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MAY 20 2019



**Woodland Enhancement Plan**  
*DCR Working Forest Initiative*  
*Bird Habitat Assessment Plan*  
*Stony Brook Conservation Area*



**For property belonging to:**

Town of Westford  
Westford Conservation Commission  
55 Main Street  
Westford, MA 01886

**Prepared by:**

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New England Forestry Consultants, Inc.  
30 Jewell Hill Road  
Ashburnham, MA 01430

**Reviewed by:**

Jeffrey Ritterson  
Mass Audubon – Field Ornithologist

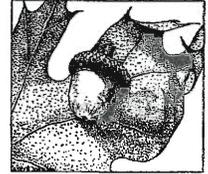


**New England  
Forestry Consultants, Inc.**  
[www.eforesters.com](http://www.eforesters.com)



# FOREST MANAGEMENT PLAN

Submitted to: Massachusetts Department of Conservation and Recreation  
For enrollment in CH61/61A/61B and/or Forest Stewardship Program **MAY 20 2019**



| CHECK-OFFS                          |                                      |                                      |  |   | Administrative Box        |                              |                              |                           |
|-------------------------------------|--------------------------------------|--------------------------------------|--|---|---------------------------|------------------------------|------------------------------|---------------------------|
| CH61 cert. <input type="checkbox"/> | CH61A cert. <input type="checkbox"/> | CH61B cert. <input type="checkbox"/> | STWSHP new <input checked="" type="checkbox"/>         | C-S EEA <input type="checkbox"/>          | Case No. <u>330-11445</u> | Orig. Case No. <u>new</u>    | Owner ID <u>5041005</u>      | Add. Case No. <u>---</u>  |
| recert. <input type="checkbox"/>    | recert. <input type="checkbox"/>     | recert. <input type="checkbox"/>     | renew <input type="checkbox"/>                         | Other <input type="checkbox"/>            | Date Rec'd <u>5-20-19</u> | Ecoregion <u>201A</u>        | Plan Period <u>2020-2029</u> | Topo Name <u>Westford</u> |
| amend <input type="checkbox"/>      | amend <input type="checkbox"/>       | amend <input type="checkbox"/>       | FSC <input type="checkbox"/>                           | Birds <input checked="" type="checkbox"/> | Rare Sp. Hab. <u>---</u>  | River Basin <u>Merrimack</u> | Plan Change: _____ to _____  |                           |
|                                     |                                      |                                      | Conservation Rest. <input checked="" type="checkbox"/> | CR Holder <u>Land Preservation Soc.</u>   |                           |                              |                              |                           |

## OWNER, PROPERTY, and PREPARER INFORMATION

Property Owner(s) Town of Westford - Westford Conservation Commission

Mailing Address 55 Main Street, Westford, MA 01886 Phone 978-692-5524

Email Address cgumbart@westfordma.gov

Property Location: Town(s) Westford Road(s) Depot Rd., Nutting Rd., River St.

Plan Preparer Gary H. Gouldrup, New England Forestry Cons., Inc. Mass. Forester License # 81

Mailing Address 30 Jewell Hill Road, Ashburnham, MA 01430 Phone (508) 397-9206

## RECORDS

| Assessor's Map No. | Lot/Parcel No. | Deed Book | Deed Page | Total Acres | Ch61/61A 61B Excluded Acres | Ch61/61A 61B Certified Acres | Stewship Excluded Acres | Stewship Acres |
|--------------------|----------------|-----------|-----------|-------------|-----------------------------|------------------------------|-------------------------|----------------|
| 031                | 0034           | 7906      | 202       | 0.739       | 0.739                       | 0.00                         | 0.00                    | 0.739          |
| 031                | 0035           | 22536     | 228       | 65.10       | 65.10                       | 0.00                         | 0.00                    | 65.10          |
| 031                | 0036           | 28740     | 28        | 12.17       | 12.17                       | 0.00                         | 0.00                    | 12.17          |
| 031                | 0037           | 18566     | 253       | 237.23      | 237.23                      | 0.00                         | 7.84                    | 229.39         |
| 035                | 0032-4         | 18566     | 253       | 19.749      | 19.749                      | 0.00                         | 0.00                    | 19.749         |
| 036                | 0002           | 21730     | 239       | 6.90        | 6.90                        | 0.00                         | 0.00                    | 6.90           |
| TOTALS             |                |           |           | 341.888     | 341.888                     | 0.00                         | 7.84                    | 334.057        |

## Excluded Area Description(s) (if additional space needed, continue on separate paper)

There are 8.42 acres to be excluded from productive woodland classification. The areas consist of facilities for the 6.42 acre Camp Nashoba and the 2.00 acre Camp Cielo. See page 2 for description of metes and bounds.

HISTORY Year acquired 2006 Year management began 2019

Are boundaries marked: Yes  blazed/painted/flagged/signs posted (circle all that apply)? No  Partially

What treatments have been prescribed, but not carried out (last 10 years if plan is a recert.)?

stand no. NA treatment NA reason NA

(if additional space needed, continue on separate page)

## Previous Management Practices (last 10 years)

| Stand #   | Cutting Plan # | Treatment | Yield     | Acres     | Date      |
|-----------|----------------|-----------|-----------|-----------|-----------|
| <u>NA</u> | <u>NA</u>      | <u>NA</u> | <u>NA</u> | <u>NA</u> | <u>NA</u> |

Remarks: (if additional space needed, continue on separate page)

*This is the first management plan prepared for this property.*

**RECORDS** (continued)

| Assessor's Map No. | Lot/Parcel No. | Deed Book | Deed Page | Total Acres    | Ch61/61A 61B Excluded Acres | Ch61/61A 61B Certified Acres | Stewshp Excluded Acres | Stewshp Acres  |
|--------------------|----------------|-----------|-----------|----------------|-----------------------------|------------------------------|------------------------|----------------|
| 031                | 0034           | 7906      | 202       | 0.739          | 0.739                       | 0.00                         | 0.00                   | 0.739          |
| 031                | 0035           | 22536     | 228       | 65.10          | 65.10                       | 0.00                         | 0.00                   | 65.10          |
| 031                | 0036           | 28740     | 28        | 12.17          | 12.17                       | 0.00                         | 0.00                   | 12.17          |
| 031                | 0037           | 18566     | 253       | 237.23         | 237.23                      | 0.00                         | 7.84                   | 229.39         |
| 035                | 0032-4         | 18566     | 253       | 19.749         | 19.749                      | 0.00                         | 0.00                   | 19.749         |
| 036                | 0002           | 21730     | 239       | 6.90           | 6.90                        | 0.00                         | 0.00                   | 6.90           |
| <b>TOTALS</b>      |                |           |           | <b>341.888</b> | <b>341.888</b>              | <b>0.00</b>                  | <b>7.84</b>            | <b>334.057</b> |

**EXCLUDED AREA DESCRIPTION** (continued):

There are 7.83 acres to be excluded from productive woodland classification. The areas consist of facilities for the 5.83-acre Camp Nashoba and the 2.00-acre Camp Cielo.

The Camp Nashoba exclusion is 5.83-acres and is bounded as follows: Beginning at the northwesterly corner of the exclusion at a point, S0E, 855'+/- to a point; thence N75E, 540'+/- to a point; thence N22E, 540'+/- to a point; thence N57W, 380'+/- to the point of beginning.

The Camp Cielo exclusion is 2.00-acres and is bounded as follows: Beginning at the northwesterly corner of the exclusion at a point, S22W, 340'+/- to a point; thence S68E, 250'+/- to a point; thence N22E, 340'+/- to a point; thence N68W, 250'+/- to the point of beginning.

**HISTORY** (continued):

| Stand # | Acres   | Management Practices                    | Yield | Value | Year |
|---------|---------|---|-------|-------|------|
| NA      | 334.058 | 1 <sup>st</sup> Forest Stewardship Plan | NA    | NA    | 2019 |

Owner(s): Town of Westford – Westford Conservation Commission

Town(s): Westford



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## Property Overview, Regional Significance, and Management Summary

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### Property Description:

The 333-acre Stony Brook Conservation Area is centrally located in the Town of Westford. The property is mostly wooded with white pine and mixed oak timber resources. The upland areas of the forest are roughly 70% of the terrain. Wetland resource areas include Burge's Pond, a kettle-hole bog, Keyes Brook to the east and Stony Brook, each with their own bordering marsh and swamp land. Four vernal pools have been certified on the property and other potential pools have been identified. Stony Brook flows southerly through the property and meets Keyes Brook just south of the property. Stony Brook flows northeast through Westford and into Chelmsford where it feeds the Merrimack River. The property is currently a popular location for passive recreation by Westford residents.

### Regional Significance:

The property is centrally located in Westford providing its residents with one of the largest protected parcels of forestland in town. The property features significant water resources which contribute to the town drinking water supply. Stony Brook provides a natural corridor facilitating the movement of a variety of native wildlife between habitat areas, such as the Lowell-Dracut-Tyngsborough State Forest and the Merrimack River. The property is located near lands with long term protection such as the Acker Conservation Land, the Grassy Pond Lot and the Cider Mill Pond Conservation Area. The property is close to the Petapawag Area of Critical Environmental Concern (ACEC) in Dunstable and Groton that connects to the Squannassit and Central Nashua River Valley ACECs.

### History:

A complete and in-depth history of the area has been compiled by Westford resident Marian Harman. This document is available for download from the Westford Friends of East Boston Camps website (<http://westfordfriendsebc.org/>). Harman reports that by 1916 most of the marketable timber had been harvested and hauled away by train. The forest continued producing wood throughout the twentieth century for use by the Hyams' "Fresh Air Camp". The most recent occurrence of stand replacing natural disturbance was the hurricane of 1938. Pit and mound microtopographical features can still be found in some areas. Some selective thinning in small areas has been done in the past few decades, however the majority of the forest has received little to no management.

### Cultural Resources:

Stonewalls along the property boundary and within the forest interior are evidence of agricultural pursuits in the past. A historic trolley line borders the property to the north and has been converted to a public rail trail. Several old buildings remain and have fallen into disrepair, such as the old boat house on Burge's Pond and several buildings that used to be Camp Waki. These features can be found on the Boundary & Stand Type Map and will be protected to preserve the property's historical value.



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## Property Overview, Regional Significance, and Management Summary

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### Soils & Forest Health:

The upland forest soils on this property are productive and capable of growing high-quality timber resources. The soils include Hinckley, Windsor and Wareham loamy sand; as well as Freetown and Scarboro muck soils. The highest quality red oak and white pine can be found growing on the lower elevation Windsor and Wareham soils along the Keyes Brook floodplain in the southeastern corner of the property. Forest health issues of concern include high stocking levels that have created closed canopy conditions throughout. As a result, many overstory trees have poor live crown ratios and the understory is either absent or declining. Other disease issues that were observed include chestnut blight, pine-oak gall rust and caliciopsis canker, which are stand specific and will be described in the stand description section of this plan. No sign of gypsy moth or hemlock wooly adelgid was observed at the time of the inventory.

### Invasive Species:

Very little invasive non-native vegetation exists on the property. Japanese barberry was found in low amounts within Stand 1 near the parking area. Invasive vegetation is currently not prolific and management on the property will always consider the impacts of invasive species.

### Wildlife Habitat:

The forest is dominated by a mature, closed-canopy overstory separated by strips of open wetlands with very little early successional forest. Mature upland pine-oak forest comprises the majority of the forested habitat, accounting for approximately 250 acres with minimal structural diversity. In general, the forest lacks structural features such as dead snags and coarse woody debris, which are important features for small mammal and bird feeding, mating and nesting. Keyes Brook and Stony Brook provide rich diversity in habitat to the property as a whole. These wetland resource areas are highly diverse themselves and are comprised of a mix of open water, shallow and deep marsh vegetation, shrubland and wooded wetland areas. Multiple vernal pools have been certified on the property; these areas provide unique habitat for amphibians and invertebrates. There is a relatively large (3.5-acre) kettle-hole bog that provides further diversity to the multiple wetland systems. These types of wetlands are associated with high acidity and low oxygen content, creating conditions that are ideal for certain rare plants and animals. The property provides food, shelter and water to various species of wildlife in the area.

### Natural Heritage Endangered Species:

The State's GIS OLIVER system indicates that there are no known rare or endangered species or their habitats on the property. Any management on the property will follow the NHESP recommendations if a rare species or its habitat is known to exist in the future and a Chapter 132 Cutting Plan will be submitted to NHESP and approved prior to any timber harvesting on the property.

### Boundaries:

Stone walls and wire fences along boundary lines occur in some areas on this property. A small portion of the southwestern boundary has been blazed and painted in red paint. Iron pipes and stone bounds were found during the inventory. These features can be seen on the Boundary & Stand Type Map. All of the boundary lines are in need of identification, blazing and painting. Blazing and painting is needed in order to protect the property from encroachment and to assist with management activities. This should occur early within the ten-year management period.



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## Property Overview, Regional Significance, and Management Summary

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### Forest Products:

Timber resources include white pine, red oak, black oak, white oak, hemlock and mixed hardwood sawlogs of poor to good timber quality. Non-sawtimber products include softwood pulp that can be used for paper and for wood chips that can be burned at wood burning facilities to produce energy. Firewood is available in the very poor-quality hardwood stems and tops. The forest can be considered “overstocked” in forestry terms. Generally, the trees are growing close together, compromising development and causing slow growth rates in the forest. Younger and small sized timber resources will benefit from periodic thinning within the forest. Harvesting will also prepare the forest understory for new production of trees. Currently, tree regeneration is limited in areas due to a dense overstory canopy and lack of sunlight reaching the forest floor. This forest will respond well to improvement thinning over the next ten years of management and the timber resources will improve in value as a result.

### Management Summary:

Management will focus on promoting a healthy forest environment providing habitat for birds, other forms of native wildlife, clean water down stream of the property, and high-quality timber and non-timber resources.

The landowner would specifically like to accomplish the following on this property:

- Enhance Bird Habitat
- Improve Timber Resources
- Promote Biological Diversity
- Enhance Recreation and Aesthetics
- Enhance Other Native Wildlife Habitats
- Create Opportunities for Public Education



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## Property Overview, Regional Significance, and Management Summary

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### *Bird Habitat Assessment Component*

The surrounding 2,500-acre landscape for bird habitat is an approximately 1-mile radius from the property and consists of suburban development (65%), forest (33%), open water (5%) and agricultural fields (2%). Though hard to tell, it is estimated that there is very little early successional habitat available for birds that depend upon these young forest conditions. Creating and maintaining this special bird habitat will help achieve an overall landscape goal of about 10% of existing forest in an early successional condition. The property is embedded in a larger landscape of moderate development, stressing the importance of this property to represent and maintain diverse bird habitat in this area.

In general, forest management for creating and maintaining bird habitat will focus on silviculture that will create openings in the forest that will provide vigorous new growth in the understory for nesting and protection. Creating and maintaining a minimum of 5+/- acres of young forest habitat will help meet the goal of 10% of existing forest in young forest habitat for birds. Currently, the gravel pit area (Stand 11) offers the only young forest habitat type but is succeeding to a more mature, stem exclusion stage, forest. Efforts to minimize the "hard edge" along the electric line and train line may be done by creating small patch cuts.

Other habitat requirements that will be considered in the management of the property will include "snag trees" and "cavity trees". It is recommended to retain 5 snag trees per acre greater than 10 inches in diameter (DBH). For cavity trees, it is recommended to retain 1-3 trees greater than 18 inches DBH per acre and 4 trees in the 12-18 inch DBH range. Leaving "coarse woody debris" on the forest floor after harvesting is recommended. Coarse woody debris is considered greater than 5 inches in diameter and greater than 5 feet long and the recommendation is to leave 2 cords per acre on the forest floor. "Fine woody debris" will also be scattered throughout the harvest areas and will consist of piles greater than 1 meter wide of tree tops and slash from chipping operations. Birds prefer this material in the understory for nesting, cover, and foraging.

Birds that will benefit from this type of management include the following:

- 1) *American Woodcock* – Hardwood or mixed woods matrix with a mix of openings and young forest in early stages of regeneration
- 2) *Black-and-white Warbler* – Mixedwood forest matrix with a mix of openings and young forest in early stages of regeneration, preferably near a shrub wetland
- 3) *Black-throated Green Warbler* – Habitat requires well-stocked, uneven-aged mixedwood and softwood sawtimber stands with >80% canopy cover
- 4) *Chestnut Sided Warbler & Brown Thrasher* – Habitat requires young 5-15 year-old hardwood forest with less than 30% canopy cover and dense shrubs and saplings 3-10 feet high
- 5) *Canada Warbler* - Most abundant in moist mixed wood forests with a 50-70% canopy cover and dense understory and mid-story. Often found in swamps and riparian areas.
- 6) *Eastern Towhee* – Habitat requires early successional open or edge habitats and dense understory with open canopy approximately 20% cover.
- 7) *Ruffed Grouse* – Requires mixed age woodlands with successional to mature forests. Dense understory and fairly open herbaceous ground cover for nesting.
- 8) *Northern Flicker & Yellow-bellied Sapsucker* – Requires snag trees in partially open mixed woodlands and along forest edge.

### Landowner Goals

Please **check** the column that best reflects the importance of the following goals:

| Goal   | Importance to Me |        |     |            |
|--|------------------|--------|-----|------------|
|  | High             | Medium | Low | Don't Know |
| Enhance the Quality/Quantity of Timber Products* |                  |        | X   |            |
| Generate Immediate Income                        |                  |        | X   |            |
| Generate Long Term Income                        |                  |        | X   |            |
| Produce Firewood                                 |                  |        | X   |            |
| Defer or Defray Taxes                            |                  |        | X   |            |
| Promote Biological Diversity                     | X                |        |     |            |
| Enhance Habitat for Birds                        | X                |        |     |            |
| Enhance Habitat for Small Animals                | X                |        |     |            |
| Enhance Habitat for Large Animals                | X                |        |     |            |
| Improve Access for Walking/Skiing/Recreation     | X                |        |     |            |
| Maintain or Enhance Privacy                      |                  |        | X   |            |
| Improve Hunting or Fishing                       |                  | X      |     |            |
| Preserve or Improve Scenic Beauty                | X                |        |     |            |
| Protect Water Quality                            | X                |        |     |            |
| Protect Unique/Special/ Cultural Areas           |                  | X      |     |            |
| Other: Public Education & Outreach               |                  | X      |     |            |

\*This goal must be checked "HIGH" if you are interested in classifying your land under Chapter 61/61A.

In your own words, describe your goals for the property:

*To inspire long-term health of the forest by reducing vulnerability and increasing resiliency. Encourage forest regeneration and diversity of plant, bird and animal species. Discourage growth and introduction of non-native invasive plants and insects. Encourage infiltration from precipitation and reduce erosion issues to improve water quality of streams and Burge's Pond. Maintain trails and accessibility for recreational activities. All to ensure the property remains natural, beautiful open space for the town and is environmentally health for the long-term.*

### Stewardship Purpose

By enrolling in the Forest Stewardship Program and following a Stewardship Plan, I understand that I will be joining with many other landowners across the state in a program that promotes ecologically responsible resource management through the following actions and values:

1. Managing sustainably for long-term forest health, productivity, diversity, and quality.
2. Conserving or enhancing water quality, wetlands, soil productivity, carbon sequestration, biodiversity, cultural, historical and aesthetic resources.
3. Following a strategy guided by well-founded silvicultural principles to improve timber quality and quantity when wood products are a goal.
4. Setting high standards for foresters, loggers and other operators as practices are implemented; and minimizing negative impacts.
5. Learning how woodlands benefit and affect surrounding communities, and cooperation with neighboring owners to accomplish mutual goals when practical.

Signature(s): \_\_\_\_\_

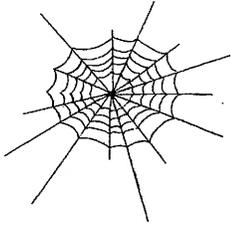
Date: \_\_\_\_\_

Owner(s) (print) \_\_\_\_\_

(This page will be included with the completed plan.)

## Stewardship Issues

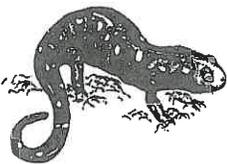
Massachusetts is a small state, but it contains a tremendous variety of ecosystems, plant and animal species, management challenges, and opportunities. This section of your plan will provide background information about the Massachusetts forest landscape as well as issues that might affect your land. **The Stand Descriptions and Management Practices sections of your plan will give more detailed property specific information** on these subjects tailored to your management goals.



**Biodiversity:** Biological diversity is, in part, a measure of the variety of plants and animals, the communities they form, and the ecological processes (such as water and nutrient cycling) that sustain them. With the recognition that each species has value, individually and as part of its natural community, maintaining biodiversity has become an important resource management goal.

While the biggest threat to biodiversity in Massachusetts is the loss of habitat to development, another threat is the introduction and spread of invasive non-native plants. Non-native invasives like European Buckthorn, Asiatic Bittersweet, and Japanese Honeysuckle spread quickly, crowding out or smothering native species and upsetting and dramatically altering ecosystem structure and function. Once established, invasives are difficult to control and even harder to eradicate. Therefore, vigilance and early intervention are paramount.

Another factor influencing biodiversity in Massachusetts concerns the amount and distribution of forest growth stages. Wildlife biologists have recommended that, for optimal wildlife habitat on a landscape scale, 5-15% of the forest should be in the seedling stage (less than 1" in diameter). Yet we currently have no more than 2-3% early successional stage seedling forest across the state. There is also a shortage of forest with large diameter trees (greater than 20"). See more about how you can manage your land with biodiversity in mind in the "Wildlife" section below. (Also refer to *Managing Forests to Enhance Wildlife Diversity in Massachusetts* and *A Guide to Invasive Plants in Massachusetts* in the binder pockets.)

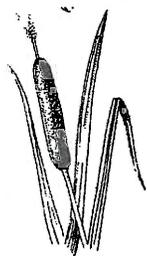


**Rare Species:** Rare species include those that are **threatened** (abundant in parts of its range but declining in total numbers, those of **special concern** (any species that has suffered a decline that could threaten the species if left unchecked), and **endangered** (at immediate risk of extinction and probably cannot survive without direct human intervention). Some species are threatened or endangered globally, while others are common globally but rare in Massachusetts.

Of the 2,040 plant and animal species (not including insects) in Massachusetts, 424 are considered rare. About 100 of these rare species are known to occur in woodlands. Most of these are found in wooded wetlands, especially vernal pools. These temporary shallow pools dry up by late summer, but provide crucial breeding habitat for rare salamanders and a host of other unusual forest dwelling invertebrates. Although many species in Massachusetts are adapted to and thrive in recently disturbed forests, rare species are often very sensitive to any changes in their habitat

Indispensable to rare species protection is a set of maps maintained by the Division of Fisheries and Wildlife's Natural Heritage & Endangered Species Program (NHESP) that show current and historic locations of rare species and their habitats. The maps of your property will be compared to these rare species maps and the result indicated on the upper right corner of the front page of the plan. Prior to any

regulated timber harvest, if an occurrence does show on the map, the NHESP will recommend protective measures. Possible measures include restricting logging operations to frozen periods of the year, or keeping logging equipment out of sensitive areas. You might also use information from NHESP to consider implementing management activities to improve the habitat for these special species.



**Riparian and Wetlands Areas:** Riparian and wetland areas are transition areas between open water features (lakes, ponds, streams, and rivers) and the drier terrestrial ecosystems. More specifically, a **wetland** is an area that has hydric (wet) soils and a unique community of plants that are adapted to live in these wet soils. Wetlands may be adjacent to streams or ponds, or a wetland may be found isolated in an otherwise drier landscape. A **riparian area** is the transition zone between an open water feature and the uplands (see Figure 1). A riparian zone may contain wetlands, but also includes areas with somewhat better drained soils. It is easiest to think of riparian areas as the places where land and water meet.

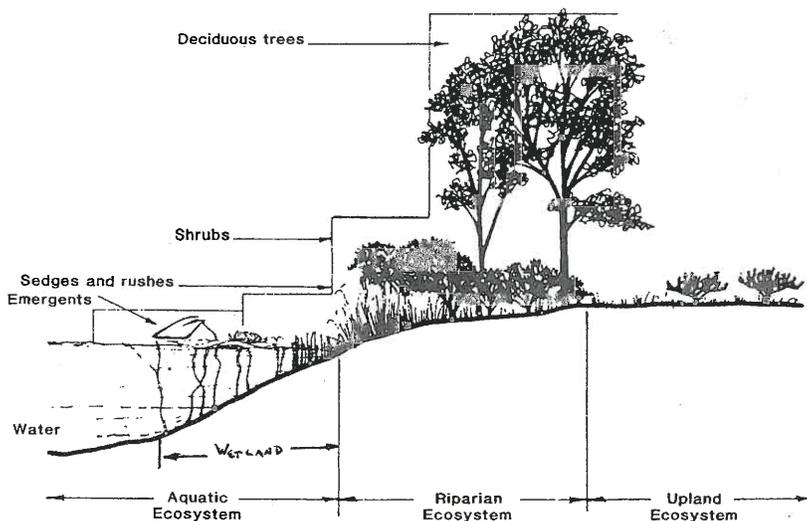


Figure 1: Example of a riparian zone.

The presence of water in riparian and wetland areas make these special places very important. Some of the functions and values that these areas provide are described below:

**Filtration:** Riparian zones capture and filter out sediment, chemicals and debris before they reach streams, rivers, lakes and drinking water supplies. This helps to keep our drinking water cleaner, and saves communities money by making the need for costly filtration much less likely.

**Flood control:** By storing water after rainstorms, these areas reduce downstream flooding. Like a sponge, wetland and riparian areas absorb stormwater, then release it slowly over time instead of in one flush.

**Critical wildlife habitat:** Many birds and mammals need riparian and wetland areas for all or part of their life cycles. These areas provide food and water, cover, and travel corridors. They are often the most important habitat feature in Massachusetts' forests.

**Recreational opportunities:** Our lakes, rivers, streams, and ponds are often focal points for recreation. We enjoy them when we boat, fish, swim, or just sit and enjoy the view.

In order to protect wetlands and riparian areas and to prevent soil erosion during timber harvesting activities, Massachusetts promotes the use of “Best Management Practices” or BMPs. Maintaining or reestablishing the protective vegetative layer and protecting critical areas are the two rules that underlie these common sense measures. DEM’s Massachusetts Forestry Best Practices Manual (included with this plan) details both the legally required and voluntary specifications for log landings, skid trails, water bars, buffer strips, filter strips, harvest timing, and much more.

The two Massachusetts laws that regulate timber harvesting in and around wetlands and riparian areas are the Massachusetts Wetlands Protection Act (CH 131), and the Forest Cutting Practices Act (CH132). Among other things, CH132 requires the filing of a cutting plan and on-site inspection of a harvest operation by a DEM Service Forester to ensure that required BMPs are being followed when a commercial harvest exceeds 25,000 board feet or 50 cords (or combination thereof).



**Soil and Water Quality:** Forests provide a very effective natural buffer that holds soil in place and protects the purity of our water. The trees, understory vegetation, and the organic material on the forest floor reduce the impact of falling rain, and help to insure that soil will not be carried into our streams and waterways.

To maintain a supply of clean water, forests must be kept as healthy as possible. Forests with a diverse mixture of vigorous trees of different ages and species can better cope with periodic and unpredictable stress such as insect attacks or windstorms.

Timber harvesting must be conducted with the utmost care to ensure that erosion is minimized and that sediment does not enter streams or wetlands. Sediment causes turbidity which degrades water quality and can harm fish and other aquatic life. As long as Best Management Practices (BMPs) are implemented correctly, it is possible to undertake active forest management without harming water quality.



**Forest Health:** Like individual organisms, forests vary in their overall health. The health of a forest is affected by many factors including weather, soil, insects, diseases, air quality, and human activity. Forest owners do not usually focus on the health of a single tree, but are concerned about catastrophic events such as insect or disease outbreaks that affect so many individual trees that the whole forest community is impacted.

Like our own health, it is easier to prevent forest health problems than to cure them. This preventative approach usually involves two steps. First, it is desirable to maintain or encourage a wide diversity of tree species and age classes within the forest. This diversity makes a forest less susceptible to a single devastating health threat. Second, by thinning out weaker and less desirable trees, well-spaced healthy individual trees are assured enough water and light to thrive. These two steps will result in a forest of vigorously growing trees that is more resistant to environmental stress.



**Fire:** Most forests in Massachusetts are relatively resistant to catastrophic fire. Historically, Native Americans commonly burned certain forests to improve hunting grounds. In modern times, fires most often result from careless human actions. The risk of an unintentional and damaging fire in your woods could increase as a result of logging activity if the slash (tree tops, branches, and debris) is not treated correctly.

Adherence to the Massachusetts slash law minimizes this risk. Under the law, slash is to be removed from buffer areas near roads, boundaries, and critical areas and lopped close to the ground to speed decay. Well-maintained woods roads are always desirable to provide access should a fire occur.

Depending on the type of fire and the goals of the landowner, fire can also be considered as a management tool to favor certain species of plants and animals. Today the use of prescribed burning is largely restricted to the coast and islands, where it is used to maintain unique natural communities such as sandplain grasslands and pitch pine/scrub oak barrens. However, state land managers are also attempting to bring fire back to many of the fire-adapted communities found elsewhere around the state.



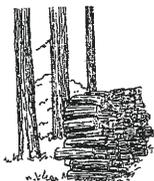
**Wildlife Management:** Enhancing the wildlife potential of a forested property is a common and important goal for many woodland owners. Sometimes actions can be taken to benefit a particular species of interest (e.g., put up Wood Duck nest boxes). In most cases, recommended management practices can benefit many species, and fall into one of three broad strategies. These are **managing for diversity, protecting existing habitat, and enhancing existing habitat.**

**Managing for Diversity** – Many species of wildlife need a variety of plant communities to meet their lifecycle requirements. In general, a property that contains a diversity of habitats will support a more varied wildlife population. A thick area of brush and young trees might provide food and cover for grouse and cedar waxwing; a mature stand of oaks provides acorns for foraging deer and turkey; while an open field provides the right food and cover for cottontail rabbits and red fox. It is often possible to create these different habitats on your property through active management. The appropriate mix of habitat types will primarily depend on the composition of the surrounding landscape and your objectives. It may be a good idea to create a brushy area where early successional habitats are rare, but the same practice may be inappropriate in the area's last block of mature forest.

**Protecting Existing Habitat** – This strategy is commonly associated with managing for rare species or those species that require unique habitat features. These habitat features include vernal pools, springs and seeps, forested wetlands, rock outcrops, snags, den trees, and large blocks of unbroken forest. Some of these features are rare, and they provide the right mix of food, water, and shelter for a particular species or specialized community of wildlife. It is important to recognize their value and protect their function. This usually means not altering the feature and buffering the resource area from potential impacts.

**Enhancing Existing Habitat** – This strategy falls somewhere between the previous two. One way the wildlife value of a forest can be enhanced is by modifying its structure (number of canopy layers, average tree size, density). Thinning out undesirable trees from around large crowned mast (nut and fruit) trees will allow these trees to grow faster and produce more food. The faster growth will also accelerate the development of a more mature forest structure, which is important for some species. Creating small gaps or forest openings generates groups of seedlings and saplings that provide an additional layer of cover, food, and perch sites.

Each of these three strategies can be applied on a single property. For example, a landowner might want to increase the habitat diversity by reclaiming an old abandoned field. Elsewhere on the property, a stand of young hardwoods might be thinned to reduce competition, while a “no cut” buffer is set up around a vernal pool or other habitat feature. The overview, stand description and management practice sections of this plan will help you understand your woodland within the context of the surrounding landscape and the potential to diversify, protect or enhance wildlife habitat.



**Wood Products:** If managed wisely, forests can produce a periodic flow of wood products on a sustained basis. Stewardship encompasses finding ways to meet your current needs while protecting the forest’s ecological integrity. In this way, you can harvest timber and generate income without compromising the opportunities of future generations.

Massachusetts forests grow many highly valued species (white pine, red oak, sugar maple, white ash, and black cherry) whose lumber is sold throughout the world. Other lower valued species (hemlock, birch, beech, red maple) are marketed locally or regionally, and become products like pallets, pulpwood, firewood, and lumber. These products and their associated value-added industries contribute between 200 and 300 million dollars annually to the Massachusetts economy.

By growing and selling wood products in a responsible way you are helping to our society’s demand for these goods. Harvesting from sustainably managed woodlands – rather than from unmanaged or poorly managed forest – benefits the public in a multitude of ways. The sale of timber, pulpwood, and firewood also provides periodic income that you can reinvest in the property, increasing its value and helping you meet your long-term goals. Producing wood products helps defray the costs of owning woodland, and helps private landowners keep their forestland undeveloped.



**Cultural Resources:** Cultural resources are the places containing evidence of people who once lived in the area. Whether a Native American village from 1,700 years ago, or the remains of a farmstead from the 1800’s, these features all tell important and interesting stories about the landscape, and should be protected from damage or loss.

Massachusetts has a long and diverse history of human habitation and use. Native American tribes first took advantage of the natural bounty of this area over 10,000 years ago. Many of these villages were located along the coasts and rivers of the state. The interior woodlands were also used for hunting, traveling, and temporary camps. Signs of these activities are difficult to find in today’s forests. They were obscured by the dramatic landscape impacts brought by European settlers as they swept over the area in the 17<sup>th</sup> and 18<sup>th</sup> centuries.

By the middle 1800’s, more than 70% of the forests of Massachusetts had been cleared for crops and pastureland. Houses, barns, wells, fences, mills, and roads were all constructed as woodlands were converted for agricultural production. But when the Erie Canal connected the Midwest with the eastern cities, New England farms were abandoned for the more productive land in the Ohio River valley, and the landscape began to revert to forest. Many of the abandoned buildings were disassembled and moved, but the supporting stonework and other changes to the landscape can be easily seen today.

One particularly ubiquitous legacy of this period is stone walls. Most were constructed between 1810 and 1840 as stone fences (wooden fence rails had become scarce) to enclose sheep within pastures, or to

exclude them from croplands and hayfields. Clues to their purpose are found in their construction. Walls that surrounded pasture areas were comprised mostly of large stones, while walls abutting former cropland accumulated many small stones as farmers cleared rocks turned up by their plows. Other cultural features to look for include cellar holes, wells, old roads and even old trash dumps.



**Recreation and Aesthetic Considerations:** Recreational opportunities and aesthetic quality are the most important values for many forest landowners, and represent valid goals in and of themselves. Removing interfering vegetation can open a vista or highlight a beautiful tree, for example. When a landowner's goals include timber, thoughtful forest management can be used to accomplish silvicultural objectives while also reaching recreational and/or aesthetic objectives. For example, logging trails might be designed to provide a network of cross-country ski trails that lead through a variety of habitats and reveal points of interest.

If aesthetics is a concern and you are planning a timber harvest, obtain a copy of this excellent booklet: *A Guide to Logging Aesthetics: Practical Tips for Loggers, Foresters & Landowners*, by Geoffrey T. Jones, 1993. (Available from the Northeast Regional Agricultural Engineering Service, (607) 255-7654, for \$7). Work closely with your consultant to make sure the aesthetic standards you want are included in the contract and that the logger selected to do the job executes it properly. The time you take to plan ahead of the job will reward you and your family many times over with a fuller enjoyment of your forest, now and well into the future.

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**This is your Stewardship Plan.** It is based on the goals that you have identified. The final success of your Stewardship Plan will be determined first, by how well you are able to identify and define your goals, and second, by the support you find and the resources you commit to implement each step.

It can be helpful and enjoyable to visit other properties to sample the range of management activities and see the accomplishments of others. This may help you visualize the outcome of alternative management decisions and can either stimulate new ideas or confirm your own personal philosophies. Don't hesitate to express your thoughts, concerns, and ideas. Keep asking questions! Please be involved and enjoy the fact that you are the steward of a very special place.



## Forest Stands

For the purposes of this report a forest stand is an easily defined area that is relatively uniform in composition, and structure, *and supports a particular suite of birds.*

### Summary of the Forest Stands on your property

| Stand | Forest/Habitat Type      | Approx. Size (acres) | Notes   |
|-------|--------------------------|----------------------|---|
| 1     | White Pine               | 26.55                | Mature white pine sawtimber with pole to small sawtimber mixed oak-hardwood. Many legacy size (26"+ DBH) white pine.  |
| 2     | Keyes Brook – Deep Marsh | 16.86                | Wetland resource area comprised of Keyes Brook and associated grasses, shrubs and swamps.   |
| 3     | White Pine – Mixed Oak   | 7.62                 | White pine and mixed oak sawtimber. Area was harvested approximately 15-20 years ago.   |
| 4     | Kettle-hole Bog          | 3.55                 | Wetland resource area containing certified vernal pool. Scattered black spruce, tamarack and white pine saplings. Composition of bog associated vegetation. |
| 5     | White Pine – Mixed Oak   | 88.84                | Extremely well-drained sandy hilly esker. High stocking levels of white pine and oak sawtimber.   |
| 6     | Stony Brook – Deep Marsh | 54.00                | Wetland resource area comprised of Stony Brook and associated grasses, shrubs and swamps.   |
| 7     | White Pine- Mixed Oak    | 34.94                | Stand includes the two excluded areas and infrastructure for summer camps. Two wetland areas exist, one contains a certified vernal pool.                   |
| 8     | White Pine – Mixed Oak   | 12.96                | Timber quality varies greatly from the wet to the dry sites. Dense witch hazel midstory by brook.   |
| 9     | Mixed Oak                | 17.18                | Only forested area without white pine component. White pine in midstory has caliciopsis canker.   |
| 10    | White Pine               | 15.02                | Overstocked white pine sawtimber, many of poor quality. Poor live crown ratio, lacks diversity.   |
| 11    | Gravel Pit               | 1.63                 | Abandoned gravel pit area. Dense small poles of aspen, white birch, white pine and mixed oak.   |
| 12    | White Pine – Mixed Oak   | 6.40                 | Well-stocked white pine sawtimber with mixed oak poles and small sawtimber. Poor access.  |
| 13    | Swamp Hardwood           | 6.39                 | Swamp hardwood dominated by red maple. Many large blowdowns between railroad tracks and stream.   |
| 14    | White Pine – Mixed Oak   | 42.09                | Area was harvested approximately 15-20 years ago. Dense white pine regeneration may be infested with pine-oak gall rust. High regeneration mortality.       |

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Owner(s) Town of Westford – Westford Conservation Commission

Towns(s) Westford

### STAND DESCRIPTIONS

| OBJ | STDNO | TYPE | AC | MSD OR SIZE-CLASS | BA/AC | VOL/AC | SITE INDEX |
|-----|-------|------|----|-------------------|-------|--------|------------|
|-----|-------|------|----|-------------------|-------|--------|------------|

|      |   |    |       |                             |           |                        |         |
|------|---|----|-------|-----------------------------|-----------|------------------------|---------|
| STEW | 1 | WP | 26.55 | 13.9" MSD<br>Sawtimber-Pole | 202 sqft. | 28,345 BF<br>21.9 Cds. | 80 (WP) |
|------|---|----|-------|-----------------------------|-----------|------------------------|---------|

White pine dominates the overstory in this overstocked sawtimber and pole sized stand. The white pine sawtimber is fair to good in form and timber quality. Many large diameter white pines have reached a legacy size class (26"+ DBH). Mixed oak poles and sawtimber comprise a minor component. Red maple and elm can be found scattered along the wetter portions of the stand. Forest regeneration primarily consists of scattered pockets of white pine seedlings and saplings. Mixed oak, red maple and scattered hickory seedlings and saplings can also be found. The understory consists of shrubs and vines including beaked hazelnut, low-bush blueberry, high-bush blueberry, witch hazel, winterberry, swamp azalea, viburnum, American chestnut, ferns, Japanese barberry and poison ivy. Low amounts of dead hardwood and pine snags (14"+ DBH) can be found scattered throughout the stand and provide excellent wildlife habitat for cavity dwelling birds and small mammals. The area is mostly flat, slopping gently to the east directly adjacent to Keyes Brook. The soils are well to poorly drained loamy sand (Windsor-Wareham) capable of producing high quality sawtimber. Management will focus on mimicking old growth characteristics, wildlife habitat enhancement, bird management and recreation. The desired future condition is a stand that is growing high quality timber resources in several size and age classes while providing habitat for native birds, all forms of native wildlife, and recreational opportunities for the public.

**Current Habitat Conditions:**

Stand One is dominated by a closed canopy of mature white pine and mixed hardwoods reaching 50-100 feet in height and the canopy is 85% closed. The midstory vegetation (5-30 feet in height) is approximately 45% cover and understory vegetation (0-5 feet in height) is approximately 65% cover. The understory consists of shrubs and vines including beaked hazelnut, low-bush blueberry, high-bush blueberry, witch hazel, winterberry, swamp azalea, viburnum, American chestnut, ferns, Japanese barberry and poison ivy. Japanese barberry was the only invasive species observed and occurs in low amounts. Low levels of coarse woody debris exist and adequate amounts of snag trees were observed. Leaf litter consists of pine needles and deciduous leaves.

**Desired Stand Conditions**

| Condition                                  | Action  | Responsibility Birds That May Benefit                         |
|--|---|---|
| Increased abundance of canopy gaps         | Expanding Gap Shelterwood<br>Develop Stand w/ Old<br>Growth Characteristics | Wood Thrush<br>Black-throated Green Warbler<br>Canada Warbler |
| Increased growth and vigor in canopy trees |   |   |
| Increased midstory density                 |   |   |
| Increased understory density               |   |   |
| Retained snags/ cavity trees               | Retain Snags/Cavity Trees<br>During Timber Harvests                         | Northern Flicker  |

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Owner(s) Town of Westford – Westford Conservation Commission

Towns(s) Westford

**STAND DESCRIPTIONS**

| OBJ | STDNO | TYPE | AC | MSD OR SIZE-CLASS | BA/AC | VOL/AC | SITE INDEX |
|-----|-------|------|----|-------------------|-------|--------|------------|
|-----|-------|------|----|-------------------|-------|--------|------------|

|      |   |    |       |                               |    |    |         |
|------|---|----|-------|-------------------------------|----|----|---------|
| STEW | 2 | MD | 16.86 | Keyes Brook<br>Grasses-Shrubs | NA | NA | 45 (RM) |
|------|---|----|-------|-------------------------------|----|----|---------|

This area is a wetland resource area including open water, deep marsh, shrubland and swampland along Keyes Brook. The edges of the marsh are vegetated primarily with wetland shrubs such as high-bush blueberry, low-bush blueberry, speckled alder, winterberry, swamp azalea, beaked hazelnut and witch hazel. Invasive plants such as oriental bittersweet, Japanese barberry and multiflora rose were also observed in low amounts. Scattered trees exist along the bank, consisting of fair to poor quality red maple, white oak, white pine and elm. The marsh also contains cattails, skunk cabbage and other marsh associated herbaceous vegetation. There are standing dead snags scattered throughout the area in various stages of decay. Beaver are very active with multiple huts scattered along the brook. This stand also contains small patches of upland separated from the majority of the property by Keyes Brook and they connect the property to Depot Road and Nutting Road. The area is flat and remains wet throughout the year with very poorly drained organic soils (Freetown). No management is recommended at this time as the stand will be allowed to develop naturally over the next ten years. The desired future condition is a stand that is providing habitat for wildlife while protecting water quality.

**Current Habitat Conditions:**

Stand Two is open with scattered trees, 20-40 feet in height, lining the banks. The midstory vegetation (5-30 feet in height) is approximately 45% cover and understory vegetation (0-5 feet in height) is approximately 70% cover. The edges of the marsh are vegetated primarily with wetland shrubs such as high-bush blueberry, low-bush blueberry, speckled alder, winterberry, beaked hazelnut and witch hazel. Invasive plants such as oriental bittersweet, Japanese barberry and multiflora rose were also observed in low amounts. Scattered trees exist along the bank consisting of fair to poor quality red maple, white oak, white pine and elm. The marsh also contains cattails, skunk cabbage and other marsh associated herbaceous vegetation. Low levels of coarse woody debris exist and adequate amounts of snag trees were observed.

**Desired Stand Conditions**

| Condition                      | Action                                | Responsibility Birds That May Benefit  |
|--------------------------------|---------------------------------------|--|
| Maintain Wetland Resource Area | No management over the next ten years | Red-winged Blackbird<br>Common Yellowthroat<br>Great Blue Heron<br>Willow Flycatcher<br>Belted Kingfisher<br>Waterfowl |

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### STAND DESCRIPTIONS

| OBJ | STDNO | TYPE | AC | MSD OR SIZE-CLASS | BA/AC | VOL/AC | SITE INDEX |
|-----|-------|------|----|-------------------|-------|--------|------------|
|-----|-------|------|----|-------------------|-------|--------|------------|

|      |   |    |      |                            |           |                        |         |
|------|---|----|------|----------------------------|-----------|------------------------|---------|
| STEW | 3 | WO | 7.62 | 15.0"MSD<br>Sawtimber-Pole | 180 sqft. | 21,368 BF<br>13.7 Cds. | 78 (WP) |
|------|---|----|------|----------------------------|-----------|------------------------|---------|

White pine and mixed oak dominate the overstory in this adequately stocked sawtimber and pole sized stand. The white pine and mixed oak poles and sawtimber are fair to good in form and timber quality. Forest regeneration is abundant due to timber harvesting activities that occurred approximately 15-20 years ago. Regeneration consists of dense white pine seedlings and saplings of good quality. Scattered mixed oak and red maple seedlings and saplings can also be found. The understory consists of low-bush blueberry with scattered high-bush blueberry shrubs. Low amounts of dead hardwood and pine snags (14"+ DBH) can be found scattered throughout the stand and provide excellent wildlife habitat for cavity dwelling birds and small mammals. The area is mostly flat with loamy sand soils that are moderately well to well-drained (Windsor) and capable of producing high quality sawtimber. Management will focus on mimicking old growth characteristics, wildlife habitat enhancement, bird management and recreation. The desired future condition is a stand that is growing high quality timber resources in several size and age classes while providing habitat for native birds and all forms of native wildlife, as well as recreational opportunities for the public.

**Current Habitat Conditions:**

Stand Three is dominated by a somewhat closed canopy of mature white pine and mixed oak reaching 50-75 feet in height and the canopy is 75% closed. The midstory vegetation (5-30 feet in height) is approximately 75% cover and understory vegetation (0-5 feet in height) is approximately 80% cover. The understory consists of low-bush blueberry with scattered high-bush blueberry shrubs. Low levels of coarse woody debris exist and adequate amounts of snag trees were observed. Leaf litter consists of pine needles and deciduous leaves.

**Desired Stand Conditions**

| Condition                                  | Action   | Responsibility Birds That May Benefit                    |
|--|--|--|
| Increased abundance of canopy gaps         | Expanding Gap Shelterwood<br>Develop Old Growth<br>Characteristics | Black-and-white Warbler<br>Wood Thrush<br>Canada Warbler |
| Increased growth and vigor in canopy trees |  |  |
| Increased midstory density                 |  |  |
| Increased understory density               |  |  |
| Retained snags/cavity trees                | Retain Snags/Cavity Trees<br>During Timber Harvests                | Northern Flicker   |

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Owner(s) Town of Westford – Westford Conservation Commission

Towns(s) Westford

**STAND DESCRIPTIONS**

| OBJ | STDNO | TYPE | AC | MSD OR SIZE-CLASS | BA/AC | VOL/AC | SITE INDEX |
|-----|-------|------|----|-------------------|-------|--------|------------|
|-----|-------|------|----|-------------------|-------|--------|------------|

|      |   |    |      |                                  |    |    |         |
|------|---|----|------|----------------------------------|----|----|---------|
| STEW | 4 | MS | 3.55 | Kettle-hole Bog<br>Sapling-Shrub | NA | NA | 35 (RM) |
|------|---|----|------|----------------------------------|----|----|---------|

This area is a wetland resource area comprised of a bog ecosystem that has developed in a glacial kettle-hole. The edges of the bog are vegetated primarily with red maple and white pine saplings and poles. Dense shrubs in the understory extend further out into the bog, consisting primarily of high-bush blueberry, swamp azalea and sweet pepperbush. The central portion of the bog is dominated by leatherleaf with sheep laurel, meadow sweet and a variety of other species of the Ericaceae family. Scattered white pine, black spruce and tamarack saplings occur throughout portions of the bog, stunted by poor growing conditions. This stand contains a certified vernal pool that becomes dry at times. The wetland lacks any inlet/outlet and has very poorly drained organic soils (Freetown). No management is recommended at this time as the stand will be allowed to develop naturally over the next ten years. The desired future condition is a stand that is providing habitat for wildlife while protecting water quality.

**Current Habitat Conditions:**

Stand Four is open with scattered trees, 5-10 feet in height spaced widely throughout. The midstory vegetation (5-30 feet in height) is approximately 80% cover occurring primarily around the edges of the bog and understory vegetation (0-5 feet in height) is approximately 100% cover. Low levels of coarse woody debris exist and low amounts of snag trees were observed around the edges.

**Desired Stand Conditions**

| Condition                      | Action                                | Responsibility Birds That May Benefit                            |
|--------------------------------|---------------------------------------|--|
| Maintain Wetland Resource Area | No management over the next ten years | Red-winged Blackbird<br>Common Yellowthroat<br>Willow Flycatcher |

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Owner(s) Town of Westford – Westford Conservation Commission      Towns(s) Westford

**STAND DESCRIPTIONS**

| OBJ | STDNO | TYPE | AC | MSD OR SIZE-CLASS | BA/AC | VOL/AC | SITE INDEX |
|-----|-------|------|----|-------------------|-------|--------|------------|
|-----|-------|------|----|-------------------|-------|--------|------------|

|      |   |    |       |                            |           |                        |         |
|------|---|----|-------|----------------------------|-----------|------------------------|---------|
| STEW | 5 | WO | 88.84 | 12.7"MSD<br>Sawtimber-Pole | 173 sqft. | 19,757 BF<br>15.7 Cds. | 68 (WP) |
|------|---|----|-------|----------------------------|-----------|------------------------|---------|

White pine and mixed oak dominate the overstory in this overstocked sawtimber and pole sized stand. The white pine is mostly sawtimber sized and timber quality varies greatly between dominant and codominant trees. Many trees are becoming suppressed and mortality is occurring in some areas. The oak component is minor in some areas and dominant in others. The oak is sawtimber and pole sized and of poor to good form and timber quality. The timber quality improves dramatically in the northwestern end of the stand. The site is very dry, resulting in a mix of predominantly black and scarlet oak with less red oak and few white oak. Pitch pine can be found scattered throughout areas that may have burned in the past. Black birch and red maple saplings and poles can be found scattered throughout the stand as well. Forest regeneration varies greatly throughout the stand. White pine, mixed oak, black birch and red maple seedlings and saplings can be found scattered throughout much of the stand. Pockets of dense white pine seedlings and saplings occur frequently; much of this regeneration is stunted and dying due to the dense overstory. Isolated pockets of dense hemlock saplings and poles can also be found. The understory consists of low-bush blueberry with scattered high-bush blueberry shrubs on the sandy uplands. Pockets with high amounts of American chestnut sprouts can be found on the north facing slopes leading down to Burge's Pond. Lower areas along Stony Brook and Burge's Pond are growing mountain laurel, sheep laurel and sweet pepperbush. Adequate amounts of dead hardwood and pine snags (14"+ DBH) can be found scattered throughout the stand and provide excellent wildlife habitat for cavity dwelling birds and small mammals. A bat nesting box has been installed just south of the old Camp Waki buildings. A gravel road leads from the entrance of the property off Depot Road to the Camp Waki area, providing excellent access to a central location on the property. The area is a wide sandy esker sloping somewhat steeply to the northeast and southwest. Areas of pit and mound microtopography are indicative of blow downs which likely occurred during the 1938 hurricane. The soils are extremely well-drained (Hinckley-Windsor) loamy sand capable of producing high quality sawtimber. Management will focus on timber harvesting, wildlife habitat enhancement, bird management and recreation. The desired future condition is a stand that is growing high quality timber resources in several size and age classes while providing habitat for native birds, all forms of native wildlife, and recreational opportunities for the public.

**Current Habitat Conditions:**

Stand Five is dominated by a closed canopy of white pine and mixed oak reaching 50-75 feet in height and the canopy is 85% closed. The midstory vegetation (5-30 feet in height) ranges from 10-100% cover and understory vegetation (0-5 feet in height) ranges from 20-60% cover. The understory consists of low-bush blueberry with scattered high-bush blueberry shrubs. Adequate levels of coarse woody debris and snag trees were observed. Leaf litter consists of pine needles and deciduous leaves.

**Desired Stand Conditions**

| Condition                                  | Action   | Responsibility Birds That May Benefit |
|--|--|---------------------------------------|
| Increased abundance of canopy gaps         | Shelterwood Harvest in Pine                      | American Woodcock<br>Canada Warbler   |
| Increased growth and vigor in canopy trees | Individual & Group Selection Harvest in Oak      | White Throated Sparrow                |
| Increased midstory density                 |  |                                       |
| Increased understory density               |  |                                       |
| Retained snags/cavity trees                | Retain Snags/Cavity Trees During Timber Harvests | Northern Flicker                      |

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Owner(s) Town of Westford – Westford Conservation Commission    Towns(s) Westford

### STAND DESCRIPTIONS

| OBJ | STDNO | TYPE | AC | MSD OR SIZE-CLASS | BA/AC | VOL/AC | SITE INDEX |
|-----|-------|------|----|-------------------|-------|--------|------------|
|-----|-------|------|----|-------------------|-------|--------|------------|

|      |   |    |       |                               |    |    |         |
|------|---|----|-------|-------------------------------|----|----|---------|
| STEW | 6 | MD | 54.00 | Stony Brook<br>Grasses-Shrubs | NA | NA | 45 (RM) |
|------|---|----|-------|-------------------------------|----|----|---------|

This area is a wetland resource area including open water, deep marsh, shrubland and swampland along Stony Brook. The edges of the marsh are vegetated primarily with wetland shrubs such as high-bush blueberry, low-bush blueberry, red osier dogwood, elderberry, sweet pepperbush, speckled alder, winterberry, swamp azalea, beaked hazelnut, sheep laurel, green briar and witch hazel. Cattails, skunk cabbage, ferns and associated wildflowers, grasses and herbs can also be found. Trees exist along the bank and consist of fair to poor quality tupelo, red maple, white pine and pitch pine. There are standing dead snags scattered within the area in various stages of decay. Beaver are very active with multiple huts scattered along the brook. The area is flat and remains wet throughout the year with very poorly drained organic soils (Freetown). No management is recommended at this time as the stand will be allowed to develop naturally over the next ten years. The desired future condition is a stand that is providing habitat for wildlife while protecting water quality.

**Current Habitat Conditions:**

Stand Six is open with trees, 20-70 feet in height, lining the banks. The midstory vegetation (5-30 feet in height) is approximately 30% cover and understory vegetation (0-5 feet in height) is approximately 70% cover. The edges of the marsh are vegetated primarily with wetland shrubs such as high-bush blueberry, low-bush blueberry, red osier dogwood, elderberry, sweet pepperbush, speckled alder, winterberry, swamp azalea, beaked hazelnut, sheep laurel, green briar and witch hazel. Cattails, skunk cabbage, ferns and associated wildflowers, grasses and herbs can also be found. Trees exist along the bank consisting of fair to poor quality tupelo, red maple, white pine and pitch pine. Low levels of coarse woody debris exist and adequate amounts of snag trees were observed.

**Desired Stand Conditions**

| Condition                      | Action                                | Responsibility Birds That May Benefit  |
|--------------------------------|---------------------------------------|--|
| Maintain Wetland Resource Area | No management over the next ten years | Red-winged Blackbird<br>Common Yellowthroat<br>Great Blue Heron<br>Willow Flycatcher<br>Belted Kingfisher<br>Waterfowl |

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**STAND DESCRIPTIONS**

| OBJ | STDNO | TYPE | AC | MSD OR SIZE-CLASS | BA/AC | VOL/AC | SITE INDEX |
|-----|-------|------|----|-------------------|-------|--------|------------|
|-----|-------|------|----|-------------------|-------|--------|------------|

|      |   |    |       |                              |           |                        |         |
|------|---|----|-------|------------------------------|-----------|------------------------|---------|
| STEW | 8 | WO | 12.96 | 12.96" MSD<br>Sawtimber-Pole | 158 sqft. | 14,162 BF<br>16.3 Cds. | 70 (WP) |
|------|---|----|-------|------------------------------|-----------|------------------------|---------|

White pine and mixed oak dominate the overstory in this adequately stocked sawtimber and pole sized stand. The white pine is mostly sawtimber sized and timber quality is poor to good but is high along Keyes Brook. The oak component is minor in some areas and dominant in others. The oak is sawtimber and pole sized and of poor to good form and timber quality. High quality red and white oak can be found closer to Keyes Brook. Red maple and white birch poles can be found scattered throughout the stand, as well. Forest regeneration consists of scattered white pine, mixed oak, black birch and red maple seedling and saplings with pockets of dense white pine, mixed oak and hardwood seedlings and saplings. The understory primarily consists of low-bush blueberry with scattered high-bush blueberry shrubs. Closer to Keyes Brook, dense witch hazel occupies the midstory. Adequate amounts of dead hardwood and pine snags (14"+ DBH) can be found scattered throughout the stand and provide excellent wildlife habitat for cavity dwelling birds and small mammals. The area is somewhat flat in the northeastern portion but contains two small, sandy, knobs one with a certified vernal pool at the base. The soils are extremely well-drained (Hinckley-Windsor) loamy sand capable of producing high quality sawtimber. Management will focus on creating young forest habitat, wildlife habitat enhancement, bird management and recreation. The desired future condition is a stand that is growing high quality timber resources in several size and age classes while providing habitat for native birds and all forms of native wildlife, as well as recreational opportunities for the public.

**Current Habitat Conditions:**

Stand Eight is dominated by a closed canopy of white pine and mixed oak reaching 50-75 feet in height and the canopy is 85% closed. The midstory vegetation (5-30 feet in height) ranges from 10-85% cover and understory vegetation (0-5 feet in height) ranges from 10-85% cover. The understory primarily consists of low-bush blueberry with scattered high-bush blueberry shrubs. Closer to Keyes Brook, dense witch hazel occupies the midstory. Adequate levels of coarse woody debris and snag trees were observed. Leaf litter consists of pine needles and deciduous leaves.

**Desired Stand Conditions**

| Condition                       | Action                 | Responsibility Birds That May Benefit   |
|---------------------------------|------------------------|---|
| Create young forest habitat     | Wildlife Patch Harvest | Black-and-white Warbler<br>Brown Thrasher<br>Chestnut-sided Warbler<br>Eastern Towhee<br>Ruffed Grouse<br>American Woodcock<br>White-throated Sparrow |
| Increased density of understory |                        |   |

OBJECTIVE CODE: CH61 = stands classified under CH61/61A/61B    STEW= stands not classified under CH61/61A/61B  
 STD= stand    AC= acre    MSD= mean stand diameter    MBF= thousand board feet    BA= basal area    VOL= volume

Owner(s) Town of Westford – Westford Conservation Commission      Towns(s) Westford



**STAND DESCRIPTIONS**

| OBJ | STDNO | TYPE | AC | MSD OR SIZE-CLASS | BA/AC | VOL/AC | SITE INDEX |
|-----|-------|------|----|-------------------|-------|--------|------------|
|-----|-------|------|----|-------------------|-------|--------|------------|

|      |    |    |       |                            |           |                        |         |
|------|----|----|-------|----------------------------|-----------|------------------------|---------|
| STEW | 10 | WP | 15.02 | 13.7"MSD<br>Sawtimber-Pole | 176 sqft. | 21,679 BF<br>20.0 Cds. | 65 (WP) |
|------|----|----|-------|----------------------------|-----------|------------------------|---------|

White pine dominates the overstory in this overstocked sawtimber and pole sized stand. The white pine sawtimber is very poor to good in form and timber quality. Mixed oak poles and sawtimber comprise a minor component that is poor to good in form and timber quality. Red maple and aspen poles and small sawtimber can be found scattered within the stand. Forest regeneration varies in density and consists of mixed oak, hardwood and white pine seedlings and saplings. The understory consists of shrubs and vines including beaked hazelnut, low-bush blueberry, hawthorn, viburnum and poison ivy. Good amounts of dead hardwood and pine snags (14"+ DBH) can be found scattered throughout the stand and provide excellent wildlife habitat for cavity dwelling birds and small mammals. The area is mostly flat, sloping gently to the north with relatively little elevation change between Keyes and Stony Brooks. The soils are moderately-well to well-drained loamy sand (Hinckley) capable of producing high quality sawtimber. Management will focus on timber harvesting, wildlife habitat enhancement, bird management and recreation. The desired future condition is a stand that is growing high quality timber resources in several size and age classes while providing habitat for native birds and all forms of native wildlife, as well as recreational opportunities for the public.

**Current Habitat Conditions:**

Stand Ten is dominated by a closed canopy of white pine and mixed hardwoods reaching 45-75 feet in height and the canopy is 90% closed. The midstory vegetation (5-30 feet in height) is approximately 45% cover and understory vegetation (0-5 feet in height) is approximately 60% cover. The understory consists of shrubs and vines including beaked hazelnut, low-bush blueberry, hawthorn, viburnum and poison ivy. Low levels of coarse woody debris exist and adequate amounts of snag trees were observed. Leaf litter consists of pine needles and deciduous leaves.

**Desired Stand Conditions**

| Condition                                  | Action   | Responsibility Birds That May Benefit |
|--|--|---------------------------------------|
| Increased abundance of canopy gaps         | Shelterwood Harvest                              | Canada Warbler                        |
| Increased growth and vigor in canopy trees |  |                                       |
| Increased midstory density                 |  |                                       |
| Increased understory density               |  |                                       |
| Retained snags/cavity trees                | Retain Snags/Cavity Trees During Timber Harvests | Northern Flicker                      |

OBJECTIVE CODE: CH61 = stands classified under CH61/61A/61B    STEW= stands not classified under CH61/61A/61B  
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Owner(s) Town of Westford – Westford Conservation Commission

Towns(s) Westford



**STAND DESCRIPTIONS**

| OBJ | STDNO | TYPE | AC | MSD OR SIZE-CLASS | BA/AC | VOL/AC | SITE INDEX |
|-----|-------|------|----|-------------------|-------|--------|------------|
|-----|-------|------|----|-------------------|-------|--------|------------|

|      |    |    |      |                          |           |         |         |
|------|----|----|------|--------------------------|-----------|---------|---------|
| STEW | 11 | GP | 1.65 | 5.8" MSD<br>Pole-Sapling | 250 sqft. | 15 Tons | 58 (WP) |
|------|----|----|------|--------------------------|-----------|---------|---------|

White pine, aspen, white birch and mixed oak are the major components of this dense pole sized stand. There is little to no understory vegetation due to the closed canopy of this midstory stand. Virtually no snags can be found within this stand. The area is mostly flat with well-drained, physically altered soil (Pits, Gravel) capable of producing high quality sawtimber. Management will focus on wildlife habitat enhancement, bird management and recreation. The desired future condition is a stand that is providing early successional forest habitat for native birds and all forms of native wildlife.

**Current Habitat Conditions:**

Stand Eleven is dominated by a closed midstory canopy of white pine and mixed hardwoods reaching 20-30 feet in height and the canopy is 100% closed. The understory vegetation (0-5 feet in height) is approximately 5% cover. There is little to no understory vegetation due to the closed canopy of this midstory stand. Low levels of coarse woody debris and snag trees were observed. Leaf litter consists of pine needles and deciduous leaves.

**Desired Stand Conditions**

| Condition                         | Action                               | Responsibility Birds That May Benefit  |
|-----------------------------------|--------------------------------------|--|
| Early Successional Forest Habitat | No Action for this Management Period | American Woodcock<br>Brown Thrasher<br>Chestnut-sided Warbler<br>Eastern Towhee<br>Ruffed Grouse<br>White-throated Sparrow |

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 STD= stand    AC= acre    MSD= mean stand diameter    MBF= thousand board feet    BA= basal area    VOL= volume

Owner(s) Town of Westford – Westford Conservation Commission    Towns(s) Westford

**STAND DESCRIPTIONS**

| OBJ | STDNO | TYPE | AC | MSD OR SIZE-CLASS | BA/AC | VOL/AC | SITE INDEX |
|-----|-------|------|----|-------------------|-------|--------|------------|
|-----|-------|------|----|-------------------|-------|--------|------------|

|      |    |    |      |                             |           |                        |         |
|------|----|----|------|-----------------------------|-----------|------------------------|---------|
| STEW | 12 | WO | 6.40 | 15.9' MSD<br>Sawtimber-Pole | 195 sqft. | 33,572 BF<br>15.3 Cds. | 70 (WP) |
|------|----|----|------|-----------------------------|-----------|------------------------|---------|

White pine and mixed oak dominate the overstory in this well-stocked sawtimber and pole sized stand. The white pine is mostly sawtimber sized and timber quality is good. The mixed oak is dominated by red oak with black, scarlet and white oak occurring in lower amounts. The oak is sawtimber and pole sized and of fair to good form and timber quality. Forest regeneration consists of many white pine, mixed oak and red maple seedling and saplings that can be found scattered throughout much of the stand. The white pine regeneration is stunted and dying due to the dense overstory. The understory consists of low-bush blueberry with high-bush blueberry shrubs and ferns in wetter areas. Lower areas along Stony Brook and Burge's Pond are growing mountain laurel, sheep laurel and sweet pepperbush. Beaver activity has created basal scars and girdled trees along Stony Brook. Adequate amounts of dead hardwood and pine snags (14"+ DBH) can be found scattered throughout the stand and provide excellent wildlife habitat for cavity dwelling birds and small mammals. Access to this stand is very limited as it is bounded by an active trainline to the south, Stony Brook to the north and east and a red maple swamp to the west (Stand 13). The area is fairly flat, rising to a point in the eastern corner. The soils are very well-drained (Windsor) loamy sand capable of producing high quality sawtimber. Management will focus on wildlife habitat enhancement, bird management and recreation. The desired future condition is a stand that is growing high quality timber resources in several size and age classes while providing habitat for native birds and all forms of native wildlife, as well as recreational opportunities for the public.

**Current Habitat Conditions:**

Stand Twelve is dominated by a closed canopy of white pine and mixed oak reaching 50-75 feet in height and the canopy is 90% closed. The midstory vegetation (5-30 feet in height) is approximately 70% cover and understory vegetation (0-5 feet in height) is approximately 85% cover. The understory consists of low-bush blueberry with high-bush blueberry shrubs and ferns in wetter areas. Adequate levels of coarse woody debris and snag trees were observed. Leaf litter consists of pine needles and deciduous leaves.

**Desired Stand Conditions**

| Condition                           | Action                    | Responsibility Birds That May Benefit |
|-------------------------------------|---------------------------|---------------------------------------|
| Maintained overstory density        | No Action                 | Black-throated Green Warbler          |
| Increased dead woody material       |                           |                                       |
| Retained/created snags/cavity trees | Create Snags/Cavity Trees | Northern Flicker                      |

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Owner(s) Town of Westford – Westford Conservation Commission    Towns(s) Westford

**STAND DESCRIPTIONS**

| OBJ | STDNO | TYPE | AC | MSD OR SIZE-CLASS | BA/AC | VOL/AC | SITE INDEX |
|-----|-------|------|----|-------------------|-------|--------|------------|
|-----|-------|------|----|-------------------|-------|--------|------------|

STEW    13    RM    6.39    11.3" MSD Pole-Sawtimber    128 sqft    19 Cords    50 (RM)

Red maple dominates this wetland resource area that includes a stream, shrubland and swampland along the southwestern edge of the property. The red maple is of fair form and timber quality. Yellow birch, sassafras and some white pine poles can be found within the stand. The edges of the swamp are vegetated primarily with wetland shrubs such as winterberry, sweet pepperbush, high-bush blueberry, witch hazel and spice bush with associated herbaceous vegetation including cattails, skunk cabbage, ferns and wildflowers. There are high amounts of standing dead snags as well as blow downs scattered throughout the area in various stages of decay. These features are most prevalent along the edge of the trainline. The area is flat and remains wet throughout most of the year with very poorly drained organic soils (Freetown-Scarboro). No management is recommended at this time as the stand will be allowed to develop naturally over the next ten years. The desired future condition is a stand that is providing habitat for native birds and all forms of native wildlife, as well as protecting water quality.

**Current Habitat Conditions:**

Stand Thirteen is dominated by a mostly closed canopy of red maple 35-50 feet in height and the canopy is 75% closed. The midstory vegetation (5-30 feet in height) is approximately 85% cover and understory vegetation (0-5 feet in height) is approximately 95% cover. The edges of the swamp are vegetated primarily with wetland shrubs such as winterberry, sweet pepperbush, high-bush blueberry, witch hazel and spice bush with associated herbaceous vegetation including cattails, skunk cabbage, ferns and wildflowers. High levels of coarse woody debris and snag trees were observed.

**Desired Stand Conditions**

| Condition                      | Action                                | Responsibility Birds That May Benefit  |
|--------------------------------|---------------------------------------|--|
| Maintain Wetland Resource Area | No management over the next ten years | Red-winged Blackbird<br>Common Yellowthroat<br>Great Blue Heron<br>Willow Flycatcher<br>Waterfowl<br>American Woodcock |

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Owner(s) Town of Westford – Westford Conservation Commission    Towns(s) Westford

**STAND DESCRIPTIONS**

| OBJ | STDNO | TYPE | AC | MSD OR SIZE-CLASS | BA/AC | VOL/AC | SITE INDEX |
|-----|-------|------|----|-------------------|-------|--------|------------|
|-----|-------|------|----|-------------------|-------|--------|------------|

|      |    |    |       |                             |           |                       |         |
|------|----|----|-------|-----------------------------|-----------|-----------------------|---------|
| STEW | 14 | WO | 42.09 | 10.9" MSD<br>Sawtimber-Pole | 104 sqft. | 8,451 BF<br>12.0 Cds. | 68 (WP) |
|------|----|----|-------|-----------------------------|-----------|-----------------------|---------|

White pine dominates the overstory in this adequately-stocked sawtimber and pole sized stand. The area was cut approximately 15-20 years ago and the residual timber quality is good. The mixed oak is dominated by black and scarlet oak; red oak can be found frequently and white oak occurs in much lower amounts. The oak is sawtimber and pole sized and of fair to good form and timber quality. Forest regeneration consists of dense white pine saplings in most areas. Many mixed oak and scattered red maple seedlings and saplings can be found throughout much of the stand. The white pine regeneration is stunted and dying due to the dense overstory. Pine-oak gall rust is present and affecting white pine saplings. This fungal infection requires pine and oak to complete its life cycle and leaves affected white pine saplings with weakened stems that are prone to snapping in high winds or under heavy snow loads. The understory consists of low-bush blueberry and huckleberry with high-bush blueberry shrubs and pockets of chestnut sprouts. Lower areas along Stony Brook and Burge's Pond are growing mountain laurel, sheep laurel and sweet pepperbush. Beaver activity has created basal scars and girdled trees along Stony Brook. Low amounts of dead hardwood and pine snags (14"+ DBH) can be found scattered throughout the stand and provide excellent wildlife habitat for cavity dwelling birds and small mammals. The area consists of a sandy knoll that is mostly flat on top and drops off steeply to Stony Brook and the red maple swamp (Stand 13). The northern part of the stand is a low, mostly flat floodplain area extending into Stony Brook. The soils are extremely well-drained (Windsor-Hinckley) loamy sand capable of producing high quality sawtimber. Management will focus on wildlife habitat enhancement, bird management and recreation. The desired future condition is a stand that is growing high quality timber resources in several size and age classes while providing habitat for native birds and all forms of native wildlife, as well as recreational opportunities for the public.

**Current Habitat Conditions:**

Stand Fourteen is dominated by a closed canopy of white pine and mixed oak reaching 40-65 feet in height and the canopy is 70% closed. The midstory vegetation (5-30 feet in height) is approximately 95% cover and understory vegetation (0-5 feet in height) ranged from 50-90% cover depending on midstory density. The understory consists of low-bush blueberry and huckleberry with high-bush blueberry shrubs and pockets of chestnut sprouts. Low levels of coarse woody debris and snag trees were observed. Leaf litter consists of pine needles and deciduous leaves.

**Desired Stand Conditions**

| Condition                           | Action  | Responsibility Birds That May Benefit  |
|-------------------------------------|---|--|
| Increased vigor in overstory trees  | Unevenaged Management<br><br>No Harvesting Activities Planned for this Ten-Year Management Period | Wood Thrush<br>Veery<br>Canada Warbler |
| Increased dead woody material       |   |  |
| Retained/created snags/cavity trees | Create Snags/Cavity Trees   | Northern Flicker                       |

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Owner(s) Town of Westford – Westford Conservation Commission      Towns(s) Westford

## Management Recommendations

For the purposes of this report management practices with an object code of *CH61* are required to be accomplished as a commitment to the Massachusetts Current Use Program. Practices with object codes of *STEW* are voluntary and are provided as suggestions of activities that can help you achieve your woodland objectives.

### Summary of the Management Recommendations for your property

#### *Phase I – Timber Harvest*

| Stand | Object Code | Recommendation                                 | Value/Cost/<br>Cost Sharing<br>opportunities | Acres | Timing    |
|-------|-------------|--|--|-------|-----------|
| 5     | STEW        | Phase I – Individual & Group Selection Harvest | Revenue Producing                            | 40+/- | 2019-2023 |
| 8     | STEW        | Wildlife Patch                                 | Revenue Producing                            | 5+/-  | 2019-2023 |
| 9     | STEW        | Individual & Group Selection Harvest           | Revenue Producing                            | 15+/- | 2019-2023 |
| 10    | STEW        | Shelterwood – Prep Harvest                     | Revenue Producing                            | 15+/- | 2019-2023 |

#### *Phase II – Timber Harvest*

| Stand | Object Code | Recommendation                                    | Value/Cost/<br>Cost Sharing<br>opportunities | Acres | Timing    |
|-------|-------------|---|--|-------|-----------|
| 5     | STEW        | Phase II – Individual & Group Selection Harvest   | Revenue Producing                            | 45+/- | 2019-2028 |
| 1     | STEW        | Expanding Gap Shelterwood – Old Growth Management | Revenue Producing                            | 24+/- | 2019-2028 |
| 3     | STEW        | Expanding Gap Shelterwood – Old Growth Management | Revenue Producing                            | 7+/-  | 2019-2028 |
| 7     | STEW        | TSI – Thinning from Below                         | Revenue Producing                            | 7+/-  | 2019-2028 |

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Owner(s) Town of Westford – Westford Conservation Commission

Town(s) Westford

## Management Recommendations cont.

For the purposes of this report management practices with an object code of *CH61* are required to be accomplished as a commitment to the Massachusetts Current Use Program. Practices with object codes of *STEW* are voluntary and are provided as suggestions of activities that can help you achieve your woodland objectives.

### Summary of the Management Recommendations for your property

| Stand | Object Code | Recommendation                                   | Value/Cost/<br>Cost Sharing<br>opportunities | Acres | Timing    |
|-------|-------------|--|--|-------|-----------|
| 2     | STEW        | Install Wood Duck Boxes                          | Stewardship<br>Reimbursement                 | N/A   | 2019-2028 |
| 6     | STEW        | Install Wood Duck Boxes                          | Stewardship<br>Reimbursement                 | N/A   | 2019-2028 |
| All   | STEW        | Recreation – Trail<br>Maintenance & Construction | Stewardship<br>Reimbursement                 | N/A   | 2019-2028 |
| All   | STEW        | Boundary Identification,<br>Blaze & Paint        | Stewardship<br>Reimbursement                 | N/A   | 2019-2023 |

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Owner(s) Town of Westford – Westford Conservation Commission

Towns(s) Westford



**MANAGEMENT PRACTICES  
to be done within next 10 years**

| OBJ | STD NO | TYPE | SILVICULTURAL PRESCRIPTION | AC | TO BE REMOVED |         | TIMING |
|-----|--------|------|----------------------------|----|---------------|---------|--------|
|     |        |      |                            |    | BA/AC         | TOT VOL |        |

***Timber Management***

|      |    |    |                             |       |         |                      |           |
|------|----|----|-----------------------------|-------|---------|----------------------|-----------|
| STEW | 10 | WP | Shelterwood<br>Prep-Harvest | 15+/- | 40 sqft | 30 MBF<br>& 525 Tons | 2019-2028 |
|------|----|----|-----------------------------|-------|---------|----------------------|-----------|

Management will focus on harvesting through the shelterwood system. The target is to harvest approximately 25-33% of the overstory volume. Management will focus on harvesting mature white pine sawtimber sized stems (16" DBH+) to improve spacing between trees and prepare the understory for new production. Harvesting poorly formed and low-quality stems of all species and sizes will be done to improve the growing conditions of the developing small sawtimber and the best formed and highest-quality timber resources growing within the stand. Harvesting will assist in the development of wind-firm trees of high quality. Harvesting will prepare the site for new production in the understory as a result of thinning. High value sawtimber will be sold as sawlogs, low quality hardwoods will be utilized as firewood or pulp, and low-quality pine stems will be utilized as pulp. Small openings will promote the growth of the understory (0-5 feet) and mid-story (5-30 feet) vegetation. Creating layers of growth within the forest will benefit a variety of song bird species.

|      |              |    |   |       |         |                         |           |
|------|--------------|----|---|-------|---------|-------------------------|-----------|
| STEW | 5<br>Phase 2 | WO | Selection Harvest<br>Individual & Group | 45+/- | 40 sqft | 135 MBF<br>& 1,575 Tons | 2019-2028 |
|------|--------------|----|---|-------|---------|-------------------------|-----------|

Management will focus on improvement thinning by selection harvesting. The target is to harvest approximately 25-33% of the overstory volume. The emphasis will be to harvest mature mixed oak hardwood sawtimber (16" DBH+) in order to improve the growing conditions of the developing high-quality mixed oak poles and small sawtimber sized stems. Poorly formed and low-quality stems of all species and sizes will also be harvested to improve the health and productivity of the stand. It will be important to release and leave mature softwood trees with good canopies for bird habitat diversity and for developing regeneration of softwood seedlings and saplings in the understory. High value sawtimber will be sold as sawlogs, while the low-quality trees and portions of trees will be chipped and utilized at wood burning facilities that generate electricity. This harvest will prepare the understory for new regeneration while releasing advanced regeneration. Chipping the tops of trees will be important for protecting and improving aesthetics and reducing the threat of forest fires. However, scattered slash piles of fine wood debris will be created to improve bird habitat. Small openings will promote the growth of the lowbush blueberry and huckleberry in the understory. Creating layers of growth within the forest will benefit a variety of song bird species.

OBJECTIVE CODE: CH61 = stands classified under CH61/61A/61B    STEW= stands not classified under CH61/61A/61B  
 STD= stand    AC= acre    MSD= mean stand diameter    MBF= thousand board feet    BA= basal area    VOL= volume

Owner(s) Town of Westford – Westford Conservation Commission    Towns(s) Westford

**MANAGEMENT PRACTICES  
to be done within next 10 years**

| OBJ | STD NO | TYPE | SILVICULTURAL PRESCRIPTION | AC | TO BE REMOVED |         | TIMING |
|-----|--------|------|----------------------------|----|---------------|---------|--------|
|     |        |      |                            |    | BA/AC         | TOT VOL |        |

*Late-successional Ecosystem Management*

STEW 1 WP Expanding Gap Shelterwood 24+/- NA 70 MBF & 90 Tons 2019-2028

Management will focus on structural complexity enhancement through the expanding gap shelterwood system. The prescribed management varies slightly from a traditional expanding gap shelterwood and may also be termed "irregular group shelterwood with reserves". The structural objectives include vertically differentiated canopies, elevated large snag and downed log densities, variable horizontal density and reallocation of basal area to larger diameter classes. The target is to harvest approximately 10% of the stand area. Management will focus on creating small gaps ( $\leq 0.25$  acres) to mimic natural disturbance and facilitate gap dynamics. Reserve trees will be retained within the gaps, including legacy trees (25"+ DBH) and/or crop trees (well-formed w/ healthy LCR). Free thinning of poorly formed and low-quality stems of all species and sizes will be done along skid trails in order to partially release crop trees and to further enhance structural complexity. Harvesting will assist in the development of wind-firm trees of high quality and prepare the site for new production in the understory. Small openings will promote the growth of the understory (0-5 feet) and mid-story (5-30 feet) vegetation. Creating layers of growth within the forest will benefit a variety of song bird species. High value sawtimber will be sold as sawlogs, low quality hardwoods will be utilized as firewood or pulp, and low-quality pine stems will be utilized as pulp. Girdling, as well as felling and leaving, 16"+ DBH trees of low vigor will be done to elevated the densities of snags and downed woody debris.

STEW 3 WO Expanding Gap Shelterwood 7+/- NA 15 MBF & 20 Tons 2019-2028

Management will focus on structural complexity enhancement through the expanding gap shelterwood system. The prescribed management varies slightly from a traditional expanding gap shelterwood and may also be termed "irregular group shelterwood with reserves". The structural objectives include vertically differentiated canopies, elevated large snag and downed log densities, variable horizontal density and reallocation of basal area to larger diameter classes. The target is to harvest approximately 10% of the stand area. Management will focus on creating small gaps ( $\leq 0.25$  acres) to mimic natural disturbance and facilitate gap dynamics. Reserve trees will be retained within the gaps, including legacy trees (25"+ DBH) and/or crop trees (well-formed w/ healthy LCR). Free thinning of poorly formed and low-quality stems of all species and sizes will be done along skid trails in order to partially release crop trees and to further enhance structural complexity. Harvesting will assist in the development of wind-firm trees of high quality and prepare the site for new production in the understory. Small openings will promote the growth of the understory (0-5 feet) and mid-story (5-30 feet) vegetation. Creating layers of growth within the forest will benefit a variety of song bird species. High value sawtimber will be sold as sawlogs, low quality hardwoods will be utilized as firewood or pulp, and low-quality pine stems will be utilized as pulp. Girdling, as well as felling and leaving, 16"+ DBH trees of low vigor will be done to elevated the densities of snags and downed woody debris. After management is conducted, Stand Three may be merged with Stand One in the 2029 Stewardship Plan.

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 STD= stand AC= acre MSD= mean stand diameter MBF= thousand board feet BA= basal area VOL= volume

Owner(s) Town of Westford – Westford Conservation Commission Towns(s) Westford

**MANAGEMENT PRACTICES  
to be done within next 10 years**

| OBJ | STD NO | TYPE | SILVICULTURAL PRESCRIPTION | AC | TO BE REMOVED |         | TIMING |
|-----|--------|------|----------------------------|----|---------------|---------|--------|
|     |        |      |                            |    | BA/AC         | TOT VOL |        |

***Timber Stand Improvement***

|      |   |    |                        |      |         |                     |           |
|------|---|----|------------------------|------|---------|---------------------|-----------|
| STEW | 7 | WO | Thinning<br>from Below | 7+/- | 80 sqft | 5 MBF<br>& 156 Tons | 2019-2028 |
|------|---|----|------------------------|------|---------|---------------------|-----------|

Management will focus on timber stand improvement by low thinning methods. The target is to harvest approximately 1/3 of the basal area. The emphasis will be to harvest suppressed, intermediate and some co-dominant white pine trees. The objective is to simulate and facilitate the natural mortality that occurs in a stand in order to improve the growing conditions of the developing high-quality white pine and mixed oak poles and small sawtimber sized stems. Poorly formed and low-quality stems of higher crown classes will also be harvested to improve the health and productivity of the stand. It will be important to release and leave mature softwood trees with healthy crowns for bird habitat diversity and for developing regeneration of softwood seedlings and saplings in the understory. High value sawtimber will be sold as sawlogs, while the low-quality trees and portions of trees will be chipped and utilized at wood burning facilities that generate electricity. Chipping the tops of trees will be important for protecting and improving aesthetics, as well as reducing the threat of forest fires. However, scattered slash piles of fine wood debris will be created to improve bird habitat. Small openings will promote the growth of lowbush blueberry and huckleberry in the understory. Creating layers of growth within the forest will benefit a variety of song bird species.

***Wildlife Habitat Management***

|      |   |    |                |      |      |                      |           |
|------|---|----|----------------|------|------|----------------------|-----------|
| STEW | 8 | WO | Wildlife Patch | 5+/- | 100% | 25 MBF<br>& 260 Tons | 2019-2023 |
|------|---|----|----------------|------|------|----------------------|-----------|

This 5-acre wildlife patch cut will be done adjacent to the sapling-pole sized stand 11 and to the open electric lines along the northern boundary. This patch-cut will create a contiguous block of over 5-acres necessary for the minimum size opening for bird species such as chestnut-sided warbler, prairie warbler, eastern towhee, ruffed grouse, and brown thrasher. Almost all of the trees will be harvested in this patch cut area, although few retention trees may be left for aesthetics. The stand will then be left to regenerate naturally with hardwood and white pine, creating thick understory (0-5 feet) vegetation and midstory (5-30 feet) vegetation for the nesting and protection of birds. High value sawtimber will be sold as sawlogs, low quality hardwoods will be utilized as firewood, and tops of trees will be chipped and burned at wood burning facilities for generating electricity. Chipping the tops of trees will be important for protecting and improving aesthetics, as well as reducing the threat of forest fires. However, scattered slash piles of fine wood debris will be created to improve bird habitat.

OBJECTIVE CODE: CH61 = stands classified under CH61/61A/61B    STEW= stands not classified under CH61/61A/61B  
 STD= stand    AC= acre    MSD= mean stand diameter    MBF= thousand board feet    BA= basal area    VOL= volume

Owner(s) Town of Westford – Westford Conservation Commission    Towns(s) Westford

**MANAGEMENT PRACTICES  
to be done within next 10 years**

| OBJ | STD NO | TYPE | SILVICULTURAL PRESCRIPTION | AC | TO BE REMOVED |         | TIMING |
|-----|--------|------|----------------------------|----|---------------|---------|--------|
|     |        |      |                            |    | BA/AC         | TOT VOL |        |

***Wildlife Habitat Management cont.***

STEW 2 & 6 MD Artificial Nesting Box NA NA NA 2019-2028  
Wood Duck

The open wetland resource areas provide habitat for *wood ducks*. The open water and emergent vegetation within these areas are important for the development of young wood ducks. The boxes should be set up approximately four feet above open water on cedar or metal poles to protect the young and eggs from predators. The boxes should also be set up over water that is 1-4 feet deep. The boxes should be cleaned every year and new bedding placed on the bottom of the box. The Division of Fisheries and Wildlife can provide further information about the box dimensions, installation, and maintenance. The recommendation is to install boxes on an experimental basis in the open wetland areas around Stony Brook and Keyes Brook.

***Biological Diversity***

STEW 8 & 9 WO & GP Wildlife Patch 6+/- 100% 25 MBF & 260 Tons 2019-2028

The landowner is interested in promoting biological diversity on the property. Preventing the introduction of and eliminating invasive and non-native trees, plants and shrubs will be done where these species exist and when economically feasible and practical. Very little invasive non-native vegetation currently exists on the property. Japanese barberry was found in low amounts within Stand 1 near the parking area. Another biodiversity issue is the distribution of forest growth stages. Trying to maintain multiple forest age and size classes on the property will also be pursued by the landowner through periodic timber harvests and wildlife habitat management. Please see the Biological Diversity issues on page 8 for more details.

OBJECTIVE CODE: CH61 = stands classified under CH61/61A/61B STEW= stands not classified under CH61/61A/61B  
STD= stand AC= acre MSD= mean stand diameter MBF= thousand board feet BA= basal area VOL= volume

**MANAGEMENT PRACTICES  
to be done within next 10 years**

| OBJ | STD NO | TYPE | SILVICULTURAL PRESCRIPTION | AC | TO BE REMOVED |         | TIMING |
|-----|--------|------|----------------------------|----|---------------|---------|--------|
|     |        |      |                            |    | BA/AC         | TOT VOL |        |

***Recreation Management  
Forest Stewardship Education***

|      |     |    |   |    |    |    |           |
|------|-----|----|---|----|----|----|-----------|
| STEW | All | NA | Trail Maintenance<br>Forest Stewardship Education | NA | NA | NA | 2019-2028 |
|------|-----|----|---|----|----|----|-----------|

Many opportunities for passive recreation are available to the residents of Westford at the Stony Brook Conservation Area. The East Boston Camps is currently operating an overnight camp and daycamp by an outside operator, as well as a day camp organized by the Town of Westford's Parks and Recreation Department. A public beach area provides swimming access to Burge's Pond. Fishing and non-motorized boating is permitted on Burge's Pond, Stony Brook and Keyes Brook. Hiking, cross-country skiing, horseback riding and biking are permitted on existing trails throughout the property. The existing trails will be periodically maintained for the safety, enjoyment and education of the residents of Westford. New trail construction may also be considered for this forest area. Trail maps, trail identification signs, resting benches, interpretive signs, and nature viewing stations will all be variables associated with the management of the trails and the education of those who will be using the trails. Interpretive signs along the trails will help educate the property users about management activities and other Forest Stewardship matters within the forest interior. Pre-harvest and post-harvest site walks will be offered to the residents of Westford for education about the harvesting projects recommended in this Plan.

***Boundary Maintenance***

|      |     |     |   |    |    |    |           |
|------|-----|-----|---|----|----|----|-----------|
| STEW | All | All | Boundary Maintenance<br>Identify, Blaze & Paint | NA | NA | NA | 2019-2023 |
|------|-----|-----|---|----|----|----|-----------|

Boundary lines on the property are in need of maintenance. Most of the boundary lines have not been identified, blazed or painted. Stonewalls along the property lines are shown on the Forest Boundary & Stand Type Map. Identification, blazing and painting the property lines will protect the property from encroachment and assist the land manager when conducting management on the property.

OBJECTIVE CODE: CH61 = stands classified under CH61/61A/61B    STEW= stands not classified under CH61/61A/61B  
 STD= stand    AC= acre    MSD= mean stand diameter    MBF= thousand board feet    BA= basal area    VOL= volume

Owner(s) Town of Westford – Westford Conservation Commission    Towns(s) Westford

**MANAGEMENT PRACTICES**  
*to be done within next 10 years*

| OBJ | STD NO | TYPE | SILVICULTURAL PRESCRIPTION | AC | TO BE REMOVED |         | TIMING |
|-----|--------|------|----------------------------|----|---------------|---------|--------|
|     |        |      |                            |    | BA/AC         | TOT VOL |        |

***Bird Habitat Assessment Component***  
***General Management Guidelines***

In general, forest management for creating and maintaining bird habitat will focus on silviculture that will create openings in the forest that provide vigorous new growth in the understory for nesting and protection. Maintaining and creating a minimum of 5-acres of early successional forest habitat is best. Efforts to minimize the “edge” will be done by creating patches within the forest along the edges of the powerlines and abandoned field.

Other habitat requirements that will be considered in the management of the property will include “snag trees” and “cavity trees”. For snag trees it is recommended to retain 5 per acre greater than 10 inches in diameter. For cavity trees, it is recommended to retain 1-3 trees greater than 18 inches in diameter (DBH) per acre, and 4 trees in the 12-18 diameter range. Leaving “course woody debris” on the forest floor after harvesting is recommended. Course woody debris is considered greater than 5 inches in diameter and greater than 5 feet long. The recommendation is to leave 2 cords per acre of this course woody debris on the forest floor. “Fine woody debris” will also be scattered throughout the harvest areas and will consist of piles greater than 1 meter wide consisting of tree tops and slag from chipping operations. Birds prefer this material in the understory for nesting, cover, and foraging. Avoiding harvests during the nesting season will also be observed. No harvesting will be conducted between May to mid-July.

Birds that will benefit from this type of management include the following:

- 1) *Chestnut-sided Warbler & Brown Thrasher*– Habitat requires young 5-15 year-old hardwood forest with less than 30% canopy cover and dense shrubs and saplings 3-10 feet high.
- 2) *Eastern Towhee* – Habitat requires early successional open or edge habitats requiring dense understory with open canopy approximately 20% cover.
- 3) *Black-throated Blue Warbler* – Habitat requires hardwood or mixed woods with 50-80% canopy cover and a dense understory.
- 4) *Veery* – Requires damp hardwood forest with intermediate 30-80% canopy cover.
- 5) *Wood Thrush* – Requires interior and edges of hardwood and mixed wood forest preferring stands with canopy greater than 50 feet in height. Requires a mid-story for nesting.
- 6) *Eastern Wood-Pewee* - Requires hardwood forest with closed canopy cover near openings and edges.
- 7) *Ruffed Grouse* – Requires mixed age woodlands with successional to mature forests. Dense understory and fairly open herbaceous ground cover for nesting.
- 8) *American Woodcock* – Hardwood or mixed woods matrix with a mix of openings and young forest in early stages of regeneration.
- 9) *Canada Warbler* - Most abundant in moist mixed wood forests with a 50-70% canopy cover and dense understory and mid-story. Often found in swamps and riparian areas.

OBJECTIVE CODE: CH61 = Forest Products (for Ch. 61/61A)      STEW= Stewardship Program practices  
 STD= stand    Type= Forest type    AC= acre    MBF= thousand board feet    BA= basal area    VOL= volume

Owner(s) Town of Westford – Westford Conservation Commission      Town(s) Westford

**Signature Page** Please check each box that applies. \_\_\_\_\_

**CH. 61/61A Management Plan** I attest that I am familiar with and will be bound by all applicable Federal, State, and Local environmental laws and /or rules and regulations of the Department of Conservation and Recreation. I further understand that in the event that I convey all or any portion of this land during the period of classification, I am under obligation to notify the grantee(s) of all obligations of this plan which become his/hers to perform and will notify the Department of Conservation and Recreation of said change of ownership.

**Forest Stewardship Plan.** When undertaking management activities, I pledge to abide by the management provisions of this Stewardship Management Plan during the ten year period following approval. I understand that in the event that I convey all or a portion of the land described in this plan during the period of the plan, I will notify the Department of Conservation and Recreation of this change in ownership.

**Green Certification.** I pledge to abide by the FSC-US Forest Management Standard and MA Private Lands Group Certification for a period of five years. To be eligible for Green Certification you must also check the box below.

**Tax considerations.** I attest that I am the registered owner of this property and have paid any and all applicable taxes, including outstanding balances, on this property.

Signed under the pains of perjury:

Owner(s)  Paul M. White Date 5/10/19

Owner(s) \_\_\_\_\_ Date \_\_\_\_\_

I attest that I have prepared this plan in good faith to reflect the landowner's interest.

Plan Preparer Gregory H. Muldowney Date 4/26/2019

I attest that the plan satisfactorily meets the requirements of CH61/61A and/or the Forest Stewardship Program.

Approved, Service Forester Laura Doolay Date 5/28/19

Approved, Regional Supervisor Pete Clarke Date 5/28/19

In the event of a change of ownership of all or part of the property, the new owner must file an amended Ch. 61/61A plan within 90 days from the transfer of title to insure continuation of Ch. 61/61A classification.

Owner(s) Town of Westford – Westford Conservation Commission Town(s) Westford

# BOUNDARY & STAND TYPE MAP

Land in Westford, MA  
Stony Brook Conservation Area

Landowner:  
Town of Westford  
Westford Conservation Commission



**New England  
Forestry Consultants, Inc.**  
www.cforesters.com

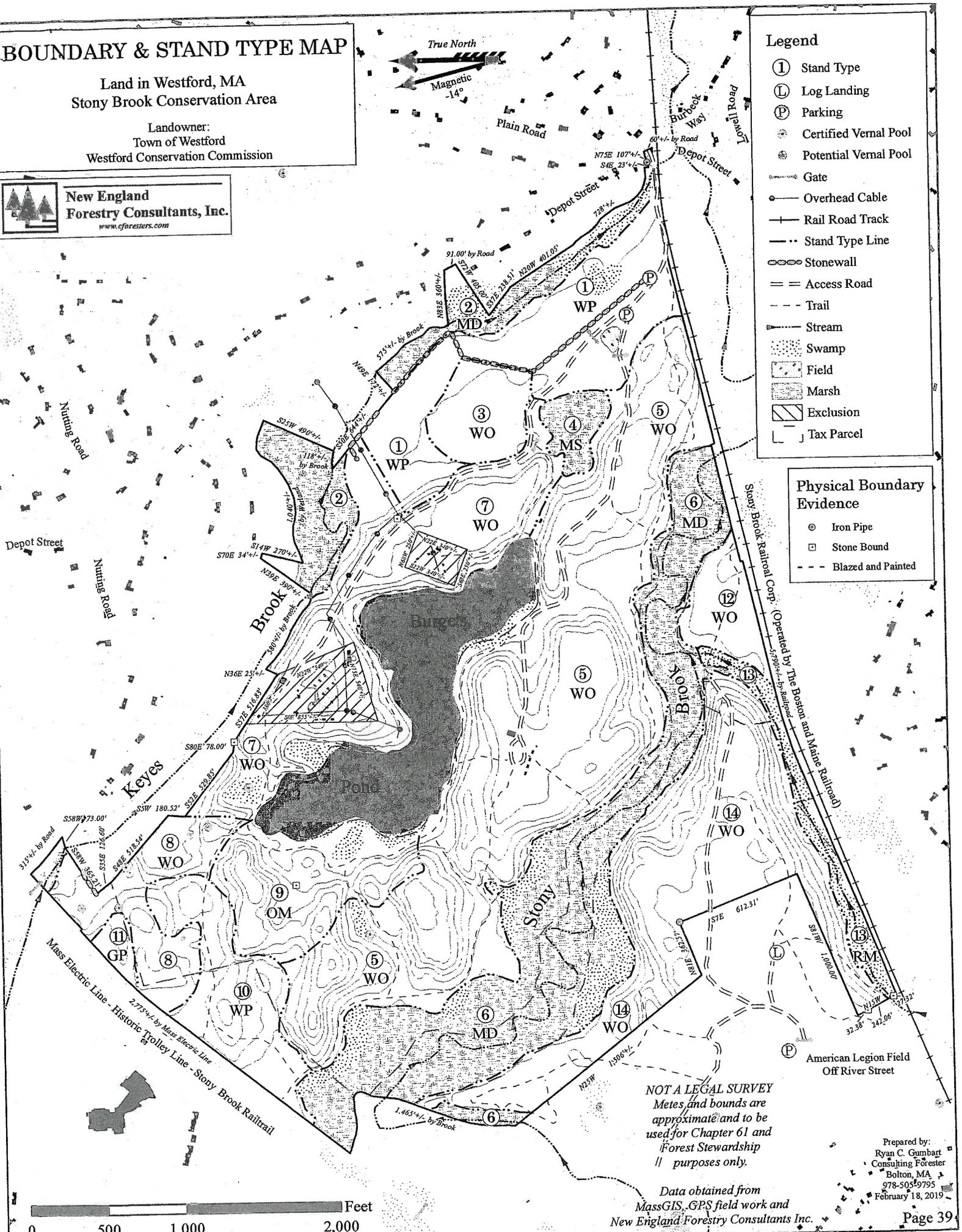


### Legend

- ① Stand Type
- Ⓛ Log Landing
- Ⓟ Parking
- ⊙ Certified Vernal Pool
- ⊙ Potential Vernal Pool
- Gate
- Overhead Cable
- Rail Road Track
- - - Stand Type Line
- ⊖ Stonewall
- == Access Road
- - - Trail
- Stream
- ⊙ Swamp
- ⊙ Field
- ⊙ Marsh
- ⊙ Exclusion
- ⊙ Tax Parcel

### Physical Boundary Evidence

- ⊙ Iron Pipe
- ⊙ Stone Bound
- - - Blazed and Painted



NOT A LEGAL SURVEY  
Mets and bounds are  
approximate and to be  
used for Chapter 61 and  
Forest Stewardship  
// purposes only.

Data obtained from  
MassGIS, GPS field work and  
New England Forestry Consultants Inc.

Prepared by:  
Ryan C. Gumbart  
Consulting Forester  
Bolton, MA  
978-505-9795  
February 18, 2019

# ORTHOGRAPHIC MAP

Land in Westford, MA  
Stony Brook Conservation Area

Landowner:  
Town of Westford  
Westford Conservation Commission



New England  
Forestry Consultants, Inc.  
[www.cforesters.com](http://www.cforesters.com)

50 100 200

Map of  
Stony Brook  
Conservation Area  
Westford, MA  
April 2005  
Page 1 of 1

# SOIL TYPE MAP

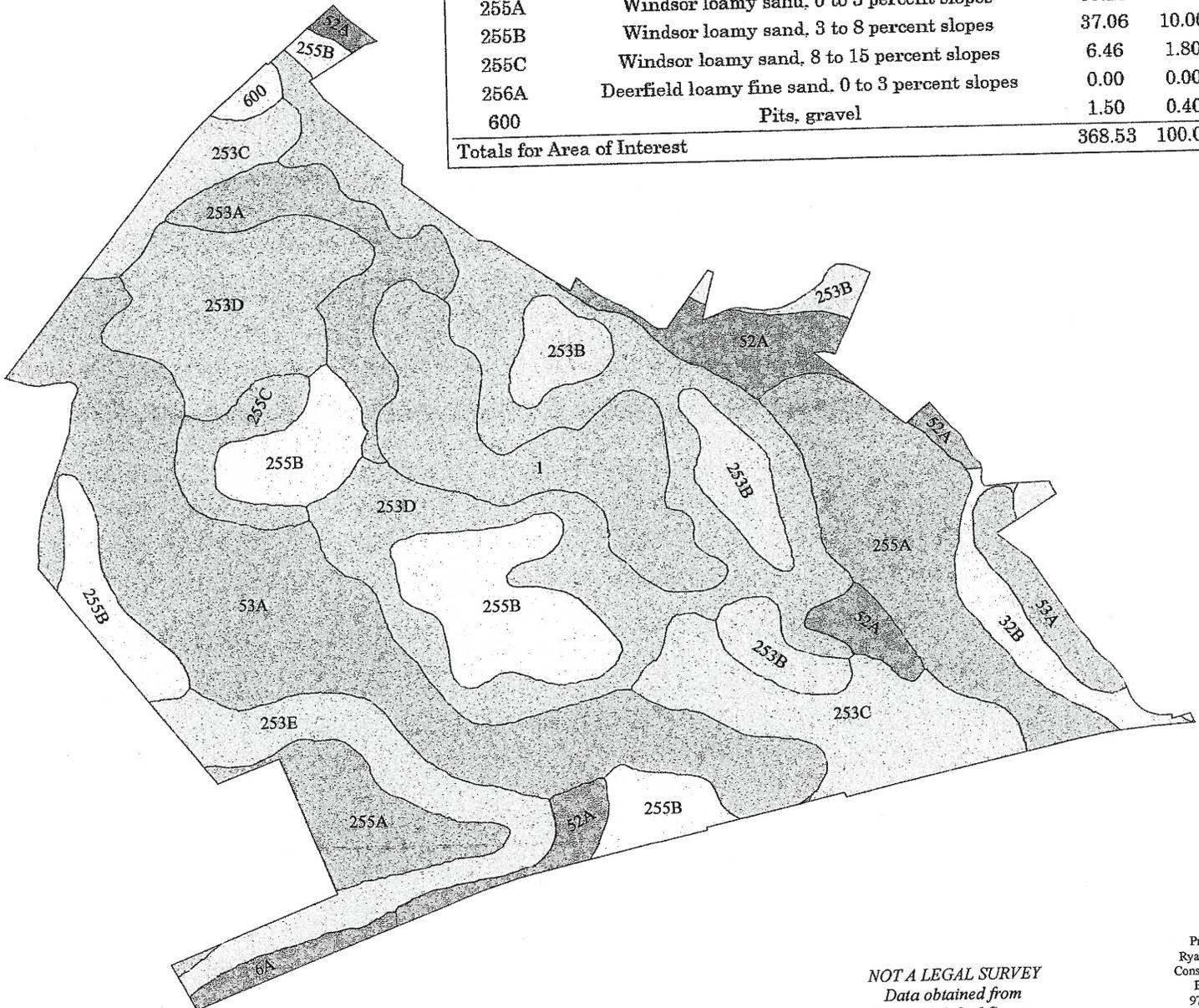
Land in Westford, MA  
Stony Brook Conservation Area

Landowner:  
Town of Westford  
Westford Conservation Commission



New England  
Forestry Consultants, Inc.  
www.foresters.com

| Map Unit Symbol                    | Map Unit Name   | Acres in AOI  | Percent of AOI |
|------------------------------------|---|---------------|----------------|
| 1                                  | Water   | 25.36         | 6.90%          |
| 6A                                 | Scarboro mucky fine sandy loam, 0 to 3 percent slopes | 2.90          | 0.80%          |
| 32B                                | Wareham loamy fine sand, 0 to 5 percent slopes        | 6.64          | 1.80%          |
| 52A                                | Freetown muck, 0 to 1 percent slopes                  | 17.59         | 4.80%          |
| 53A                                | Freetown muck, ponded, 0 to 1 percent slopes          | 70.47         | 19.10%         |
| 253A                               | Hinckley loamy sand, 0 to 3 percent slopes            | 14.04         | 3.80%          |
| 253B                               | Hinckley loamy sand, 3 to 8 percent slopes            | 18.25         | 5.00%          |
| 253C                               | Hinckley loamy sand, 8 to 15 percent slopes           | 27.42         | 7.40%          |
| 253D                               | Hinckley loamy sand, 15 to 25 percent slopes          | 80.86         | 21.90%         |
| 253E                               | Hinckley loamy sand, 25 to 35 percent slopes          | 20.78         | 5.60%          |
| 255A                               | Windsor loamy sand, 0 to 3 percent slopes             | 39.21         | 10.60%         |
| 255B                               | Windsor loamy sand, 3 to 8 percent slopes             | 37.06         | 10.00%         |
| 255C                               | Windsor loamy sand, 8 to 15 percent slopes            | 6.46          | 1.80%          |
| 256A                               | Deerfield loamy fine sand, 0 to 3 percent slopes      | 0.00          | 0.00%          |
| 600                                | Pits, gravel  | 1.50          | 0.40%          |
| <b>Totals for Area of Interest</b> |   | <b>368.53</b> | <b>100.00%</b> |



NOT A LEGAL SURVEY  
Data obtained from  
USDA Web Soil Survey,  
MassGIS, GPS field work and  
New England Forestry Consultants Inc.

Prepared by:  
Ryan C. Gumbart  
Consulting Forester  
Bolton, MA  
978-505-9795  
April 1, 2019

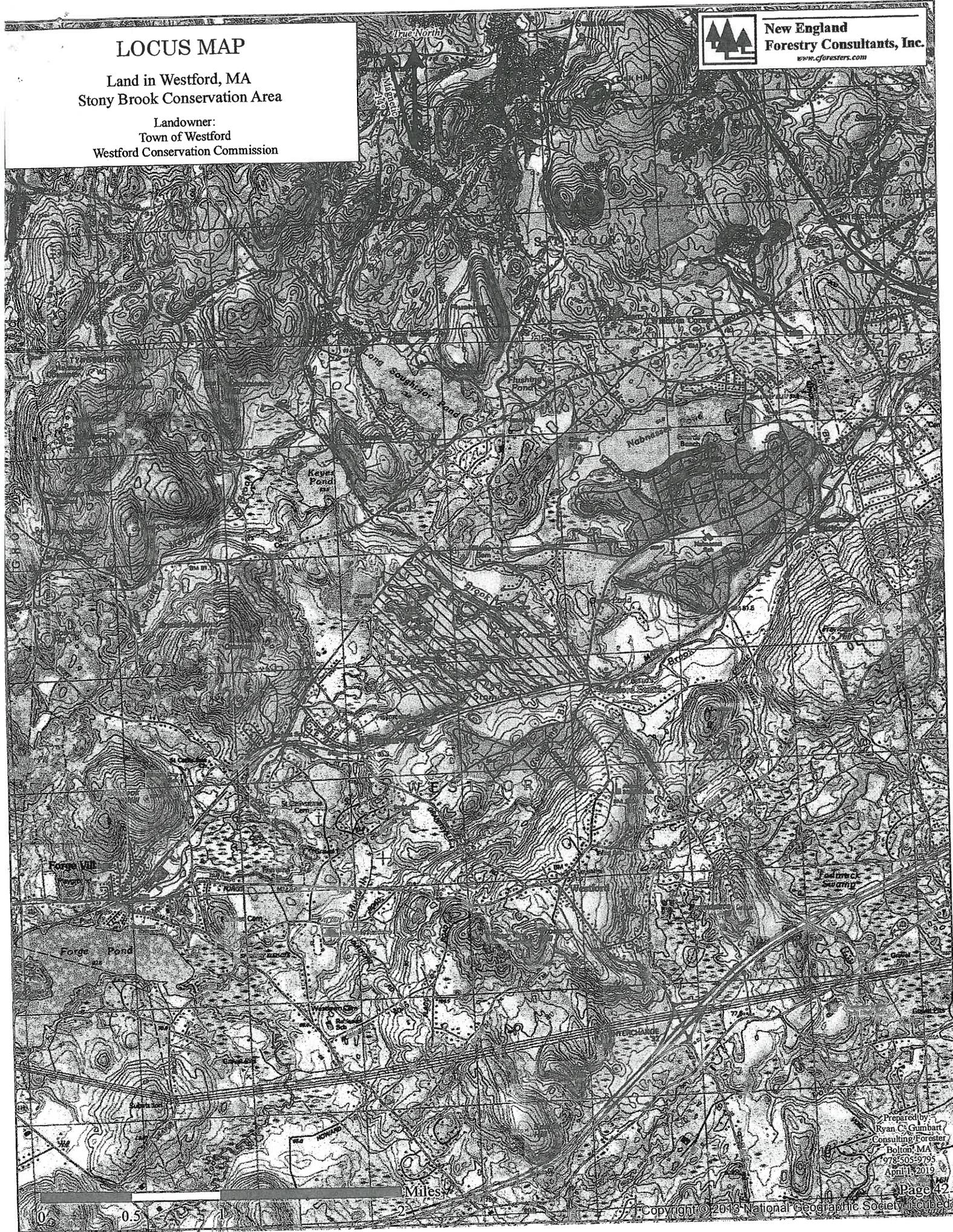
# LOCUS MAP

Land in Westford, MA  
Stony Brook Conservation Area

Landowner:  
Town of Westford  
Westford Conservation Commission



New England  
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