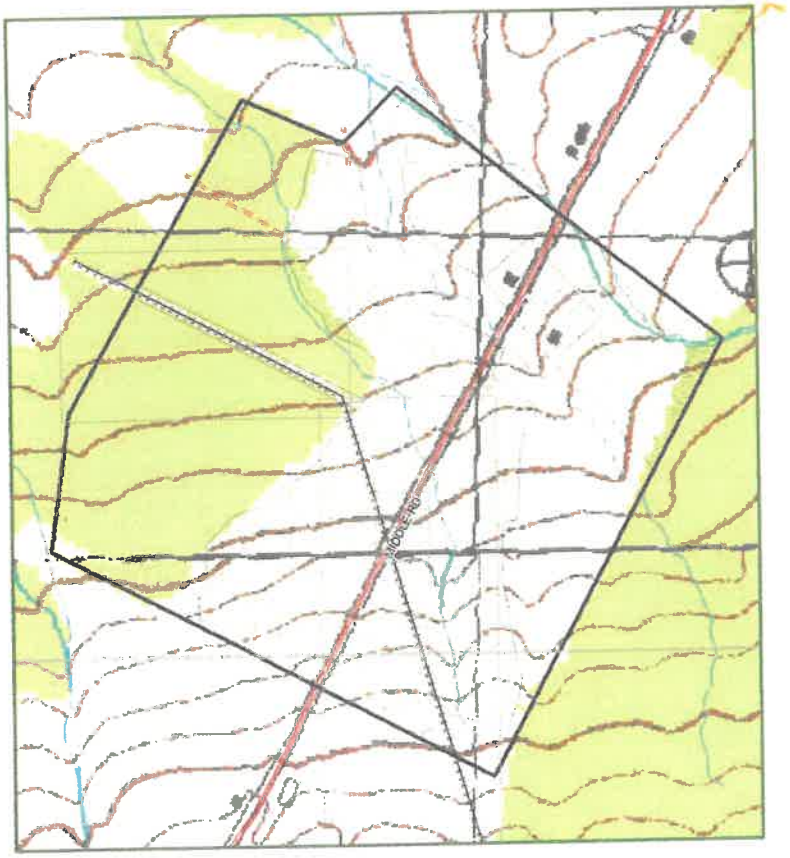
USE VALUE APPRAISAL FOREST MANAGEMENT PLAN

Sandra J Wells Trust

Plainfield, Washington County, Vermont
90 Acres

August 2020



F&W Forestry Services, Inc.

79 River Street Suite 301
Montpelier, VT 05602

Tel: (802) 223 8644
Fax: (802) 229 2155

www.fwforestry.com

Date: 06/15/2020

NOTICE TO TAXPAYER OF USE VALUE ALLOCATION

Town of Plainfield - Board of Listers/Assessor

Your current use allocation of your property, identified in the Grand List as:
Parcel ID: 001-1211. located at: 1211 MIDDLE ROAD with SPAN: 483-152-10567

To: WELLS SANDRA J TRUST
1211 MIDDLE ROAD
PLAINFIELD VT 05667-9684

Use Value Allocations for: 2019 Homestead Status: Filed Homestead

Previous Values	Acres	Total	Homestead	Nonhomestead
Dwelling & Non-Excluded Farm Buildings		164,500	164,500	0
Enrolled Farm Buildings		0	0	0
Listed Value - Excluded Land	2.00	66,000	66,000	0
Listed Value - Enrolled Land	88.00	232,300	232,300	0
Total Listed Value	**90.00**	**462,800**	**462,800**	**0**
Use Value	88.00	21,200	21,200	0
Taxable Grand List		**251,700**	**251,700**	**0**
Exemption Reduction (Exemption Amount)		**211,100**	**211,100**	**0**

Use Value Allocations as of: 06/15/2020 10:21:58 Homestead Status: Filed Homestead

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Exemption Reduction (Exemption Amount)		**210,100**	**210,100**	**0**

You have the right to grieve these values. The Listers have developed the attached application to assist you in preparing for your grievance hearing. Please use one application for each property you are appealing. Return completed forms to our office (there is a drop box at the office) or by mail at PO Box 217 Plainfield VT 05667 or email at plainfieldlisters@gmail.com. There will be no in-person grievance meetings. If you wish to speak to us about your grievance, please call the town office before June 29, 2020 to schedule a phone call. We will accept phone calls on Monday June 29, 2020 from 4:00 pm to 6:00 pm.

Lister: Sandy Ross, Rick Pope & Alex Forbes

32 V.S.A. § 4111(g) A person who feels aggrieved by the action of the listers and desires to be heard by them, shall, on or before the day of the grievance meeting, file with them his or her objections in writing and may appear at such grievance meeting in person or by his or her agents or attorneys. No grievance shall be allowed for a change solely to reflect a new use value set by the current use advisory board or the adjustment of that value by the common level of appraisal. Upon the hearing of such grievance, the parties thereto may submit such documentary or sworn evidence as shall be pertinent thereto.

32 V.S.A. § 3756 Qualification for use value appraisal (d) The assessing officials shall appraise qualifying agricultural and managed forestland and farm buildings at use value as defined in subdivision 3752(12) of this title. If the land to be appraised is a portion of a parcel, any portion not receiving a use value appraisal shall be valued at its fair market value as a stand-alone parcel, and for the purposes of the payment under section 3760 of this chapter, the entire parcel shall be valued at its fair market value as other similar parcels in the municipality.

Forest Management Plan

Sandra J Wells Trust

90 Town-Listed Acres
Plainfield, Washington County, Vermont
August, 2020

Orthophoto Base Map:	156192
Town Parcel Number:	001-1211.
SPAN Number:	483-152-10567
Grand List Description:	90 Acres & Dwelling

I have reviewed and approved this management plan and related maps, and I authorize submission of both 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. These management standards include the practices outlined in the booklet, *"Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont"* in order to control stream siltation and soil erosion.

Sandra Wells 9/21/2020

Sandra Wells, Trustee
Sandra J Wells Trust
1211 Middle Road
Plainfield, VT 05667

Date

Prepared by:

State of Vermont
Charlie A. Stabolepszy
No. 148.0122549
Licensed Forester

Charlie Stabolepszy 9/14/2020

Devon Stoddard (Charlie Stabolepszy, Supervisor)
Stabolepszy VT Forester License #148.0122549 (expires 9/30/2020)
F&W Forestry Services, Inc.
79 River Street Suite 301
Montpelier, VT 05602

Date

Approved by:

Robert A. Nelson 5/17/21

Washington County Forester

Date

F&W

TABLE OF CONTENTS

F&W

ACTIVITY SUMMARY

Stand	Forest Type	Acres	Scheduled Activity	Year
1	Mixedwood Large Poles (MW3B)	43.4	Single Tree/Group Slection	2023
			Forest Review	2026
			Plan Update	2031

*Acreage is based on map measurement.

USE VALUE APPRAISAL PROGRAM ENROLLMENT

Stand Acreage Summary

Area	Type	Map Acres
Productive Forestland		
	Stand 1 Mixedwood Large Poles (MW3B)	43.3
Open/Idle		1.0
Agriculture		46.4
Non-Productive Forestland		
Excluded From UVA		2.0
Total Map Measured Acres:		**92.7**

Chart of Acreage Adjustments

Town listed acres in parcel	90.0
Actual acres to be excluded as measured on orthophoto	2.0
Acres to be entered	88.0
Acres to be entered according to map measurements	90.7
Factor to prorate acres	0.97

UVA Summary

	Map Acres	Factor	Prorated Acres
Productive Forestland	43.30	0.97	42.0
Open/Idle	1.00	0.97	1.0
Agriculture	46.40	0.97	45.0
Non-Productive Forestland	0.00	0.97	0.0
Total UVA Enrolled Acres	90.70		88.0
Excluded Acres	2.00		2.0
Total Map Measured Acres:	**92.70**	**Grand List:**	**90.0**

MAPS

Your forest is depicted on several maps on the following pages. These maps should be used together with the information presented in the *General Description* and *Stand Description* sections, for a better understanding of your forest.

Maps are a fundamental part of forest management. Landowners and foresters use maps to plan and administer forest management such as harvesting and thinning operations, invasive species control, protection of streams and other sensitive sites, and boundary maintenance. Reasonable accuracy in mapping is important for the success of projects, so we ask your assistance and agreement in confirming that the maps in this plan meet this standard.

The Use Value Appraisal Program requires maps to be drawn to detailed specifications. There is no requirement that maps be drawn with the precision of a boundary survey, but we strive to make them as precise and accurate as possible.

F&W Forestry has used the best available information to map your forest, and the property boundaries, features, and areas excluded from the Use Value Appraisal Program (if applicable).

However, there may be information about property boundaries and/or the Use Value Appraisal Program exclusions which were not available to us while preparing this plan.

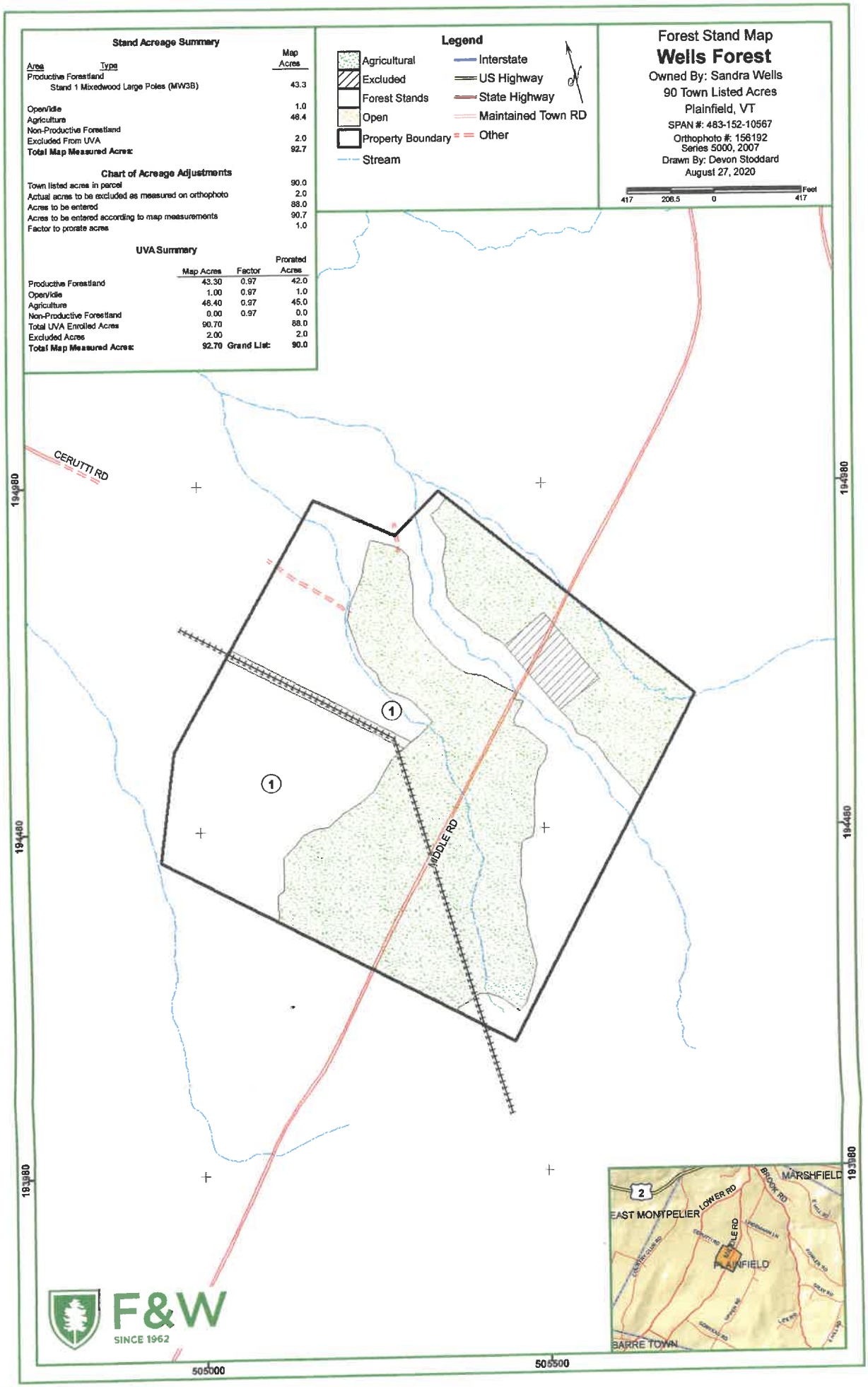
Please review the map carefully, and if you notice anything about the map which conflicts with your understanding of the property, or its enrollment in Use Value Appraisal, let us know as soon as possible. We will correct the map immediately.

Your acceptance of the plan, and your authorization to submit the plan to the Use Value Appraisal Program, indicates your agreement that the map generally conforms to your understanding of the property boundaries and other features.

Included are:

- A Forest Type Map of the property drawn to a scale of 1:5000 (1" = 417'). This map shows property and forest stand boundaries, roads, trails, streams, and many other internal features.
- A Topographic Map, which depicts the property while showing the topography of the local area.
- A Vermont Orthophotograph, which is a scale-corrected composite of aerial photographs.

The maps used in this plan are based on Vermont Orthophotographs (aerial photo), Plainfield tax maps, previous management plan maps, and field evidence.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Map Acres Factor Prorated Acres
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Legend
Agricultural
Excluded
Forest Stands
Open
Property Boundary
Stream
Interstate
US Highway
State Highway
Maintained Town RD
Other
Forest Stand Map
Wells Forest
Owned By: Sandra Wells
90 Town Listed Acres
Plainfield, VT
SPAN #: 483-152-10567
Orthophoto #: 156192
Series 5000, 2007
Drawn By: Devon Stoddard
August 27, 2020
417 208.5 0 417 Feet
CERUTTI RD
MIDDLE RD
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194980
194480
193980
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505500
MARSHFIELD
EAST MONTPELIER
LOWER RD
BROOK RD
MIDDLE RD
PLAINFIELD
BARRE TOWN
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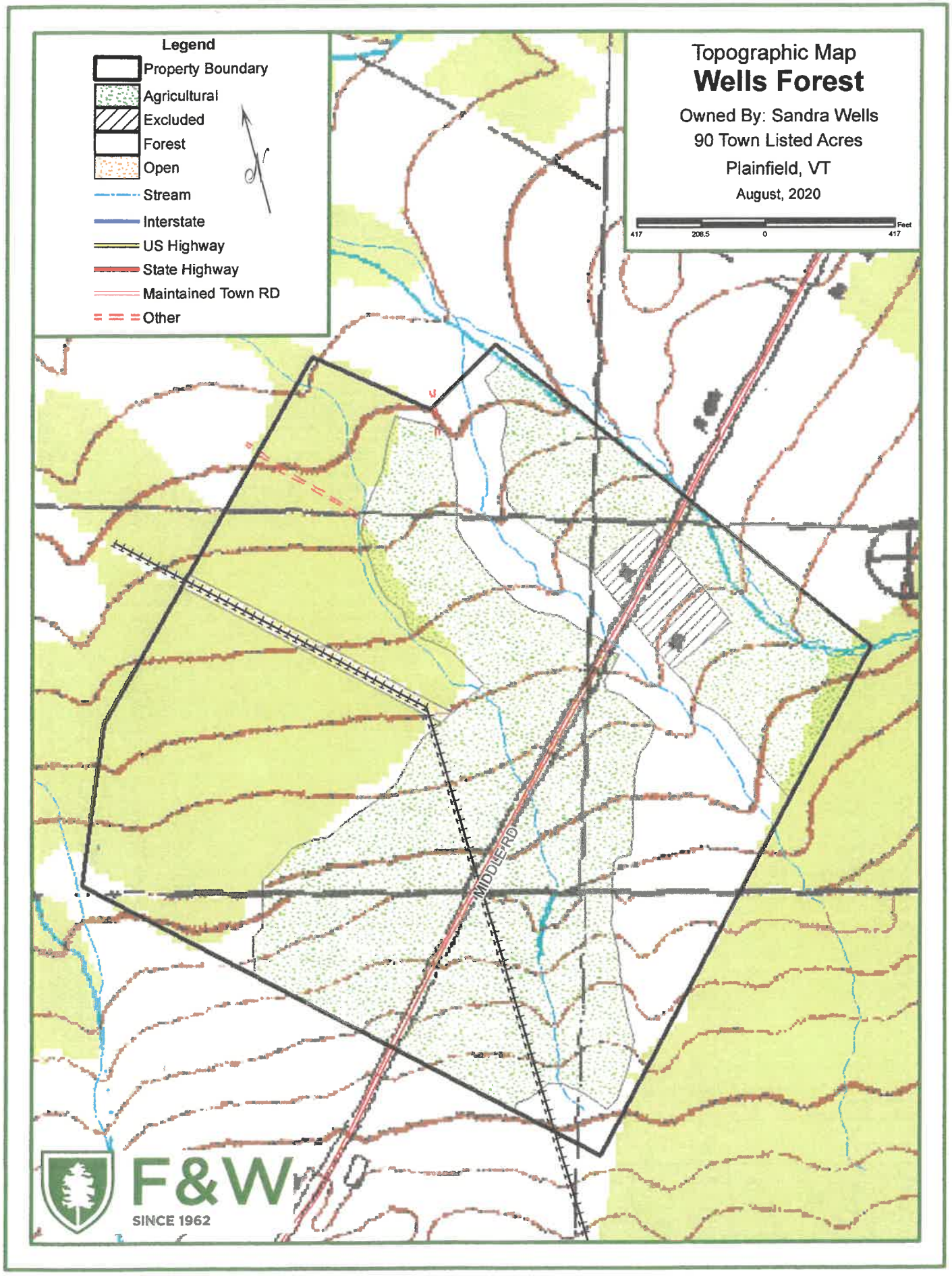
F&W
SINCE 1962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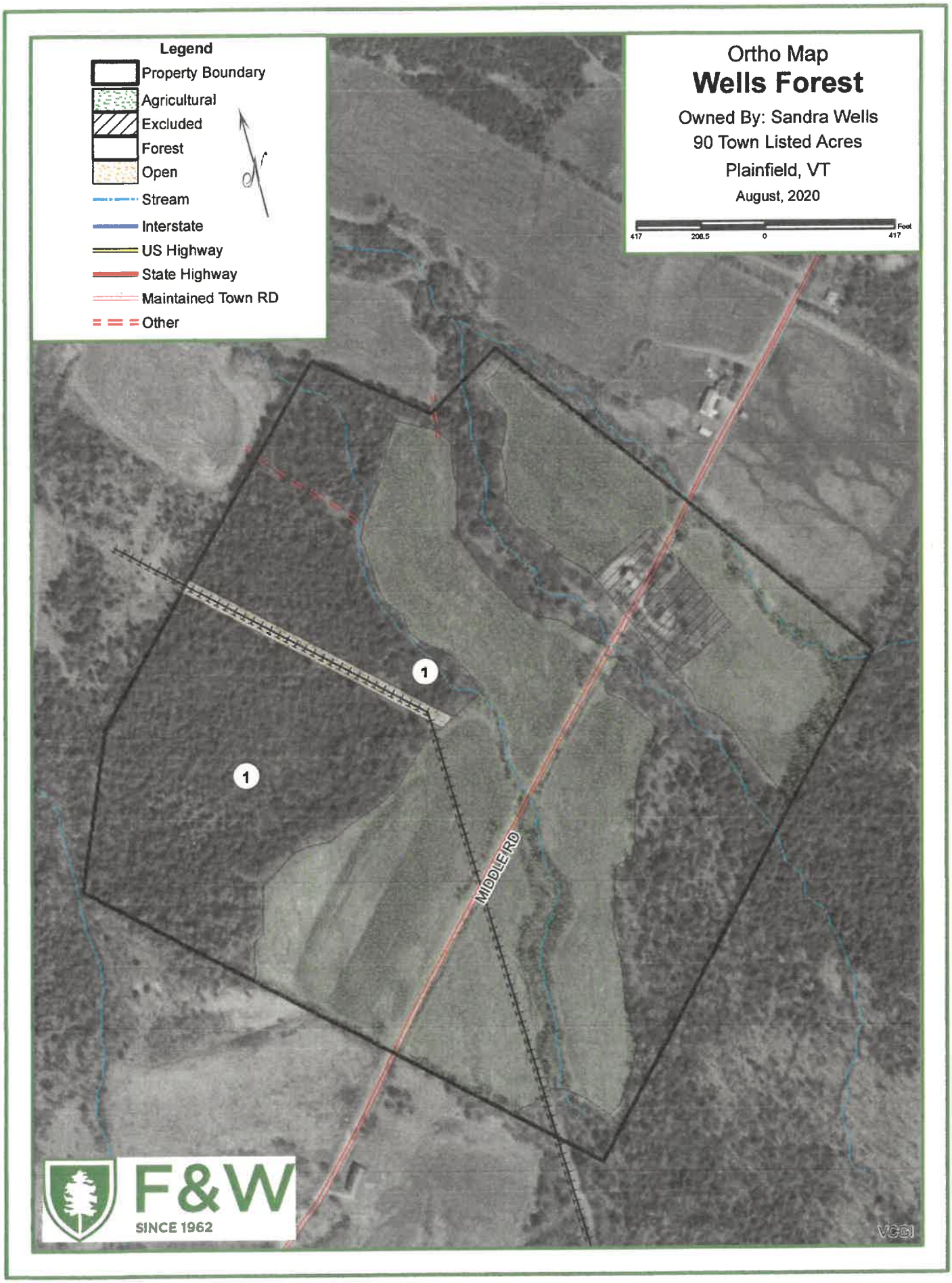
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August, 2020
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417
Feet
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1
MIDDLE RD
F&W
SINCE 1962
VCGI

PREFACE

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. 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.

KEY CONCEPTS

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.

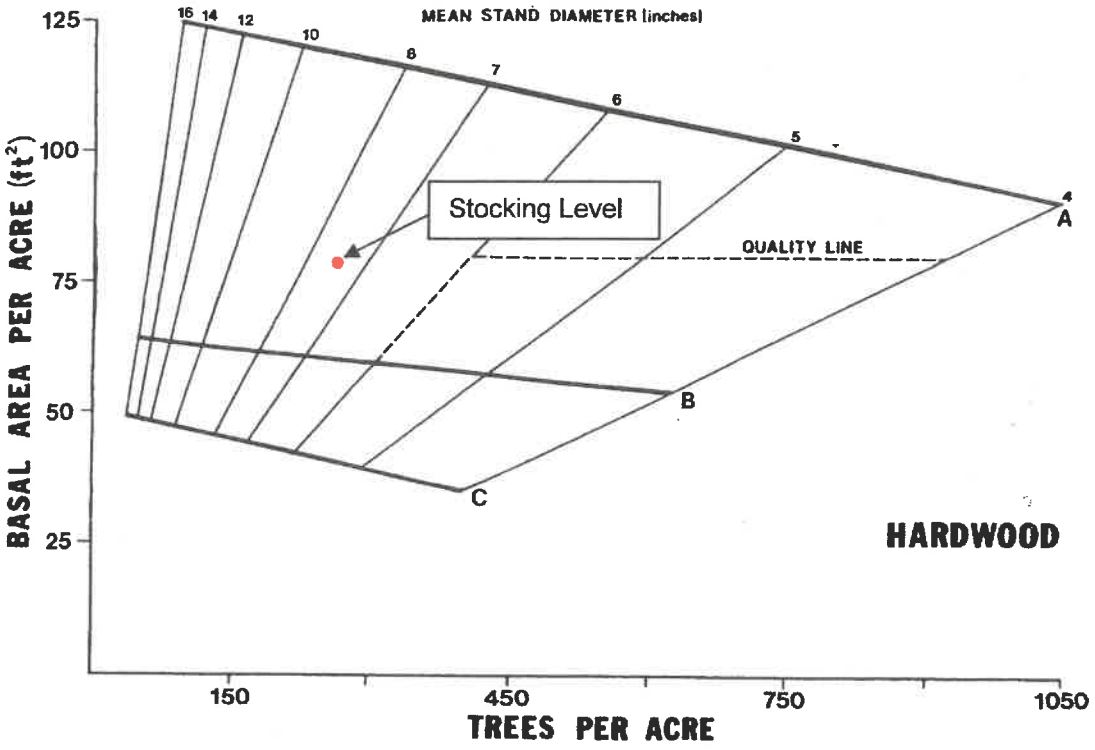
With the use of aerial photography and topographic maps, the forester maps the stands following the field inventory process. Appropriate sampling techniques are applied and field measurements are made to determine basal area, stocking density, timber volume, and other characteristics of the stand. Stand measurements are made based on representative sampling. Data are collected at numerous locations within a property, 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.

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

Basal area is a critical forest measurement. It refers to the cross-sectional 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.

Stocking Guides are a graphical representation of the stocking of a stand. Stocking guides have been developed for most major forest types (white pine, northern hardwoods, spruce/fir, etc.) The stocking guide is a basic tool that the forester uses to describe and prescribe management for a stand. An example of a stocking guide is given below:



The stocking guide describes stand density by a point which defines values along the three scales of the guide: *Basal Area* along the vertical access, *Trees per Acre* along the horizontal axis, and *Mean Stand Diameter* along the diagonal axis at the top of the graph. In the example above, the point describes a northern hardwood stand with a basal area of 77 ft^2 per acre, 275 trees per acre and a mean stand diameter of about 7.5".

The stocking guide also defines three stocking levels for the forest type, which are shown as the three lines ending with an A, B, or C at their right end. These lines represent the following stocking levels:

A Line: This is considered full stocking (the average density of undisturbed stands).

B Line: This is considered the minimum density for maximizing growth while maintaining quality.

C Line: This is considered the minimum stocking of a "manageable" stand.

Volume figures are an estimate of the number of board feet of sawlogs and cords of pulpwood contained in a stand. Sawlog specifications are determined by the market, but are, in general, logs sufficiently free of rot and other defects to be sawn into lumber. Pulp (used for making paper) and firewood volumes are found in both large trees of sufficiently poor quality that they are not considered sawlogs and in pole-size trees. When quality is poor, a tree may be a prime candidate for removal in a thinning operation. If sufficient quantities are present, markets exist, and access is reasonable, poor quality trees may be sold for pulp or firewood.

INTRODUCTION TO FOREST MANAGEMENT

IMPLEMENTING OWNERSHIP 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.

Management objectives are often compatible with one another. For instance, a healthy, vigorous forest is usually an aesthetically appealing one. Harvesting techniques can create small openings which will enhance wildlife habitat. Cutting for firewood can remove poor quality trees and allow more growing space for the better quality stems.

However, in certain cases, management objectives are mutually exclusive. For example, sugarbush management is not conducive to producing quality sawlogs as the bole of a good "sugar" tree is limby and supports a long, wide crown. Short-term economic goals may be incompatible with long-term development of the timber resource.

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]

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

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

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-age" or "uneven-age". 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-age. Management which tends a variety of different age classes within a single stand is considered uneven-age 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-age techniques and other stands with uneven-age techniques.

Even-age management consists of a variety of techniques which tend a crop of trees of approximately the same age and, when mature, regenerates 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-age 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-age 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-age stand. Uneven age techniques include both single-tree and group selection harvests. Group selections are a regeneration technique. This type of management (once fully implemented) will allow a harvest every 15-20 years and assures that there is always tree cover on all acres.

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

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 2020 tax year, these values are $151 per acre for forestland and $382 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, constructing houses or other non agricultural structures, or harvesting timber in a way which is in conflict with the plan. The penalty is currently 10% of the fair market value of the developed land. Fair market value is interpreted to be the town's assessed value of the developed 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 as 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 F&W 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 (AMPs)* to protect the waters of the state from these risks.

The AMPs 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 AMPs were not in place. Violations of the AMPs 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.

F&W 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 the appropriate design of skid trails and truck roads. F&W's policies and guidelines allow for the delineation of Stream Management Zones (SMZs), or buffers, that are in compliance with, and often exceed the requirements of AMPs.

GENERAL DESCRIPTION OF THE FOREST

OWNERSHIP OBJECTIVES

The management of Wells Trust Forest will be guided by the following objectives:

- to produce high-quality forest products;
- to maintain a healthy and productive forest;
- to be a good land steward;
- to maintain the aesthetic quality of the forest;
- to maintain the recreational resources of the forest;
- to maintain and enhance the wildlife habitat on the property.

LOCATION, ACREAGE & USE VALUE APPRAISAL ENROLLMENT

The Wells property consists of 90 town-listed acres of wooded, open and excluded land in Plainfield, Washington County, Vermont. It lies on both sides of Middle Road, a well-maintained dirt road in the west-central part of town..

The property's enrollment in the Use Value Appraisal (UVA), or "Current Use", program will be maintained with this management plan. The UVA enrollment consists of 42 acres of forest enrolled, 45 acres of agricultural land and 1 acre of open/idle land. 2 acres surrounding a home and barn have been excluded from the program.

UVA enrollment resulted in a tax savings of **$3,800** for the 2020 tax year.

The Current Use Program requires the landowner to have and follow a Forest Management Plan. The plan is to be updated on a 10-year cycle. This plan will need to be updated by April 1, 2031

LAND FEATURES

The Wells property lies on gentle topography in the Northern Green Mountains biophysical region of Vermont. Route 2 is located approximately 3 miles to the northwest of the property, and the city of Barre is located approximately 5 miles to the south.

The area has both well-drained and somewhat poorly-drained soils which are well suited to the species present. Ground water reaches the surface in some low-lying areas, which may be seasonally wet; where water does run, the soils are erodable.

Aspect is to the west and northwest, and slopes are steepest along the banks of intermittent streams that run through the center of the property. Slopes are gentle throughout the remainder of the property.

Soil quality (for growing commercial species of trees) generally ranges from good to poor Site index may be classified as high Site 2 in most areas; however, some areas contain shallow, wet soils with poor-quality timber. The best woodland soils are located within

areas of slightly higher slope positions. These soils are generally deeper and better drained. They support mixedwood stands with ash, hemlock and white pine.

The poorest soils are found throughout Stand 2. A high water table restricts root growth on these sites, and windthrow is a hazard. Management activities which leave individual trees exposed to strong winds should be avoided when possible. These soils support mixedwood stands with a poor quality hardwood component.

Elevation ranges from 1,080' ASL (above sea level) in the northwest corner of the property to 1,300' ASL in the southeast corner of the property. A USGS topographical map, with the property boundary delineated on it, can be found in the *Maps* section of this management plan.

FOREST DESCRIPTION & HISTORY

Wells Trust Forest is a diverse mixedwood forest, dominated by the following species: eastern hemlock (45% of the basal area), white ash (13%), yellow birch (9%), white pine (5%) and sugar maple (4%). Miscellaneous hardwoods species (such as brown ash, black cherry and aspen), tamarack and red spruce are all present as minor associates and can be found throughout the forest.

As a whole, Wells Trust Forest is currently adequately stocked and in good condition. Management is prescribed in this plan to meet the goals and needs of the landowner while ensuring the forest is able to attain maturity and regenerate itself.

Most or all of Wells Trust Forest was likely cleared for pasture in the 1800s. Small areas on relatively gentle terrain may have been used as tilled fields or hayland. However, the majority of the currently forested land, especially where steeper or poorly drained, was used as pasture.

The fields and pastures were abandoned from agricultural use, and allowed to revert to forest, within the last 80 years. Some stands appear to have reverted to forest within the last 50 years.

Most recently, harvesting occurred in the 1990s. This operation appears to have been very light and focused on white pine and hemlock.

CULTURAL RESOURCES

Cultural resources consist of the evidence of past human land use, such as stone walls, foundations and wells. Cultural resources may also include the assemblage of plants which are often found associated with land use history, such as lilacs, apple trees and white cedar, all of which were commonly planted in and around farmsteads.

Numerous cultural resources were observed during the field inventory. Old fence line runs along the property boundaries, attesting to the former use of the land as pasture. Stone piles and areas of smooth micro-topography can be found in the western portion of the property, indicating that small areas were once tilled or harrowed. Apple trees can also be found scattered along the edges of the forest.

All significant cultural resources should be avoided during harvesting. A 50-foot "No Cut" buffer and equipment exclusion zone should be maintained around any foundations or cellar holes. Stone walls should be avoided where possible. If a stone wall must be crossed, the number of crossings should be minimized and existing openings should be used whenever possible.

ROADS, INTERNAL ACCESS & MAINTENANCE NEEDS

Access to the property for forest management has not been developed, but will likely occur through an access that will need to originate from one of the meadows on the property. A potential landing site in the open land would need to be designated. This access is generally adequate for tractor trailer access and would require little upgrading. Landing development and other access improvements may require a small investment but could be incorporated into a timber sale contract.

Woods trails consist of two small access points that connect fields on the property to fields that are adjacent, but on the neighboring property. 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 gentle throughout the property. All skidding will be uphill, though it is very gradual. Isolated areas are wet and/or poorly drained. They should be avoided during harvesting operations, with little negative effect on operations.

BOUNDARY LINES & MAINTENANCE NEEDS

The landowner is aware of the location of all lines, and all lines appear to have been respected by other landowners in the area. The landowner has marked some lines, but has not had the lines blazed or painted. It is recommended that all lines receive this standard marking as soon as possible, and before any active management (harvesting) occurs. Currently the boundary lines are marked by old fence as well as flagging that looks to have been updated every few years. No paint or blazes were located during the field inventory.

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 requires that the boundaries of any harvest area be clearly marked on the ground. Boundary lines are typically marked with axe blazes on trees. Blazes 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.

INVASIVE SPECIES & MANAGEMENT NEEDS

No invasive species were identified during the field inventory.

WILDLIFE HABITAT

The Wells Trust property contains the following notable habitat features: snags and cavity trees, field edge, softwood cover, hard and soft mast, and stream habitat.

Snags and cavity trees are common throughout the property. These include large-diameter, old-field hardwoods and broken softwoods 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. They also provide nesting and roosting habitat for larger birds such as owls, hawks and pileated woodpeckers. The smaller trees provide habitat for small mammals and cavity-nesting birds such as nuthatches. Cavities are often excavated by woodpeckers such as the hairy woodpecker. Once cavities have been excavated and then depleted of their food source, secondary excavators move in and build nests within the cavities. Secondary excavators include birds such as the black-capped chickadee, red and white-breasted nuthatches, eastern bluebird, winter wren and tufted titmouse. Standing snags also support a wide variety of invertebrates and fungi that are essential to biological diversity.

Forest openings, fields and field edges are valuable to a variety of wildlife species. Herbaceous and shrub vegetation found within these areas are an important spring and summer food source for grazers such as deer. These areas tend to harbor higher populations of insects than surrounding forested areas. This, in turn, provides important feeding areas for various species of bats and provides important brooding areas for grouse and turkeys. Raptors, fox, coyotes and other predators are drawn to these openings because of their increased population of rodents and other prey. It is recommended that fields be maintained through periodic brush-cutting on no more than a 3 to 5-year basis.

The softwood component is a majority of the property, but has not been identified as a deer wintering area. When managing forests for deer, it is important to maintain quality cover for the protection of the deer herd. This can be achieved through the retention of certain softwood species like hemlock, red spruce and white cedar. Quality cover is defined as having a minimum 70% softwood crown closure and a canopy height of at least 35 feet. Quality cover will minimize extreme winter conditions by acting as a thermal blanket (increasing the average daily temperatures) and by intercepting snowfall (minimizing the amount of snow reaching the forest floor).

Hard and soft mast trees are found throughout the property and are essential to wildlife management. Mast is the seed and fruit produced by trees and shrubs, and is a critical food source for many species of wildlife.

Hard mast generally possesses a hard exterior and consists of hard-shelled seeds and nuts. Important species producing hard mast include beech, oaks, maples, pines, ashes and hazelnuts. Hard mast is high in carbohydrates, fat and protein, and serves as an important source of food during the fall and winter. Numerous species of wildlife, such as black bears and white-tailed deer, depend on hard mast to prepare them for the long winters in northern New England.

Soft mast is generally soft and fleshy, and consists of berries, pomes, drupes and catkins. Important species producing soft mast include apples, hawthorns, cherries, viburnums, serviceberries, raspberries, blackberries, blueberries, cranberries, hophornbeam, birches and aspens. Soft mast is generally low in fat and protein, yet provides high energy in the form of sugars and carbohydrates, and is usually available throughout the summer and fall. Soft mast is a staple of many wildlife species including migratory birds, grouse, turkey, small mammals, black bear, deer and fox. Numerous species of song birds depend on soft mast to prepare them for fall migration to warmer climates. In order to maintain their productivity, soft mast trees, such as apple trees, should be released from all over-topping competition and periodically pruned of dead and diseased wood.

Stream habitat can be found in several spots in the center of the property. These are intermittent streams which go dry during the summer. These areas provide a water source throughout the year for local mammals as well as habitat for amphibians. These stream areas are surrounded by thick brush and are currently used as a major travel corridor by deer and bears.

RARE, THREATENED OR ENDANGERED SPECIES

According to information provided by the Non-Game and Natural Heritage Program of the Vermont Department of Fish and Wildlife, no records of rare, threatened or endangered species or critical natural communities occur within Wells Trust Forest.

If rare, threatened or endangered species are located on the property, their locations should be mapped and management strategies developed using sound science and best management practices. The Non-Game and Natural Heritage Program, Nature Serve, and The Nature Conservancy may be consulted when such strategies are unclear.

RIPARIAN AREAS, STREAMS & WETLANDS

Riparian areas, streams and wetlands will be protected by implementation of water quality protection policies and Vermont's Acceptable Management Practices. Several small intermittent streams crisscross the center of the property.

Riparian habitat serves as a travel corridor and water supply for numerous species, and provides a food source for predators of amphibians, invertebrates and fish. Standing dead trees, or "snags", in the surrounding area provide perches for predators and critical nesting sites for birds and small mammals. These natural resources not only provide habitat for herbaceous plants and invertebrates but they also are an important source of drinking water for numerous animals and birds.

A small perennial stream flows through the northwestern portion of the property. Given the highly erodible nature of the soils present, deep ravines with steep banks can be seen in

some areas. Riparian areas are sensitive to disturbances created by harvesting equipment and can easily be degraded if not adequately protected.

Wetlands are important for a number of reasons including mitigating the effects of flood waters, absorbing toxins and heavy metals, and acting as a carbon sink. Wetlands are protected under federal law, though they are becoming increasingly rare as human development spreads. They are also under attack from non-native invasive plant species, such as purple loosestrife and shrub honeysuckle, which threaten to alter their unique characteristics. Wetlands are usually a year-'round supply of water, providing habitat for mammals, birds, amphibians and aquatic invertebrates. Likely inhabitants and visitors include an assortment of songbirds, turtles, frogs, salamanders and numerous mammals.

Seepages tend not to freeze during the winter months, and maintain lower snow depths than surrounding areas due to a high water table. This allows for seepages to serve as important feeding sites for turkey and other ground feeders during periods of deep snow. In addition, these areas usually support the early spring growth of herbaceous plants when food supplies are scarce. This is often an important source of food for black bears emerging from hibernation. Seepages generally contain wet soils year 'round and are sensitive to soil compaction by heavy equipment.

RECREATION & AESTHETIC VALUES

For many landowners, the appearance of their forest is an important aspect of forest management and forest ownership. In some cases, the aesthetics of the forest contribute substantially to the owners' enjoyment of their land. Careful planning and implementation of projects can make a positive impact on aesthetics. For instance, landing and trail restoration (after harvesting is complete) is usually an important aspect of managing aesthetics. The type of harvest, the distribution of residual trees, and how branches and other slash are treated, all contribute to the appearance of a harvest, and are often key points for harvest planning.

Other practices which may have an impact on aesthetics include the following: Interesting natural features (such as unusually large or unique trees or shrubs or waterfalls) or cultural resources can be preserved in their natural state, and views to those features can be opened through harvesting. Trails may be located so as to allow viewing of these areas without negatively impacting them. Consideration may also be given to the view of the property from a distance, and harvesting may be modified to avoid or mitigate any adverse impacts at the landscape scale.

STAND DESCRIPTIONS & MANAGEMENT PRESCRIPTIONS

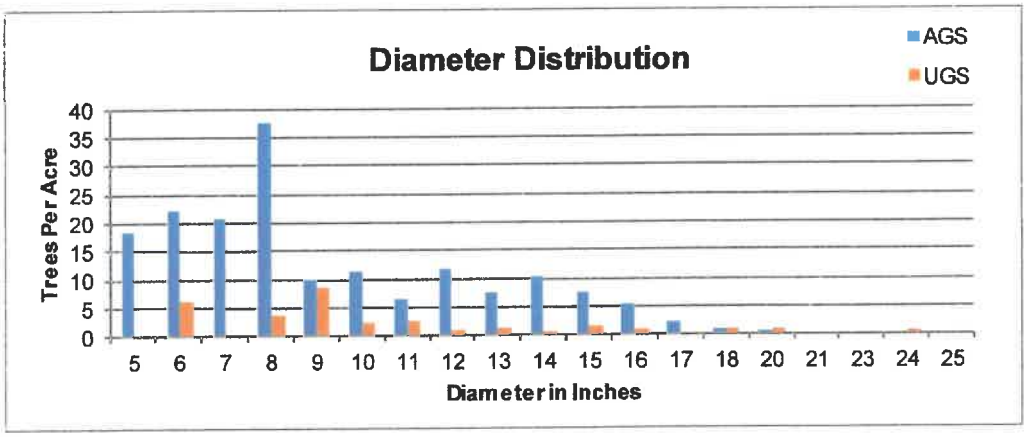
STAND 1
43.4 ACRES (by map measurement)

TYPE
Mixedwood Large Poles (MW3B)

SAMPLING METHOD
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 16
Data Collected: August 25, 2020

STAND DATA
Natural Community Designation: Hemlock-Northern Hardwood Forest
Quadratic Stand Diameter: 9.4"
Total Basal Area/Acre (BA): 114 ft^2
Acceptable Growing Stock Basal Area/Acre: 92 ft^2
Current Volume/Acre: 6.1 MBF and 19.7 Cords

MANAGEMENT
Age Class Distribution: Even
Target Age Class Distribution: Uneven
Cutting Cycle: 15 years
Desired Diameters: SF-16"; HK-16"; PI-20"
Q Factor: 1.7 Target: 1.6



Insects or Disease: white pine blister rust on scattered individual trees
Desired Products: High-quality sawtimber
Access Distance (to likely landing location): 200'-1,200'

SITE CHARACTERISTICS
Site Class: 2 (Soil survey verification)
Soil Type: Cabot Silt Loam & Buckland Loam

MANAGEMENT STRATEGY

This stand will be managed for high-quality timber production, aesthetics and wildlife habitat. Over the long term, long-lived trees such as sugar maple and yellow birch will be favored. Uneven-age techniques will be utilized to promote and maintain stand growth and encourage the establishment and growth of desirable regeneration.

The stand is currently dominated by pole and sawtimber-sized trees, and the q-factor, judged by a tabulation of percent sawtimber, is approximately enter 1.7 (45% sawtimber, by TPA) The structural goal for the management of this stand is to gradually increase the proportion of sawtimber-size trees over time, targeting a q-factor of 1.6.

STAND DESCRIPTION

This stand is dominated by eastern hemlock (45% of the basal area), white ash (13%), yellow birch (9%), white pine (5%) and sugar maple (4%). Miscellaneous hardwoods species (such as brown ash, black cherry and aspen), tamarack and red spruce are all present as minor associates and can be found throughout the forest. This stand contains varying cover types throughout. Some areas are almost exclusively hemlock dominated with a poor-quality hardwood component and have up to 200 ft^2 of basal area. Areas along the field edges tend to be dominated by white pine and aspen, with a northern hardwood understory. Pockets of higher-quality hardwoods, such as ash and yellow birch, can be found in central regions of the stand.

HISTORY

The stand originated from abandoned pasture approximately 100 years ago. It was last harvested in the late 1980s or 1990s, according to evidence found in the field.

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 and currently are at 150 stems/acre. Spruce fir can also be found at 30 stems/acre.

HABITAT

No habitats mapped as "significant" by the State of Vermont were noted in this stand.

The area serves as upland habitat and contains occasional cavity trees, field edge habitat, stream habitat and hard and soft mast. This stand contains many beneficial factors for local wildlife throughout the year. The edge habitat can be found in many areas and is used largely by deer and other mammals that are entering the fields to eat. Cavity trees can be identified as large open grown hardwoods and broken white pines, providing perfect roost sites for owls, turkeys and other birds of prey who can scan the open fields for prey. The stream habitat often goes dry or nearly dry during summer month, but still provides adequate habitat for amphibians, and also provides a secure and thick travel corridor connecting each area of the stand.

FOREST HEALTH

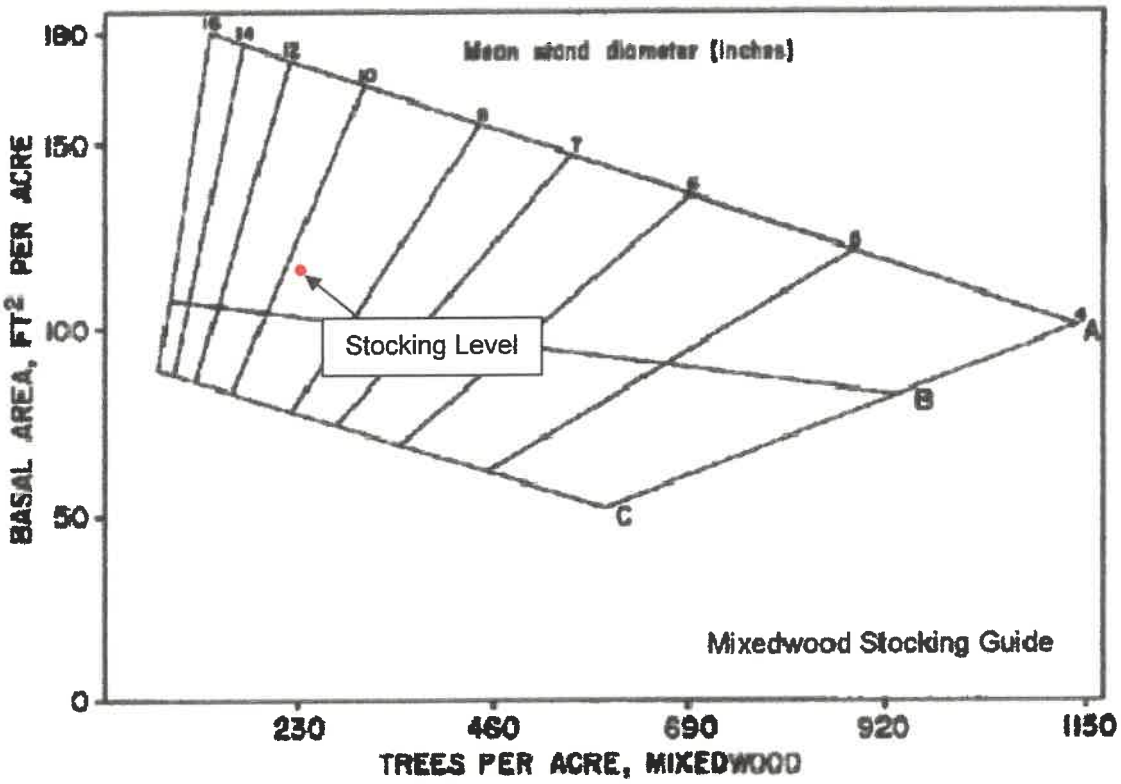
White pine blister rust can be identified on scattered individuals located along the field edge, but does not appear to be having a detrimental effect throughout the stand.

INVASIVE SPECIES

No invasive species were identified during the field inventory.

STOCKING

Total stocking (the "crowdedness" of the trees) is just above the B Line of the Northern Hardwood stocking guide. Stocking of only those trees which will produce sawlogs (acceptable growing stock) is just below the B line. This density is in the optimum range for individual tree and stand growth (the trees are well spaced to efficiently use the resources of the site). At this density, the growth rate of the dominant trees is good, that of the intermediate trees is fair and mortality due to crowding is low to moderate. The stocking level is displayed graphically on the Stocking Guide below.



Source: Leak, Solomon and DeBald, Silvicultural Guide for Northern Hardwood Types in the Northeast (revised). USDA Forest Service Research Paper NE-603. 1987

ACCESS & OPERABILITY

Access to the stand will likely occur from the open land along the established main trail and perhaps along one new trail entering the forest further south. Operability is good, although almost all areas will require minimal uphill skidding.

SCHEDULED TREATMENT

A single tree and group selection harvest is prescribed during this management period to create regeneration in some areas while maintaining fairly dense forest cover in others. The mature balsam fir and hardwood with poor crowns will be targeted for removal, as well as aspen and poor-quality white pine along the field edge. Hemlock and good quality northern hardwoods will be retained. Groups will range from a few trees up to ½ acre, and cover approximately 30% of the stand. Basal area will average 100 -110 ft^2 per acre.

Scheduled Date: 2023

APPENDIX

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.

PRODUCT SPECIFICATIONS

Veneer	White Birch: 12" DBH and greater to a 10" top, clear logs with no defects. Other Hardwoods: 14" DBH and greater to a 12" top, clear logs with no defects. Usually measured in board feet.
Sawlog	Hardwoods: 12" DBH and greater to a 10" top, with two or more faces free of defects. Free of excessive sweep. Spruce/Fir: 8" DBH and greater to a 6" top and free of excessive defect. Usually minimum length is 12 feet. Pine and Hemlock: 10" DBH to an 8" top, and free of excessive defect. Usually minimum length is 12 feet. Usually measured in board feet.
Pallet Stock	Hardwood trees greater than 12" DBH to a 10" top with less than two clear faces, straight and sound. Usually measured in board feet.
Pulpwood	Hardwood or softwood between 8" and 26" DBH. No more than 50% rotten.
Defect	Any irregularity or imperfection in a tree or log that reduces the volume of sound wood, or lowers its durability, strength, utility, or disfigures the end product. Defect may result from such factors as growth conditions or abnormalities, insect or fungus attack, etc.
Sweep	Gradual bend in a tree or log, considered as a defect.

These specifications represent regional averages and form the basis for all current and projected valuations. Specifications may vary from mill to mill and are further affected by market conditions, changing technologies, and method of measurement.

MAJOR NEW ENGLAND TREE SPECIES

HARDWOODS

Aspens *(Populus spp.)*

Often called "popple", these are fast growing, light demanding trees with a light soft timber that can be cut into very thin sheets without splintering. Used in fruit and vegetable baskets and some joinery. Price is usually low, although occasional sales of large trees can receive good prices.

Basswood *(Tilia americana)*

Found throughout New England in small quantities. A light, fairly soft wood, popular with carvers and for engraving blocks, while the veneer is often used in small amounts as cross-banding to contrast with darker woods. Price level is fair.

American beech *(Fagus grandifolia)*

Common throughout New England. A timber that works well and finds uses in furniture and tool making, although it is not durable outdoors. Unfortunately, however, beech bark disease normally attacks this tree when it is of small to medium sawlog size, and therefore the removal of this species is favored. Prices are usually low.

Black cherry *(Prunus serotina)*

Locally distributed in New England, but more common in Pennsylvania to West Virginia. A light, strong, fine grained hardwood used for quality furniture and engraving blocks. Has good to excellent price.

Butternut *(Juglans cinerea)*

A minor component of the entire northeastern forest. A member of the walnut family and not unlike it in uses, although lighter in color. Price range is good.

Hickory *(Carya spp.)*

A number of species of nut-bearing trees with ash-like leaves. The logs have a white sapwood and red-brown heartwood. It is a very tough, hard, heavy, resilient wood which is used for tool handles, sporting goods, wheel spokes and ladder rungs, while green hickory chips are used to flavor meat in smoking and barbecuing. Price range, however, is usually low to medium.

Red maple *(Acer rubrum)*

Common on wetter lands in the northern hardwood mixture. Softer and less strong than sugar maple, it has a low hardwood price.

Red oak *(Quercus rubra)*

Common in the Champlain and Connecticut River Valleys of Vermont, southern New Hampshire and all states further south in the Appalachian chain. A very attractive grain and easy working characteristics make this timber popular for furniture and other quality hardwood applications where appearance is important. Has a good to excellent hardwood price.

Sugar maple *(Acer saccharum)*
The prime component of the northern hardwoods forest type, and very common in New England. A very hard wood, known as Hard or Rock Maple, that works well and is used in furniture, flooring, turnery and kitchenware. Has a very good hardwood price and figured grain can make it more valuable.

White ash *(Fraxinus americana)*
Exists as small proportion of many forests on the east coast and occupies moist fertile sites. Used in furniture, sporting goods and tool handles. Price range is good to very good.

White birch *(Betula papyrifera)*
A major component of the northern boreal forest, it is a less common associate of the northern hardwoods. A rapid growing tree, it is used for a variety of turned goods, furniture and cabinets. Price range is average to good.

White oak *(Quercus alba)*
Common in the Appalachians from Connecticut south. An attractive, durable wood, highly prized for furniture and in the manufacture of water-tight casks. Achieves good hardwood prices.

Yellow birch *(Betula alleghaniensis)*
A common secondary component of the Northern Hardwood forest type. It makes attractive turned goods and is used in furniture and house fittings such as doors. Price range is average to good. A less common close relative, Black Birch *(Betula lenta)*, is very similar in use and price.

SOFTWOODS

Balsam fir *(Abies balsamea)*
A major softwood component of the Boreal Forest, it is a common associate of the northern hardwoods. This short-lived, rapid growing tree is used for general construction and pulp. Achieves low to average price for sawlogs and has a good pulpwood price.

Eastern hemlock *(Tsuga canadensis)*
A common associate of the northern hardwoods, it has limited use in general construction, boxes, crates and landscaping ties. Has a low price.

Red spruce *(Picea rubens)*
A northeastern conifer commonly found throughout the northern hardwood mixture. Used for structural timber, pulpwood and musical instruments. Achieves an average price.

Eastern white pine *(Pinus strobus)*
A five-needled pine that grows rapidly throughout the northeast. Its timber is used for building and is popular stained dark for the manufacture of pine furniture. Fetches an average hardwood price.

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-Age 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-Age 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-age 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-age 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-age 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-Age	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-Age 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-age 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.

LANDOWNER FORESTRY RESOURCES

FORESTER

F&W Forestry Services, Inc.: www.fwforestry.com
F&W Forestry offers its expertise in the areas of forest management, forestland sales, appraisals, and related forestry services.

FORESTLAND MARKETING

Fountains Land, Inc.: www.fountainsland.com
Fountains Land 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 & 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	http://stumpage.uvm.edu/
NH	http://extension.unh.edu/
ME	http://extension.umaine.edu/

State Forestry Departments
VT Division of Forestry: www.vtfpr.org/htm/forestry.cfm
NH Division of Forests & Lands: www.dred.state.nh.us/divisions/forestandlands/
ME Forest Service: www.maine.gov/doc/mfs

State Links
http://www.vtfpr.org/resource/for_forres_useapp.cfm
VT FPR Division of Forestry Use Value Appraisal Program and 2010 Manual
http://maps.vermont.gov/imf/sites/VCGI_basemap/jsp/launch.jsp
VT Interactive Map Viewer – View and Create Digital Maps with Aerial Photography

CERTIFYING AGENCIES

Rainforest Alliance: https://www.rainforest-alliance.org/

"The Rainforest Alliance's ambitious mission is to conserve biodiversity and ensure sustainable livelihoods by transforming land-use practices, business practices, and consumer behavior."

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." * F&W Forestry Services, Inc. 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." *

Small Woodland Owners Association of Maine: www.swoam.org

"The Small Woodland Owners Association of Maine (SWOAM) promotes the stewardship of privately owned forestland."

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: 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: 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."

http://websoilsurvey.nrcs.usda.gov/app/

Create soil maps, interpretations, and more.