



*Woodland Management Services  
Green Certified Resource Managers*

## **MID-MAINE FORESTRY**

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## **FOREST MANAGEMENT PLAN**

for the  
**Town of Liberty**

Selectmen's Office  
P.O. Box 116  
Liberty, Maine 04949

properties located in:  
Liberty, Maine

Dump lot - Tax Map 10, Lots 17, 19 & 20  
Perkins lot - Tax Map 11, Lots 7 & 10  
Freedom Lumber lot - Tax Map 4, Lot 20

Prepared by:

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LPF #3206

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## TABLE OF CONTENTS

	<u>Page</u>
<b>CHAPTER 1 - GENERAL OVERVIEW</b>	
Introduction	1
Location/Topographic Maps	1a & 1b
Management Objectives	2
Soils	3
- Soils Maps	3a & 3b
- Soils Legend	4
- Soil Ratings	5
Boundaries	6
Timber Resource	6
Insects, Disease And Weather Influences	8
Forest Health And Ecological Forestry	8
Wildlife	9
Legal Restrictions	10
Markets	12
Commercial Harvest Of Wood Products	13
 <b>CHAPTER 2 - DUMP LOT</b>	
Property Description And Land Use History	14
Topography And Accessibility	14
Boundaries	15
Timber Resource	15
Insects, Disease And Weather Influences	17
Wildlife	17
Recreation, Aesthetics And Cultural Features	18
Legal Restrictions	18
Wildlife Habitat of Management Concern Map	18a
Estimates of Timber Volumes and Values By Species	19
Property Map	19a
Stand Descriptions And Management Recommendations	20
Conclusions	30

CHAPTER 3 - PERKINS LOT	
Property Description And Land Use History	31
Topography And Accessibility	31
Boundaries	32
Timber Resource	32
Insects, Disease And Weather Influences	34
Wildlife	34
Recreation, Aesthetics And Cultural Features	35
Legal Restrictions	35
Estimates of Timber Volumes and Values By Species	36
Property Map	36a
Stand Descriptions And Management Recommendations	37
Conclusions	51
CHAPTER 4 - FREEDOM LUMBER LOT	
Property Description And Land Use History	52
Topography And Accessibility	52
Boundaries	53
Timber Resource	53
Insects, Disease And Weather Influences	55
Wildlife	55
Recreation, Aesthetics And Cultural Features	56
Legal Restrictions	56
Wildlife Habitat of Management Concern Map	56a
Estimates of Timber Volumes and Values By Species	57
Property Map	57a
Stand Descriptions And Management Recommendations	58
Conclusions	73
SUMMARY CONCLUSION	74
GLOSSARY	77
ADDITIONAL SOURCES OF ASSISTANCE	81
APPENDIX – Proposed trails and campsites	82-4

# CHAPTER 1 - GENERAL OVERVIEW

## INTRODUCTION

This plan presents an evaluation of three parcels owned by the town of Liberty, in Liberty, Maine and suggestions for their management. It will inform the reader of the nature of the forests, their various attributes and their potential to achieve expressed ownership objectives. It will also discuss management options for different areas and suggest a schedule of activities.

The town successfully applied for a 50% grant through the Project Canopy program of the Maine Forest Service (funded by the USDA Forest Service - Urban and Community Forestry). In addition to the management plan, the project also includes public educational outreach. Letters of support in the application came from the following local groups:

Board of Selectmen (with support from the Budget Committee and Conservation Committee)

Liberty Volunteer Fire Department

Walker School, the elementary school in Liberty

Sheepscot Wellspring Land Alliance (SWLA)

Cub Scout Pack 39 of Liberty & Montville

Citizens Association of Liberty Lakes (CALL)

Forest management is a long-term endeavor. The recommendations given here are a first step towards achieving the stated goals. As time passes and the recommendations are implemented, this plan will need updating, typically at 10-year intervals. This will allow incorporation of changes arising from human and natural, non-human influences.

The plan begins with a statement of management objectives. It then provides general information about soils, boundaries, timber resources, wildlife habitat, legal restrictions on management activities, market conditions and commercial harvesting guidelines. In separate chapters, each parcel is then described in more detail regarding its history, topography, soils, timber, and wildlife resources. Legal restrictions, if any, are mentioned, plus a table of estimated wood volumes and values. Accompanied with a map, forest stands in each parcel are described in more detail and specific management recommendations are presented. A table lists the high priority activities for each parcel, with income/cost estimates. The plan concludes with a glossary of forestry terms and a listing of sources available for further assistance.

The three parcels are:

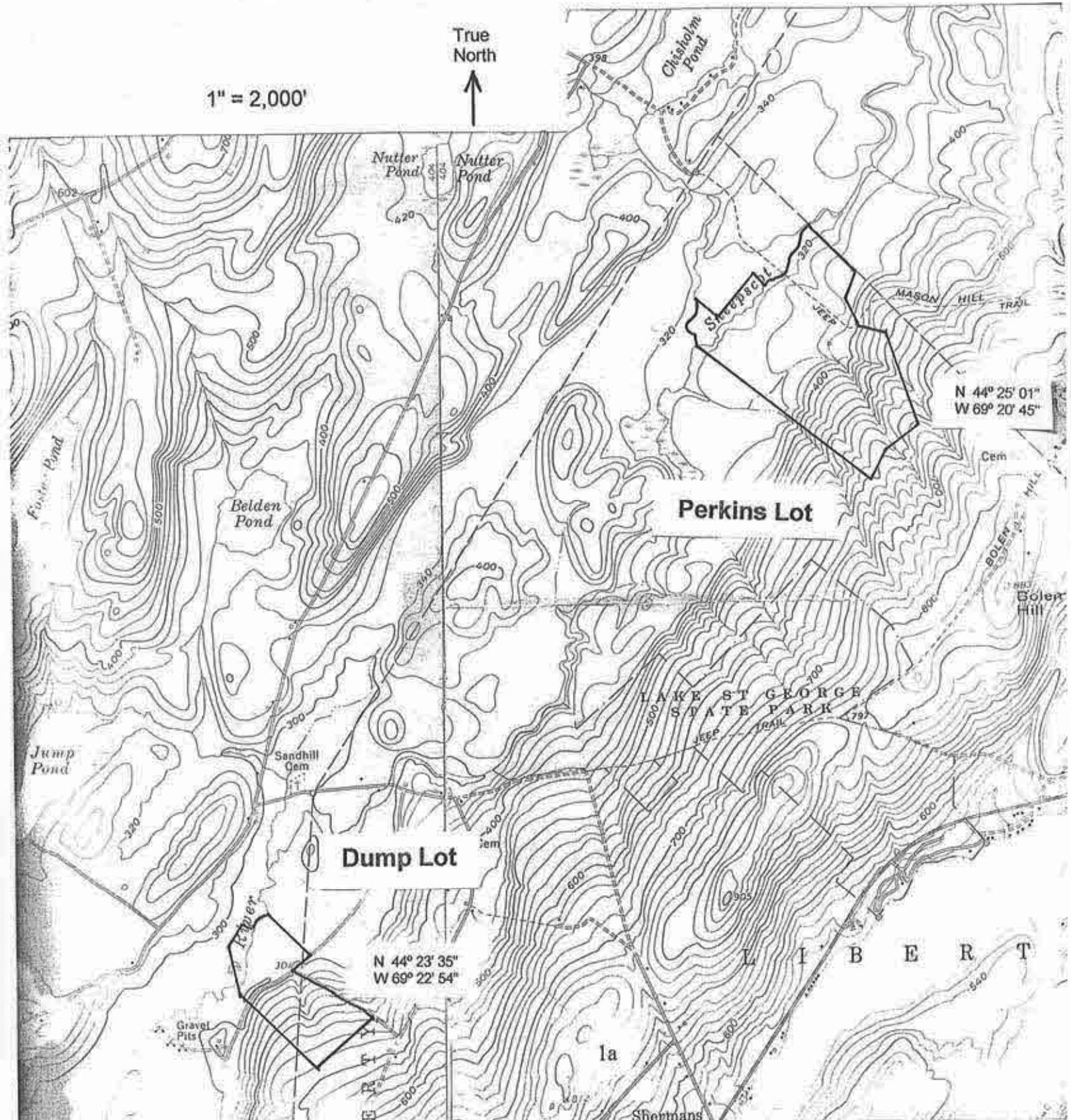
<u>Lot</u>	<u>Acres</u>	<u>Location</u>
Dump	59	Arthur Plummer Rd.
Perkins	155	off Bolen Hill Rd.
Freedom Lumber	129	Ridge School Rd.
Total:	343	

# LOCATION & TOPOGRAPHIC MAP

## Town of Liberty

1" = 2,000'

True North  
↑





# LOCATION & TOPOGRAPHIC MAP

## Town of Liberty

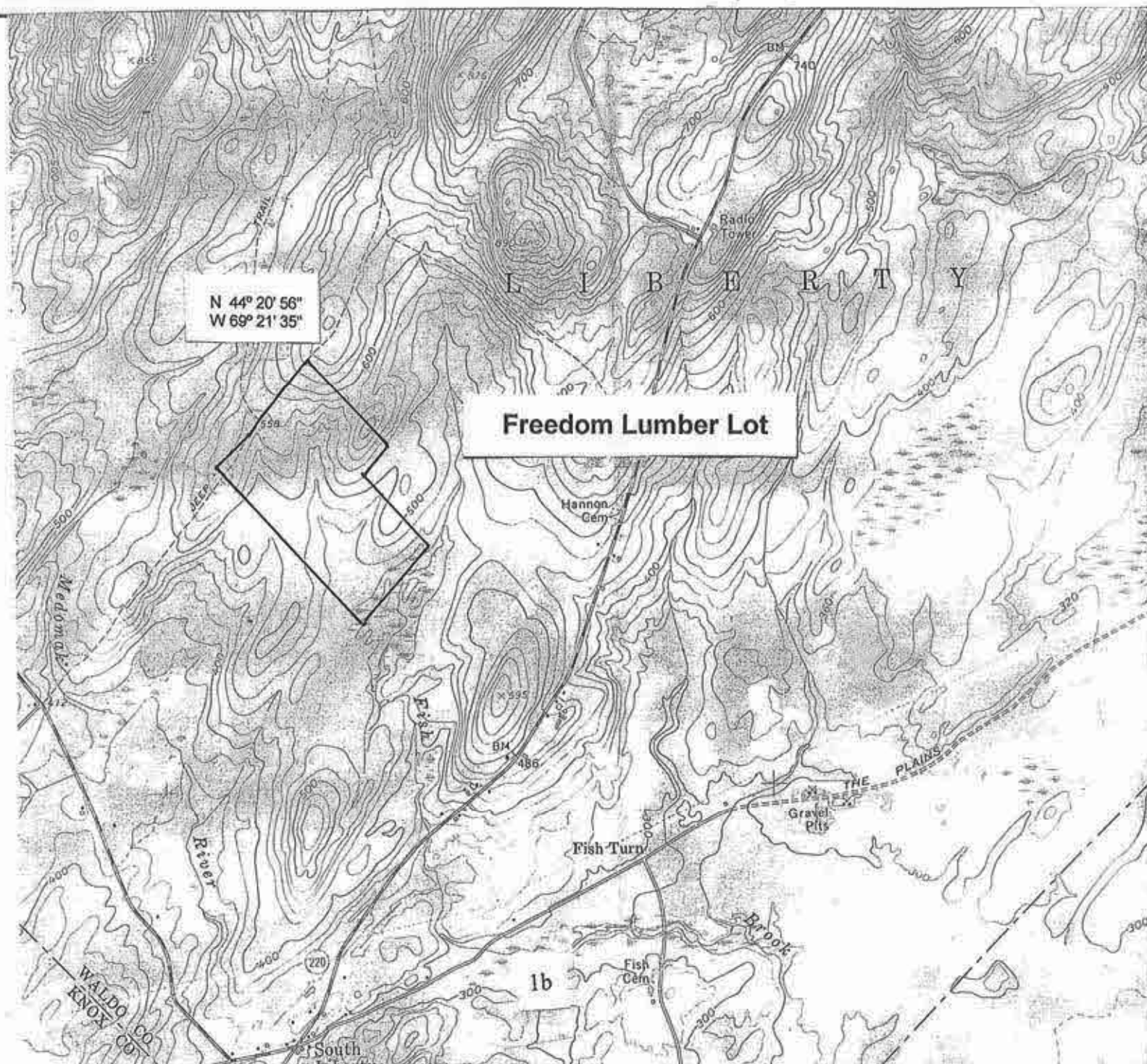
1" = 2,000'

True  
North



N 44° 20' 56"  
W 69° 21' 35"

Freedom Lumber Lot



## MANAGEMENT OBJECTIVES

The town forests are to be managed on a multiple use basis. The interested parties listed above were surveyed regarding their views as to what management goals should be emphasized. The overwhelming response was that the primary objectives should be the maintenance/enhancement of wildlife habitat, protection of soil & water resources, aesthetics and providing recreational opportunities. Timber production for income is a moderate goal for the selectmen and conservation comm., but rated as a low priority by the other groups. The Conservation Committee hopes that any future harvests can serve as "demonstration forestry." The Fire Department is interested in fire training and insuring accessibility in case of wild fire on the town forests. The SWLA promotes leaving the ecosystem as intact as possible. If timber harvesting does occur, it advocates minimal cutting and a no-cut buffer of at least 250' along the Sheepscot River. Cutting to attain the above objectives should strive to improve the growth, health, stocking, and species composition of the forest. Any activity performed in the parcels should not detract from the aesthetics of a managed forest. An additional objective is the preservation of cultural structures, such as cellar holes, cemeteries and stone walls. This was not mentioned by any group only through ignorance of the existence of such features.

When managed according to this plan and under the direction of Mid-Maine Forestry, the Liberty forests can be green certified under the internationally recognized Forest Stewardship Council (FSC) standards through the Resource Manager program of Scientific Certification Systems (SCS). This certification recognizes forest management practices that effectively sustain timber resources while maintaining the ecological viability of the forest and benefiting the surrounding community. In the long run, products from this forest can be sold as "green certified", hopefully commanding higher prices as green markets develop.

## SOILS

Refer to the soils maps on the following pages. There is a wide range of soils represented on the 3 town lots. The swamps contain very poorly drained organic soils while dry, excessively drained areas have soils that are shallow to bedrock with some exposed ledge. They can be grouped by drainage class as follows:

### Very poorly drained

Borosaprists

### Poorly drained

Limerick and Rumney

Swanville

### Moderately well drained to poorly drained

Boothbay

### Moderately well drained

Madawaska

Peru

Podunk

### Well drained

Marlow

Tunbridge

### Somewhat excessively drained

Adams

Lyman

Masardis Variant

The following legend summarizes basic characteristics of the soils mapped on the lots.







## SOILS LEGEND

- AdB - Adams loamy fine sand, 3-8% slopes; deep; somewhat excessively drained.
- AdC - Adams loamy fine sand, 8-15% slopes; deep; somewhat excessively drained.
- BoB - Boothbay silt loam, 3-8% slopes; moderate to hardpan; moderately well drained to somewhat poorly drained; seasonal high water table.
- Bs - Borosaprists, level; deep; very poorly drained; often ponded; high water table most of the year.
- BvB - Brayton very stony fine sandy loam, 0-8% slopes; deep; somewhat poorly to poorly drained; water table perched near the surface for most of the year.
- Lk - Limerick & Rumney, 0-2% slopes; deep; poorly drained; in flood plains of streams & rivers.
- LrB - Lyman-Rock outcrop complex, 3-8% slopes; shallow to bedrock; somewhat excessively drained.
- LrC - Lyman-Rock outcrop complex, 8-15% slopes; shallow to bedrock; somewhat excessively drained.
- LrE - Lyman-Rock outcrop complex, 15-60% slopes; shallow to bedrock; somewhat excessively drained.
- MaB - Madawaska fine sandy loam, 3-8% slopes; moderately deep to hardpan; moderately well drained; seasonal high water table.
- MbC - Marlow fine sandy loam, 8-15% slopes; deep to hardpan; well drained.
- MeB - Marlow very stony fine sandy loam, 3-8% slopes; deep to hardpan; well drained.
- MeC - Marlow very stony fine sandy loam, 8-15% slopes; deep to hardpan; well drained.
- MeD - Marlow very stony fine sandy loam, 15-25% slopes; deep to hardpan; well drained.
- MeE - Marlow very stony fine sandy loam, 25-45% slopes; deep to hardpan; well drained.
- MrC - Masardis Variant fine sandy loam; very rocky; 8-15% slopes; moderately deep; somewhat excessively drained
- PaB - Peru fine sandy loam, 3-8% slopes; moderate to hardpan; moderately well drained; seasonal high water table.
- PbB - Peru very stony fine sandy loam, 3-8% slopes; moderate to hardpan; moderately well drained; seasonal high water table.
- PbC - Peru very stony fine sandy loam, 8-15% slopes; moderate to hardpan; moderately well drained; seasonal high water table.
- PcC - Peru extremely stony fine sandy loam, 8-15% slopes; moderate to hardpan; moderately well drained; seasonal high water table.
- Py - Podunk fine sandy loam; 0-2% slopes; deep; moderately well drained; found on the flood plains of major streams and rivers.
- Sw - Swanville silt loam, 0 - 3% slopes; shallow to hardpan; poorly drained; high water table most of the year.
- TrC - Tunbridge - Lyman complex, 8-15% slopes; moderately deep to shallow to bedrock; well drained to somewhat excessively drained.
- Ud - Udorthents-Urbanland complex, with 50%+ fill material.



## SOIL RATINGS \*

The following table lists the various productivity ratings and factors affecting management for the pertinent soil types (except for the very poorly drained Borosaprist). This can be referenced to the soils maps for each town parcel, on which the soil types are delineated. The letter codes pertain to the particular soil types, as identified in the legend.

<u>Soil Series</u>	<u>Site Quality</u>			
	<u>White Pine</u>	<u>White Spruce</u>	<u>Red Oak</u>	<u>Northern Hardwood</u>
AdB & C	fair	--	fair	fair
BoB	good	good	--	good
BvB	excellent	good	excellent	excellent
Lk	good	--	--	excellent
LrB, C & E	good	--	excellent	fair
MaB	excellent	fair	--	excellent
MbC, MeB, C & D	excellent	good	excellent	excellent
MrC	fair	--	--	--
PaB, PbB, PbC, PcC	excellent	good	excellent	good
Py	excellent	fair	--	good
Sw	fair	fair	--	fair
TrC - Tunbridge	excellent	good	excellent	good
TrC - Lyman	good	--	excellent	fair

<u>Soil Series</u>	<u>Factors Affecting Management</u>			
	<u>Erosion Hazard</u>	<u>Equipment Limitation</u>	<u>Seedling Mortality</u>	<u>Windthrow Hazard</u>
AdB & C	slight	slight	severe	slight
BoB	slight	slight	slight	slight
BvB	slight	severe	severe	severe
Lk	slight	severe	severe	severe
LrB, LrC	slight	slight	severe	moderate
LrE	slight	moderate	severe	moderate
MaB, MbC, MeB & C	slight	slight	slight	slight
MeD	slight	moderate	slight	slight
MeE	moderate	severe	slight	slight
MrC	slight	slight	moderate	slight
PaB, PbB, PbC	slight	slight	slight	slight
PcC	slight	moderate	slight	slight
Py	slight	slight	slight	slight
Sw	slight	severe	severe	severe
TrC - Tunbridge	slight	slight	slight	slight
TrC - Lyman	slight	slight	severe	moderate

\* from Soil Survey of Waldo County, Maine. 1984.  
USDA, Natural Resources Conservation Service.

## BOUNDARIES

Property boundary lines should be permanently delineated, especially before any cutting occurs. Ideally, the line is cleared for unobstructed viewing and boundary trees are painted and/or blazed (scarred with an ax). All boundary lines should be reblazed and painted every 15 years to preserve current boundary evidence and to protect against timber trespass.

## TIMBER RESOURCE

For purposes of describing the forest and setting management priorities, different forest stands were identified. These are found in the Stand Description section and on the Property Map for each of the 3 parcels. Stands are denoted by a number, but if composed of 2 non-contiguous units, each unit is also denoted by a lower case letter, e.g. 4a. Inventory data were taken at variable radius plots, with the goal of 1 plot representing 2 acres. The data was processed using the INVENT Forest Inventory Program from the University of New Hampshire. Each of the 3 parcels was processed separately.

Three factors determine forest type of the stands: 1) the dominant tree species or species group in the canopy; 2) canopy height; and 3) canopy density (also referred to as crown closure). Determination of dominance is based on basal area in the canopy, not the raw number of trees or wood volume. Basal area expresses the amount of growing space a species is utilizing in the stand. The breakdown is as follows:

SOFTWOOD = S = 75%+ softwood

HARDWOOD = H = 75%+ hardwood

MIXEDWOOD = M = both hard- and softwood 25%+

Two sub-types identified on the properties include:

PINE = P = 75%+ red & white pine

HEMLOCK = HE = 75%+ hemlock

Stocking level is determined by the basal area per acre and average tree diameter of the canopy trees (the "featured" stand). Therefore, the suppressed trees in the understory are excluded, usually the saplings less than 5" in diameter. However, in the case of stand 4, the saplings are part of the featured canopy. Canopy height is classified into 3 levels: 1 = low = <30'; 2 = moderate = 30-60'; and 3 = high >60'. Canopy density also comes in 3 levels: A = high = >70% crown closure; B = moderate = 40-70%; and C = low = 10-40%. An area with less than 10% crown closure is not considered a forested stand. Growth rate is expressed as volume per acre per year. Volumes are expressed as board feet for sawtimber stands or as cords for poletimber stands. The standard conversion between board feet and cords is 1,000 board feet (1 mbf) = 2 cords. All numbers are estimates, so the "about" qualifier will not be used.

Together, the 3 lots contain 294 wooded acres. Shrub swamps and open water make up the remaining 49 acres. The Hardwood type accounts for a little more than 1/2 of the total acreage. The distribution of the 3 broad timber types among the 5 lots are:



<u>Type</u>	<u># of acres</u>	<u>% of total</u>
Hardwood	160	55
Mixedwood	95	32
Softwood	39	13
	294 acres	100%

The total volume of the 3 lots is estimated to be 921,000 board feet and 5,040 cords. This is an average volume per acre, with 3,130 board feet and 17 cords per acre. The lots' total worth is estimated to be \$166,700. This works out to \$567/acre, which is average. At an average growth rate of ½ cord/acre/year, about 147 cords of wood can grow annually on the entire ownership. At a harvest frequency of 15 years, 2,205 cords will have grown. Averaged across the wooded acreage, this means that an average of 7½ cords per acre can be sustainably harvested. Based on a 20-year harvest frequency, the wood volume grown becomes 2,940 (10 cords per acre).

Through a program of cutting the poor quality individuals and favoring the better trees, overall tree quality will be maintained or improved over time. The sawtimber percentage of the total wood volume can be maintained or increased over time if the good quality small sawtimber is allowed to continue to grow rather than cut prematurely.

Sustainability (of wood products) can be expressed in a variety of spatial and temporal scales. The larger the scales, the easier it is to average or spread out the volumes. A clearcut of a 10 acre stand, for example, is not sustainable over 20 years since no commercial wood will have grown back in that time. However, it can be sustainable over a period of 60+ years (with thinnings yielding wood volume over time). Achieving sustainability levels is a mid- to long-term proposition. It should be remembered that the baseline from which sustainability is measured should be the volume per acre at the recommended stocking level for the respective forest type. Often for a highly stocked stand, the volume recommended for harvest (to reduce stocking from current to recommended levels) exceeds the sustainable amount. A harvest volume in a certain stand that is more than the calculated sustainable volume is certainly justified if it is in an appropriate context of reaching stocking level or regeneration goals. The stand level is, nevertheless, quite small and cumbersome for sustainability concerns; it is more appropriately addressed on a forest ownership basis.

Not much timber harvesting is recommended for the next 10 years. This is because of either prior heavy harvests in the Perkins and Freedom Lumber lots resulting in a current lack of silvicultural need or other objectives and considerations, such wetlands and wildlife habitat protection, take precedence. The salvage of storm damaged wood in the Freedom Lumber Lot is scheduled to be finished up soon. Two harvest recommendations are given for the Dump lot. The pine plantations can be salvaged/thinned, yielding an estimated 53 mbf and 20 cords for a gross stumpage of \$4,900. A modest selection harvest in the balance of the mature woods south of Plummer Rd. would yield about 9 mbf and 44 cords, worth \$2,200.

## INSECT, DISEASE AND WEATHER INFLUENCES

In general, a forest can be considered healthy despite poor health of individual trees as long as the ecological processes still function. These include food production for wildlife, prevention of erosion and the cycling of water and nutrients. Trees with wounds, hollows, seams or are under stress often contain any one of many fungal infections which slowly rot the trees' wood. This is caused by overcrowding or age, which limits tree growth and vigor and makes them more susceptible to fungal infection. The presence of these wood-decaying fungi is a normal part of a natural forest.

The microburst of October, 2007 affected the Freedom Lumber lot, significantly in some areas. The other 2 lots were spared. In general, any tree that suffers stem breakage or tearing, large top breakage, loss of more than 75% of its crown, or is uprooted should be cut. A wait-and-see approach should be applied to less damaged trees.

## FOREST HEALTH AND ECOLOGICAL FORESTRY

Barrie Brusila, partner in Mid-Maine Forestry, offers the following essay:

*"Forest health* is an often used, and often abused and misunderstood concept. In terms of forest management, forest health is often defined as growing trees that are vigorous, free of insects and diseases, of good form, of desirable (a.k.a. commercially valuable) species, and at a spacing in the forest that allows them as fast a growth as possible without compromising timber quality. This definition frames health in terms of human (economic) values for wood products. Forest health can also be defined on an ecological basis. Dead, diseased, old, and slow-growing trees of all species naturally occurring on the site are part of a healthy forest from a biodiversity perspective.

"It's important to remember and acknowledge that we are most often discussing forest health in terms of human values. The forest doesn't care if a large veneer quality tree dies, rots, or burns. We humans often do. When viewed through a set of ecological values, the number of reasons to justify timber harvesting decrease noticeably. They might include:

- 1) Infestation of an exotic, non-native insect or disease whose spread could be prevented or significantly reduced by harvesting.
- 2) Improving wildlife habitat or maintaining habitat for species that are rare or declining.
- 3) Significant mortality or blowdown resulting from exotic, non-native causes.
- 4) Applying the principles of restoration forestry, as we are beginning to understand them. This might include, for example, addressing years of build-up of fuels due to past human interference with natural fire cycles.

"Silviculture is a practice by which we respectfully remove products from the forest for human use, employing methods that we believe most closely imitate and least impact the "natural" processes occurring there. It's important to acknowledge the distinction between our human and ecological definitions of forest health, and not to use the former to justify creating forests of diminished ecological value."

In the June 2006 issue of *Forest Wisdom*, newsletter of the Forest Guild (a national forest advocacy organization) Forester Ehrhard Frost identified 5 basic aspects of forests responsible for creating commodities for society: structure, diversity, function, complexity and processes. He argues the forests should be managed for wholeness and complexity rather than for efficiency and simplicity; and that emphasis should be placed on structure, function and process rather than a particular product. The following is a brief listing of basic principles he has developed for ecological forestry:

- Maintain a functioning forest first; all other outcomes will follow.
- Design silvicultural techniques that stimulate the development of species and structures that will naturally evolve over time on a site and reflect natural disturbance patterns.
- Practice multi-aged management.
- When harvesting, base the selection process on tree quality and vigor.
- Always retain some trees that are not suitable for timber, as these serve essential biological functions.
- Incorporate perpetual, variable retention of all stand structures to ensure that the entire range of naturally occurring forest structures is present.
- Identify Legacy Trees that will remain for their natural life cycle, providing a biological legacy for the future, essential elements of stand structure and continued function of the forest.
- Attempt to maintain the naturally occurring species composition of all plants and animals.
- Maintain soil structure and productivity.
- Relax utilization standards.

## WILDLIFE

Certain trees should be retained in the forest to benefit wildlife, although they may not have sawtimber value. These include den trees (live hollow) and snags (standing dead). Birds and small mammals primarily use these 2 types of trees. Snags should not be cut unless they pose a safety hazard during logging. Recommendations vary as to how many trees per acre should be left. According to *Biodiversity in the Forests of Maine: Guidelines for Land Management*, recommended practices include retaining a minimum of four wildlife (den or snag) trees per acre, with one exceeding 24" in diameter and three exceeding 14". They do not need to be evenly distributed, but may be clumped into areas such as along rock walls, field edges or swamp. In addition to existing wildlife trees, potential future ones should be identified and allowed to grow old and die. Leaving large downed tree stems >12" dbh and over 6' long is desirable to provide coarse woody debris used as habitat by small mammals, salamanders, etc. Slash, both scattered and piled, provides cover, nesting and forage sites. The edges of the semi-openings and roads present an interface of habitat for both food and cover for animals such as deer, moose, partridge, fox and rabbit.

Food for animals is provided through seeds of the softwoods, birch and alders, beech-nuts, oak acorns and fruit from the occasional black cherry or apple tree. Aspen buds are an important food for partridge.

Harvesting can be used as a way to create or maintain age and structural diversity (both vertical and horizontal) within the forest ecosystem. This in turn will create habitats that are more varied. Any timber cutting should avoid sensitive habitats and wetter areas and be timed to minimize disruption of the important nesting and young rearing seasons in spring and early summer. Seeding of log yards and roads after use with conservation mix will improve forage opportunities for many species. Opportunities for viewing wildlife will be improved by an extended trail network, either as a result of harvesting or a separate project. If desired, wildlife trees and shrubs such as mountain ash, highbush cranberry, hawthorne, serviceberry, or stag-horn sumac could be planted in openings or along woods roads.

Vernal pools are depressions that fill with water from snow melt and spring runoff and typically dry out later in the season. The best time to look for vernal pools is in the spring. They are usually found in shallow depressions in the ground. The absence of fish in these pools makes them ideal breeding and feeding areas for local amphibian populations. Any management activity which impacts a pool directly or the water regime of a vernal pool indirectly may affect the survival of these amphibians. *Forestry Habitat Management Guidelines for Vernal Pool Wildlife* (2004) by University of Maine, Maine Audubon and ME Dept. of Inland Fisheries and Wildlife should be used when working near vernal pools. In brief, within 400' of the pool's edge, one should 1) minimize disturbance to the forest's organic layer, 2) maintain coarse woody debris of various sizes and decay classes, and 3) provide partial shade from residual vegetation (>50% canopy cover); within 100' of the pool, canopy cover should be >75%.

## LEGAL RESTRICTIONS

The state-mandated Shoreland Zoning Ordinance was designed for the protection of wetlands. Mapped wetlands are located on each of the town forests. The Shoreland Zone designation that affects all 3 town parcels is the Limited Residential zone, a 250' strip of land along the edges of the wetlands. Cutting is allowed in this zone, but is simply limited to no more than 40% of the timber volume within the zone in any 10-year period. A well-distributed stand of trees must remain, with canopy openings no larger than 250 ft<sup>2</sup> in the first 100' and no larger than 10,000 ft<sup>2</sup> elsewhere. Harvesting activity must not result in ground disturbance. Resulting slash is not allowed to be higher than 4' nor within 50' of any waterbody. The first 75' is to be an unscarified strip of vegetation for slopes of less than 10%. For each additional 10% of slope, 20' more is to be added to this protective strip. To go beyond the regulations, a permit from the Planning Board is usually required and justified by a harvest plan prepared by a licensed forester.



During a harvest operation, procedures outlined in the Maine Forest Service's *Best Management Practices for Forestry: Protecting Maine's Water Quality* (2004) should be followed regarding working in and around wetlands and streams. This will allow the landowner to comply with the Protection and Improvement of Waters Law (sections 413 & 417). Specifically, this law prohibits causing erosion of soil into water bodies and disposing of slash in streams, lakes and tidal waters. For road construction, compliance of the Erosion and Sedimentation Control Law is necessary, which regulates activities involving filling, displacing or exposing soil. Specifically, erosion control practices (such as hay bales, silt fence and hay mulch) are properly installed and maintained whenever filling or soil disturbance occurs.

Maine's Natural Resources Protection Act (NRPA) regulates work in and adjacent (within 75') to lakes, streams, freshwater wetlands and tidal wetlands (as well as in elevations greater than 2,700'). Activities regulated include disturbing soil, placing fill and building permanent structures in or adjacent to these areas. A permit is required from the DEP for such common work as:

- ◆ Road building, excavating, filling, or otherwise disturbing the soil within 75' of lakes, rivers, streams and wetlands,
- ◆ Building new bridges, fords or installing culverts for road or trail crossings,
- ◆ Building or placing permanent structures in, on or over lakes, rivers, streams, wetlands or fragile mountain areas, and
- ◆ Harvesting operations above 2,700' in elevation.

Exempt activities include:

- ◆ Temporary structures, such as a road crossing using a temporary bridge, that are in place less than 7 months in a protected resource is exempt. However, it is not exempt if fill is used.
- ◆ Repair, maintenance or replacement of an existing culvert, provided any replacement is not more than 25% longer than that being replaced and not longer than 75'. Erosion control must be used and fish passage may not be blocked.
- ◆ Forest management, including associated road construction or maintenance, in or adjacent to forested wetlands as long as it:
  - 1) meets minimum stocking requirements under the Forest Practices Act;
  - 2) meets "permit-by-rule" standards for road crossing of a stream, or for soil disturbance adjacent to great pond, river or stream and DEP is notified prior to starting the work;
  - 3) the area is not a forested wetland mapped as a significant wildlife habitat; and
  - 4) the road construction is not used to access development, but is primarily used for forest management activities.

Two permitting programs exist under the NRPA. "Permit-by-rule" is the simpler procedure and covers most minor activities, such as installing bridges and culverts in rivers and streams or disturbing soil 25-75' from the waterbody or wetland, and maintenance and repair of structures. It requires a 1-page notice to the DEP and following applicable construction and erosion control standards. A full NRPA permitting process covers activities with greater potential impacts than those under permit-by-rule.



Before any commercial harvesting occurs, landowners (or their agent) must file a harvest notification form with the Maine Forest Service. Year-end reports of harvested volumes and stumpage prices are a part of this requirement. All boundary lines within 200' of cutting must be clearly marked. All slash from a harvest must be removed at least 25' from adjoining properties if they pose a fire hazard. Landowners who own >100 acres (statewide) must comply with the Forest Practices Act if any clearcuts are >5 acres. This law deals with separation zones between clearcuts and regeneration standards. Harvest plans must be submitted to the Maine Forest Service for proposed clearcuts >20 acres.

## MARKETS

All wood greater than 6" dbh is currently marketable. Harvested pulpwood would most likely be trucked to one of five mills - Verso Co. in both Bucksport (for spruce-fir) or Jay (hardwood), SAPPI in Hinckley (hardwood, hemlock and pine), Madison Paper in Madison (low-grade spruce-fir), or Mead in Rumford. Aspen is used for making chipboard by Domtar, located downeast in Woodland. Firewood could be sold to local dealers, homeowners or used domestically. There are quite a few sawmills in the mid-coast area. The largest local sawmill is Robbins Lumber in Searsmont, specializing in white pine. Irving, in Dixfield, is another large pine mill. The N.C. Hunt sawmill, in Jefferson, is a good market for short and low-grade pine and hemlock.

A specialty market for the red pine logs is utility poles, which pays more than for sawlogs. This should be pursued for the red pine in the Dump lot. Two Maine-based companies are active buyers: Prentiss & Carlisle in Bangor and Maine Wood Treeters in Mechanic Falls. Hardwood boltwood, in 4' lengths, is also a possible market. Oak boltwood, for example, offers 3 times the price for wood than if sold for firewood. Depending on the logging contractor and/or trucker, logs would be sold to one of these local mills, wood brokerage companies such as Premium in Cooper's Mills. Wood markets fluctuate in price, product specifications, and demand. Current market conditions should be assessed as part of any timber harvest. The oak sawlog market has been significantly down for the last 2 years. The pine and spruce sawlog, hardwood pulp and firewood markets are high, however.

## COMMERCIAL HARVESTS OF WOOD PRODUCTS

Properly done, commercial harvests are one part of an environmentally sound, multiple-use forest management system. Through cutting, a forester manipulates the vegetative structure within a forest stand to attain stated objectives. Timber can often be harvested while enhancing wildlife habitat and recreational opportunities. Typically, the long-term goal is the production of high value wood products, such as grade white pine and spruce saw logs as well as oak veneer and sawlogs. To this end, low quality and unhealthy trees and/or mature individuals are chosen for removal. This allows faster growth to occur in the more valuable, vigorous, immature trees. It also favors the release or establishment of natural regeneration of desired species. The regeneration is part of the property's long-term potential. Thus, proper harvesting not only generates immediate income for the owner but, over time, can also improve the health and quality of the timber and wildlife resources of the property. Forest canopy openings, however, should be limited to no greater than  $\frac{1}{4}$  acre.

Commercial harvesting should be conducted on a marked tree or species designation basis and under the supervision of a licensed professional forester. This will ensure that the selection of trees for cutting is in the best short- and long-term interest of the owner, and leaves a desirable residual stocking of trees. In addition, the forester supervises harvesting operations (usually weekly) to ensure proper utilization, minimal felling and skidding damage to residual trees, and to help assure accurate payment for harvested wood products.

Sales should be conducted on a competitive bid basis or by direct negotiation with reputable contractors. The timing of specific sales is dependent on economic and silvicultural considerations, as well as seasonal ground conditions. To prevent rutting and preserve the integrity of the soil's organic mat, harvesting should be done when ground is either frozen or dry so that it is stable enough to hold up heavy machinery. Low impact machinery, such as a forwarder (usually in combination with a cut-to-length system) is recommended for its ability to drive the wood out to the landing instead of dragging it. Other preferred alternatives to skidders include horses and 4-wheel drive tractors with winches.

Recreational and aesthetic concerns and wildlife needs should be given appropriate emphasis during timber marking and while supervising harvesting jobs. Yards and skid roads should be located to minimize soil erosion and visual impact, as well as to improve interior access. Cutting along existing roads, trails, streams and vistas may need to be modified to maintain an aesthetically pleasing appearance. Appropriate numbers of wildlife trees and other critical areas should be left to provide both cover and food, especially along wetlands.