Forest Stewardship Plan

(10-Year Planning Period)

Town of Pelham, NH
Spaulding Hill Road Town Forest
23.9+/- Acres
December 4, 2009

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NH LPF #363
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Property Owners: Town of Pelham
Location: Spaulding Hill Road Town Forest, Pelham, NH
Total Acreage: **23.9 +/- Acres**[1]
Map/Lot Numbers: Map 32, Block 1, Lot 145
Date Prepared: December 4, 2009

General Description of the Property

This small area of hardwood forestland is located in southwestern Pelham, south of Gumpas Pond Conservation area and northwest of Merriam/Cutter Conservation area, on the Class 6 section of Spaulding Hill Road off Sherburne Road. This parcel is nestled in an area with many other forested parcels, and helps to support the deer population with all the excellent oak trees growing here. The property is not heavily used by a large portion of the public, although the OHRVs have been using a trail through the northern part of the property. Due to the small size and isolated location of this parcel, very little forest management has taken place in this area in recent years.

Boundaries

The boundaries are fairly discernible around most of this property. Some of the boundaries are stone wall. This property sits on the east side of the Class 6 section of Spaulding Hill Road, north of Sherburne Road, with the nearest (southernmost) corner being about 500' from the end of the pavement.

The western line of the property is Spaulding Hill Road, with about 1,400' of frontage along the road. Where the road junctions to the north and northwest, this property leaves the road to the east.

The northern boundary line is stone wall running along the edge of a sizable beaver swamp to the north. This stone wall eventually leaves the swamp and continues straight through the woods to a corner of stone walls.

The eastern line consists of a series of jogs on high ground to the south and west, made mostly of stone wall, but with a few stretches of open, unmarked line. These jogs end at a drill hole at the end of one stone wall, where the southern boundary line heads west back to first point on the road. Unfortunately, this particular corner point has not been located, and thus this southern boundary line cannot yet be blazed. An initial survey for the development to the south and east yielded detailed information for this boundary line, but not monumentation has yet been found. These lines should be surveyed and monuments set in place, so that the boundaries can be blazed and painted.

[1] This acreage figure was ascertained using GPS field data and the latest GIS aerial photography available from the UNH GRANIT database, and may or may not match the Assessor's data exactly.

Access

As mentioned, this property has a sizeable amount of frontage on Spaulding Hill Road. However, some of this property slopes steeply to the west, offering little in the way of landing locations for future timber harvesting. Following Best Management Practices (BMPs), access to this property should most likely be built at the northwestern corner of the property, despite the fact that this requires the most road building and upkeep. This will minimize the amount of drainage that would flow off the steep slopes into a landing area, thus minimizing erosion from the exposed soil in the landing after harvesting. This landing could potentially be upgraded into temporary parking area (when not in use for logging) with a property map and a sign urging recreational users to self-police trash dumping and other such unsightly habits. A trail enters the property from this corner and travels across the property into the development land to the east. This trail could be upgraded and expanded to incorporate other areas of the forest, and given waterbars on steeper slopes; such a project could be undertaken by a local Eagle Scout, as has been done in the past on Town lands.

Forest Types & Harvest History

Forests with varying composition in terms of species, age, and density are able to respond with more resilience 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.

This particular property has an abundance of harvest history. Judging from the stone walls and proximity to rivers, this woodlot most likely was cleared in the mid-1800s for sheep pasture, part of the movement across much of New England to increase wool production for water-powered mills along the banks of most New Hampshire waterways. When the pastures were abandoned, white pine grew in and the area was forested again. Subsequent cutting removed the white pine from some areas, and the open environment allowed red oak to seed in and become established in direct sunlight. The oldest trees on this property are likely 80-100 years old, although most are younger. Most of this land has not been harvested in the past 40 years. Overall, the forest is healthy and growing well, although it is overcrowded and growth is beginning to stagnate due to lack of nutrients and sunlight.

In quantitative terms, this property is considered all one stand, despite a few scattered areas with a slightly higher concentration of white pine stems. The entire property is growing about 150 MBF (thousand board feet) of timber and about 250 cords of hardwood and softwood pulp. Red oak is the dominant species in terms of volume, accounting for about 2/3 of the standing timber volume (about 95 MBF of timber). The remaining volume is fairly evenly split between black oak and white pine, with only a very small amount of white oak and red maple sawtimber. More details on the timber cruise are available below, and a complete summary is available on Page 7.

Soils, Terrain, & Hydrology

Forests are essential for preventing erosion of existing soil and maintaining clean water. 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 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 accepts the runoff from the higher-elevation property to the east, which was heavily cut over for development. The steep slopes on this parcel should remain forested into the future, since this slopes will either prohibit or encourage siltation into wetlands in lower elevations. The steep slopes in this property flatten off in about the center of the property on the western side, near Spaulding Hill Road, and seasonal water collects in this flat area and flows under the road into the property to the west. This stream flows into a larger watercourse emptying the sizable beaver pond to the north of this property, which eventually flows into a pond located along the Hudson/Pelham town line.

Soils on this property vary somewhat, from very well-drained upland soils with to very poorly-drained soils with standing water in the center of the property along Spaulding Hill Road. Most areas have deep, fertile soils, and with appropriate management these areas could yield increased production of quality red oaks. Appendix A handles the soil types found on this property in depth. Drainage on this property tends to be towards the west.

This property has gently rolling terrain in some areas above and below the steep slopes found on the property, but generally the land slopes heavily to the west, with plateaus that will allow for forest management to occur throughout most of the property.

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. This property specific value for wildlife because of the presence of trees producing hard mast (acorns). While this fact does not single out this parcel as particularly unique, neither in Pelham nor in the surrounding parcels, it can be noted that this parcel maintaining a forested cover is essential to maintaining a wide area of "green space" in this corner of Pelham.

Two of the biggest threats to biological diversity today are loss of habitat to non-forest uses and invasive species. Neither of these threats is of any particular concern for this parcel, although it will provide valuable open space for forest-dwellers that may be displaced from the property to the east. Not only that, this property abuts a sizable wetland to the north, which makes this property of particular importance for forest-dwelling fauna that prefer proximity to wetland habitats, such as great horned owls. Overall, this property provides a very important role in offering forested habitat between a planned development and a wetland.

Timber Cruise

A detailed timber cruise was completed on the property yielding 11 plots of tree data across the breadth of the parcel. 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, it was determined that the whole property could be described as one stand with some variation found in spots along the eastern line. Stands are areas of trees with similar species composition, size, and frequency of occurrence.

Landowner Goals & Objectives

The Town of Pelham has been very proactive in protecting various areas around the town from development by keeping areas open for recreational use and maintaining areas of forestland for wildlife habitat and timber production. Many of these parcels are associated with wetland areas that benefit greatly from the forested buffer they have instead of having pavement and lawns in the riparian zones. The Town continues to

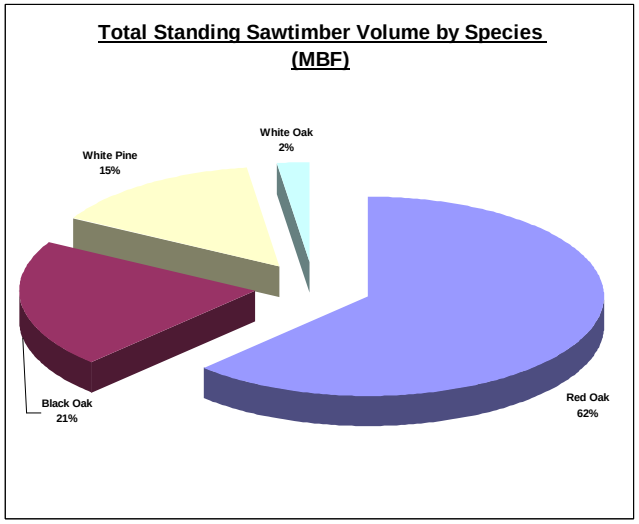
educate citizens and developers alike, explaining the benefits of forested lands around built-up areas. The general goals of the Town can best be summed up with the key words of the New Hampshire Tree Farm System, of which the Town is a member: wood, water, wildlife, and recreation. The Town is interested in managing their woodlots for long-term, sustainable forest management. They are interested in generating periodic revenue from timber harvests that encourage quality wood growth on residual trees as well as encourage regeneration, in order to grow tomorrow's forest beneath the forest of today. The Town owns many of their properties in order to protect sensitive wetland sites and waterways by maintaining a forested buffer between the open water and built-up areas. Because Pelham is a town with many people, the municipal officials recognize that families, individuals, and schoolchildren benefit from having wooded areas for walking and nature watching. The Town hopes to keep these areas open to responsible recreation without compromising the other three goals. Finally, the Town recognizes that the native wildlife species of New Hampshire need areas for food, water, shelter, and raising young. To that end, these forests are kept as biologically diverse as possible while maintaining the other three goals as simultaneously as possible.

The goals for this specific property are to periodically thin the forest to gain some revenue over the years; maintain a trail system through the area for walking, biking, and non-motorized winter activities; maintain this block of land as a forested buffer for the wetland to the north to prevent pollution, siltation, or alteration of the terrain; and provide a diversity of species with enough cover, food, and water so as not to lose species from living in this area of Pelham. Sound forest management will be able to meet most of these goals.

Currently, the property is being used by only a small cross-section of the public, with mainly hunters and wheeled recreationists. Given the current size of this property, it may be best to maintain a lower amount of use on this public land, given the number of sizable forests that are open to the public around Pelham. This forest should be managed under the sound, proven management of field forestry professionals to help thin out the forest, increasing the growth rate on quality trees currently found here as well as encouraging more mast production and understory browse for wildlife food.

Forest Products Summary Table for All Stands
Town of Pelham
Spaulding Hill Road Town Forest
Total Acreage: 23.9 +/- acres

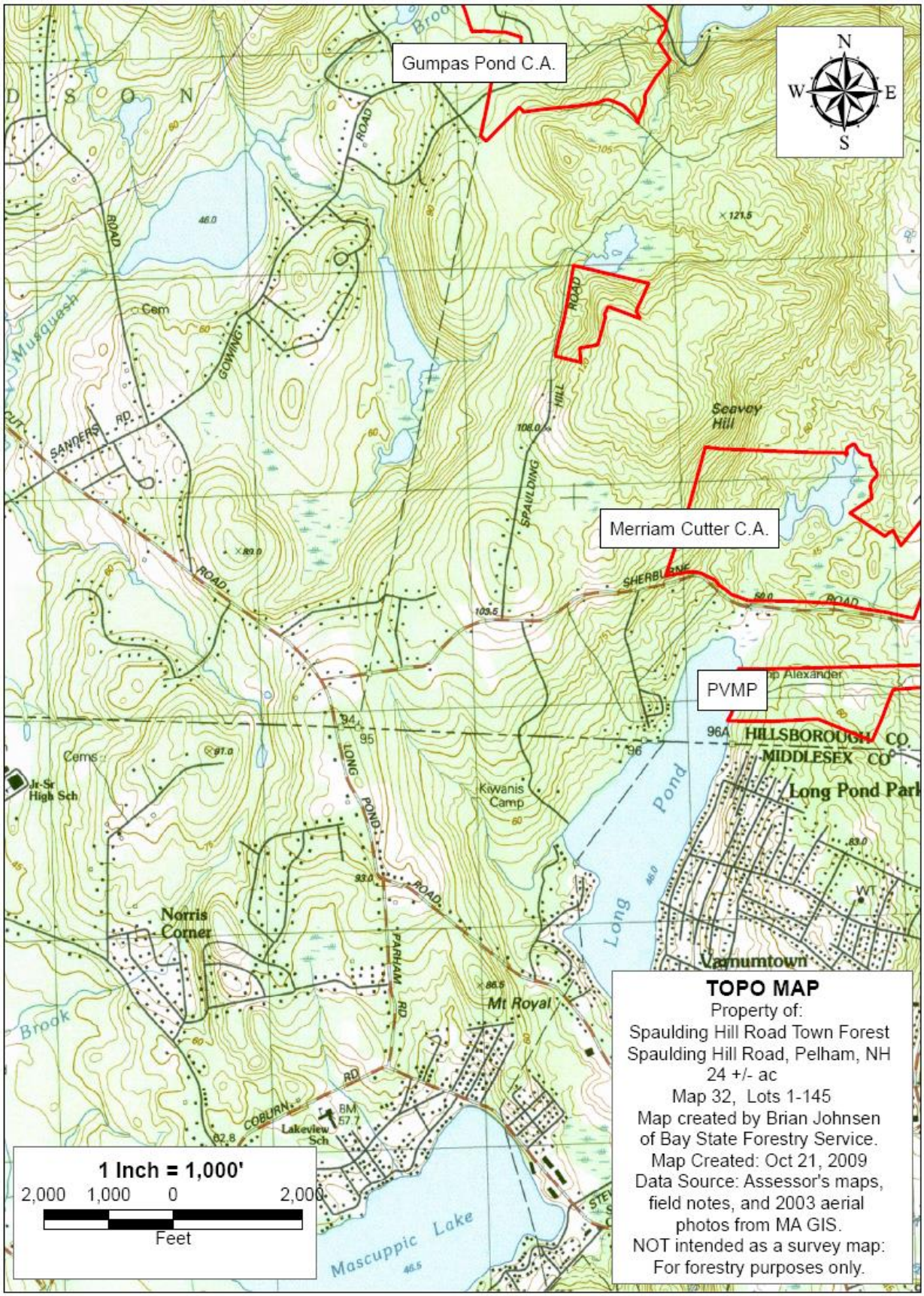
Species	Board Feet
Red Oak	95,455
Black Oak	31,636
White Pine	22,909
White Oak	3,273
Total Sawtimber	**153,273**[2]
Hardwood Cordwood	231 Cords
Softwood Pulpwood	15 Cords
Total Cordwood	**246 Cords**[3]

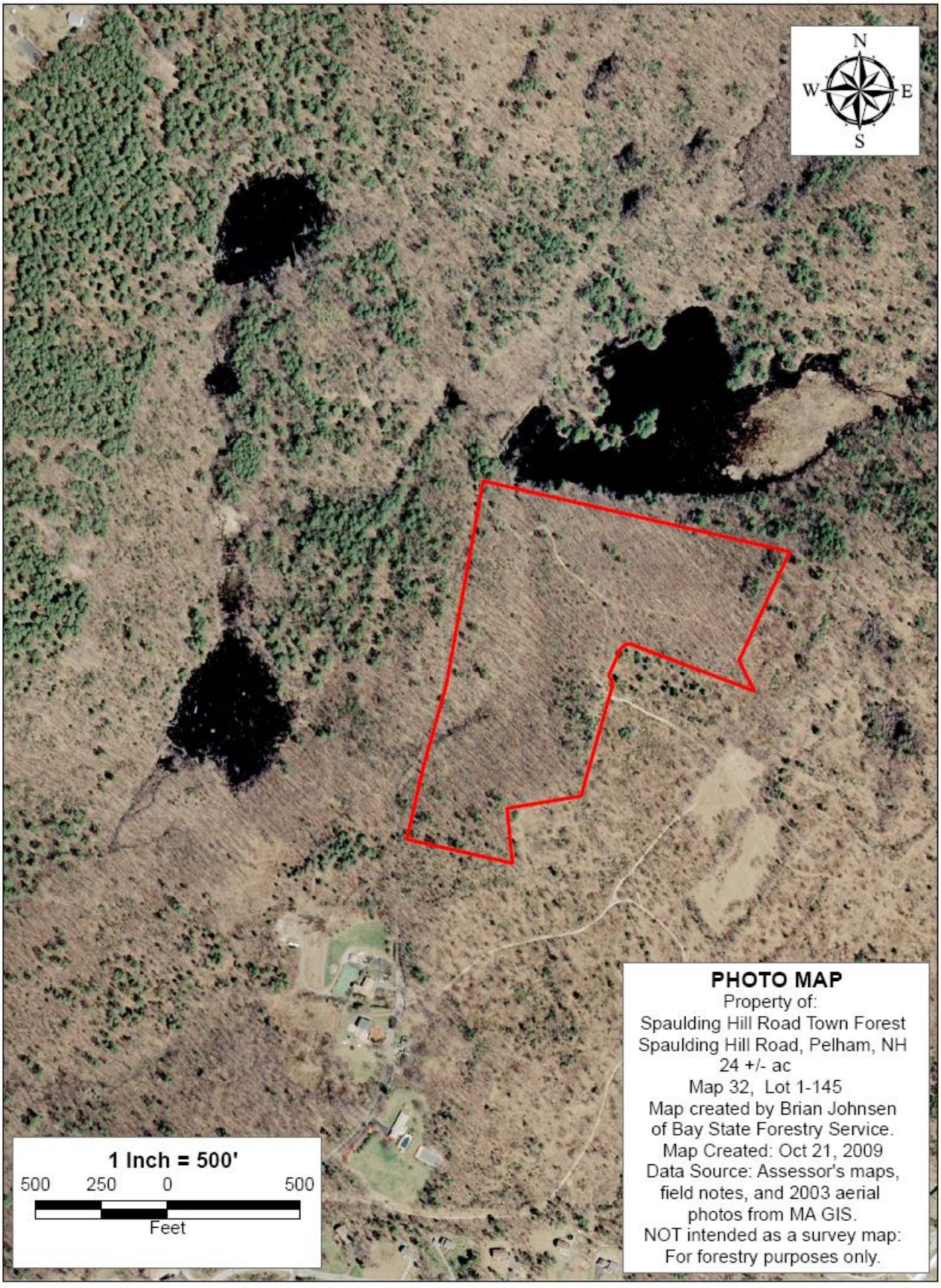


A basal area factor 10 prism was used to conduct the inventory sample. A total of 11 plots, distributed across the entire property, were taken to arrive at this cruise summary. Some of this timber is located on steep slopes, and should not be considered accessible.

[2] 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.

[3] 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.


Gumpas Pond C.A.
Merriam Cutter C.A.
PVMP
N
W
E
S
Seavey Hill
Spaulding Hill Road
Sanders Rd.
Gowing Road
Long Pond Road
Parham Rd.
Coburn Rd.
Norris Corner
Kiwanis Camp
Mt Royal
Vamumtown
Long Pond Park
Hillsborough Co.
Middlesex Co.
Lakeview Sch
Jr-Sr High Sch
Cems
Cem
Mascuppic Lake
Long Pond
Musquash Brook
1 Inch = 1,000'
2,000 1,000 0 2,000
Feet
TOPO MAP
Property of:
Spaulding Hill Road Town Forest
Spaulding Hill Road, Pelham, NH
24 +/- ac
Map 32, Lots 1-145
Map created by Brian Johnsen
of Bay State Forestry Service.
Map Created: Oct 21, 2009
Data Source: Assessor's maps,
field notes, and 2003 aerial
photos from MA GIS.
NOT intended as a survey map:
For forestry purposes only.


N
W
E
S
1 Inch = 500'
500 250 0 500
Feet
PHOTO MAP
Property of:
Spaulding Hill Road Town Forest
Spaulding Hill Road, Pelham, NH
24 +/- ac
Map 32, Lot 1-145
Map created by Brian Johnsen
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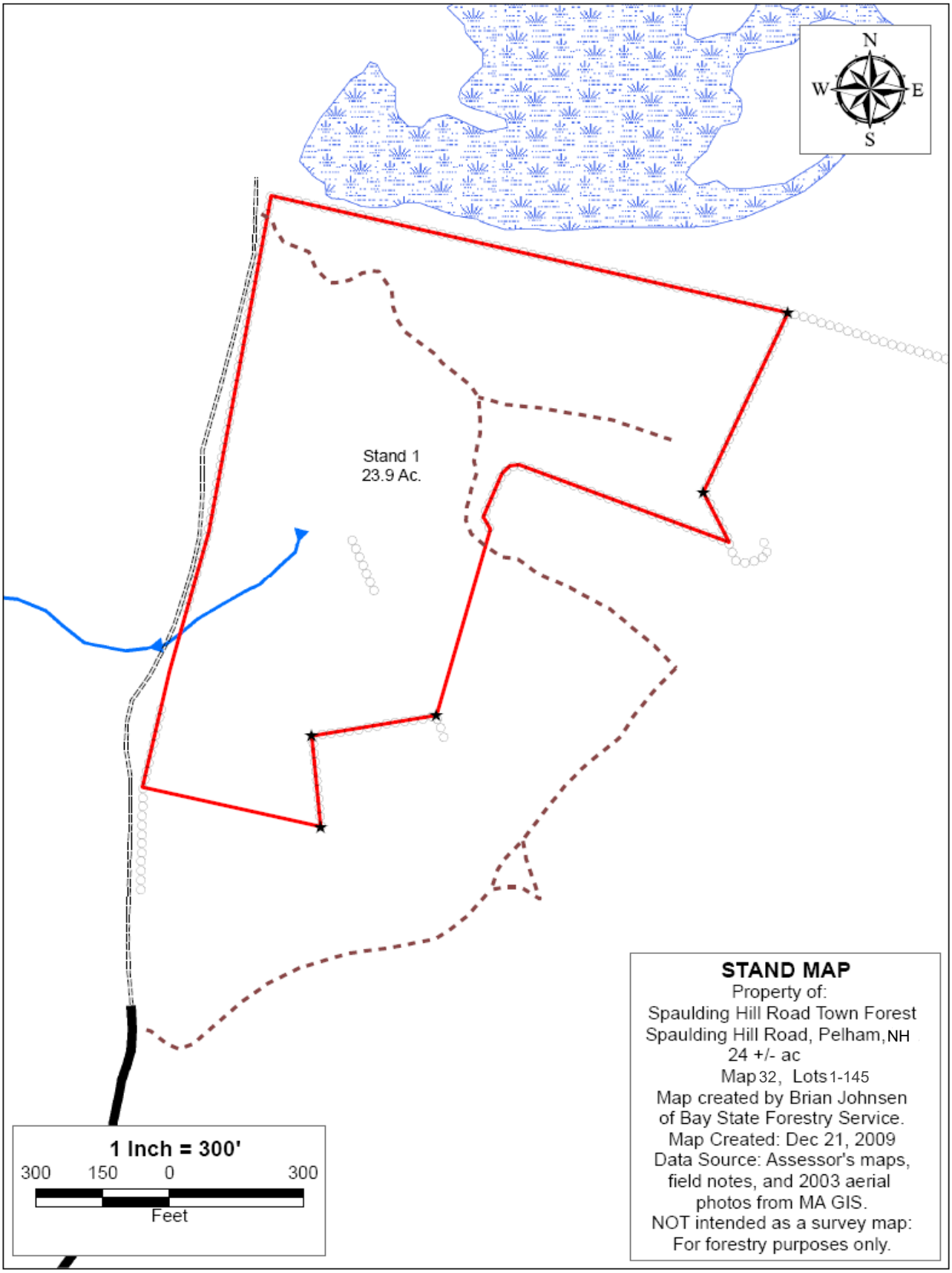
N
W
E
S
Stand 1
23.9 Ac.
1 Inch = 300'
300 150 0 300
Feet
STAND MAP
Property of:
Spaulding Hill Road Town Forest
Spaulding Hill Road, Pelham, NH
24 +/- ac
Map 32, Lots 1-145
Map created by Brian Johnsen
of Bay State Forestry Service.
Map Created: Dec 21, 2009
Data Source: Assessor's maps,
field notes, and 2003 aerial
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NOT intended as a survey map:
For forestry purposes only.

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.

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. Keeping large browsers in mind, there will be some areas that are opened up to sunlight to encourage young growth on the forest floor. Harvesting methods will minimize damage to young saplings to provide food low to the ground. Some large mast trees (oaks) will be maintained despite poor quality as lumber as a food source for small mammals; their presence will, in turn, help to feed the raptor population that frequents this area for food.

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. Specific concern will be focused on preventing overland flow from the development land to the east into the headwater area of the stream on this property, as well as preventing siltation in the wetland to the north. Landings will be located in appropriate areas on the parcel and 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. All these erosion controls will not prevent erosion, however, if OHRV's are not controlled. The Town will need to decide the best way the handle this situation.

Water Quality – Buffers will be left along streams and the wetland edges 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 steams will be left intact to keep the water clean and silt-free. Poled fords will be used when crossing smaller steams to further prevent siltation. Fueling of machines will not take place near the water's edge to prevent pollution.

Wetlands – Although no wetlands exist on this particular property, care will be taken during harvest operations to protect the wetland to the north.

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. A walking trail system could be designed and completed during this 10-year period, along with a temporary parking area and kiosk describing the natural features of the Town Forest as well as the beneficial outcomes of timber harvesting. Access issues include upgrading the current Class 6 road into a travel-way that can handle traffic and appropriately divert water runoff from the road surface. The small culvert handling the water coming off this property and flowing west under the road should be upgraded and improved.

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. Logging crews may specifically leave high brush, rocks, and log barricades along trails that should be closed to OHRV's, but this will be an exception, following the landowner's goals to prevent erosion and maintain the integrity of steep slopes or loose soil.

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 – This forest would benefit from some more diversity, to prevent a forest pest looking for a monoculture. This diversity should be encouraged to the extent that appropriate trees are growing in appropriate soils and conditions. It may be that red oak is the best tree to grow on this ground, at which point it would be counterproductive to attempt to encourage other species. 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.

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 either exotic, invasive, or toxic. If at some time any species are identified on this property as such, appropriate measures will be taken to prevent the spread of that species.

Forest Management Plan

Stand 1 – Mixed Oak Sawtimber

Standing Volumes -- Stand 1			24 Acres	
Species	**Average BA/acre (sq. ft./ac.)**	**Average Height (16' sticks)**	**Volume per acre (bd. ft./ac.)**	**Total Volume (bd. ft.)**
Red Oak	45	1.3	3,977	95,455
Black Oak	15	1.2	1,318	31,636
White Pine	8	1.8	955	22,909
White Oak	2	1.0	136	3,273
Sawtimber Total:	**70**	**1.3**	**6,386**	**153,273**
		8' sticks	**Cords/ac.**	**Total Cords**
Cordwood	41	3.7	10	231
Softwood Pulp	2	6.0	1	15
Total BA/acre	**113**			

Description:

Despite the smaller size of this property, it is somewhat unusual in southern New Hampshire to have an entire 20-acre parcel consisting of the same forest type. Nevertheless, this property is really quite homogeneous in nature, with a few variations that will be discussed later. Overall, however, this stand is dominated by overstory red oak 8-18" in diameter, with occasional larger trees over 20" in diameter. Mixed in with overstory is black oak of similar size, although generally not as healthy (blowdown, rot, etc.) Scattered across the property are isolated white pine 14-24" in diameter, as well as white oak and red maple individuals 10-14" in diameter. The lower canopy consists of the above-mentioned species ranging in size from 6-10" in diameter. Regeneration is comprised of some scattered white pine 2-8' tall, as well as some red maple saplings 4-10' tall, although in general this property has little in the way of understory regeneration due to the heavy oak shade. In general, the larger trees are located in the western half of the property, below the steep slopes, with the smaller trees found along the top of the ridge on the higher, drier soils.

Soils range from moderately well-drained in the west to very well-drained in the east (on top of the hill), and similarly ranged from very productive to somewhat productive. There were generally a number of rocks to be found on the surface, in fact quite bouldery at times, with generally rolling terrain to the west and east with grades ranging from 3-8%, with a band through the middle of the property of steep west-oriented faces with 20-30% slopes. Access to this stand is generally good, with the old Class 6 road and pavement less than ½-mile away.

There were a few pockets that had a higher concentration of white pine overstory than the rest of the property, and these were generally located along the eastern and southern boundaries. These areas consisted of more dense white pine poles and small sawtimber, with a much lower concentration of hardwoods.

Recommendations:

Parts of this stand are growing well, and would benefit from a thinning, at times merely a TSI operation. A light thinning would be helpful to open up holes in the canopy around the best sawtimber trees in order to speed up their growth, specifically in the western half of the property below the steep ridge. Such a harvest would only remove competing trees from the future crop trees and trim out low-quality stems or those that are too large and taking up excessive room in the forest canopy. Further up the hill, such a harvest should be more like a TSI operation, cutting out the low-quality white birch, black oak, and weeviled, stunted pine. Such a harvest will remove about 20 square feet of basal area and approximately 40MBF of sawtimber, but will improve the growth of the forest.

Management Schedule

2009

- Prepare the forest management plan.
- Blaze and paint identifiable boundary lines and survey unknown boundaries.

2010-11

- Conduct a timber harvest in harvestable areas, using either biomass or conventional equipment. Seed and lime the landing at the conclusion of the timber harvest.
- Consider constructing a parking area in the landing after the timber harvest.
- Consider land acquisitions and neighbor agreements to gain a "greenway" all the way from Merriam/Cutter Conservation Area on Sherburne Road to Gumpas Pond.

2010-19

- 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.
- Address parking issues for trailheads, and trail creation and maintenance.
- 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
N.H. License #363