fountains

USE VALUE APPRAISAL FOREST MANAGEMENT PLAN

Prepared for:

The City of Montpelier, Vermont

For Lands in Berlin, Washington County, Vermont

672 and 67.75 Acres

December, 2008

fountains forestry inc

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Forest Management Plan

City of Montpelier Forests

Berlin, Washington County, Vermont
December 2008

Berlin Pond Parcel
Tax Lot R3-045: 672 Town Listed Acres
Water Treatment Plant Parcel
Tax Lot 00 SA1-016: 3.55 Town Listed Acres
Tax Lot 00 SA1-020: 64.2 Town Listed Acres

Orthophoto Base Map: 144188 Berlin Corner and 144184 Berlin Pond

I authorize submittal of this plan to the State of Vermont to meet the requirements of the Use Value Appraisal program. I affirm that the forest described herein is under active management in accordance with acceptable standards for forest management.

William Fraser, City Manager (for)
City of Montpelier, Vermont
39 Main Street
Montpelier, Vermont 05602

12-30-08
Date

Prepared by:

fountain forestry
7 Green Mountain Drive, Suite 3
Montpelier, VT 05602-2708

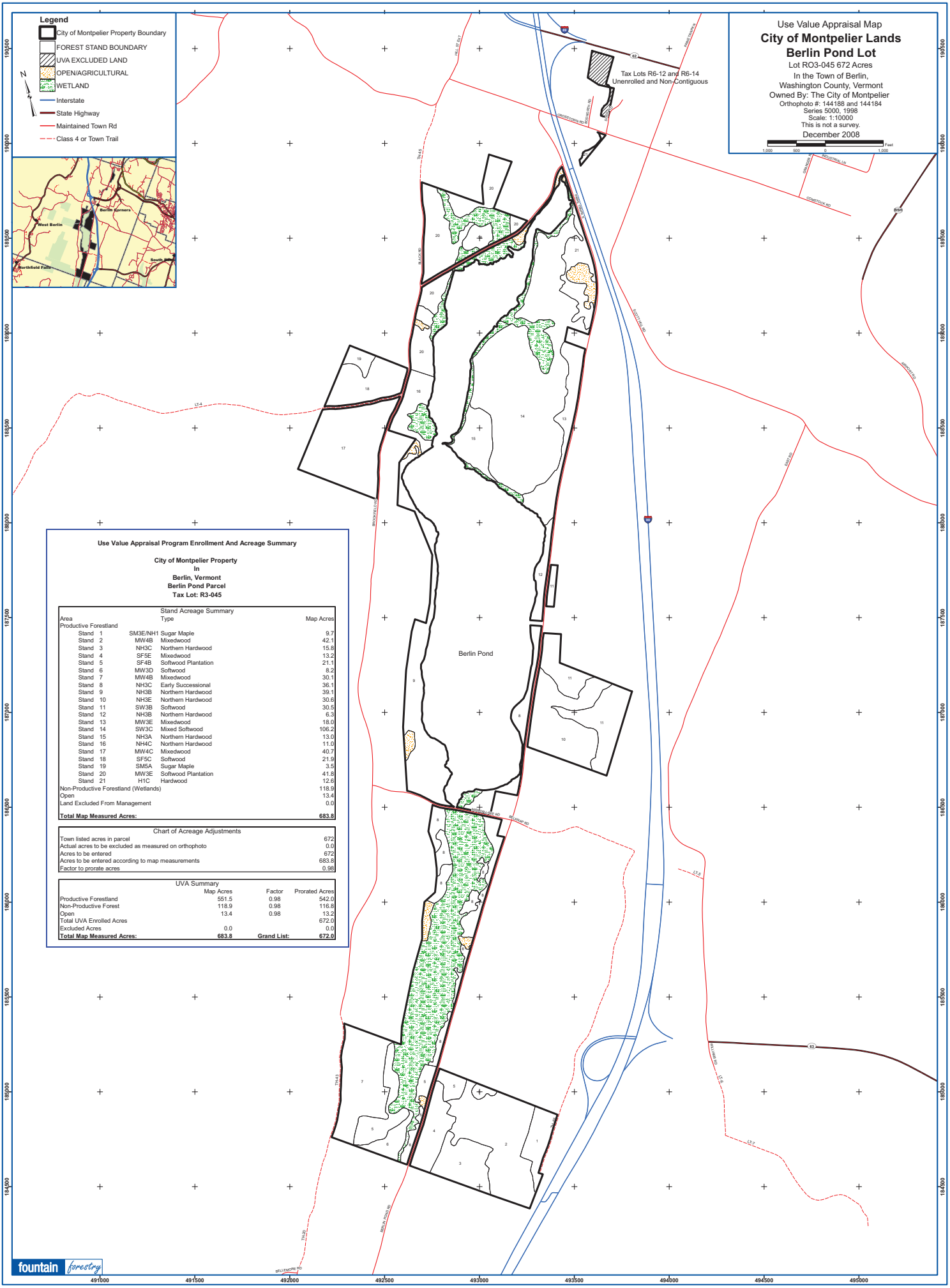
12.30.08
Date

Approved by:

Washington County Forester

1/5/08
Date

TABLE OF CONTENTS


Legend
City of Montpelier Property Boundary
FOREST STAND BOUNDARY
UVA EXCLUDED LAND
OPEN/AGRICULTURAL
WETLAND
Interstate
State Highway
Maintained Town Rd
Class 4 or Town Trail
Use Value Appraisal Map
City of Montpelier Lands
Berlin Pond Lot
Lot RO3-045 672 Acres
In the Town of Berlin,
Washington County, Vermont
Owned By: The City of Montpelier
Orthophoto #: 144188 and 144184
Series 5000, 1998
Scale: 1:10000
This is not a survey.
December 2008
Tax Lots R6-12 and R6-14
Unenrolled and Non-Contiguous
Berlin Pond
West Berlin
Berlin Corners
Northfield Falls
South Barre
Use Value Appraisal Program Enrollment And Acreage Summary
City of Montpelier Property
In
Berlin, Vermont
Berlin Pond Parcel
Tax Lot: R3-045
Stand Acreage Summary
Area Type Map Acres
Productive Forestland
Stand 1 SM3E/NH1 Sugar Maple 9.7
Stand 2 MW4B Mixedwood 42.1
Stand 3 NH3C Northern Hardwood 15.8
Stand 4 SF5E Mixedwood 13.2
Stand 5 SF4B Softwood Plantation 21.1
Stand 6 MW3D Softwood 8.2
Stand 7 MW4B Mixedwood 30.1
Stand 8 NH3C Early Successional 36.1
Stand 9 NH3B Northern Hardwood 39.1
Stand 10 NH3E Northern Hardwood 30.6
Stand 11 SW3B Softwood 30.5
Stand 12 NH3B Northern Hardwood 6.3
Stand 13 MW3E Mixedwood 18.0
Stand 14 SW3C Mixed Softwood 106.2
Stand 15 NH3A Northern Hardwood 13.0
Stand 16 NH4C Northern Hardwood 11.0
Stand 17 MW4C Mixedwood 40.7
Stand 18 SF5C Softwood 21.9
Stand 19 SM5A Sugar Maple 3.5
Stand 20 MW3E Softwood Plantation 41.8
Stand 21 H1C Hardwood 12.6
Non-Productive Forestland (Wetlands) 118.9
Open 13.4
Land Excluded From Management 0.0
Total Map Measured Acres: 683.8
Chart of Acreage Adjustments
Town listed acres in parcel 672
Actual acres to be excluded as measured on orthophoto 0.0
Acres to be entered 672
Acres to be entered according to map measurements 683.8
Factor to prorate acres 0.98
UVA Summary
Map Acres Factor Prorated Acres
Productive Forestland 551.5 0.98 542.0
Non-Productive Forest 118.9 0.98 116.8
Open 13.4 0.98 13.2
Total UVA Enrolled Acres 672.0
Excluded Acres 0.0 0.0
Total Map Measured Acres: 683.8 Grand List: 672.0
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Use Value Appraisal Map

City of Montpelier Lands
Water Treatment Plant Lots

Lot 00 SA1-016 3.55 Listed Acres
Lot 00 SA1-020 64.2 Listed Acres
(Contiguous)
Total Acreage 67.75
In the Town of Berlin,
Washingron County, Vermont

Owned By: The City of Montpelier

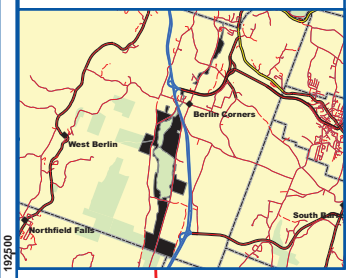
Orthophoto #: 144188 and 144192
Series 5000, 1998
This is not a Survey

December 2008

500 250 0 500 Feet

Legend

- City of Montpelier Property Boundary
- FOREST STAND BOUNDARY
- UVA EXCLUDED LAND
- OPEN/AGRICULTURAL
- WETLAND
- Interstate
- State Highway
- Maintained Town Rd
- Class 4 or Town Trail



Use Value Appraisal Program Enrollment And Acreage Summary

City of Montpelier Property
In
Berlin, Vermont
Water Treatment Parcel
Tax Lots: 00 SA1-016 (3.55 Acres) and SA1-020 (64.2 Acres) Contiguous

Stand Acreage Summary

Area		Type	Map Acres
Productive Forestland			
Stand 22	MW3C	Mixed Composition	12.2
Stand 23	MW3B	Mixed Composition	22.7
Non-Productive Forestland (Wetlands)			6.9
Open			
Land Excluded From Management			17.5
Total Map Measured Acres:			**59.3**

Chart of Acreage Adjustments

Town listed acres in parcel	67.75
Actual acres to be excluded as measured on orthophoto	17.5
Acres to be entered	50.283
Acres to be entered according to map measurements	41.8
Factor to prorate acres	1.20

UVA Summary

	Map Acres	Factor	Prorated Acres
Productive Forestland	34.9	1.20	42.0
Non-Productive Forest	6.9	1.20	8.3
Open	0.0	1.20	0.0
Total UVA Enrolled Acres			50.3
Excluded Acres	17.5		17.5
Total Map Measured Acres:	**59.3**	**Grand List:**	**67.75**

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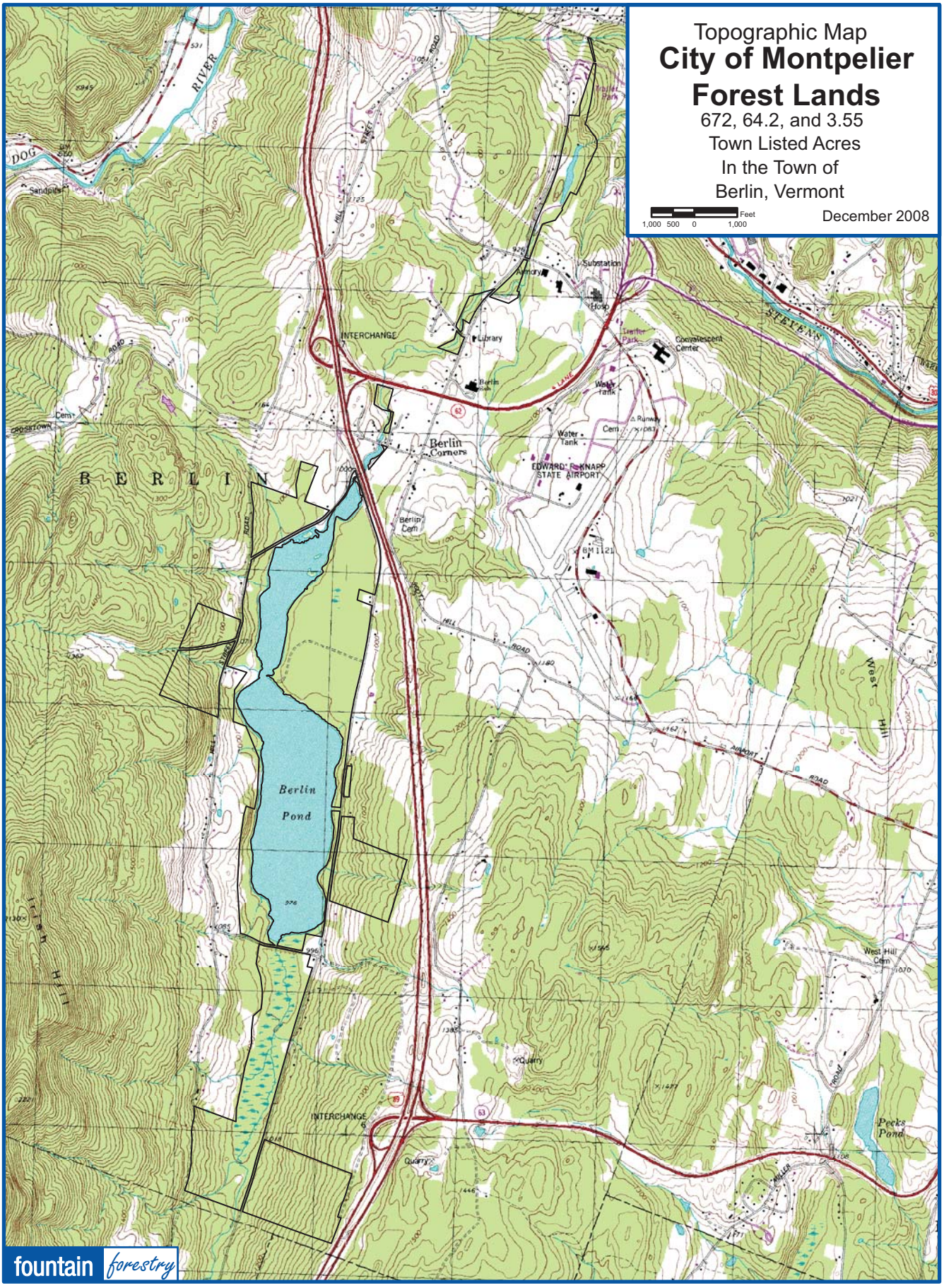

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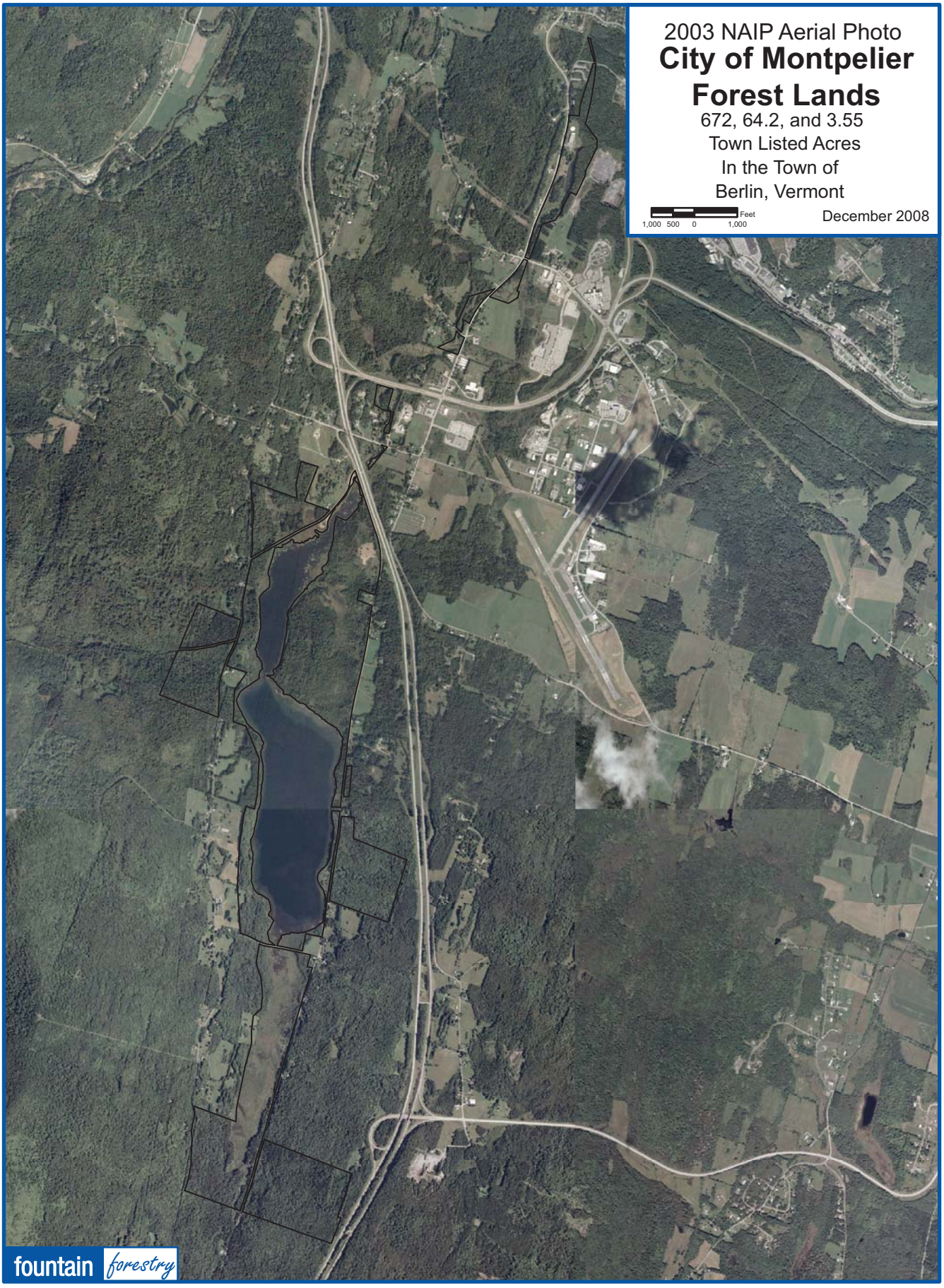
1998 NAIP Aerial Photo
City of Montpelier
Forest Lands
672, 64.2, and 3.55
Town Listed Acres
In the Town of
Berlin, Vermont
1,000 500 0 1,000 Feet
December 2008
fountain forestry


2003 NAIP Aerial Photo
City of Montpelier
Forest Lands
672, 64.2, and 3.55
Town Listed Acres
In the Town of
Berlin, Vermont
1,000 500 0 1,000 Feet
December 2008
fountain forestry

ACTIVITY SUMMARY

Berlin Pond Parcel

Tax Lot: R3-045

Stand #	Forest Type	Acres	Scheduled Activity	Year	Priority	Notes
1	Sugar Maple	9.7	No Activity			
2	Mixedwood	42.1	Selection			
3	Northern Hardwood	15.8	No Activity			
4	Mixedwood	13.2	Thin			
5	Softwood Plantation	21.1	No Activity			
6	Softwood	8.2	No Activity			
7	Mixedwood	30.1	No Activity			
8	Early Successional	36.1	No Activity			
9	Northern Hardwood	39.1	No Activity			
10	Northern Hardwood	30.6	No Activity			
11	Softwood	30.5	No Activity			
12	Northern Hardwood	6.3	No Activity			
13	Mixedwood	18.0	No Activity			
14	Mixed Softwood	106.2	No Activity			
15	Northern Hardwood	13.0	No Activity			
16	Northern Hardwood	11.0	No Activity			
17	Mixedwood	40.7	No Activity			
18	Softwood	21.9	No Activity	2012		Thin small area previously unthinned
19	Sugar Maple	3.5	No Activity			
20	Softwood Plantation	41.8	Overstory Removal			Remove white and Scots pine
21	Hardwood	12.6	No Activity			
			Forest Review	2014	2	
			Plan Update	2019	1	

Water Treatment Plant Parcel

Tax Lots: 00 SA1-016 (3.55 Acres) and SA1-020 (64.2 Acres) Contiguous

Stand #	Forest Type	Acres	Scheduled Activity	Year	Priority
22	Mixed Composition	12.2	No Activity		
23	Mixed Composition	22.7	No Activity		
			Forest Review	2014	2
			Plan Update	2019	1

FOREST MANAGEMENT PLAN

STATEMENT OF PURPOSE

Forest Management is the practical application of silvicultural principles to the growth, harvest, regeneration and conservation of forests in order to maintain healthy forests and to meet the specific objectives of the landowner.[1]

This Forest Management Plan is intended to be a fundamental tool to the practice of forest management on the City of Montpelier property.

The purpose of this Forest Management Plan is to:

- note the landowner's objectives, priorities and special concerns.
- present a description of the current state of the forest.
- propose a schedule of activities which will allow the landowner to achieve his or her objectives.
- fulfill the requirements of Vermont's Use Value Appraisal Program.
- serve as an educational tool with which the landowner's awareness of the forest, and understanding of its management, may be enhanced.

OBJECTIVES

The management objectives, or goals, of the owner are of the highest importance in the creation of a Forest Management Plan. These objectives should express a landowner's vision for the development of the forest and its resources. They should also reflect the biological capabilities and limitations of the forest. Management objectives may be either general or specific, but they should be realistic and suggest certain courses of action.

Landowners should become aware of the interrelationship of management objectives. The managing forester may help landowners to evaluate their objectives, steering them toward realistic objectives or away from unrealistic or conflicting ones.

While many different landowner objectives may be achieved through active forest management, production of high quality forest products shall be the primary focus of management efforts on all properties enrolled in Vermont's Use Value Appraisal Program.[2] The management of the City of Montpelier Forest will be guided by the following objectives:

- to produce high quality forest products;
- to maintain a healthy and productive forest;
- to maintain water quality throughout the properties;
- to be a good land steward;
- to maintain the aesthetic quality of the forest;
- to maintain the recreational resources of the forest;

[1] State of Vermont, Department of Forests, Parks, and Recreation, Forest Management Plan Standards
[2] State of Vermont, Department of Forests, Parks, and Recreation, Forest Management Plan Standards

- to maintain and enhance the wildlife habitat on the property.

INTRODUCTION

INTERPRETING THE PLAN

A basic structure of the plan is the concept of a forest stand. A forest stand is an area that is relatively homogeneous in species composition, tree height, density and site characteristics. The State of Vermont defines a stand as “A group or groups of trees sufficiently uniform in age class distribution, composition and structure, and growing on a site of sufficient uniform quality, to be a distinguishable unit”.

Stands occur as a result of site conditions, topography, and past history and use. A stand is a basic unit of forest management and is often identified by one or more dominant species in the stand and the size of the trees present, for example, “sawlog size northern hardwoods”. "Sawlog size" refers to trees over 11” in diameter, with diameter measured 4.5’ above the ground, a measurement referred to as “diameter at breast height” (DBH). "Northern hardwoods" refers to a commonly occurring association of species including American beech, sugar maple and yellow birch.

With the use of an aerial photograph and topographic maps, the forester maps the stands and makes subsequent field checks to verify his or her projections. Appropriate sampling techniques are applied, and field observations are made, to determine basal area, stocking density, timber volume and other characteristics of the stand. Stand measurements are made based on representative sampling. Data are collected at several locations within a stand, usually by a method called variable radius plot sampling. By this method, the image of a tree, when viewed through a calibrated wedge shaped piece of glass called a prism, allows the forester to select trees to be included in a sample which will be used to represent the stand. Data are typically processed by a computer program which calculates stocking, timber volume and species composition.

Basal area is a critical forest measurement. It refers to the cross-section surface of the tree stem and is measured in square feet (ft^2). For example, a 14” DBH tree has a basal area of 1.07 ft^2 and an 8” tree has a basal area of 0.35 ft^2. Most often used on a per acre basis, basal area is an index to stand density. If the stand basal area is low, it means that the site can support more and/or larger trees than it currently does. Conversely, a high density stand contains more trees than is optimal for vigorous growth. The term “stocking” is used to describe the density of a stand, given its age and species composition. A stand may be “understocked”, “adequately stocked”, “fully stocked”, “overstocked”, etc.

Basal area figures for an adequately stocked stand will vary by stand type. For example, conifers typically grow well in denser clusters, due to their narrow conical growing space. As a result, one could expect a fully stocked softwood stand to have a higher basal area than a fully stocked hardwood stand.

MITIGATING FACTORS

Many factors - biological, natural and economic - interact to create constraints on the feasibility of forestry activities. The constant fluctuation of these factors may occasionally require that the plan be amended. Barring major disruptions, however, management consistency and continuity are vital

Biological factors may include the ability or inability of forest vegetation to grow on various soils, the presence or absence of insects or disease, the silvics or ecology of individual tree species, occurrence of wildlife species and their populations, and more.

Natural factors include occurrences such as fire, wind storms, ice storms and weather that prohibit the use of machinery.

Economic factors, including market conditions, current technology and economies of scale, all play a role in determining what forest practices are the most appropriate.

Forest management is, by nature, a long term practice, as trees are long-lived organisms. It is not uncommon for the intended effects of management activities to be expected to be years or decades in the future. Management directed toward desirable results often requires substantial initial investments of time, effort and capital. It may also require that short term opportunities be foregone to reap long term benefits. While the merits of long term versus short term management can be argued, it is generally agreed that productivity is optimized under long term management. It has also been demonstrated that professional planning and supervision of forest management increases economic returns, while protecting or enhancing amenities. Professional forest management does this in the short term, as well as over the long term. While savings from the Use Value Appraisal (UVA) Program are substantial and do provide an incentive for sound forest management, they should not be the sole reason for following recommendations contained in this plan. Rather, management recommendations are based on many factors that optimize economic and biological potentials for the good of the landowner and improvement of the resources.

Because physical and biological factors may affect a forest at any time, and because technology and markets are always changing, it is important to periodically reassess the management plan. The Vermont UVA Program recognizes this need and mandates that plans be updated every ten years. It is prudent to check on the physical condition of the forest and the appropriateness of the plan at least every five years.

SILVICULTURE

Silviculture has been defined by the US Forest Service as the “art, science and practice of establishing, tending and reproducing forest stands with desired characteristics.”

Forest stands and forest management may be described as “even aged” or “uneven aged”. Within each category, various silvicultural strategies are appropriate. Stands with one or two distinct age classes are even aged and stands with three or more age classes are uneven aged. Management which tends one age class through its life span to maturity, harvest and regeneration, is considered even aged. Management which tends a variety of different age classes within a single stand is considered uneven aged management. A forester prescribes management based on the landowner’s objectives and the condition of the forest. It is possible to manage some stands on a forest with even aged techniques and other stands with uneven aged techniques.

Even aged management consists of a variety of techniques which tend a crop of trees of approximately the same age and, when mature, regenerate the stand to desirable species. These techniques include precommercial and intermediate thinnings in immature stands, and shelterwood, strip cutting, patchcutting and clearcutting to regenerate mature stands.

Uneven aged management consists of techniques which tend and manipulate several different age classes within the same stand. A stand might contain seedlings, saplings, small poles and sawtimber, either individually or in small groups of trees. In most cases, uneven aged management will manipulate these age classes to allocate an equal amount

of growing space to each age class. A measurement called the Q factor describes the proportional amounts of small trees and large trees in an uneven aged stand. Uneven aged techniques include both single tree and small group selection thinnings. Group selections are a regeneration technique. This type of management (once fully implemented) will allow a thinning every 15-20 years and assure that there is always tree cover on all acres.

In general, uneven aged management tends to appeal to owners of small private forests, because it is perceived to be less aesthetically disruptive. However, even aged techniques may be more appropriate in some situations: in existing even aged stands, on poor sites, in areas prone to wind damage or in low quality stands. In addition, even aged management can be implemented with a high degree of attention to aesthetic objectives. Even aged stands may be converted to a balanced uneven aged stand structure, but this may take several cutting cycles (30 to 45 or more years).

USE VALUE APPRAISAL

Vermont's Use Value Appraisal (UVA), or "Current Use", program is a state program providing abatement of local property taxes in exchange for a commitment by the landowner to manage his or her land for productive forestry and/or agriculture.

The program is available to owners of eligible parcels (25 acres or greater, though 2 acres surrounding dwellings are ineligible). The Current Use Advisory Board sets a taxable value, for local property tax purposes for each tax year (April 1 through March 31). For the 2008 tax year, these values are $136 per acre for forestland and $187 per acre for agricultural land.

The program also places a lien in the town records, assessing a "land use change tax", or penalty, if the property, or portions of it, are developed or removed from the program. "Development" is defined in three ways: subdividing the property into unenrollable lots, building houses or other non agricultural structures or harvesting timber in a way which is in conflict with the plan. The penalty is currently 20% of the fair market value of the developed land for land enrolled 10 years or less, and 10% of the fair market value for land enrolled more than 10 years. Fair market value is interpreted to be the town's assessed value of the property.

The program requires that a Forest Management Plan be prepared, approved by the County Forester and updated every 10 years. As landowners' objectives change, and as unexpected events occur, amendments to the Management Plan are acceptable, once approved by the County Forester. The landowner must also submit a Forest Management Activity Report (FMAR) to the County Forester (in years in which any forestry activity occurs on the land) and allow State inspections of the land to insure compliance.

The landowner is responsible for implementing the activities in the Forest Management Plan and approved by the County Forester. If, upon inspection by the County Forester, it is determined that stands are cut contrary to the management plan, the property may be removed from the program for a period of five tax years, and the "land use change tax" may be assessed. If a landowner fails to make a prescribed harvest within the allowed period (three years on either side of the scheduled date), an amendment must be submitted, or an extra year may be granted. If the activity is not completed within the one year extension, the property may be removed from the program for at least one year. It is strongly

recommended that a forester administers the implementation of the Management Plan. For additional information, see *Use Value Appraisal of Forestland in Vermont*, published by the Vermont Department of Forests, Parks, and Recreation, and available from **fountain forestry**, or call Vermont Property Valuation and Review at (802) 828-5861.

WATER QUALITY PROTECTION

The State of Vermont seeks to improve the quality of its waters and protect them from risks such as sedimentation and other pollution. Typically, if water quality degradation occurs on a harvesting operation, it is likely to occur as a result of sedimentation from roads, skid trails or landings. Another detriment to water quality is an increase in temperature, which can disrupt the biology of a stream or other water body. Vermont has developed a set of *Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont (AMP's)*, to protect the waters of the state from these risks.

The AMP's are enforced by the state and have the force of law. Penalties can be costly if there is a discharge of sediment into a stream and AMP's were not in place. Violations of the AMP's also jeopardize enrollment in the Use Value Appraisal Program. Use Value Appraisal rules state "It is the obligation of the landowner to ensure that significant soil erosion and/or stream sedimentation does not occur on any lands enrolled in the Use Value Appraisal program. Appropriate preventative soil erosion and stream pollution control practices, as outlined in the publication entitled *Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont* or a successor publication, shall be employed to the maximum practicable extent on all enrolled parcels.

fountain forestry has a water quality protection policy and water quality protection guidelines that provide our foresters with the field tools to designate stream types, and to protect them through design of skid trails and truck roads, and delineation of Stream Management Zones (SMZ's), or buffers, all in compliance with, and often exceeding the requirements of AMP's. The overriding goals are to keep sediment out of the water and maintain water temperature.

BOUNDARIES

Knowing the location of a forest is a fundamental step to forest management. Boundaries serve to protect landowners on both sides of the line. Mutual agreement regarding the location of the lines, and clear marking, will prevent misunderstandings and conflict between neighbors.

Boundary lines may deteriorate beyond recognition if not maintained. Some states require that boundary lines be located and marked, and/or receive periodic maintenance, before timber is harvested. Vermont does not have any requirement for boundary maintenance, but can impose damages for timber trespass.

Boundary lines are marked with axe blazes on trees which are coated with durable paint to ensure visibility. Only a licensed surveyor can create or monument a line, but a landowner may maintain monumentation once it has been established, including clearing brush and re-painting blazes.

It is recommended that the condition of boundary lines be assessed every 5 years. Blazed and painted lines will likely need maintenance every 10 to 15 years. Blazes may survive longer in a mature and undisturbed forest, but may be difficult to locate after just 10 years

in a young forest (where the trees are growing vigorously) or when there has been significant management activity.

GENERAL PROPERTY DESCRIPTION

LOCATION/ACREAGE

The City of Montpelier properties in Berlin Vermont consist of several parcels: All of these parcels are associated with Berlin Pond, its outflow (a small stream flowing to the north from Berlin Pond and unnamed on the topographic map), and a water treatment plant which lies to the north along the outflow.

Tax Parcel R03-045 surrounds Berlin Pond, and is listed as 672 acres by the town of Berlin. The Grand List description refers to a dwelling, but no dwelling was encountered during the field work for this plan, the City Assessor is unaware of any dwelling, and the Town of Berlin assigns no value to the dwelling. It is believed that this is an erroneous description. This tax parcel includes a small area divided from the remainder by the Interstate 89 corridor. As this small parcel was originally part of the larger piece, and is listed by the town under the same tax lot and description, it is included in this Use Value Appraisal enrollment. The entire 672 acres are enrolled in Use Value Appraisal.

Tax Parcels R6-12 and R6-14 are small parcels near the Berlin Town Clerks office, but which are non-contiguous with any other City of Montpelier lands. They are too small to be enrolled in UVA individually, and they are not a subject of this Management Plan.

Tax Parcel SA1-020 surrounds the Water Treatment Plant and the outflow stream of Berlin Pond. It is listed by the Town of Berlin as 64.2 acres. Several areas along Paine Turnpike are excluded from Use Value Appraisal.

Tax Parcel SA1-016 is a small parcel at the water treatment Plant. This parcel is listed by the town of Berlin as 3.55 acres. As it is contiguous with SA1-020, it is included on the maps prepared for this management plan, but is excluded from Use Value Appraisal in its entirety.

The properties will be enrolled in the UVA program with this management plan.

The map used in this plan is based on a Vermont Orthophotograph (aerial photo) and field evidence.

The City of Montpelier property's enrollment in UVA is detailed below:

Berlin Pond Parcel

Use Value Appraisal Program Enrollment And Acreage Summary

City of Montpelier Property
In
Berlin, Vermont
Berlin Pond Parcel
Tax Lot: R3-045

Stand Acreage Summary

Area			Type	Map Acres
Productive Forestland				
Stand	1	SM3E/NH1	Sugar Maple	9.7
Stand	2	MW4B	Mixedwood	42.1
Stand	3	NH3C	Northern Hardwood	15.8
Stand	4	SF5E	Mixedwood	13.2
Stand	5	SF4B	Softwood Plantation	21.1
Stand	6	MW3D	Softwood	8.2
Stand	7	MW4B	Mixedwood	30.1
Stand	8	NH3C	Early Successional	36.1
Stand	9	NH3B	Northern Hardwood	39.1
Stand	10	NH3E	Northern Hardwood	30.6
Stand	11	SW3B	Softwood	30.5
Stand	12	NH3B	Northern Hardwood	6.3
Stand	13	MW3E	Mixedwood	18.0
Stand	14	SW3C	Mixed Softwood	106.2
Stand	15	NH3A	Northern Hardwood	13.0
Stand	16	NH4C	Northern Hardwood	11.0
Stand	17	MW4C	Mixedwood	40.7
Stand	18	SF5C	Softwood	21.9
Stand	19	SM5A	Sugar Maple	3.5
Stand	20	MW3E	Softwood Plantation	41.8
Stand	21	H1C	Hardwood	12.6
Non-Productive Forestland (Wetlands)				118.9
Open				13.4
Land Excluded From Management				0.0
Total Map Measured Acres:				**683.8**

Chart of Acreage Adjustments

Town listed acres in parcel	672
Actual acres to be excluded as measured on orthophoto	0.0
Acres to be entered	672
Acres to be entered according to map measurements	683.8
Factor to prorate acres	0.98

UVA Summary

	Map Acres	Factor	Prorated Acres
Productive Forestland	551.5	0.98	542.0
Non-Productive Forest	118.9	0.98	116.8
Open	13.4	0.98	13.2
Total UVA Enrolled Acres			672.0
Excluded Acres	0.0		0.0
Total Map Measured Acres:	**683.8**	**Grand List:**	**672.0**

Water Treatment Plant Parcel

Use Value Appraisal Program Enrollment And Acreage Summary

City of Montpelier Property
In
Berlin, Vermont
Water Treatment Parcel
Tax Lots: 00 SA1-016 (3.55 Acres) and SA1-020 (64.2 Acres) Contiguous

Stand Acreage Summary

Area		Type	Map Acres
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Chart of Acreage Adjustments

Town listed acres in parcel	67.75
Actual acres to be excluded as measured on orthophoto	17.5
Acres to be entered	50.283
Acres to be entered according to map measurements	41.8
Factor to prorate acres	1.20

UVA Summary

	Map Acres	Factor	Prorated Acres
Productive Forestland	34.9	1.20	42.0
Non-Productive Forest	6.9	1.20	8.3
Open	0.0	1.20	0.0
Total UVA Enrolled Acres			50.3
Excluded Acres	17.5		17.5
Total Map Measured Acres:	**59.3**	**Grand List:**	**67.75**

This Forest Management Plan will need to be updated by April 1, 2019.

ACCESS

Access to the property for forest management has been developed for most of the Berlin Pond Parcel, and skid trails and landings serve all of the currently manageable stands. Several landings exist and are generally sufficient for the activity prescribed in this plan. No access costs are anticipated during the current management period for the BVerlin Pond Parcel.

Access to the Water Treatment Plant Parcel has not been developed and management of this parcel will be challenging due to access and topography. As no active harvesting is currently prescribed, there is no access development expense anticipated for the ten year period of this plan. The City should be prepared to develop access, with some expense involved, likely in the following ten year period.

Timber harvesting may involve some ground disturbance. Winter logging is strongly recommended for all activities to minimize the potential for erosion and sedimentation. These risks can be minimized by pre-installing waterbars and stream crossings before the harvesting season, and performing maintenance throughout a harvest, and at its conclusion. Winter harvest areas are particularly susceptible to erosion during the period when frozen trails are thawing in the spring. Pre-installed waterbars can prevent erosion from occurring during this period and before final restoration occurs during the summer.

Some trails may be used for public recreation. The use of trails for both forestry and recreational use may require a higher degree of restoration work after logging operations than is customary for a standard operation. This restoration work should be specified in timber sale contracts and could result in an added expense.

The topography will not unduly limit logging operations. Slopes are generally moderate and are operable throughout. Many areas are wet and/or poorly drained. These conditions are most common at the "toe" of steep slopes. They should be protected during harvesting operations (operated only with sufficient snow depth), with little negative effect on operations.

LAND FEATURES

The City of Montpelier properties lie on diverse terrain, but all within the watershed of Berlin Pond and its outflow, a small stream which is unnamed on the topographic map. As such, the terrain is often influenced by these water bodies, with several stands located on very poorly drained sites in close proximity to the pond, and associated wetlands.

Regionally, the property lies east of the Northfield Range of the central Green Mountains. Rich Vershire, Dummerston and Glover soils are common, and where at least moderately drained, they are very productive. In these areas with better drainage, the sites are well suited to northern hardwood stands and will likely favor good growth of sugar maple, white ash, and other desirable species.

Several areas on this property were planted to softwood stands, likely in the 1930's to 1950's. Such plantings were a common means of maintaining the productivity of farmland, as farming suffered economically during this period. Now many of these plantedstands are mature. In most cases these stands were established with exotic species: Norway spruce and Scots pine. It is recommended that these stands be converted to native species through natural regeneration over time.

BOUNDARIES

Several surveys exist of different portions of the City of Montpelier lands in Berlin, and no discrepancies between these surveys and the evidence on the ground was noted during the field inventory for this plan. Most boundary lines which were encountered during the inventory are marked with yellow blazes in fair to poor condition. Some lines appear to be marked only by old stone walls and fence lines. A full review of the condition of the lines is outside the scope of this management plan, but sufficient lines were seen to recommend boundary maintenance within the next ten years. This activity is not required for Use Value Appraisal enrollment, but is a necessary step for responsible stewardship. It is recommended that this activity occurs in incremental stages over the ten year period.

WILDLIFE

With some exceptions, wildlife benefit from the careful manipulation of the land. Forest management activities generally create openings in the forest canopy, create slash for cover, and stimulate growth, resulting in increased levels of available browse as well as stimulating fruit and seed production.

While specific recommendations for each management area can be found in the Stand Description and Management Prescription section, following are general management recommendations which should be kept in mind while planning and completing harvesting operations.

All of the following habitat types or conditions were noted within the City of Montpelier Forests.

Deer Winter Areas
A portion of the City of Montpelier property is located within a state designated deer wintering area. The management of a deer wintering area requires two primary objectives: 1) the perpetuation of effective cover as defined by at least 70% softwood crown closure in trees at least 35 feet tall; 2) the availability of preferred, accessible browse. As a general rule, not less than half of the deer wintering area should be maintained in effective cover with remaining areas either in browse production or being regenerated.

Effective winter cover for deer is found throughout Stands 2, 4, 5, and 6. Field review concluded that these areas are being actively used by deer as evidenced by well established trails, beds, droppings and browsed hardwood seedlings. Canopy closure in these areas is generally greater than 75 percent in trees 35 feet and taller.

Snags & Cavity Trees
Standing dead snags and cavity trees are common throughout the property. These include larger cull hemlock and hardwoods, and 6” to 10" diameter suppressed trees which have died or have low vigor from competition with more vigorous trees. The larger cavity trees provide habitat for mammals such as porcupine and fisher. The smaller trees provide habitat for small mammals and cavity nesting birds. In general it is recommended that all snag and den trees be retained during harvesting operations where they do not present safety hazards. At a minimum, it should be a goal to maintain two to four snags per acre with slightly more near wetland areas.

Riparian Areas
Riparian areas consist of those sites which contain or are located along seasonal or permanent water bodies such as intermittent or perennial streams. These areas provide several functions including filtering runoff and protecting water quality, maintaining cool water temperatures for fish and amphibians, providing critical habitat for tree-nesting waterfowl. These areas are also used extensively as travel corridors and feeding areas by deer, bobcat and coyote.

In order to protect these riparian resources, all AMP’s should be adhered to and it is further recommended that all harvesting operations follow **fountain forestry’s** *Water Quality Protection Guidelines*.

THE FOREST STANDS

INTRODUCTION

A forest stand, or type, is an area that is relatively homogeneous in species composition, tree height, density and site characteristics. Stands occur as a result of site conditions, topography, and past history and use. Foresters describe stands based on their species composition, tree size and density. The following codes are used in this plan to designate individual stands within the context of three classes: forest type, size and density.

FOREST TYPE-SIZE-DENSITY CLASSES

Forest Type

Four major forest types are recognized, each with a number of subtypes.

Northern Hardwood Types

NH northern hardwood types contain at least 65% of their total basal area in sugar maple, red maple, American beech, yellow birch, paper birch, sweet birch, white ash, basswood, black cherry, aspen and eastern hemlock. Black cherry and white ash represent less than 25% of the total, oak species represent less than 25% of the total and no single species represents more than 50% of the total.

H Pioneer hardwood types are northern hardwoods where paper birch, white ash, aspen, red maple and sugar maple represent more than 65% of the total basal area.

NO northern oak types are northern hardwoods which contain at least 25% of their basal area in red oak, but less than 25% in black cherry or white ash.

AB aspen-birch types are northern hardwoods that contain at least 65% of their basal area in paper birch, quaking aspen, big-tooth aspen or balsam poplar.

BE beech types are northern hardwoods that contain at least 50% of their basal area in American beech.

SM sugar maple types are northern hardwoods that contain at least 50% of their basal area in sugar maple.

RM red maple types are northern hardwoods that contain at least 50% of their basal area in red maple.

BC black cherry types are northern hardwoods that contain at least 50% of their basal area in black cherry.

Oak Types

OH oak-hickory types contain at least 65% of their basal area in any oak species.

OT oak-northern hardwood transition types contain at least 65% of their basal area in northern hardwood or oak-hickory species and at least 25% in species of each of these types, but less than 65% of either.

Softwood Types

SW Softwood types contain at least 65% of their total basal area in hemlock, spruce, fir, pine, larch or cedar, but do not qualify for any of the subordinate softwood types.

SF spruce-fir types are softwood types that contain at least 65% of their basal area in any spruce or balsam fir.

PI pine types are softwood types that contain at least 65% of their basal area in white or red pine.

CS cedar types are softwood types that contain at least 50% of their basal area in northern white cedar.

HK hemlock types are softwood types that contain at least 50% of their basal area in eastern hemlock.

Mixed Types

MW mixedwood types contain at least 65% of their basal area in either softwood or northern hardwood species and at least 25% in species of each of these types, but less than 65% of either.

PO pine-oak types contain at least 65% of their basal area in either pine or oak species and at least 25% of each species group, but less than 65% of either.

Size

Size classes are based upon the average stand diameter. Quadratic diameter (QD) of all trees 1.0” dbh and larger is used for this determination.

1 sapling stands have a QD of less than 4.5”. Sapling stands are too small to have any operable cut, even if the biggest trees are selected for cutting.

2 small pole stands have a QD between 4.5” and 7.5”. Small pole stands may support a merchantable cut, but merchantable cuts in such stands result in highgrading. It is usually best to avoid cutting in these stands unless it is precommercial thinning.

3 large pole stands have a QD between 7.5” and 10.5”. Large pole stands are suitable for a first commercial thinning if there is a pulpwood market. Most of the trees cut will be pulpwood, with very little sawtimber.

4 small sawtimber stands have a QD between 10.5” and 13.5”. Small sawtimber stands will usually support commercial thinning with at least a modest amount of sawtimber.

5 medium sawtimber stands have a QD between 13.5” and 16.5”. Medium sawtimber stands are very near the end of the rotation. Such stands are usually suitable for a commercial thinning or a thin-harvest cut. There are good sawtimber volumes available and a thinning that won't high-grade the stand may be possible even if pulp markets are limited.

6 large sawtimber stands have a QD greater than 16.5”. Large sawtimber stands are usually mature, or very near to maturity, and should be harvested within 5 to 10 years. Such stands usually have a medial diameter in the merchantable sizes only of 18” or more.

Density

Density classes are determined from the stocking guide appropriate to each forest type, or from a universal relative density guide, like the one in the inventory processor SILVAH. Classes that correspond to silvicultural prescriptions are:

A density at or above the A line stocking level. Such stands are at or near the maximum density possible and should be highest priority for partial cutting.

B density below the A line and at or above the B line stocking level. Such stands are above the optimum density for best growth and should be thinned if the volumes available will permit a commercial sale. Urgency of cutting is less than A density stands.

C density below the B line and at or above the C line stocking level. . Such stands are in the optimum density range for growth of high quality sawtimber and veneer, and do not need partial cutting.

D density below the C line but acceptable growing stock (AGS) basal area at or above 35 square feet per acre. Such stands are understocked, but still contain enough good quality stems to warrant continued management. No partial cutting is needed; time required to accumulate enough volume to warrant partial cutting will exceed 20 years.

E AGS basal area below 35 square feet per acre. Such stands do not contain enough good quality stems to warrant continued management; they should be harvested and a new stand regenerated on the site.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 1
9.7 ACRES
TYPE: SM3E/NH1 Sugar Maple Residuals over Northern Hardwood Regeneration

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 3
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 9.0
Total Basal Area/Acre (BA): 43 square feet
Acceptable Growing Stock Basal Area/Acre: 23 square feet

MANAGEMENT:
Age Class Distribution: Even
Target Age Class Distribution: Even
Rotation Age: 100
Estimated Current Age: 20 and 80-100
Insects or Disease: None Noted
Desired Products: High Quality Sawtimber and Veneer
Access Distance (to likely landing location): 1200 feet

SITE CHARACTERISTICS:
Site Class: 2 (field verification)
Soil Type: Vershire Dummerston

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat. Over the long term the existing regeneration will be allowed to develop. The existing residual overstory will be retained until a thinning occurs in the younger age class.

STAND DESCRIPTION:
This stand is dominated by sugar maple. Other northern hardwoods (including butternut) are present as minor associates. This is an adequately regenerated stand, with a low stocking of residuals.

STAND HISTORY:
The stand originated from the clearcut of a red pine plantation approximately 10 to 15 years ago

REGENERATION:
Advanced seedling and sapling regeneration is present in a moderate but uneven distribution in this stand. Northern hardwoods are the most commonly regenerating species. The stand is adequately regenerated

FOREST HEALTH
No signs of insect or disease damage were noted in this stand.

SCHEDULED TREATMENT
No Activity is scheduled for this management period.

SPECIAL CONSIDERATIONS
A portion of this strand lies within a deer wintering area mapped by the State of Vermont.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 2
42.1 ACRES
TYPE: MW4B Mixed Composition Small Sawtimber

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 4
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 11.1
Total Basal Area/Acre (BA): 147 square feet
Acceptable Growing Stock Basal Area/Acre: 115 square feet

MANAGEMENT:
Age Class Distribution: Even
Target Age Class Distribution: Uneven
Cutting Cycle: 15
Desired Diameter: Hemlock-18", Hardwood-18", White Pine-20"
Insects or Disease: None Noted
Desired Products: High Quality Sawtimber and Veneer
Access Distance (to likely landing location): 400-2000

SITE CHARACTERISTICS:
Site Class: 2 (field verification)
Soil Type: Vershire-Dummerston, and Glover-Vershire

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat, specifically deer winter habitat. Over the long term, the current stand will be treated with small group selections to regenerate softwoods, specifically hemlock, and areas of hardwood browse.

STAND DESCRIPTION:
This stand is dominated by eastern hemlock, white ash, Norway spruce, and sugar maple. Northern Hardwoods, black cherry, white cedar and white pine are present as minor associates. This is an adequately stocked small sawtimber size stand.

STAND HISTORY:
The stand originated from abandoned pasture approximately 100 years ago. The northern portion was planted to Norway spruce, likely in the 1930's or 1940's. The stand was last harvested in the early to mid 1990's, in a thinning operation.

REGENERATION:
Advanced seedling and sapling regeneration is present in a patchy and uneven distribution in this stand. Three of four inventory plots were stocked with small sapling size northern hardwood, white pine and hemlock regeneration. Raspberries are still occupying the site in

some areas, and are the result of the recent harvesting. They will likely be replaced with regenerating trees over time.

FOREST HEALTH
No signs of insect or disease damage were noted in this stand.

SCHEDULED TREATMENT
A selection harvest is recommended and scheduled for the 4th year of the management period. This harvest has been marked by the State of Vermont and is currently under contract. Mature and declining trees should be harvested to improve quality and provide opportunities for regeneration of shade tolerant and intermediately tolerant species. Residual basal area should be approximately 100 square feet per acre.
Scheduled Date: 2012 (+/- 3 years)

SPECIAL CONSIDERATIONS
A portion of this strand lies within a deer wintering area mapped by the State of Vermont.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 3
15.8 ACRES
TYPE: NH3C Northern Hardwood Poles

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 4
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 11.0
Total Basal Area/Acre (BA): 80 square feet
Acceptable Growing Stock Basal Area/Acre: 50 square feet

MANAGEMENT:
Age Class Distribution: Even
Target Age Class Distribution: Even
Rotation Age: 100
Estimated Current Age: 60
Insects or Disease: None Noted
Desired Products: High Quality Sawtimber and Veneer
Access Distance (to likely landing location): 1200

SITE CHARACTERISTICS:
Site Class: 2 (field verification)
Soil Type: Dummerston Fine Sandy Loam

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat. Over the long term, the existing stand will be allowed to mature, and will then be regenerated to desirable species, likely by the shelterwood method.

STAND DESCRIPTION:
This stand is dominated by sugar maple and white ash poles. Other northern hardwoods and northern white cedar are present as minor associates. This is an adequately stocked large pole size stand.

STAND HISTORY:
The stand originated from abandoned pasture approximately 70 years ago. It was last harvested in approximately the late 1990's or early 2000's. This operation appears to have been a thinning and harvest of mature white birch.

REGENERATION:
Advanced seedling and sapling regeneration is present in a light and uneven distribution in this stand. Sugar maple is the most commonly regenerating species, but adequate regeneration was tallied at only one of four inventory plots. Elsewhere, regeneration is

patchy and is completely absent from some areas. Fern and grasses are present and may interfere with attempts to regenerate this stand.

FOREST HEALTH
No signs of insect or disease damage were noted in this stand.

SCHEDULED TREATMENT
This stand should be thinned to reduce stocking to the B Line (approximately 70 square feet) in coordination with activity in Stand 2.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 4
13.2 ACRES

TYPE: SF5E Softwood Plantation and Mixed Composition over Northern Hardwood Saplings

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 2
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 15
Total Basal Area/Acre (BA): 35 square feet
Acceptable Growing Stock Basal Area/Acre: 25 square feet

MANAGEMENT:
Age Class Distribution: Two-Age
Target Age Class Distribution: Even
Rotation Age: 80
Estimated Current Age: 70-80
Insects or Disease: None Noted
Desired Products: High Quality Sawtimber and Veneer
Access Distance (to likely landing location): 0-600

SITE CHARACTERISTICS:
Site Class: 2 (field verification)
Soil Type: Cabot Silt Loam, Dummerston Fine Sandy Loam

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat, specifically deer winter habitat. Over the long term, this stand will be managed to regenerate desirable species (with a preference for softwoods).

STAND DESCRIPTION:
This stand is dominated by Norway spruce, aspen, white birch, and white cedar. Other northern hardwoods are present as minor associates. This is an under-stocked large sawtimber size stand.

STAND HISTORY:
The stand originated from abandoned pasture approximately 100 years ago. The southern portion of the stand was planted to Norway spruce approximately 70 years ago. This portion of the stand received a heavy thinning or shelterwood harvest in approximately 2000. The northern portion was planted to red pine, and was clearcut in the 1980's or 1990's.

REGENERATION:
Advanced seedling and sapling regeneration is not yet established as a result of the 2000 operation. Site limitations (poor drainage) are likely delaying the establishment of regeneration.

FOREST HEALTH
No signs of insect or disease damage were noted in this stand.

SCHEDULED TREATMENT
This stand should be allowed to develop without further removals, likely until adequate regeneration is established. The stand should be reinspected in 10 years to monitor regeneration.

SPECIAL CONSIDERATIONS
Poor drainage may make this stand susceptible to wind damage. The stand lies within an area delineated as deer winter habitat by the State of Vermont.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 5
21.1 ACRES
TYPE: SF4B Softwood Plantation

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 7
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 11.8
Total Basal Area/Acre (BA): 151 square feet
Acceptable Growing Stock Basal Area/Acre: 137 square feet

MANAGEMENT:
Age Class Distribution: Even
Target Age Class Distribution: Even
Rotation Age: 100
Estimated Current Age: 80
Insects or Disease: None Noted
Desired Products: High Quality Sawtimber
Access Distance (to likely landing location): 0-1200

SITE CHARACTERISTICS:
Site Class: 1 and 2 (field verification)
Soil Type: Cabot Silt Loam, Buckland Silt Loam, Glover Vershire

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat, specifically deer winter habitat. Over the long term, this stand will be allowed to mature, and then regenerated to desirable species, with a preference for softwoods.

STAND DESCRIPTION:
This stand is dominated by planted Norway spruce. Northern hardwoods are present as very minor associates. This is an adequately stocked small sawtimber size stand. The stand is composed of several non-contiguous blocks in the southern portion of the property. As these blocks lie on either side of the wetlands in this area, access to some areas will be from Brookfield Road, and to other areas from Paine Turnpike.

STAND HISTORY:
The stand originated from abandoned pasture approximately 100 years ago. It was planted to Norway spruce approximately 60-70 years ago. The stand was last thinned in approximately 2000, although not all areas were treated.

REGENERATION:
Advanced seedling and sapling regeneration is present in a light and uneven distribution in this stand. Norway spruce is the most commonly regenerating species, but the

regeneration is not adequate to reproduce the stand. Regeneration is completely absent from some areas.

FOREST HEALTH
No signs of insect or disease damage were noted in this stand.

SCHEDULED TREATMENT
This stand should receive a thinning to reduce stocking and harvest low vigor trees. Some establishment of regeneration may also occur. Basal area should be reduced to approximately 100 square feet per acre. The stand will then be allowed to develop until maturity.

SPECIAL CONSIDERATIONS
Portions of this stand lie within an area delineated as deer winter habitat by the State of Vermont.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 6
8.2 ACRES
TYPE: MW3D Mixed Composition Poles

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 1
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 9.6
Total Basal Area/Acre (BA): 50 square feet
Acceptable Growing Stock Basal Area/Acre: 40 square feet

MANAGEMENT:
Age Class Distribution: Even
Target Age Class Distribution: Uneven
Cutting Cycle: 20 years
Desired Diameters: SF-16" HK-18" PI-24"
Insects or Disease: None Noted
Desired Products: High Quality Sawtimber
Access Distance (to likely landing location): 0-1200

SITE CHARACTERISTICS:
Site Class: 1 and 2 (field verification)
Soil Type: Buckland Silt Loam and Cabot Silt Loam

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat, specifically deer winter habitat. Over the long term, the stand will be treated by uneven aged selection harvests to develop multiple age classes.

STAND DESCRIPTION:
This stand is dominated by white spruce, Norway spruce, red maple, white birch, and yellow birch. This is an under-stocked large pole size stand. The stand is composed of two non-contiguous blocks in the southern portion of the property. As these blocks lie on either side of the wetlands in this area, access to the western area will be from Brookfield Road, and to the eastern area from Paine Turnpike.

STAND HISTORY:
The stand originated from abandoned pasture approximately 100 years ago. Portions of the stand were planted to white and Norway spruce approximately 60 years ago. It was last harvested in approximately 1992. Some wind damage (tipped over trees) has occurred before and after this harvest.

REGENERATION:
Advanced seedling and sapling regeneration is present in a patchy and uneven distribution in this stand. Sugar maple is the most commonly regenerating species. The regeneration is not adequate to reproduce the stand.

FOREST HEALTH
No signs of insect or disease damage were noted in this stand. The site is susceptible to wind damage because of poorly drained soils.

SCHEDULED TREATMENT
The stand should be allowed to grow for this management period.

SPECIAL CONSIDERATIONS
Portions of this stand lie within an area delineated as deer winter habitat by the State of Vermont.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 7
30.1 ACRES
TYPE: MW4B Mixed Composition Sawtimber

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 3
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 11.4
Total Basal Area/Acre (BA): 123 square feet
Acceptable Growing Stock Basal Area/Acre: 100 square feet

MANAGEMENT:
Age Class Distribution: Even
Target Age Class Distribution: Even
Rotation Age: 100
Estimated Current Age: 60-70
Insects or Disease: None Noted
Desired Products: High Quality Sawtimber and Veneer
Access Distance (to likely landing location): 0-1000

SITE CHARACTERISTICS:
Site Class: 2 (field verification)
Soil Type: Glover-Vershire Complex

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat. Over the long term, this stand will be allowed to mature, and then regenerated to desirable species.

STAND DESCRIPTION:
This stand is dominated by white and Norway spruce, sugar maple and white ash. Other northern hardwoods, northern white cedar and hemlock are present as minor associates. This is an adequately stocked small sawtimber size stand.

STAND HISTORY:
The stand originated from abandoned pasture approximately 100 years ago. Portions were planted to white and Norway spruce. The stand was most recently harvested in approximately 2000, in a thinning operation.

REGENERATION:
Advanced sapling regeneration is present in a patchy and uneven distribution in this stand. Two out of three inventory plots were stocked with adequate amounts of regeneration. Northern hardwoods are the most commonly regenerating species. The regeneration is currently inadequate to reproduce the stand.

FOREST HEALTH

No signs of insect or disease damage were noted in this stand. The stand is susceptible to wind damage due to poor drainage, and some trees have already been lost, especially in the southern portion of the stand.

SCHEDULED TREATMENT

This stand should receive salvage of wind damaged trees and those trees in the area susceptible to further wind damage, as practical. This activity will likely be coordinated with activity on adjacent land in Northfield. This salvage operation is not a commercial operation in itself. (2012, +/- 3 years)

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 8
36.1 ACRES
TYPE: NH3C Early Successional and Northern Hardwood Poles

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 4
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 7.9
Total Basal Area/Acre (BA): 62 square feet
Acceptable Growing Stock Basal Area/Acre: 50 square feet

MANAGEMENT:
Age Class Distribution: Even
Target Age Class Distribution: Even
Rotation Age: 100
Estimated Current Age: 30-50
Insects or Disease: None Noted
Desired Products: High Quality Sawtimber and Veneer
Access Distance (to likely landing location): 0-1000

SITE CHARACTERISTICS:
Site Class: 2 (field verification)
Soil Type: Cabot Silt Loam

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat. Over the long term, the current stand will be allowed to mature and will eventually be managed to regenerate to desirable species, likely through even-aged methods.

STAND DESCRIPTION:
This stand is dominated by white ash and sugar maple. Other northern Hardwoods are present as minor associates. This is an adequately stocked pole size stand. The stand is in several small non-contiguous blocks on both sides of the wetland in the southern portion of the property.

STAND HISTORY:
The stand originated from abandoned pasture approximately 40-60 years ago.

REGENERATION:
Advanced seedling and sapling regeneration is present in a patchy and uneven distribution in this stand. Northern hardwoods and spruce are the most commonly regenerating species. Regeneration is patchy and is completely absent from some areas. Ferns occupy the site in some areas and will interfere with the establishment of desirable regeneration

FOREST HEALTH
No signs of insect or disease damage were noted in this stand. In some areas, vigor is low due to poor drainage.

SCHEDULED TREATMENT
The stand should be allowed to grow for this management period.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 9
39.1 ACRES
TYPE: NH3B Northern Hardwood Poles and Sawtimber

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 6
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 9.9
Total Basal Area/Acre (BA): 89 square feet
Acceptable Growing Stock Basal Area/Acre: 68 square feet

MANAGEMENT:
Age Class Distribution: Even
Target Age Class Distribution: Even
Cutting Cycle: 15
Desired Diameters: Northern Hardwoods 20”
Insects or Disease: None Noted
Desired Products: High Quality Sawtimber and Veneer
Access Distance (to likely landing location): 0-3000

SITE CHARACTERISTICS:
Site Class: 1 and 2 (field verification)
Soil Type: Cabot Silt Loam and Glover-Vershire

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat. Over the long term, this stand will receive selection harvest to develop multiple age classes.

STAND DESCRIPTION:
This stand is dominated by white ash and sugar maple. Aspen, other northern hardwoods, and white cedar are present as minor associates. This is an adequately stocked large pole/small sawtimber size stand. The stand lies along the western shore of Berlin Pond. Access is from Mirror Lake Road or across neighboring lands to the west.

STAND HISTORY:
The stand originated from abandoned pasture approximately 100 years ago. It was last harvested at least 15 to 20 years ago.

REGENERATION:
Advanced seedling and sapling regeneration is present in a patchy and uneven distribution in this stand. Sugar maple is the most commonly regenerating species, and is present from seedling to sapling size, but the regeneration is too scattered to adequately reproduce the stand. Fern is present in some areas, and may interfere with attempts to regenerate the stand.

FOREST HEALTH
No signs of insect or disease damage were noted in this stand.

SCHEDULED TREATMENT
The stand should be allowed to grow for this management period.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 10
30.6 ACRES
TYPE: NH3E Northern Hardwood Residuals and Regeneration

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 4
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 8.4
Total Basal Area/Acre (BA): 37 square feet
Acceptable Growing Stock Basal Area/Acre: 17 square feet

MANAGEMENT:
Age Class Distribution: Two Aged
Target Age Class Distribution: Even Aged
Rotation Age: 100
Estimated Current Age: 75 and 10
Insects or Disease: None Noted
Desired Products: High Quality Sawtimber and Veneer
Access Distance (to likely landing location): 0-1000

SITE CHARACTERISTICS:
Site Class: 1 and 2 (field verification)
Soil Type: Buckland Silt Loam

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat. The existing stand will be allowed to develop without further removals.

STAND DESCRIPTION:
This stand is dominated by white ash, beech, black sherry and red maple. Other northern hardwoods and white cedar are present as minor associates. This is an understocked stand of residuals remaining after heavy cutting.

STAND HISTORY:
The current stand originated from heavy cutting approximately 15 to 30 years ago. Residuals remain from the pre-harvest stand.

REGENERATION:
Advanced seedling and sapling regeneration is developing throughout the stand. The stand may be considered successfully regenerated at this point.

FOREST HEALTH:
No signs of insect or disease damage were noted in this stand.

SCHEDULED TREATMENT:
The stand should be allowed to grow for this management period.

SPECIAL CONSIDERATIONS:
Most of this stand lies within an area delineated as winter deer habitat by the State of Vermont.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 11
30.9 ACRES
TYPE: SW3B Mixed Softwood

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 5
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 9.7
Total Basal Area/Acre (BA): 160 square feet
Acceptable Growing Stock Basal Area/Acre: 110 square feet

MANAGEMENT:
Age Class Distribution: Even
Target Age Class Distribution: Uneven
Cutting Cycle: 15-20 years
Desired Diameters: SF-16" HK-18" "
Insects or Disease: None Noted
Desired Products: High Quality Sawtimber
Access Distance (to likely landing location): 0-2000

SITE CHARACTERISTICS:
Site Class: 2 (field verification)
Soil Type: Cabot Silt Loam and Buckland Silt Loam

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat, specifically, winter deer habitat. Over the long term, the stand will receive group selection to develop multiple age classes.

STAND DESCRIPTION:
This stand is dominated by eastern hemlock, white cedar and white ash. Northern hardwoods are present as minor associates. This is an adequately stocked small sawtimber size stand. It is composed of three non-contiguous blocks.

STAND HISTORY:
The stand may have originated from abandoned pasture approximately 100 years ago. It was last harvested in approximately the late mid 1990's in a thinning operation.

REGENERATION:
Advanced seedling and sapling regeneration is present only in a light and scattered distribution in this stand. White ash has regenerated successfully in just a few locations. This regeneration is inadequate to reproduce the stand.

FOREST HEALTH
No signs of insect or disease damage were noted in this stand.

SCHEDULED TREATMENT
The stand should be allowed to grow for this management period.

SPECIAL CONSIDERATIONS
Most of this stand lies within an area delineated as winter deer habitat by the State of Vermont.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 12
6.3 ACRES
TYPE: NH3B Northern Hardwood Poles

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 2
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 9.0
Total Basal Area/Acre (BA): 80 square feet
Acceptable Growing Stock Basal Area/Acre: 55 square feet

MANAGEMENT:
Age Class Distribution: Even
Target Age Class Distribution: Uneven
Cutting Cycle: 20
Desired Diameters: Northern Hardwoods 20”
Insects or Disease: None Noted
Desired Products: High Quality Sawtimber and Veneer
Access Distance (to likely landing location): 0-800

SITE CHARACTERISTICS:
Site Class: 2 (field verification)
Soil Type: Cabot Silt Loam

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat. Over the long term the stand will be managed to allow the development of multiple age classes and maintain a relatively continuous canopy.

STAND DESCRIPTION:
This stand is dominated by white ash, white birch, and sugar maple. Aspen, butternut and white cedar are present as minor associates. This is an adequately stocked large pole size stand. The stand forms a riparian buffer for Berlin Pond.

STAND HISTORY:
The stand originated from abandoned pasture approximately 50 years ago.

REGENERATION:
Advanced seedling and sapling regeneration is present in a patchy and uneven distribution in this stand. Sugar maple is the most commonly regenerating species.

FOREST HEALTH
No signs of insect or disease damage were noted in this stand.

SCHEDULED TREATMENT

The stand should be allowed to grow for this management period.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 13
18 ACRES
TYPE: MW3E Swamp and Marginally Productive Early Successional

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 4
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 7.6
Total Basal Area/Acre (BA): <20 square feet
Acceptable Growing Stock Basal Area/Acre: <20 square feet

MANAGEMENT:
Age Class Distribution: Even
Target Age Class Distribution: Even
Rotation Age: 100
Estimated Current Age: 30
Insects or Disease: None Noted
Desired Products: Sawtimber
Access Distance (to likely landing location): 0-300

SITE CHARACTERISTICS:
Site Class: 3 (field verification)
Soil Type: Cabot Silt Loam

MANAGEMENT STRATEGY:
This stand will be managed for timber production, aesthetics and wildlife habitat. The stand should develop further before a long term strategy is determined.

STAND DESCRIPTION:
This stand is a marginally productive wet area dominated by black ash, spruce, and non-commercial species.

STAND HISTORY:
The stand has not been harvested since abandonment from use as pasture.

REGENERATION:
Wet site conditions have prevented the establishment of regeneration in most areas. Scattered spruce and fir saplings are found in some areas, but are inadequate to reproduce the stand.

FOREST HEALTH
Vigor is low due to wet site conditions.

SCHEDULED TREATMENT
The stand should be allowed to grow for this management period.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 14
104.7 ACRES
TYPE: SW3C Mixed Softwood Poles and Small Sawtimber

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 16
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 8.4
Total Basal Area/Acre (BA): 94 square feet
Acceptable Growing Stock Basal Area/Acre: 64 square feet

MANAGEMENT:
Age Class Distribution: Multi-Age
Target Age Class Distribution: Balanced Uneven-Aged
Cutting Cycle: 20 years
Desired Diameters: SF-16" HK-18" PI-24"
Insects or Disease: None Noted
Desired Products: High Quality Sawtimber
Access Distance (to likely landing location): 800-2000

SITE CHARACTERISTICS:
Site Class: 3 (field verification)
Soil Type: Markey and Wonsqueak Mucks, Cabot Silt Loams

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat. Over the long term, the stand will be managed by selection harvests to develop multiple age classes

STAND DESCRIPTION:
This stand is dominated by white cedar, balsam fir, hemlock, white pine with various northern hardwoods as minor associates. This is an adequately stocked large pole size stand. The stand occupies a very wet site with standing water in some areas.

STAND HISTORY:
The stand is approximately 50 to 60 years old, and does not show sign of recent harvest.

REGENERATION:
Advanced seedling and sapling regeneration is present in a light and uneven distribution in this stand. Spruce and fir are the most commonly regenerating species. Six out of 16 inventory plots were stocked with adequate amounts of regeneration. This level of regeneration is inadequate to reproduce the stand.

FOREST HEALTH
Vigor is low due to poor drainage.

SCHEDULED TREATMENT
The stand should be allowed to grow for this management period.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 15
13.0 ACRES
TYPE: NH3A Northern Hardwood Poles

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 2
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 9.0
Total Basal Area/Acre (BA): 125 square feet
Acceptable Growing Stock Basal Area/Acre: 88 square feet

MANAGEMENT:
Age Class Distribution: Even
Target Age Class Distribution: Uneven
Cutting Cycle: 15 years
Desired Diameters: Northern Hardwoods 20”
Insects or Disease: None Noted
Desired Products: High Quality Sawtimber and Veneer
Access Distance (to likely landing location): 1200 to 2000

SITE CHARACTERISTICS:
Site Class: 1 and 2 (field verification)
Soil Type: Cabot Silt Loam

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat. Over the long term selection harvests will be used to develop multiple age classes, and to retain a near continuous canopy near Berlin Pond.

STAND DESCRIPTION:
This stand is dominated by sugar maple, black cherry and balsam fir. Other northern hardwoods are present as minor associates. This is an adequately stocked large pole size stand.

STAND HISTORY:
The stand originated from abandoned pasture approximately 60 years ago. It was last harvested in approximately the mid 1990’s.

REGENERATION:
Advanced seedling and sapling regeneration is present in a patchy and uneven distribution in this stand. Spruce and fir are the most commonly regenerating species.

FOREST HEALTH
No signs of insect or disease damage were noted in this stand.

SCHEDULED TREATMENT
The stand should be allowed to grow for this management period.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 16
11.0 ACRES
TYPE: NH4C Northern Hardwood Poles and Small Sawtimber

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 1
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 11.6
Total Basal Area/Acre (BA): 60 square feet
Acceptable Growing Stock Basal Area/Acre: 40 square feet

MANAGEMENT:
Age Class Distribution: Even
Target Age Class Distribution: Uneven
Cutting Cycle: 15 years
Desired Diameters: Northern Hardwoods 20”
Insects or Disease: None Noted
Desired Products: High Quality Sawtimber and Veneer
Access Distance (to likely landing location): 1200 to 2000

SITE CHARACTERISTICS:
Site Class: 1 and 2 (field verification)
Soil Type: Glover-Vershire Complex

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat. Over the long term selection harvests will be used to develop multiple age classes, and to retain a near continuous canopy near Berlin Pond.

STAND DESCRIPTION:
This stand is dominated by sugar maple. Other northern hardwoods and black cherry are present as minor associates. This is an adequately stocked large pole size stand.

STAND HISTORY:
The stand originated from abandoned pasture approximately 60 years ago. It was last harvested in approximately the early to mid 1990’s.

REGENERATION:
Advanced seedling is generally lacking in this stand.

FOREST HEALTH
No signs of insect or disease damage were noted in this stand.

SCHEDULED TREATMENT
The stand should be allowed to grow for this management period.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 17
40.7 ACRES
TYPE: MW4C Mixed Composition Small Sawtimber

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 7
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 11.7
Total Basal Area/Acre (BA): 89 square feet
Acceptable Growing Stock Basal Area/Acre: 73 square feet

MANAGEMENT:
Age Class Distribution: Even
Target Age Class Distribution: Even
Estimated Current Age: 60 years
Rotation Age: 100 years
Insects or Disease: None Noted
Desired Products: High Quality Sawtimber and Veneer
Access Distance (to likely landing location): 0-1600

SITE CHARACTERISTICS:
Site Class: 2 (field verification)
Soil Type: Vershire-Dummerston, Buckland Silt-Loam

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat. Over the long term, this stand will be allowed to mature and regenerated to desirable species through even-aged methods.

STAND DESCRIPTION:
This stand is dominated by eastern hemlock, white ash, sugar maple and white pine. Northern hardwoods are present as minor associates. This is an adequately stocked small sawtimber size stand.

STAND HISTORY:
The stand originated from abandoned pasture approximately 70 years ago. Several small blocks of plantation were established including white pine and Scots pine. The stand was last harvested in approximately 2002 in a thinning operation. Earlier harvesting occurred in approximately 1990.

REGENERATION:
Advanced sapling regeneration is present in a light distribution in this stand. Sugar maple and white ash are the most commonly regenerating species. Adequate regeneration was

present at two of seven inventory plots. Raspberries are occupying the site in many areas and will delay the establishment of desirable regeneration.

FOREST HEALTH

No signs of insect or disease damage were noted in this stand.

SCHEDULED TREATMENT

This stand should be allowed to grow for the current management period, and will likely receive a partial overstory removal when regeneration is established.

If an opportunity occurs to remove the Scots pine through thinning or patch cutting, this plan should be amended.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 18
21.9 ACRES
TYPE: SF5C Softwood Plantations

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 5
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 14.3
Total Basal Area/Acre (BA): 90 square feet
Acceptable Growing Stock Basal Area/Acre: Approximately 90 square feet

MANAGEMENT:
Age Class Distribution: Even
Target Age Class Distribution: Even
Rotation Age: 90
Estimated Current Age: 70
Insects or Disease: None Noted
Desired Products: High Quality Sawtimber
Access Distance (to likely landing location): 0-1200

SITE CHARACTERISTICS:
Site Class: 1 and 2 (field verification)
Soil Type: Dummerston-Vershire, Glover Vershire

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat. Over the long term, this stand will be allowed to mature, and then regenerated to desirable species.

STAND DESCRIPTION:
This stand is dominated by planted Norway spruce. Northern hardwoods are present as associates. This is an adequately stocked small sawtimber size stand. The stand is composed of three non-contiguous blocks in the northern portion of the property.

STAND HISTORY:
The stand originated from abandoned pasture approximately 70 years ago. It was planted to Norway spruce approximately 60-70 years ago. The stand was last thinned in approximately 2002, although not all areas were treated.

REGENERATION:
Advanced seedling and sapling regeneration is present in a light and uneven distribution in this stand. Sugar maple is the most commonly regenerating species, but the regeneration is not adequate to reproduce the stand. Regeneration is completely absent from some areas.

FOREST HEALTH

No signs of insect or disease damage were noted in this stand.

SCHEDULED TREATMENT

This stand should be allowed to grow for the current management period, and will likely receive a partial overstory removal when regeneration is established.

The northern-most block of this stand was not thinned in 2002. It should be thinned to the B Line in coordination with activity in Stand 20.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 19
3.5 ACRES
TYPE: SM5A Sugar Maple Sawtimber over Sugar Maple Poles

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 1
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 14.6
Total Basal Area/Acre (BA): 130 square feet
Acceptable Growing Stock Basal Area/Acre: 60 square feet

MANAGEMENT:
Age Class Distribution: Even
Target Age Class Distribution: Even
Rotation Age: 100
Estimated Current Age: 80
Insects or Disease: None Noted
Desired Products: High Quality Sawtimber and Veneer
Access Distance (to likely landing location): 400-800

SITE CHARACTERISTICS:
Site Class: 2 (field verification)
Soil Type: Glover-Vershire

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat. Over the long term the current stand will be allowed to grow to maturity, and will likely be regenerated by removing the older age class (overstory removal leaving pole size trees)

STAND DESCRIPTION:
This stand is dominated by sugar maple. Other northern hardwoods are present as minor associates. This is an adequately stocked small sawtimber size stand.

STAND HISTORY:
The stand originated from abandoned pasture approximately 100 years ago. It was last thinned in approximately 2005.

REGENERATION:
Adequate regeneration is not yet established in this stand.

FOREST HEALTH
No signs of insect or disease damage were noted in this stand.

SCHEDULED TREATMENT

The stand should be allowed to grow for the current management period.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 20
81.8 ACRES
TYPE: MW3E Mixedwood Poles and Sawtimber

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 2
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 9.0
Total Basal Area/Acre (BA): 50 square feet
Acceptable Growing Stock Basal Area/Acre: 30 square feet

MANAGEMENT:
Age Class Distribution: Multi-Aged
Target Age Class Distribution: Even
Rotation Age: 70
Estimated Current Age: 70 and 40
Insects or Disease: None Noted
Desired Products: High Quality Sawtimber
Access Distance (to likely landing location): 0-2000

SITE CHARACTERISTICS:
Site Class: 2 and 3 (field verification)
Soil Type: Glover Vershire and Cabot Silt Loam

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat. Over the long term, the stand should be regenerated using the best trees as a seed source.

STAND DESCRIPTION:
This stand is dominated by white pine, sugar maple, Scots pine, white ash, and aspen. Red spruce and other northern hardwoods are present as minor associates. This is an under stocked pole and large sawtimber stand.

STAND HISTORY:
The stand originated from abandoned pasture approximately 70 years ago. Portions were planted to Scots pine approximately 60 to 70 years ago. It was last harvested in approximately the mid 1990's

REGENERATION:
Advanced seedling and sapling regeneration is present in a patchy and uneven distribution in this stand. Red maple and sugar maple are the most commonly regenerating species. Some areas are fully regenerated. Elsewhere, regeneration is patchy and is completely absent from some areas.

FOREST HEALTH
No signs of insect or disease damage were noted in this stand.

SCHEDULED TREATMENT
An overstory removal of the white pine component in the area north of Paine Turnpike is recommended to release the hardwood saplings and poles. Careful harvesting will be necessary to minimize damage to the younger age class. Removal of the Scots pine south and east of Paine Turnpike should occur in a similar operation, but the removal will result in a C to B line stocking in the residual stand. In this area the treatment will be a thinning operation.

The stand includes a small Scots pine plantation in the northeast corner of the property. That plantation should be clearcut at the same time to regenerate native species.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 21
12.6 ACRES
TYPE: Early Successional and Hardwood Saplings

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 2
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: <5”
Total Basal Area/Acre (BA): <20 square feet
Acceptable Growing Stock Basal Area/Acre: <20 square feet

MANAGEMENT:
Age Class Distribution: Even
Target Age Class Distribution: Even
Rotation Age: 100
Estimated Current Age: 20
Insects or Disease: None Noted
Desired Products: Sawtimber
Access Distance (to likely landing location): 0-300

SITE CHARACTERISTICS:
Site Class: 3 (field verification)
Soil Type: Cabot Silt Loam and Peacham Muck

MANAGEMENT STRATEGY:
This stand will be managed for timber production, aesthetics and wildlife habitat. The stand should develop further before a long term strategy is determined.

STAND DESCRIPTION:
This stand is a marginally productive wet area dominated by black ash, spruce, and non-commercial species.

STAND HISTORY:
The stand has not been harvested since abandonment from use as pasture.

REGENERATION:
Wet site conditions have prevented the establishment of regeneration in most areas. Scattered spruce and fir saplings are found in some areas, but are inadequate to reproduce the stand.

FOREST HEALTH
Vigor is low due to wet site conditions.

SCHEDULED TREATMENT
The stand should be allowed to grow for this management period.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 22
11.5 ACRES
TYPE: MW3E Mixed Composition Poles

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 5
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 10.4
Total Basal Area/Acre (BA): 88 square feet
Acceptable Growing Stock Basal Area/Acre: 34 square feet

MANAGEMENT:
Age Class Distribution: Even
Target Age Class Distribution: Even
Rotation Age: 80
Estimated Current Age: 40-60
Insects or Disease: None Noted
Desired Products: High Quality Sawtimber
Access Distance (to likely landing location): 0-800

SITE CHARACTERISTICS:
Site Class: 2 and 3 (field verification)
Soil Type: Cabot Silt Loam and Buckland Silt Loam

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat. Over the long term, this stand will be allowed to mature with thinning as necessary.

STAND DESCRIPTION:
This stand is dominated by white pine, black cherry and red maple. Other northern hardwoods are present as minor associates. This is an under-stocked pole size stand. It includes a small area of Norway spruce plantation too small to be independently managed, for convenience. The stand lies in three non-contiguous blocks.

STAND HISTORY:
The stand originated from abandoned pasture approximately 40 to 60 years ago. There are no signs of recent harvest.

REGENERATION:
Advanced seedling and sapling regeneration is present in a patchy and uneven distribution in this stand. Northern hardwoods are the most commonly regenerating species. Regeneration is patchy and is completely absent from some areas.

FOREST HEALTH
No signs of insect or disease damage were noted in this stand.

SCHEDULED TREATMENT
The stand should be allowed to grow for this management period.

STAND DESCRIPTION AND MANAGEMENT PRESCRIPTION

STAND 23
23.0 ACRES
TYPE: MW3C Mixed Composition Poles

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 10
Data Collected: December 2008

STAND DATA:
Mean Stand Diameter: 9.9
Total Basal Area/Acre (BA): 100 square feet
Acceptable Growing Stock Basal Area/Acre: 66 square feet

MANAGEMENT:
Age Class Distribution: Even
Target Age Class Distribution: Uneven
Cutting Cycle: 20 years
Desired Diameters: Hemlock 18", Northern Hardwoods: 20"
Insects and Disease: None Noted
Desired Products: High Quality Sawtimber
Access Distance (to likely landing location): 0-1600

SITE CHARACTERISTICS:
Site Class: 2 (field verification)
Soil Type: Glover-Vershire

MANAGEMENT STRATEGY:
This stand will be managed for high quality timber production, aesthetics and wildlife habitat. Over the long term, this stand will receive group selection harvests to allow the development of multiple age classes over time and to maintain a near-continuous canopy cover.

STAND DESCRIPTION:
This stand is dominated by white ash, hemlock and white pine. Other northern hardwoods and white cedar are present as minor associates. This is an adequately-stocked pole and small sawtimber size stand.

STAND HISTORY:
The stand originated from abandoned pasture approximately 60 years ago. There are no signs of harvest within the last 15 years.

REGENERATION:
Advanced seedling and sapling regeneration is present in a patchy and uneven distribution in this stand. Northern hardwoods are the most commonly regenerating species. Regeneration is patchy and is completely absent from some areas.

FOREST HEALTH
No signs of insect or disease damage were noted in this stand.

SCHEDULED TREATMENT
The stand should be allowed to grow for this management period.

APPENDIX

GLOSSARY OF FORESTRY TERMS COMMON IN THE NORTHEASTERN UNITED STATES

AGS	Acceptable Growing Stock. Trees that are either quality sawlogs or have the potential to grow into quality sawlogs (grade 2 or better).
Advance Growth	Young trees that have become established naturally before regeneration cuttings are begun or a clearcutting is made.
Basal Area	The area of the cross-section of a tree, inclusive of bark, at breast height (4.5' or 1.37 m above ground) most commonly expressed as square feet per acre (ft^2/acre) or square meters per hectare (m^2/hec). For a stand, basal area is computed from all living trees.
Biomass	The total quantity, at a given time, of living organisms of one or more species, usually expressed in weight per unit area.
Board Foot	A piece of lumber 1" thick, 12" wide and 12" long or its equivalent. It is used as a volume measure of sawlogs and is commonly expressed by the thousand (MBF).
Cleaning	Elimination or suppression of competing vegetation from stands not past the sapling stage (2"-4" or 5-10 cm) in diameter as measured 4.5' or 1.37 m above ground. Specifically, removal of (a) weeds, climbers, or sod-forming grasses, as in plantations or (b) trees of similar age and of less desirable species or form than crop trees which they are, or may soon be, overtopping.
Clearcutting	The cutting method that describes the silvicultural system in which the old crop is cleared over a considerable area at one time. Regeneration then occurs from a) natural seeding from adjacent stands, b) seed contained in the slash or logging debris, c) advance growth or d) planting or direct seeding. An even-aged forest usually results.
Climax Forest	A plant community that represents, for its locality and its environment, the culminating stage of a natural succession. When the culminating stage is influenced by topography, it is termed a topographic climax and when maintained by regular fires, it is termed a fire climax.

Co-dominant A tree with its crown in the upper forest canopy but less free than the dominant trees and freer and taller than the intermediates and suppressed trees. A crown class.

Coppice A regeneration method in which standing trees are cut and subsequent crops originate mainly from adventitious or dormant buds on living stumps; but also as suckers from roots and rhizomes.

Cord A pile of 4' pieces of wood, 4' high and 8' long, occupying 128 cubic feet (ft^3) of space. Solid wood volume of a cord is approximately 85 ft^3, but can vary significantly. It is used as a volume measure of pulpwood, firewood and boltwood. The cord is sometimes defined by its weight equivalent. This, however, is not standardized and varies by species and by mill. The green (fresh cut) weight of a cord of hardwood is commonly 5000 lbs.

Crop Tree A tree that forms, or is selected to form, a component of the final crop, specifically, one selected to be carried through to maturity. Also known as a final crop or growing stock tree.

Crown Class Any class into which trees of a stand may be divided based on their crown development and crown position relative to crowns of adjacent trees. Commonly used crown classes are dominant, co-dominant, intermediate and suppressed.

Crown Thinning A thinning that favors the most promising (not necessarily the dominant) stems, with due regard to even distribution over the stand, by removing those trees that interfere with them; also called thinning from above.

DBH Tree diameter at breast height (4.5' or 1.37 m above ground).

Dominant A tree with its largely free-growing crown in the upper most layers of the forest canopy. A crown class.

Even-Aged The condition of a forest or stand composed of trees having no, or relatively small, differences in age, although differences of as much as 30% are admissible in rotations greater than 100 years of age.

Even-Aged Management The application of a combination of actions that results in the creation of stands in which trees of essentially the same age grow together. The difference in age between trees forming the main canopy level of a stand usually does not exceed 20% of the age of the stand at maturity. Regeneration in a particular stand is obtained during a short period at or near the time that a stand has reached the desired age or size for regeneration and is harvested. Cutting methods producing even-aged stands are clearcut, shelterwood or seed-tree.

Group Selection	The cutting method which describes the silvicultural system in which trees are removed periodically in small groups resulting in openings that do not exceed an acre or two in size. This leads to the formation of an uneven-aged stand in the form of a mosaic of age-class groups in the same forest.
Improvement Cutting	The elimination or suppression of less valuable trees in favor of more valuable trees, typically in a mixed, uneven-aged forest.
Individual Tree Selection	The cutting method that describes the silvicultural system in which trees are removed individually, here and there, each cutting cycle over an entire forest or stand. The resultant stand usually regenerates naturally and becomes all-aged.
Intermediate	A tree of the middle canopy, dominated by others in the dominant and co-dominant crown classes. A crown class.
Intermediate Cutting	Any removal of trees from a stand between the time of its formation or establishment and the harvest cut. Generally taken to include cleaning, thinning, liberation and improvement cuttings, increment felling and sometimes even salvage and sanitation cuttings.
Intolerant	Trees unable to survive or grow satisfactorily under specific conditions, most commonly used with respect to their sensitivity to shade, but also to conditions such as wind, drought, salt and flooding.
Low Thinning	A thinning that favors the dominants or selected dominants more or less evenly distributed over the stand by removing a varying proportion of the other trees. Also called a thinning from below.
Overstory	The trees in a forest of more than one story that form the upper or uppermost canopy layer.
Preparatory Cutting	The removal of trees near the end of a rotation, which permanently opens the canopy and enables the crowns of seed bearers to enlarge, to improve conditions of seed production and natural regeneration. Typically done in the shelterwood system.
Regeneration	The reproduction of tree crop, whether by natural or artificial means. Also the young crop itself, which commonly is referred to as reproduction.
Regeneration Cutting	Any removal of trees intended to assist regeneration already present or to make regeneration possible.

Release	Freeing a tree or group of trees from competition by cutting or otherwise eliminating growth that is overtopping or closely surrounding them.
Relative Density	A measure of stand density that takes into account variations in growing space requirements of different species and tree sizes within a stand. Usually expressed as a percentage of average maximum density.
Salvage Cutting	The exploitation of trees that are dead, dying or deteriorating, because they are over mature or have been damaged by fire, wind, insect, fungi or other injurious agents, before their timber becomes worthless.
Sanitation Cutting	The removal of dead, damaged, or susceptible trees, done primarily to prevent the spread of pests or pathogens and so promote forest hygiene.
Scarification	Loosening of the topsoil of open areas, or breaking up the forest floor, in preparation for regenerating by direct seeding or natural seed fall.
Seed Cutting	Removal of trees in a mature stand to effect permanent openings in the canopy (if not done in preparatory cutting) and thereby provide conditions for securing regeneration from the seed of trees retained for this purpose. Also the first of the shelterwood cuttings.
Seed-Tree	The cutting method that describes the silvicultural system in which the dominant feature is the removal of all trees in one cut except for a small number of seedbearers left singly or in small groups, usually 8-10 per acre (20-25 per hectare). The seed trees generally are harvested when regeneration is established. An even-aged stand results.
Shelterwood	The cutting method that describes the silvicultural system in which, in order to provide a source of seed and/or protection for regeneration, the old crop (the shelterwood) is removed in two or more successive shelterwood cuttings. The first cutting is ordinarily the seed cutting and the last is the final cutting. Any intervening cutting is termed removal cutting. An even-aged stand results.
Site	An area, considered in terms of its environment, determined by the type and quality of the vegetation it can carry.
Site Index	A measure of site class based upon the height of the dominant trees in a stand at an arbitrarily chosen age, most commonly at 50 years in the East and 100 years in the West.

Stand A community of naturally or artificially established trees of any age, sufficiently uniform in composition, constitution, age, spatial arrangement or condition to be distinguishable from adjacent communities, thereby forming a silvicultural or management entity.

Stand Density A quantitative measure of the degree of crowding of stems within a stand. Usually expressed in number of stems, basal area or crown closure.

Stocking A relative term to describe the adequacy of a given stand density in meeting management objectives. Three levels of stocking are generally recognized:

1. *"A" level stocking* - The maximum stocking a stand can carry without overcrowding and the resultant loss of growth. Stands with stocking above this level are overstocked.

2. *"B" level stocking* - The minimum stocking a stand can carry and fully utilize the site. Stands with stocking below the "B" level are understocked.

3. *"C" level stocking* - Stands that will require 10 years or less of growth to reach "B" level stocking. These stands are considered potentially adequately stocked.

Structure Of a forest, crop or stand, the distribution and representation of age and/or size (particularly diameter) classes and of crown and other tree classes.

Succession The gradual supplanting of one community of plants by another.

Suppressed One of the four main crown classes. Very slowly growing trees with crowns in the lower layer of the canopy and leading shoots not free. Suppressed trees are subordinate to dominant, co-dominant and intermediates in the crown canopy.

Thinning A treatment made in an immature stand, primarily to maintain or accelerate diameter increment and also to improve the average form of the remaining trees without permanently breaking the canopy. An intermediate cutting.

Type An aggregate of similar stands grouped together to improve statistical analysis and simplify management.

UGS Unacceptable Growing Stock. Sound trees that either do not have the potential to make quality sawlogs, or that have some damage, disease or other condition that make them a poor risk to survive for future management.

Understory	Trees and woody species growing under an overstory.
Uneven-Aged	The condition of a forest, crop or stand composed of intermingling trees that differ markedly in age. In practice, a minimum age difference of 25% of the length of the rotation usually is used.
Uneven-Aged Management	The application of a combination of actions needed to simultaneously maintain continuous high-forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes. Cutting methods that develop and maintain uneven-aged stands are single tree selection and group selection.
Yield	The amount of forest product that may be harvested periodically from a specified area over a stated period in accordance with the objectives of management.

Definitions contained in this glossary are based on those that appear in the December 1983 edition of *Silvicultural Systems for the Major Forest Types of the United States*, published by the United States Forest Service, United States Department of Agriculture. In instances where definitions were not available or were not appropriate in the Forest Service publication, composites were prepared from other sources or new definitions developed.

RESOURCES

FORESTER

Fountain Forestry, Inc.: www.fountainforestry.com

Fountain Forestry offers its expertise in the areas of forest management, forestland sales, appraisals and related forestry services.

FORESTLAND MARKETING

Fountains Real Estate, Inc.: www.fountainsrealestate.com

Fountains Real Estate specializes in the sale of forestland and rural estates.

BOOKS/MAGAZINES

Working with your Woodland by Molly Beattie, Charles Thompson, and Lynn Levine
University of New England Press
A landowner guide to forest management.

Northern Woodlands www.northernwoodlands.org

A quarterly magazine devoted to natural resource and forest management issues in New England and New York.

A Landowner's Guide to Wildlife Habitat Forest Management for the New England Region
by Richard DeGraff, Mariko Yamasaki, William Leak, Anna Lester
University of Vermont Press

STATE AND FEDERAL SERVICES

Forest Landowner's Guide to Internet Resources: http://na.fs.fed.us/pubs/misc/flg/

This is a guide, written by the US Forest Service of the Department of Agriculture, to all sorts of online resources related to forestry.

State Extension Services

Each state has an extension service, usually based at the state university, which offers practical help with all aspects of land management.

VT – Stumpage: http://stumpage.uvm.edu/
NH – Forestry http://ceinfo.unh.edu/Forestry/Forestry.htm
NH – Wildlife http://ceinfo.unh.edu/Wildlife/Wildlife.htm

StateForestry Departments

VT Division of Forestry: www.vtfpr.org/htm/forestry.cfm
NH Division of Forests and Lands: www.dred.state.nh.us/divisions/forestandlands/

CERTIFYING AGENCIES

Smartwood: www.rainforest-alliance.org/programs/forestry/smartwood/

"Through independent auditing, certification and the promotion of certified forest products, SmartWood's purpose is to improve forest management by providing economic incentives to businesses that practice responsible forestry. SmartWood is a program of the Rainforest Alliance, a global nonprofit conservation organization."

Forest Stewardship Council: www.fsc.org

"FSC is an independent, membership-based organization that brings people together to promote responsible management of the world's forests through developing standards, a certification system and trademark recognition." * Fountain Forestry is a FSC certified Resource Manager.

PRIVATE ORGANIZATIONS

Private Landowner Network: www.privatelandownernetwork.org

"The Private Landowner Network (PLN) provides a centralized repository of information and resources for landowners and their service providers." *

New Hampshire Timberland Owners Association: www.nhtoa.org

"The New Hampshire Timberland Owners Association is a nonprofit organization of forest owners and users working together to promote better forest management and a healthy wood products industry." *

MAPPING

Historic Topographical Maps: http://docs.unh.edu/nhtopos/nhtopos.htm

A site for historic topographical maps, provided by the University of New Hampshire

Satellite/Aerial Imagery:

www.terraserver.com

This is a commercial site, offering both maps and software. It may be used to view aerial photography of any area in the United States.

http://earth.google.com

Google Earth is a free software that allows users to view satellite images for nearly any point on the Earth's surface from many different angles.

Soil Mapping: Web Soil Survey http://websoilsurvey.nrcs.usda.gov

"Web Soil Survey (WSS) provides soil data and information produced by the National Cooperative Soil Survey. It is operated by the USDA Natural Resources Conservation Service (NRCS) and provides access to the largest natural resource information system in the world. The site is updated and maintained online as the single authoritative source of soil survey information."