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FOREST MANAGEMENT PLAN

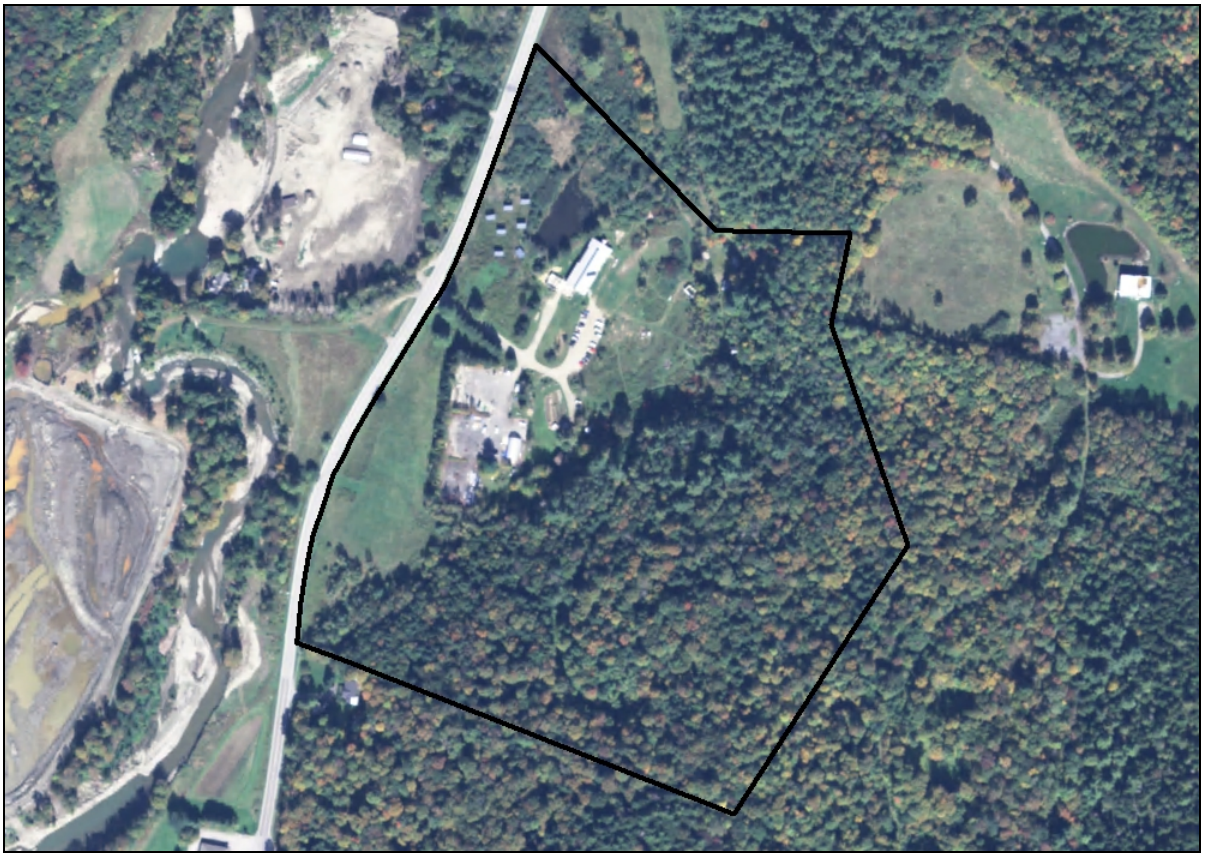
Prepared for:

Yestermorrow Design/Build School

Waitsfield, Washington County, Vermont

38 Acres

July, 2012



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ACREAGE SUMMARY

Yestermorrow Acreage Summary

Area			Acres
Forest Land			
	Stand 1	Hemlock (HK3B)	2.2
	Stand 2	Mixedwood (MW3B)	3.0
	Stand 3	Hemlock (HK4B)	3.3
	Stand 4	Mixedwood (MW4B)	5.5
	Stand 5	Northern Hardwood (NH4B)	6.8
		Total Forest Land	*20.8*
Wetland			1.6
Ponds			0.4
Campus			15.2
		Total Non-Forest	*17.2*
Total Acreage of Parcel			**38.0**

ACTIVITY SUMMARY

Yestermorrow Forest Activity Summary

Stand #	Forest Type	Acres	Scheduled Activity	Schedule	Implemented By
Stand 1	HK3B	2.2	Harvest trees of concern	Current	School
Stand 2	MW3B	3.0	Single-tree selection	On-going	School
Stand 2	MW3B	3.0	Harvest trees of concern	On-going	School
Stand 3	HK4B	3.3	Single-tree selection	On-going	School or Contractor
Stand 4	MW4B	5.5	Single-tree selection	On-going	Contractor
Stand 5	NH4B	6.8	Single-tree selection	On-going	School or Contractor

Forest Review	2017
Plan Update	2022

RECOMMENDATIONS

- Activities in Stands 2 and 3 are well suited to supply the School with timber for the Stump to Sticker class.
- Activities in Stand 5 are well suited to supply the School with firewood and small volumes of hardwood lumber.
- We recommend the primary landing and log processing area be sited at the Fire Truck Access, primarily due to its central location and the cost of alternatives.
- An alternative landing and log processing area could be established within the southern portion of the forest in an area of gentle terrain along the main trail, although road improvements including culverts and surface gravel would be necessary.
- Buffers and machine exclusion zones should be established around water supply areas, streams, and other sensitive features.
- All boundaries lines should be marked with durable boundary paint as soon as possible and before harvesting occurs.
- Control of an invasive species, shrub honeysuckle, should take place by hand-pulling.
- New recreational trails should be developed to access all of the eastern forestland.

PREFACE: AN INTRODUCTION TO FOREST MANAGEMENT

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.

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 their objectives;
- serve as an educational tool with which the landowner's awareness of the forest, and understanding of its management, may be enhanced.

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 land-use history. 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.

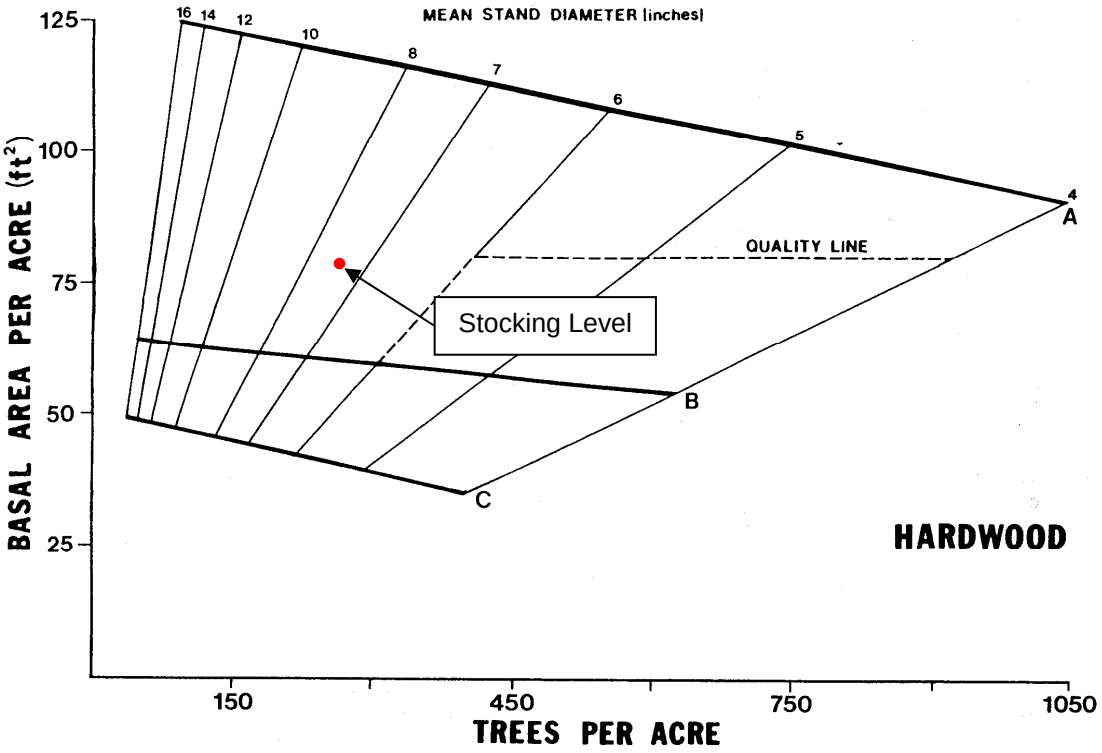
With the use of an aerial photograph and topographic maps, the forester maps the stands and makes subsequent field checks to verify his or her projections. Appropriate sampling techniques are applied, and field observations are made to determine basal area, stocking density, timber volume and other characteristics 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.

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 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 (i.e. the average density of undisturbed stands).

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

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.

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 management 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 cull 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.

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 years or decades into 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 while protecting or enhancing amenities. Professional forest management does this in the short-term, as well as over the long-term. 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. For these reasons, forest management plans should 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-age and stands with three or more age classes are uneven-age. 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, 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-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 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 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 such as 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 to 45 or more years).

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. 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.

Fountains 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.

OWNERSHIP & PLAN OBJECTIVES

This management plan is intended to reflect the broad objectives that the leadership of the Yestermorrow Design/Build School has identified for their campus and forest. It is also intended to reflect the specific needs and objectives related to forest resources, wood products, wildlife habitat, water quality, and other issues regarding the use of the forest.

In general, the management of the Yestermorrow Forest will be guided by the following broad objectives:

- Forest management will keep the forest healthy and productive, and will allow natural processes such as growth, development, succession, and regeneration to occur compatibly with human use of the forest;
- Forest management will enhance wildlife habitat, protect water quality, and control storm water runoff to the extent possible;
- Forest management will be responsive to change, which may result from forest development, climate change, weather events, etc.;
- Forest management will maintain biodiversity;
- Forest management will occur compatibly with the educational function of the school;
- As with all aspects of planning at Yestermorrow, forest management will serve all of the stakeholders of Yestermorrow: Students, Co-creators, Earth, Community, Investors.

Specifically, the management of the Yestermorrow Forest will serve the current and long-term needs of the school, including:

- A mapping system to house data on forest stands, recreational trails, etc.;
- Opportunities to harvest small volumes of wood for the School's use in buildings, classes, and for firewood;
- Consultation regarding placement of semi-permanent logging trails and landings which will function compatibly with the work of the school;
- Planning for harvesting of trees that may be less accessible after the planned campus build-out;
- Recommendations for locations for additional tent platforms;
- Recommendations for locations for wood and lumber storage areas;
- Protection water sources and water supply areas.

GENERAL DESCRIPTION OF THE FOREST

LOCATION & ACREAGE

The Yestermorrow property consists of 38 town-listed acres of wooded and open land in Waitsfield, Washington County, Vermont. The property is located in the southern portion of Waitsfield on the Waitsfield/Warren town line. Yestermorrow Forest is situated on the east side of Route 100, approximately 2.9 miles south of Waitsfield Village.

LAND FEATURES

The property lies on gentle to steep topography within the biophysical region of Vermont known as the Northern Green Mountains. Sugarloaf Mountain is situated 3.0 miles to the southwest and Mount Ellen lies 4.6 miles to the west. The Mad River is found just to the west of the property.

Aspect is generally to the west. Slopes are gentle to steep throughout the property and are, with the exception of the steepest slopes, conducive to harvesting. The steepest slopes are found in the central portion of the property. Areas of exposed ledge and glacial erratics can be found throughout the property.

Soil quality (for growing commercial tree species) is generally good. Despite poor drainage in some areas, site index is high, and most areas may be classified as Site 1 or 2. The best woodland soils are located in the southeastern portion of the property and occur on the concave slopes where the soil profile is thicker. This soil type consists of deep, well-drained soils that tend to support stands composed of sugar maple, beech, white ash, and yellow birch. The poorest soils are found in the northern portion of the property and consist of deep, excessively drained soils. This soil type occurs on steep slopes, has a high potential for soil erosion, and tends to support forest types with a softwood component.

Poor soils are found scattered across the property in wet, low-lying areas and on rocky outcrops. The presence of bedrock, shallow soils, or a high water table restricts root growth on these sites and windthrow may be a hazard. Management activities which leave individual trees exposed to strong winds should be avoided when possible.

Elevation ranges from 780’ ASL (above sea level) along Route 100 in the western portion of the property to 1,050’ ASL in the southeast corner of the property. A USGS Topographic map, with the property boundary delineated on it, can be found in the Maps section of this management plan.

TIMBER RESOURCE

Timber volumes are currently 5 MBF and 24 cords per commercial acre. This is a relatively high timber volume for the area. Approximately 46% of the sawlog volume is accounted for in eastern hemlock. Another 25% of the sawlog volume is accounted for in sugar maple.

There are, on average, 220 overstory trees per acre and the average acceptable growing stock basal area is 75 ft^2. The quadratic mean diameter for all trees sampled is 10.3”.

Due to landowner objectives and the maturity of the forest, a single-tree selection harvest is prescribed for Stands 2, 3, 4, and 5. Trees with low vigor, injuries, disease, or those at risk of dying before the next management period should be considered as candidates for removal in silvicultural harvests. Also, trees considered to be high risk that will be inaccessible following the campus renovation should be harvested before construction begins. Healthy, long-lived trees with the potential to produce high quality sawlogs (such as hemlock, sugar maple, and yellow birch) should be favored for retention.

HISTORY & CULTURAL FEATURES

A majority of Yestermorrow Forest was likely cleared for sheep pasture in the 1800's as evident by old fence lines. Areas on relatively gentle terrain in the western portion of the property may have been used as tilled fields or hayland. However, steep, rocky areas in the eastern portion of the property may have been maintained as wooded pastures or as forests for a source of building material and firewood. Fields and pastures were abandoned from agricultural use and allowed to revert to forest within the last 80-100 years.

The Yestermorrow Design/Build School was founded in 1980 by John Connell. After 10 years of renting space for the campus, the School purchased the 38-acre subject property from the Alpine Inn in 1990 and has been renovating and improving the campus ever since.

Harvesting has occurred across a majority of the forest on an on-going basis and has taken place in the form of a single-tree selection harvest. Harvesting during Yestermorrow's ownership has been light and has been conducted for the purposes of classroom demonstration and for supplying the School with lumber. There is no evidence of extensive harvesting prior to the Yestermorrow's ownership.

Cultural resources consist of the evidence of past human land-use such as stonewalls, foundations, or the assemblage of plants which are often found associated with land-use history. Aside from sheep fence, no examples of cultural resources or artifacts were encountered during the course of conducting the inventory for this plan. If any cultural resources are identified in the future, they should be buffered with a 50-foot machine exclusion zone during harvesting operations.

ROADS, INTERNAL ACCESS, & MAINTENANCE NEEDS

Access to Yestermorrow Forest for forest management purposes will likely occur from Route 100. Access from Bundy Road to the east will be challenging and will involve obtaining permission from abutting landowners, constructing new trails on the neighboring property, and locating and constructing a new landing area.

The fire truck access and log landing area located in the eastern portion of the campus, as identified on the Site Plan prepared by McCain Consulting, will serve as an excellent landing site in the winter months under frozen conditions. Upon the completion of any harvesting activities, the landing should be smoothed, seeded, and mulched, as deemed necessary by the condition of the site.

The terrain ranges from gentle to excessively steep throughout the property and will pose a challenge to harvest operations. Operability will be challenging in Stands 2 and 3 and the northern portion of Stand 4 due to the presence of streams, ledge, and very steep slopes.

Skid trails should be planned to provide access while protecting sensitive areas. Accessing all portions of the forest will involve downhill and minimal uphill skidding. Harvesting in the winter months under frozen conditions is recommended to minimize ground disturbance and the creation of ruts. Some areas are wet and/or poorly drained and could be avoided during harvesting, with little negative effect on operations.

Woods trails consist of one main trail and several spur trails that access most portions of Yestermorrow Forest. The main trail extends south from the eastern edge of campus, up slope through Stands 2 and 3, and loops back to the north on gentle terrain in Stands 4 and 5. The main trail provides good access to the central portion of Yestermorrow Forest. However, access is not well developed in the southern portions of Stands 2 and 3 or the northern half of Stand 4.

Existing trails appear to be in good condition and have been used for forest management purposes in the past. Additional trails will need to be constructed to access all portions of the forest. The use of trails for both forestry and recreational use will 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.

To minimize erosion and to ensure the long-term stability of the trail network, all trails should be waterbarred according to Vermont AMP guidelines following the completion of any harvesting activities and as soon as conditions allow (see Table 1). Waterbars should be monitored on a continuous basis, cleaning outlets as needed to ensure that water can flow freely from the trail surface and dissipate into the adjacent leaf litter.

Table 1

Recommended Distance Between Waterbars	
Grade (%)	**Distance (Feet)**
1	400
2	250
5	135
10	80
15	60
20	45
25	40
30	35
40	30

Waterbars should be maintained on trails to prevent erosion and to ensure that the trails continue to be usable for recreational and forest management purposes. Waterbars should be constructed at not less than a 30^{o} angle, down slope, and across the trail. Outlets should be free-flowing with at least a 3% outslope to ensure that water does not pool up in the trail.

OTHER FOREST INFRASTRUCTURE

Yestermorrow has requested that other infrastructure be considered for harvesting and processing logs and firewood for School use. After considering all options, the most cost-efficient option is to utilize the fire truck access and log landing area as identified on the Site Plan prepared by McCain Consulting. This area will require minimal work to make it usable and will be easily accessible to the proposed wood storage building, carpenter shop, and woodworking shop.

Another possibility is to locate and construct a landing area on gentle terrain along the main trail in Stand 5 within the area of the old bathhouse. This would require upgrading the main trail to a gravel road and would entail culvert installation, ditching, gravelling, and grading.

Upon completion of this work, the landing area would be accessible to pick-up trucks, portable sawmills, and 10-wheeler log trucks.

BOUNDARY LINES & MAINTENANCE NEEDS

The northern, southern, and eastern boundary lines of Yestermorrow Forest are designated by old fence line and/or old, red blazes in poor to fair condition. The western boundary line is formed by Route 100. Old fence line can be found in most places and the boundary line is likely at or near the fence line. It appears as though all lines are being respected by abutting landowners. It is strongly recommended that all boundary lines are painted as soon as possible, and before any active management (harvesting) occurs.

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. A new law passed by the State of Vermont in 2010 requires that boundary lines be located and marked prior to harvesting adjacent to property lines. If the boundary has not been marked and a trespass occurs, the landowner is subject to a fine ranging from $250 to $1000.

Boundary lines are generally marked with axe blazes on trees which are coated with durable paint to ensure visibility. While only a licensed surveyor can create or "monument" a line, a landowner may maintain monumentation once it has been established, including clearing brush and re-painting blazes. Blazes are typically placed on either side of a tree which is located directly on a boundary (the boundary line passes through the tree). A blaze is placed at the entry and exit point in the tree. Given that few trees are actually located on the boundary, trees within approximately five feet of the line are typically marked with one blaze facing or "pointing" to the boundary.

The condition of boundary lines should 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, vigorous forest or when there has been significant management activity.

INVASIVE SPECIES & MANAGEMENT RECOMMENDATIONS

An invasive plant species, shrub honeysuckle (*Lonicera* spp.), has become established on the property and has the potential to alter the character and biodiversity of the forest. If left unchecked, invasive species will out-compete and crowd out native species through the formation of dense thickets and will certainly interfere with future attempts to establish desirable regeneration.

Shrub honeysuckle can be found growing as scattered individuals along the main trail in Stands 2 and 3 in the central portion of the property. Control of this invasive species should begin as soon as possible.

Manual, mechanical, and chemical control options are available and are generally the most effective when employed together. The best course of action at this time if for the School to manually remove honeysuckle through hand-pulling. The School can also utilize a

mechanical method to gain control through the use of brush saws. However, if chemical control is deemed necessary, the School should consult with a certified herbicide applicator to conduct the work.

It is recommended that invasive species control be conducted as soon as time permits and should be discussed further before any active forest management begins. While the current level of infestation is light, it is worth noting that this problem will only lead to more significant and costly challenges later on.

WILDLIFE HABITAT

Yestermorrow Forest contains the following notable wildlife habitat features: seepages, snags and cavity trees, forest openings, and hard and soft mast trees. The issues of forest bird habitat and connectivity of habitat across the landscape will also be discussed. The State of Vermont has classified a majority of the property as significant wildlife habitat, specifically, as a deer wintering area.

Seepages are found in the southern and northeastern portions of the property. Seepages commonly have the most diverse herbaceous communities as compared to other terrestrial ecosystems. These are areas where ground water has reached the surface and can often be the beginning of streams. 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.

Snags and cavity trees are common throughout the property. These include large diameter hemlock, sugar maple, and beech, and 8” to 16" diameter aspen which have died or have low vigor. Cavities are often excavated by woodpeckers such as the hairy and pileated woodpeckers. 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. 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. 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 three to five year cycle if to be managed for wildlife. Mowing should take place after August 15th to ensure that fledglings have had enough time to develop and to leave the nest.

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 hard mast producing species found on the property include American beech, red maple, red spruce, sugar maple, white ash, and white pine. 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 soft mast producing species found on the property include blackberries, black cherry, eastern hophornbeam, quaking aspen, raspberries, yellow birch, and white birch. 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.

The forest has been identified as a portion of a deer wintering area. A deer wintering area or deer yard is an area of softwood cover where deer find refuge from severe winter conditions. Deer yard management generally involves the encouragement of the softwood component and implementation of practices designed to provide hardwood browse (hardwood twigs and buds at a convenient height) as a winter food source for deer. When managing forests for deer, it is important to maintain quality cover for the protection of the deer herd. Quality cover is defined as having a minimum 70% softwood crown closure and a canopy height of at least 35 feet. Quality softwood cover will act as a thermal blanket increasing the average daily temperatures and will intercept snowfall minimizing the snow pack. Numerous bird species, including certain species of warblers, also prefer this habitat for nesting and foraging purposes so it is important to maintain the softwood component of this forest.

Complex and intact forest bird habitat is critical for the survival of various bird species and is especially important for successful breeding, nesting, foraging, and evading predation. Of particular concern in forests such as Yestermorrow's, are habitat features such as structural diversity, species composition, canopy closure, snags and cavity trees, and coarse woody material. These features are vital to a number of song bird species that can be observed in Yestermorrow Forest such as the scarlet tanager, black-throated green warbler, wood thrush, red-eyed vireo, and black-and-white warbler.

Forest bird habitat is essential to the successful reproduction of "responsibility forest bird" species. We have borrowed the concept of "responsibility forest bird" from the Audubon Society, which defines it as a "bird species with a significant amount of its global breeding population found in the Northern Forest region." A majority of song birds found in the northeast are considered to be responsibility forest bird species.

When assessing forest bird habitat, it is important to view a particular stand or property as it relates to the surrounding landscape as birds do not follow anthropogenic features such as boundary lines. A landscape-level approach is important when assessing quality habitat because it allows for a comparison of forest structures and land use patterns and how they may influence forest bird habitat. For instance, a young regenerating stand within a mature forest will increase structural diversity directly providing habitat for bird species that prefer early successional habitat. The landscape surrounding Yestermorrow is generally intact

mature forest or actively-used farm fields with a distinct lack of lack of early successional habitat.

Forest bird habitat in Yestermorrow Forest can be maintained or enhanced through a number of various methods. The establishment of streamside management zones along riparian corridors will maintain canopy closure and will provide for nesting, foraging, and perching. An increase in structural diversity through the creation of small gaps in the canopy and the establishment of an understory and midstory vegetation layer will provide additional cover for nesting, foraging, perching, and evading predation. The creation of patch cuts and the establishment of young growth will provide early successional habitat for species that are not represented in a mature forest. The retention of snags, cavity trees, and coarse woody material will provide nesting and foraging sites for numerous species.

The diversity of forest bird habitat directly influences the number of bird species present. At Yestermorrow Forest, maintaining and enhancing an assortment of forest attributes will lead to an increase in diversity by providing a range of habitat features that will be utilized by multiple bird species. On the Yestermorrow Forest, this involves cutting trees to enhance vertical structural diversity (maintaining trees of all size and age classes), preserving and creating snags and cavity trees, supplying coarse woody material by cutting and leaving trees on the forest floor, and protecting riparian areas.

The concept of connectivity of habitat in the landscape relates to the movement of wildlife species and ecological processes between areas of intact habitat. As our climate continues to change and as forest fragmentation and development continue to isolate habitat blocks, conserving habitat connectivity across the landscape has become increasingly important. It is widely acknowledged as a way to preserve biodiversity while maintaining functional ecosystems and viable wildlife populations.

Yestermorrow Forest is situated in the Mad River Valley where fragmentation in the form of houses, farms, fields, and roads is largely confined to the valley. Outside of the valley, large areas of intact forest blocks spread across the landscape that generally consist of mature, even-age forests. Early successional habitat is generally lacking across the landscape and usually consists of abandoned farms and fields where it does occur. Through its mature, closed-canopy forest, Yestermorrow Forest allows for the connectivity of large blocks of mature forest on the east and west sides of the Mad River. Yestermorrow's mature forest also allows for connectivity to neighboring forests to the north and south. The perennial stream in the northern portion of the property will serve as a travel corridor for certain wildlife species and connects the surrounding forest to the wetland in the northwestern corner of the property.

As with all forest ecosystems, fragmentation is a concern and does occur throughout the landscape. Route 100 is a major obstacle for wildlife and directly limits connectivity to intact forest west of the Mad River. Farms and fields adjacent to Yestermorrow limit connectivity to mature forests to the east.

RARE, THREATENED, & 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 Yestermorrow Forest.

RIPARIAN AREAS, PONDS, STREAMS, & WETLANDS

An un-named stream flows through the northern portion of the property, sometimes eroding away large amounts of sediment. This stream serves as riparian habitat and provides a travel corridor, water supply, and food source for predators of amphibians, invertebrates, and fish. Standing dead trees (snags) in the surrounding area provide perches for predators and critical nesting sites. Given the highly erodible nature of the soils present, deep ravines with steep banks can be seen in some areas. This natural resource not only provides habitat for herbaceous plants and invertebrates but is also are a source of drinking water for numerous animals and birds. Riparian habitat is sensitive to disturbances created by harvesting equipment and can easily be degraded if not protected properly.

An intermittent stream flows seasonally through the central portion of the property. This stream is dry for a majority of the year and generally flows following the spring snow melt or high precipitation events.

Two wetlands are located in the western portion of the property. This natural resource not only provides habitat but is also a source of drinking water for numerous animals and birds. Wetlands are important for a number 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 and 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 a year-round supply of water that provide habitat for mammals, birds, amphibians, and aquatic invertebrates. Likely inhabitants and visitors include an assortment of song birds, turtles, frogs, salamanders, and numerous mammals.
A pond is located in the northwest corner of the property. Ponds are a year-round supply of water that provide habitat for fish, amphibians, and aquatic invertebrates. Wildlife comes to these areas year after year to feed, drink, and sometimes bath. Likely inhabitants and visitors include an assortment of birds from great blue herons to black ducks, various fish species such as brook trout and sunfish, turtles, frogs, salamanders, and numerous mammals.

Riparian areas, ponds, streams, and wetlands will be protected through the establishment of buffers and the implementation of water quality protection policies and Vermont's Acceptable Management Practices.

RECREATION & AESTHETIC VALUES

Yestermorrow Forest currently provides for recreational activity through the existing network of hiking trails. Trails are currently unmarked and are lightly used. The trails allow for the students and faculty of Yestermorrow to get outdoors and to enjoy nature.

The forest has good potential for the development of a more extensive trail network. While many configurations are possible, a loop system utilizing the existing main trail and

connecting to the trail along the stream and tent platforms would be ideal. A series of secondary trails could then be established that connect to the main trail and allow for the enjoyment and viewing of the forest and its natural features.

Harvesting activities should take into account the level of recreational use and should plan accordingly to allow for the creation of additional trails. Depending on the equipment used, skid trails and hiking trails may be compatible or may conflict. Skid trails used by a tractor for the Stump to Sticker class can likely be used as hiking trails. If a conventional logging contractor implements the harvest plan, trails used by a skidder or forwarder may be too wide and may disrupt or negatively impact the enjoyment of hiking trails. In this case, maintaining hiking trails and crossing them with a skid trail network at minimal locations may be the best course of action.

Aesthetically important areas may be maintained and enhanced during harvest operations. Interesting natural features such as unusually large or unique trees, ledge, glacial erratics, or other natural resources may be preserved in their natural state. Trails may be located so as to allow for the viewing of these areas without negatively impacting them. Views of the river valley may be created through the creation of openings in the forest canopy and could be located at the top of exposed ledge or steep slopes. Consideration may also be given to any negative impacts on the landscape that any activity might have when viewed from a distance.

FOREST INVENTORY

The Yestermorrow Forest was inventoried on July 12th and 13th, 2012. Cruise design was a 175' x 175' grid, with a total of 29 points tallied using a ten factor prism. Inventory data were processed using a program called Two Dog. This type of inventory provides data on species composition, stand stocking, timber volume, and a variety of other stand characteristics.

The inventory resulted in a statistical accuracy of ±11.0% at the 95% confidence level for total timber volume. Statistical accuracy is directly related to the variability of the forest and the number of observations. The achieved statistics are within expectations for properties of this size, but should not be used to predict precise value or to sell timber.

STAND DESCRIPTIONS & MANAGEMENT PRESCRIPTIONS

STAND 1
2.2 ACRES

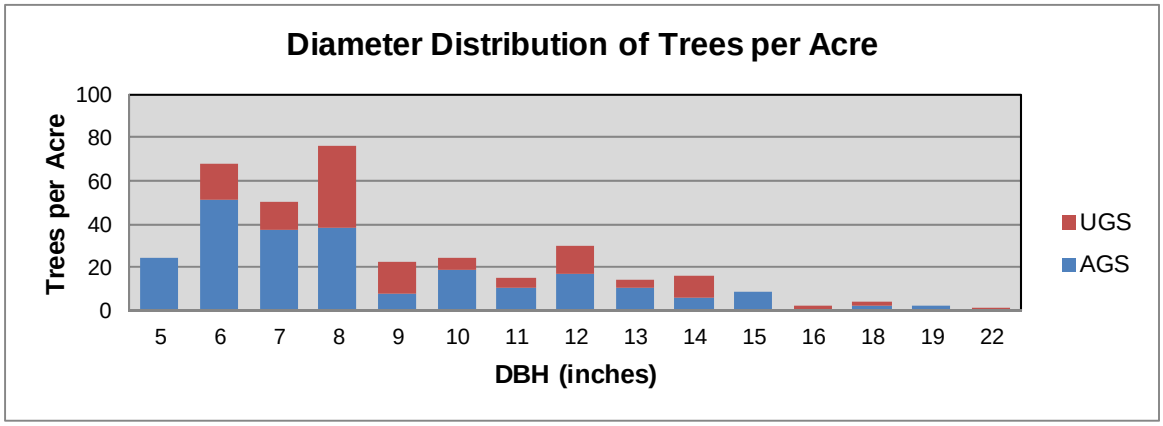
TYPE:
HK3B (hemlock large poles and small sawtimber)

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 3
Data Collected: 7/13/12

STAND DATA:
Natural Community Designation: Hemlock Forest
Quadratic Stand Diameter: 9.3
Total Basal Area/Acre (BA): 170 ft^2
Acceptable Growing Stock Basal Area/Acre: 103 ft^2
Current Volume/Acre: 4.2 MBF & 34 cords

MANAGEMENT:
Age Class Distribution: Even
Cutting Cycle: 20 years
Desired Diameters: HK-24" QA-16" RM-24" WB-18"
Q Factor: 1.7
Insects or Disease: None noted
Desired Products: High quality sawlogs
Access Distance (to likely landing location): 400'-800'

DIAMETER DISTRIBUTION



SITE CHARACTERISTICS:
Site Class: 2 (Washington County Soil Survey & field verification)
Soil Type: Colton gravelly loamy sand, 25-60% slopes

MANAGEMENT STRATEGY
This stand will be managed as a riparian buffer to minimize soil erosion by maintaining an intact forest canopy. This stand will also be managed for wildlife habitat, recreation, and aesthetics. Over the long-term, long-lived, shade-tolerant species such as hemlock will be favored. If harvesting occurs, uneven-age techniques will be utilized to encourage and maintain a balanced distribution of multiple age classes while maintaining an intact canopy.

STAND DESCRIPTION
This young hemlock stand is located on a very steep slope and is composed of eastern hemlock (63% of the basal area), quaking aspen (12%), red maple (10%), white birch (10%), and sugar maple (6%). White pine and other northern hardwoods are present as minor associates. This is an adequately stocked stand of large poles and small sawtimber.

HISTORY
The stand likely originated from abandoned pasture approximately 80-100 years ago. Field evidence indicates that a light, single-tree selection harvest has taken place on an on-going basis and appears to have targeted mature white pine and unacceptable growing stock for removal.

REGENERATION
Advance seedling and sapling regeneration is present in a very sparse and uneven distribution. In most areas of the stand, advance regeneration is completely absent. The regeneration is generally inadequate to reproduce any portion of the stand to desirable species.

FOREST HEALTH
No signs of insects or disease were observed within this stand.

INVASIVE SPECIES
No invasive species were observed within this stand.

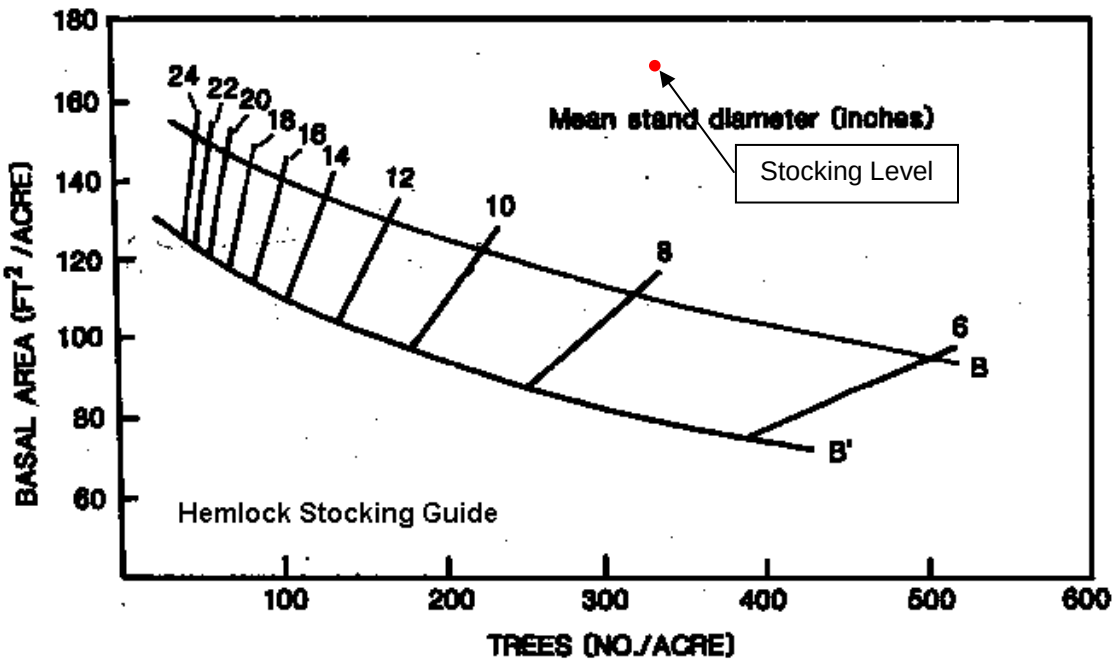
HABITAT
The State of Vermont has identified this stand as significant wildlife habitat and has designated it as a deer wintering area. Several well-defined deer trails can be found traversing the steep slopes that typify the stand. Active forest management should strive to maintain the softwood component where possible to ensure that the stand continues to provide effective winter cover.

An unnamed perennial stream forms the southern boundary of the stand providing riparian habitat and a travel corridor for wildlife.

The stand serves as softwood habitat and contains sporadic cavity trees. Quaking aspen should be allowed to increase in diameter with the intent of recruiting large-diameter trees to become future cavity trees. Coarse woody material and snags are generally lacking from this stand. Active management could focus on identifying potential candidates and recruiting these features through girdling or felling. Over time and with an increase in the number of cavity trees, snags, and coarse woody material, this stand has the potential to become quality bird habitat.

STOCKING

Total stocking (the "crowdedness" of the trees) is above the B Line of the Hemlock Stocking Guide. Stocking of only those trees which will produce sawlogs (acceptable growing stock) is 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, growth rate of the dominant trees is good, that of the intermediate trees is fair, and mortality due to crowding is low. The stocking level is displayed graphically on the Stocking Guide below.



Source: Lancaster, K. F., Managing Eastern Hemlock: A Preliminary Guide, USDA Forest Service, NA-FR-30, 1985

ACCESS AND OPERABILITY

Access to the stand will likely occur from the fire truck access and log landing area located on the east side of campus in the central portion of the property. Access within the stand is poor due to the steep terrain and the lack of existing trails. The terrain is very steep throughout and will hinder harvest operations. Short skid distances will be required to access all portions of the stand.

SCHEDULED TREATMENT

No activity is prescribed for the current management period. The stand should be allowed to grow and to be maintained in its current condition to protect soil and water quality.

However, due to the stand's close proximity to the campus and the limited access that will occur following the campus renovation, trees of concern should be removed as soon as possible. Trees of concern include declining aspens and white pines that may be a windthrow hazard to campus buildings.

To address the issue of habitat connectivity within the landscape, Yestermorrow Forest should maintain a closed-canopy forest and enhance forest attributes that would benefit bird species that prefer mature forests.

SPECIAL CONSIDERATIONS

Aside from harvesting trees of concern, this stand is a poor option for the Stump to Sticker class due to the steep terrain, the close proximity of the perennial stream, and the potential for soil erosion.

If harvesting does occur, maintaining stable trails will be a top priority. The main concern is the potential for soil erosion in the skid trails. Temporary water bars should be installed and maintained during any active forest management. Permanent water bars should be installed according to the Vermont AMP manual upon the completion of harvest operations.

STAND 2
3.0 ACRES

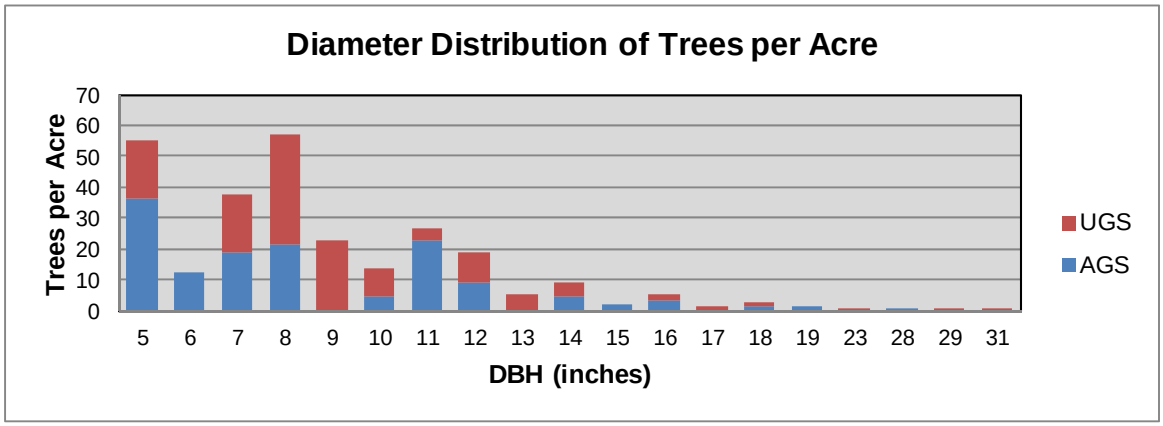
TYPE:
MW3B (mixedwood large poles and small sawtimber)

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 4
Data Collected: 7/12/12

STAND DATA:
Natural Community Designation: Hemlock Forest
Quadratic Stand Diameter: 9.5
Total Basal Area/Acre (BA): 135 ft^2
Acceptable Growing Stock Basal Area/Acre: 65 ft^2
Current Volume/Acre: 3.5 MBF & 25 cords

MANAGEMENT:
Age Class Distribution: Even
Cutting Cycle: 20 years
Desired Diameters: HK-24" QA-16" YB-24" WP-36"
Q Factor: 1.7
Insects or Disease: White pine blister rust
Desired Products: High quality sawlogs & veneer
Access Distance (to likely landing location): 0'-1,000'

DIAMETER DISTRIBUTION



SITE CHARACTERISTICS:
Site Class: 1 & 2 (Washington County Soil Survey & field verification)
Soil Type: Tunbridge-Lyman complex, very rocky, 35-60% slopes

MANAGEMENT STRATEGY
This stand will be managed for high quality timber production, wildlife habitat, recreation, and aesthetics. Over the long-term, long-lived, shade-tolerant species such as hemlock will be favored. Uneven-age techniques will be utilized to encourage and maintain a balanced distribution of multiple age classes while maintaining an intact canopy.

STAND DESCRIPTION
This mixedwood stand is composed of eastern hemlock (39% of the basal area), quaking aspen (13%), yellow birch (13%), red maple (11%), and white pine (9%). White ash and other northern hardwoods are present as minor associates. Large white pines can be found scattered throughout the northern half of the stand. This is an adequately stocked stand of large poles and small sawtimber. A cabin and tent platform are located in the northern portion of the stand.

HISTORY
The stand likely originated from abandoned pasture approximately 80-100 years ago as evident by the presence of old barbed wire fencing. Field evidence indicates that a light, single-tree selection harvest has taken place on an on-going basis and appears to have targeted mature white pine and unacceptable growing stock for removal.

REGENERATION
Advance seedling and sapling regeneration is present in a very sparse and uneven distribution. In most areas of the stand, advance regeneration is completely absent. The regeneration is generally inadequate to reproduce any portion of the stand to desirable species.

FOREST HEALTH
White pine blister rust (*Cronartium ribicola*) was observed within this stand. White pine blister rust is a non-native fungus from Europe and Asia that attacks five-needled pines, most notably, white pine. The disease has an alternate host, *Ribes* species, which is required to complete its life cycle. Trees with signs of the disease should be removed as soon as possible.

INVASIVE SPECIES
An invasive species, shrub honeysuckle (*Lonicera* spp.), was observed in the central portion of the stand along the main trail. Removal and control of this species should begin as soon as possible as it poses a serious threat to the long-term health and sustainability of the forest. Due to the light level of infestation, control can be conducted by the School and should take place in the form of hand-pulling. If left unchecked, this species has the potential to take over the understory through the formation of dense thickets. An infestation of shrub honeysuckle will negatively impact recreational activities and will crowd out native species reducing the overall biodiversity of the forest.

HABITAT
The State of Vermont has identified this stand as significant wildlife habitat and has designated it as a deer wintering area. Active forest management should strive to maintain the softwood component where possible to ensure that the stand continues to provide effective winter cover.

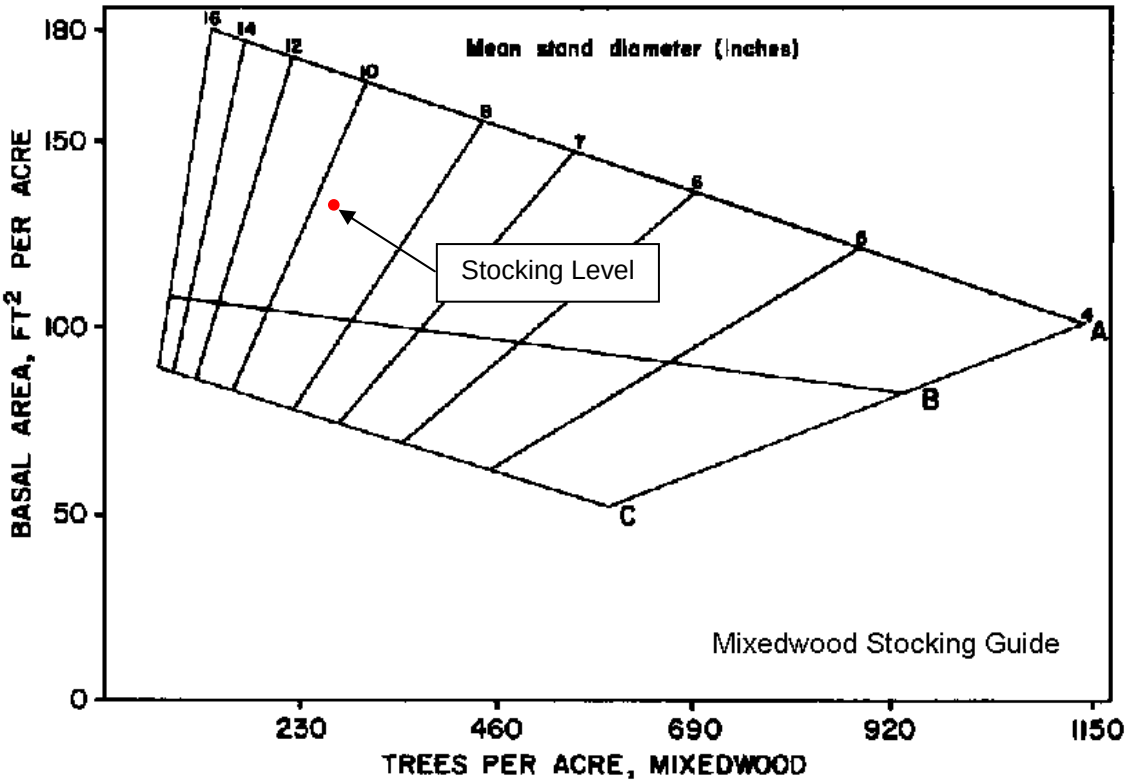
An unnamed perennial stream forms the northern boundary of the stand providing riparian habitat and a travel corridor for wildlife. An intermittent stream flows through the northern portion of the stand during the spring snow melt and during high precipitation events.

The stand serves as conifer habitat and contains occasional cavity trees. Coarse woody material and snags are well distributed throughout the stand providing ample sites for nesting and foraging. A majority of the snags consist of aspen trees. However, a larger diameter white pine snag can be seen on the stand edge in close proximity to several buildings.

Bird habitat could be enhanced through an increase in structural diversity with the establishment of an understory and midstory vegetation layer which would provide additional cover for nesting, foraging, perching, and evading predation. The softening of the stand edge with the open land to the west could enhance bird habitat for interior forest birds through a gradual increase in vegetation height as a transition is made from the open land to the forest.

STOCKING

Total stocking (the “crowdedness” of the trees) is above the B Line of the Mixedwood Stocking Guide. Stocking of only those trees which will produce sawlogs (acceptable growing stock) is below the C 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, growth rate of the dominant trees is good, that of the intermediate trees is fair, and mortality due to crowding is low. 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 AND OPERABILITY

Access to the stand will likely occur from the fire truck access and log landing area located on the east side of campus in the central portion of the property. Access within the stand is fair due to the moderately steep terrain and the existing main trail. However, areas of steep slopes, exposed ledge, and glacial erratics will hinder harvest operations. Short skid distances will be required to access all portions of the stand.

SCHEDULED TREATMENT

A single-tree selection harvest is recommended and scheduled for the first year of the management period. The harvest should target mature aspen and white pine trees infected with white pine blister rust for removal. The residual basal area should be reduced to approximately 110-120 ft^2 in order to maintain crown closure and maintain conditions suitable to the regeneration of softwood species. Trees with low vigor, injuries, disease, or those at risk of dying before the next management period should be harvested. Growth should be focused on trees with the potential to produce high quality sawlogs. This harvest should take place in areas of the stand where stocking levels are high enough to meet the criteria set under this prescription.

Should enhancement of forest bird habitat be prioritized higher, no harvesting should occur during the breeding season from May to August. Cavity trees, snags, and coarse woody material should be identified and retained. Buffer zones should be established along riparian zones where little to no harvesting will occur to maintain canopy closure. Harvesting should occur along the stand boundary with the open area to the west with the

intent of softening the stand edge through the establishment of new growth. Invasive species should be identified and hand-pulled as soon as possible.

To address the issue of habitat connectivity within the landscape, Yestermorrow Forest should maintain a closed-canopy forest and enhance forest attributes that would benefit bird species that prefer mature forests.

SPECIAL CONSIDERATIONS

This stand is ideally situated to easily provide trees for the Stump to Sticker class. Large white pines are easily accessible in the northern half of the stand.

Due to the stand's close proximity to the campus and the limited access that will occur following the campus renovation, trees of concern should be removed as soon as possible. Trees of concern here consist of trees that may be a windthrow hazard to campus buildings or trees that may interfere with solar gain.

Special consideration should be given to the perennial stream located along the northern boundary of the stand. A 50-foot "No Cut" buffer and equipment exclusion zone should be maintained along the stream.

Due to the presence of easily erodible soils, maintaining stable trails will be a top priority. The main concern is the potential for soil erosion in the skid trails. Temporary water bars should be installed and maintained during any active forest management. Permanent water bars should be installed according to the Vermont AMP manual upon the completion of harvest operations.

STAND 3
3.3 ACRES

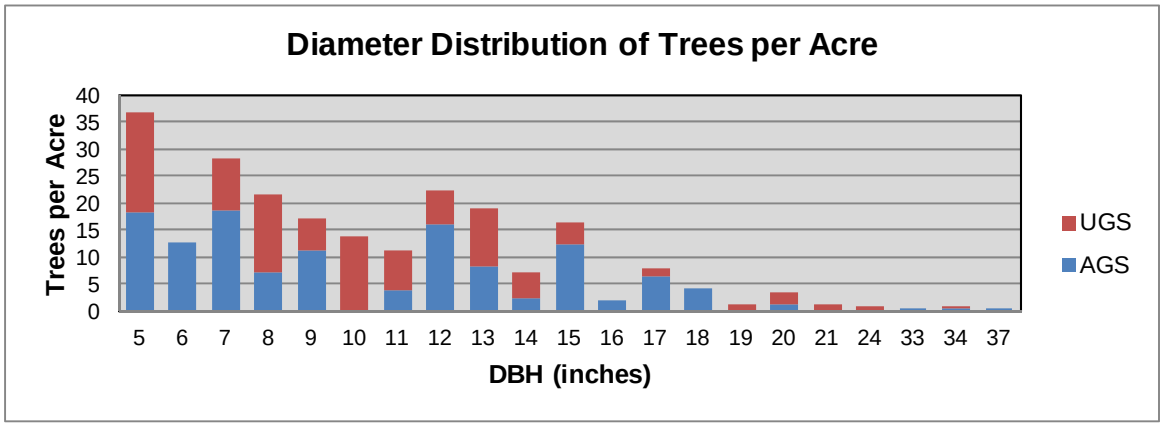
TYPE:
HK4B (hemlock medium and large sawtimber)

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 4
Data Collected: 7/12/12

STAND DATA:
Natural Community Designation: Hemlock Forest
Quadratic Stand Diameter: 11.2
Total Basal Area/Acre (BA): 155ft^2
Acceptable Growing Stock Basal Area/Acre: 88 ft^2
Current Volume/Acre: 7.6 MBF & 26 cords

MANAGEMENT:
Age Class Distribution: Even
Cutting Cycle: 20 years
Desired Diameters: HK-24" SM-24" WB-18" WP-36"
Q Factor: 1.7
Insects or Disease: None noted
Desired Products: High quality sawlogs
Access Distance (to likely landing location): 200'-900'

DIAMETER DISTRIBUTION



SITE CHARACTERISTICS:
Site Class: 1 & 2 (Washington County Soil Survey & field verification)
Soil Type: Tunbridge-Lyman complex, very rocky, 15-60% slopes

MANAGEMENT STRATEGY
This stand will be managed for high quality timber production, wildlife habitat, recreation, and aesthetics. Over the long-term, long-lived, shade-tolerant species such as hemlock and red spruce will be favored. Uneven-age techniques will be utilized to encourage and maintain a balanced distribution of multiple age classes while maintaining an intact canopy.

STAND DESCRIPTION
This mature hemlock stand is composed of eastern hemlock (69% of the basal area), sugar maple (8%), white birch (8%), white pine (5%), and yellow birch (3%). Red spruce, red maple, and other northern hardwoods are present as minor associates. Large white pines can be found scattered throughout the northern half of the stand. This is an adequately stocked stand of medium and large sawtimber.

HISTORY
The stand likely originated from abandoned pasture approximately 80-100 years ago as evident by the presence of old barbed wire fencing. Field evidence indicates that a light, single-tree selection harvest has taken place on an on-going basis and appears to have targeted mature white pine and unacceptable growing stock for removal.

REGENERATION
Advance seedling and sapling regeneration is present in a very sparse and uneven distribution. In most areas of the stand, advance regeneration is completely absent. The regeneration is generally inadequate to reproduce any portion of the stand to desirable species.

FOREST HEALTH
No signs of insects or disease were observed within this stand.

INVASIVE SPECIES
An invasive species, shrub honeysuckle (*Lonicera* spp.), was observed in the central portion of the stand along the main trail. Removal and control of this species should begin as soon as possible as it poses a serious threat to the long-term health and sustainability of the forest. Due to the light level of infestation, control can be conducted by the School and should take place in the form of hand-pulling. If left unchecked, this species has the potential to take over the understory through the formation of dense thickets. An infestation of shrub honeysuckle will negatively impact recreational activities and will crowd out native species reducing the overall biodiversity of the forest.

HABITAT
The State of Vermont has identified this stand as significant wildlife habitat and has designated it as a deer wintering area. Active forest management should strive to maintain the softwood component where possible to ensure that the stand continues to provide effective winter cover.

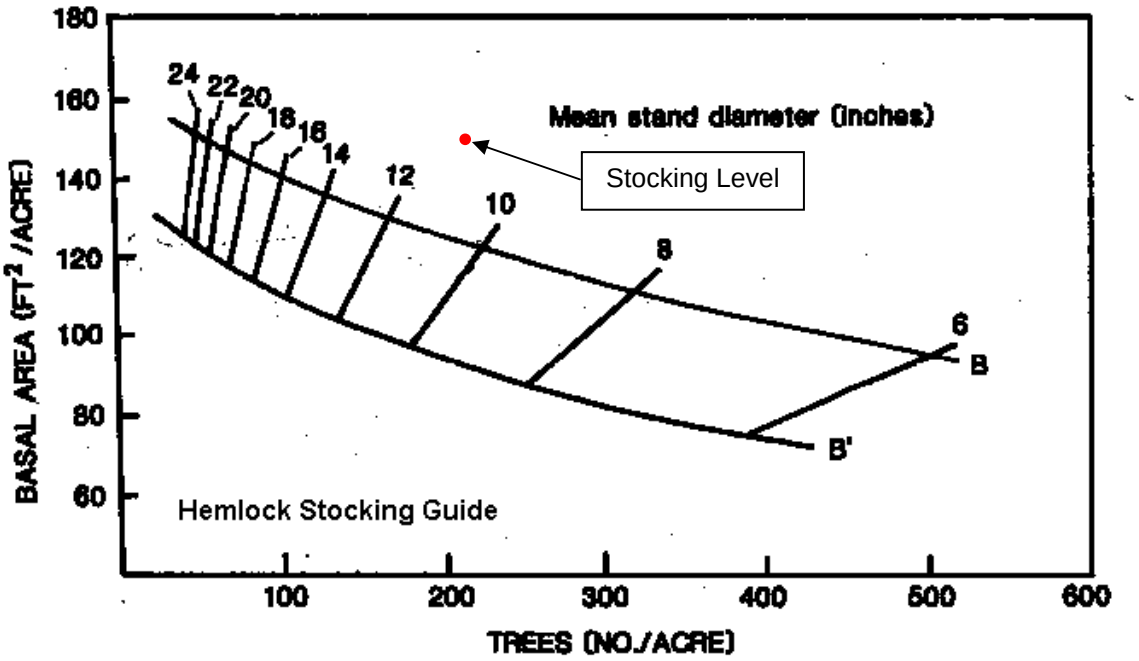
An intermittent stream flows through the northern portion of the stand during the spring snow melt and during high precipitation events.

The stand serves as softwood habitat and contains occasional cavity trees. Coarse woody material and snags are well distributed throughout this stand providing sufficient sites for nesting and foraging. Bird habitat could be enhanced through an increase in structural

diversity with the establishment of understory and midstory vegetation layers which would provide additional cover for nesting, foraging, perching, and evading predation.

STOCKING

Total stocking (the "crowdedness" of the trees) is above the B Line of the Hemlock Stocking Guide. Stocking of only those trees which will produce sawlogs (acceptable growing stock) is 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, growth rate of the dominant trees is good, that of the intermediate trees is fair, and mortality due to crowding is low. The stocking level is displayed graphically on the Stocking Guide below.



Source: Lancaster, K. F., Managing Eastern Hemlock: A Preliminary Guide, USDA Forest Service, NA-FR-30, 1985

ACCESS AND OPERABILITY

Access to the stand will likely occur from the fire truck access and log landing area located on the east side of campus in the central portion of the property. Access within the stand is fair due to the moderately steep terrain and the existing main trail. However, areas of steep slopes, exposed ledge, and glacial erratics will hinder harvest operations. Short skid distances will be required to access all portions of the stand.

SCHEDULED TREATMENT

A single-tree selection harvest is recommended and scheduled for the third year of the management period. The harvest should target mature white pine and unacceptable growing stock for removal. The residual basal area should be reduced to approximately 115-125 ft^2 in order to maintain crown closure and maintain conditions suitable to the regeneration of softwood species. Trees with low vigor, injuries, disease, or those at risk of dying before the next management period should be harvested. Growth should be focused on trees with the potential to produce high quality sawlogs. This harvest should take place in areas of the stand where stocking levels are high enough to meet the criteria set under this prescription.

Should enhancement of forest bird habitat be prioritized higher, no harvesting should occur during the breeding season from May to August. Cavity trees, snags, and coarse woody material should be identified and retained. Buffer zones should be established along riparian zones where little to no harvesting will occur to maintain canopy closure. Invasive species should be identified and hand-pulled as soon as possible.

As Stand 3 is an interior forest stand with light treatment in the stand and in surrounding areas, it is unlikely that habitat connectivity within the landscape will be adversely impacted by the scheduled activity. Yestermorrow Forest should maintain a closed-canopy forest and enhance forest attributes that would benefit bird species that prefer mature forests.

SPECIAL CONSIDERATIONS

The stand's close proximity to the campus allows the area to be a good candidate for the Stump to Sticker class. Timber can be obtained from the eastern hemlock found throughout and from the large white pines found in the northern half of the stand.

Due to the presence of easily erodible soils, maintaining stable trails will be a top priority. The main concern is the potential for soil erosion in the skid trails. Temporary water bars should be installed and maintained during any active forest management. Permanent water bars should be installed according to the Vermont AMP manual upon the completion of harvest operations.

STAND 4
5.5 ACRES

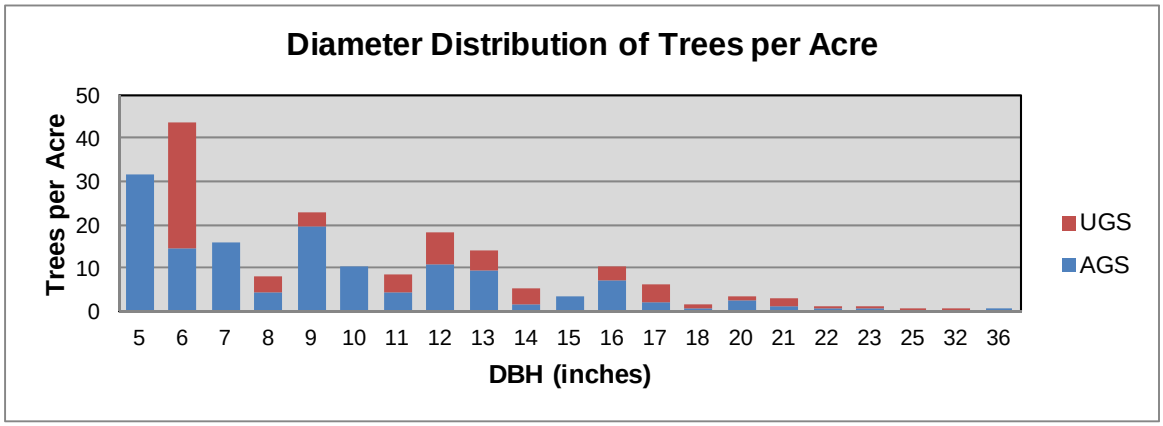
TYPE:
MW4B (mixedwood small and large sawtimber)

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 7
Data Collected: 7/12/12

STAND DATA:
Natural Community Designation: Hemlock Forest
Quadratic Stand Diameter: 10.7
Total Basal Area/Acre (BA): 130 ft^2
Acceptable Growing Stock Basal Area/Acre: 80 ft^2
Current Volume/Acre: 5.5 MBF & 25 cords

MANAGEMENT:
Age Class Distribution: Even
Cutting Cycle: 20 years
Desired Diameters: HK-24" SM-24" RM-24" YB-24" WP-36"
Q Factor: 1.7
Insects or Disease: None noted
Desired Products: High quality sawlogs & veneer
Access Distance (to likely landing location): 300'-1,500'

DIAMETER DISTRIBUTION



SITE CHARACTERISTICS:
Site Class: 1 & 2 (Washington County Soil Survey & field verification)
Soil Type: Tunbridge-Lyman complex, very rocky, 15-60% slopes

MANAGEMENT STRATEGY
This stand will be managed for high quality timber production, wildlife habitat, recreation, and aesthetics. Over the long-term, long-lived, shade-tolerant species such as hemlock, red spruce, and sugar maple will be favored. Uneven-age techniques will be utilized to encourage and maintain a balanced distribution of multiple age classes while maintaining an intact canopy.

STAND DESCRIPTION
This mixedwood stand is composed of eastern hemlock (46% of the basal area), sugar maple (22%), red maple (10%), yellow birch (9%), and quaking aspen (5%). White pine, red spruce, white ash, and other northern hardwoods are present as minor associates. Large white pines can be found in the northwestern portion of the stand. This is an adequately stocked stand of small and large sawtimber. Several tent platforms are located in the northwest corner of the stand.

HISTORY
The stand likely originated from abandoned pasture approximately 80-100 years ago as evident by the presence of old barbed wire fencing. The occurrence of large-crown, old-field sugar maples also attest to the area's former use as a pasture. Field evidence indicates that a light, single-tree selection harvest has taken place on an on-going basis and appears to have targeted mature hardwoods and unacceptable growing stock for removal.

REGENERATION
Advance seedling and sapling regeneration is present in a very sparse and uneven distribution. In most areas of the stand, advance regeneration is completely absent. The regeneration is generally inadequate to reproduce any portion of the stand to desirable species.

FOREST HEALTH
No signs of insects or disease were observed within this stand.

INVASIVE SPECIES
No invasive species were observed within this stand.

HABITAT
The State of Vermont has identified this stand as significant wildlife habitat and has designated it as a deer wintering area. Active forest management should strive to maintain the softwood component where possible to ensure that the stand continues to provide effective winter cover.

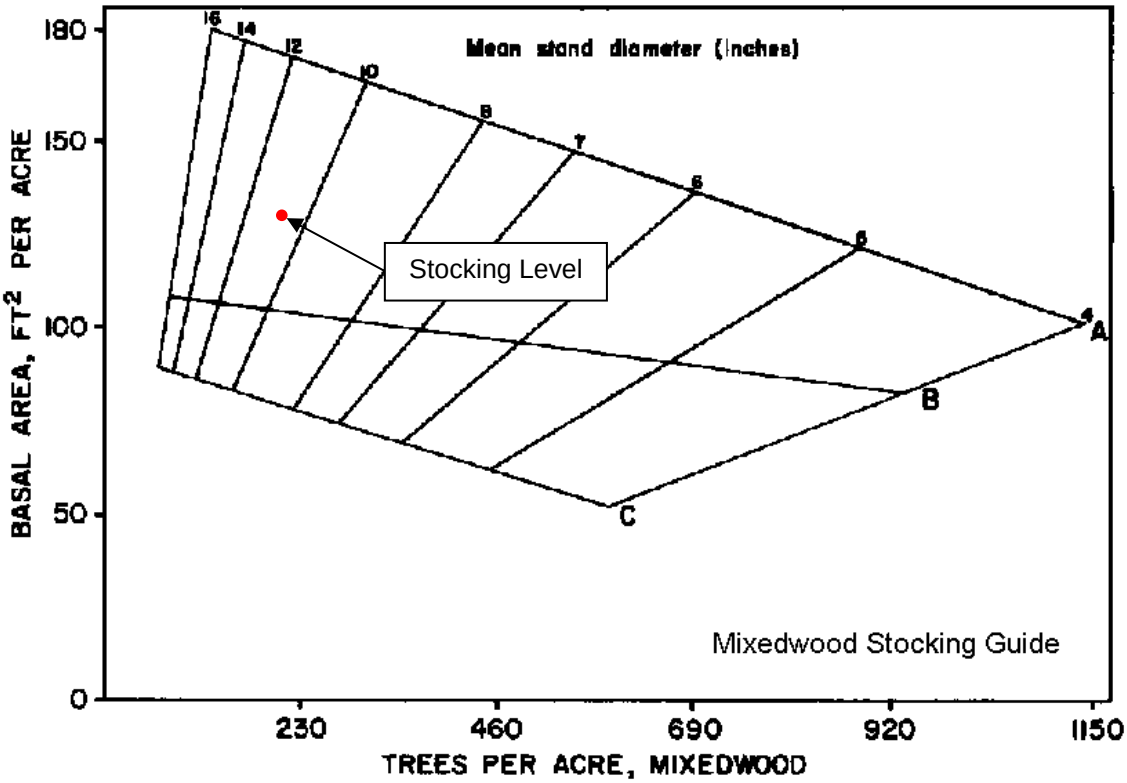
An unnamed perennial stream forms the northern boundary of the stand providing riparian habitat and a travel corridor for wildlife. An intermittent stream flows through the central portion of the stand during the spring snow melt and during high precipitation events.

The stand serves as softwood habitat and contains occasional cavity trees. Coarse woody material and snags are well distributed throughout the stand providing an abundance of nesting and foraging sites. Several large-diameter sugar maple snags can be found in the central portion of the stand. The occurrence of large, rectangular-shaped holes on these snags is a key indicator that pileated woodpeckers were foraging for insects. Bird habitat could be enhanced through an increase in structural diversity with the establishment of

understory and midstory vegetation layers which would provide additional cover for nesting, foraging, perching, and evading predation.

STOCKING

Total stocking (the "crowdedness" of the trees) is above the B Line of the Mixedwood Stocking Guide. Stocking of only those trees which will produce sawlogs (acceptable growing stock) is 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, growth rate of the dominant trees is good, that of the intermediate trees is fair, and mortality due to crowding is low. 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 AND OPERABILITY

Access to the stand will likely occur from the fire truck access and log landing area located on the east side of campus in the central portion of the property. Access within the stand is fair due to the moderately steep terrain and the existing main trail. However, areas of steep slopes, exposed ledge, and soft, wet soils will hinder harvest operations. Short to moderate skid distances will be required to access all portions of the stand.

SCHEDULED TREATMENT

A single-tree selection harvest is recommended and scheduled for the third year of the management period. The harvest should target mature white pine and unacceptable growing stock for removal. The residual basal area should be reduced to approximately 105-115 ft^2 in order to maintain crown closure and maintain conditions suitable to the regeneration of softwood species. Trees with low vigor, injuries, disease, or those at risk of dying before the next management period should be harvested. Growth should be focused on trees with the potential to produce high quality sawlogs. This harvest should take place in areas of the stand where stocking levels are high enough to meet the criteria set under this prescription.

Should enhancement of forest bird habitat be prioritized higher, no harvesting should occur during the breeding season from May to August. Cavity trees, snags, and coarse woody material should be identified and retained. Buffer zones should be established along riparian zones where little to no harvesting will occur to maintain canopy closure. Invasive species should be identified and hand-pulled as soon as possible.

As Stand 4 is an interior forest stand with light treatment in the stand and in surrounding areas, it is unlikely that habitat connectivity within the landscape will be adversely impacted by the scheduled activity. Yestermorrow Forest should maintain a closed-canopy forest and enhance forest attributes that would benefit bird species that prefer mature forests. The riparian area, along the stream at the northern end of the stand should be maintained to protect its function as a travel corridor.

SPECIAL CONSIDERATIONS

With the exception of the northwest corner, this stand is a poor option for the Stump to Sticker class due to its distance from the campus. However, this stand is a good candidate for firewood production.

Special consideration should be given to the perennial stream located along the northern boundary of the stand. A 50-foot “No Cut” buffer and equipment exclusion zone should be maintained along the stream.

Due to the presence of easily erodible soils, maintaining stable trails will be a top priority. The main concern is the potential for soil erosion in the skid trails. Temporary water bars should be installed and maintained during any active forest management. Permanent water bars should be installed according to the Vermont AMP manual upon the completion of harvest operations.

STAND 5
6.8 ACRES

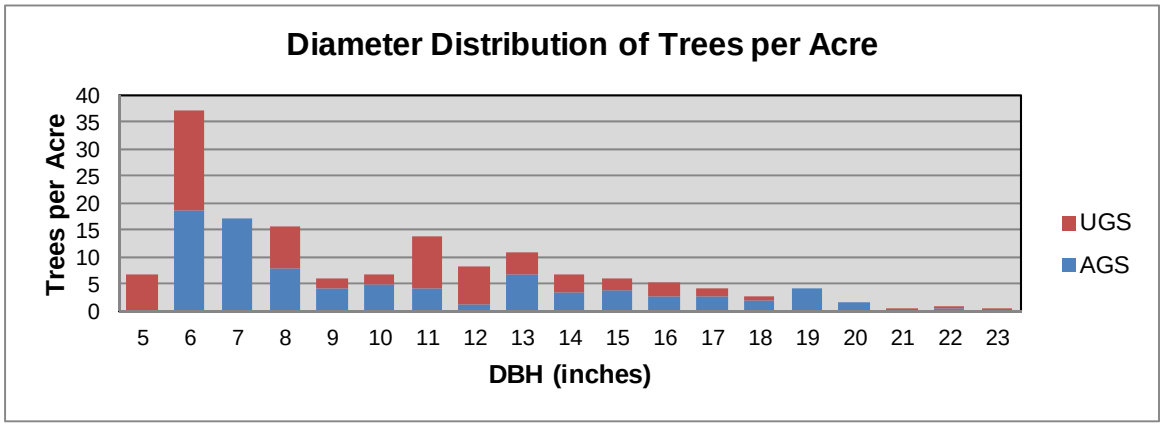
TYPE:
NH4B (northern hardwood small and large sawtimber)

SAMPLING METHOD:
Variable Radius (prism) Sampling: BAF 10
Number of Plots for this Stand: 11
Data Collected: 7/12/12

STAND DATA:
Natural Community Designation: Northern Hardwood Forest
Quadratic Stand Diameter: 10.8
Total Basal Area/Acre (BA): 98 ft^2
Acceptable Growing Stock Basal Area/Acre: 58 ft^2
Current Volume/Acre: 4.3 MBF & 17 cords

MANAGEMENT:
Age Class Distribution: Even
Cutting Cycle: 20 years
Desired Diameters: SM-24" YB-24" HK-24" WA-24"
Q Factor: 1.7
Insects or Disease: Beech bark disease, Eutypella canker
Desired Products: High quality sawlogs & veneer
Access Distance (to likely landing location): 800'-1,500'

DIAMETER DISTRIBUTION



SITE CHARACTERISTICS:
Site Class: 1 & 2 (Washington County Soil Survey & field verification)
Soil Type: Tunbridge-Lyman complex, very rocky, 8-60% slopes

MANAGEMENT STRATEGY
This stand will be managed for high quality timber production, wildlife habitat, recreation, and aesthetics. Over the long-term, long-lived, shade-tolerant species such as sugar maple will be favored. Uneven-age techniques will be utilized to encourage and maintain a balanced distribution of multiple age classes while maintaining an intact canopy.

STAND DESCRIPTION
This mature northern hardwood stand is composed of sugar maple (48% of the basal area), yellow birch (15%), hemlock (15%), white ash (7%), and American beech (6%). Red maple, black cherry, and other northern hardwoods are present as minor associates. Pockets of ironwood are found in the southern portion the stand. This is an adequately stocked stand of small and large sawtimber. An old bathhouse and outhouse are located in the central portion of the stand.

HISTORY
The stand likely originated from abandoned pasture approximately 80-100 years ago as evident by the presence of old barbed wire fencing. Field evidence indicates that a light, single-tree selection harvest has taken place on an on-going basis and appears to have targeted mature hardwoods and unacceptable growing stock for removal.

REGENERATION
Advance seedling and sapling regeneration is present in a light and uneven distribution. In most areas of the stand, advance regeneration is completely absent. Beech, sugar maple, and yellow birch are the most commonly regenerating species. The regeneration is generally inadequate to reproduce any portion of the stand to desirable species.

FOREST HEALTH
Beech trees with signs of beech bark disease were observed within this stand. When actively managing this stand, beech trees that appear to be resistant to the disease should be identified and retained. The intent is for the resistant beech trees to increase their numbers through the establishment of resistant seedlings.

A number of sugar maples were observed that are infected with Eutypella canker (*Eutypella parasitica*). Eutypella canker is a native fungus that attacks and kills the cambium of maple trees. In response to the fungal invasion, trees produce callus tissue that results in the typical hump-shaped cankers. Trees with signs of the disease should be removed as soon as possible to prevent the release of spores and to minimize the chance of infecting healthy trees in the surrounding stand.

INVASIVE SPECIES
No invasive species were observed within this stand.

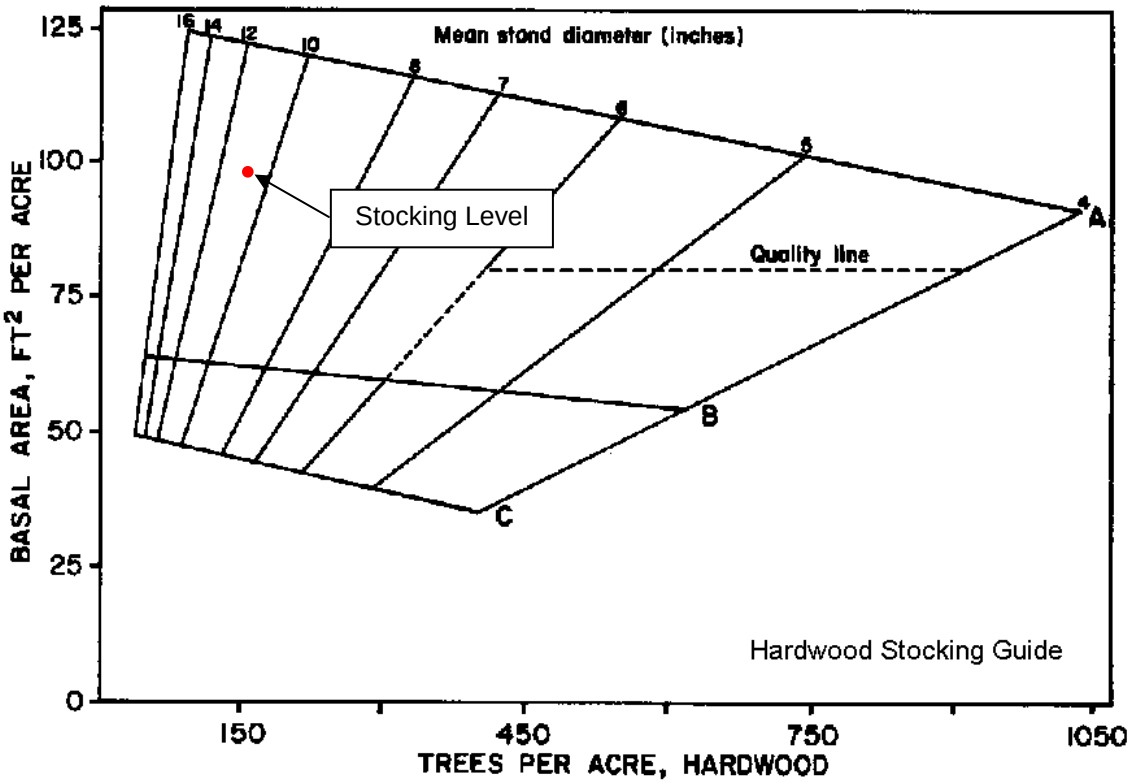
HABITAT
The State of Vermont has identified this stand as significant wildlife habitat and has designated it as a deer wintering area. Active forest management should strive to maintain the softwood component where possible to ensure that the stand continues to provide effective winter cover.

An intermittent stream flows through the northern portion of the stand during the spring snow melt and during high precipitation events.

The stand serves as upland habitat and contains occasional cavity trees. Coarse woody material and cavity trees are well distributed throughout the stand offering numerous sites for nesting and foraging. Sugar maple and beech snags can be found scattered throughout. The vertical structure of the stand, and ultimately bird habitat, could be enhanced through uneven-age practices that would create small openings in the canopy facilitating the development of understory and midstory vegetation layers.

STOCKING

Total stocking (the "crowdedness" of the trees) is 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, growth rate of the dominant trees is good, that of the intermediate trees is fair, and mortality due to crowding is low. 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 AND OPERABILITY

Access to the stand will likely occur from the fire truck access and log landing area located on the east side of campus in the central portion of the property. Access within the stand is fair due to the moderately steep terrain and the existing main trail. However exposed ledge and soft, wet soils will hinder harvest operations. Moderate skid distances will be required to access all portions of the stand.

SCHEDULED TREATMENT

A single-tree selection harvest is recommended and scheduled for the third year of the management period. The harvest should target diseased sugar maple and unacceptable growing stock for removal. The residual basal area should be reduced to approximately 70-80 ft^2 in order to maintain conditions suitable to the regeneration of sugar maple. Trees with low vigor, injuries, disease, or those at risk of dying before the next management period should be harvested. Growth should be focused on trees with the potential to produce high quality sawlogs. This harvest should take place in areas of the stand where stocking levels are high enough to meet the criteria set under this prescription.

Should enhancement of forest bird habitat be prioritized higher, no harvesting should occur during the breeding season from May to August. Cavity trees, snags, and coarse woody material should be identified and retained. Buffer zones should be established along riparian zones where little to no harvesting will occur to maintain canopy closure. Invasive species should be identified and hand-pulled as soon as possible.

As Stand 5 is an interior forest stand with light treatment in the stand and in surrounding areas, it is unlikely that habitat connectivity within the landscape will be adversely impacted by the scheduled activity. Yestermorrow Forest should maintain a closed-canopy forest and enhance forest attributes that would benefit bird species that prefer mature forests.

SPECIAL CONSIDERATIONS

This stand is a poor option for the Stump to Sticker class due to its distance from the campus. However, it is an excellent candidate for firewood production and could provide high-quality sugar maple lumber for the Stump to Sticker class, if the distance to the stand is considered reasonable.

Due to the presence of easily erodible soils, maintaining stable trails will be a top priority. The main concern is the potential for soil erosion in the skid trails. Temporary water bars should be installed and maintained during any active forest management. Permanent water bars should be installed according to the Vermont AMP manual upon the completion of harvest operations.

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.

Mixedwood 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 high-grading. It is usually best to avoid cutting in these stands unless it is a 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 sp.)*

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 sp.)*

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, it is 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 type. 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 have started or a clear-cut 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.
Clear-cutting	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-age 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.
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 clear-cut, 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.
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 to 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 affect permanent openings in the canopy (if not done in a 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 seed-bearers 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-age 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.
Single-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.
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 The distribution and representation of age and/or size (particularly diameter) classes and of crown and other tree classes. Usually refers to the crop, stand, or forest.

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 high 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 were developed.

LANDOWNER FORESTRY RESOURCES

FORESTER

Fountains Forestry, Inc.: www.fountainforestry.com

Fountains 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/

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/
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

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." * Fountains 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." *

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: 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."

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

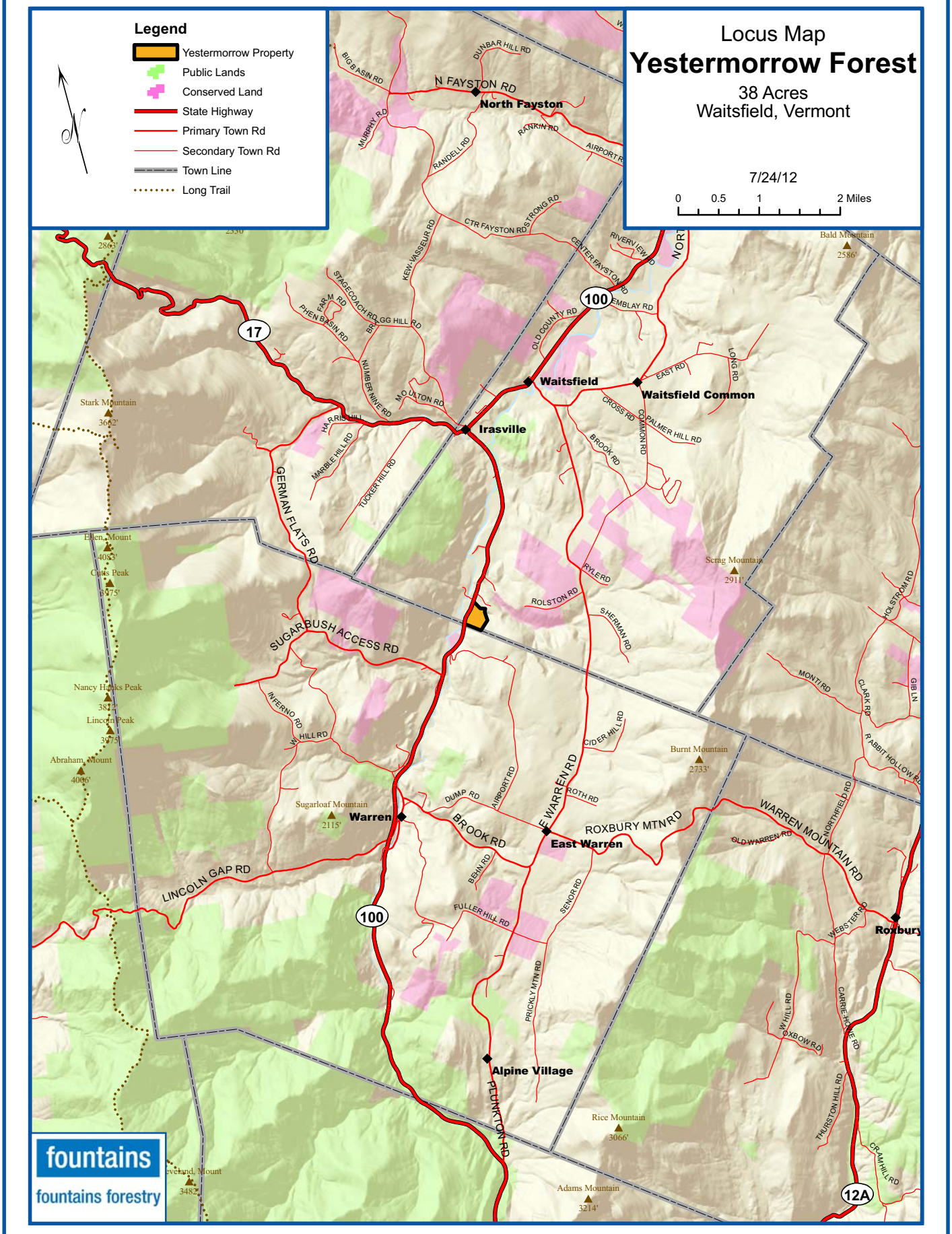
Create soil maps, interpretations, and more.

MAPS

Maps are a fundamental part of this management plan. The maps on the following pages should be used in conjunction with the information in the *General Description* & *Stand Description* sections for a more complete understanding of the forest. Included are:

- A Locus Map, showing the property's orientation to major roads in the area.
- A Forest Management Map, drawn to a scale of 1:1800 (1" = 150'). This map shows property and forest stand boundaries, roads, trails, streams, and many other internal features. This map also includes a Soils Map and a Deer Wintering Area Map as insets.
- A Topographic Map, drawn at a scale of 1:6000 (1" = 500). This map depicts the property while showing the topography of the local area.
- A Vermont Orthophoto Map (black and white) taken in 2006, drawn at a scale of 1:6000 (1" = 500).
- A Vermont Orthophoto Map (color), drawn at a scale of 1:6000 (1" = 500).

The maps used in this plan are based on 2006 Vermont Orthophotographs, field evidence, and a 2012 Site Plan prepared by McCain Consulting, Inc.


Legend
Yestermorrow Property
Public Lands
Conserved Land
State Highway
Primary Town Rd
Secondary Town Rd
Town Line
Long Trail
Locus Map
Yestermorrow Forest
38 Acres
Waitsfield, Vermont
7/24/12
0 0.5 1 2 Miles
N FAYSTON RD
North Fayston
DUNBAR HILL RD
BIG B ASIN RD
MURPHY RD
RANDELL RD
RANKIN RD
CTR FAYSTON RD
KEW-VASSEUR RD
STAGECOACH RD
FARM RD
PHEN BASIN RD
GG HILL RD
NUMBER NINE RD
M O LATON RD
HARRIS HILL
MARBLE HILL RD
TUCKER HILL RD
GERMAN FLATS RD
OLD COUNTY RD
CENTER FAYSTON RD
RIVERVIEW RD
EMBLAY RD
100
17
Waitsfield
Irasville
Waitsfield Common
EAST RD
LONG RD
CROSS RD
COMMON RD
PALMER HILL RD
BROOK RD
RYLE RD
ROLSTON RD
SHERMAN RD
SUGARBUSH ACCESS RD
Bald Mountain
2586'
Stark Mountain
3602'
Ellen, Mount
4083'
Cats Peak
3975'
Scrag Mountain
2911'
HOLSTROM RD
MONTI RD
CLARK RD
GIB LN
RABBIT HOLLOW RD
Nancy Hanks Peak
3821'
Lincoln Peak
3975'
Abraham, Mount
4006'
INFERNO RD
W HILL RD
CIDER HILL RD
Burnt Mountain
2733'
Sugarloaf Mountain
2115'
Warren
DUMP RD
AIRPORT RD
E WARREN RD
ROTH RD
ROXBURY MTN RD
East Warren
BROOK RD
WARREN MOUNTAIN RD
OLD WARREN RD
NORTHFIELD RD
LINCOLN GAP RD
BEHN RD
FULLER HILL RD
SENOR RD
WEBSTER RD
Roxbury
PRICKLY MTN RD
W HILL RD
OXBOW RD
CARRIE HOWE RD
THURSTON HILL RD
CRAM HILL RD
Alpine Village
PLUNKTON RD
Rice Mountain
3066'
Adams Mountain
3214'
12A
fountains
fountains forestry

Forest Management Map

Yestermorrow Forest

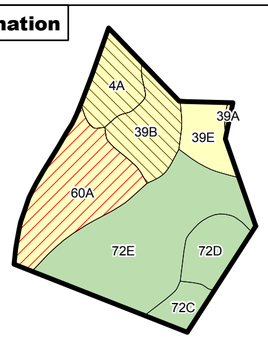
38 Acres
Waitsfield, Washington County, Vermont
Owned By: Yestermorrow, Inc.
SPAN #: 675-214-11130
Town ID #: 99222000

7/24/12

150 75 0 150 Feet

True

NRCS Soils Information



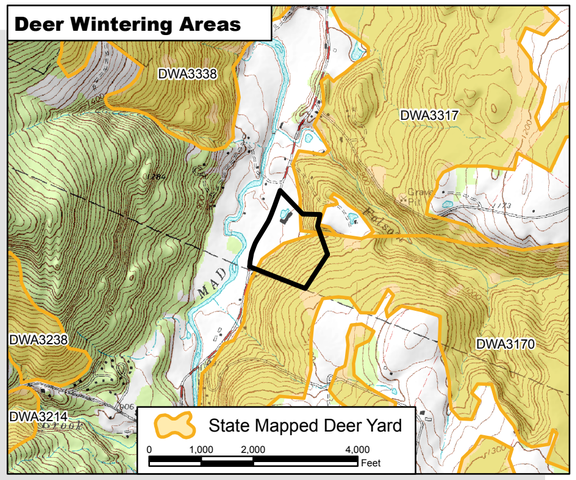
Legend

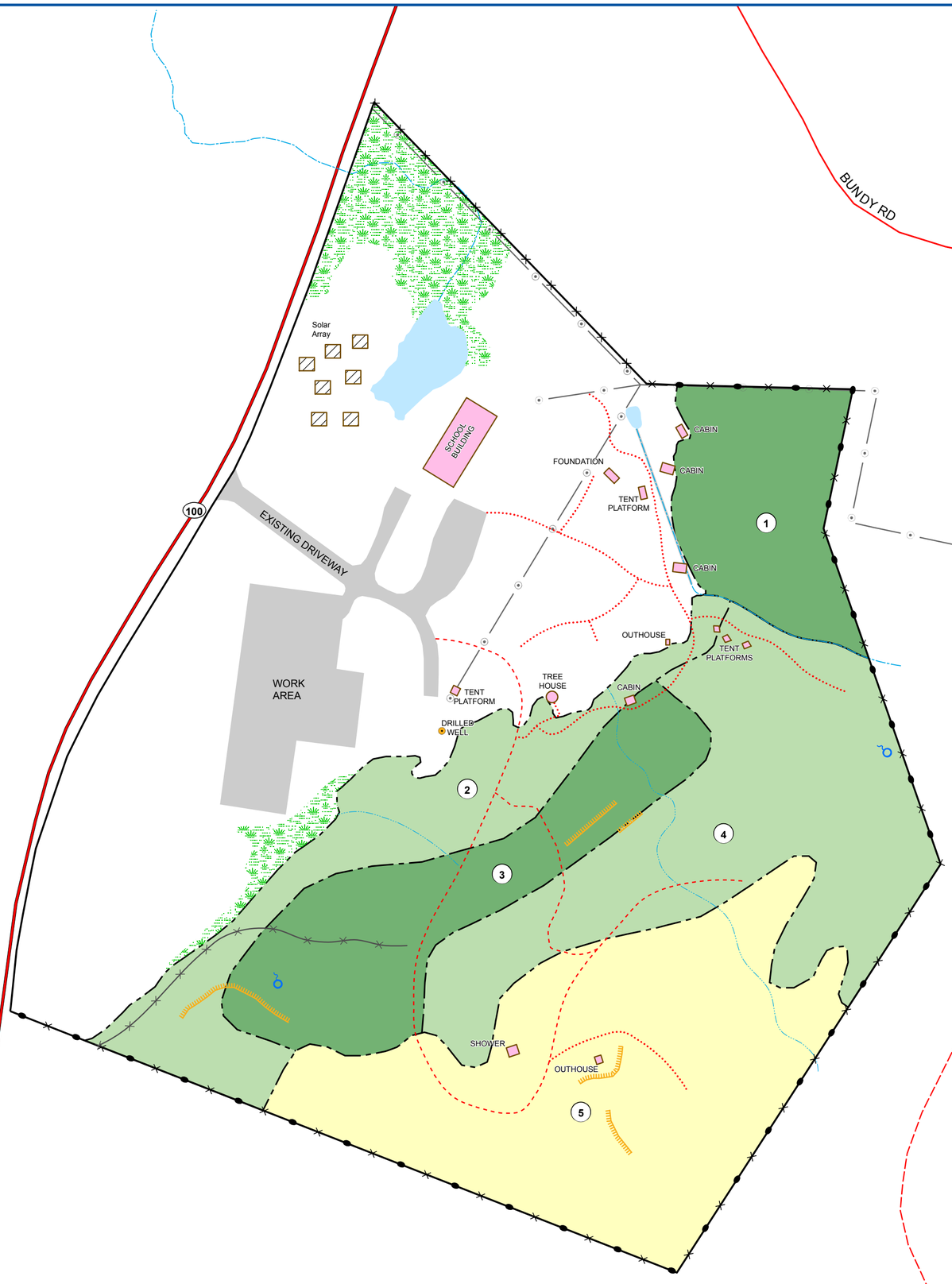
Agricultural Soil Classification
- Prime Ag Soil
- Ag Soil of Statewide Importance

Forest Soil Classification
- Class I Soils
- Class II Soils

Symbol	Name
39A	COLTON GRAVELLY LOAMY SAND, 0 TO 3 PERCENT SLOPES
39B	COLTON GRAVELLY LOAMY SAND, 3 TO 8 PERCENT SLOPES
39E	COLTON GRAVELLY LOAMY SAND, 25 TO 60 PERCENT SLOPES
4A	SUNNY SILT LOAM, 0 TO 2 PERCENT SLOPES
60A	WEIDER VERY FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES
72C	TUNBRIDGE-LYMAN COMPLEX, 8 TO 15 PERCENT SLOPES, VERY ROCKY
72D	TUNBRIDGE-LYMAN COMPLEX, 15 TO 35 PERCENT SLOPES, VERY ROCKY
72E	TUNBRIDGE-LYMAN COMPLEX, 35 TO 60 PERCENT SLOPES, VERY ROCKY

Deer Wintering Areas





Acreage Summary

Area		Acres
Forest Land		
Stand 1	Hemlock (HK3B)	2.2
Stand 2	Mixedwood (MW3B)	3.0
Stand 3	Hemlock (HK4B)	3.3
Stand 4	Mixedwood (MW4B)	5.5
Stand 5	Northern Hardwood (NH4B)	6.8
	Total Forest Land	*20.8*
Wetland		1.6
Ponds		0.4
Campus		15.2
	Total Non-Forest	*17.2*
Total Acreage of Parcel		**38.0**

Legend

Boundary Detail
- Fence Line
- Fence & Red Blazes
- Other Boundary

Forest Stand Boundary

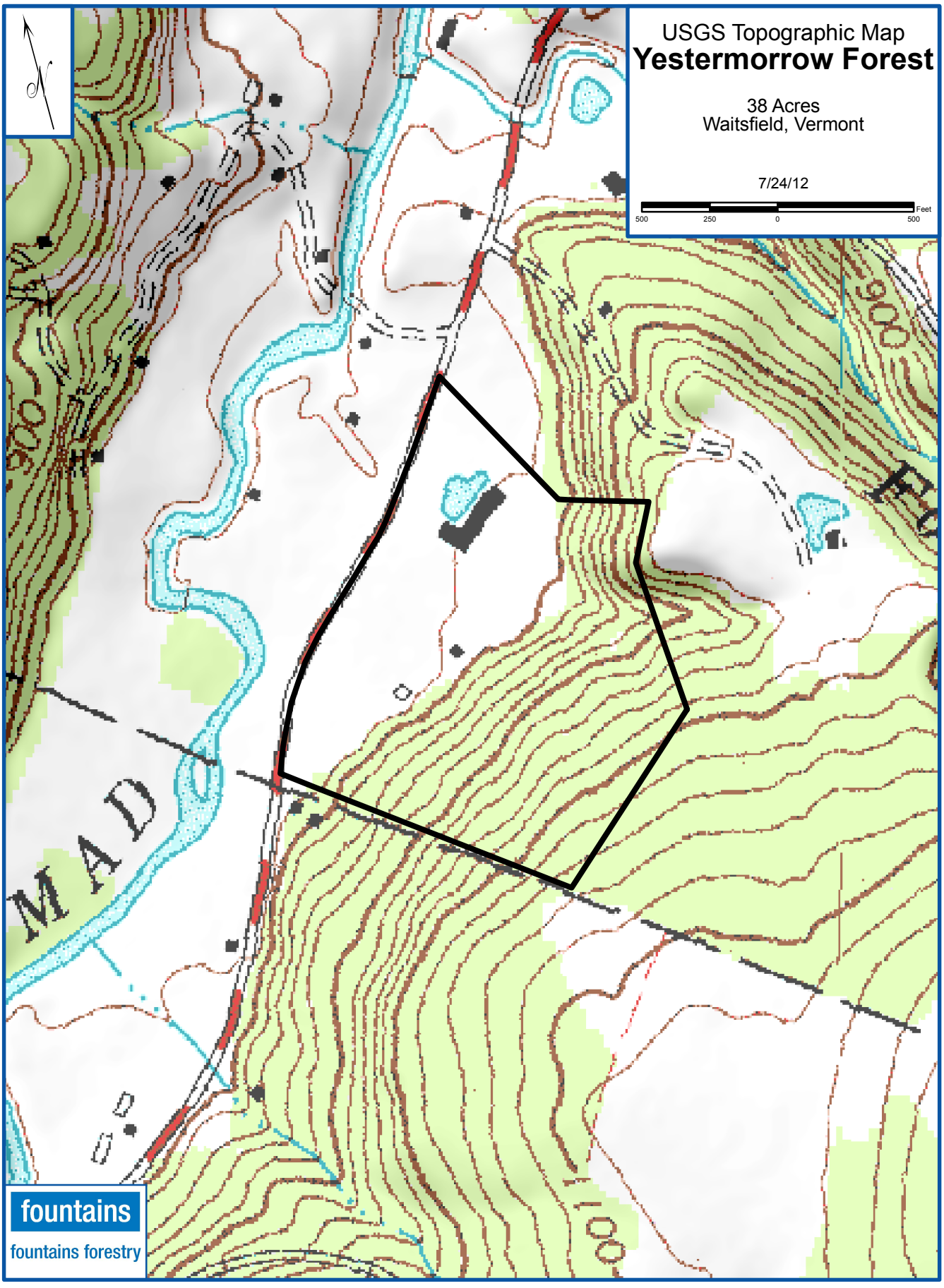
Broad Forest Type
- Hardwood
- Mixedwood
- Hemlock

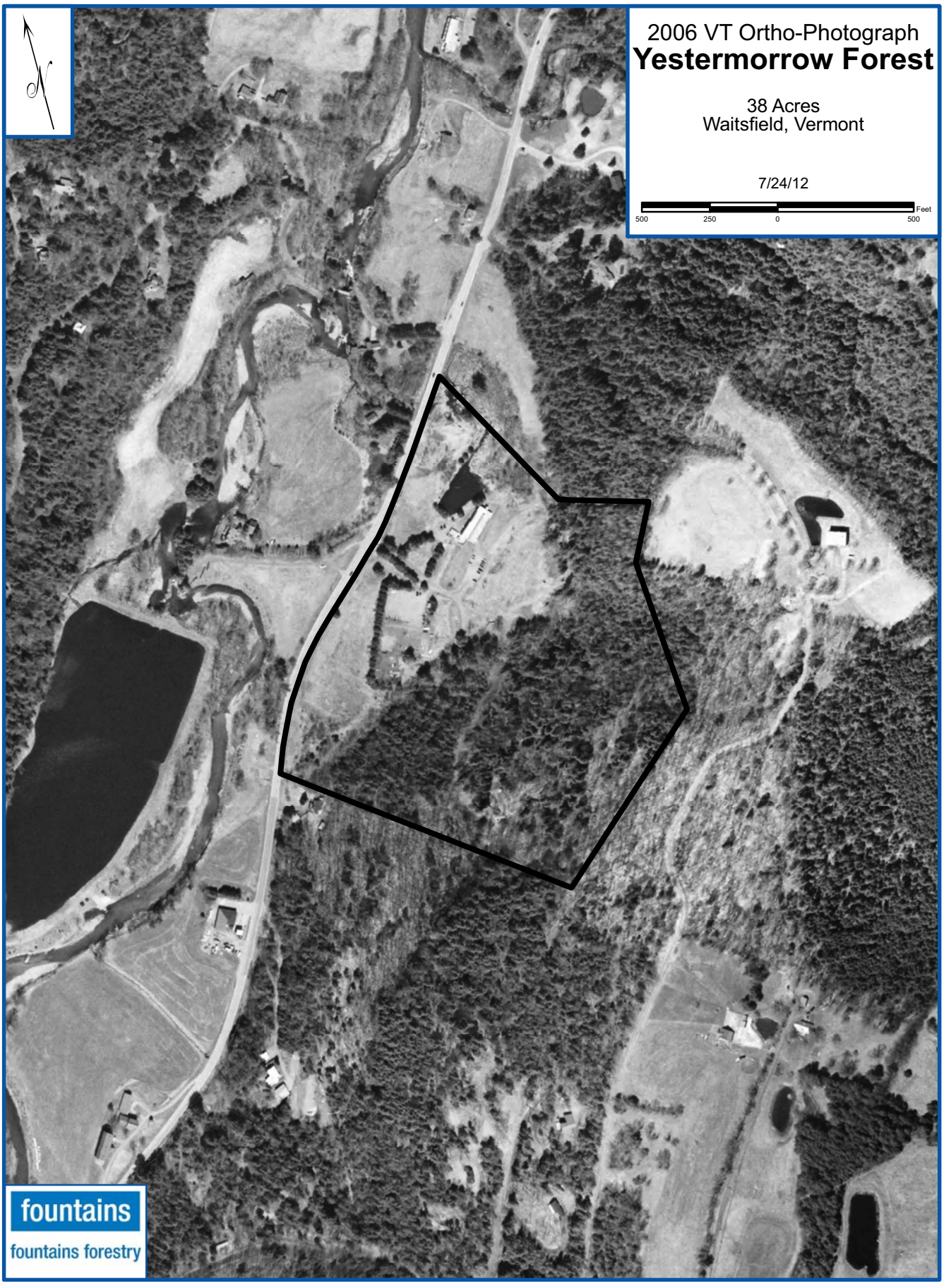
Water Courses
- Culverted Stream
- Perennial Stream
- Intermittent Stream

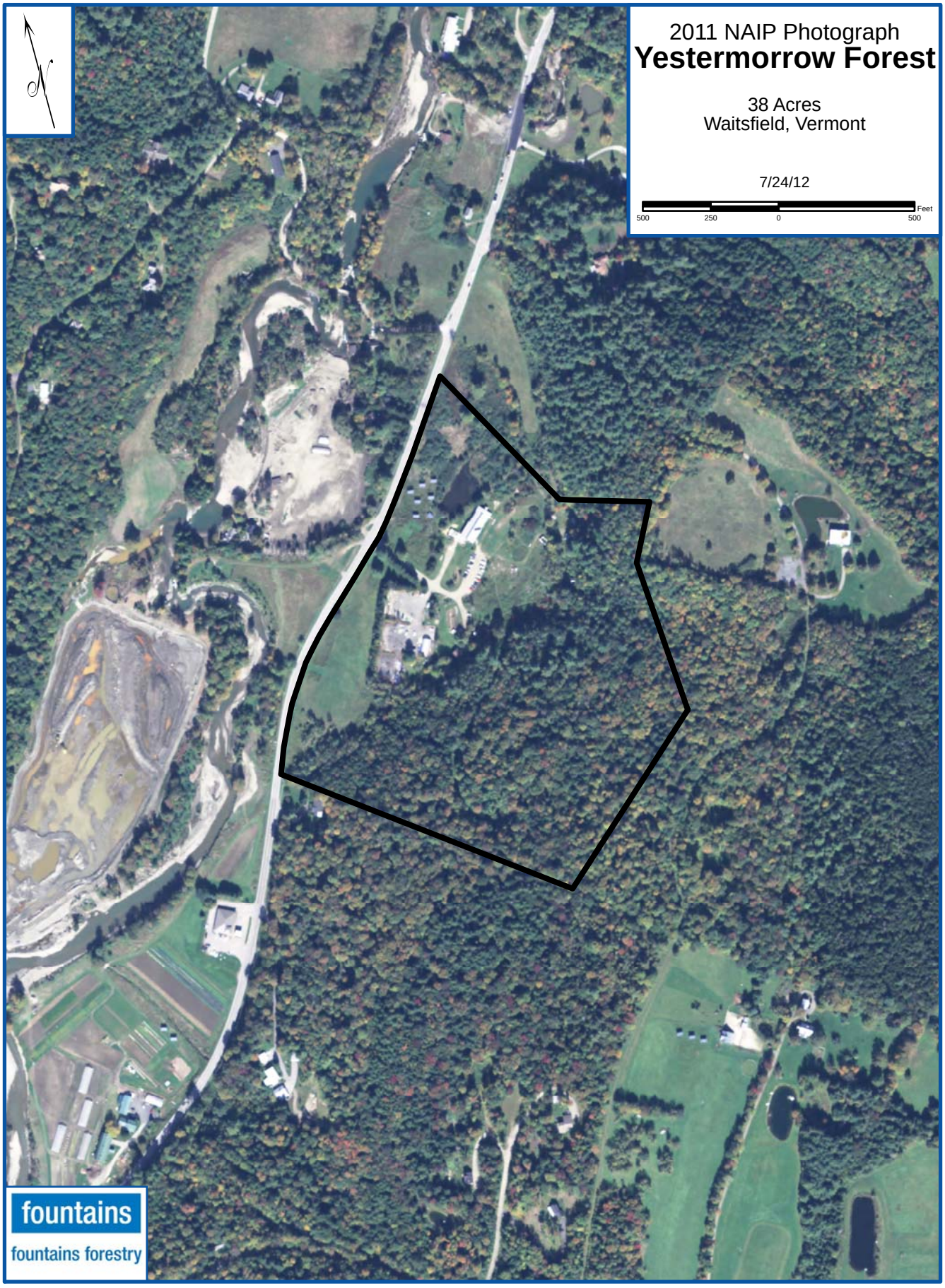
Access
- State Highway
- Maintained Town RD
- Private Gravel RD
- Hiking Trail
- Skid Trail

Features
- Ledge
- Existing Structure
- Natural Spring
- Pond
- Wetland
- Utility Line
- Internal Fence Line

fountains
fountains forestry


USGS Topographic Map
Yestermorrow Forest
38 Acres
Waitsfield, Vermont
7/24/12
500 250 0 500 Feet
900
900
MAD
fountains
fountains forestry


2006 VT Ortho-Photograph
Yestermorrow Forest
38 Acres
Waitsfield, Vermont
7/24/12
500
250
0
500
Feet
fountains
fountains forestry


2011 NAIP Photograph
Yestermorrow Forest
38 Acres
Waitsfield, Vermont
7/24/12
500 250 0 500 Feet
fountains
fountains forestry