</u>
1- SH5C/HS3C	12.2	None	104	10.7	8,300	0	9.3	0
2- H5C/H4C	17.8	None	111	10.2	7,200	2,635	14.4	3.4
3- HS5C/H3C	6.4	None	145	12.7	13,000	7,865	18.2	7.5
4- SH5C/H3C	33.9	None	129	13.2	14,800	10,239	13.0	8.1
5- H5D/H3C	21.1	None	100	11.5	5,400	1,601	16.0	6.6

4.3.1.2 Management Unit Prescriptions

MU1) This MU should be designated as a natural area, in which nature be allowed to run its course without interruption or interference. This stand has high aesthetic value, and is an invaluable asset to the Town as an uncommon example of a mature hemlock forest. The extension of the hiking trail along the shore would allow more Town residents to enjoy this exceptional softwood forest.

MU2) This MU should be designated as a natural area, in which nature be allowed to run its course without interruption or interference. This stand has a high aesthetic value, and is an invaluable asset to the Town as an increasingly rare example of a mature hardwood forest. A second reason not to cut this stand is to preserve the viewshed for everyone who uses and lives around the Pond. A loop trail into this MU connecting to the proposed trail for MU1 would allow more Town residents to enjoy this exceptional hardwood forest.

MU3) MU3 is an excellent candidate for a timber harvest , with expected cut volumes in excess of 7,000 board feet to the acre. Cutting the mature pine, maple, oak and spruce that currently grows in this stand would benefit the younger sugar maple and white ash poles growing below, hardwood species that are destined to inherit the canopy eventually. There is no point in keeping the white pine for a seed source because it would be very time consuming and expensive to try to keep pine in a stand where hardwoods have the advantage.

MU4) The two stands of MU4 are excellent candidates for timber harvests, with potential cut volumes in excess of 10,000 board feet to the acre. MU4 is a fully stocked, mature white pine stand with dense hardwood saplings growing underneath. These pines have reached their economic maturity, and will only begin to deteriorate as time goes on. There is no reason to retain white pine in the canopy given the vigor and density of the hardwoods below. The removal of the pine will only speed up the natural conversion to hardwoods that is already taking place. If the hardwood saplings are thinned out to favor the best stems after the white pine are removed, a thriving young hardwood stand will quickly replace the pines that

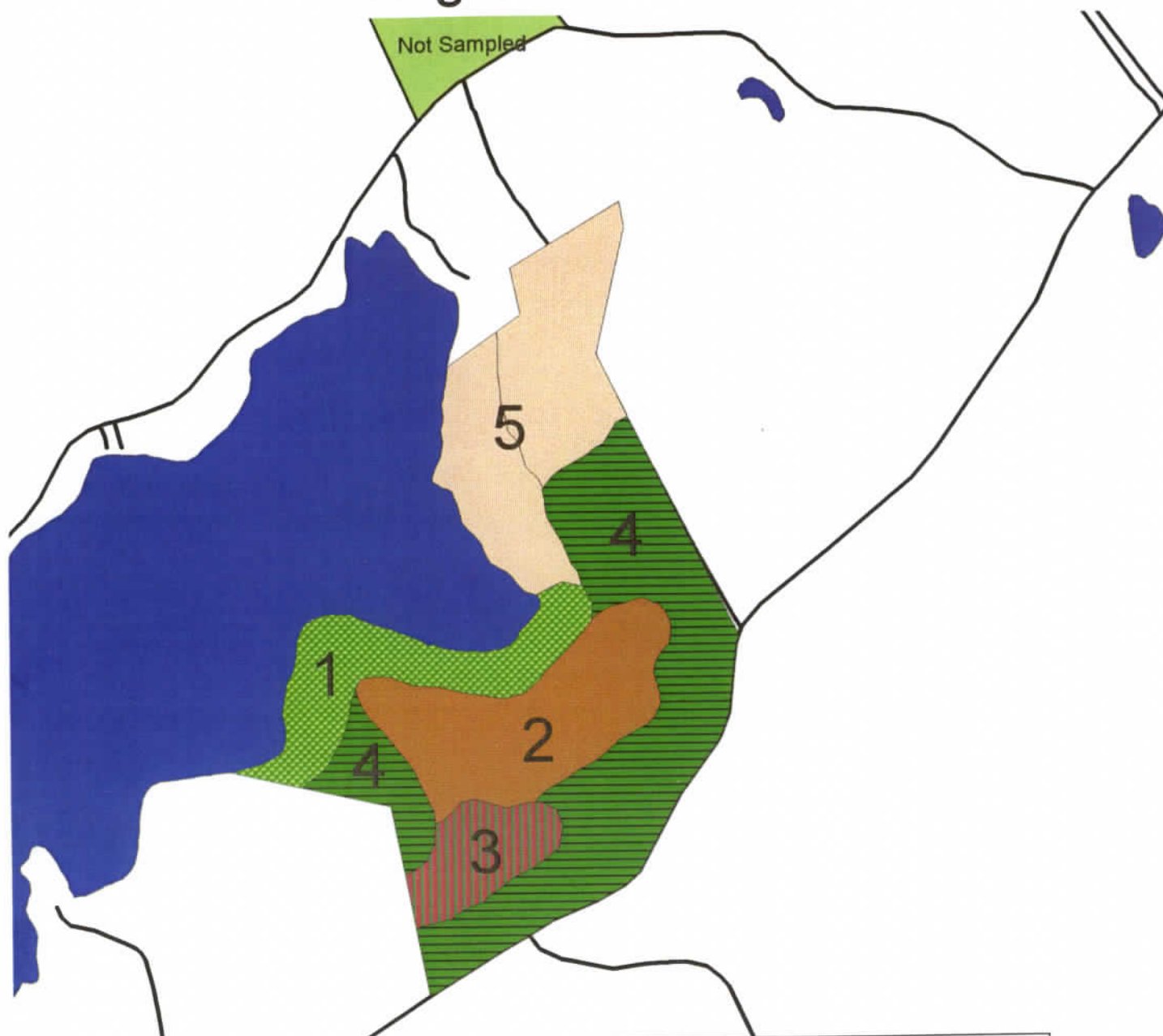
already show signs of decline.

MU5). Given the proximity of the eastern half of MU5 to Millen Pond, it would be better to divide the MU into two halves; east and west.

The western half of MU5 should be designated as a natural area, in order to buffer the Pond from the risks of siltation. Further, by allowing this stand to mature, the trail along the shore would be maximized in terms of aesthetic value.

The eastern half of MU5 should be left to grow, as current cut volumes are far lower than those for MU's 3 and 4. In ten years, however, a timber harvest could take place aimed at decreasing the abundance of red maple in favor of more desirable species.

Camp Morgan - Management Units



Forest Types	Dominant Tree Species
 SH5C/HS3C	Hemlock, Red Spruce, Yellow Birch, Red Maple
 H5C/H4C	Sugar Maple, White Ash, Red Oak, Beech
 HS5C/H3C	Red Maple, White Pine, Red Spruce
 SH5C/H3C	White Pine, White Ash, Red Maple
 H5D/H3C	Red Maple, Beech, Sugar Maple, White Birch



1000 0 1000 Feet

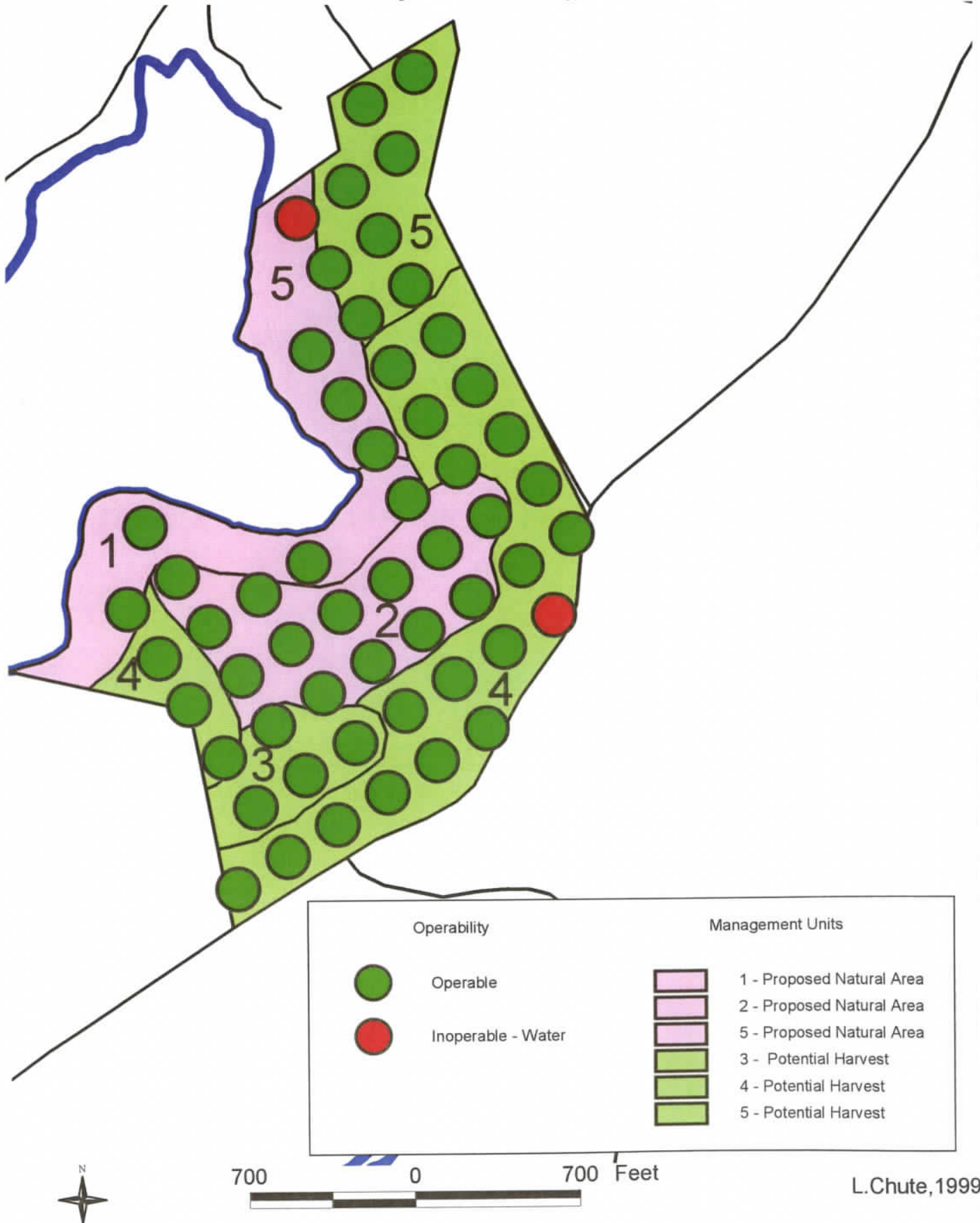


L.Chute, 1999

Table 5: Forest Type Legend

<u>Overstory</u>	<u>/Understory Codes</u>
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<i>2 =</i>	<i>Saplings 4.5 feet in height up to 4" in diameter</i>
<i>3 =</i>	<i>Poles 4" to 12" for hardwoods, 4-10" for softwoods</i>
<i>4 =</i>	<i>Small Sawlogs 12" to 16"</i>
<i>5 =</i>	<i>Large Sawlogs 18" in diameter and larger</i>
<u>Crown</u>	<u>Closure</u>
<i>A =</i>	<i>80 to 100% Crown Closure</i>
<i>B =</i>	<i>61 to 80% Crown Closure</i>
<i>C =</i>	<i>31 to 60% Crown Closure</i>
<i>D =</i>	<i>5 to 30% Crown Closure</i>
<i>MSD =</i>	<i>Mean stand diameter, a measure of relative diameter sizes</i>
<i>BA =</i>	<i>Basal Area, a relative measure of stand density or stocking. Desired basal area for hardwoods is 70 square feet per acre; 80 square feet for softwoods, and 90 square feet for white pine. Basal area averages that exceed 30 or more square feet to the acre (for each category) can be thinned back to the desired basal area to maximize stand potential.</i>
<i>Cut Volumes</i>	<i>Cut volumes per acre indicate the amount of sawlogs or pulpwood volumes per acre that are merchantable. The board foot cut volumes should exceed 1,000 BF of sawlogs per acre (or 2 to 4 cords of pulp per acre or a combination of both) in order to be of commercial interest to a logger.</i>

Camp Morgan - Operability



Camp Morgan - Management Recommendations



Point Prescriptions

- Improvement Cut
- Salvage Cut
- Single Tree Selection
- 1st Step Shelterwood Cut
- Group Selection
- Overstory Removal
- Leave to Grow
- Natural Area

Management Recommendations



- 1 - Designate as Natural Area
- 2 - Designate as Natural Area
- 3 - Possible Harvest
- 4 - Possible Harvest
- 5 - Possible Harvest in 10 Years
- 6 - Designate as Natural Area



800 0 800 Feet

L.Chute, 1999

Table 6: Harvest Schedule and Estimated Revenue

The following revenue would be generated by harvests of MU's 3 and 4:

CAMP MORGAN	<u>Management Unit 3</u>		<u>Management Unit 4</u>		<u>Property Total</u>	
PRODUCT	VOLUME	VALUE	VOLUME	VALUE	VOLUME	VALUE
White Pine saw	31.8	\$5,247	298	\$49,170	329.8	\$54,417
Red Oak saw	3.9	\$1,755	5	\$2,250	8.9	\$4,005
Red Maple saw	5	\$250	35	\$1,750	40	\$2,000
White Ash saw	7.2	\$1,368	2	\$380	9.2	\$1,748
Sugar Maple saw	4	\$1,200	0	\$0	4	\$1,200
Red Maple tie	4.4	\$198	12	\$540	16.4	\$738
White Birch saw	0	\$0	4	\$600	4	\$600
Black Cherry saw	1.6	\$80	3	\$150	4.6	\$230
TOTAL saw (Mbf)	57.9	\$10,098	359	\$54,840	416.9	\$64,938
TOTAL pulp (cords)	48	\$240	276	\$1,380	324	\$1,620
TOTAL all products		\$10,338		\$56,220		\$66,558

A small amount of additional revenue could also be realized by including a salvage cut of the western edge of MU2, if desired. This would have to be done soon, however, before the trees begin to rot.

Harvest Schedule:

2000. Given the closeness of MU's 3 and 4, the timber sale could include both MU's or deliberately be cut over a two-year period.

It should be noted that Camp Morgan has already been harvested by the Town for timber revenue. The following cut history was assembled from Reports of Cut on file in Town Hall:

CAMP MORGAN	<u>Reports of Cut:</u>			
	<u>3/31/83</u>	<u>3/31/87</u>	<u>3/31/89</u>	<u>3/31/96</u>
PRODUCT				
White Pine saw	34.5			32.8
Pallet/Tie				4.4
Red Oak saw				
Hemlock saw				
White Birch saw				
White Ash saw				
Spruce/Fir saw	5.7			0.6
Sugar Maple saw				
Beech/Red Maple saw				
TOTAL saw (Mbf)	40.2			37.9
TOTAL whole tree chips (tons)				536
TOTAL firewood (cords)	9.5	15	5.75	8

5 FARNSWORTH HILL LOT

5.1 Property Data

5.1.1 Regional Context (See Map # 1)

The 146-acre Farnsworth Hill Lot is located in western Washington, between Farnsworth Hill Road, the Lempster Town line, and the Ashuelot River. An important land for conservation, this property has more than 2,000 feet of undeveloped river frontage along Ashuelot River. The Farnsworth Hill Lot also abuts the 657-acre Lempster Long Pond Town Forest to the north, creating a combined undeveloped area of 803 acres.

5.1.2 Tax and Deed Information

Deed reference: 219/255

Date acquired: 1989

Previous owner: Not on file at Town Hall

Tax information: Map # 10, lot 005

Assessed value: Land assessed at \$66,000 as of 6-25-98

Current use value: \$66,000

5.1.3 Boundary Line Status

The south bound of this property is Farnsworth Hill Road. The eastern bound is unknown and unmarked. Most of the north bound is the Ashuelot River, above which is the Lempster Town line. It is not known whether or not the Lempster Town line is clearly blazed at present. The entire eastern bound is completely unknown and unmarked.

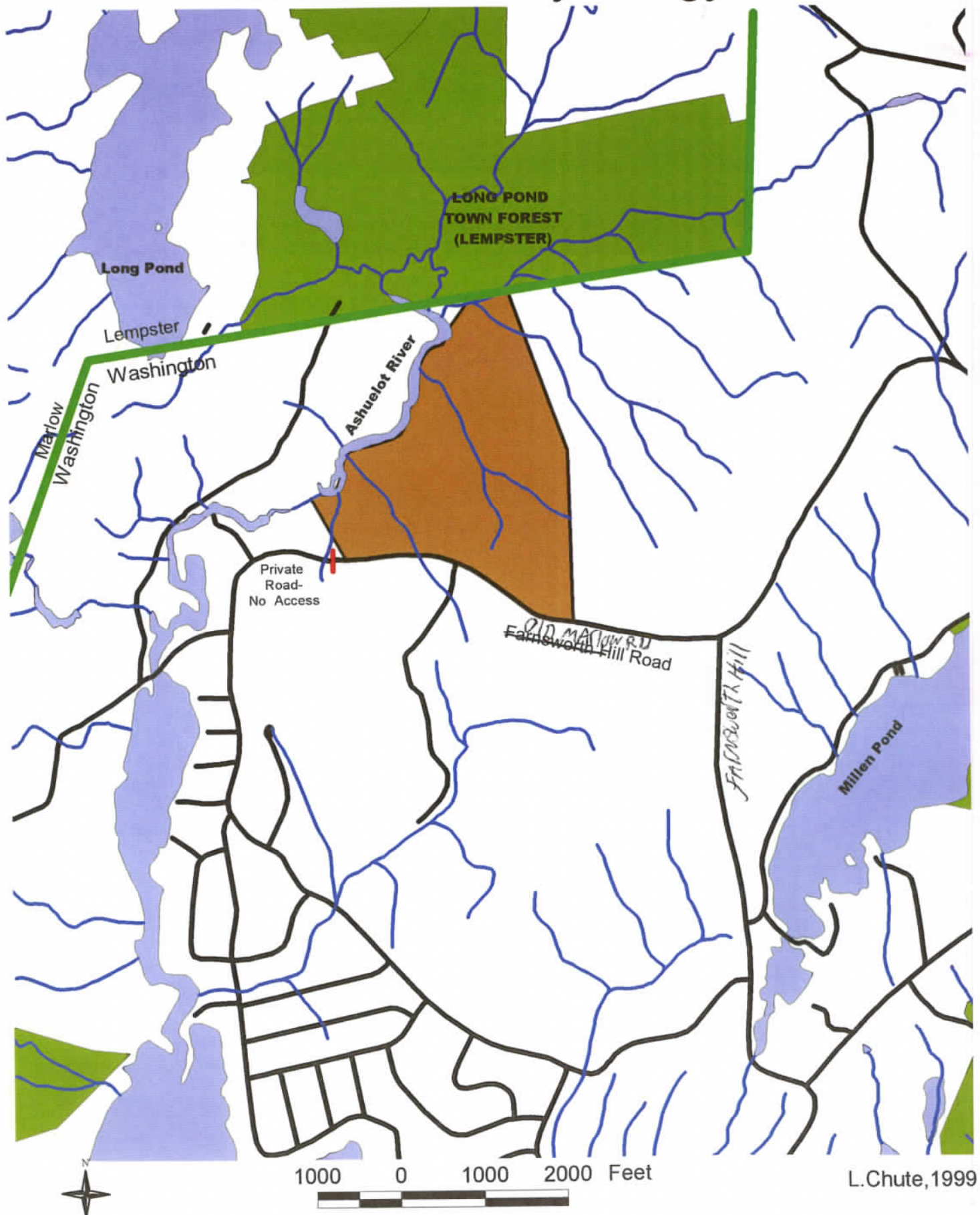
Survey map: No survey map is known for this property

Property corner markers: No property corners are known for this property.

ACTION ITEM: This property is in critical need of survey. In particular, the location of the western and eastern bounds are badly needed in order to know exactly where the property is and how many acres it consists of. A valuable sugar maple stand believed to be within the eastern side of the property will be ready for thinning in a few years. Without knowing our eastern boundary, the sale of this timber could cause legal problems with the abutting landowner. This would not only be embarrassing for the Town, but could also be very costly. The Farnsworth Hill Lot is an excellent forest for profitable and long-term timber management, but not knowing the bounds causes insurmountable difficulties.

Property Map #1: Location and Hydrology

Farnsworth Hill Lot- Location and Hydrology



5.1.4 Access

Main road: The Farnsworth Hill Road makes up the entire southern bound of the property, and is in very good condition. The road is deliberately blocked westerly toward Marlow, however, so access to and from the property can only occur from the east.

Gate(s): There are no gates on this property.

Property signs: There are no signs on this property.

Internal roads: There are no internal roads on this property, but there are many recent skid trails that are mostly still in working condition.

5.1.5 Recreation

Hiking trails: There are no trails on this property.

Other uses: No evidence of recreational use was observed during the inventory.

5.1.6 Historical Influences

5.1.6.1 Human

Old fields that have mostly grown back to forest can be found along the road to the east, but no old foundations were encountered.

Recent timber harvests have left a network of logging roads, some of which have become wet seeps.

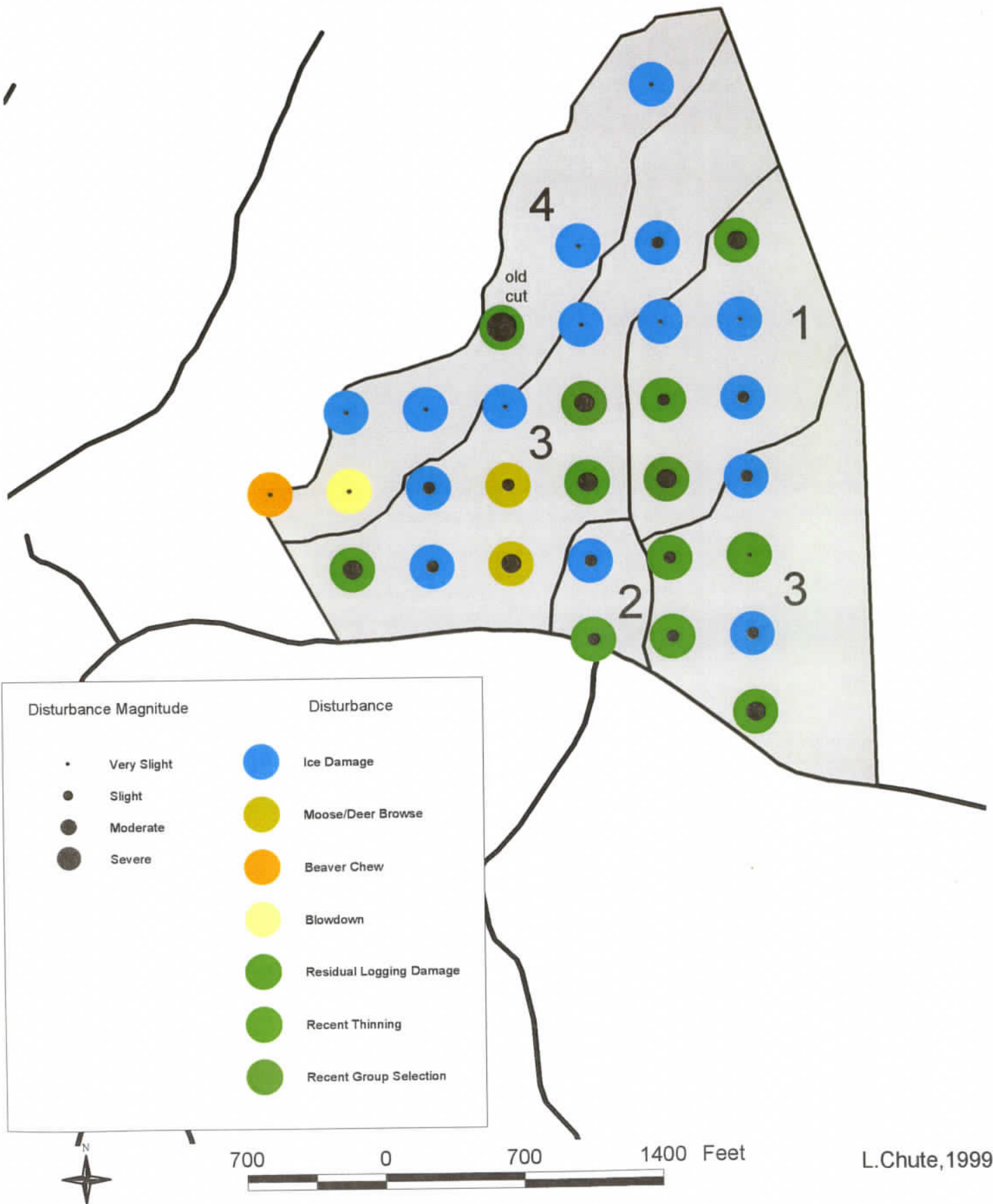
5.1.6.2 Non-Human

Some moose barking of red maple poles was observed near the center of the property during the inventory.

5.1.7 Impact of the Ice Storm of 1998 (See Map #2)

While most of the property was found to have been affected by the ice storm, the severity was only slight to very slight. Pulled-out tops of trees was infrequent, with the bulk of all ice storm damage found to be occasional broken branches. the ice storm damage at the Farnsworth Hill Lot is minor overall, and is not expected to diminish the value or lifespans of the affected trees.

Farnsworth Hill- Ice Storm Damage and Other Disturbances



5.2 Ecosystem Information

5.2.1 Hydrology (See Map #1)

Wetlands Features: The Ashuelot River is an important part of this property, making up nearly the entire northern boundary. In addition to the river channel itself, expansive sedge and shrub marshes extend south from the shores of the river far into the property.

Two intermittent streams also flow north over the property and drain into the Ashuelot. These streams must be considered and protected during any future timber harvests to prevent siltation of the river.

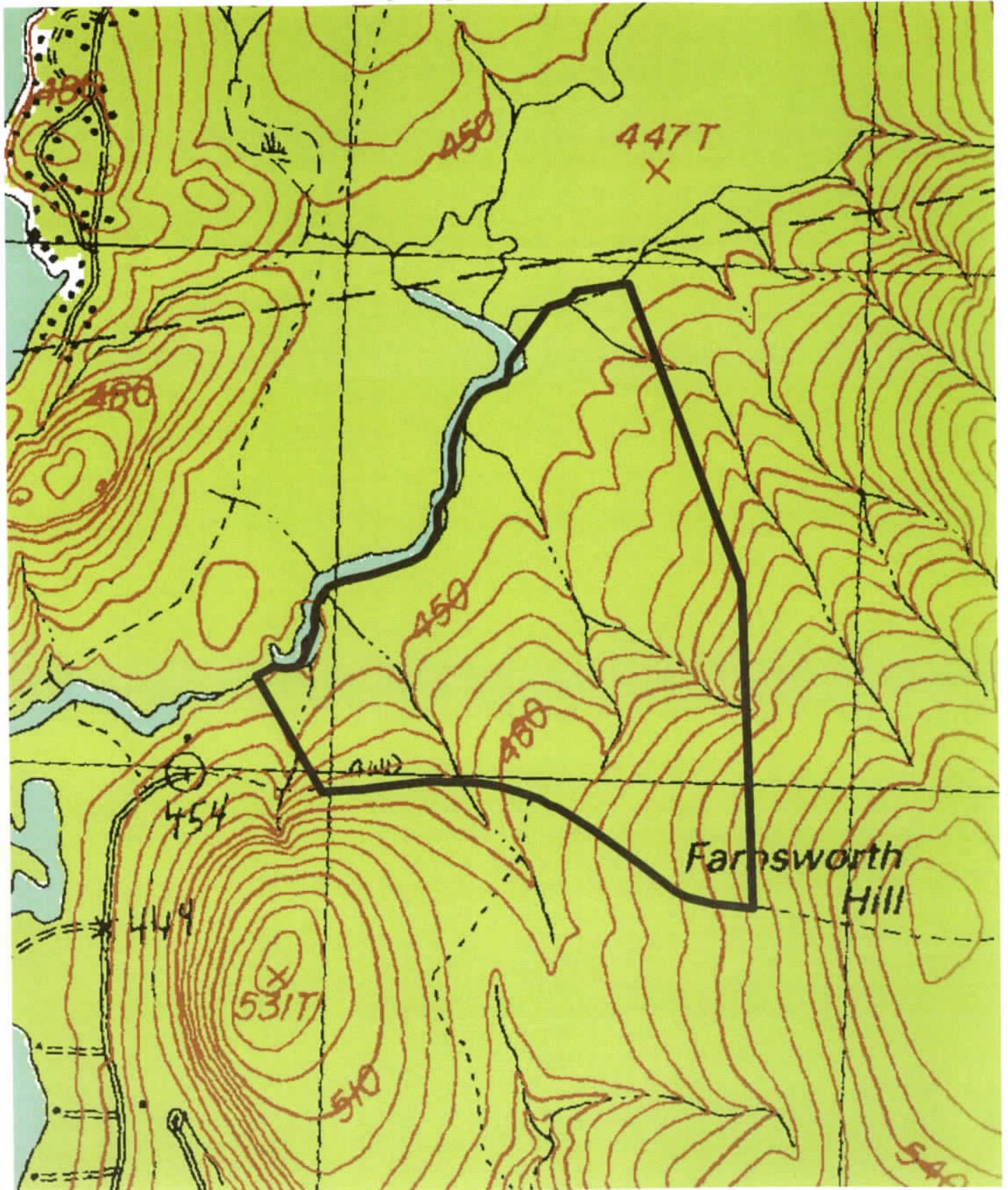
5.2.2 Topography (See Map #3)

The property occupies much of the western slopes of Farnsworth Hill, at the base of which is located Ashuelot River. Slopes are gradual, however, and will not cause problems with forest management activities.

5.2.3 Soils (See Map #4 and Table 1)

There are three principal soil types on the Farnsworth Hill Lot. Hermon very stony fine sandy loam is the most abundant. Hermon soils tend not to be either nutrient rich or moist, and are best suited for growing trees such as red oak, white pine, red spruce and birches. Alternating with the Hermon soils along the intermittent stream channels are Lyme/Moosilauke very stony loams, which are poorly drained and not well suited for forest management. However, softwood species will do well on these soils, particularly spruce, fir and hemlock. Marlow very stony loam is found along the eastern bound of the property. This soil is both rich and moist, and is an excellent soil for growing hardwoods such as sugar maple, white ash, birch and red oak. In fact, a vigorous stand of sugar maple was found to currently occupy this area, a forest type that was not found elsewhere on the property.

Farnsworth Hill Lot - Topography



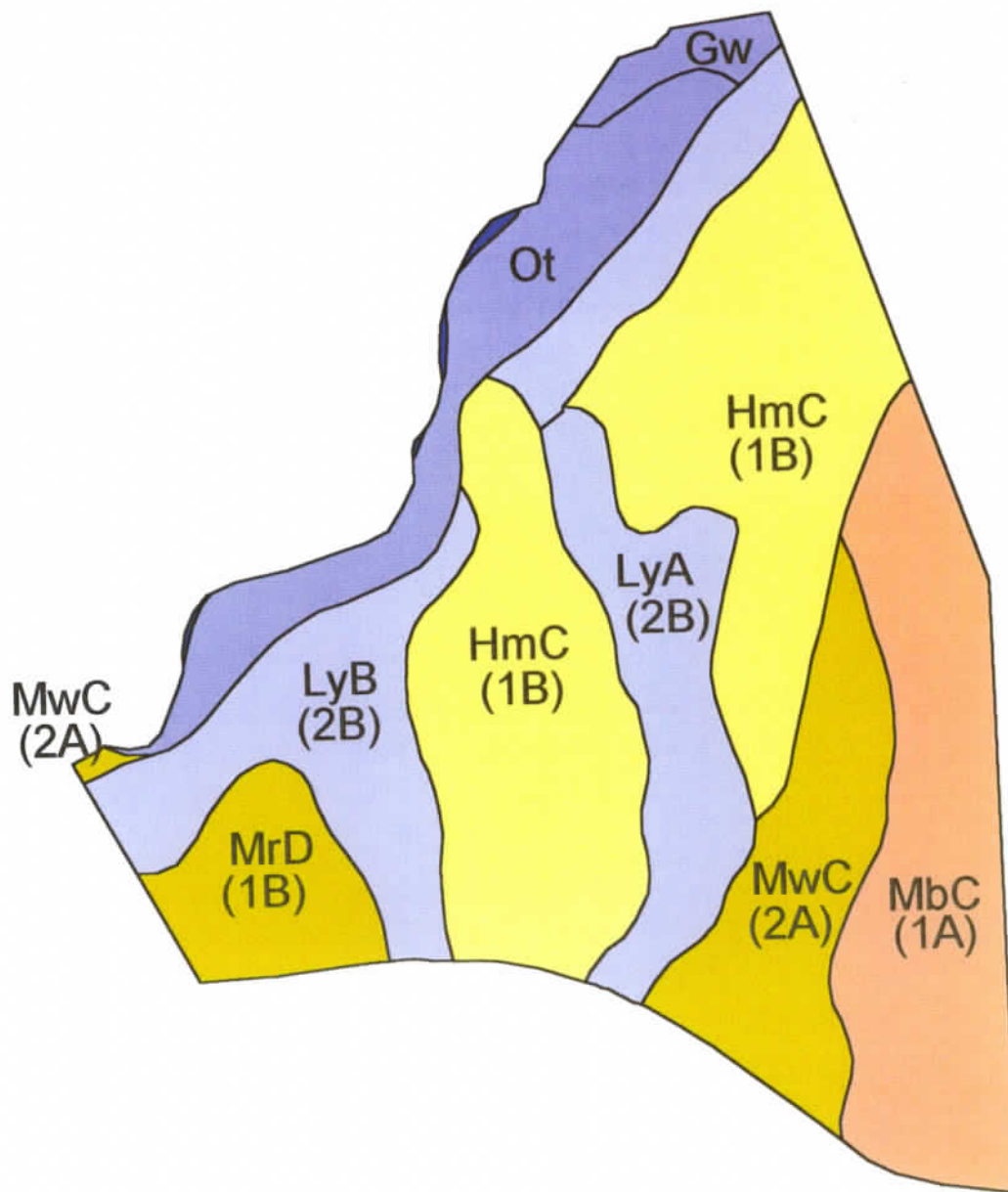
800 0 800 1600 Feet

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Table 1: Soils

Soil Type	Acreage	Drainage & Slope	Woodland Limitation Ratings
Ossipee Hemic material Ot	15.0	very poorly drained	erosion-----slight use of equipment-----severe seedling mortality-----severe Windthrow-----severe
Greenwood Mucky peat Gw	2.4	very poorly drained	erosion-----slight use of equipment-----severe seedling mortality-----severe Windthrow-----severe
Lyme/Moosilauke Very stony loam LyA LyB	6.6(A) 29.8(B)	poorly drained	erosion-----slight use of equipment-----severe seedling mortality----moderate Windthrow-----severe
Water (greater than 40) Water	0.4	x	erosion-----x use of equipment-----x seedling mortality-----x windthrow-----x
Hermon Very stony-fine sandy loam HmC	51.5	somewhat excessively drained	erosion-----slight use of equipment-----slight seedling mortality---moderate windthrow-----slight
Marlow Very stony loam MbC	26.0	well drained	erosion-----slight use of equipment-----slight seedling mortality-----slight windthrow-----moderate
Monadnock/Lyman/ Rock Outcrop Very stony-fine sandy loam MwC	15.5	well to somewhat excessively drained	erosion-----slight use of equipment-----slight seedling mortality-slight/mod. windthrow-----slight/severe
Monadnock/Herm on Extremely stony-fine sandy loam MrD	8.7	well to somewhat excessively drained	erosion-----moderate use of equipment----moderate seedling mortality-----slight/severe windthrow-----slight

Farnsworth Hill Lot- Soils



Soil Drainage Classes

	somewhat excessively drained
	well to somewhat excessively drained
	well drained
	poorly drained
	very poorly drained
	water

Important Forest Soil Groups

- 1A loamy; favor sugar maple, white ash, birch and red oak
- 1B sandy/loamy; favor red oak, white pine, birch and red spruce
- 2A physically limited for forest management
- 2B limited by poor drainage; favor spruce, fir and hemlock



500 0 500 1000 Feet



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5.2.4 Wildlife

5.2.4.1 Habitats

Several types of wildlife habitat are well represented on this property. Most importantly, the Ashuelot River and various marshes and wet areas adjacent to it are excellent examples of riverine wildlife habitat, supporting numerous species of amphibians, reptiles, birds, mammals and fishes. Both forested and non-forested wetlands can be found along the river, with a variety of different resident plant species. This habitat diversity is ideal for maximizing the number of wildlife species that can reside in or near the river.

Other habitats include extensive red maple floodplain forests (a little further back from the river), as well as both softwood (spruce/fir, also pine) and hardwood (sugar maple and red maple) upland forests. Recent logging operations have made new openings in which fruiting shrubs such as blackberries and winterberry holly can be found.

5.2.4.1.1 Dead Standing Trees (Snags)

Table 2: Snags

Snags are dead standing trees that are used by wildlife. Ten species of birds excavate cavities in dead or dying trees for nesting and roosting; another 15 birds and 18 mammals use these cavities for nesting, roosting, or denning. The “Good Forestry in the Granite State” guide recommends 6 snags per acre; 4 of which should be greater than 12” in diameter, and at least 1 greater than 18”. The following table summarizes the estimate of snag trees per acre per forest type on the Farnsworth Hill property:

Forest Type	Percent of all trees that are dead(snags)	Total snag Trees/acre	6 snag trees/acre?	4 snags > 12”?	1 snag > 18”?
1	22%	18.8	Yes	No	Yes
2	5%	12.7	Yes	No	No
3	15%	6.5	Yes	Yes	Yes

All three management units currently provide 6 or more snag trees per acre, but only MU’s 1 and 3 have enough snags in the largest size class target. Fortunately, MU’s 1 and 3 make up the most of this property, so wildlife snag needs are probably being well met on this property overall

ACTION ITEM: During harvests, retain snags and cavity trees where possible, especially the largest stems.

5.2.5 Plant-life

85 species of plants were identified during the Farnsworth Hill Lot inventory, in addition to the tree species tallied by the timber cruise. No rare, endangered or unusual plants were found, but the floodplain sedge meadows and other rivervine communities not sampled during the forest inventory may contain a variety of interesting plant species.

Table 3: Plants Recorded on the Property During the Inventory

FARNSWORTH HILL LOT

COMMON NAME	SCIENTIFIC NAME
Alternate Leaved Dogwood	Cornus alternifolia
Arrow Leaved Tearthumb	Polygonum sagittatum
Arrowwood	Viburnum dentatum var. lucidum
Aster species	Aster sp
Beaked Hazelnut	Corylus cornuta
Bedstraw	Galium sp
Bluebead Lily	Clintonia borealis
Broad Beech fern	Phegopteris hexagonoptera
Bunchberry	Cornus canadensis
Canada Fly Honeysuckle	Lonicera canadensis
Canada Mayflower	Maianthemum canadense
Cardinal Flower	Lobelia cardinalis
Christmas Fern	Polystichum acrostichoides
Cinnamon Fern	Osmunda cinnamomea
Closed Gentian	Gentiana clausa
Creeping Snowberry	Gaultheria hispidula
Dalibarda	Dalibarda repens
Dewberry spp.	Rubus sp
Dwarf Raspberry	Rubus pubescens
False Solomon Seal	Smilacina racemosa
Foamflower	Tiarella cordifolia
Fringed Bindweed	Polygonum cilinode
Goldthread	Coptis trifolia var. groenlandica
Hay-scented Fern	Dennstaedtia punctilobula
Hobblebush	Viburnum alnifolium
Indian Cucumber Root	Medeola virginiana
Indian Pipes	Monotropa uniflora
Indian Poke	Veratrum viride
Indian Tobacco	Lobelia inflata
Interrupted Fern	Osmunda claytoniana
Iris species	Iris sp
Jack-in-the-Pulpit (Common)	Arisaema triphyllum
Jewelweed Species	Impatiens sp
Joe Pye Weed	Eupatorium sp
June Pink	Rhododendron prinophyllum

Lady Fern
 Maddog Skullcap
 Male-berry
 Marginal Wood Fern
 Marsh St. John's-wort
 Meadow Rue
 Meadow-sweet
 Mountain Ash
 Mountain Holly
 Mountain Maple
 Nannyberry
 New England Rose
 Northern Running-pine
 Northern Wood Sorrel
 Northern Water Horehound
 Oak Fern
 Painted Trillium
 Partridge-berry
 Pickeral Weed
 Pink Lady's-slipper
 Pipsissewa

 Purple Trillium
 Rock Polypody
 Royal Fern
 Rubus species
 Sensitive Fern
 Serviceberry Species
 Shining Clubmoss
 Skunk Currant
 Speckled Alder
 Spinulose Wood Fern
 Star-flower
 Stiff Clubmoss
 Swamp Candles
 Swamp Dewberry
 Swamp Rose
 Tree Clubmoss
 Turtlehead
 Vaccinium species
 Velvet Leaf Blueberry
 Virgin's Bower
 Water Pennywort
 White Wood Aster
 Whorled Wood Aster
 Wild Lettuce
 Wild Oats
 Wild Raisin

 Wild Sarsaparilla
 Winterberry Holly
 Wintergreen

Athyrium felix-femina var.
 angustum
 Scutellaria lateriflora
 Lyonia ligustrina
 Dryopteris marginalis
 Hypericum virginicum
 Thalictrum sp
 Spiraea alba
 Sorbus americana
 Nemopanthus mucronata
 Acer spicatum
 Viburnum lentago
 Rosa nitida
 Diphasiastrum complanatum
 Oxalis acetosella
 Lycopus uniflorus
 Gymnocarpium dryopteris
 Trillium undulatum
 Mitchella repens
 Pontederia cordata
 Cypripedium acaule
 Chimaphila umbellata var.
 cisatlantica
 Trillium erectum
 Polypodium virginianum
 Osmunda regalis var. spectabilis
 Rubus sp
 Onoclea sensibilis
 Amelanchier sp
 Huperzia lucidula
 Ribes glandulosum
 Alnus incana var. americana
 Dryopteris carthusiana
 Trientalis borealis
 Lycopodium annotinum
 Lysimachia terrestris
 Rubus hispidus
 Rosa palustris
 Lycopodium dendroideum
 Chelone glabra
 Vaccinium sp
 Vaccinium myrtilloides
 Clematis virginiana
 Hydrocotyle americana
 Aster divaricatus
 Aster acuminatus
 Lactuca canadensis
 Uvularia sessilifolia
 Viburnum nudum var.
 cassinoides
 Aralia nudicaulis
 Ilex verticillata
 Gaultheria procumbens

5.3 Timber Resources

5.3.1 Management Units (See Map #5)

5.3.1.1 Management Unit Descriptions (See Maps #5 and #6)

There are four forest types or management units (MU's) on the Farnsworth Hill Lot:

1) MU 1 consists of well-spaced sugar maples, with some red maple and white ash mixed in. The majority of stems are pole-sized (less than 12" in diameter), but scattered small and large sawtimber trees of the same species also occur. Much of this MU is park-like in appearance, with little underbrush other than grasses and brambles. This valuable hardwood stand has been recently thinned and needs time to mature.

2) MU 2 is a small (6-acre) pocket of small and large sawtimber white pine. Secondary species include red spruce and red maple poles and small sawtimber. This stand has been recently logged, leaving some bole damage on the residual pines, but overall this is a valuable stand that should be perpetuated.

3) MU 3 makes up the bulk of this property, with two large stands spanning both sides of MU's 1 and 2. Management unit 3 is a mix of red maple, red spruce, balsam fir and yellow birch. Most of the stems are between pole and small sawtimber size (8-14"), but patchy and scattered large sawtimber trees of all species can also be found. Much of this MU has been repeatedly harvested in the past 20 years, but the remaining trees tend to be well spaced and undamaged.

4) MU 4 is inoperable due to wet soils that are frequently saturated by fluctuations in the Ashuelot River water level. MU4 is the Ashuelot River floodplain, with a variety of sedge meadows and other wetland plant communities. The majority of forested areas consist of pole-sized stands of either pure red maple, red maple with spruce/fir, or pure spruce/fir.

Table 4: Operable Forest Type Management Units

<u>MU# - Forest Type</u>	<u>Total Acres</u>	<u>Operability Limitations</u>	<u>Basal Area per Acre</u>	<u>Mean Stand Diameter</u>	<u>Total saw timber/acre (bd.ft.)</u>	<u>Cut saw timber/acre (bd.ft.)</u>	<u>Total pulp /acre (cfs.)</u>	<u>Cut pulp /acre (cfs.)</u>
1- H5D/H3B	28.3	None	47	9.3	1,600	0	8.1	0
2- S5D/SH4C	6.4	None	140	9.9	8,900	3,884	20.5	12.3
3- H5D/SH3B	88.6	None	112	9.3	3,400	1,496	16.3	7.6

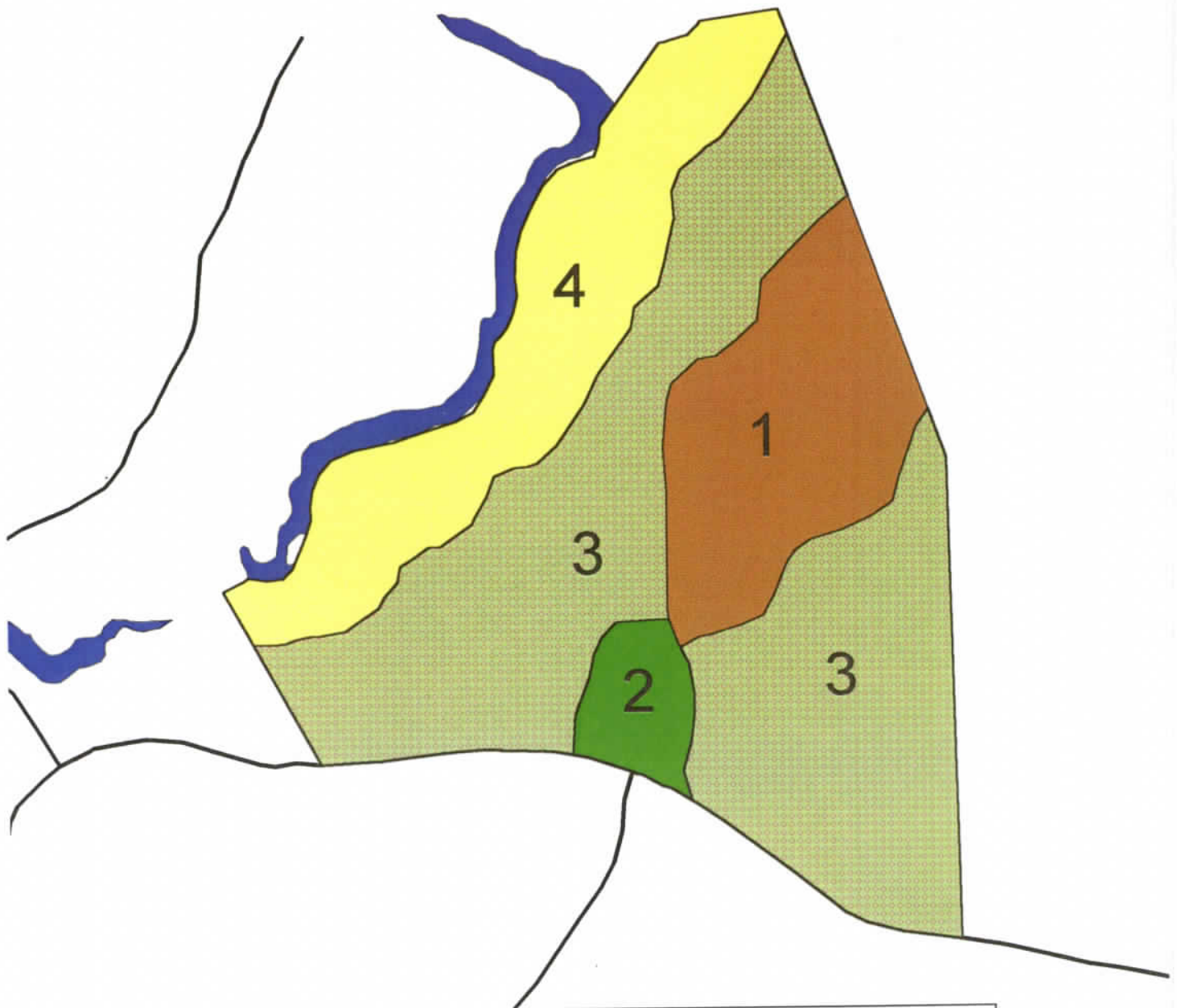
5.3.1.2 Management Unit Prescriptions (See Map #7)

MU1) This hardwood stand has been recently thinned and needs time to develop. However, an improvement cut in 15-20 years should be done to reduce red maple in favor of sugar maple. This stand could be a reliable long-term source of high quality sugar maple logs, and should be managed accordingly.

MU2) This white pine stand should be managed with the goal of perpetuating white pine indefinitely. The first step is to thin out the competing red maple and red spruce in favor of the pines currently in the canopy. If done today, this thinning would yield an estimated 25,000 board feet of red spruce and red maple sawlogs. However, repeated harvests in the past 15 years have taken their toll on these pines (and on the soil), and the stand needs time to recover before the next treatment. For this reason, it would be best to wait 8-10 years before re-entry. Following this thinning, future treatments would then focus on promoting white pine regeneration, by gradually removing the pine canopy and scarifying the soil to expose the mineral layer. This management strategy is also known as a "shelterwood" cut, since the remaining pine canopy would be deliberately left to shelter the next generation of pine seedlings from insects, drying winds and other threats. Once the understory becomes thick with well-rooted young pines, the overstory can be removed, and the perpetuation of white pine is assured.

MU3) Like MU2, these two large stands could support a commercial harvest today, yielding an approximate 132,000 board feet of red maple, red spruce, balsam fir and white birch sawlogs and 26,000 board feet of red maple tie logs. The purpose of this cut would be to improve the tree quality, form and species mix of this management unit, continuing the objective of recent thinnings done within the past 3 years. Because cutting has just taken place on this MU, however, the next treatment needs to be postponed for at least 8 years to give the land time to recover. Too frequent re-entry can cause problems with soil erosion and compaction in skid trails, and may increase the likelihood of insect and disease outbreaks. For this reason, MU3 should be cut at the same time as MU2, in about 8 to 10 years from now.

Farnsworth Hill Lot - Management Units



Forest Types		Dominant Tree Species	
	H5D/H3B	Sugar Maple, Red Maple, White Ash	
	S5D/SH4C	White Pine, Red Maple, Red Spruce	
	H5D/SH3B	Red Maple, Red Spruce, Balsam Fir	
	Inoperable - Wet	Red Maple, Red Spruce, Balsam Fir	



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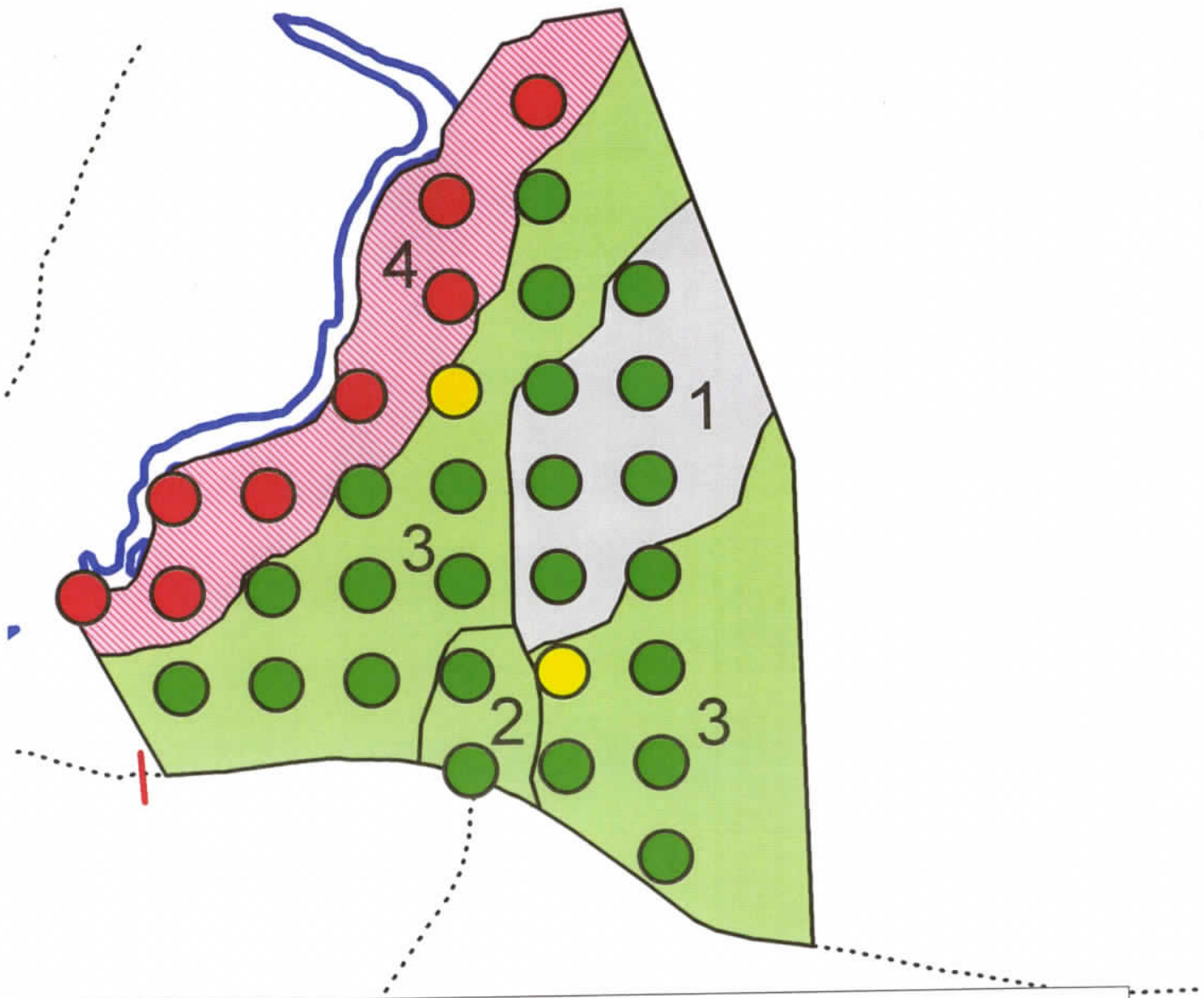


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Table 5: Forest Type Legend

<u>Overstory</u>	<u>/Understory Codes</u>
<i>H =</i>	<i>Majority of trees are hardwood</i>
<i>S =</i>	<i>Majority of trees are softwoods</i>
<u>Diameter</u>	<u>Codes</u>
<i>1 =</i>	<i>Seedlings up to 4.5 feet in height</i>
<i>2 =</i>	<i>Saplings 4.5 feet in height up to 4" in diameter</i>
<i>3 =</i>	<i>Poles 4" to 12" for hardwoods, 4-10" for softwoods</i>
<i>4 =</i>	<i>Small Sawlogs 12" to 16"</i>
<i>5 =</i>	<i>Large Sawlogs 18" in diameter and larger</i>
<u>Crown</u>	<u>Closure</u>
<i>A =</i>	<i>80 to 100% Crown Closure</i>
<i>B =</i>	<i>61 to 80% Crown Closure</i>
<i>C =</i>	<i>31 to 60% Crown Closure</i>
<i>D =</i>	<i>5 to 30% Crown Closure</i>
<i>MSD =</i>	<i>Mean stand diameter, a measure of relative diameter sizes</i>
<i>BA =</i>	<i>Basal Area, a relative measure of stand density or stocking. Desired basal area for hardwoods is 70 square feet per acre; 80 square feet for softwoods, and 90 square feet for white pine. Basal area averages that exceed 30 or more square feet to the acre (for each category) can be thinned back to the desired basal area to maximize stand potential.</i>
<i>Cut Volumes</i>	<i>Cut volumes per acre indicate the amount of sawlogs or pulpwood volumes per acre that are merchantable. The board foot cut volumes should exceed 1,000 BF of sawlogs per acre (or 2 to 4 cords of pulp per acre or a combination of both) in order to be of commercial interest to a logger.</i>

Farnsworth Hill Lot - Operability



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Farnsworth Hill Lot - Management Recommendations



Point Prescriptions

- Pulpwood Thinning
- Fuelwood Thinning
- ▲ Improvement Cut
- Sawlog Thinning
- Leave to Grow
- Natural Area

Management Recommendations

- 1 - Leave to Grow
- 2 - Possible Harvest in 10 Years
- 3 - Possible Harvest in 10 Years
- 4 - Designate as Natural Area

Table 6: Harvest Schedule and Estimated Revenue

The following revenue would be generated by harvests of MU's 2 and 3, were the cut to take place this year (future prices may vary):

FARNSWORTH HILL	<u>Management Unit 2</u>		<u>Management Unit 3</u>		<u>Property Total</u>	
	VOLUME	VALUE	VOLUME	VALUE	VOLUME	VALUE
PRODUCT						
Balsam Fir saw	0	\$0	58.7	\$5,753	58.7	\$5,753
Red Spruce saw	16.9	\$1,656	9.3	\$911	26.2	\$2,568
White Birch saw	0	\$0	22	\$2,376	22	\$2,376
Red Maple saw	8	\$344	42.6	\$1,832	50.6	\$2,176
Red Maple tie	0	\$0	25.7	\$1,028	25.7	\$1,028
TOTAL saw (Mbf)	24.9	\$2,000	158.3	\$11,900	183.2	\$13,900
TOTAL pulp (cords)	79	\$395	670	\$3,350	749	\$3,745
TOTAL all products		\$2,395		\$15,250		\$17,645

Harvest Schedule:

2009. Given the adjacency of MU's 2 and 3, the timber sale should include both MU's. The additional decade of growth may also yield higher cut volumes.

The Farnsworth Hill property has been harvested several times in the past 15 years, most recently by the Town of Washington. The following cut history was assembled from Reports of Cut on file at Town Hall:

FARNSWORTH	<u>Reports of Cut:</u>		
	3/31/85	3/31/96	3/31/98
PRODUCT			
White Pine saw	128.5	29.9	
Pallet/Tie	14.2	53.8	23.8
Red Oak saw	7.2		0.4
Hemlock saw	3.8		
White Birch saw	0.2	4.4	
White Ash saw	0.2	16.9	7.8
Spruce/Fir saw	0.1	4.0	5.5
Sugar Maple saw		9.0	4.2
Beech/Red Maple saw			5.2
TOTAL saw (Mbf)	154.2	117.9	46.9
TOTAL pulp (tons)	0	78	0
TOTAL firewood (cords)	0	14	0

6 HUNTLEY MOUNTAIN ROAD LOT

6.1 Property Data

6.1.1 Regional Context (See Map # 1)

The Huntley Mountain Road property is located just west of Ashuelot Pond, near the southwestern corner of Washington. Consisting of 106 acres, this property contains the summit and southern half of a small unnamed hill overlooking Ashuelot Pond. There are no conservation lands that adjoin this property, but its proximity to Ashuelot Pond as a large and undeveloped tract makes it an important conservation property in its own right.

6.1.2 Tax and Deed Information

Deed reference: Not on file at Town Hall

Date acquired: Not on file at Town Hall

Previous owner: Not on file at Town Hall

Tax information: Map # 14, lot 400

Assessed value: Land assessed at \$41,100 as of 7-2-98

Current use value: \$41,100

6.1.3 Boundary Line Status

The bounds of this property are mostly unknown and unmarked. The western bound is the Marlow Town line, which is blazed and painted. Some blazes were found for the north line, but only on the western side in one small section. The eastern and southern lines were not found during the inventory.

Survey Map: No survey map is known for this property.

Property corner markers: No property corners were found during the inventory.

ACTION ITEM: This property must be surveyed and blazed, especially the north, east and south property lines. Conducting forest management activities on properties whose boundaries are unknown is time-intensive, and can result in costly legal battles.

6.1.4 Access

Main Road: The Huntley Mountain Road is the main access road, running north/south through the property. The road is in poor condition, however, due to erosion and frequent use by ATV's. The road will need fill work to be used as a haul road in the future, and should also be brushed out as the forest is quickly growing in.

Gate(s): There are no gates on this property.

Property signs: There are no property signs on this property.

Internal Roads: The Huntley Mountain Road bisects the property, affording excellent access into most of the property. The road is in very bad shape, however, and will need substantial work before it can be used for hauling timber.

ACTION ITEM:

Discuss the feasibility of reclaiming this road with the Washington Highway Department. Work could be done gradually over several years if this would be preferable. Also, look into the possibility of gating the road during mud seasons to prevent further deterioration by ATV's and other off-road vehicles.

6.1.5 Recreation

Hiking Trails: There are no hiking trails on the property, however Huntley Mountain Road could be considered a hiking trail at this point given its poor condition.

Other uses: Dirt bikes and ATV's were seen using the road during the inventory.

ACTION ITEM:

Consider building a hiking trail to the summit of the hill from the road, but restrict its use to foot traffic to prevent trail erosion on the sloping terrain.

Investigate the possibility of gating the road in wet seasons to discourage the harmful use of the road by dirt bikes and ATV's at these times.

6.1.6 Historical Influences

6.1.6.1 Human

A large and impressive cellar hole was found on the west side of the road in the southern part of the property. Old sugar maples are nearby, with what appears to be a large barn-site as well. Further west in the woods, an interestingly stacked stone pile was carefully assembled on top of a large boulder.

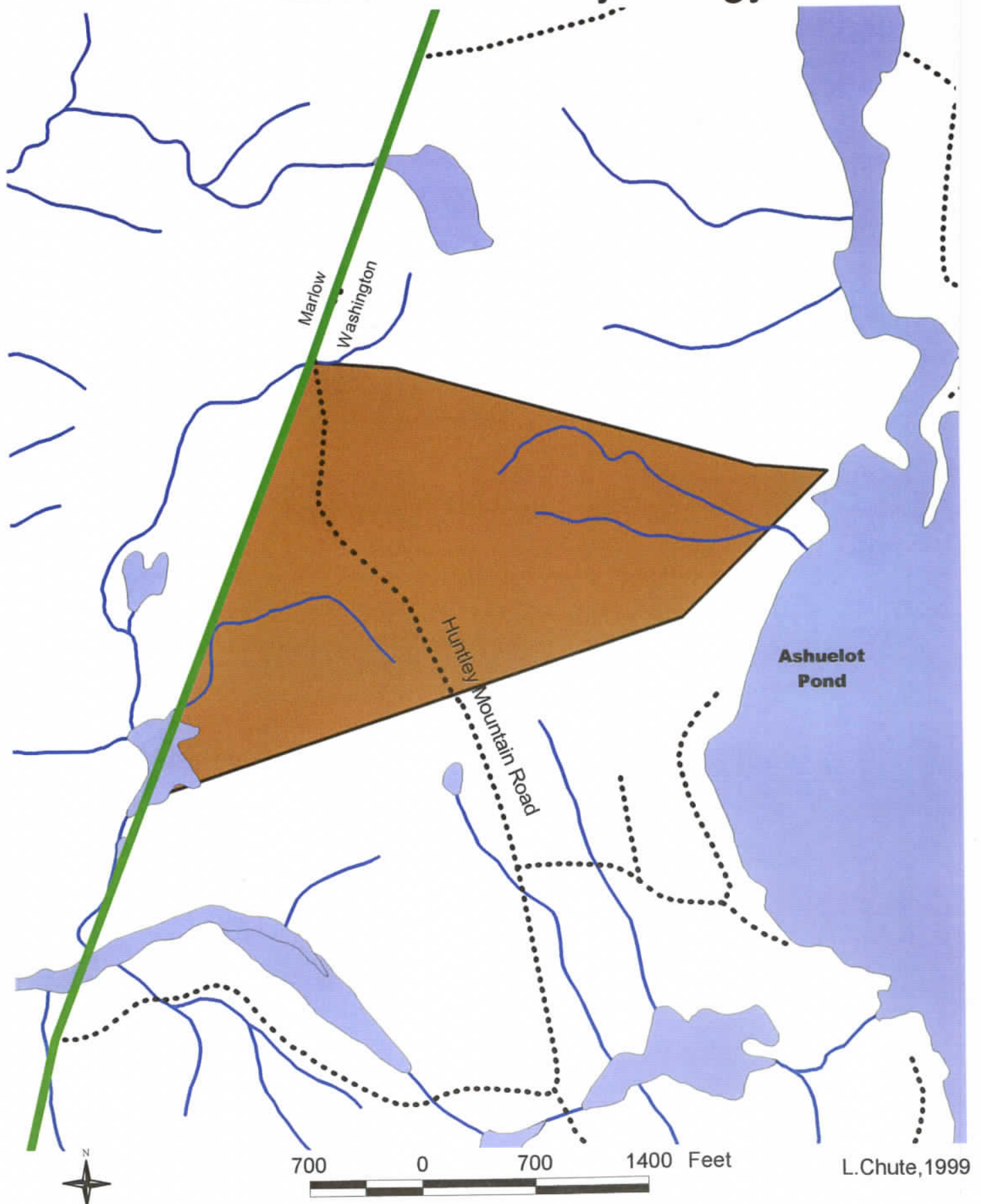
On the east side of the property, about in the middle from north to south, were several old stone foundations and what may have been an old roadway. This property may have been settled by several families at one time, and the Washington Historical Society should be contacted to see what they know about the area.

6.1.6.2 Non-Human

Old evidence of a hot fire was seen on the summit of the unnamed hill. Specifically, the trees there are extremely stunted and uniform, and old charred wood was found on the ground in several places. The fire appears to have stripped the hill of any organic matter that its soil might have had, leaving an impoverished substrate for trees to make use of.

Evidence of old and more recent logging was seen at points along the roadway, with some sapling-filled small patch clearcuts as well as single-tree thinnings.

Huntley Mountain Road Lot - Location and Hydrology



Moose barking of red maples was observed at three locations on the east and west sides of the property. The impact to the maples may be fatal, but more desirable timber species will benefit from their absence. The wounds on these trees may also develop into cavities which will quickly become occupied by wildlife.

6.1.7 Impact of the Ice Storm of 1998 (See Map #2)

Ice storm damage was observed on much of this property, but most of it was of minor severity. Two locations sustained moderate damage, however; a small pocket of red oak in the southwestern part of the property, and the eastern slopes of the unnamed hill. The pocket of red oak in the southwest was ruined, with most tops of the trees popped out completely. Fortunately, the damage was confined to a 2-acre area. Most of these stems are poor in quality and a salvage cut would not be worth the effort. The damage on the eastern slopes of the hill was also localized in pockets, but parts were badly hit, leaving a tangle of branches and whole trees on the ground. The steepest slopes near the summit are inoperable, making these trees unsalvageable. Further down, however, a salvage operation is possible.

6.2 Ecosystem Information

6.2.1 Hydrology (See Map #1)

Wetlands Features:

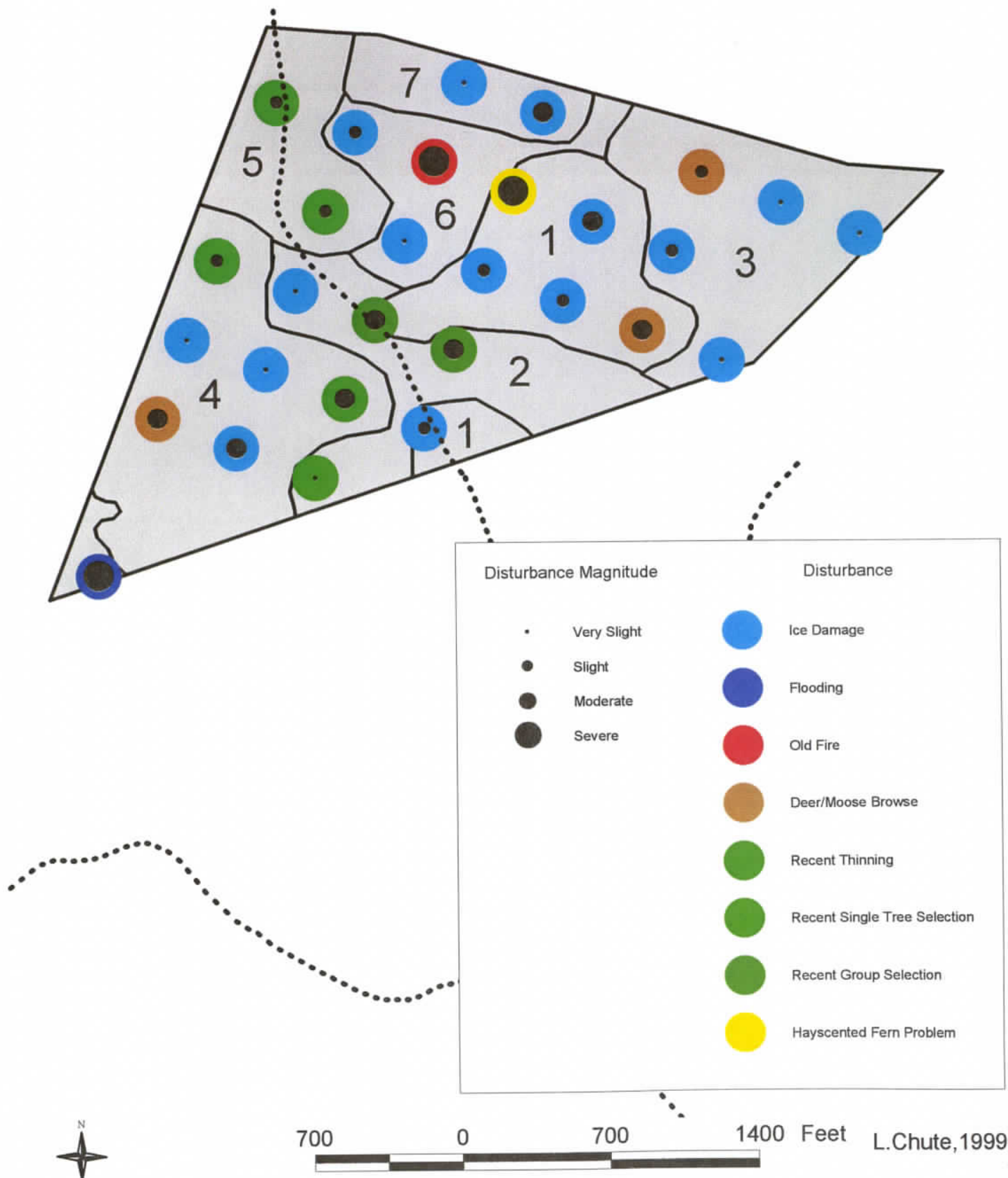
The most significant wetland feature on the Huntley Mountain Road property is the deepwater marsh on the southern corner. This wetland is pristine and remote, offering good habitat for ducks and other waterfowl.

A perennial stream flows southwesterly through the property to the marsh, beginning in a small bog on the west side of Huntley Mountain Road. On the east side of the property is a 1-2 acre sphagnum wetland, near to the eastern bound. Intermittent streams also flow down the east slopes of the unnamed hill to Ashuelot Pond below.

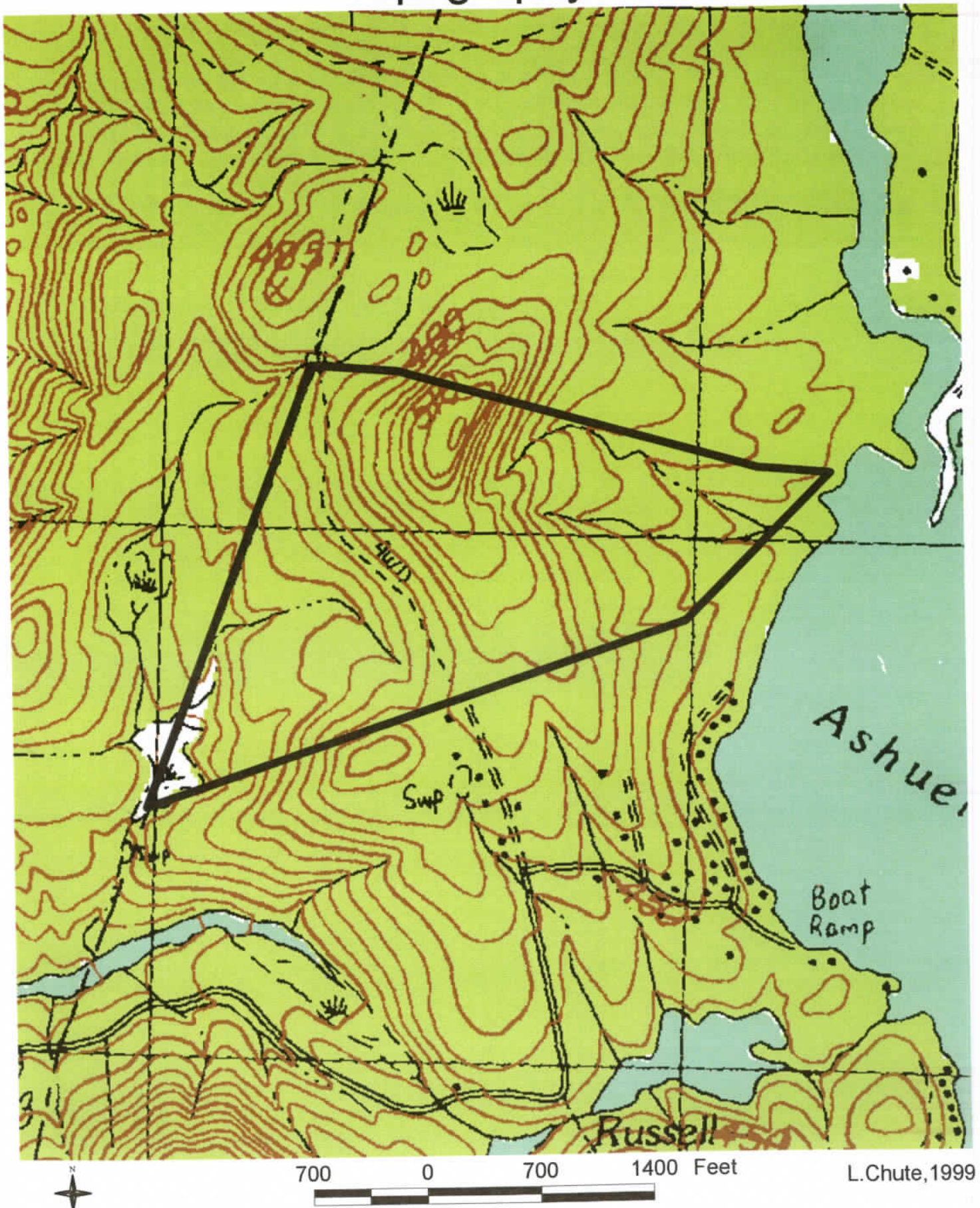
6.2.2 Topography (See Map #3)

The unnamed hill provides the greatest relief, with slopes exceeding 50% on the east side. There is a nice partial view of Ashuelot Pond from the summit of the hill.

Huntley Mtn. Rd. Lot- Ice Storm Damage and Other Disturbances



Huntley Mtn. Rd. Lot - Topography



6.2.3 Soils (See Map #4 and Table 1)

There are six primary soils on the Huntley Mountain Road Lot. The most abundant is Monadnock/Lyman/Rock Outcrop very stony fine sandy loam, a physically limited soil due to slope and rocky terrain. Lyman/Monadnock/Rock Outcrop very stony fine sandy loam covers the summit of the unnamed hill, and is also physically limited for forest management. Monadnock/Hermon extremely bouldery fine sandy loam makes up the eastern slopes of the hill and is also physically limited for obvious reasons. A 10 patch of Sunapee very stony fine sandy loam occurs in the northeast corner of the property. This soil is well suited for nutrient demanding hardwoods such as sugar maple and white ash, as well as red oak and birch. Another good forest soil is the Monadnock/Lyman very stony fine sandy loam along the southern bound. This soil best for good commercial species such as red oak and white pine. Finally, a 5 acre patch of poorly drained Lyme/Mooselauke very stony loam occurs in a small bog west of Huntley Mountain Road.

6.2.4 Wildlife

6.2.4.1 Habitats

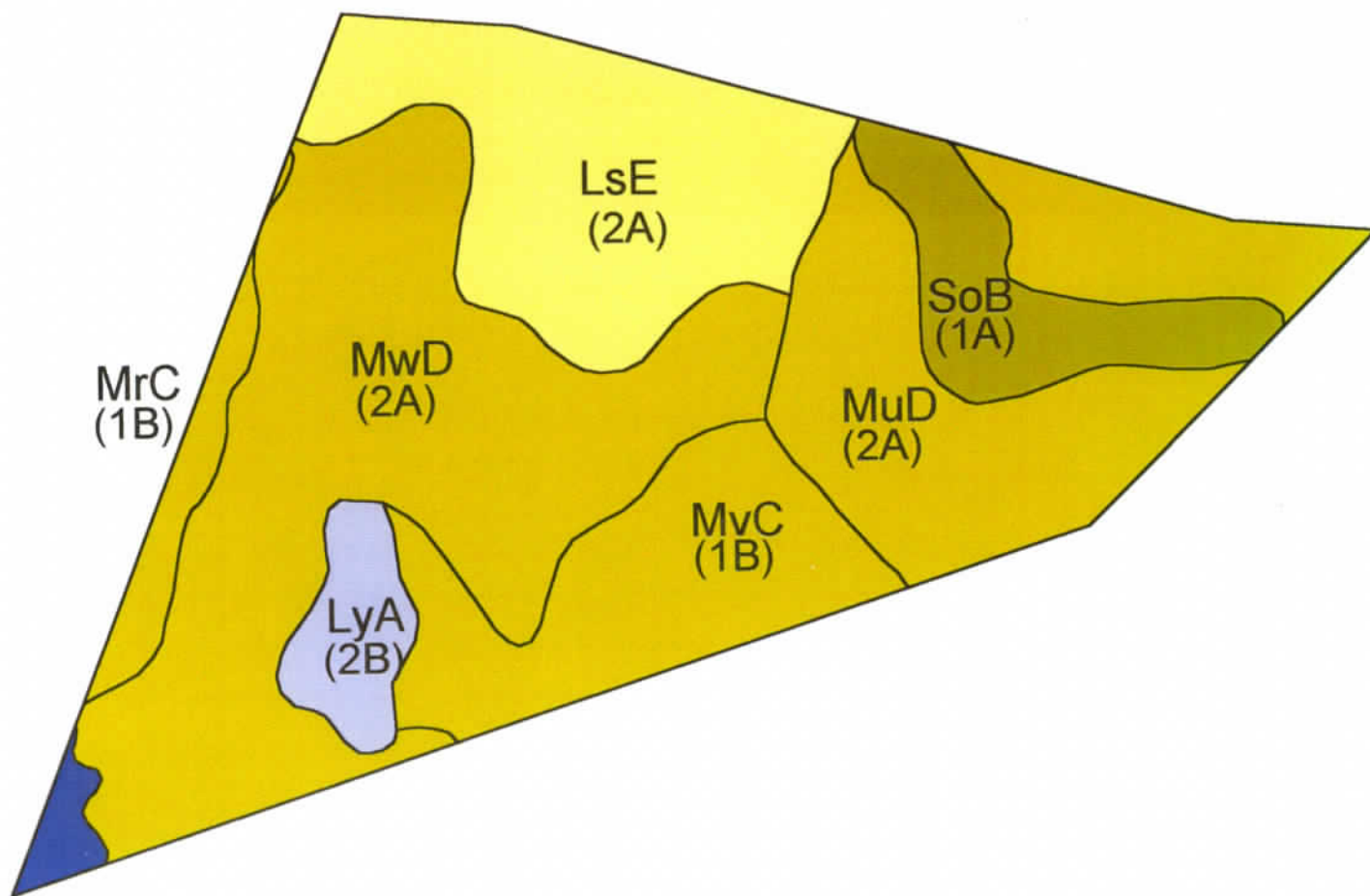
Perhaps the most important wildlife habitat on the property is the marsh in the south, where the abundance of water, sedges, grasses, shrubs and snag trees combine to meet the needs of many animals. Rocky slopes on and around the unnamed hill are good for small rodents and the reptiles that eat them. The forested habitat diversity is good in terms of tree species, with areas of hemlock, red oak, sugar maple, red maple, and spruce and fir forming distinct stands. The age-class distribution of trees is less than ideal, however, with little to no young stands or upland openings. A future timber removal should include the provision at least one opening, preferably one-half acre or more in size and away from Huntley Mountain Road.

ACTION ITEM: Consider creating a wildlife opening during the next timber sale of at least one-half acre in size, preferably away from Huntley Mountain Road.

Table 1: Soils

Soil Type	Acreage	Drainage & Slope	Woodland Limitation Ratings
Monadnock/Hermon Extremely bouldery- fine sandy loam MuD	26.4	well to somewhat excessively drained	erosion-----moderate use of equipment-----severe seedling mortality----- slight/severe windthrow-----slight
Lyman/Monadnock/ Rock Outcrop Very stony-fine sandy loam LsE	23.9	somewhat excessively to well drained	erosion-----severe use of equipment-----severe seedling mortality---mod./slight windthrow-----severe/ slight
Sunapee Very stony-fine sandy loam SoB	9.6	moderately well drained	erosion-----slight use of equipment-----slight seedling mortality-----slight windthrow----- slight
Monadnock/Hermon Extremely stony-fine sandy loam MrC	3.8	well to somewhat excessively drained	erosion-----slight use of equipment---slight/mod. seedling mortality----- slight/severe windthrow-----slight
Monadnock/Lyman/ Rock Outcrop Very stony-fine sandy loam MwD	44.7	well to somewhat excessively drained	erosion-----moderate use of equipment-----moderate seedling mortality---slight/mod. windthrow-----slight/severe
Monadnock/Lyman Very stony-fine sandy loam MvC	17.0	well to somewhat excessively drained	erosion-----slight use of equipment-----slight seedling mortality---slight/mod. windthrow-----slight/severe
Lyme/Moosilauke Very stony-loam LyA	4.8	poorly drained	erosion-----slight use of equipment-----severe seedling mortality-----moderate windthrow-----severe
Water (greater than 40) Water	1.5	x	erosion-----x use of equipment-----x seedling mortality-----x windthrow-----x

Huntley Mtn. Rd. Lot - Soils



Soil Drainage Classes

	somewhat excessively to well drained
	well to somewhat excessively drained
	moderately well drained
	poorly drained
	water

Important Forest Soil Groups

1A	loamy; favor sugar maple, white ash, birch and red oak
1B	sandy/loamy; favor red oak, white pine, birch and red spruce
2A	physically limited for forest management
2B	limited by poor drainage; favor spruce, fir and hemlock



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6.2.4.2 Availability of Dead Standing Trees (Snags)

Table 2: Snags

Snags are dead standing trees that are used by wildlife. Ten species of birds excavate cavities in dead or dying trees for nesting and roosting; another 15 birds and 18 mammals use these cavities for nesting, roosting, or denning. The “Good Forestry in the Granite State” guide recommends 6 snags per acre; 4 of which should be greater than 12” in diameter, and at least 1 greater than 18”. The following table summarizes the estimate of snag trees per acre per stand on the Huntley Mountain Road property:

Forest Type	Percent of all trees that are dead(snags)	Total snag Trees/acre	6 snag trees/acre?	4 snags > 12”?	1 snag > 18”?
1	6%	6.5	Yes	No	Yes
2	0%	0	No	No	No
3	5%	10.6	Yes	No	Yes
4	6%	15.7	Yes	No	Yes
5	6%	4.8	No	Yes	No
6	9%	3.8	No	Yes	No

The preceding table indicates a shortage of snag trees in most of the forest stands. MU’s 1,3 and 4 have enough total snags and large snags per acre, but most of these snags are less than 12” in diameter, limiting their use by wildlife. MU’s 5 and 6 have the opposite condition: enough snags greater than 12”, but not enough large snags or total snags per acre. MU2 is the most deficient, with no snag target met.

ACTION ITEM: Time is needed to develop more snag trees on this property, but the retention of existing snags and cavity trees during future harvests would be helpful.

6.2.5 Plant-life

Table 3: Plants Recorded on the Property During the Inventory

72 species of plants were observed on this property, in addition to the tree species tallied during the timber cruise. No rare, endangered or unusual plants were found, but the marsh in the southern corner may harbor interesting species not picked up in the forest inventory.

HUNTLEY MOUNTAIN ROAD LOT

COMMON NAME	SCIENTIFIC NAME
"Lowbush" Blueberry Species	Vaccinium sp
Alternate-leaved Dogwood	Cornus alternifolia
Arrow-wood	Viburnum dentatum var. lucidum
Aster Species	Aster sp
Bedstraw Species	Galium sp
Bluebead Lily	Clintonia borealis
Bracken Fern	Pteridium aquilinum var. latiusculum
Bristly Sarsaparilla	Aralia hispida
Broad Beech Fern	Phegopteris hexagonoptera
Bunchberry	Cornus canadensis
Bush Honeysuckle	Diervilla lonicera
Canada Mayflower	Maianthemum canadense
Canadian Fly Honeysuckle	Lonicera canadensis
Christmas Fern	Polystichum acrostichoides
Cinnamon Fern	Osmunda cinnamomea
Closed Gentian	Gentiana clausa
Cow-wheat	Melampyrum lineare var. americanum
Crested Wood Fern	Dryopteris cristata
Dewberry	Rubus flagellaris
Dwarf Enchanter's Nightshade	Circaea quadrisulcata
Dwarf Raspberry	Rubus pubescens
False Solomon's Seal	Smilacina racemosa
False Violet	Dalibarda repens
Fringed Bindweed	Polygonum cilinode
Goldenrod Species	Solidago sp
Goldthread	Coptis trifolia var. groenlandica
Hairy Solomon's Seal	Polygonatum pubescens
Hawthorn Species	Crataegus sp
Hay-scented Fern	Dennstaedtia punctilobula
Hobblebush	Viburnum alnifolium
Indian Cucumber-root	Medeola virginiana
Indian Pipes	Monotropa uniflora
Indian Poke	Veratrum viride
Interrupted Fern	Osmunda claytoniana

Jack-in-the-Pulpit (Common)
Lady Fern

Maple-leaved Viburnum
Marginal Wood Fern
Marsh Fern

Meadow-sweet
Mountain Holly
Mountain Maple
Nannyberry
New York Fern
Northern Running-pine
Northern Water Horehound
Northern Wood Sorrel
Painted Trillium
Panicked Hawkweed
Partridge-berry
Pink Lady's-slipper
Red Elderberry
Rock Polypody
Rubus Species
Sensitive Fern
Serviceberry Species
Shining Clubmoss
Skunk Currant
Speckled Alder
Spinulose Wood Fern
Star-flower
Swamp Dewberry
Tree Clubmoss
Turtlehead
Violet Species
White Wood Aster
Whorled Wood Aster
Wild Oats
Wild Raisin
Wild Sarsaparilla
Winterberry Holly
Wintergreen

Arisaema triphyllum
Athyrum felix-femina var.
angustum
Viburnum acerifolium
Dryopteris marginalis
Thelypteris palustris var.
pubescens
Spiraea alba
Nemopanthus mucronatus
Acer spicatum
Viburnum lentago
Thelypteris noveboracensis
Diphasiastrum complanatum
Lycopus uniflorus
Oxalis acetosella
Trillium undulatum
Hieracium paniculatum
Mitchella repens
Cyripedium acaule
Sambucus racemosa ssp. pubens
Polypodium virginianum
Rubus sp
Onoclea sensibilis
Amelanchier sp
Huperzia lucidula
Ribes glandulosum
Alnus incana var. americana
Dryopteris carthusiana
Trientalis borealis
Rubus hispidus
Lycopodium dendroideum
Chelone glabra
Viola sp
Aster divaricatus
Aster acuminatus
Uvularia sessilifolia
Viburnum nudum var. cassinoides
Aralia nudicaulis
Ilex verticillata
Gaultheria procumbens

6.3 Timber Resources

6.3.1 Management Units (See Map #5)

6.3.1.1 Management Unit Descriptions (See Maps #5 and #6)

There are seven management units on the Huntley Mountain Road property:

- 1) MU 1 consists of two stands, one to the east and one to the south of the unnamed hill. Both contain large sawtimber sugar maple and red oak trees, with a mix of red oak, red maple, sugar maple, white ash and white and yellow birch poles below. The east side of this MU may pose problems in terms of operability, as this area has some steeper slopes and rocky areas.
- 2) MU 2 serves to separate the two stands of MU1 from each other, then continuing to the south and to the north along both sides of the road. MU2 has a large sawtimber canopy of scattered white pine and red oak, with more numerous red maple and red oak poles underneath.
- 3) MU 3 makes up the northeastern corner of the property, and is dominated by fairly uniform red maple poles. There is some red oak in this stand that should be favored in future treatments. A 1-2 acre sphagnum wetland is also in this MU, which must be avoided by harvesting activities.
- 4) MU 4 is one large stand of red oak, red maple and red spruce in the southwest part of the property. Mostly poles, there are some small and large sawtimber trees, but they are scattered.
- 5) MU 5 is a small to large sawtimber hemlock /red oak/red spruce stand in the northeastern corner of the property. Overall the stand is understocked, meaning that more trees are needed to fully occupy the available growing space.
- 6) MU 6 is a stunted red oak and red maple pole stand on the summit of the unnamed hill. These trees may be much older than their small stature might suggest, as an earlier fire appears to have robbed the site of much of its topsoil. Operability will be a problem in this MU, as there is a fair amount of exposed and jagged ledge.
- 7) MU 7 is inoperable due to steep slopes and very rocky terrain. Heavy to spruce in the east and beech and red oak in the west, this stand is a mix of poles and small sawtimber with an occasionally larger tree.

Table 4: Operable Forest Type Management Units

<u>MU# - Forest Type</u>	<u>Total Acres</u>	<u>Operability Limitations</u>	<u>Basal Area per Acre</u>	<u>Mean Stand Diameter</u>	<u>Total saw timber/acre (bd.ft.)</u>	<u>Cut saw timber/acre (bd.ft.)</u>	<u>Total pulp /acre (cfs.)</u>	<u>Cut pulp /acre (cfs.)</u>
1- H5C/H3C	23	Partial terrain problems north	88	12.4	5,200	2,704	17.1	4.4
2- SH5D/H3B	18.5	None	103	9.7	4,400	1,882	17.1	9.7
3- H4D/H3A	24.3	One 1-acre wetland, otherwise none	90	8.9	800	0	15.5	0
4- HS5D/HS3B	30.2	None	83	10.6	4,600	539	12.4	0
5- SH5C/HS4C	13.5	None	106	12.3	4,400	0	15.3	0
6- H3B	12.3	Partial terrain problems north	66	8	300	0	11.2	0

6.3.1.2 Management Unit Prescriptions (See Map #7)

MU1) This management unit is a good candidate for a timber harvest, with an expected yield of 71,000 board feet of good quality red oak, white pine, and white ash sawlogs (as well as some red maple saw and tie logs). The objective of the cut would be to improve the stand overall, by weeding out the poorer stems and diminishing the abundance of red maple. A second objective would be to salvage the ice storm damaged stems from the eastern end of the MU. Difficult terrain in this eastern end, however, may pose obstacles to maneuverability.

MU2) This management unit is a good candidate for a timber harvest, with an expected yield of 35,000 board feet of white pine and red maple sawlogs. The purpose of the cut would be to harvest the large white pine before it begins to decline, simultaneously making room for the hardwoods that are growing below. In time, this stand should closely resemble MU1 (with or without treatment), as the white pine is probably more a reflection of past land use than ecological conditions. The understory is currently made up of red maple and red oak poles. Reducing the abundance of red maple would be a second goal of this harvest, favoring the much more valuable red oak as the future crop tree species.

MU3) MU3 should be left to grow, as the average tree is still not commercial (under 12"). This stand needs 15-20 years before entry, at which time red maples should be thinned out in favor of the less abundant red oaks. Proximity to Ashuelot Pond and a 1-2 acre sphagnum wetland will necessitate careful operation in the eastern end of

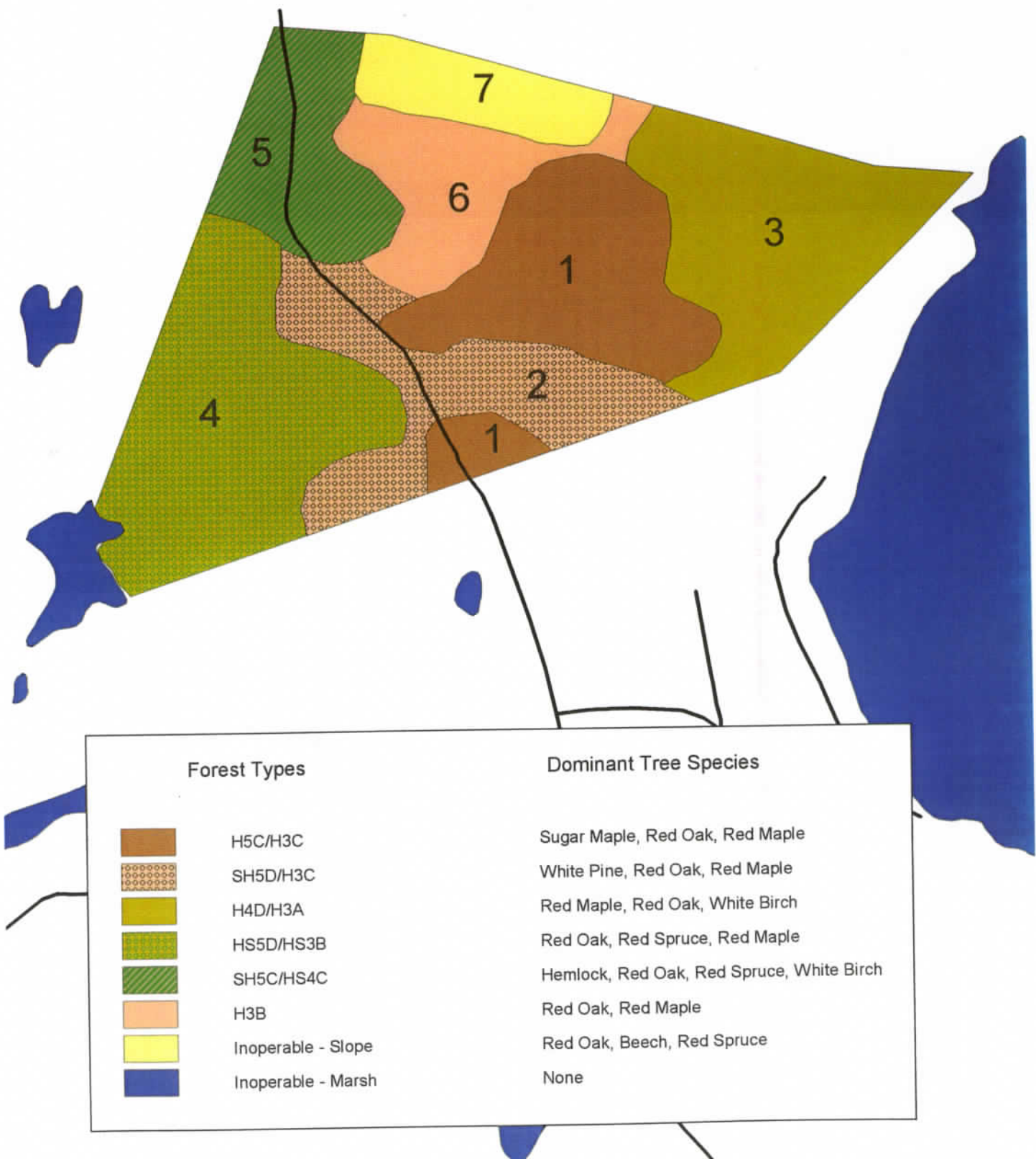
this MU.

MU4) This stand should be left to grow to build up volumes for another 15 years before entry. At that time, an improvement thinning of red oak and red maple should yield substantial volumes.

MU5) This hemlock stand will be a good candidate for harvest in ten years, as current total volumes are already high. The stand will benefit from an additional ten years of growth, however, as many of the standing trees which are currently small sawtimber size will have grown into the much more valuable large sawtimber category.

MU6) This stand should be left to grow, perhaps indefinitely. The trees in this MU are stunted and gnarled, and thin ledgy soils are the reason. It is doubtful that the trees that grow on this hilltop will ever be valuable as timber trees, and problems with access and operability are additional disincentives.

Huntley Mtn. Rd. Lot - Management Units



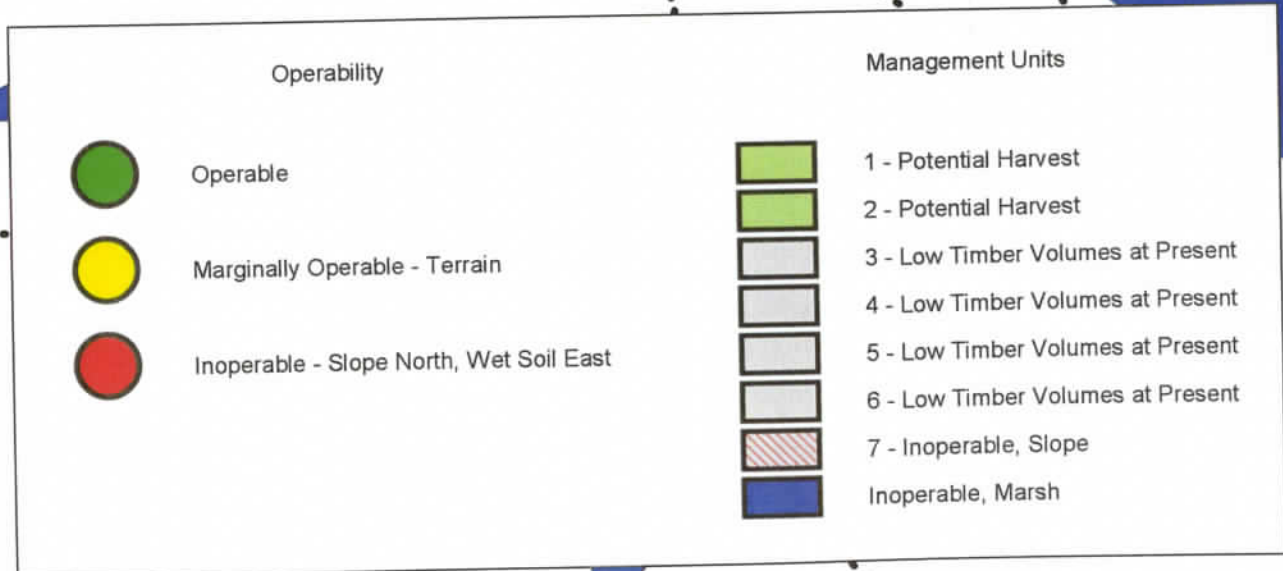
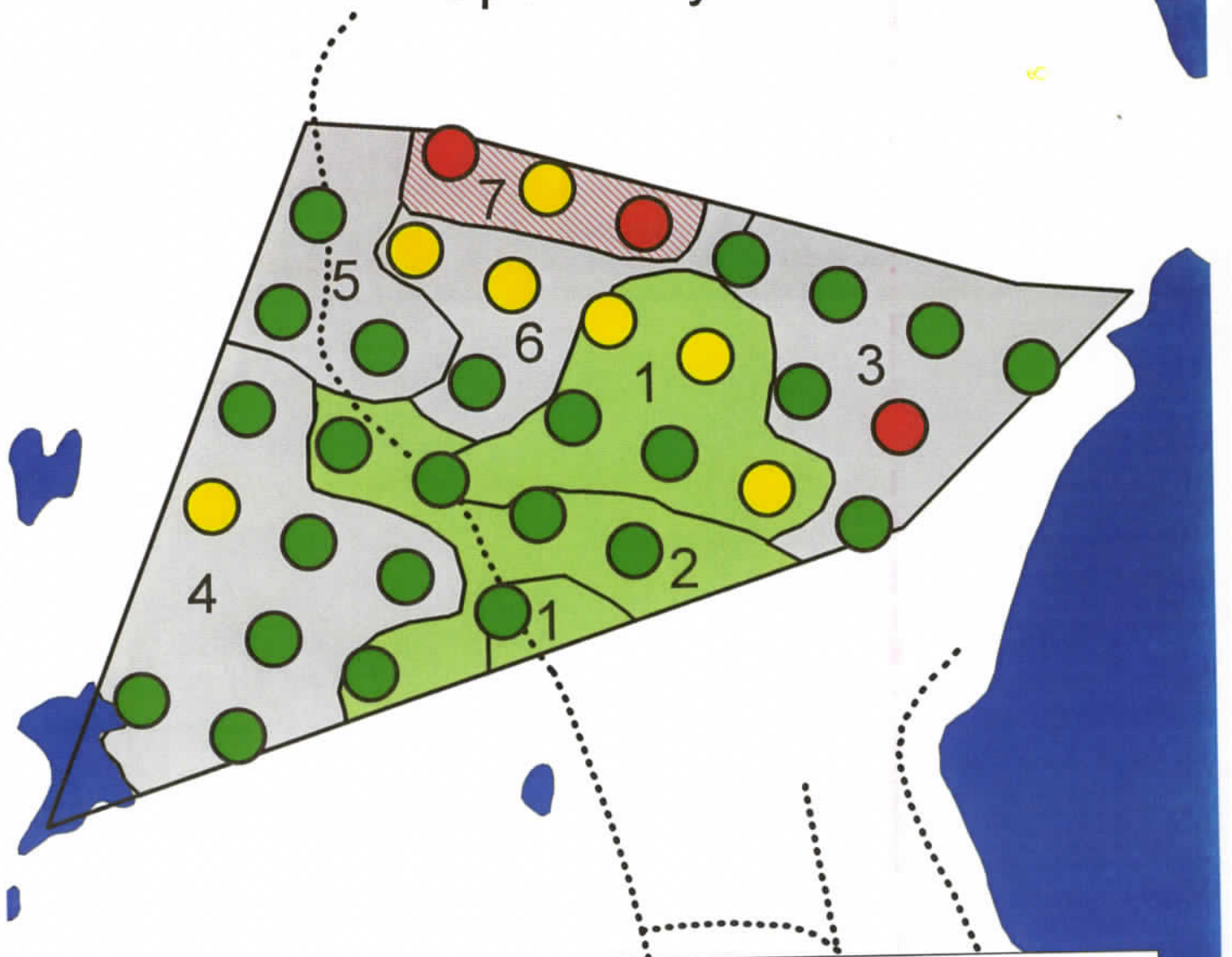
700 0 700 Feet

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Table 5: Forest Type Legend

<u>Overstory</u>	<u>/Understory Codes</u>
<i>H =</i>	<i>Majority of trees are hardwood</i>
<i>S =</i>	<i>Majority of trees are softwoods</i>
<u>Diameter</u>	<u>Codes</u>
<i>1 =</i>	<i>Seedlings up to 4.5 feet in height</i>
<i>2 =</i>	<i>Saplings 4.5 feet in height up to 4" in diameter</i>
<i>3 =</i>	<i>Poles 4" to 12" for hardwoods, 4-10" for softwoods</i>
<i>4 =</i>	<i>Small Sawlogs 12" to 16"</i>
<i>5 =</i>	<i>Large Sawlogs 18" in diameter and larger</i>
<u>Crown</u>	<u>Closure</u>
<i>A =</i>	<i>80 to 100% Crown Closure</i>
<i>B =</i>	<i>61 to 80% Crown Closure</i>
<i>C =</i>	<i>31 to 60% Crown Closure</i>
<i>D =</i>	<i>5 to 30% Crown Closure</i>
<i>MSD =</i>	<i>Mean stand diameter, a measure of relative diameter sizes</i>
<i>BA =</i>	<i>Basal Area, a relative measure of stand density or stocking. Desired basal area for hardwoods is 70 square feet per acre; 80 square feet for softwoods, and 90 square feet for white pine. Basal area averages that exceed 30 or more square feet to the acre (for each category) can be thinned back to the desired basal area to maximize stand potential.</i>
<i>Cut Volumes</i>	<i>Cut volumes per acre indicate the amount of sawlogs or pulpwood volumes per acre that are merchantable. The board foot cut volumes should exceed 1,000 BF of sawlogs per acre (or 2 to 4 cords of pulp per acre or a combination of both) in order to be of commercial interest to a logger.</i>

Huntley Mtn. Rd. Lot - Operability



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Huntley Mountain Road Lot - Management Recommendations

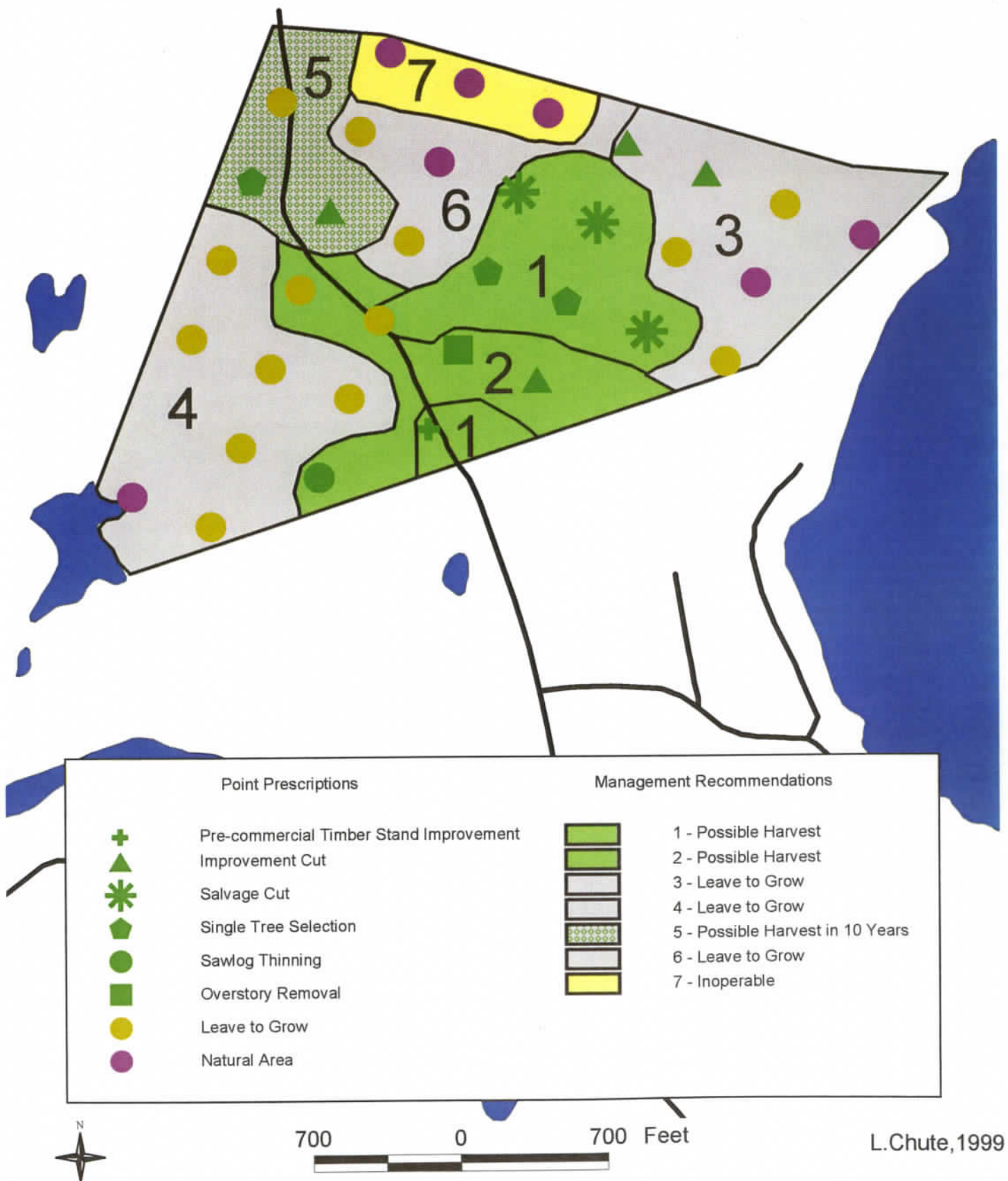


Table 6: Harvest Schedule and Estimated Revenue

The following revenue would be generated by harvests of MU's 1 and 2, provided that Huntley Mountain Road were in a more usable condition:

HUNTLEY MTN. RD.	<u>Management Unit 1</u>		<u>Management Unit 2</u>		<u>Property Total</u>	
PRODUCT	VOLUME	VALUE	VOLUME	VALUE	VOLUME	VALUE
Red Oak saw	20.2	\$6,828	0	\$0	20.2	\$6,828
White Pine saw	11	\$1,408	21.2	\$2,714	32.2	\$4,122
Sugar Maple saw	8.3	\$1,785	0	\$0	8.3	\$1,785
Red Maple saw	16.7	\$718	13.6	\$585	30.3	\$1,303
White Ash saw	5.9	\$856	0	\$0	5.9	\$856
Red Maple tie	9.2	\$368	0	\$0	9.2	\$368
TOTAL saw (Mbf)	71.3	\$11,962	34.8	\$3,298	106.1	\$15,260
TOTAL pulp (cords)	101	\$505	180	\$900	281	\$1,405
TOTAL all products		\$12,467		\$4,198		\$16,665

Harvest Schedule:

2002. Given the adjacency of MU's 2 and 3, the timber sale should include both MU's. Any harvest at this property, however, is contingent on the improvement of Huntley Mountain Road, which is currently in disrepair.

7 NEW ROAD (TWIN BRIDGES) LOT

7.1 Property Data

7.1.1 Regional Context (See Map # 1)

At 45-acres, the New Road Lot is currently the smallest of the forested properties the Town owns. Located just south of Pillsbury State Park, however, this property is an important conservation “stepping stone” that may one day help to bridge two large forest blocks together. Heading north, Pillsbury State Park is a large piece of a very large forest complex that extends north all the way to Lake Sunapee. Heading south, beginning in southern Washington, is the equally large Andorra Forest complex that reaches down to the Towns of Sullivan and Nelson. Each of these great forests is more than 10,000 acres in size, representing the combined determination of many private and public landowners to keep southwestern New Hampshire wild and forested. It is now the hope of many people throughout the region that someday these two forests may become connected. If so, Washington Town forests such as the New Road Lot will be important members of the forested bridge that has yet to be built.

7.1.2 Tax and Deed Information

Deed reference: 940/599

Date acquired: 6-13-91

Previous owner: Atkinson-Davis Corp.

Tax information: Map # 07, lot 011

Assessed value: Land assessed at \$34,000 as of 6-4-98

Current use value: \$3,000

7.1.3 Boundary Line Status

Except for the northern bound (which appears to be blazed) all bounds of this property are currently unmarked. However, the existence of several corner markers would make survey and line-blazing by a surveyor relatively simple.

Survey Map: No survey map is known for this property.

Property corner markers: A painted and flagged rebar was found in the southwest corner of the property. Iron pipes were also found on the northwest and northeast corners, as well as on the east and west bounds along New Road. In fact, the only corner that wasn't found was in the southeast, but further investigation may reveal this marker as well.

ACTION ITEM: A survey of this property should be done eventually, in order to obtain blazed property lines around the perimeter. Given the known location of most property corners, the cost of a survey should be relatively low. The survey needs to be done prior to the next timber harvest, however, in order to avoid legal complications with abutting landowners.

7.1.4 Access

Main Road: The New Road (also called Twin Bridges Road) provides excellent access into the property, and is in good condition. Prior to a timber sale, however, the road will need to be brushed out, as tree growth has begun to overgrow the road in places.

Gate(s): There are no gates on this property.

Property signs: There are no property signs on this property.

Internal Roads: The New Road (also called Twin Bridges Road) bisects the property into two sections; a large piece north of the road, and a smaller piece to the south. The road is in very good condition (little to no erosion), but will need to be brushed out prior to a timber sale.

7.1.5 Recreation

Hiking Trails: There are no hiking trails on this property.

Other uses: There is an established snow-mobile trail that comes onto the property from the east on New Road. The trail leaves the road, turning sharply north, several hundred feet west of the eastern bound. The trail then continues north through the woods, presumably to Pillsbury State Park.

ACTION ITEM: Consider building a short hiking trail spur off of New Road on the west side of the property. This trail would be a loop on the north side of New Road that would allow residents to visit a small patch of ancient yellow birches discovered during the inventory.

7.1.6 Historical Influences

7.1.6.1 Human

Logging is the only indication of human influence on this property, with both old and more recent stumps observed at a few locations.

7.1.6.2 Non-Human

Hardwoods in the southwestern corner of the property were observed to be heavily browsed by moose. Some beech scale disease was also seen near the southern border, but the impact so far is very slight.

New Road Lot - Location and Hydrology



7.1.7 Impact of the Ice Storm of 1998 (See Map #2)

Minor ice storm damage was observed on most of the property, with occasional broken branches sustained by more hardwoods than softwoods. The damage was slightly worse in the south (where trees were more exposed by steeper slopes), but overall the storm's impact to this property was negligible.

7.2 Ecosystem Information

7.2.1 Hydrology (See Map #1)

Wetlands Features: There are few wetland features on this property, although a small river flowing from west to east was seen within feet of the northern bound (not shown correctly on map #1). Two intermittent streams also occur on the property, both flowing north; one drains into a large wetland east of the property, the other drains into the river further north. A 1-acre wetland/seep also occurs in the northwestern corner of the property, which must be avoided in any future timber harvests.

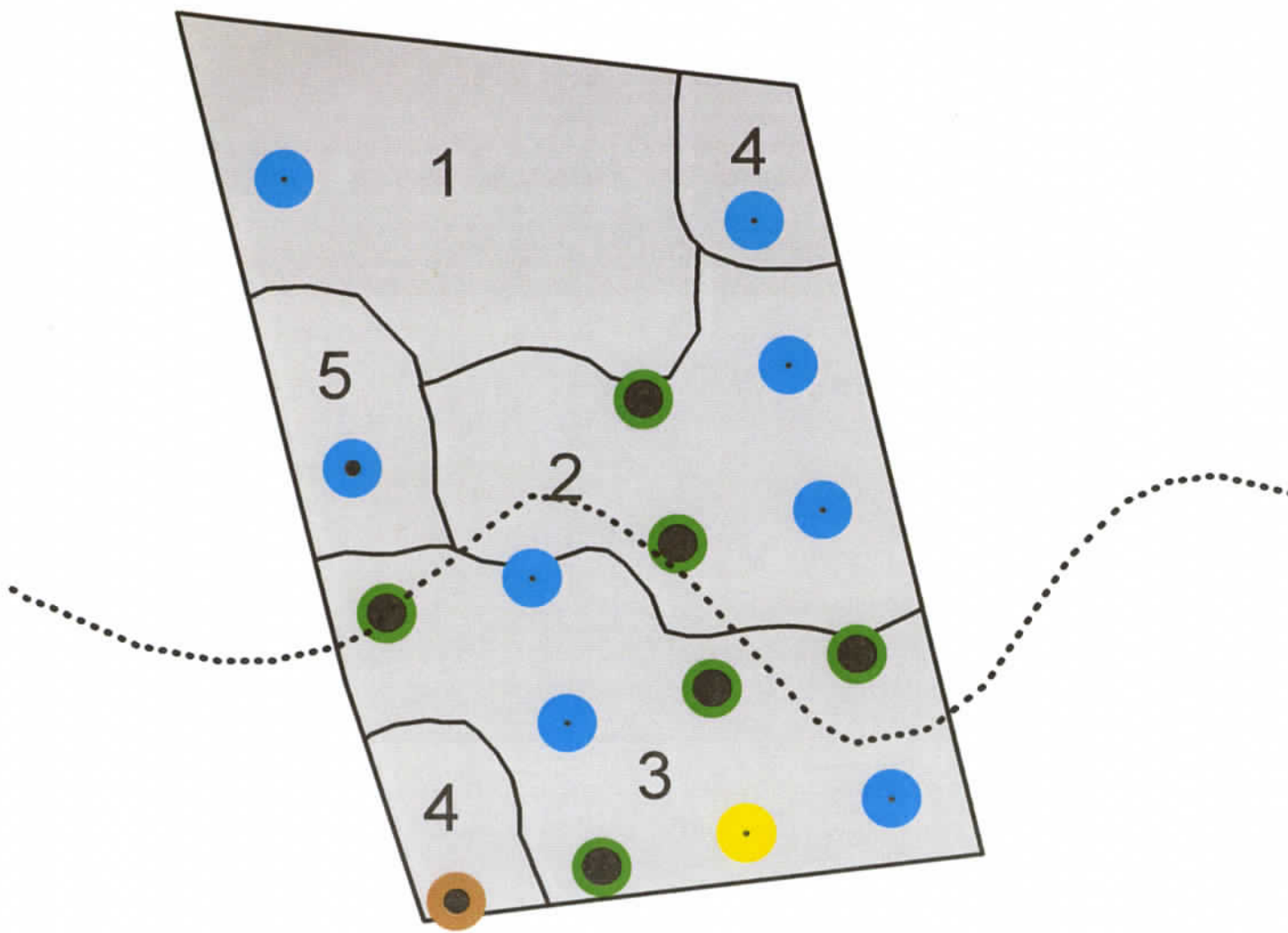
7.2.2 Topography (See Map #3)

Located on the lowest north-facing slopes of a mountain ridge, the entire property has a northern aspect. The steepness of the slope increases as one moves south, but at no point does the slope angle preclude forest management activities.

7.2.3 Soils (See Map #4 and Table 1)

There are four soil types on the New Road Lot. The most abundant is Monadnock/Lyman very stony-fine sandy loam, located both north and west on the property. These sandy/loamy soils are best suited for growing red oak, white pine, birch and red spruce. Currently, red spruce and yellow birch both occupy the site, with little to no red oak or white pine. Marlow very stony loam is also well represented, located mostly to the south of New Road in the center of the Lot. This soil is deeper and richer than Monadnock/Lyman, and is well suited for hardwoods such as sugar maple, white ash, red oak and birches. This area is currently well stocked with white ash, with lesser amounts of sugar maple and yellow birch also present. To the east of the Marlow soil is Peru very stony loam, another good soil for sugar maple and other hardwoods. As with the Marlow area, this land currently has both white ash, sugar maple and yellow birch, but little to no red oak. The fourth soil is poorly drained Lyme/Moosilauke very stony loam, found in the northwestern corner of the property. These soils are limited for forest management by wetness, but are good for growing hemlock, spruce and fir. Currently, spruce and fir are both dominant species of the canopy.

New Road Lot - Ice Storm Damage and Other Disturbances

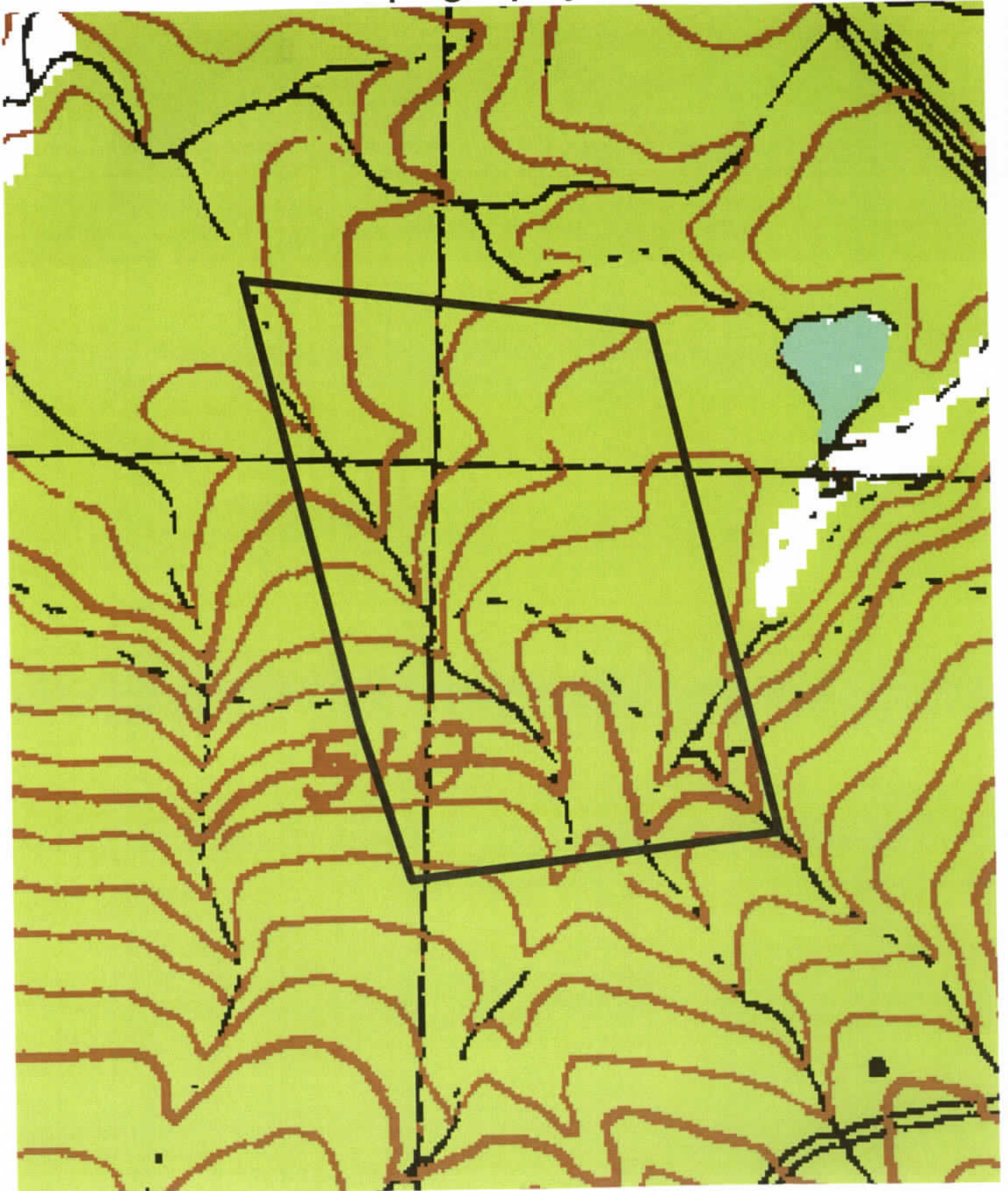


Disturbance Magnitude		Disturbance	
•	Very Slight		Ice Damage
●	Slight		Deer/Moose Browse
●	Moderate		Insect/Disease
●	Severe		Old Thinning



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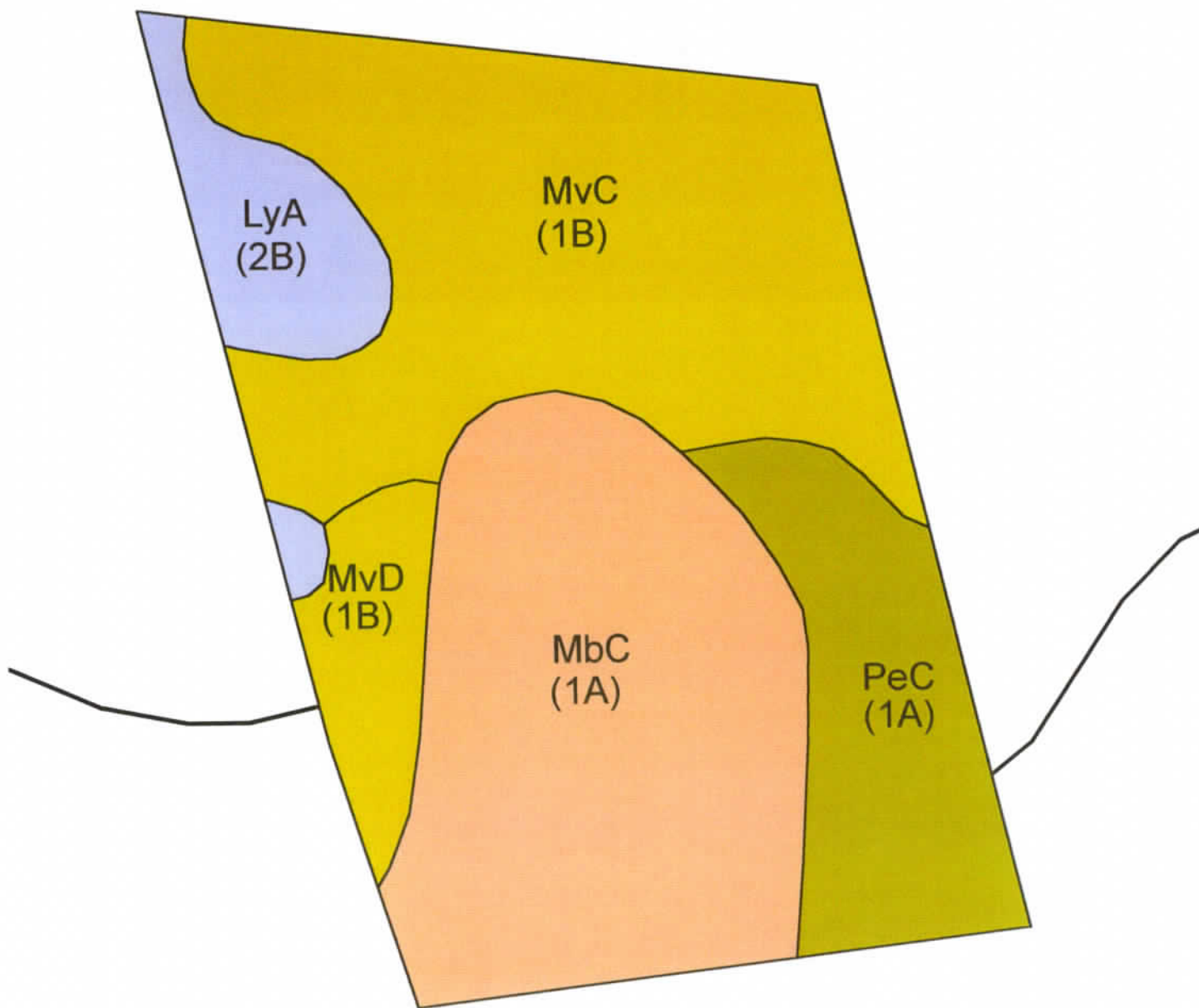
New Road Lot - Topography



300 0 300 600 Feet

L.Chute, 1999

New Road Lot - Soils



Soil Drainage Classes

	well to somewhat excessively drained
	well drained
	moderately well drained
	poorly drained

Important Forest Soil Groups

1A	loamy; favor sugar maple, white ash, birch and red oak
1B	sandy/loamy; favor red oak, white pine, birch and red spruce
2B	limited by poor drainage; favor spruce, fir and hemlock



300 0 300 Feet



L.Chute, 1999

Table 1: Soils

Soil type	Acreage	Drainage & Slope	Woodland Limitation Ratings
Monadnock/Lyman Very stony-fine sandy loam MvC MvD	12.1(C) 1.9(D)	Well to somewhat excessively drained	erosion---C slight, D moderate use of equipment-- C slight, D moderate seedling mortality- slight/mod. windthrow----- slight/severe
Marlow Very stony-loam MbC	11.1	well drained	erosion-----slight use of equipment-----slight seedling mortality-----slight windthrow-----moderate
Peru Very stony-loam PeC	4.8	moderately well drained	erosion-----slight use of equipment-----slight seedling mortality-----slight windthrow-----moderate
Lyme/Moosilauke Very stony-loam LyA	2.4	poorly drained	erosion-----slight use of equipment-----severe seedling mortality----moderate windthrow-----severe

7.2.4 Wildlife

7.2.4.1 Habitats

The New Road Lot does not have much diversity in terms of wildlife habitat. The majority of the property is pole and small sawtimber hardwoods (red maple, sugar maple, white ash and yellow birch), with one softwood stand in the northwest end (red spruce, balsam fir and red maple). Major wetland features are lacking within the property, although a river and swamp are located nearby. Future management activities should include providing at least one one-half acre wildlife opening, preferably away from New Road.

ACTION ITEM: Consider creating a wildlife opening during the next timber sale, preferably away from New Road.

7.2.4.2 Dead Standing Trees (Snags)

Snags are dead standing trees that are used by wildlife. Ten species of birds excavate cavities in dead or dying trees for nesting and roosting; another 15 birds and 18 mammals use these cavities for nesting, roosting, or denning. The “Good Forestry in the Granite State” guide recommends 6 snags per acre; 4 of which should be greater than 12” in diameter, and at least 1 greater than 18”. The following table summarizes the estimate of snag trees per acre per stand on the New Road property:

Table 2: Snags

Forest Type	Percent of all trees that are dead(snags)	Total snag Trees/acre	6 snag trees/acre?	4 snags > 12”?	1 snag > 18”?
1	14%	42.9	Yes	Yes	No
2	30%	54.4	Yes	Yes	No
3	17%	34.1	Yes	No	No
4	30%	14.7	Yes	Yes	No

While all MU’s meet the guideline for total snags per acre, not one currently has enough large snags (greater than 18”). Fourteen species of wildlife, including wood ducks, mergansers, barred owl, pileated woodpeckers, and fisher require snags that are 18” in diameter or greater. Bear and Gray Fox require cavity trees at least 24” in diameter or greater. As the property ages, the abundance of large snags will increase, providing more habitat opportunities for these and other wildlife species.

ACTION ITEM: Retain large diameter snags and cavity trees during harvesting activities, where possible.

7.2.5 Plant-life

47 species of plants were identified during the inventory, in addition to tree species picked up by the timber cruise. No rare or endangered plants were found, however, a small population of purple fringed orchid (*Platanthera psycodes*) was found in the northeastern wetland/seep. This orchid is quite uncommon in this part of New Hampshire and very beautiful when in bloom. A hiking trail could be built that would allow people to see these summer-blooming orchids, as well as the small grove of ancient yellow birches nearby.

Table 3: Plants Recorded on the Property During the Inventory

NEW ROAD LOT

COMMON NAME	SCIENTIFIC NAME
Alternate Leaved Dogwood	Cornus alternifolia
American Yew	Taxus canadensis
Arrow Leaved Tearthumb	Polygonum sagittatum
Bluebead Lily	Clintonia borealis
Broad Beech Fern	Phegopteris hexagonoptera
Bunchberry	Cornus canadensis
Bush Honeysuckle	Diervilla lonicera
Canada Fly Honeysuckle	Lonicera canadensis
Canada Mayflower	Maianthemum canadense
Christmas Fern	Polystichum acrostichoides
Common Dewberry	Rubus flagellaris
Dwarf Enchanter's	Circaea alpina
Nightshade	
Dwarf Raspberry	Rubus pubescens
False Solomon Seal	Smilacina racemosa
Foamflower	Tiarella cordifolia
Fringed Bindweed	Polygonum cilinode
Hay Scented Fern	Dennstaedtia punctilobula
Hobblebush	Viburnum alnifolium
Indian Cucumber Root	Medeola virginiana
Indian Pipes	Monotropa uniflora
Indian Poke	Veratrum viride
Interrupted Fern	Osmunda claytoniana
Jack In The Pulpit	Arisaema triphyllum
Jewelweed	Impatiens sp
Lady Fern	Athyrium felix-femina var. angustum
Mad-dog Skullcap	Scutellaria lateriflora
Mountain Ash	Sorbus sp
Mountain Maple	Acer spicatum
New York Fern	Thelypteris noveboracensis
Northern Wood Sorrel	Oxalis acetosella
Oak Fern	Gymnocarpium dryopteris
Painted Trillium	Trillium undulatum
Pin Cherry	Prunus pensylvanica
Pink Lady's-slipper	Cypripedium acaule
Purple-fringed Orchid	Platanthera psycodes
Rose Twisted Stalk	Streptopus roseus var. perspectus
Shining Clubmoss	Huperzia lucidula
Spinulose Wood Fern	Dryopteris carthusiana
Star-flower	Trientalis borealis
Stiff Clubmoss	Lycopodium annotinum

Tree Clubmoss
Turtlehead
Water Pennywort
Whorled Wood Aster
Wild Lettuce Species
Wild Oats

Lycopodium dendroideum
Chelone glabra
Hydrocotyle americana
Aster acuminatus
Lactuca sp
Uvularia sessilifolia

7.3 Timber Resources

7.3.1 Management Units (See Map #5)

7.3.1.1 Management Unit Descriptions (See Maps #5 and #6)

There are five management units on the Huntley Mountain Road property:

- 1) MU 1 consists of a well-stocked mixture of red spruce, balsam fir and red maple, and is found in the northeast end of the property. Most trees are pole-sized, with occasional small-sawtimber stems scattered throughout. Much of this MU includes bouldery terrain and wet soils that will make forest management challenging, but not impossible.
- 2) MU 2 is a low quality and low value hardwood stand dominated by red maple poles and scattered small sawtimber. The left-overs from earlier high-grading ("take the best, leave the rest"), this stand will need a lot of work before it will become profitable. The western end of this MU has some terrain problems that will have to be contented with.
- 3) MU 3 is a northern hardwood stand that is somewhat understocked due to previous harvesting practices. This stand occupies most of the southern half of the property, with a good representation of valuable tree species such as white ash and sugar maple. Unfortunately, red maple of only fair quality is by far the most common species, but this can be corrected over time through targeted thinnings. Trees range in size from poles to small sawtimber, only pockets of which are currently well stocked.
- 4) MU 4 is made up of two small stands on opposite sides of the property. This MU is very similar to MU3, except for the additional presence of some scattered large sawtimber trees (sugar maple, white ash, yellow birch and red maple). The bulk of stems are still just poles, however, dominated by sugar maple, red maple, and white ash.
- 5) MU 5 is distinguished by a large and impressive boulder field, making this stand inoperable for timber management purposes. As a lucky result, however, a small group of extremely old and massive yellow birches have survived to the present day. These trees are worthless as timber, having very poor form and advanced decay in their boles. But they are priceless for their size and age, and serve to remind us how the forests of the past might have looked.

Table 4: Operable Forest Type Management Units

<u>MU# - Forest Type</u>	<u>Total Acres</u>	<u>Operability Limitations</u>	<u>Basal Area /acre</u>	<u>Mean Stand Diameter</u>	<u>Total saw timber/acre (bd.ft.)</u>	<u>Cut saw timber/acre (bd.ft.)</u>	<u>Total pulp /acre (cfs.)</u>	<u>Cut pulp /acre (cfs.)</u>
1- H4D/SH3B	9	Terrain Problems	112	8.9	3,800	524	18.4	0
2- H4C/H3C	7.9	Partial terrain problem west	84	11	1,600	930	15.0	0
3- H4C/H3C	9.8	None	93	9.8	4,400	1,115	14.8	0
4- H5D/H3B	3.2	None	134	10.3	5,000	1,220	26.0	0

7.3.1.2 Management Unit Prescriptions (See Map #7)

MU1) This stand is not yet ready for a timber harvest, as most of the trees need time to grow larger. The stand is well-stocked however, and should support a commercial thinning in ten years (provided that the rocky and wet terrain can be overcome). The long-term goal of this stand should be to reduce the red maple in favor of spruce and fir, as they are not only more valuable but are better suited for the site.

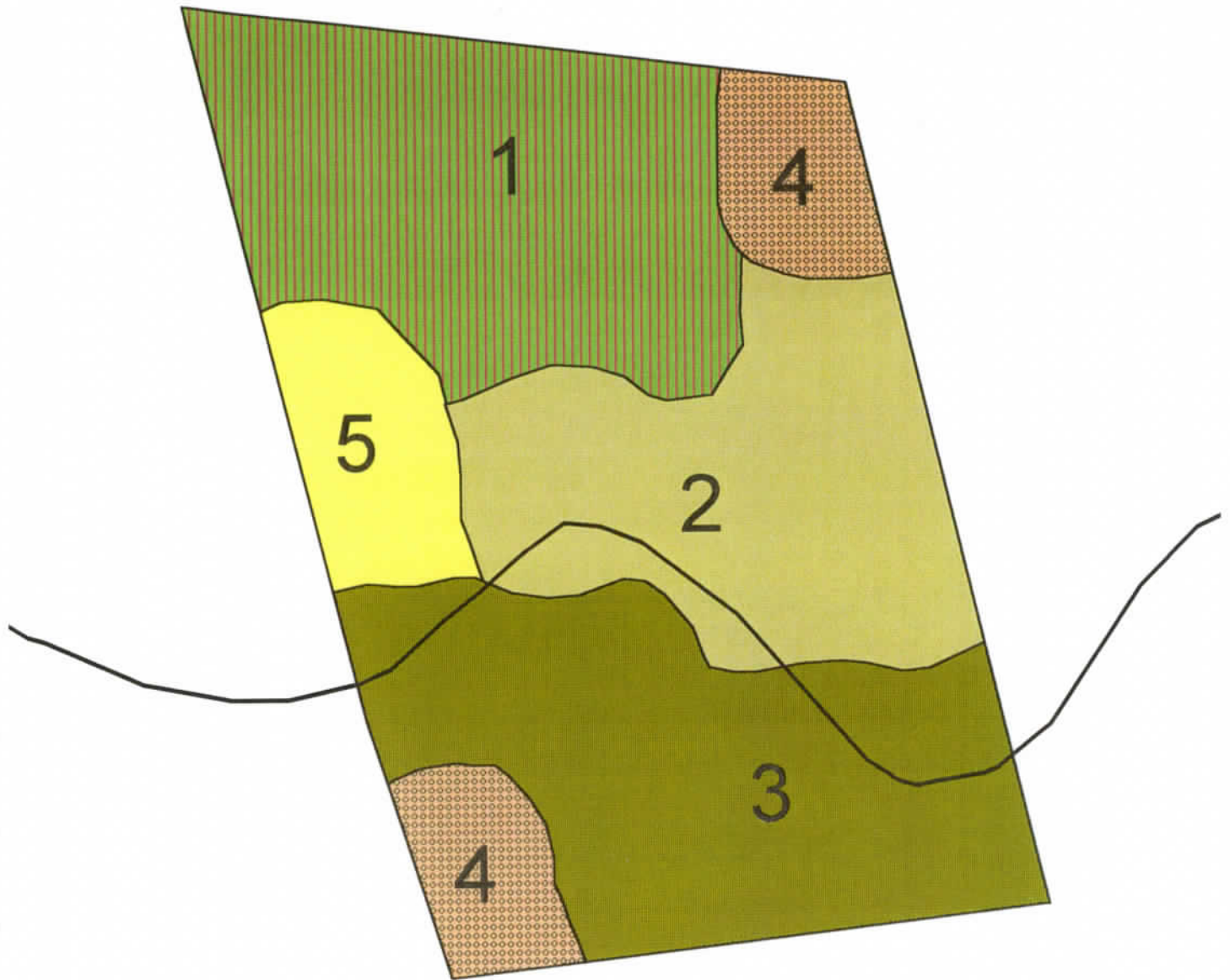
MU2) MU2 is a poor stand in need of an overhaul. Currently, the volumes are too low to support a thinning, but given the preponderance of poor-quality red maple, it would be more sensible to start the whole stand over instead. Small patch clear-cuts could be employed in this stand, to encourage a new species mix of tighter stems. A second benefit of using patch cuts would be the creation of wildlife openings, at least one of which could be kept open as the others became reforested.

MU3) This management unit has great potential to be a valuable and productive source of white ash and sugar maple sawlogs. But improvement cutting is needed to reduce the red maple currently dominating the stand, and favor the straightest and healthiest crop trees. Present cut volumes are too low to justify a harvest. In ten years, however, the stand will be ready, and the Town will earn revenue in the process.

MU4) Although cut volumes of MU4 are beginning to approach harvestability, these two small stands don't contain enough total volume to be harvested by themselves. Coupled with MU3, however, a timber sale in ten years could easily be put together. At that time, some large sawtimber trees can be cut to make room for the next generation, but the main goal should be to reduce red maple and improve the quality of the stands overall.

Property Map #5: Management Units

New Road Lot - Management Units



Forest Types		Dominant Tree Species	
	H4D/SH3B	Red Maple, Red Spruce, Balsam Fir	
	H4C/H3C	Red Maple, Yellow Birch	
	H4C/H3C	Red Maple, White Ash, Sugar Maple, Yellow Birch	
	H5D/H3B	Sugar Maple, Red Maple, White Ash	
	Inoperable - Terrain	Yellow Birch, Red Maple	



300 0 300 Feet

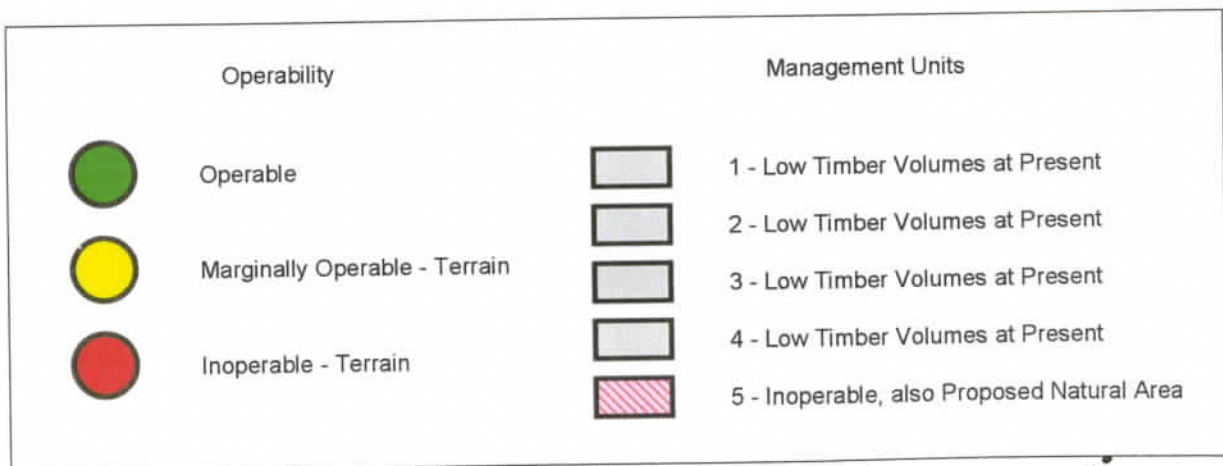
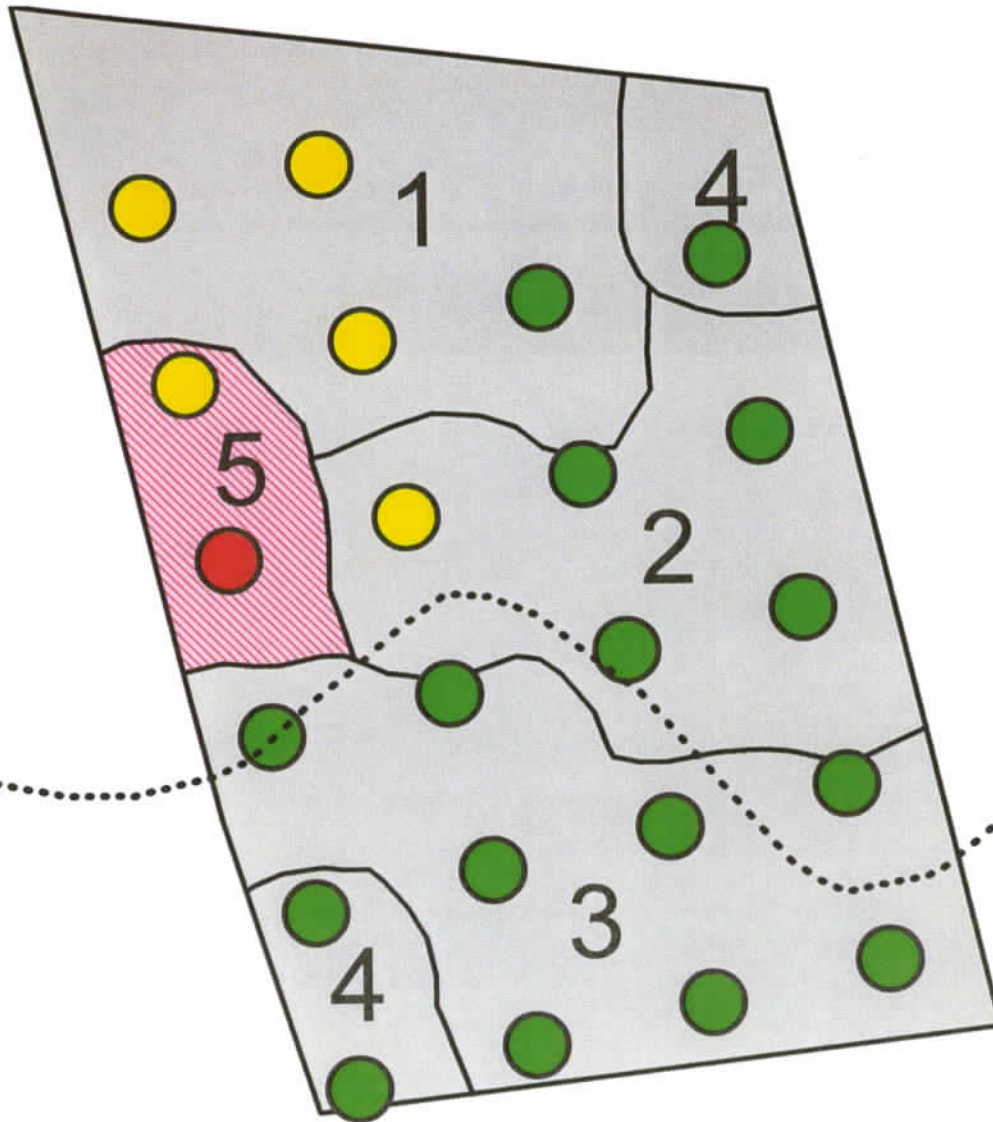


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Table 5: Forest Type Legend

<u>Overstory</u>	<u>/Understory Codes</u>
<i>H =</i>	<i>Majority of trees are hardwood</i>
<i>S =</i>	<i>Majority of trees are softwoods</i>
<u>Diameter</u>	<u>Codes</u>
<i>1 =</i>	<i>Seedlings up to 4.5 feet in height</i>
<i>2 =</i>	<i>Saplings 4.5 feet in height up to 4" in diameter</i>
<i>3 =</i>	<i>Poles 4" to 12" for hardwoods, 4-10" for softwoods</i>
<i>4 =</i>	<i>Small Sawlogs 12" to 16"</i>
<i>5 =</i>	<i>Large Sawlogs 18" in diameter and larger</i>
<u>Crown</u>	<u>Closure</u>
<i>A =</i>	<i>80 to 100% Crown Closure</i>
<i>B =</i>	<i>61 to 80% Crown Closure</i>
<i>C =</i>	<i>31 to 60% Crown Closure</i>
<i>D =</i>	<i>5 to 30% Crown Closure</i>
<i>MSD =</i>	<i>Mean stand diameter, a measure of relative diameter sizes</i>
<i>BA =</i>	<i>Basal Area, a relative measure of stand density or stocking. Desired basal area for hardwoods is 70 square feet per acre; 80 square feet for softwoods, and 90 square feet for white pine. Basal area averages that exceed 30 or more square feet to the acre (for each category) can be thinned back to the desired basal area to maximize stand potential.</i>
<i>Cut Volumes</i>	<i>Cut volumes per acre indicate the amount of sawlogs or pulpwood volumes per acre that are merchantable. The board foot cut volumes should exceed 1,000 BF of sawlogs per acre (or 2 to 4 cords of pulp per acre or a combination of both) in order to be of commercial interest to a logger.</i>

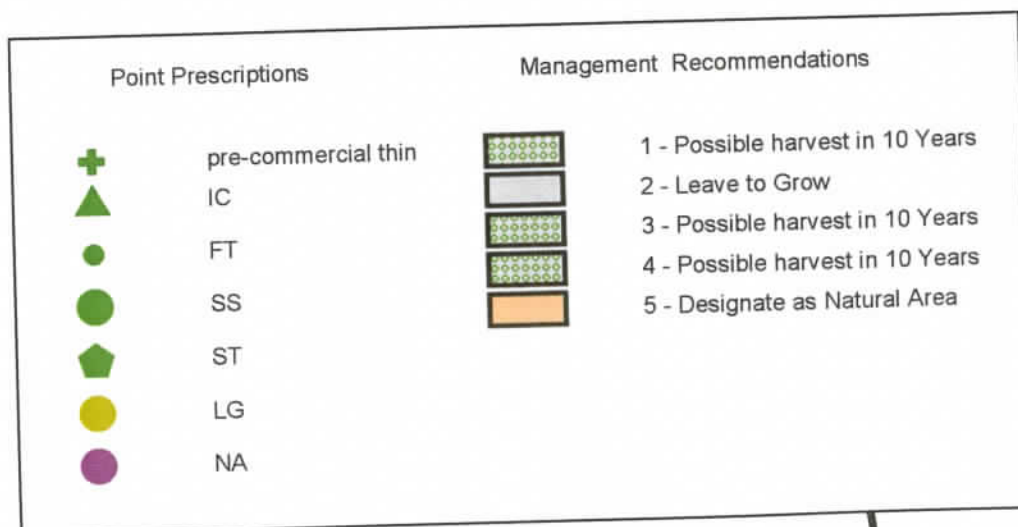
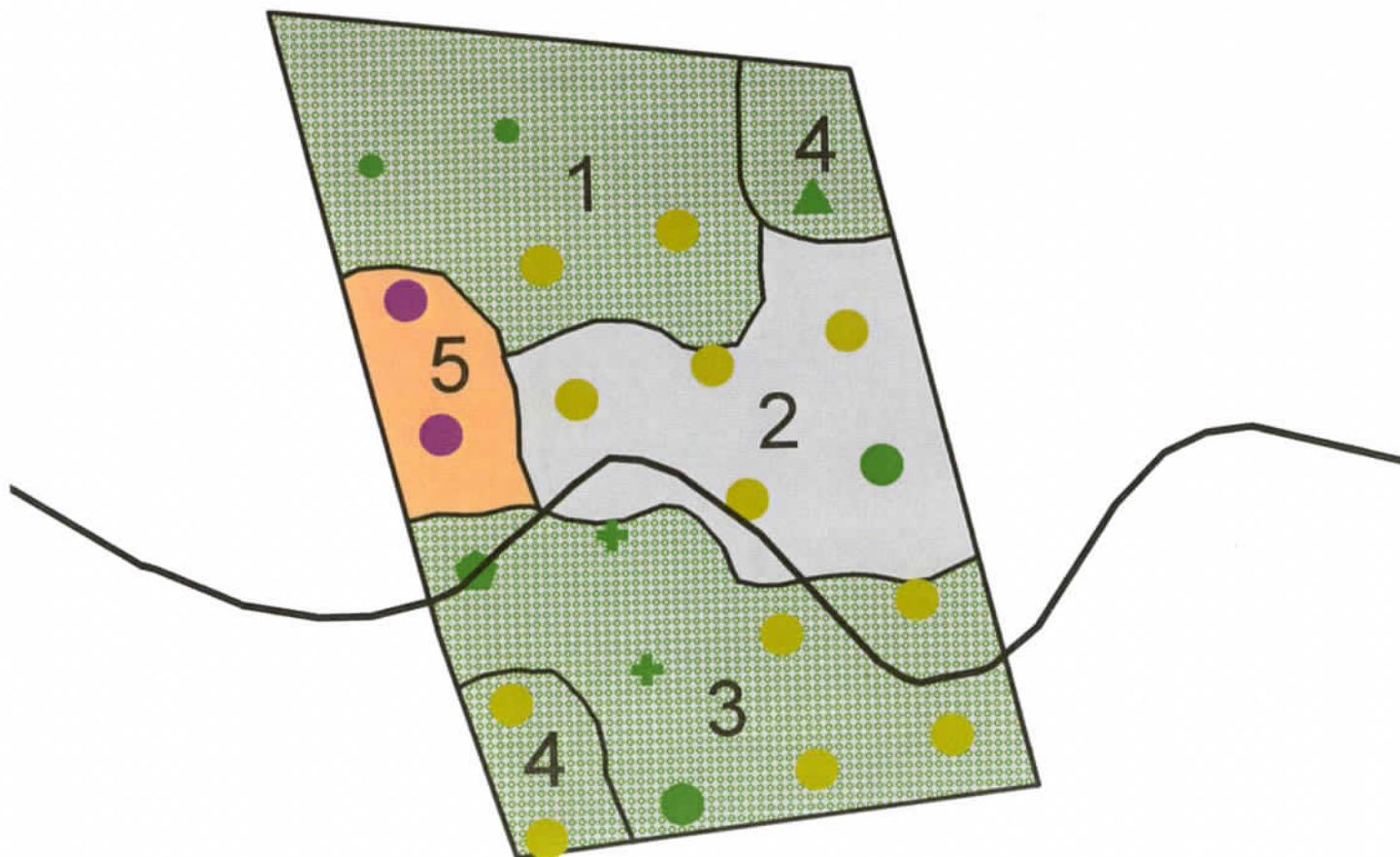
New Road Lot - Operability



300 0 300 Feet

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New Road Lot - Management Recommendations



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Table 6: Harvest Schedule and Estimated Revenue

No management units on the New Road Lot currently have enough size, density or volume to justify a commercial harvest. Patch clearcuts in MU2 could be done at any time, but by themselves would be difficult to sell (and may even cost the Town to be done). In ten years, however, the entire property (with the exception of MU5, which is inoperable,) would benefit from a commercial thinning aimed at improving the quality and species mix of the remaining trees. At that time, small patch clear-cuts could also be done, since the logging equipment would already be on the location.

8 OLD MEADOW LOT

8.1 Discussion and Recommendations (See Maps #1 and #2)

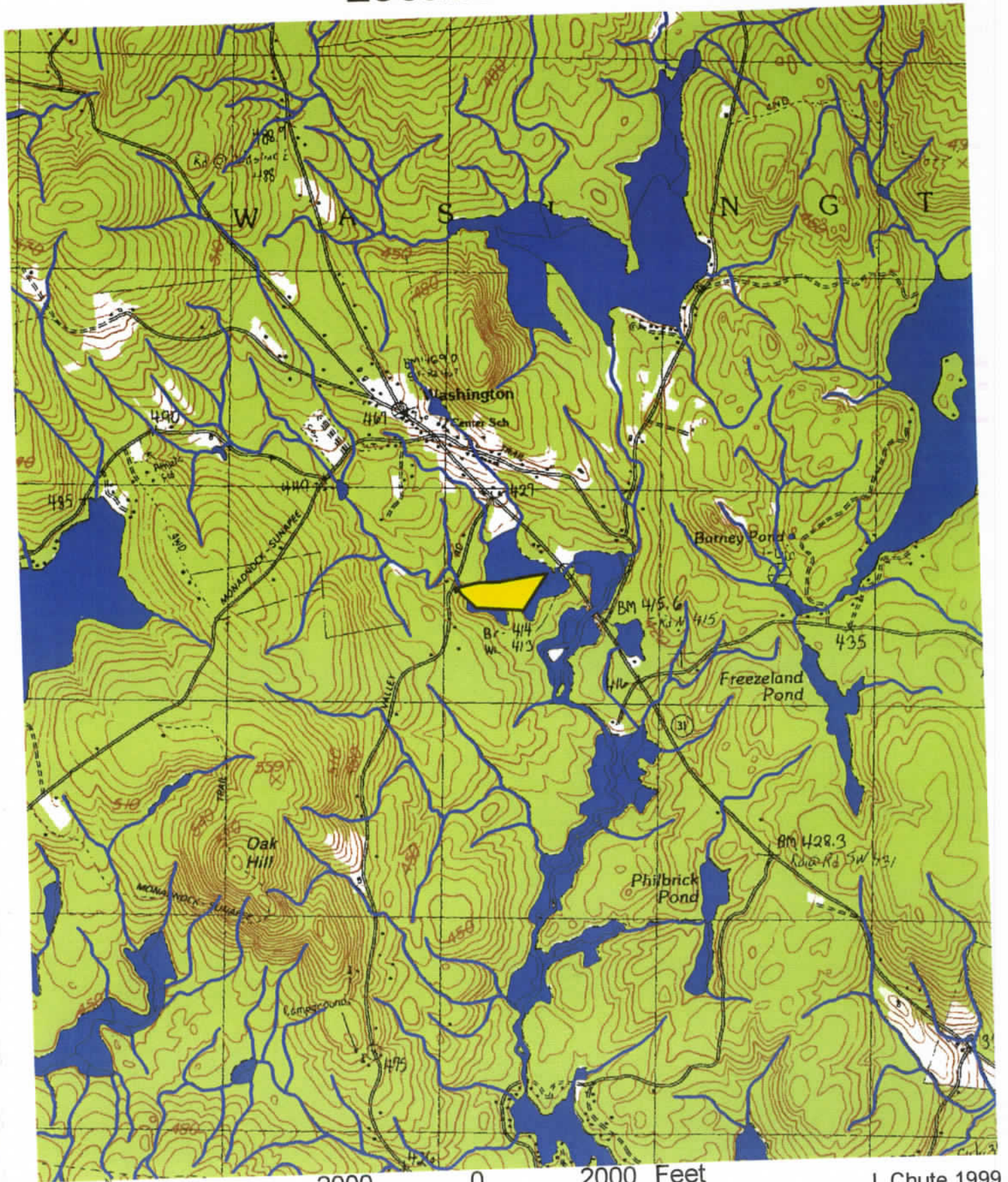
The Old Meadow Lot was not inventoried, as it is largely an unforested wetland. But the value of this property may be greater than its timber-growing potential. Map #1 of the Old Meadow Lot seem to show this wetland as an important storage area for waters traveling from Half Moon Pond down to Highland Lake. The wetland may also play a role in filtering and settling these waters prior to their arrival at Highland Lake; it is difficult to say without being a hydrologist.

Map #2 reveals that the Old Meadow Lot is not just one wetland, but five different kinds of wetlands connected together. The names are complicated: for example, a PEM1E is a *palustrine emergent persistent seasonally flooded/saturated wetland*. Without being an expert in hydrology it is difficult to interpret these names or to know what value they may have for the Town, but it might be good to find out.

Another unknown is who and what lives in these wetlands. There may be rare or endangered plants, or rare or endangered animals such as certain frogs, salamanders or turtles.

There are several New Hampshire schools that have students who are specializing in such topics as water resource management, wetlands ecology, hydrology and zoology. These students are always looking for good projects that will give them meaningful field experience. The Town might consider offering the Old Meadow Lot to such a group (such as UNH in Durham, or Antioch in Keene) in order to find out more about these wetlands and how they function. An added incentive is that the research would be conducted for free.

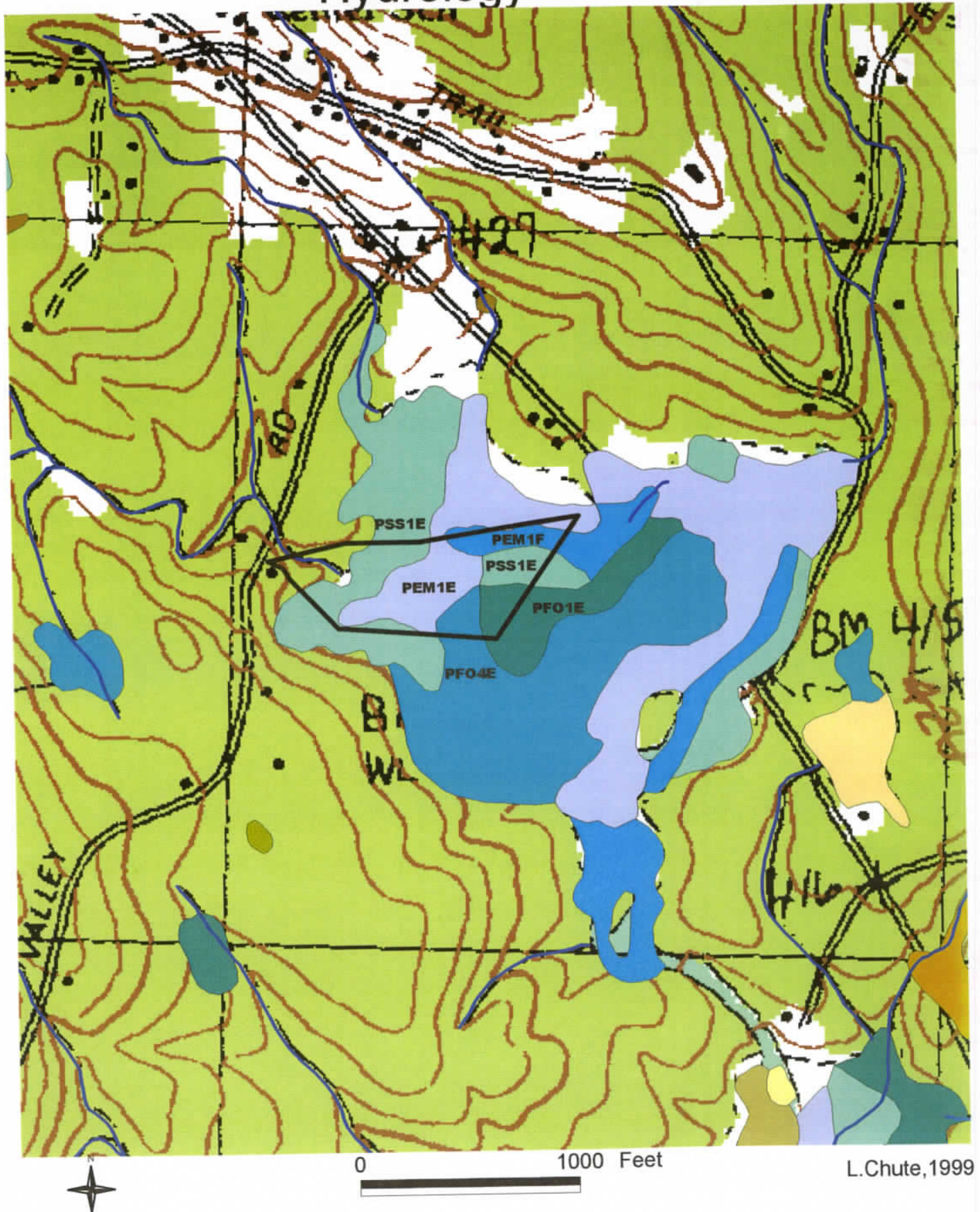
Old Meadow Lot - Location



2000 0 2000 Feet

L.Chute, 1999

Old Meadow Lot - Hydrology



9 CONCLUSION

The Washington Town Forests are good long-term investments for the Town to hold onto. An estimated gross profit of \$105,868 can be realized by the Town through sustainable timber harvests in the next ten years, with perhaps as much to be gained in the following decade. Further, the forests that would remain following the harvests will actually increase in value, as the best stems would be left to take advantage of the additional growing space. By maximizing quality, the Town can eventually develop a very valuable forest base that will yield high profits on a consistent and perpetual basis.

There are also costs associated with forest management. Most of the Town properties require surveys to determine where certain bounds are located. The Town would be unwise to continue harvesting its land without blazed bounds, as this opens the door for problems with abutting neighbors that could be costly and embarrassing. Other necessary costs include road maintenance and pre-commercial activities such as thinning sapling stands when needed. Ideally, some revenue from timber harvests would be cycled back into the properties, allowing them to effectively “take care of themselves”.

A careful management strategy aimed at improving quality and cultivating large diameter crop trees of high value will result in Town Forests that are both increasingly valuable and enjoyable to visit. Washington has an impressive collection of Town Forests that promise to benefit the Town in many ways.

10 SUMMARY OF RECOMMENDATIONS

Back Mountain Lot

ACTION ITEM: Boundary Line Status (pg. 10)

The property needs to be surveyed, especially the north line and most of the west line (which are currently unknown).

ACTION ITEM: Access (pg. 12)

Consider installing a "Washington Town Forest" sign alongside of Old Bradford Road.

ACTION ITEM: Recreation (pg. 12)

Consider a hiking trail from the southwest corner to the northeast corner. A nice partial view to the North currently exists on the northeast corner, which is very ledgy and open.

ACTION ITEM: Plant Life (pg. 19)

Periodically monitor the rich woods plant community, to see if additional uncommon species colonize the site over time. As this area is inoperable due to steep cliffs, the usual risk of disturbance through timber harvest will never be a concern.

ACTION ITEM: Forest Management (pg. 28)

A timber sale of MU's 3 and 4 should be conducted in the summer, as Old Bradford Road is unplowed in winter. The inability to access the northern stand of MU3 will reduce the potential revenue of a MU3 harvest to perhaps half of the total, or \$1,000. Nevertheless, an estimated yield of about \$3,000 could be realized by the Town by harvesting the other three accessible stands in MU's 3 and 4. This is a relatively small sale which may make it hard to find an operator, but certainly not impossible.

Harvest Schedule:

2003, or after harvests at the Camp Morgan and Huntley Mountain Road prop

Barrett Pond Lot

ACTION ITEM: Boundary Line Status (pg. 32)

This property is in critical need of survey. The property map used during the inventory did not "work" on the ground: most bounds could not be located, and distance problems in the Russell Pond area were significant. It would be very unwise for the Town to conduct timber harvests given these problems, as a timber trespass could be the unfortunate result. Further, an ATV trail system by Russell Pond may be encroaching on Town land, but this could not be determined with certainty due to the problems with the map. A portion of timber revenues from another Town Forest harvest can and should be used to pay for a survey of this property, which will prove to be a valuable timber asset to the Town in time.

ACTION ITEM: Recreation (pg. 32)

Consider eventually building a hiking trail to the very special pocket of ancient trees in MU2. Future harvests of the “Russell Millpond” and “Barrett Pond” sections will create skid trails that could facilitate foot access as far as the north edge of the “Jeft’s Lot” section. From there, a hiking trail could continue to the rough terrain of MU2.

Encourage users of the snowmobile trail to stop littering at the shore of Barrett Pond. Consider installing a sign at this location to that effect.

ACTION ITEM: Wildlife (pg. 39)

Consider emphasizing the “Jeft’s Lot” section as a wildlife refuge, to maximize it’s value as a bridge between the Orenda and Audubon Society Wildlife Sanctuaries. Investigate the possibility of monetary compensation by the Orenda group for either an easement or other vehicle that would ensure the use of the “Jeft’s Lot” by wildlife in perpetuity.

ACTION ITEM: Forest Management (pg. 50)

No management units are recommended for harvest on the Barrett Pond property for the next decade. In ten years, however, much of the “Barrett Pond” and “Russell Millpond” sections will be ready for thinnings and improvement cuts. Although this property will not contribute income for the next ten years its long-term value to the Town is very high, as most of the property is well stocked with fast-growing desirable timber species such as red oak, sugar maple, white pine and red spruce.

Camp Morgan Lot**ACTION ITEM: Boundary Line Status (pg. 53)**

Reconnoiter the bound that runs northwesterly from the woods road. If the line cannot be determined with certainty, have this short segment surveyed and blazed within the next five years to keep the costs down.

ACTION ITEM: Recreation (pg. 54)

Discuss any plans for forest management of Camp Morgan with the Washington Snowriders, to make sure that their use of the property is not interrupted.

Consider extending the existing hiking trail along the shore of Millen Pond to include a loop through the majestic hemlock and hardwood stands west and south of Chapel Cove (also see section 4.3.1.2).

ACTION ITEM: Hydrology (pg. 56)

Consider re-routing the section of snowmobile trail that runs through the wetland, in order to avoid the risk of damaging this wetland as a filter for the stream below. If the trail cannot be moved, consider building a small bridge to protect the wetland from being damaged by ATV use in the summer.

ACTION ITEM: Forest Management (pg. 70)**Harvest Schedule:**

2000. Given the closeness of MU's 3 and 4, the timber sale could include both MU's or deliberately be cut over a two-year period.

A small amount of additional revenue could also be realized by including a salvage cut of the western edge of MU2, if desired. This would have to be done soon, however, before the trees begin to rot.

Farnsworth Hill Lot

ACTION ITEM: Boundary Line Status (pg. 71)

This property is in critical need of survey. In particular, the location of the western and eastern bounds are badly needed in order to know exactly where the property is and how many acres it consists of. A valuable sugar maple stand believed to be within the eastern side of the property will be ready for thinning in a few years. Without knowing our eastern boundary, the sale of this timber could cause legal problems with the abutting landowner. This would not only be embarrassing for the Town, but could also be very costly. The Farnsworth Hill Lot is an excellent forest for profitable and long-term timber management, but not knowing the bounds causes insurmountable difficulties.

ACTION ITEM: Forest Management (pg. 88)

Harvest Schedule:

2009. Given the adjacency of MU's 2 and 3, the timber sale should include both MU's. The additional decade of growth may also yield higher cut volumes.

Huntley Mountain Lot

ACTION ITEM: Boundary Line Status (pg. 89)

This property must be surveyed and blazed, especially the north, east and south property lines. Conducting forest management activities on properties whose boundaries are unknown is time-intensive, and can result in costly legal battles.

ACTION ITEM: Access (pg. 89)

Discuss the feasibility of reclaiming this road with the Washington Highway Department. Work could be done gradually over several years if this would be preferable. Also, look into the possibility of gating the road during mud seasons to prevent further deterioration by ATV's and other off-road vehicles.

ACTION ITEM: Recreation (pg. 90)

Consider building a hiking trail to the summit of the hill from the road, but restrict its use to foot traffic to prevent trail erosion on the sloping terrain.

Investigate the possibility of gating the road in wet seasons to discourage the harmful use of the road by dirt bikes and ATV's at these times.

ACTION ITEM: Wildlife (pg. 95)

Consider creating a wildlife opening during the next timber sale of at least one-half acre in size, preferably away from Huntley Mountain Road.

ACTION ITEM: Forest Management (pg. 108)

Harvest Schedule:

2002. Given the adjacency of MU's 2 and 3, the timber sale should include both MU's. Any harvest at this property, however, is contingent on the improvement of Huntley Mountain Road, which is currently in disrepair.

New Road (Twin Bridges) Lot

ACTION ITEM: Boundary Line Status (pg. 109)

A survey of this property should be done eventually, in order to obtain blazed property lines around the perimeter. Given the known location of most property corners, the cost of a survey should be relatively low. The survey needs to be done prior to the next timber harvest, however, in order to avoid legal

ACTION ITEM: Recreation (pg. 110)

Consider building a short hiking trail spur off of New Road on the west side of the property. This trail would be a loop on the north side of New Road that would allow residents to visit a small patch of ancient yellow birches discovered during the inventory.

ACTION ITEM: Wildlife (pg.116)

Consider creating a wildlife opening during the next timber sale, preferably away from New Road.

ACTION ITEM: Forest Management (pg.124)

No management units on the New Road Lot currently have enough size, density or volume to justify a commercial harvest. Patch clearcuts in MU2 could be done at any time, but by themselves would be difficult to sell (and may even cost the Town to be done). In ten years, however, the entire property (with the exception of MU5 which is inoperable) would benefit from a commercial thinning aimed at improving the quality and species mix of the remaining trees. At that time, small patch clear-cuts could also be done, since the logging equipment would already be on the location

Old Meadow Lot

ACTION ITEM: Wetland Management (pg.125)

There are several New Hampshire schools that have students who are specializing in such topics as water resource management, wetlands ecology, hydrology and zoology. These students are always looking for good projects that will give them meaningful field experience. The Town might consider offering the Old Meadow Lot to such a group (such as UNH in Durham, or Antioch in Keene) in order to find out

more about these wetlands and how they function. An added incentive is that the research would be conducted for free.

11 GLOSSARY

Access Road: A temporary or permanent route into forest land for over-the-road vehicles.

Age Class: Intervals of tree age used to describe stand characteristics, for example, 10 or 20 year age class.

Basal Area: A measure of tree density. The cross-sectional area of a single stem (including bark) or all stems of a species or all stems in a stand, measured at breast height (4.5 feet) and expressed per unit of land area, (for example 105 square feet of basal area per acre).

Browse: Leaves, buds and woody stems used as food by woodland mammals like deer, moose, and snowshoe hare.

DBH: Diameter at breast height. The average diameter of a standing tree, measured outside the bark, at a point 4.5 feet above the ground.

Canopy: The more or less continuous cover of branches and foliage formed by the crowns of adjacent trees and other woody growth..

Cavity Trees: Trees, either live or dead, which contain hollowed out areas. Used as shelter for a variety of animal species.

Crop Tree: A tree which is retained for maximum longevity in a stand due to desired characteristics such as commercial quality or biotic contribution (a good mast or cavity tree for wildlife, old-growth, future snag)

Crown: The above-ground portion of a tree extending up and out from the first main branches of the stem.

Cruise: A forest survey to locate and estimate the quantity of timber on a given area according to species, size, quality, forest products, and other characteristics.

Forest Type: A natural group or association of different species of trees which commonly occur together over a large area. Forest types are defined and named after one or more dominant species of trees in the type.

Geographic Information System (GIS): An organized collection of computer hardware, software, geographic and descriptive data, personnel, knowledge, and procedures designed to efficiently capture, store, update, manipulate, analyze, report, and display the forms of geographically referenced information and descriptive information.

Lopping: Cutting off branches, tops and small trees after felling, into lengths

such that the resultant slash will lie close to the ground (1-4 feet in height).

Pole Timber: A DBH size-class representing trees that are usually more than 4.0 inches DBH and less than 10.0 inches DBH.

Prism Cruising: The use of a glass wedge or prism of known angle to estimate basal area of a forest stand from which volumes can be estimated.

Mast: The fruit, seeds, or berries of trees and shrubs that provide important food for wildlife, especially birds and mammals. Some examples includes hard mast (acorns, beech nuts, walnuts, butternuts, hickory nuts) and soft mast (apples, blueberries, cherry, cranberry).

Release: Remove the competing trees surrounding a crop tree, on two or more sides, so that the crop tree can receive more sunlight and develop a larger more vigorous crown.

Sapling: Trees that are more than 4.5 feet tall but less than 4.0 inches DBH

Sawlog: A log at least 8 ft long (plus 6" of trim) up to 16 ft in length. A softwood sawlog quality tree must be at least 10" DBH down to 8" on the small end. A hardwood sawlog quality tree must be at least 12" DBH down to 10" on the small end. The logs (or tree) must be reasonably straight, free of defects, and be sound.

Snag: A standing dead tree generally left for wildlife management purposes.

Timber Stand Improvement (TSI): Silvicultural activities that improve the composition, constitution, condition and growth of a timber stand. This is often done by girdling the undesirable trees or cutting them down and lopping the tops.

Source of definitions: *Good Forestry in the Granite State: Recommended Voluntary Forest Management Practices for New Hampshire.* NH Forest Sustainability Standards Work Team, published by the NH Division of Forest & Lands, and SPNHF. 1997.

The Dictionary of Forestry, John Helms, editor, published by the Society of American Foresters. 1998.

APPENDIX A. MANAGEMENT UNIT SUMMARY

Property	Management Unit (MU)	MU ac	total saw vol mbf/ac	total cds pulp/ac	total Live BA/ac	"cut" BA/ac	Residual BA/ac	"cut" saw vol mbf/ac	% of saw bf that is cut	% of Total BA that is Cut	all MSD	cut MSD	total SAW Standard Error (SE)
back	1 - SH3C/HS2C(RS, RM, WB)	11	0.0	7.6	57	0	57	0.000	0		6.4	na	0
back	2 - H3B/HS2C(WB, RM, SM3, RS)	22.5	0.6	8.9	57	10	47	0.211	33	18	7.1	7.7	92
back	3 - H5D/H3C(WA, RM, WP)	7.1	4.5	12.3	100	23	77	1.689	38	23	10	10.8	42
back	4 - S5D/HS4C(RS, RM)	7.5	7.8	14.8	120	53	67	3.300	43	44	10	10.5	60
back	ALL OPERABLE ACRES	48.1	104.3	na	na	na	na	41.486	40	na	na	na	28
	/ac		2.2										
barrett	1 - H4D/H3B(WA, RM, SM1, WB)	76.8	1.7	16.8	109	39	70	0.500	29	36	8.6	8.1	50
barrett	2 - H5D/H3B(WA, SM1, RM)	17.8	4.4	18.4	137	37	100	1.800	41	27	11	11.5	55
barrett	3 - HS5D/HS3B(RM, RS, BC)	24.8	1.8	22	136	52	84	0.000	0	38	8.2	7.4	55
barrett	4 - S5D/H3B(WP, RM, WB)	8.6	0	13.2	130	40	90	0.000	0	31	10.4	8	0
barrett	5 - H4D/H3B(RO, RM, SM1)	48.6	1.8	14.4	93	42	51	0.400	22	45	8.9	7.9	42
barrett	ALL OPERABLE ACRES	176.6	349.299	na	na	na	na	85.500	24	na	na	na	25
	/ac		2.0										
camp	1 - SH5C/HS3C(EH, RS, YB, RM)	12.2	8.3	9.3	104	0	104	0	0	0	10.7	na	45
camp	2 - H5C/H4C(SM1, WA, RO, AB1)	17.8	7.2	14.4	111	29	82	2.635	36	26	10.2	11.9	13
camp	3 - HS5C/H3C(RM, WP, RS)	6.4	13.0	18.2	145	75	70	7.865	60	52	12.7	17.5	19
camp	4 - SH5C/H3C(WP, WA, RM)	33.9	14.8	13.0	129	87	42	10.239	69	67	13.2	13.9	15
camp	5 - H5D/H3C(RM, AB1, SM1, WB)	21.1	5.4	16.0	100	40	60	1.601	30	40	11.5	10.6	15
camp	ALL OPERABLE ACRES	92.4	936.1	na	na	na	na	479.699	51	na	na	na	9
	/ac		10.1										
farnsworth	1 - H5D/H3B(SM1, RM, WA)	28.3	1.6	8.1	47	7	40.3	0.000	0		9.3	6.8	72
farnsworth	2 - S5D/SH4C(WP, RM, RS)	6.4	8.9	20.5	140	80	60	3.884	44	57	9.9	10	221
farnsworth	3 - H5D/SH3B(RM, RS, BF)	88.6	3.4	16.3	112	51	61	1.496	45	46	9.3	8.9	28
farnsworth	ALL OPERABLE ACRES	123.3	400.2	na	na	na	na	157.451	39	na	na	na	25
	/ac		3.2										
huntley	1 - H5C/H3C(SM1, RO, RM)	23	5.2	10.0	88	37	51	2.704	52	42	12.4	11.4	41
huntley	2 - SH5D/H3B(WP, RO/RO, RM)	18.5	4.4	17.1	103	55	48	1.882	42	53	9.7	9.1	73
huntley	3 - H4D/H3A(RM, RO, WB)	24.3	0.8	15.5	90	23	67	0.000	0		8.9	8.3	73
huntley	4 - HS5D/HS3B(RO, RS, RM)	30.2	4.6	12.4	83	11	72	0.539	12	13	10.6	11.4	67
huntley	5 - SH5C/HS4C(EH, RO, WB)	13.5	4.4	15.3	106	33	73	0.000	0		12.3	9.9	116
huntley	6 - H3B(RO, RM)	12.3	0.3	11.2	66	20	46	0.000	0		8	9.1	188
huntley	ALL OPERABLE ACRES	121.8	425.6	na	na	na	na	113.284	27	na	na	na	27
	/ac		3.5										
new	1 - H4D/SH3B(RM, RS, BF)	9	3.8	18.4	112	32	80	0.524	14	29	8.9	9.1	50
new	2 - H4C/H3C(RM, YB)	7.9	1.6	15.0	84	20	64	0.930	57	24	11	14	69
new	3 - H4C/H3C(RM, WA, SM1, YB)	9.8	4.4	14.8	93	30	63	1.115	25	32	9.8	9.7	42
new	4 - H5D/H3B(SM1, WA, RM, YB)	3.2	5.0	26.0	134	53	81	1.220	24	40	10.3	9.5	12
new	ALL OPERABLE ACRES	29.9	106.8	na	na	na	na	26.899	25	na	na	na	22
	/ac		3.6						0				