

**Forest**  
**Stewardship**  
**Plan**  
(10-Year Planning Period)

South-Eastern Properties  
Osgood Road  
Windham, NH  
203.2 +/- Acres  
January 6, 2012

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**Property Owners: Town of Windham**

**Phone Number:**

**Location: Osgood Road, Windham, NH**

**Total Acreage: 203.2 +/-**

**Map/Lot Numbers: Stolarz: Map 25 Lot 103**

**Lord: Map 25 Lot 6500, Lot 6000A**

**Bayberry: Map 25 Lot 7010, Lot 7025, Lot 8000**

**Date Prepared: January 6, 2012**

**General Description of the Property**

The property is located in the south-eastern part of Windham. Access into the property is from Osgood Road to the west and from Bayberry Road to the north. The property is comprised of three different lots. The Lord property to the south, which is approximately 78.9 acres in size, the Stolarz property, which is located in the central portion of the land base and is approximately 78.7 acres in size, and the Bayberry Road property to the north, which is approximately 45.7 acres in size. The three properties form one large contiguous forested land base. Most of the property boundary corners have been located and marked using GPS. Some of the boundaries are stone walls and are easily discernable; however most of the lines have no physical location on the ground to determine their exact location. It would be important to discern the location of all the boundaries, especially if a timber sale were to take place on the property to prevent any trees being harvested on a neighbor's property. Identifying boundaries would also serve to discourage neighbors from cutting trees on town land and from dumping garbage and yard debris as well.

Like much of southern New England in the early to mid 19<sup>th</sup> century, and from observing the numerous stone walls found on the property, the land was probably at one point pasture for sheep and or cattle. The land was probably abandoned and has since reverted to forestland. There is also some evidence in the form of cut stone that granite had been quarried in the central and western parts of the Stolarz property. The forest in general can be described as being in the mid to late successional stages of development. There is little evidence that any timber harvesting has occurred on the Stolarz and Lord properties over the last 30 years. The Bayberry property appears to have been harvested approximately 20-30 years ago. The property appears to have been harvested heavily, possibly as a precursor for being developed. The forest in this section of the property is in more of an early to mid successional stage of development. Like most of south eastern NH the forest tends to be a white pine-oak type. This property is no different. The overstory species composition is dominated by red and black oak ranging in size from 12-18 inches in diameter. White pine is also prevalent in the overstory and makes up a majority of the total sawtimber volume. The size of the white pine varies across the

property but the trees generally range from 10-24 inches in diameter. The understory is comprised of a mix of hardwood species such as red maple, white birch and white oak. Most of these species occur in the intermediate strata of the forest canopy in the large sapling to medium-pole size class. These trees tend to be suppressed by the larger overstory trees, and many have moderate to severe crown die-back from being shaded by the larger trees. Regeneration is fairly consistent throughout the property. White pine seedlings and saplings make up the majority of the tree regeneration on the property. Again because of shady conditions much of this regeneration has stagnated in growth. A more detailed description is provided on a stand by stand basis in the forest management section of this plan.

The terrain across the property can be described as rolling. As would be expected the higher ground is well-drained and the lower ground is more poorly-drained. Although the terrain is undulating there are no real severe slopes over 15 % grade and most of the ground would be operable for forestry equipment. There are several vernal pools found scattered throughout the property but there seems to be a higher concentration of these pools found on the Lord property to the south. These pools provide excellent breeding and foraging opportunities for turtles, salamanders and frogs. High bush blueberry can be found in and around these pools. A higher concentration of red maple trees can also be found around the pools as these trees seem to prefer the more poorly drained soils associated with the pools and wetlands.

A large wooded wetland complex is located in the central section of the Stolarz property. The soils are very poorly drained and the wetland for the most part is inoperable to forestry equipment. The wetland is mainly comprised of red maple in the overstory along with white pine that is growing on dry hummocks. Streams connect this larger wetland to a smaller wetland located to the south-east on the Lord property. The wetland continues off of the town property to the east into a larger wetland complex. There is also a small beaver pond which appears to be abandoned, located in the north-east part of the property.



Access onto the property at this point is limited. There is a trail head located off of the Bayberry Road cul-de-sac which gives access to a nice network of trails located in the northern part of the property. There are trails also located on the Stolarz property which are being utilized mostly by ATVs. These trails have been mapped in this plan using GPS. Some erosion/sedimentation issues are occurring due to ATV use on the northeastern portion of the property on the eastern side of the abandoned beaver pond. In order to gain access for forestry equipment the most likely point of entry onto the property would be off of Osgood Street, although this still remains to be determined.

A property of this size is an important open space area for a town like Windham that has seen a tremendous amount of development over the past 30 years. Large parcels like this one are becoming much rarer in southern NH.

### **Landowner Goals & Objectives**

The main goal for the Town of Windham acquiring land is to conserve the land and keep it from being developed. Maintaining these open space areas provides passive recreational opportunities as well as habitat for wildlife. Because Windham is a town



with a growing population, the conservation commission members recognize that the citizens of the town benefit from having wooded areas for walking and nature watching.

This particular parcel is associated with many wetland areas that benefit greatly from a forested buffer around them as opposed to having pavement and lawns in the riparian zones. A major benefit of the town owning land is that sensitive wetland

sites and waterways will be protected by maintaining a forested buffer between the open water and built-up areas. Forests protect water quality by providing a type of filter that keeps non-point source pollution such as sediment from entering wetlands, ponds or lakes directly.

The town is interested in a multiple use concept for its forested properties. This concept includes recreation, wildlife habitat, soil and water conservation and sound long term sustainable timber management. One of the many benefits that can be derived from long-term sustained yield forestry is the generation of periodic revenue from timber harvests. Far more important is that responsible timber harvesting also encourages the growth of quality trees that remain after the harvest as well as the establishment and or release of tree regeneration, in order to grow tomorrow's forest beneath the forest of today. Forest management can also be beneficial to wildlife in that harvesting has the potential to create browse from sprouting cut trees as well as provide cover for wildlife as the seedling trees develop into saplings. In short the main goal of long term forestry is to continually improve the overall health of the forest with each harvest entry, by removing low quality and mature trees.

Finally, the town recognizes that the native wildlife species of New Hampshire need areas for food, water, shelter, and raising young. To that end, diversity is encouraged by utilizing proper forest management practices.

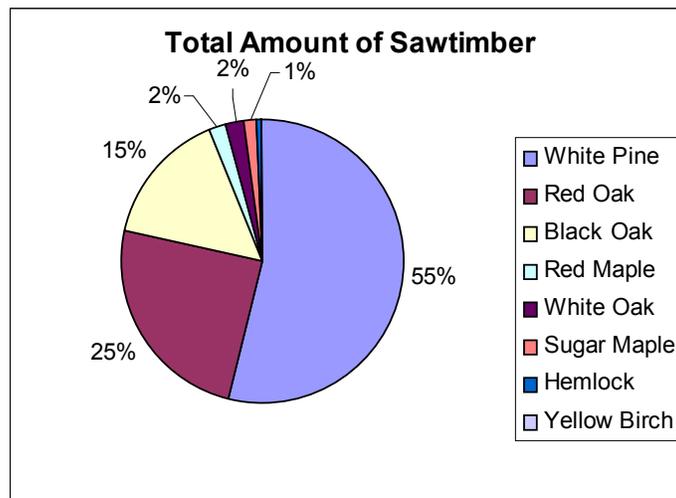
**Forest Products Summary Table for Accessible Stands  
Town of Windham– South-Eastern Properties—Windham, NH  
Total Acreage: 203.2 +/- acres**

**Total Sawtimber by Species**

<b>Species</b>	<b>Board feet</b>
White Pine	595,246
Red Oak	275,473
Black Oak	171,529
Red Maple	23,090
White Oak	22,123
Sugar Maple	15,860
Hemlock	5,495
Yellow Birch	1,406
<b>Total</b>	<b>1,110,222<sup>1</sup></b>

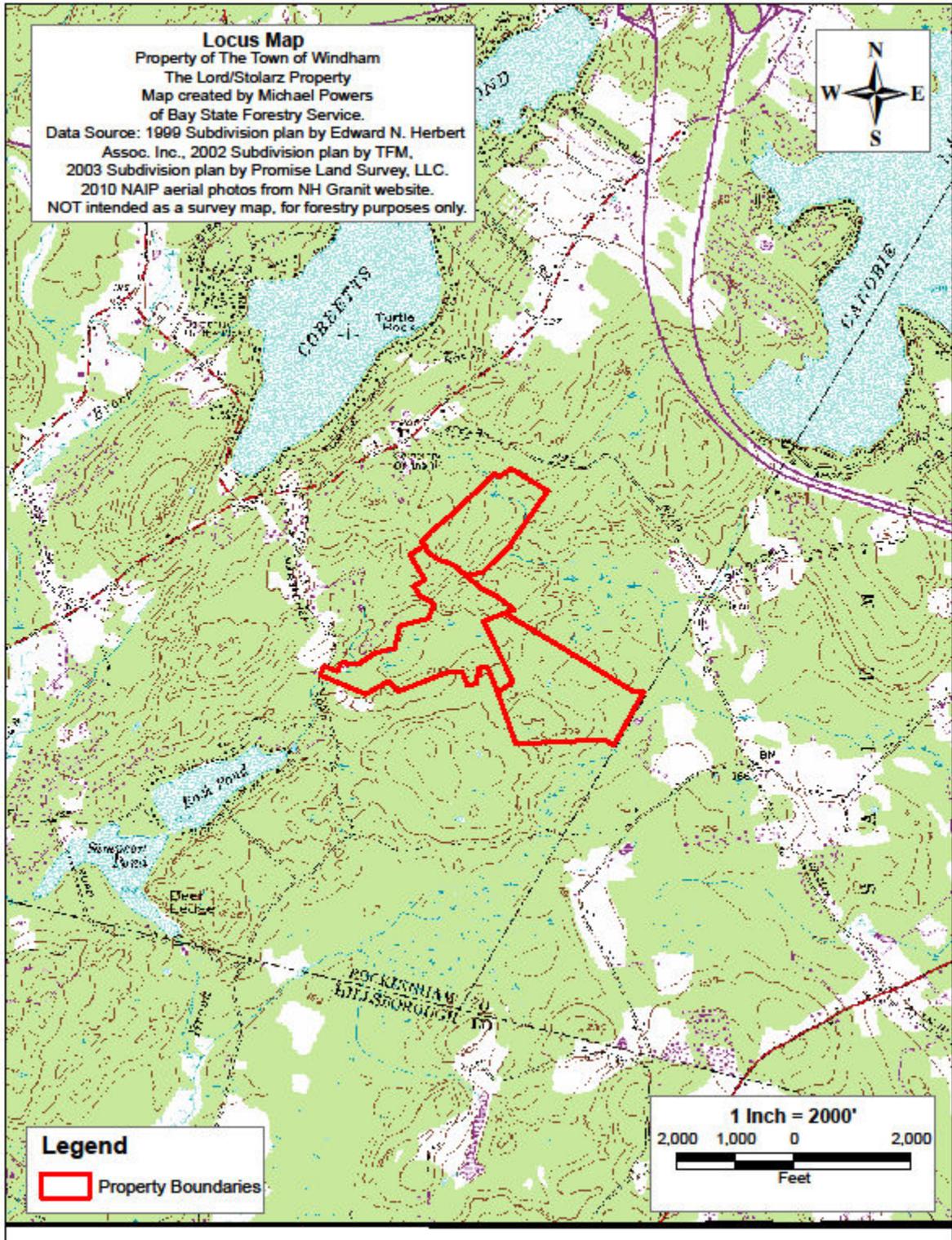


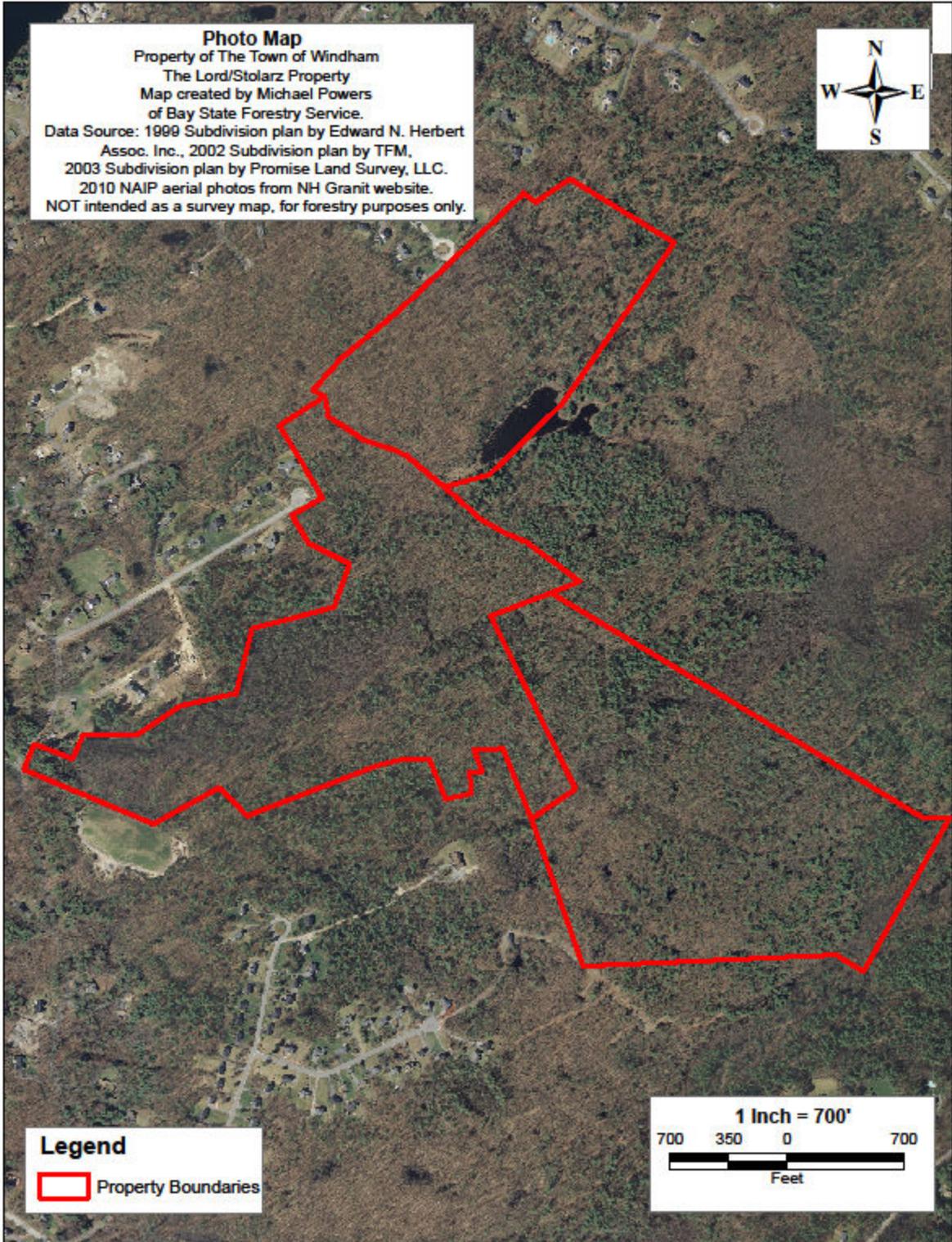
Hardwood growing stock/lowgrade	1,274 cords
Softwood growing stock/lowgrade	279 cords
<b>Total</b>	<b>1,553 cords<sup>2</sup></b>

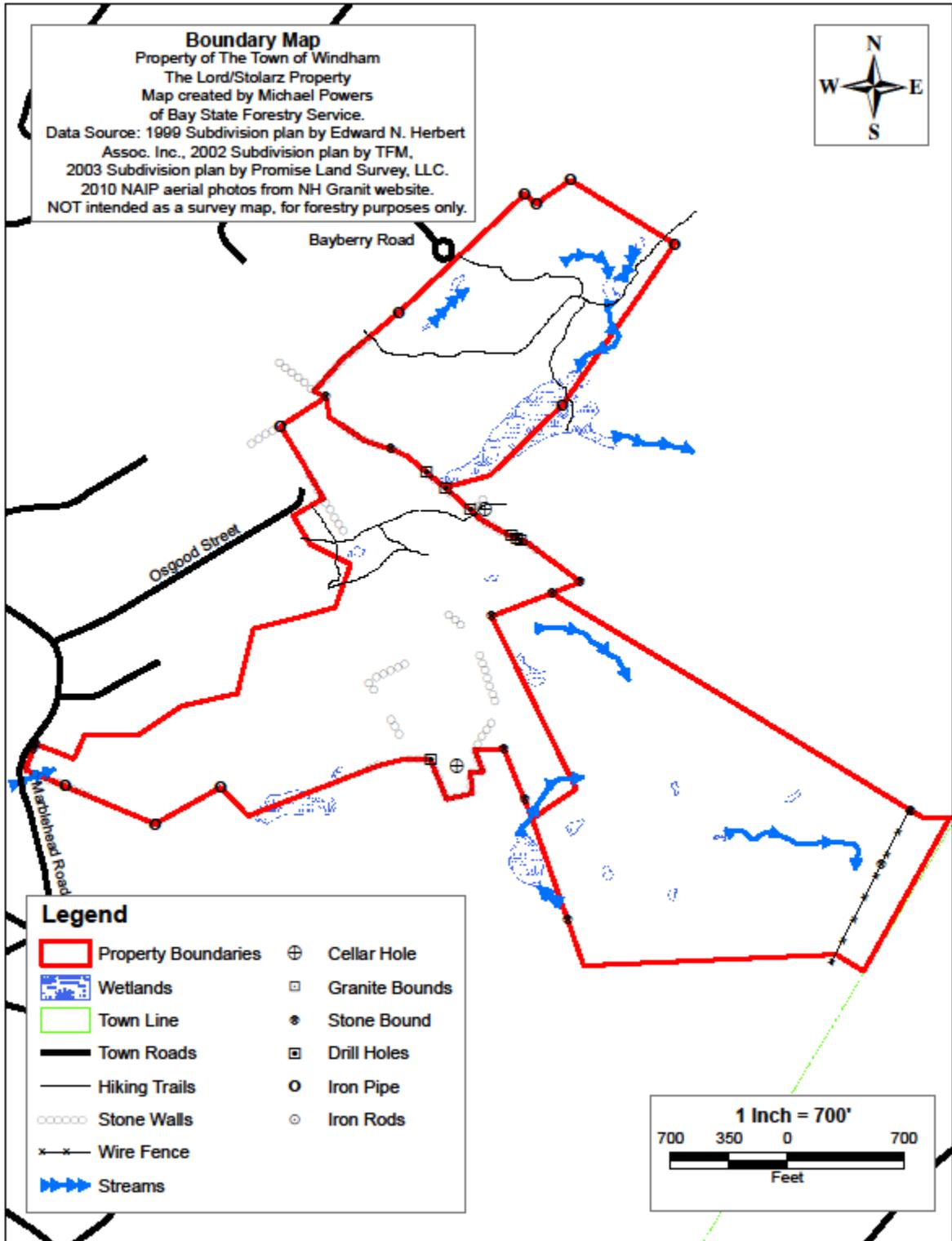


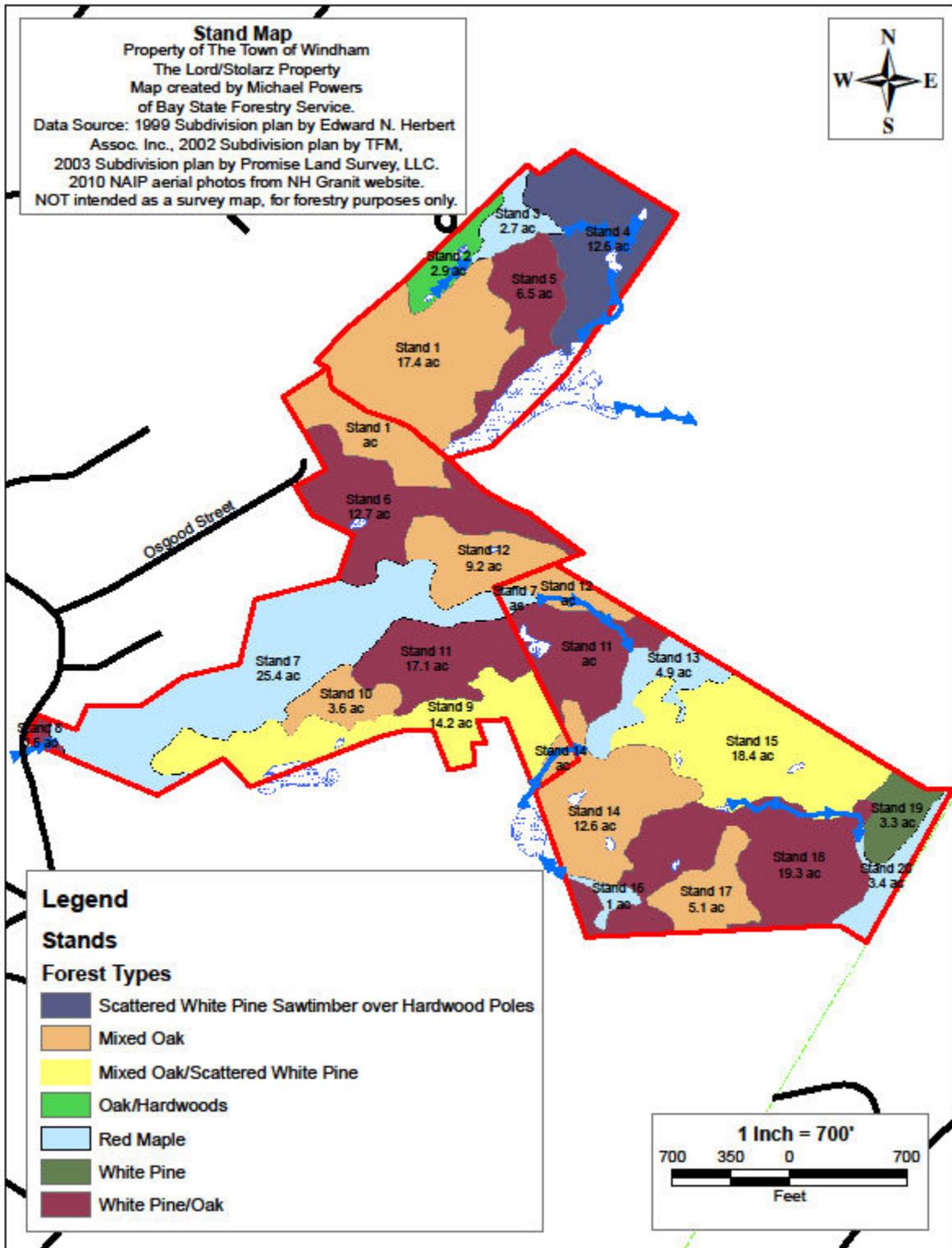
<sup>1</sup> This sawtimber total represents all the trees of sawtimber quality 12 inches and greater in diameter found in this block. In order to capture this total volume, all trees of this specification would have to be harvested.

<sup>2</sup> 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









## **General Management Strategies**

**Timber** – One of the main goals for this property is sound timber management in order to produce a periodic income, as well as promote overall forest health. 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 tree species, protecting and possibly enhancing existing habitat. Care will be taken retain dead snag trees which provide shelter and areas to forage for a variety of wildlife. White oak acorns seem to be preferred by wildlife as a food source. Where possible, good quality, acorn producing white oak will be retained for acorn production. Harvesting trees causes some areas to be opened up to sunlight and stimulates seedling germination and understory growth on the forest floor. The resulting sprouts and young growth can become a great food source for browsing wildlife.



**Soil** – Care will be taken to avoid harvesting during wet times of the year, 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** – In accordance to the State of NH best management practices, buffers will be left along streams 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 streams will be left intact to keep the water clean and silt-free. Poled fords, culverts or bridges will be used as needed when crossing smaller streams to prevent siltation.

**Wetlands** – In order to preserve the integrity of more sensitive areas of this property, forested wetlands will only be harvested under dry or frozen conditions, if at all.

**Recreational Resources** –When a harvesting operation is complete, skid trails can provide good access into the woods for recreational opportunities, both for walking and wildlife viewing. To this end, main trails will be kept free of slash where possible.

**Aesthetic Values** –To maintain aesthetics, logging operations will minimize rutting by avoiding wet and poorly drained areas. The tops of harvested trees will be cut up so they lay close to the ground for rapid decay.



**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. Care will also be taken when working near cellar holes to not disturb these important historical areas.

**Forest Protection** – The diversity of tree species does well to protect this property from a forest pest looking for a monoculture

of trees. By keeping logging slash low to the ground, decay is speeded up, preventing 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.

## Forest Management Plan

### Stand 1 - Mixed Oak-17.4 acres

#### Standing Volumes:

Species	Average BA per acre (sq. ft.)	Volume per acre (bd. ft.)	Total Volume (bd. ft.)
Oak, red	31	2,672.7	46,505
Oak, Black	12	1,007.9	17,537
Pine, white	5	832.6	14,487
Oak, Scarlet	2	165.8	2,885
Oak, white	2	141.1	2,455
Maple, red	1	69.4	1,208
<b><i>Sawtimber Total</i></b>	<b>53</b>	<b>4,890</b>	<b>85,078</b>
Cordwood	53	9.5 cds	166 cds
Pulpwood	2	0.3 cds	5 cds
<b><i>Cord/Pulp Total</i></b>	<b>55</b>		
<b><i>All Products</i></b>	<b>108</b>		

#### Description:

This stand is located in the northern part of the property. It is described as being a mixed oak stand. The overstory composition of the stand is primarily comprised of red and black oak, and the trees range in size from 12-16 inches in diameter. The red oak in this stand is probably some of the highest quality oak on the property. The stand also contains white oak, hickory, red maple and white birch primarily in the intermediate strata of the stand underneath the red oak. These trees are being suppressed by the oak and many are dead or dying, especially the white birch. White pine regeneration can be found throughout the stand from 4-10 feet in height. This white pine regeneration is also suppressed and growth has been stagnated by the shady conditions.

The terrain can be described as rolling. In general the stand slopes to the south east towards the large wetland complex. Although there are small to medium-sized boulders scattered throughout the stand, it is still very operable for forestry equipment. The soils are moderately well drained.

#### Recommendations:

The basal area determined by the timber cruise indicates that the stocking is somewhat high for this stand type. It is recommended that a single tree/group selection in conjunction with a “weeding” type harvest be carried out in this stand to reduce the basal

area to a level that will optimize growth. Trees to be targeted for removal should be the red maple, white birch and black oak that are suppressed in the intermediate strata. If the basal area can be kept at an acceptable level, a few of the larger red oak can also be targeted for removal. The openings in the forest canopy made by removing some of these larger trees will allow sunlight to be shed on some of the white pine regeneration, which will stimulate growth if the trees are not too suppressed.

**Stand 2 – Oak-Hardwood-2.9 acres**

**Standing Volumes:**

<b>Species</b>	<b>Average BA per acre (sq. ft.)</b>	<b>Volume per acre (bd. ft.)</b>	<b>Total Volume (bd. ft.)</b>
Oak, red	25	2,157.0	6,255
Maple, red	10	779.5	2,261
Oak, Black	5	551.7	1,600
<b><i>Sawtimber Total</i></b>	<b>40</b>	<b>3,488</b>	<b>10,116</b>
Cordwood	60	12.3 cds	36 cds
<b><i>Cord/Pulp Total</i></b>	<b>60</b>		
<b><i>All Products</i></b>	<b>100</b>		

Description:

This small stand is located in the northern part of the property just off of the Bayberry Road cul-de-sac. This is an oak stand with mixed hardwoods found in the overstory. The quality of the red oak is very good and range in size from 16-24 inches in diameter. The other primary overstory species in this stand is red maple. The quality of these trees is not as high as the red oak and they are somewhat smaller, ranging in size from 10-14 inches in diameter. There is a small stream that runs through the stand from southwest to the northeast. The stream widens in spots forming small wetland areas with poorly drained soils. The red maple trees like these poorly drained conditions which would explain why they are so numerous in this stand. Red maple, white ash and hickory can all be found in the understory in the small to medium pole size class. White pine regeneration can also be found scattered throughout the stand. In and around the wetland areas, wetland shrubs such as high bush blueberry are common.

Recommendations:

Because most of the soils in this stand are poorly drained, little harvest activity should occur. Some of the low grade red maple around the edges of the wetland areas could be harvested to create growing space for some of the high quality red oak. Care would need to be taken around these wetland areas to prevent any negative impacts from harvesting. Harvesting should only occur under very dry or frozen conditions.

### **Stand 3 – Red Maple-2.7 acres**

#### Description:

This stand is located in the northern section of the property. It is one of several wooded wetlands located throughout the property. The tree species that is most prevalent in this stand is red maple, a tree that thrives in wet soil conditions. Wetland shrub species such as high bush blueberry can be found in the understory. There was no inventory information taken in this stand due to the wet ground conditions.

#### Recommendations:

Since this is a very wet stand with poorly drained soil conditions, very little harvest activity should occur within the stand, because harvesting equipment may cause deep rutting which could lead to erosion and sedimentation issues. This stand serves as valuable wildlife habitat by leaving it intact and limiting harvest activity.

**Stand 4 – Mixed hardwood poles-Scattered white pine-12.6 acres**

**Standing Volumes:**

<b>Species</b>	<b>Average BA per acre (sq. ft.)</b>	<b>Volume per acre (bd. ft.)</b>	<b>Total Volume (bd. ft.)</b>
Pine, white	12	1,405.6	17,711
Oak, red	3	254.6	3,208
<b><i>Sawtimber Total</i></b>	<b>15</b>	<b>1,660</b>	<b>20,919</b>
Cordwood	58	9.8 cds	123 cds
Pulpwood	10	1.4cds	18 cds
<b><i>Cord/Pulp Total</i></b>	<b>68</b>		
<b><i>All Products</i></b>	<b>83</b>		

Description:

This stand is located in the north eastern part of the property. It appears that this stand was harvested heavily approximately 20 years ago, maybe in preparation for development. The result is a stand in the intermediate stage of development, with a high stem count per acre of white pine, red, black and white oak, hickory and red maple all ranging in size from 8-12 inches in diameter. Some larger sawlog-size white pine can be found scattered throughout the stand as well. These trees were probably left behind from the previous harvest.

The terrain in this stand can be described as rolling with few surface rocks or boulders to be found. A small stream flows out of Stand 3 to the east into Stand 4 and merges with another small stream and small wetland areas that are found in the eastern part of the stand. This in turn flows to the south into the larger wetland complex that can be on the map. The soils can be described as moderately well drained, except in and around the wetland areas, which as would be expected are more poorly drained.

Recommendations:

Because this stand is in an early successional to intermediate stage of development it is recommended that little harvest activity occur in this stand. Many of the trees in this stand have little commercial value, but the stand offers very good habitat opportunities to wildlife that utilizes these young forest types.

## Stand 5 – White Pine-Oak-6.5 acres

### Standing Volumes:

Species	Average BA per acre (sq. ft.)	Volume per acre (bd. ft.)	Total Volume (bd. ft.)
Pine, white	40	7,113.9	46,240
Oak, Black	20	1,575.0	10,237
Oak, red	13	1,142.2	7,424
<b><i>Sawtimber Total</i></b>	<b>73</b>	<b>9,831</b>	<b>63,902</b>
Cordwood	50	9.4 cds	61 cds
Pulpwood	7	1.1 cds	7 cds
<b><i>Cord/Pulp Total</i></b>	<b>57</b>		
<b><i>All Products</i></b>	<b>130</b>		

### Description:

This stand is located just to the north of the large wetland complex in the northern part of the property. The white pine in this stand is good quality and ranges in size from 16-24 inches in diameter. The red and black oak ranges in size from 12 to 16 inches in diameter. The oak in this stand is similar to the good quality red oak found in Stand 1. The oak in this part of the property seems to be the highest quality on the property. White pine can be found throughout the stand but seems to be concentrated along the northern edge of the wetland. The understory consists of red maple and white pine in the large sapling to small pole size classification. White pine regeneration can also be found throughout the stand, 4-10 feet high. This white pine regeneration along with most of the regeneration found throughout the property is suppressed from growing under shady conditions.

The terrain in this stand generally slopes to the south toward the large wetland complex. The soils can be described as being moderately well drained to well drained.

### Recommendations:

This stand is very operable for forestry equipment. The basal area is also quite high for this forest type. The suppressed white pine and red maple trees in the intermediate strata should be targeted for removal first. If the basal area can be kept at an acceptable level, some of the large diameter white pine can then be targeted for removal along with some of the poor quality black oak. Very few red oak should be removed from this stand. These trees should be retained as crop trees for the future. An added benefit to having a healthy amount of red oak in Stands 1 and 5 is the abundance of hard mast that these trees will produce over time in the form of acorns. These acorns are an important food source for wildlife such as deer, turkey and squirrels.

## Stand 6 – White Pine-Oak- 12.7 acres

### Standing Volumes:

Species	Average BA per acre (sq. ft.)	Volume per acre (bd. ft.)	Total Volume (bd. ft.)
Pine, white	28	3,959.1	50,280
Oak, red	17	1,475.4	18,738
Oak, Black	10	839.2	10,658
Oak, white	3	259.8	3,300
Maple, red	3	259.8	3,300
<b><i>Sawtimber Total</i></b>	<b>61</b>	<b>6,793</b>	<b>86,276</b>
Cordwood	22	3.8 cds	48 cds
Pulpwood	12	2.4 cds	31 cds
<b><i>Cord/Pulp Total</i></b>	<b>34</b>		
<b><i>All Products</i></b>	<b>95</b>		

### Description:

This stand is located in the northern-central part of the property just off of the Osgood Road cul-de-sac. Like Stand 5 it is characterized as white pine-oak stand, but is more variable, with more of a mix of hardwood species, especially in the southern part of the stand. The red and black oak is in the large pole to medium sawlog size class. The black oak in the northern part of the stand is poor quality. White pine is found throughout the stand and is in the medium to large sawlog size class. White Pine, red maple and white birch are found in the intermediate strata and are in the large sapling to small pole size class. There is a moderate amount of white pine regeneration found throughout the stand, varying in height from 1-10 feet.

The terrain slopes quite drastically to the south east with grades of 10-15%. The soils in the northern part of the stand, which is higher in elevation, tend to be well drained, while the soils in the southern part of the stand at lower elevation tend to be moderately well drained to poorly drained. There is also a small vernal pool located in the western part of the stand.

### Recommendations:

The black oak in the northern part of the stand is low quality and should be targeted for removal. There is also a substantial amount of white pine regeneration located in this part of the stand and harvesting these black oak will allow much needed sunlight to reach these suppressed pine. Like many of the other stands found on the property, much of the low quality hardwood and white pine found in the intermediate strata can also be targeted

for removal. Care would need to be taken when working around the vernal pool located in the western part of the stand, not to disturb the ecological significance of this habitat.

## Stand 7 – Red Maple-25.4 acres

### Description:

This is one of the largest stands and is located in the central-western part of the property. There is no inventory data for the stand because the ground conditions were too saturated. The stand is a forested wetland, with the most prevalent tree species being red maple which thrives in poorly drained soils. White Pine can also be found throughout the stand growing on islands of dry hummocks. Most of the understory is comprised of red maple and wetlands shrubs such as high bush blueberry.

A small stream flows into the wetland area from the west to the east. The wetland is subsequently drained by a stream that exits the stand to the east and flows to the southeast into Stand 13 which is also characterized as a red maple forested wetland.

### Recommendations:

Because the soils are so poorly drained in this stand, very little harvest activity if any at all should occur. Some red maple or pine can be harvested around the edges of the stand if the conditions are either very dry in the summer months or frozen in the winter months. Leaving the stand intact offers benefits to wildlife species that utilize these wooded wetland types. This type of large wetland area also acts as a filter for improved water quality.

## **Stand 8 – White Pine-Oak-.6 acres**

### Description:

This very small stand is located in the western-most part of the property just off of Marblehead Road. It is so small that no inventory data was taken in it. The stand is isolated from the rest of the property by the wetland area that is Stand 7 which is located adjacent to Stand 8 to the east. The stand contains some large sawtimber size white pine as well as some red oak and red maple. A small stream flows under Marblehead Road to the east into Stand 8 and then continues to the east into Stand 7. The soils along the edge of this stream are moderately to poor drained.

### Recommendations:

Because this stand is so small and because it is so isolated from the rest of the property, it would not be cost effective to have any kind of harvest activity occur here. The area is too small and the volume of merchantable timber too little to try and construct some sort of staging area to service this stand. The stand should be left intact, as is, to serve as a forested buffer along Marblehead Road.

**Stand 9 – Mixed Oak-Scattered white pine-14.2 acres**

**Standing Volumes:**

<b>Species</b>	<b>Average BA per acre (sq. ft.)</b>	<b>Volume per acre (bd. ft.)</b>	<b>Total Volume (bd. ft.)</b>
Pine, white	30	4,781.9	67,903
Oak, red	38	3,093.3	43,925
Oak, Black	21	1,780.4	25,282
Maple, red	2	198.8	2,823
Birch, yellow	1	99.4	1,411
Oak, white	1	98.5	1,398
<b><i>Sawtimber Total</i></b>	<b>93</b>	<b>10,052</b>	<b>142,742</b>
Cordwood	45	8.3 cds	117 cds
Pulpwood	9	1.6 cds	23 cds
<b><i>Cord/Pulp Total</i></b>	<b>54</b>		
<b><i>All Products</i></b>	<b>147</b>		

Description:

This stand is more variable with the amount of white pine found on it compared to other stands typed as white pine-oak. Although the basal area is highest for red oak, the white pine in this stand has the highest volume of sawtimber per acre. The white pine is medium to large sawlog size and is scattered in the eastern part of the stand, but seems to be somewhat more concentrated in the western part of the stand. Red and black oak, small to large sawtimber size is found throughout the stand. The black oak is poor quality, especially in the higher elevation areas of the stand where the site conditions are very dry. The red oak is good quality especially in the western part of the stand. The understory consists of a mix of hardwood pole-size trees in the intermediate strata of the stand and regeneration is mostly white pine. White pine regeneration is heavier in the eastern part of the stand and becomes more scattered as you move west in the stand.

The terrain can be described as rolling, and the soils tend to be moderately well drained to well drained. There is a wetland area that is mostly located off of the property, but does spill into the south western part of the stand across the property line. Just to the north east of this wetland area is a small vernal pool. There is also a very nice cellar hole located in the central-eastern portion of the stand, surrounded by stone walls which also act as property boundary lines.

Recommendations:

According to the inventory data, this stand is considered over-stocked for its forest type. A single tree/group selection harvest should be carried out in this stand to bring stocking levels down to a point that will optimize growth. Because the black oak is very poor quality, these trees should first be targeted for removal, along with some of the poorly growing hardwood trees in the intermediate stage of development. Some of the large, mature white pine can also be targeted for removal if the basal area can be kept at an acceptable level. The red oak appear to be the best quality tree growing in the stand and should be targeted as crop trees to be grown into the future.

**Stand 10 – Mixed Oak-3.6 acres**

**Standing Volumes:**

<b>Species</b>	<b>Average BA per acre (sq. ft.)</b>	<b>Volume per acre (bd. ft.)</b>	<b>Total Volume (bd. ft.)</b>
Oak, red	45	3,686.5	13,271
Oak, Black	25	1,980.5	7,130
Pine, white	5	813.6	2,929
<b><i>Sawtimber Total</i></b>	<b>75</b>	<b>6,481</b>	<b>23,330</b>
Cordwood	40	6.7 cds	24 cds
<b><i>Cord/Pulp Total</i></b>	<b>40</b>		
<b><i>All Products</i></b>	<b>115</b>		

Description:

This small stand is located just to the north on Stand 9 in the central part of the property. This is a mixed oak stand that is comprised almost entirely of red and black oak ranging in size from 10-14 inches in diameter. The black oak seems to be very poor quality. The understory consists of yellow birch, red oak and white pine pole-size trees. The white pine poles are very suppressed and not growing well. White pine regeneration can be found throughout the stand ranging in size from 2-10 feet in height.

The stand slopes to the north towards the large wooded wetland that is Stand 7. The soil type appears to be well drained

Recommendations:

The black oak in this stand should be targeted for removal. Since there is an abundance of black oak in the stand, this would be a fairly aggressive harvest that would bring the basal area down to low levels. It would be classified as more of a shelterwood harvest where the red oak and some of the better quality black oak would be retained for future growth. This type of harvest would also be beneficial to establishing new tree regeneration as well as releasing white pine regeneration that is already established. It is difficult to predict how existing white pine regeneration will respond to release since the trees have been suppressed for quite some time.

## Stand 11 – White Pine-Oak-17.1 acres

### Standing Volumes:

Species	Average BA per acre (sq. ft.)	Volume per acre (bd. ft.)	Total Volume (bd. ft.)
Pine, white	64	10,607.7	181,391
Oak, red	19	1,509.9	25,819
Oak, Black	14	1,168.2	19,977
Oak, white	4	340.4	5,820
Maple, red	3	267.1	4,567
Hemlock	3	225.1	3,849
<b><i>Sawtimber Total</i></b>	<b>107</b>	<b>14,118</b>	<b>241,423</b>
Cordwood	34	5.9 cds	101 cds
Pulpwood	20	4.2 cds	72 cds
<b><i>Cord/Pulp Total</i></b>	<b>54</b>		
<b><i>All Products</i></b>	<b>161</b>		

### Description:

This white pine-oak stand is found in the central part of the property. The white pine found in this stand is 16-24 inches in diameter and is of good quality. White pine per acre sawlog volumes are high in this stand, and the white pine seems to be more concentrated in the western part of the stand. Red, black and white oak can be found throughout the stand ranging in size from 10-16 inches in diameter, however, there are larger trees to be found scattered throughout the stand. The understory consists of a mix of hardwood species. These trees range in size from large saplings to medium size poles. There is a small area in the western part of the stand where some hemlock can be found. These trees range in size from large sapling to medium poles. Like most of the other stands on the property, regeneration consists mostly of white pine from 1-15 feet tall.

The soils in the stand can be described as moderately well drained to well drained. The terrain is also quite rocky in the eastern part of the stand. A small stream flows through the stand to the south into Stand 13. A large vernal pool is located in the central portion of the stand.

### Recommendations:

The basal area in this stand is very high which means growth becomes stagnant. Like other stands the black oak should be targeted removal because the quality of these trees is very low. Many of the large mature and over-mature white pine trees can also be harvested from the stand. This will create growing space for the remaining red oak, mixed hardwoods and white pine that will be retained, as well as stimulate regeneration growth.

## Stand 12 – Mixed oak-9.2 acres

### Standing Volumes:

Species	Average BA per acre (sq. ft.)	Volume per acre (bd. ft.)	Total Volume (bd. ft.)
Oak, red	38	3,269.2	30,077
Pine, white	15	2,375.8	21,857
Oak, Black	15	1,199.2	11,032
Maple, red	5	397.4	3,656
Oak, white	3	259.8	2,391
Hemlock	2	179.0	1,647
Birch, white	2	132.5	1,219
<b><i>Sawtimber Total</i></b>	<b>80</b>	<b>7,813</b>	<b>71,879</b>
Cordwood	37	7.0 cds	65 cds
Pulpwood	7	1.3 cds	12 cds
<b><i>Cord/Pulp Total</i></b>	<b>44</b>		
<b><i>All Products</i></b>	<b>124</b>		

### Description:

This stand is located in the central-eastern part of the property. Unlike some of the other stands typed as mixed oak, this stand is a little more variable. However the majority of the stocking is still primarily made up of red and black oak, which is why it has still been typed as a mixed oak stand. The red oak varies in size from large pole to medium sawlog, with some larger sawlog-size trees scattered throughout the stand. White pine can also be found scattered throughout the overstory. The understory is made up of a mix of hardwood saplings and poles, as well as a substantial amount of white pine regeneration found throughout the stand. Some of this regeneration found in the central part of the stand is growing quite well, which differs from most of the regeneration found on the property which is suppressed because of over stocking.

A small vernal pool is located in the northern central part of the stand. A small stream flows through the stand to the south east towards Stand 13. The terrain slopes to the south and is rocky, especially along the stream in the south east part of the stand.

### Recommendations:

A single tree-group selection harvest should be carried out in this stand, targeting the low quality black oak, white birch and red maple for removal. The better quality red oak and white pine should be retained for future growth. White oak in this stand should also be retained for the wildlife value. White oak acorns are favored by deer and turkey over red and black oak acorns and are an important source of nutrition for these animals.

### **Stand 13 – Red Maple-4.9 acres**

#### Description:

This stand is similar to the other red maple stands typed on the property. No inventory data was taken in the stand due to the saturated ground conditions. The overstory of the stand is dominated by red maple ranging in size from 10-16 inches in diameter. White pine of varying size can be found growing along the edge of this stand as well. The understory is comprised of mostly wetlands shrubs such as high bush blueberry. This wooded wetland connects to a larger more open wetland complex to the east off of the property.

#### Recommendations:

Again like other stands similar to this one on the property, harvest activity should be very limited. Any harvesting that does occur should be around the edges of the stand and only when conditions are very dry or frozen.

## Stand 14 – Mixed Oak-12.6 acres

### Standing Volumes:

Species	Average BA per acre (sq. ft.)	Volume per acre (bd. ft.)	Total Volume (bd. ft.)
Oak, Black	19	1,578.8	19,893
Oak, red	18	1,460.1	18,397
Pine, white	4	559.2	7,046
Maple, red	2	175.9	2,216
Oak, white	1	84.9	1,070
<b><i>Sawtimber Total</i></b>	<b>44</b>	<b>3,859</b>	<b>48,622</b>
Cordwood	51	8.6 cds	109 cds
Pulpwood	9	1.3 cds	16 cds
<b><i>Cord/Pulp Total</i></b>	<b>60</b>		
<b><i>All Products</i></b>	<b>104</b>		

### Description:

This stand is located in the south western part of the property. It is a mixed oak stand with very few tree species other than red and black oak. The most common species is black oak. These trees are very poor quality and range in size from 10-16 inches. Regeneration is sparse in most areas in this stand and is primarily made up of suppressed white pine from 2-10 feet tall.

The soils in this stand are well drained and the terrain can be described as undulating. There is a valley in the eastern part of the stand, and more surface boulders and rock can be found in this area. There are two small vernal pools located in this stand. These pools serve as excellent habitat for breeding and foraging reptiles and amphibians.

### Recommendations:

The black oak in this stand is very poor quality and should be targeted for removal. Because of the amount of black oak in this stand this would be a fairly aggressive harvest. This would be considered a shelterwood type cut with the better quality red oak being retained as an even-aged stand. This type of harvest would also benefit the established regeneration in this stand, and may also encourage new tree germination by providing more sunlight to the forest floor. Care would need to be taken when working around the vernal pools found in this stand. Trees should be left around the pools to provide shade so that they do not prematurely dry out in the spring, and skid trail location should be far enough away as to not impact the pools.

## Stand 15 –Mixed Oak-Scattered White Pine-18.4 acres

### Standing Volumes:

Species	Average BA per acre (sq. ft.)	Volume per acre (bd. ft.)	Total Volume (bd. ft.)
Pine, white	21	2,627.3	48,342
Oak, red	24	2,053.5	37,785
Oak, Black	19	1,484.8	27,321
Oak, white	4	356.1	6,552
<b><i>Sawtimber Total</i></b>	<b>68</b>	<b>6,522</b>	<b>119,999</b>
Cordwood	51	8.0 cds	147 cds
Pulpwood	11	1.8 cds	34 cds
<b><i>Cord/Pulp Total</i></b>	<b>62</b>		
<b><i>All Products</i></b>	<b>130</b>		

### Description:

This large stand is located in the south eastern part of the property. It is typed as a mixed oak stand with scattered white pine. There is a section in the north west part of the stand that has a higher concentration of white pine. This area is too small to be classified as its own stand. The white pine in the stand vary in size from 12-24 inches in diameter and are generally of good quality. Although red and black oak make up most of the overstory composition, the white pine has the highest sawlog volume per acre totals. The red and black oak vary in size from 10-16 inches in diameter, and like the other stands on the property the black oak tends to be very poor quality. There are other hardwood species such as black, red and white oak and red maple found in the intermediate strata of the stand. Suppressed pole-size white pine can also be found in the intermediate strata. Also like other stands found on the property, the regeneration is mostly made up of white pine. Some parts of the stand have heavier concentrations of regeneration than other areas.

The terrain in the western part of the stand is very undulating with large boulders and rocks found to be prevalent in this part of the stand. The soils can be described as moderately well drained to well drained. There are two small vernal pools located in this stand, and the headwaters to a small stream that flows to the south east originate in this stand as well. Soils around these wetland features, as would be expected are poorly drained.

### Recommendations:

It is recommended that a single tree-group selection be carried out in this stand to lower the basal area to a level that will increase growth rates on the remaining trees and provide much needed sunlight to the suppressed white pine regeneration. The low quality hardwoods located in the intermediate strata should be targeted for removal, along with

the black oak. Like Stand 14, care needs to be taken when working around the vernal pools located in this stand.

## Stand 16 – Red Maple-1 acre

### Description:

This small stand is located in the south western part of the property. It is a red maple stand that is a wooded wetland, similar to the other stands of this type on the property. No inventory data was taken because of the saturated soil conditions. Most of the trees found in this stand are red maple, and the understory is made up of wetland shrub species such as high bush blueberry.

### Recommendations:

Because of the saturated soil conditions, no harvest activity should occur in this stand. The stand provides critical habitat for wildlife that utilizes these wooded wetland types.

**Stand 17 – Mixed Oak-5 acres**

**Standing Volumes:**

<b>Species</b>	<b>Average BA per acre (sq. ft.)</b>	<b>Volume per acre (bd. ft.)</b>	<b>Total Volume (bd. ft.)</b>
Pine, white	7	820.2	4,101
Oak, Black	10	795.1	3,976
Oak, white	3	264.1	1,320
<b><i>Sawtimber Total</i></b>	<b>20</b>	<b>1,879</b>	<b>9,397</b>
Cordwood	77	11.8 cds	59 cds
Pulpwood	10	1.6 cds	8 cds
<b><i>Cord/Pulp Total</i></b>	<b>87</b>		
<b><i>All Products</i></b>	<b>107</b>		

Description:

This stand is located in the southern part of the property. It is very similar in composition to Stand 14. The main species found in this stand is black oak and these trees are very low quality. They range in size from 10-16 inches in diameter. The understory consists of suppressed, small to medium pole-size white pine, and regeneration is also made up of white pine 2-15 feet tall.

The terrain is can be described as rolling and the soils are well drained.

Recommendations:

A shelterwood harvest should be carried out in this stand to remove the poor quality black oak leaving the better quality red and black oak as crop trees. The basal area in this stand at the conclusion of the harvest would be low, but the resulting openings in the forest canopy would greatly benefit the white pine regeneration that has already been established in the stand.

**Stand 18 – White Pine -Oak-19.2 acres**

**Standing Volumes:**

<b>Species</b>	<b>Average BA per acre (sq. ft.)</b>	<b>Volume per acre (bd. ft.)</b>	<b>Total Volume (bd. ft.)</b>
Pine, white	41	5,343.0	102,585
Oak, red	13	1,071.9	20,581
Oak, Black	7	562.0	10,791
Maple, red	1	113.6	2,181
<b><i>Sawtimber Total</i></b>	<b>62</b>	<b>7,091</b>	<b>136,138</b>
Cordwood	51	9.2 cds	176 cds
Pulpwood	13	2.6 cds	51 cds
<b><i>Cord/Pulp Total</i></b>	<b>64</b>		
<b><i>All Products</i></b>	<b>126</b>		

Description:

This large stand is located in the southern part of the property. It is characterized as a white pine-oak stand. The white pine in the stand range in size from 10-24 inches in diameter. The red and black oak in the stand are 10-16 inches in diameter. The understory consists of a mix of white pine, red maple and white oak 4-8 inches in diameter. Many of these intermediate sized trees are suppressed and dying. Like most of the stands on the property, regeneration consists of white pine seedlings and saplings 1-10 feet tall.

The terrain is rolling and slopes to the east. There is a small stream in the northern part of the stand that originates in Stand 15 and flows to the east into Stand 18. There is also a small vernal pool located in the western part of the stand.

Recommendations:

The basal area for this stand indicates that is somewhat over-stocked. A light single tree-group selection harvest should occur in this stand to bring stocking levels down to acceptable levels. The suppressed/dying trees intermediate trees should be targeted for removal first. Some of the larger, mature and over-mature white pine can also be harvested from the stand if the basal area can be kept at an acceptable level.

### Stand 19 – White Pine-3.3 acres

#### Standing Volumes:

Species	Average BA per acre (sq. ft.)	Volume per acre (bd. ft.)	Total Volume (bd. ft.)
Pine, white	60	9,200.5	30,362
Maple, sugar	37	4,805.5	15,858
Oak, red	10	839.3	2,770
Maple, red	3	265.0	875
Oak, white	3	264.1	871
<b><i>Sawtimber Total</i></b>	<b>113</b>	<b>15,374</b>	<b>50,736</b>
Cordwood	40	6.8 cds	22 cds
Pulpwood	17	4.5 cds	15 cds
<b><i>Cord/Pulp Total</i></b>	<b>57</b>		
<b><i>All Products</i></b>	<b>170</b>		

#### Description:

This is the only white pine stand typed on this property. Most of the stands contain white pine, and most of the stands contain some significant amount of red and black oak. This is the only stand other than the red maple stands that do not contain a significant amount of red or black oak. The white pine in this stand is 16-26 inches in diameter. The pine in this stand is some of the better quality pine on the property. The understory of this stand is comprised of red maple, white oak and white birch all of which is 4-8 inches in diameter. There is also more red maple located along the edges of this stand to the east where the soils are more poorly drained.

The terrain in this stand is flat and the soils are moderately well drained to well drained except along the southern and eastern edges of the stand where the soils are more poorly drained.

#### Recommendations:

Since this stand is an even-aged pine stand a light thinning should be conducted to reduce the basal area. Suppressed low-grade hardwood should be targeted for removal along with inferior growing white pine with weak crowns. If the basal area can be kept at an acceptable level, some of the large mature pine can also be harvested from the stand for sawtimber.

## **Stand 20- Red Maple- 3.4 acres**

### Description:

This stand is located in the south eastern-most part of the property. It is a wooded wetland in which the overstory composition is made up of mostly red maple ranging in size from 8-12 inches in diameter. There was no inventory data recorded in this stand because of the saturated soil conditions.

### Recommendations:

No harvest activity should take place in this stand, because of the poorly drained soil conditions. This stand should remain intact and will serve as crucial habitat for wildlife that utilizes these wooded wetland areas.

## **Management Schedule**

### **2012**

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

### **2013-22**

- Begin infrastructure construction and conduct a biomass timber harvest in designated areas chosen by the conservation committee.
- Seed and lime the landing at the conclusion of the timber harvest.
- Address recreational issues (hunting, hiking, marking trails, kiosks, ect)
- Monitor the property for wind damage, ice damage, fire, invasive species or disease and take appropriate corrective actions as needed to ensure the continued health of this forested parcel.
- Re-assess the property in 10 years and write a new 10-year management plan, specifically looking at forest health improvement and the potential for another harvest midway through the next management period.
- (Recommended Item) Make this property available for Project Learning Tree excursions for the local schools and utilize any other educational opportunities for town residents.

### **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 weather. Through sound silvicultural practices and using best management practices (BMP's), mature, diseased, and defective trees will be harvested to provide healthier more vigorous growing trees more growing space, and to stimulate regeneration on the forest floor. 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 Town's objectives for their property. Implementing these recommendations will help ensure that this forestland is being managed with long-term sustainability in mind.

Respectfully Submitted,

Michael F. Powers, Consulting Forester  
N.H. License #379