

Forest Stewardship Plan

(10-Year Planning Period)

Hebert Forest
Salisbury Road
Mont Vernon, NH
153.8 +/- Acres
November 28, 2007

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Property Owners: Mont Vernon Conservation Commission
Wes Robertson, Chairman
PO Box 444
Mont Vernon, NH 03057

Location: Salisbury Road, Mont Vernon, NH

Total Acreage: 153.8 +/- acres

Wetland Acres: 9.5 acres

Map/Lot Numbers: Map 6, Lot 17

Date Prepared: November 28, 2007

General Description of the Property

This large, unbroken piece of property located in western Mont Vernon, east of Salisbury Road, offers quite a valuable source of habitat for wildlife between Hazen Drive and Salisbury Road. This becomes particularly more essential to wildlife populations as Beech Hill Road continues to become a main artery for development in this area of town. This property will also begin to provide the Town Conservation Commission with opportunities for periodic revenue from timber as well as an excellent place to educate the public about sound forest management. This property is located across the road from another area of Town land that includes a very large wetland that flows into the wetland complex located south of this parcel. With dense hemlock sapling stands, intermittent brooks, areas of deep, old conifer forest, and isolated pockets of wetlands, this forest offers excellent habitat for wildlife as well as a place to conduct forest management operations.

Boundaries

The boundaries for this property are fairly discernible, and all boundaries have now been blazed with yellow paint. Boundary lines consist almost entirely of lines between known corner monuments. The property has been surveyed by licensed surveyor Robert Todd, which has helped immensely in gaining access for this woodlot. Apparently there is a slight boundary dispute over monuments in the southeastern corner of this property with the owner to the east of this land. There is also one corner of this property in the northwest that has not yet been definitively defined as belonging to the Town of Mont Vernon. A note on the survey by Mr. Todd indicates that more research would be needed to determine this with accuracy.

Access

Access to this property is currently fairly poor. The woodlot does have road frontage on Salisbury Road to the west, although no formal access point has been created at this time. The only other access onto this property is from ATV trails entering the woodlot from the north, west, and east. The large wetland complex to the south of this property prohibits access from that direction.

Forest Types & Harvest History

Forests with varying composition in terms of species, age, and density are able to respond with more resiliency to catastrophic events than monocultures. Most trees in unmanaged, overgrown forests are chronically short of much-needed nutrients, sunlight, and water, and are therefore constantly living in a stressed environment. Pre-stressed trees are much more susceptible to disease than their healthy counterparts growing in a well-spaced, healthy forest. Forests are broken down into management units called stands, which are areas of trees with similar species composition, size, and frequency of occurrence.

White pine clearly dominates this property in the overstory, with very few areas that do not have large overstory pine. On the other hand, much of this property is dominated by hemlock in the understory. Overall, this woodlot consists of the most common species of tree found in southern New Hampshire: white pine, red oak, hemlock, and red maple.

Portions of this woodlot were certainly harvested in the past 50-75 years, which is where the oak-hardwood stands have come from. On the other hand, some areas (like Stand 5) appear to not have had much active forestry work in the past 100 years. On a much more recent note, however, a timber trespass appears to have occurred in Stand 11 from the neighbor to the west within the past 10 years. Unless the Town gave permission for their trees to be harvested, it would seem that someone crossed over the boundary line, cut a number of large white pine, and removed them to the west.

The obvious lack of stone walls in an area that is so rich with an agricultural history would seem to indicate that this whole property was part of a larger area of pasture, or that the property was not used agriculturally in the past. However, given the abundance of white pine growth and stone walls found on adjacent parcels, it would seem that the former theory is probably more correct.

Soils, Terrain, & Hydrology

Forests are essential for preventing erosion of existing soil and maintaining clean water. For the most part, there is very little erosion taking place on this woodlot because of the undisturbed duff layer of organic material sitting on top of mineral soil. The exception to point would be certain locations along the ATV trail network, which either go through poorly-drained soils or lack erosion control measures to keep water from carrying away mineral soil.

Overall, the terrain on this property is gently rolling, with some areas of steeper ground rising up a low ridge on esker-like formations. This property divides two watersheds to the north and south, with streams flowing out of this forest in both directions.

Riparian and wetland areas are the places that open water and upland sites meet. A riparian zone is the general term for the area where water and land meet, whereas a wetland is an area in a riparian zone that specifically has hydric, or wet, soils as well as vegetation that grows on that type of soil. Riparian areas are important for a number of



reasons. They offer critical habitat for many wildlife species, providing shelter, food, water, and travel corridors. They are also very useful for flood control by acting as a sponge during times of high water volume, and then releasing that water slowly and consistently over time. Without wetlands, streams would fluctuate greatly between periods of high flow and dry streambeds. Finally, riparian areas are key for filtering water as it travels from upland sites to the open water, keeping out many chemical impurities and keeping water silt-free.

This property has a number of small, isolated wetland pockets that might be considered kettle holes or vernal pools. In general, these are divided into two categories: wooded and non-wooded. The non-wooded wetland pockets consist of flat areas located in depressions of rolling terrain, with high bush cranberry, blueberry, alders, and ferns. These areas can be some of the first areas to grow new grass and green growth in the spring and the last areas to maintain green growth in the fall, thereby being quite important for browsing animals like rabbit and deer. Forested wetland areas are generally dominated by red maples growing on hummocks, often with standing water found between hummocks. Hardwood wetland shrubs similar to those found in the unforested wetland areas can be found these wetland areas as well.

Wildlife

Biological diversity can be described as the variety of plants and animals located in a given tract of land or landscape and the communities that are formed by that variety of species. Overall, this property has general biodiversity, without any incredibly unique habitat types. The small wetland depressions located throughout this property, however, do offer areas of different vegetation, such as high bush cranberry and other hardwood shrubs. Coupled with the very existence of water, these small areas greatly enhance the wildlife diversity.

One of the benefits to thinning this property would be to allow the immature red and white oaks an opportunity to produce hard mast to their full potential, since they are rather crowded between other trees at the moment. By allowing the oak crowns more space, they will be able to expand and enlarge, which in turn will increase their photosynthetic capabilities. This increase in energy production allows the tree more energy to focus on reproduction, which increases the amount of mast on a given tree. These oaks are essential for providing deer, turkey, and many small mammals with protein-packed food to eat during the fall months in preparation for winter. By increasing the small mammal population, larger predators such as weasels, foxes, coyotes, bobcats, and raptors have more abundant food with which to feed their own young.



A typical northern hardwood stand with few trees of value in the overstory. This would be a prime site for a patch clearing.

Another area of habitat improvement to be done on this property would be to open up small patches ($\frac{1}{4}$ to $\frac{1}{2}$ acre in size, or even larger) to allow brushy, sapling growth close to the forest floor. This management strategy, applied in each harvest, will provide a periodic supply of early successional habitat throughout

the property instead of being confined to the area of the powerline. Furthermore, it would help to offer some area of open grassland in the northern that is only mowed once a year, perhaps with fruit trees planted along the northern edge of the opening to provide soft mast for animals.

Two of the biggest threats to biological diversity today are loss of habitat to non-forest uses and invasive species. Thankfully, neither of these two threats currently pose much danger for the Hebert Lot.

Timber Cruise

A detailed timber cruise was completed on the property using a 300' by 300' spacing, which yielded 50 plots of tree data. This data was used to tabulate the current tree growth on the property and the field notes made during this cruise helped to create many of the maps in this management plan. A cruise is a statistical sample that is used to determine the volumes of various forest products growing on the property. This cruise generates volumes in terms of cords (for all trees 6-11" in diameter, or trees larger than 11" that are not suitable for sawtimber) and board feet (for trees 12" and greater in diameter that could be sold and sawn into boards). The diameter of a tree is measured at 4.5' above the ground, which is an industry standard referred to as diameter at breast height (DBH). From this intensive cruise, a total of thirteen stands are shown for this property. Stands are areas of trees with similar species composition, size, and frequency of occurrence. These stands will be the basis for the methodical analysis of the forest management plan, and are depicted on the following Stand Map.

Landowner Goals & Objectives

The Mont Vernon Conservation Commission is interested in protecting key parcels of property in town from development, but is interested in doing more than simply keeping the land locked up. As part of an overall strategy for land use management, the MVCC would like to utilize their land to the best possible potential while keeping in mind the diversity of the public. In this, the Commission has outlined a number of goals, which generally tend to mirror the National Tree Farm standards. These standards include a willingness to harvest timber and manage forestlands for the production of forest products, maintaining and/or creating and enhancing wildlife habitat, recreation, and water quality. In addition, the MVCC is interested in using their wooded parcels as examples for how private landowners can manage their forestlands sustainably.

Specifically for this forestland, management will include improved access for emergency and timber vehicles, locating a potential parking area, and improving trail access throughout this forestland. Active forest management will include managing for forest products while enhancing wildlife habitat for multiple species and avoiding sensitive areas that are not conducive to logging operations. This enhancement of wildlife habitat will include creating and maintaining small wildlife openings where appropriate, thinning around mast trees to increase food production, and allowing new succulent growth to be established on the forest floor in the form of new regeneration. Using the revenue from periodic, sustainable harvests, the Commission will be able to invest back into the property by maintaining wildlife openings, planting fruit-bearing trees, paying for surveys on other Town forested areas, and potentially help to finance the

protection of other lands in town. Overall, by using the land to its highest forestry potential instead of simply locking it up, this Conservation Commission's goals for the property clearly show a dedication to the land and a long-term ownership ethic.

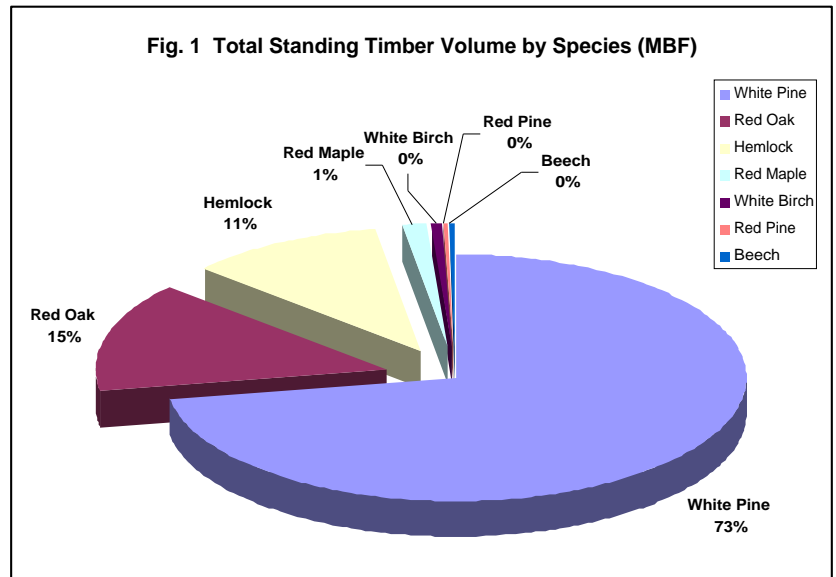
Forest Products Summary Table for Entire Property
Town of Mont Vernon – Hebert Forest—Mont Vernon, NH
Total Acreage: 153.8+/- acres

<u>Species</u>	<u>Board Feet</u>
White Pine	973,036
Red Oak	192,493
Hemlock	146,458
Red Maple	20,168
White Birch	5,485
Red Pine	4,113
Beech	3,488

Total Sawtimber 1,345,240¹

Hardwood Cordwood	1,410 Cords
Softwood Pulpwood	1,395 Cords

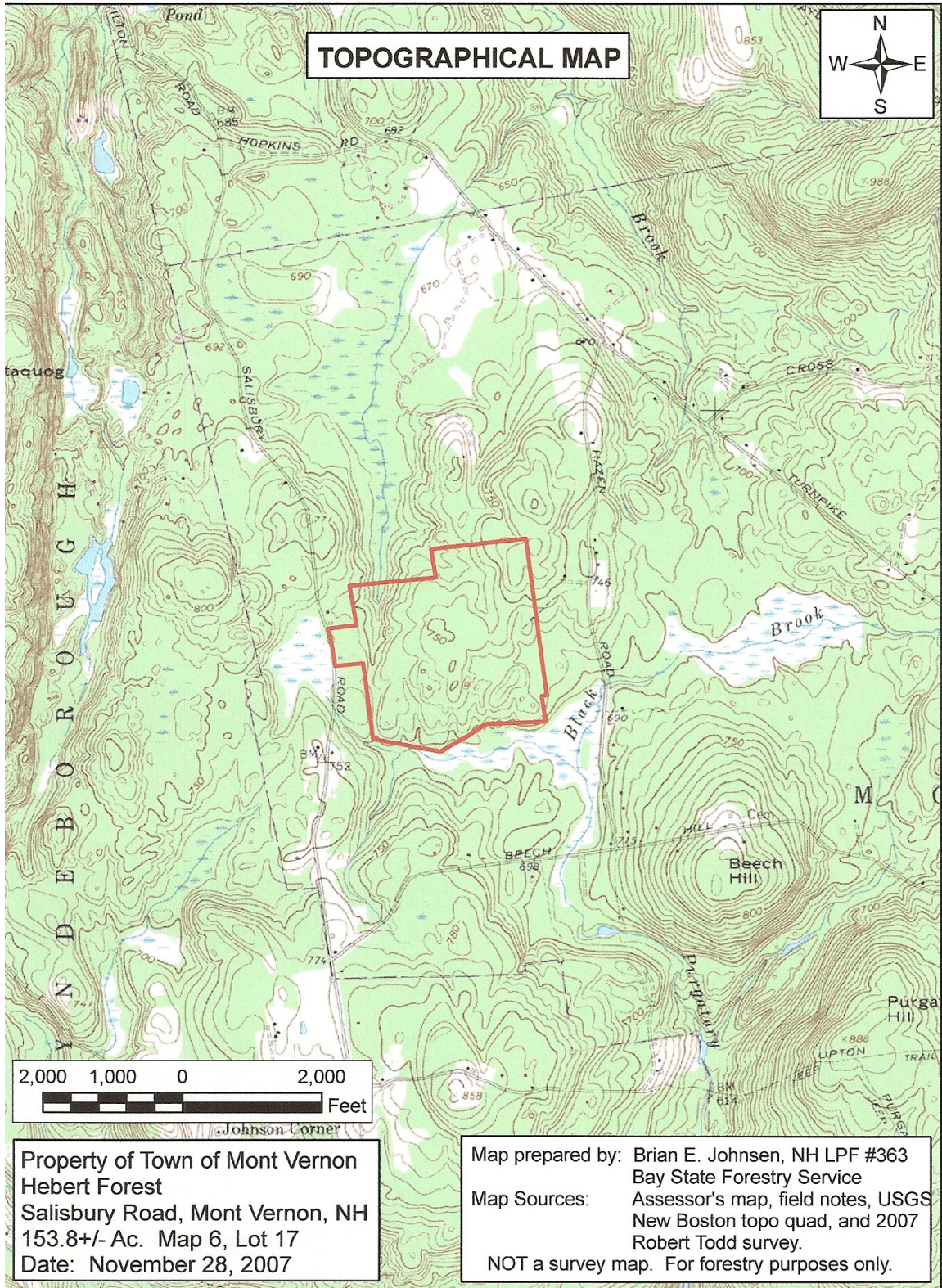
Total Cordwood 2,804 Cords²

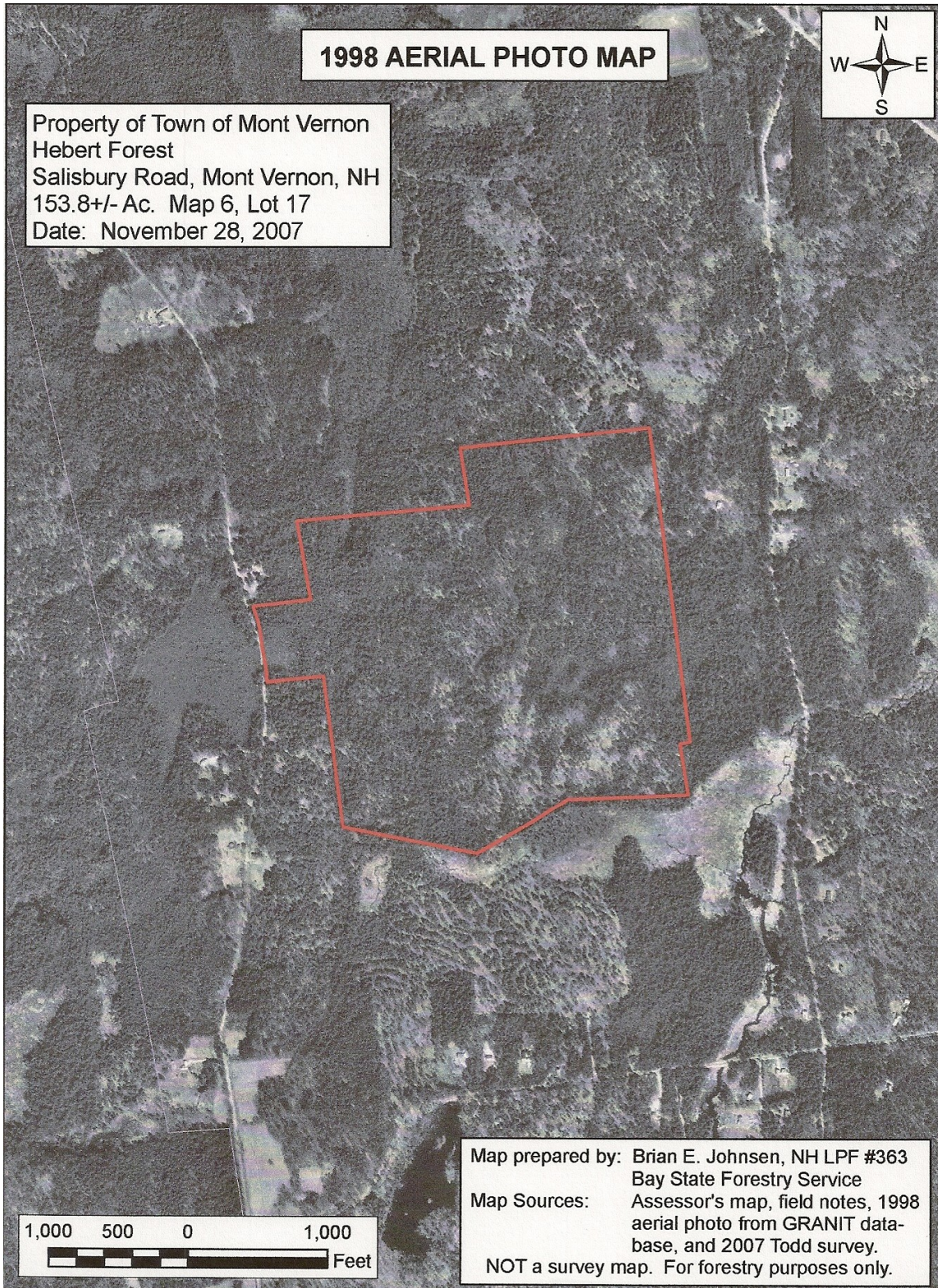


A basal area factor 10 prism was used to conduct the inventory sample. A total of 50 plots, distributed across each forested stand, were taken to arrive at this cruise summary.

¹ This sawtimber total represents all the trees of sawtimber quality 12 inches and greater in diameter found in this block. In order to capture this total volume, all trees of this specification would have to be harvested.

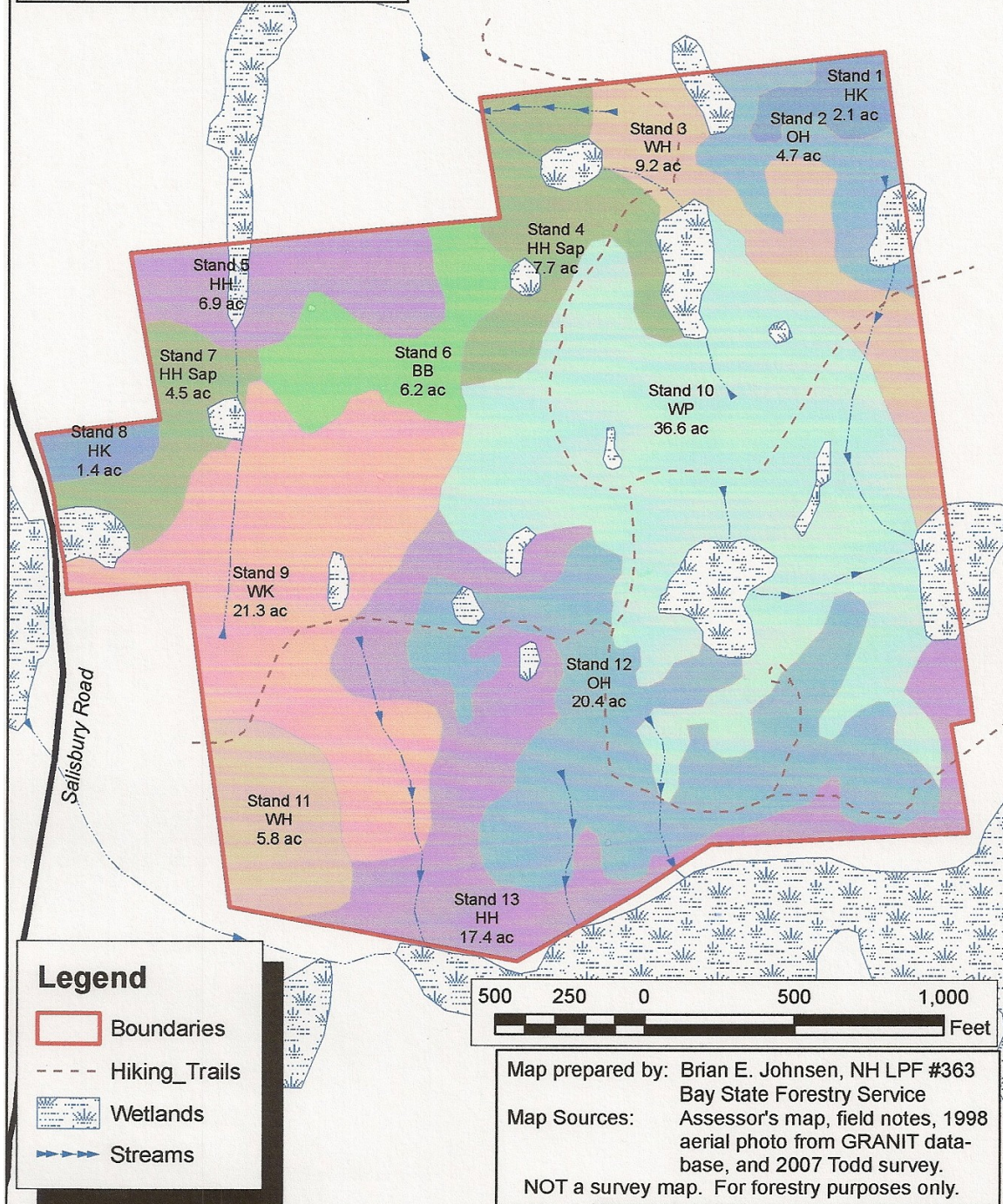
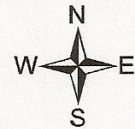
² These cordwood totals, both softwood and hardwood, represent all the standing trees with diameters of 6-11.9 inches found in this block, as well as trees of larger diameters that do not meet sawtimber quality specifications. In order to capture this total volume, all trees of this specification would have to be harvested.





Property of Town of Mont Vernon
 Hebert Forest
 Salisbury Road, Mont Vernon, NH
 153.8+/- Ac. Map 6, Lot 17
 Date: November 28, 2007

STAND MAP



General Management Strategies

Timber – One of the main goals for this property is sound timber management in order to produce a periodic income. A list of management strategies on a stand-by-stand basis is discussed later in this plan. In general, the timber quality and value on this property would increase with a thinning across the entire area to reduce overstocking. Most of the thinning will use spacing between desirable overstory crowns as a rule, although some areas will be opened up with small patch clearings in areas with little desirable overstory growth.



Fish/Wildlife Habitat – Although some activities can manage for a specific plant or animal (species specialists), most forest management activity focuses on habitat generalists by managing for a diversity of species, protecting existing critical habitat, and enhancing existing habitat. Care will be taken to maintain some dense hemlock areas to provide deer wintering areas for the local populations of deer and moose that enjoy the use of this property and adjacent properties. Keeping these large browsers in mind, there will be some areas that are opened up to sunlight to encourage young growth on the forest floor. These types of small openings that are allowed to grow back into early successional habitat will be beneficial to upland game birds and snowshoe hare that frequent this property.

Soil – Care will be taken to not harvest in mud season, when the ground is too soft, or on excessive slopes, to minimize rutting and erosion during harvest operations. Landings will be seeded with a conservation mix and limed at the conclusion of the job to stabilize the soil, and waterbars will be installed on skid trails where necessary.

Water Quality – Buffers will be left along streams and the wetland edge to avoid removing too many trees at once; this will provide soil stabilization along waterways and adequate shade. This shade will decrease water temperature and therefore increase the water's oxygen-holding capacity. The wetlands and streams will be left intact to keep the water clean and silt-free. Poled fords or temporary bridges will be used when crossing smaller streams to further prevent siltation. Fueling of machines will not take place near the water's edge to prevent pollution.

Wetlands – In order to preserve the integrity of more sensitive areas of this woodlot, wetlands will only be harvested under dry or frozen conditions.

Recreational Resources – The skid trails will provide a nice network of trails for recreational opportunities, both for walking and wildlife viewing. To this end, trails will be kept free of slash where possible.

Aesthetic Values – To maintain good aesthetics, logging operations will not rut up the soils and will cut up the tops so they lay close to the ground for rapid decay. Thinning that takes place along Salisbury Road should allow passersby to observe sound forest management, without being so heavy that blowdown occurs.

Cultural Features – Care will be taken to avoid breaching or breaking the stone walls during timber harvests unless no openings exist to allow the trees to be skidded to the landing. To accomplish this, loggers will use existing barways for skidding.

Forest Protection – The diversity of tree species does well to protect this property from a forest pest looking for a monoculture of timber. By keeping logging slash low to the ground, decay is speeded up; this prevents too much of a buildup of fuels as a fire hazard. Having the boundaries blazed should help to deter any mistaken timber trespass that might occur onto Town land in the future.

Threatened/Endangered Species and Unique Natural Communities – During all the walks through this forestland, no species were identified as either threatened or endangered. If at some time any flora or fauna are identified on this property as such, appropriate measures will be taken to prevent disturbing that species.

Invasive Species Considerations – During all the walks through this forestland, no species were identified as non-native, exotic, invasive species. If at some time any vegetation is identified on this property as such, appropriate measures will be taken to prevent the spread of that species, and a plan for management and control for that species will be considered.

Forest Management Plan

Stand 1 – Hemlock/White Pine Sawtimber

Standing Volumes -- Stand 1				2.1 Acres
Species	Average BA/acre (sq. ft./ac.)	Average Height (16' sticks)	Volume per acre (bd. ft./ac.)	Total Volume (bd. ft.)
Hemlock	70	1.8	8,000	16,800
White Pine	40	2.3	5,500	11,550
Sawtimber Total:	110	2.0	13,500	28,350
		8' sticks	Cords/ac.	Total Cords
Cordwood	40	2.5	7	14
Softwood Pulp	80	3.9	19	41
Total BA/acre	230			

Description:

This small dense stand, located in the northeastern corner of the property, consists mostly of a hemlock sawtimber overstory with some white pine sawtimber as well, both in the 12-20" diameter range. Scattered throughout this stand is an understory of mostly hemlock 8-10" in diameter, along with some mixed oak poles of similar size. The heavy conifer overstory allows little sunlight to reach the forest floor, which translates into very little in the way of regeneration. Only a few pockets of hemlock saplings 3-6' tall have managed to survive in this sunlight-robbed environment. Soils are moderately well-drained, with some surface rocks. The terrain is undulating, with grades of 3-8% generally sloping to the west and south. Access to this stand must be established using skid trails to connect this stand with the landing on Salisbury Road. This stand is one of the furthest points from vehicular access.

Recommendations:

This stand would benefit from a thinning that would remove much of the mature hemlock sawtimber as well as some of the slow-growing hemlock pulpwood. This thinning would release the better-quality and higher-valued white pine sawtimber to increase in diameter growth, as well as open up the forest floor to plenty of sunlight, allowing more diverse regeneration to be established. Overall, this thinning would change the composition of this stand into more of a mixed white pine and hardwood stand, instead of being dominated by hemlock. This stand's stocking level should be reduced to 110-150, so as not to remove too much and suffer from wind damage after the harvest. This harvest would remove about 8 MBF of hemlock along with other products.

Stand 2 – Red Oak/Hardwood Small Sawtimber & Large Poles

Standing Volumes -- Stand 2				4.7 Acres
Species	Average BA/acre (sq. ft./ac.)	Average Height (16' sticks)	Volume per acre (bd. ft./ac.)	Total Volume (bd. ft.)
Red Oak	30	1.2	2,500	11,750
White Pine	10	3.0	1,750	8,225
Red Pine	5	3.0	875	4,113
Beech	5	1.0	375	1,763
Sawtimber Total:	50	2.0	5,500	25,850
		8' sticks	Cords/ac.	Total Cords
Cordwood	65	3.2	13.5	64
Softwood Pulp	30	3.3	6.4	30
Total BA/acre	145			

Description:

This stand, located in the northeastern corner of the property, wraps around the southern and eastern edges of Stand 1. It is comprised of red oak, red maple, and beech 8-16" in diameter, along with some scattered overstory white pine 18" in diameter. Scattered throughout this stand and other stands in this area (namely 3 and 10) are occasional red pines 14-18" in diameter. Growing under this mid-sized overstory is moderate amounts of sapling and seedling regeneration, mostly beech and hemlock 6-12' tall. Soils are moderately well-drained to well-drained with undulating terrain, generally sloping to the east and west with grades ranging from 3-6% to 5-10%. Access to this stand is currently fairly poor, although the terrain will not make it difficult for a skid trail from the landing on the western side of the property to reach this area. One of the main trails that leads off the property passes through the southern tip of this stand. This stand sits between two of the many small depression wetland areas on this property, one to the northwest and one to the southeast.

Recommendations:

This stand would benefit from a chipping operation that would thin out the poor-quality hardwoods and red-rotted or weeviled white pines, allowing the best growth to increase for the high-quality red oak, black birch, red maple, and white pine. Some poorly-formed white oaks, though not worth much for future sawtimber, should be left as a source of preferred hard mast producers for wildlife habitat. This light thinning will also help open up the forest floor to new growth, allowing more species to regenerate other than beech and hemlock, and result in stocking levels of 80-110 square feet per acre. Such a thinning would remove about 4 MBF of white pine sawtimber, 3 MBF of mixed hardwoods, and 20 cords of firewood.

Stand 3 – White Pine/Red Oak/Hemlock Sawtimber and Poles

Standing Volumes -- Stand 3				9.2 Acres
Species	Average BA/acre (sq. ft./ac.)	Average Height (16' sticks)	Volume per acre (bd. ft./ac.)	Total Volume (bd. ft.)
White Pine	28	2.0	3,500	32,200
Hemlock	10	1.0	750	6,900
Red Oak	5	1.3	438	4,025
Red Maple	5	1.0	375	3,450
Sawtimber Total:	48	1.3	5,063	46,575
		8' sticks	Cords/ac.	Total Cords
Cordwood	35	3.2	7.3	67
Softwood Pulp	63	3.4	13.7	126
Total BA/acre	145			

Description:

This stand, located in a band running northwest to southeast along the edge of Stand 2, consists of white pine 12-18" in diameter with a component of mixed hardwood (red oak, red maple) and hemlock 10-14" in diameter. There is also a mixed understory of white pine, hemlock, and hardwood poles 6-10" in diameter. Regeneration is patchy in this stand, with some areas of mediocre regeneration, and other pockets of very good white pine 2-4' tall as well as some beech 3-6' tall. Essentially, this stand is the mixing point between Stands 2 and 10, with more hardwood in Stand 2 and more white pine in Stand 10. Soils are moderately well-drained, with some isolated pockets of poor drainage, and the terrain is rolling. The northern main ATV trail through this property enters and exits the property through this stand and Stand 2, with the middle portion of the trail found in Stand 10. Access to this stand will be through skid trails coming through Stands 9 and 10.

Recommendations:

This stand would benefit greatly from a harvest of similar intensity as Stand 2, given the similar starting stocking levels. The thinning in this stand, however, would focus more on removing some of the largest white pine overstory trees as well as removing much of the poor-quality understory to allow the white pine regeneration to grow up into larger saplings. This harvest will bring the stocking levels down to 90-110 square feet of basal area per acre, yielding 10 MBF of white pine sawtimber and more than 30 cords of low-quality trees.

Stand 4 – Dense Hemlock & Hardwood Poles

Standing Volumes -- Stand 4				7.7 Acres
Species	Average BA/acre (sq. ft./ac.)	Average Height (16' sticks)	Volume per acre (bd. ft./ac.)	Total Volume (bd. ft.)
White Pine	5	3.0	875	6,738
Hemlock	5	1.0	375	2,888
Sawtimber Total:	10	2.0	1,250	9,625
		8' sticks	Cords/ac.	Total Cords
Cordwood	60	3.3	12.6	97
Softwood Pulp	120	3.4	25.9	199
Total BA/acre	190			

Description:

This stand, located along the northern edge of the property, is more than 7 acres of dense hemlock poles 4-10" in diameter intermixed with some hardwood and white pine of similar size. Scattered throughout this stand are isolated larger trees (white pine, hemlock) 14-18" in diameter growing over the dominant make-up of this stand. Given the very dense conifer shade in this stand, there is little or no regeneration. Soils are generally somewhat poorly-drained, stony, and fairly flat. This stand is the meeting point for two drainage areas from the south and east, both of which merge in this stand and flow to the northwest. Access for this stand will need to be created with skid trails coming through Stands 6 or 10.

Recommendations:

This stand is still in the growing phase of development, and yet is rather overcrowded with a low-value species. A biomass thinning should occur in this stand to reduce the softwood pulp stocking (mostly hemlock) by about a half, leaving a residual stand of over 100 square feet of basal area per acre and removing about 100 cords of low-value product.

Stand 5 – Red Oak and Hemlock Sawtimber

Standing Volumes -- Stand 5				6.9 Acres
Species	Average BA/acre (sq. ft./ac.)	Average Height (16' sticks)	Volume per acre (bd. ft./ac.)	Total Volume (bd. ft.)
Hemlock	50	2.0	16,750	115,575
Red Oak	43	1.7	4,750	32,775
White Pine	23	3.5	4,667	32,200
White Birch	3	2.0	417	2,875
Red Maple	3	1.5	333	2,300
Beech	3	1.0	250	1,725
Sawtimber Total:	127	1.9	27,167	187,450
		8' sticks	Cords/ac.	Total Cords
Cordwood	50	2.9	9.6	66
Softwood Pulp	50	3.5	11.0	76
Total BA/acre	227			

Description:

This stand, located in the northwestern corner of the property, consists of large red oak, hemlock, and white pine sawtimber 16-22" in diameter. This heavy stocking of large sawtimber also has made room for some beech, birch, and red maple sawtimber 16" in diameter to grow as well, along with an understory of hemlock, red maple, red oak, and white birch poles 6-10" in diameter. This understory, however, is somewhat patchy depending on the stocking of conifers in the overstory. Most of this stand has very little or no regeneration found on the forest floor. Soils are rocky, moderately well-drained, and slope to the west with grades of 3-6%. This stand is split in two by a stream and wetland complex that starts in Stand 9 and flows off the property to the north. As one of the aesthetic highlights of this stand, the stream falls through a series of jagged ledge outcrops in a rather steep gorge before finally hitting the wetland to the north. Access to this stand will need to come from two locations on either side of the gorge, with the western half accessed through Stand 7 and the eastern half accessed through Stand 6. This stand is located in the area that has not yet been definitely determined as belonging to the Town of Mont Vernon.

Recommendations:

This stand, made up of so much large timber, would benefit both economically and silviculturally from a thinning that would remove some of the largest sawtimber of all species, basing choices mostly on appropriate spacing between residual stems. This thinning should focus on removing more of the hemlock and poor-quality understory, making space for the residual sawtimber trees and younger crop trees to develop. Such a harvest would yield about 20 MBF of hemlock timber, 8 MBF of red oak sawlogs, and 14 MBF of white pine, as well as a sizable tonnage of chipwood.

However, this being the location of the oldest and largest timber on the property, this stand could also serve as an area that is left alone and allowed to grow perpetually. This action will not be best for wildlife food sources, since there currently is little in the way of young browse and the oak trees are too crowded to reach their full potential of hard mast production. However, it would offer denning animals opportunities to find large, standing snags in which to nest or den, including species such as woodpecker, raccoon, flying squirrel, other small mammals, and raptors. Deer currently use this stand as an area to walk through to reach a water source, but it does not offer much else for them. In leaving this area alone, it offers the best potential for simulating an “old-growth” type of forested area, since many of the trees in this corner of the property are much more mature than across the rest of the woodlot.

A third option would be to blend the first two in such a way that some forest management is done, while leaving patches of older trees growing together so that not all the oldest trees on the property are removed. This could be done by thinning out the crowns around the best acorn producers to encourage more wildlife food to be produced in this stand, but to leave areas of high stocking alone if there are no oak trees in the mix.

These options, or variations thereof, should be considered by the Conservation Commission and discussed with the foresters on the ground before any harvest is started.

Stand 6 – White Pine Sawtimber Overstory over Hardwood/Hemlock Poles

Standing Volumes -- Stand 6				6.2 Acres
Species	Average BA/acre (sq. ft./ac.)	Average Height (16' sticks)	Volume per acre (bd. ft./ac.)	Total Volume (bd. ft.)
White Pine	15	2.0	1,875	11,625
Red Oak	5	1.0	375	2,325
Hemlock	5	1.0	375	2,325
Sawtimber Total:	25	1.3	2,625	16,275
		8' sticks	Cords/ac.	Total Cords
Cordwood	55	2.5	9.2	57
Softwood Pulp	20	3.3	4.2	26
Total BA/acre	100			

Description:

This stand, located between Stands 4 and 5 along the northern boundary of this property, consists of a scattered overstory of white pine sawtimber 14-18" in diameter growing over a predominantly hardwood pole understory. More than half of this pole-sized understory consists of red maple 6-8" in diameter, along with some red oak, white birch, and beech of similar size. Soils are moderately well-drained to well-drained, rocky, and slope to the west with grades of 4-10%. Very little regeneration can be found on the forest floor, with only some pockets of beech, hemlock, and spruce 3-8' tall. Access to this stand should come from skid trails leading through Stand 9 back to the landing on Salisbury Road.

Recommendations:

Management in this stand could mirror the type of management that will take place in Stands 2 or 4, except that this stand has about half the stocking of Stand 4. Given that, a very light thinning should take place through most of this stand. This stand, as well as Stand 2, also have some areas that would make them prime candidates for small patch clearcuts that will grow back into early-successional habitat for wildlife. The remainder of the stand should be thinned in a way to let the best crop trees develop and remove the poorly-formed and low-value species. This thinning will not only increase growth rates on the residual trees, but will also allow new sunlight to reach the forest floor as a way of establishing new regeneration.

Stand 7 – Dense Hemlock & Hardwood Poles

Standing Volumes -- Stand 7				4.5 Acres
Species	Average BA/acre (sq. ft./ac.)	Average Height (16' sticks)	Volume per acre (bd. ft./ac.)	Total Volume (bd. ft.)
White Pine	20	2.5	3,000	13,500
Hemlock	5	1.0	375	1,688
Sawtimber Total:	25	1.8	3,375	15,188
		8' sticks	Cords/ac.	Total Cords
Cordwood	80	2.8	14.9	67
Softwood Pulp	65	2.5	11.2	50
Total BA/acre	170			

Description:

This stand, located along the northwestern boundary line of the property, is almost identical in stocking and size class to Stand 4, with the main difference between these stands being a higher stocking of hardwood poles as opposed to hemlock. Like Stand 4, the majority of the trees in this stand are hemlocks and pole-sized hardwoods (mainly red maple 4-8" in diameter, with a few larger stems of hemlock, maple, or birch. This stand has a little bit of a scattered overstory of larger white pine as well, ranging in size from 10-16" in diameter. As in Stand 4, the forest floor is almost devoid of green growth due to the dense growth in the bulk of the forest. The soils are rather poorly-drained, low-lying, rocky, and fairly flat, sloping to the northeast with grades of 2-4%. This stand serves as a runoff area that drains into the headwaters of the stream/wetland system found in Stand 5. Access to this stand will come from a landing to the south in Stand 9, although the soils are not suitable for year-round traveling unless a road is upgraded.

Recommendations:

As with Stand 4, this stand is still in the growing phase of development, and yet is rather overcrowded with a low-value species. A biomass thinning should occur in this stand to remove about half of the hemlock pulp stocking, roughly a quarter of the red maple cordwood stocking, and some hemlock and white pine sawtimber where appropriate. This will result in a residual stand of over 100 square feet of basal area per acre while removing about 5 MBF of sawtimber and about 40 cords of low-value product.

Stand 8 – Hemlock Sawtimber and Poles

Standing Volumes -- Stand 8				1.4 Acres
Species	Average BA/acre (sq. ft./ac.)	Average Height (16' sticks)	Volume per acre (bd. ft./ac.)	Total Volume (bd. ft.)
Hemlock	70	2.5	10,500	14,700
White Pine	10	3.0	1,750	2,450
Red Oak	10	2.0	1,250	1,750
Sawtimber Total:	90	2.5	13,500	18,900
		8' sticks	Cords/ac.	Total Cords
Cordwood	60	3.7	13.9	19
Softwood Pulp	30	3.3	6.4	9
Total BA/acre	180			

Description:

This small stand, located on the western boundary of the property along the northern frontage of Salisbury Road, consists mainly of hemlock sawtimber and poles 10-20" in diameter, with some understory hardwood poles 8-10" in diameter (mainly red maple and white birch). This dense overstory allows very little sunlight to reach the forest floor, and thus regeneration is very sparse throughout this stand. Soils are somewhat poorly-drained, undulating yet fairly flat overall, and generally slope to the south and east with slight grades. This stand is right on the road and next to the area where a landing will be placed.

Recommendations:

Given the high hemlock content of this stand and the high visibility from the road of any action, this stand would be a prime location for a light thinning that would remove some of the poorest-quality trees as well as some of the over-mature hemlock, leaving the straightest trees to grow further. Such a thinning would be a good example for people to see from the road of how this property is managed overall. Care should be taken not to open the stand up too much, since these wet soils and the shallow-rooted nature of the species could result in excessive blowdown. Such a thinning would result in about 5 MBF of sawtimber harvested as well as some pulp.

Stand 9 – White Pine Sawtimber with Hemlock/Hardwood Poles

Standing Volumes -- Stand 9				21.3 Acres
Species	Average BA/acre (sq. ft./ac.)	Average Height (16' sticks)	Volume per acre (bd. ft./ac.)	Total Volume (bd. ft.)
White Pine	62	2.7	9,792	208,563
Hemlock	10	1.6	1,042	22,188
Red Oak	10	1.0	750	15,975
Red Maple	2	1.0	125	2,663
Sawtimber Total:	83	1.6	11,708	249,388
		8' sticks	Cords/ac.	Total Cords
Cordwood	57	2.8	10.6	225
Softwood Pulp	50	2.9	9.4	201
Total BA/acre	190			

Description:

This large stand, making up much of the western area of the property, has a high stocking of white pine and a fairly dense lower canopy of hemlock and hardwood poles. The overstory consists mainly of white pine 14-24" in diameter, about a quarter of which is weeviled. Hemlock and red oak sawtimber can also be found in this overstory, with diameters ranging from 12-20". While some of the standing hemlock appears to be old and acquiring rot, the red oak appears to be healthy and vigorous and needs more time to develop fully. Some of the softwood pulp component is composed of weeviled white pines with no sawtimber value, but most of this pulpwood is hemlock 6-10" in diameter. The hardwood cordwood component generally consists of red maple poles of similar size, as well as some white birch and scattered red oaks. Given the dense conifer cover, most of this stand lacks much in the way of regeneration, with only pockets of hemlock 1-3' tall in some locations. Soils vary from being well-drained to somewhat well-drained, and there are small depressions in this rolling terrain that catch and hold moisture in poorly-drained pockets. Overall, soils are rocky, and generally slope to the north or southeast, with a watershed dividing line bisecting this stand into northern and southern drainages. This appears to be the best access point for trucks to access the property and to conduct forestry operations with the frontage on Salisbury Road, and thus most stands will be accessed through skid trails leading out of this stand.

Recommendations:

This stand would benefit greatly from a timber/cordwood harvest that would remove about half of the pulpwood and hemlock sawtimber component, about a third of the white pine sawtimber component, and roughly a quarter of the standing hardwood cordwood. This thinning would reduce the basal area to a range of 100-130 square feet of basal area per acre, and would result in about 60 MBF of white pine timber, 10 MBF of hemlock timber, about 60 cords of firewood, and about 100 cords of softwood pulp. This harvest should take care to leave as much pole white pine and red oak as possible.

An access road should be built into this property coming off of Salisbury Road, with a landing built near the corner of the property before the line runs south.

Stand 10 – White Pine Sawtimber & Poles

Standing Volumes -- Stand 10				36.6 Acres
Species	Average BA/acre (sq. ft./ac.)	Average Height (16' sticks)	Volume per acre (bd. ft./ac.)	Total Volume (bd. ft.)
White Pine	79	2.5	11,977	438,368
Red Oak	13	1.1	1,000	36,600
Hemlock	3	1.7	295	10,814
Sawtimber Total:	95	1.8	13,273	485,782
		8' sticks	Cords/ac.	Total Cords
Cordwood	39	3.0	7.7	280
Softwood Pulp	29	4.1	7.4	270
Total BA/acre	163			

Description:

This large stand, accounting for the middle and eastern fifth of the property, consists mainly of white pine sawtimber 12-22" in diameter growing over white birch (and other hardwood) poles 6-8" in diameter. Some red oak sawtimber 12-16" in diameter can also be found here, and occasional 14-16" red pine are scattered throughout this stand also. Although the bulk of the pulpwood component is quality growing stock of white pine poles 8-10", there are sections with a hemlock pulp component in this stand as well. Regeneration varies quite a bit across this stand, with some areas of very good white pine saplings 6-10' tall, while other areas have very little regeneration at all, while still other areas have scattered beech clumps 4-8" in diameter or hemlock 3-8' tall. Soils vary to some degree, but are generally upland, well-drained soils with some rock. Like Stand 9, this stand breaks the drainage of the property to flow north and west or south and east. Overall, the terrain is rolling, without very steep slopes, and few large boulders. Access to this stand will be good from the landing in the adjacent Stand 9 to the west. This stand has most of the existing ATV trails winding through it, which junction off into other stands.

Recommendations:

This stand is the perfect candidate for a thinning that would remove some trees from all size classes: large, over-mature timber that is robbing younger and more vigorous trees of light and nutrients; small, poorly-formed or suppressed trees that will not respond well to a thinning and should be removed; and thinning out between crop trees to allow for appropriate spacing. This thinning will also allow plenty of sunlight to reach the forest floor to increase growth on the advance regeneration. This thinning would result in about 100 MBF of white pine sawtimber, 5 MBF of red oak timber, and 100 cords each of hardwood and softwood pulp.

Stand 11 – White Pine Sawtimber with Hardwood Poles

Standing Volumes -- Stand 11				5.8 Acres
Species	Average BA/acre (sq. ft./ac.)	Average Height (16' sticks)	Volume per acre (bd. ft./ac.)	Total Volume (bd. ft.)
White Pine	80	2.7	12,667	73,467
Hemlock	10	1.3	917	5,317
Red Oak	3	1.0	250	1,450
Sawtimber Total:	93	1.7	13,833	80,233
		8' sticks	Cords/ac.	Total Cords
Cordwood	30	2.7	5.4	31
Softwood Pulp	33	3.2	6.9	40
Total BA/acre	157			

Description:

This stand, located in the southwestern corner of the property, is similar to Stands 9 and 10, but has more hardwood understory than Stand 9 and more hemlock understory than Stand 10. This stand, with an overstory of mostly white pine 14-22" in diameter, is growing at a lower density than the other two stands. The understory found in this stand has a higher component of red oak than Stand 9, with poles 8-12" in diameter, and more white pine pole growth as well. Soils are moderately well-drained, growing beech, chestnut, hemlock, and alder 4-8' tall as well as some scattered red spruce 2-4' tall. The terrain generally slopes to the south with gentle grades, although the ground throughout this stand rolls and pitches with aspects of slope in all directions. Access to this stand will come from skid trails out of Stand 9 to the north.

It should be noted that this stand was the location of a timber trespass, in which large pines were cut down and removed across the boundary line to the property to the west.

Recommendations:

This stand should undergo a similar thinning as that of Stands 9 and 10, keeping the best quality pines in the overstory to grow further into larger sawtimber, removing some large timber as well as poor-quality wood with little future potential for development, and opening up the forest floor to more sunlight for increased growth. Such a thinning would remove about a quarter of the stocking of white pine, resulting in a harvest of about 17 MBF of timber, as well as some pulpwood.

Stand 12 – Oak & Hardwood Poles/Sawtimber

Standing Volumes -- Stand 12				20.4 Acres
Species	Average BA/acre (sq. ft./ac.)	Average Height (16' sticks)	Volume per acre (bd. ft./ac.)	Total Volume (bd. ft.)
Red Oak	33	1.3	2,929	59,743
White Pine	14	1.9	1,714	34,971
Hemlock	3	1.0	214	4,371
Red Maple	1	1.0	107	2,186
Sawtimber Total:	51	1.3	4,964	101,271
		8' sticks	Cords/ac.	Total Cords
Cordwood	46	3.4	9.9	201
Softwood Pulp	21	2.8	4.0	81
Total BA/acre	119			

Description:

This stand, located in the southern-central part of the property, is dominated by red oak 12-18" in diameter growing over and along with pole-sized mixed oak (red and white) and beech. Some large white pine sawtimber 16-22" in diameter can be found here as well, although it appears that the soils mainly favor hardwood growth. In general, the regeneration in this stand is similar to that of Stand 10, with patches of very good white pine 4-10' tall, and other areas with only clumps of beech or hemlock 6-15' tall. Although some white birch is growing well in this stand, there are many birch clumps that have died or are dying. Soils are generally well-drained, fertile, and drain to the south. Throughout this stand are small esker-like formations with a north-south orientation and steeper western and eastern sides. These terrain features may isolate some pockets of wood, but generally will not prevent harvesting. The main southern ATV trail leads through this area and junctions with a northern segment of trails in this stand. Access is good using existing trails coming out of Stand 9.

Recommendations:

This stand would benefit from a thinning that will allow the best-quality oaks a chance to increase in diameter growth. This thinning would do best to remove some of the most mature white pine as well as competing hardwoods around the oaks. Such a thinning should produce about 10 MBF each of white pine and red oak, along with 40-50 cords of firewood.

Stand 13 – Scattered White Pine Sawtimber over Hemlock/Hardwood

Standing Volumes -- Stand 13				17.4 Acres
Species	Average BA/acre (sq. ft./ac.)	Average Height (16' sticks)	Volume per acre (bd. ft./ac.)	Total Volume (bd. ft.)
White Pine	28	1.8	9,000	156,600
Red Oak	18	1.2	1,500	26,100
Hemlock	10	1.7	1,100	19,140
Red Maple	6	1.3	550	9,570
White Birch	2	1.0	150	2,610
Sawtimber Total:	64	1.4	12,300	214,020
		8' sticks	Cords/ac.	Total Cords
Cordwood	62	3.2	12.7	221
Softwood Pulp	70	3.1	14.0	244
Total BA/acre	196			

Description:

This stand, making up the southern edge of the property and projecting a finger northward along series of valley drainages, has a different “visual” impression than the above numbers would indicate. This stand is dominated by hemlock 6-20” in diameter, with hardwood (mostly red oak) growing as well, with scattered, large overstory white pine as a super-canopy. Soils are somewhat rocky and moderately well-drained, with generally south-facing aspects of slope with grades of 3-5% and rolling terrain. Little regeneration grows under the heavy hemlock canopy, although some areas have enough sunlight to allow hemlock saplings 2-6’ tall and some hardwood whips as well. As this stand is found the north-reaching valley system into the heart of the property, this stand is generally located on steeper sides of slopes; however, along the southern edge of the property, this stand is located on the gently-sloping ground that meets the wetland edge to the south of this property. Access to this stand, then, will depend on slope, terrain, and wetness of soils along the southern boundary line.

Recommendations:

This stand, like Stand 9, would benefit from a thinning that would remove some of the large mature white pine and hemlock timber, as well as some oaks. The harvest would concentrate on removing much of the hemlock pulp understory in order to allow new species to grow on the forest floor. Such a harvest would yield about 50 MBF of white pine sawtimber, roughly 7 MBF each of red oak and hemlock, and more than 100 cords of softwood pulp.

Management Schedule

2007-08

- Prepare the forest management plan.
- Conduct a biomass timber harvest in harvestable areas, building a permanent access way at the same time.
- Seed and lime the landing at the conclusion of the timber harvest.
- Address recreational issues (hunting, hiking, etc.), and consider how to make the public more aware of this Town resource.

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- Monitor the woodlot for wind damage, ice damage, fire, or disease and take appropriate corrective actions as needed to ensure the continued health of this forest block.
- Re-assess the woodlot in 10 years and write a new 10-year management plan, specifically looking at TSI potential and another harvest midway through the next management period.
- (Recommended Item) Make this property available for Project Learning Tree excursions for the local schools.

Concluding Remarks

The recommendations proposed in this 10-year management plan should be implemented within the next 10 years, although timing will depend on landowner priorities, market conditions, and environmental conditions such as pest outbreaks and weather. Through sound silvicultural practices and using best management practices (BMP's), mature, diseased, and defective trees will be harvested to allow residual trees to grow in their place. This forest should be monitored for pest outbreaks and destructive weather events; corrective action should be taken as needed over the next 10 years in response to any such events. These recommendations are silviculturally and operationally sound and should result in meeting the landowners' objectives for their woodlot. Implementing these recommendations will help ensure that this forestland is being managed with long-term sustainability in mind.

Respectfully Submitted,

Brian E. Johnsen, Consulting Forester
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