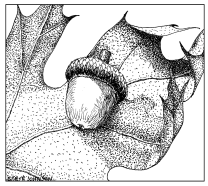
FOREST MANAGEMENT PLAN

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



CHECK-OFFS					*Administrative Box*			
CH61	CH61A	CH61B	STWSHP	C-S	Case No.		Orig. Case No.	
cert. ☐	cert. ☐	cert. ☐	new ☒	EEA ☐	Owner ID		Add. Case No.	
recert. ☐	recert. ☐	recert. ☐	renew ☐	Other ☐	Date Rec'd		Ecoregion	
amend ☐	amend ☐	amend ☐	Green Cert ☐		Plan Period		Topo Name	*Haverhill*
			Conservation Rest. ☐		Rare Spp. Hab.		River Basin	*Merrimack*
Plan Change: _____ to _____			CR Holder _____					

OWNER, PROPERTY, and PREPARER INFORMATION

Property Owner(s) ***City of Haverhill, Haverhill Conservation Dept., c/o Robert E. Moore***
Mailing Address *City Hall Room 310, 4 Summer Street, Haverhill, MA 01830* Phone *978-374-2334*

Property Location: Town(s) *Haverhill* Road(s) *Main Street, Route 121*

Plan Preparer ***Gary H. Gouldrup, New England Forestry Cons., Inc.*** Mass. Forester License # *81*
Mailing Address *72 Townsend Street, Pepperell, MA 01463* Phone *978-433-8780*

RECORDS

Forest Legacy Only

Assessor's Map No.	Lot/Parcel No.	Deed Book	Deed Page	Total Acres	Ch61/61A/61B *Excluded* Acres	Ch61/61A/61B **Certified** Acres	Stewardship *Excluded Acres*	Stewardship *Agricultural* Acres	Stewardship Acres
654	608-2	2838	461	52.08	NA	NA	9.31	0.00	42.77
			TOTALS	**52.08**	**NA**	**NA**	**9.31**	0.00	**42.77**

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

There are 9.31 acres to be excluded from Forest Stewardship Classification. The area includes softball fields, paved automobile parking, and VFW buildings with open land. Please see the Boundary & Stand Type Map on page 22 for exclusion details.

HISTORY

Year acquired *1980* Year management began *1980*

Is subdivision plan on file with municipality? Yes ☐ No ☒
Are boundaries blazed/painted/flagged/signs posted? (circle all that apply) Yes ☒ No ☐ Partially ☒
Have forest products been cut within past 2 years? Yes ☐ No ☒

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	Value	Acres	Date
All	*NA*	*Trail Management*	*NA*	*NA*	*40+/-*	*2001-2010*

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

This is the first Forest Stewardship Plan prepared for the property.

RECORDS (continued)

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EXCLUDED AREA DESCRIPTION (continued):

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HISTORY (continued):

The City of Haverhill accepted the property from the American Legion, Wilbur M. Comeau Post in 1980.

This is the first Forest Management Plan that has been prepared for the property. The last timber harvest on the property was done in the early to mid 1970's. The harvest was conducted by Ralph A. Esty and Sons, Inc. out of Groveland, MA.

Management activities on the property since 1980 also include trail maintenance and periodic mowing of the open field along Main Street in the southeastern corner of the property. Pruning of trees has also been done along the edges of the open field and in the areas south and west of the VFW buildings. The northwestern and southerly boundary lines have been blazed and painted with red paint within the last ten years.

Please see page 3 for more history of the Clement Farm property.

Property Overview, Regional Significance, and Management Summary

The 40-acre Clement Farm forest is located in a northwest section of Haverhill along the Plaistow, New Hampshire border. Route 121 is the properties eastern boundary. The Clement Farm property is approximately one mile northwest of Exit 51off of Route 495 and the highly populated city limits of Haverhill on the west side of Route 495. The property is surrounded by private landowners. The nearest property with long term protection is over two miles away. Densely populated residential dwellings and commercial properties are located along Route 121 near the Clement Farm property. The non-forest areas on the property also include five softball fields, a 25 car parking lot and an open field in the south east corner of the property along Route 121. The field is used periodically for car shows, flea markets, picnicking and other local events approved by the City of Haverhill. The location and non-forest uses of this property make it attractive to people for hiking. The property is listed in the Haverhill Trails Committee guide: A Guide to Exploring Haverhill Trails.

Cultural resources are associated with the Clement Farm property. *"It has been speculated that the Pawtucket Indians' main village may have been located along the Little River, and that early settlers may have used this waterway as a main transportation pathway. One of the first settlers to Haverhill was Robert Clement, Sr. who came with his family from England in 1642. His son, Robert, Jr. was one of the colonists who signed the original Deed of Haverhill from the residing Native Americans. Lt. John Clement, a grandson of Robert Clement, Jr., was given a grant of land in Haverhill's North Parish on January 29, 1721. This land is the site of the present Clement Farm, on which sits the second family home, built in 1813. On March 6, 1930, the farm was deeded to the American Legion, Wilbur M. Comeau Post until 1980, at which time the City of Haverhill accepted the deed to the property*" (Haverhill Trails Committee, 2009). The American Legion continues to meet and maintains the buildings on the property.

The property lies in the Merrimack Watershed. Water that passes through the property flows into Little River which is the western property boundary. The Little River empties into the Merrimack River approximately 3 miles south of the property.

The forest stewardship land is diverse and consists of mature woodlands (79%), an open field (4%), river flood plains (9%) and storm damaged young forest habitat (4%). White pine is the dominant tree species in the uplands and represents approximately 60% of the forest stocking. Timber resource quality ranges from poor to high. The areas that were thinned in the northern sections of the property are growing high quality white pine sawtimber. Most areas that were not previously harvested are growing a mixture of poor quality and high quality timber resources. The large sawtimber component within the forest (20"+ Diameter at Breast Height) is noteworthy. Almost 9% of the trees on the property fall into the large sawtimber category. Several trees exceed 25" DBH. Several sugar maples on the south side of the western foot bridge are particularly impressive. Most of these large diameter trees can be found on the south side of the stream that dissects the property. Invasive and non-native vegetation on the property include barberry, buckthorn, firebush, knotweed, honeysuckle and Norway maple. Norway maple saplings are the primary source of regeneration in Stand #7 below the large diameter white pine stems. The last timber harvest on the property was conducted in the early to mid 1970's. The purchaser and harvester of the timber was Ralph A. Esty & Sons, Inc.

Forest soils on the upland sections of the property include well and moderately well drained loamy sand and sandy loam soils (Hinckley-Windsor-Montauk-Deerfield-Woodbridge). The river flats consist of poorly drained silt loam (Limerick-Rumney), and the upland drainage areas are seasonally wet and poorly drained (Pipestone). The upland soil types occupy approximately 80% of the land area. The presence of ironwood, hop-hornbeam and sugar maple are indicators of the moderately drained and poorly drained silty loam soils located near rivers and river basins similar to the Little River. The majority of the upland forest soils are productive and capable of producing high quality timber resources.

The Haverhill City Mayor, through the Conservation Department, established the Haverhill Forest Stewardship Committee in 2009. The Forest Stewardship Committee has developed the following goals for the Clement Farm property:

Management will focus on promoting a healthy forest environment for the safety and enjoyment of the residents of Haverhill and others who will visit the property. The City would like to specifically accomplish the following on this property:

- Enhance both the quality and quantity of future timber products;
- Conduct a biomass operation to improve regeneration and aesthetics;
- Produce firewood that will be made available to residents;
- Enhance wildlife habitat by diversifying tree age and species, creating successional “pockets”, and protecting heritage trees and the hemlock grove;
- Improve trail, fishing, and paddling access to Little River;
- Create a picnic grove within the forest edge along the existing softball fields;
- Protect the water quality of Little River; and
- Create a self-guided stewardship trail for public education and enjoyment.

Trail maintenance and interpretive signage will be a priority on this forest for the safety and forest stewardship education of those using the property. A self guided trail, picnic tables, a kiosk and gates have all been considered by the Stewardship Committee when considering recreational use of the property. Making access to the Little River will be done in the future for fishing, canoeing, and kayaking. Creating a picnic grove where the forest meets the softball fields will also be pursued.

Timber resource management will be aimed at enhancing the quality of timber resources into the future while improving wildlife habitats and aesthetics throughout the property. Commercial sales of timber will require whole-tree chipping of low quality trees and portions of trees that do not have firewood or sawtimber products primarily for aesthetic and fire protection purposes. Removing low quality hardwoods for firewood will be done in order to generate a supply of firewood for the residents of Haverhill.

Wildlife habitats will be enhanced through the timber harvesting practices. Creating multiple age classes within the forest will benefit a variety of wildlife species. Artificial nest boxes and periodic mowing of the open field will also enhance wildlife habitats.

All forest management activities will be sensitive to protecting water quality, soils, cultural resources, wildlife habitats, rare and endangered species and their habitats, aesthetics and recreational values. When harvesting timber resources on the property a Chapter 132 Cutting Plan will be filed with the Department of Conservation and Recreation. The Division of Fisheries and Wildlife's Natural Heritage & Endangered Species Program (NHESP) will make recommendations to protect any special vegetation or wildlife and their habitats should they exist on the property. Historically, the Clement Farm property has been documented as suitable wood turtle habitat.

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			X	
Improve 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.**

1. In your own words please describe your goals for the property:

The City of Haverhill would like to improve and protect the forest resources on the Clement Farm property for the benefit of the residents of Haverhill. This goal will be accomplished by periodically harvesting timber resources, maintaining a safe network of trails, enhancing wildlife habitat and educating the public on forest stewardship matters.

Stewardship Purpose

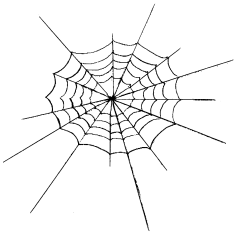
By enrolling in the Forest Stewardship Program and following a Stewardship Plan, I understand that I will be joining with many other landowners across the state in a program that promotes ecologically responsible resource management through the following actions and values:

1. Managing for long-term forest health, productivity, diversity, and quality.
2. Conserving or enhancing water quality, wetlands, soil productivity, 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:** _____

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.

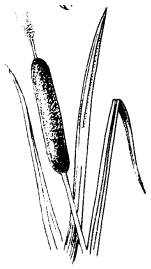
Another factor influencing biodiversity in Massachusetts concerns the amount and distribution of forest growth stages. Wildlife biologists have recommended that, for optimal wildlife habitat on a landscape scale, 5-15% of the forest should be in the seedling stage (less than 1" in diameter). Yet we currently 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.

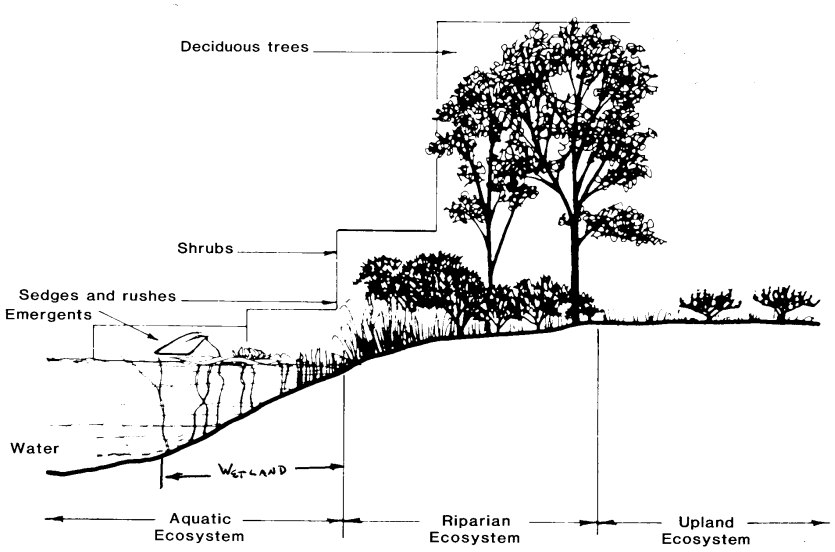


Figure 1: Example of a riparian zone.

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 keeps 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 then 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 17th and 18th 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.

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.

STAND DESCRIPTIONS

OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	1	WP	9.46	13.7" DBH Sawtimber	145 sqft	16,811 BF & 18.2 Cds	65 (WP)

White pine is the dominant overstory species in this overstocked sawtimber sized stand. The white pine stems are generally well formed and fair to high in timber quality. Scattered mixed hardwoods can also be found which included red maple, black birch and mixed oak poles and sawtimber of poor to fair form and timber quality. A timber harvest occurred in this stand in the early to mid 1970's. Forest regeneration is adequate and well advanced as a result of the harvest, although the dense crown canopy is suppressing the growth of the understory vegetation. White pine, black birch and other mixed hardwood saplings are the primary source of regeneration. The area is flat to steeply sloped with well and moderately well drained gravelly loam sand soils (Hinckley-Windsor-Montauk). The forest soils are capable of producing high quality timber resources. Management will focus on harvesting a portion of the overstory timber through the shelterwood system. The desired future condition is a stand that is growing high quality timber resources in several size and age classes while providing scenic beauty and recreational opportunities for the residents of Haverhill.

STEW	2	MH	1.59	6.3" DBH Sapling-Pole	40 sqft	6.0 Cords	65 (WP)

Mixed oak and mixed hardwoods saplings and pole sized stems dominate the overstory of this young forest habitat that was created by wind storms in the past. Several large white pine blow-downs can be found in the northern section of this stand. The mixed hardwoods include aspen, hickory, black birch, gray birch, sugar maple, hop hornbeam, and red maple. Scattered white pine saplings are present as well. Honeysuckle and other early successional vegetation can be found growing in the understory. The area is gently sloped with soils that are well to moderately drained, sandy loam (Montauk). The soils are capable of producing high quality timber resources. No management is recommended at this time. The stand will be allowed to develop over the next ten years. Removing the blow-downs may be attempted in the event a harvest is conducted in Stand #1. The desired future condition is a stand that is developing into the pole class that provides habitat for young forest dwelling forms of wildlife.

STEW	3	WH	5.01	8.9" DBH Pole-Sawtimber	120 sqft	1,714 BF 24.9 Cds	63 (WP)

White pine and mixed hardwoods are the dominant overstory species in this adequately stocked pole and small sawtimber sized stand. The mixed hardwood component includes aspen, sassafras, red oak, red maple, white ash, hickory, American elm, black cherry, sugar maple, and hop hornbeam. The overall timber quality is poor, although scattered red oak poles and sawtimber sized stems of high quality can be found. Forest regeneration is scattered and includes mixed hardwood saplings competing with honeysuckle, bittersweet and barberry in the understory. The area is gently to moderately sloped with moderately drained sandy loam and loamy sand (Montauk-Windsor) capable of producing high quality timber resources. Management will focus on improvement thinning and recreation enhancement along the trails. The desired future condition is a stand that is growing high quality timber resources in several size and age classes while providing scenic beauty and recreational opportunities for the residents of Haverhill.

STAND DESCRIPTIONS

OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	4	WH	2.15	11.8" DBH Pole	160 sqft	733 BF & 38.2 Cds	60 (WP)

This stand of trees is a mix of white pine, pitch pine, red pine, Scotch pine, Colorado blue spruce, Norway spruce, American elm, white ash, red maple and black cherry. The white pine is located in the western section of the stand while the hardwoods are situated in the eastern sections. It is most likely that the spruce and red pine were planted here in the past. The white pine component is very poor in form and timber quality as a result of white pine weevil damage. Most of the trees have been pruned within eight feet of the ground. The area is used for cookouts by the VFW. The terrain is flat to gently sloped with well to moderately drained loamy sand soils (Windsor) capable of producing high quality timber resources. Management will focus on aesthetic improvements. The desired future condition is an area that continues to provide shade for activities pursued by the VFW.

STEW	5	OH	2.73	14.5" DBH Sawtimber-Pole	100 sqft	6,555 BF & 18.8 Cds	63 (RO)

Red oak and mixed hardwoods are the dominant overstory species in this well stocked sawtimber and pole sized stand. High quality red oak sawtimber can be found along the southwestern side of the stream that runs through this stand. Black birch, sugar maple, basswood, white ash, hickory, ironwood, yellow birch and American beech poles and sawlogs of poor to good form and timber quality can also be found. Areas close to Route 121 are comprised of red maple in the pole class. Forest regeneration is scattered and consists of mixed hardwood saplings. Japanese barberry, hawthorn, honeysuckle, witch hazel, bittersweet, firebush, silky dogwood, alder and other wetland shrubs and plants are present in the understory. Management will focus on improvement thinning while maintaining a filter strip for water quality protection and good aesthetics. The desired future condition is a stand of trees that will continue to provide protection of water quality and highlight the large red oak and mixed hardwoods for aesthetics.

STEW	6	FD	3.34	Field	NA	NA	65 (WP)

This area is mostly a field that is periodically mowed. There are small groups of trees along the edges of the field which include Black locust, mixed oak, sugar maple, white pine, gray birch, black cherry, red maple, basswood and American elm poles and sawtimber sized trees. Many of the trees have been pruned in the past. Antique car shows, flea markets, picnicking and other recreational activities occur within this area with the approval of the City of Haverhill. The area is flat to gently sloped with well to moderately well drained loamy sand soils (Deerfield). Management will continue to focus on periodic mowing and aesthetic tree management. Artificial bird nesting boxes will also be considered by the Haverhill Forest Stewardship Committee. The desired future condition is an area that provides recreational opportunities and space for special events for the citizens of Haverhill.

STAND DESCRIPTIONS

OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	7	WH	10.81	12.5" DBH Sawtimber	220 sqft	24,838 BF & 31.4 Cds	65 (WP)

White pine is the dominant overstory species in this overstocked sawtimber sized stand. The white pine stems are generally poor to fair in form and timber quality. The mixed hardwoods include red maple, Norway maple, black cherry, black birch, white ash, hickory and mixed oak poles and sawtimber of poor to fair form and timber quality. Forest regeneration is scattered and consists primarily of Norway maple and mixed hardwood saplings. Scattered hemlock saplings are present as well. The area is gently to steeply sloped with moderately well drained sandy loam soils (Montauk). The forest soils are capable of producing high quality timber resources. Management will focus on harvesting a portion of the overstory timber through the shelterwood system. The desired future condition is a stand that is growing high quality timber resources in several size and age classes while providing scenic beauty and recreational opportunities for the residents of Haverhill.

STEW	8	HH	1.61	14.3" DBH Sawtimber	190 sqft	20,277 BF & 28.6 Cds	65 (WP)

Hemlock and mixed hardwoods are the dominant overstory species in this overstocked sawtimber sized stand. The hemlock stems are well formed and poor to fair in timber quality. The mixed hardwood component includes sugar maple, black birch, red oak, and red maple poles and sawtimber of poor to good from and timber quality. Scattered white pine sawtimber sized stems are present as well. Several unique and large sugar maple stems can be found on the south side of the foot bridge in the northeastern corner of the stand. Forest regeneration is limited due to the dense crown overstory. Hemlock saplings are the primary source of regeneration. No evidence of the hemlock woolly adelgid was found. The area is gently to moderately sloped with well to moderately well drained sandy loam soils (Montauk-Windsor) capable of producing high quality timber resources. Management will focus on promoting old growth characteristics within the stand. The desired future condition is a stand that has large sawtimber sized trees with old growth characteristics that provides habitat for wildlife and safe trails for the public.

STEW	9	MH	2.22	10.6" DBH Pole-Sawtimber	120 sqft	1,524 BF 24.4 Cds	63 (WP)

Mixed hardwoods are the dominant overstory species in this adequately stocked pole and small sawtimber sized stand. The mixed hardwood component includes black oak, red maple, black cherry, white ash, white birch, ironwood, hop hornbeam, and aspen poles and sawtimber of mostly poorly formed and low quality stems. Scattered white pine poles and sawtimber can be found as well. Forest regeneration is scattered and includes mixed hardwood saplings competing with honeysuckle, barberry, firebush, bittersweet, arrowwood and wetland plants and shrubs in the understory. The area is gently sloped with poorly to moderately well drained fine sandy loam soils (Woodbridge) capable of producing high quality timber resources. Management will focus on improvement thinning and recreation enhancement along the trails. The desired future condition is a stand that is growing high quality timber resources in several size and age classes while providing scenic beauty and recreational opportunities for the residents of Haverhill.

STAND DESCRIPTIONS

OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	10	MS	3.85	10.5” DBH Pole	20 sqft	3.6 Cords	50 (RM)

Mixed hardwoods are the primary species along the banks and in the flood plains of the Little River. Ironwood, hop hornbeam, gray birch, hickory, and red maple poles and sawtimber sized stems of poor form and timber quality can be found. Silky dogwood, alders, winterberry, honeysuckle and wetland plants and shrubs are present in the understory. The area is a flat flood plain that is subject to flooding during periods of high water and flooding. The soils are poorly drained silt loam (Limerick). No management is recommended in this area at this time. Wood duck boxes may be considered by the Forest Stewardship Committee. The desired future condition is an area that provides habitat for wildlife while serving as a flood plain zone.

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	1	WP	Shelterwood	9+/-	40 sqft	40 MBF & 225 Tons	2011-2015

Management will focus on harvesting through the shelterwood system. The target is to harvest approximately 1/3 of the overstory volume. The emphasis will be to harvest mature white pine sawtimber (18" DBH+) in order to improve the growing conditions of the developing high quality white pine poles and small sawtimber sized stems. Poorly formed and low quality white pine and mixed hardwood stems will also be harvested to increase the health and productivity of the stand. High value sawtimber will be sold as sawlogs, while the low quality softwood trees and portions of trees will be chipped and utilized at wood burning facilities that generate electricity. The low quality hardwoods that are harvested will be cut, skidded and landed in the open field (Stand 6) for the purpose of providing firewood to the citizens of Haverhill. Please see page 21 for details about the Haverhill Home Fuelwood Program. Whole-tree chipping the tops of trees will be important for protecting and improving aesthetics and reducing the threat of forest fires. A small one acre patch cut will also be considered for creating young forest habitat for wildlife management purposes.

STEW	7	WP	Shelterwood	10+/-	40 sqft	40 MBF & 300 Tons	2011-2015

Management will focus on harvesting through the shelterwood system. The target is to harvest approximately 1/4 -1/3 of the overstory volume. The emphasis will be to harvest mature white pine sawtimber (18" DBH+) in order to improve the growing conditions of the developing high quality white pine poles and small sawtimber sized stems. Poorly formed and low quality white pine and mixed hardwood stems will also be harvested to increase the health and productivity of the stand. High value sawtimber will be sold as sawlogs, while the low quality softwood trees and portions of trees will be chipped and utilized at wood burning facilities that generate electricity. The low quality hardwoods that are harvested will be cut, skidded and landed in the open field (Stand 6) for the purpose of providing firewood to the citizens of Haverhill. Please see page 21 for details about the Haverhill Home Fuelwood Program. Whole-tree chipping the tops of trees will be important for protecting and improving aesthetics and reducing the threat of forest fires. A small one acre patch cut will also be considered for creating young forest habitat for wildlife management purposes.

Continued …….

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	3 & 9	WH	Improvement Thin By Selection Harvest	6+/-	30 sqft	4 MBF & 150 Tons	2011-2015

Management will focus on harvesting poorly formed and low quality hardwood poles (4-11" DBH) and small sawtimber sized stems (12-15" DBH) for firewood. Occasional mixed hardwood and white pine sawtimber (12" DBH+) will also be harvested. Removing individual and small groups of poorly formed, suppressed, and low quality hardwood trees will be done to improve the growth and development of the healthiest and highest quality white pine and red oak poles and sawtimber sized stems. Retaining well formed and healthy aspen trees will be done for wildlife habitat enhancement. The target is to harvest approximately 25-33% of the total overstory volume. This harvest will focus on removing the unacceptable growing stock. Harvesting will be done when ground conditions are dry, frozen, or otherwise stable in order to protect the soils and water quality. High value sawtimber will be sold as sawlogs, while the low quality softwood trees and portions of trees will be chipped and utilized at wood burning facilities that generate electricity. The low quality hardwoods that are harvested will be cut, skidded and landed in the open field (Stand 6) for the purpose of providing firewood to the citizens of Haverhill. Please see the paragraph below for details about the Haverhill Home Fuelwood Program. Whole-tree chipping the tops of trees will be important for protecting and improving aesthetics and reducing the threat of forest fires.

Home Fuelwood Program

The Forest Stewardship Committee has developed the *Haverhill Home Fuelwood Program* as a means of making available firewood to the residents of Haverhill. The low quality hardwood stems that are harvested in the recommended timber sales on the Clement Farm property will be the source of wood for this program. Hardwood stems that are cut on the property will be skidded to the open field along Route 121. The trees will be cut to a length of approximately 24 feet and stacked in one-cord piles within the field. Haverhill residents will be allowed to bid on the one-cord piles at the completion of the commercial harvest. Successful bidders will be required to cut the trees into stove lengths and remove the firewood on their own. The successful bidders will be required to sign a liability waiver that does not hold the City of Haverhill liable for any accidents, injury or death as a result of cutting and removing the stacked firewood. The intent is to make the project revenue neutral and as safe as possible. There will be a cost of having the firewood trees cut, skidded and landed of approximately $40 per cord. Bids for the stacked firewood must at least cover this cost. The recommended harvest on the Clement Farm property should generate approximately 15-20 cords of firewood for this program.

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	1-9	All	Trail Maintenance Forest Stewardship Education	42+/-	NA	NA	2011-2020

The existing trails at the Clement Farm will periodically be maintained for the safety, enjoyment and education of the residents of Haverhill. Trail maps, tags, interpretive signs, picnic tables, gates and a kiosk will all be variables associated with the management of the trails and the education of those who will be using the trails. Currently, the trails are marked with paint. The Forest Stewardship Committee would like to provide maps at the trail heads located on the west side of the softball fields and at the open field along Route 121. Interpretive signs along the trails will help educate the property users about Forest Stewardship matters within the forest interior. The construction of a kiosk in the open field will also be beneficial for educating the public about the history of the property and forest stewardship. Creating access to the Little River will be pursued through Stand #3. Access to the river will be for the purpose of kayaking, canoeing and fishing. The Trails Committee and Forest Stewardship Committee will work together to determine as to where, when and how these items are accomplished.

Wildlife Habitat Enhancement

STEW	6	FD	Mowing Artificial Nest Boxes	3+/-	NA	NA	2011-2020

Periodic mowing and vegetation control will maintain the open areas of this field as habitat necessary for many wildlife species presently using the site. The white-tailed deer, turkeys, American kestrel, American woodcock, song birds, and many other native species will use the open areas as a feeding, mating, and nesting sites. Ground nesting songbirds will use areas within this site for nesting in the spring. Mowing should be done after July 31 to avoid damaging any nests in those areas. Artificial nest boxes to encourage songbird species will also be considered.

Timber harvesting practices alone will enhance wildlife habitat. Creating an unevenaged forest structure while maintaining a variety of forest types and vegetation will greatly increase the diversity of wildlife species using this property for food, protection, mating and nesting. For more information on wildlife management please refer to *"Enhancing Wildlife Habitats; A Practical Guide For Forest Landowners"*. Please also see the Timber Management recommendations on page 17 and 18.

In looking to implement the three-strategy approach of managing for diversity, protecting existing habitat, and enhancing existing habitat, the Forest Management Committee is currently seeking council from such regulatory and advocacy agencies as the Massachusetts Division of Fisheries & Wildlife and Mass Audubon. The Committee is also reviewing services that might be provided by a wildlife habitat consultant to assist in ensuring the long-term protection of the City's wildlife.

MANAGEMENT PRACTICES
to be done within next 10 years

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

Biological Diversity

STEW	1-10	All	Invasive Species Control	42+/-	NA	NA	2011-2020

The Forest Stewardship Committee is interested in promoting biological diversity on the property. Eliminating invasive and non-native trees, plants and shrubs will be done where these species exist and when economically feasible and practical. Buckthorn, firebush (winged euonymus), bittersweet, honeysuckle, Norway maple, Japanese barberry and knotweed are currently known to be growing on the property. Natural communities are being affected by their presence in several areas within the forest. Cutting the stems with saws will help reduce and control the spread of the invasive species. Controlling the invasive species through well timed timber management activities is another management tool. Encouraging vigorous growth of native tree species in the forest understory will be accomplished by scarifying the soil prior to seed dissemination. 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 on this property through periodic timber harvests and wildlife habitat management. Please see the Biological Diversity issues on page #6 for more details.

The Forest Stewardship Committee is currently seeking council from the UMass Amherst Extension Center for Agriculture and the United States Forest Service with regard to controlling invasive species as part of a forest stewardship program to ensure active management activities do not result in proliferation of these species in any of the City's forest lands.

Old Growth Timber Management

STEW	8	HH	Old Growth Management	1.6+/-	NA	NA	2011-2015

Stand #8 contains a significant number of trees that are in the large sawtimber class that have old growth characteristics. The recommendation for this stand is to promote the health and vigor of these large diameter hemlocks, sugar maples, black birch and red oaks. The University of Massachusetts Mass Woods Forest Conservation Program (masswoods.net) has published a brochure that can be used to assist landowners with the management of these old forest types. One requirement of restoring old growth characteristics involves having large trees with diameters of 25-30" in diameter (DBH). This stand has several trees that have reached that size with many more approaching this desired size. Thinning around these "Legacy Trees" would improve their growth and health into the future. Selecting the legacy trees would be done prior to removing the undesirable trees. This practice could be timed when harvesting is conducted in Stand #7.

MANAGEMENT PRACTICES
to be done within next 10 years

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

Boundary Maintenance

STEW	All	All	Blaze & Paint	42+/-	NA	NA	2011-2020

Most of the property lines have been blazed and painted with red paint. These lines should be re-painted within the next five years. The City may also want to identify the property with signs along the boundary lines. Property lines without stone walls should be marked along Rosemont Street with stakes. A survey of the property was prepared by the Haverhill Engineering Department in 1930. The Plan was prepared by Louis C. Lawton, City Engineer.

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**. I pledge to abide by the management provisions of this Stewardship Management Plan for a period of at least ten years, 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.

Signed under the pains of perjury:

Owner(s) _____ Date _____

_____ Date _____

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

Plan Preparer _____ Date _____

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

Approved, Service Forester _____ Date _____

Approved, Regional Supervisor _____ Date _____

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.

City of Haverhill
Clement Farm Lot
Haverhill, MA
2008 Aerial Photo

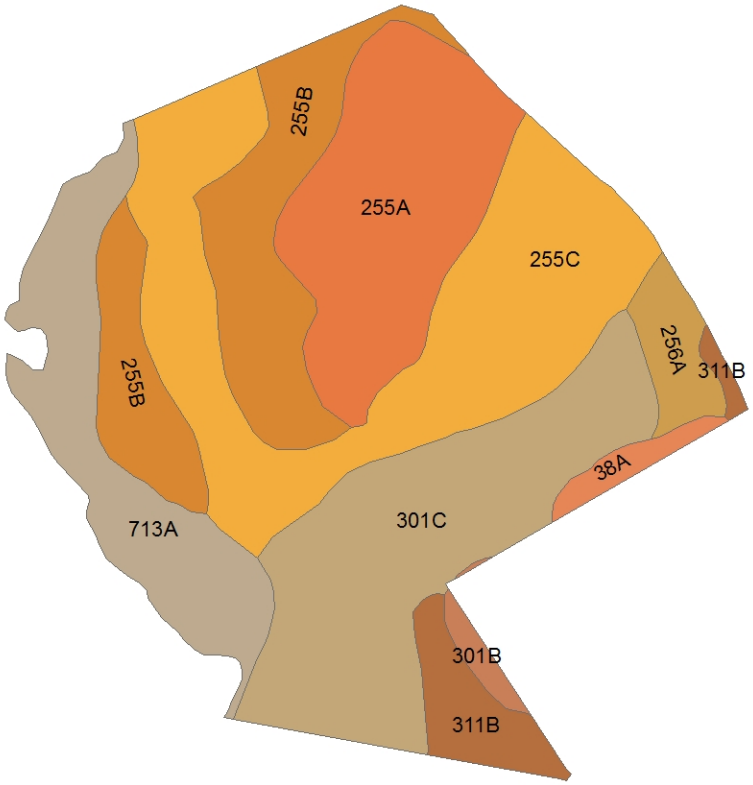
500 250 0 500 1,000 Feet

N
W E
S

Prepared by:
New England Forestry Consultants, Inc
Sherman R. Small, Consulting Forester
Maine License # LF655
New Hampshire License # 409
March 30, 2011

Sketch map for management and planning purposes only, NOT A LEGAL SURVEY
Data obtained from MASS GIS, & New England Forestry Consultants, Inc.

City of Haverhill
Clement Farm Lot
Haverhill, MA
Soils Map



307B Soils Symbol

500 250 0 500 1,000 Feet

N
W E
S

Prepared by:
New England Forestry Consultants, Inc
Sherman R. Small, Consulting Forester
Maine License # LF655
New Hampshire License # 409
March 30, 2011

Sketch map for management and planning purposes only, NOT A LEGAL SURVEY
Data obtained from MASS GIS, & New England Forestry Consultants, Inc.

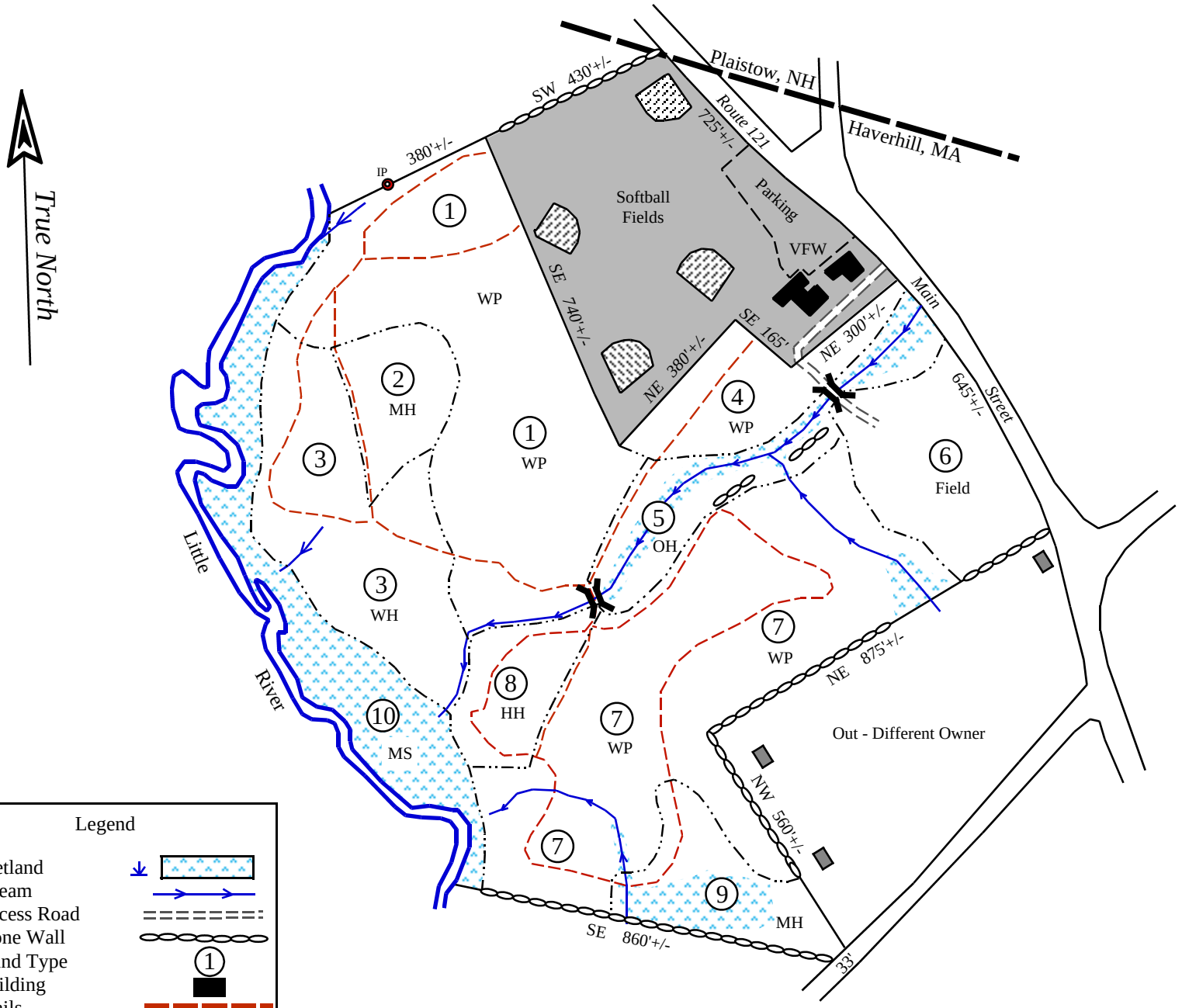
New England
Forestry Consultants, Inc.

Prepared By:
Gary H. Gouldrup
Consulting Forester
72 Townsend Street
Pepperell, MA 01463
978-433-8780
3/18/2011

BOUNDARY & STAND TYPE MAP

Land in Haverhill, MA
Clement Farm

Owned By:
City of Haverhill
Haverhill Conservation Department



Legend

Wetland	
Stream	
Access Road	
Stone Wall	
Stand Type	1
Building	
Trails	
Excluded Area	
White Pine Hardwood	*WH*
White Pine	*WP*
Mixed Hardwoods	*MH*
Hemlock-Hardwoods	*HH*
River Flood Plain	*MS*
Stand Type Line	
Parking	P
Iron Pipe	IP
Bridge	

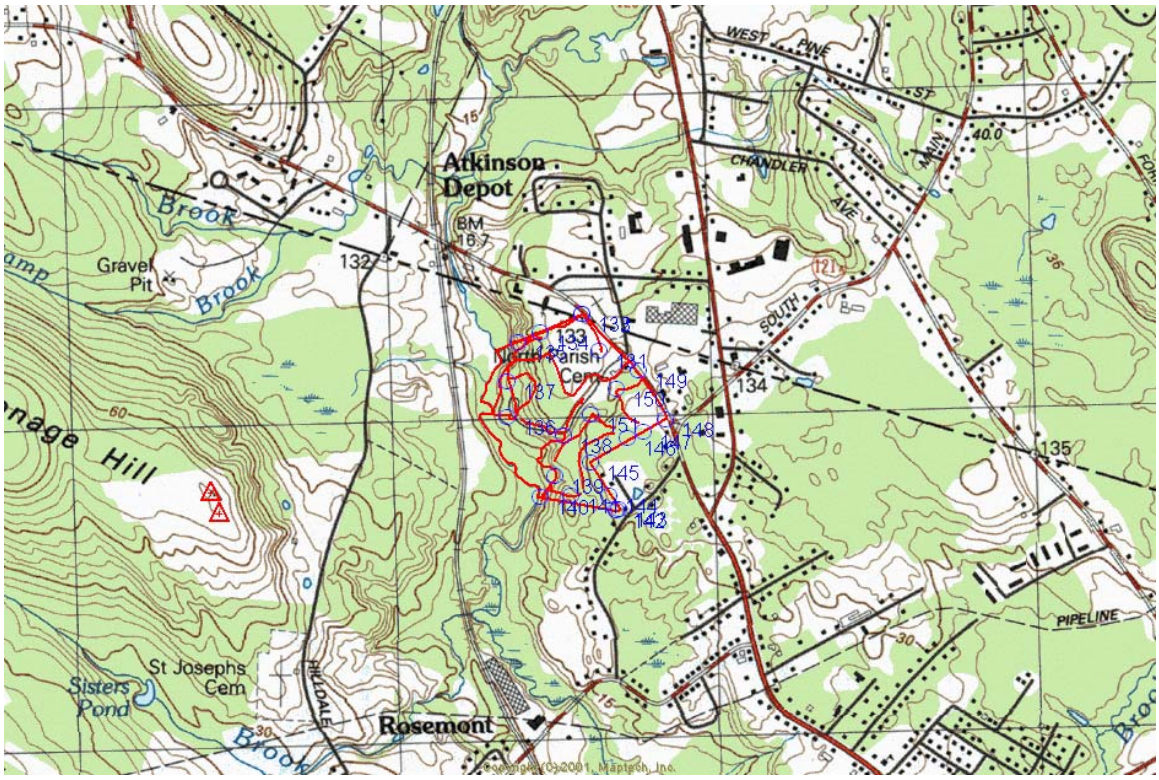
Metes and bounds are based on the Haverhill Assessor's Maps, A Survey of Land and GPS Field Work 2011.

graphic scale (in feet)
0 330 660

TOPOGRAPHICAL MAP

Land In:
Haverhill, MA
Clement Farm Lot

Owned By:
City of Haverhill
City Hall Room 310, 4 Summer Street
Haverhill, MA 01830



Topographical Map – Haverhill Quadrangle

Scale 1 inch = 2000 feet

March 21, 2011

Prepared By: Gary H. Gouldrup, New England Forestry Consultants, Inc.