Cruise Report and Forest Management Plan

Town of Falmouth, Maine

Blackstrap Hill Community Forest
Hadlock Community Forest
Woods Road Community Forest
Falmouth Nature Preserve
North Falmouth Community Forest
Falmouth Community Park
Pine Grove Park
Town Forest

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I. Overview

A forest inventory of eight lots owned by the Town of Falmouth has been completed with funding from the Maine Forest Service under Project Canopy.

The goals of owning and managing this land are to maintain open space, healthy forest ecosystems, preserve and improve wildlife habitat, and provide opportunities for recreation.

Obviously, forest will grow on most of this land without any help from humans. Left to its course, nature will provide what it provides. By managing it, it is possible to improve over what would naturally be provided. Proper cultural treatments will improve the volume, quality, value of timber, and increase income. Treatments will keep the forest more diverse, vigorous, and continually renewing itself. Treatments can create forest conditions that will provide wildlife habitat for desired species.

Based on this inventory, a management plan has been prepared describing the forest and other resources found on the property. Recommendations for the management of the forest resources are also part of the plan.

The eight lots total 860 acres, of which 758 are woodland. These wooded acres have a total stocking of 5,000,000 board feet of logs suitable for sawing into lumber or better products, and 19,000 cords of lower value pulpwood and firewood quality material. Using cords as a standard measure, all the wood on the property would total 29,000 cords, which is an average stocking of about 40 cords per acre. This is considered well stocked to somewhat overstocked. The value of this timber totals $1,106,704 based on sales of similar timber during the past six months. This value assumes typical sustainable forestry practices are required.

Most of the forest stands are highly stocked and recommendations for thinnings, improvement cuts, and harvesting are made in the plan. The treatments recommended are to maintain a healthy vigorous forest, improve wildlife habitat, and harvest a sustainable crop. If all of these recommendations are implemented it would result in a harvest of 7,000 to 8,000 cords of wood.

This would be mostly lower quality timber, but would include 20% to 30% of higher quality wood. The stumpage value (value of standing trees) would be approximately $250,000.

Prioritizing the work is not an easy task as all of the lots will benefit from treatment. The Nature Preserve and Pine Grove Park are the neediest from a forestry point of view, but harvesting timber is likely to be controversial on those lots. Therefore, treatment should start with Blackstrap Hill Community Forest, Woods Road Community Forest or the Hadlock Community Forest. They all have stands that need work and are more traditional woodlots. Treating 50 to 100 acres annually would result in about a 10-year treatment cycle. Markets are not great as this is being written, but the first treatments will focus on removing low-grade material that never will have a high value.

The forest provides habitat for many species. For the most part the light thinnings and small harvests will not change the habitat very much. Some improvement in food and cover in the understory can be expected that will benefit ground dwelling animals. The overstory will be maintained preserving winter habitat for deer and canopy habitat for birds. Snags, wildlife trees, and other features attractive to wildlife will be preserved to the extant practical. (This is not always possible. A snag can also be a safety hazard that should be removed.) It is recommended that several areas that are in early succession brushland/young forest be maintained in this habitat. Also, some small areas in more mature stands are identified that could be returned to this habitat type.

One problem is common to many of the lots: the problem of invasive plants. On only two of the lots were invasive plants not observed, North Falmouth Community Forest and Hadlock Community Forest. There are some major infestations in some areas of the town properties; others have small populations. Recommendations regarding control of these plants are made throughout the plan as appropriate.

Table I: Summary of Lots				
Name	Total Acres (Town records)	Acres Wood-land (GPS)	Cords per Acre Avg.	Total Value of Timber
Blackstrap Hill Community Forest	195	179	42	$238,038
Hadlock Community Forest	227	241	38	$303,864
Woods Road Community Forest	135	111	45	$222,348
Nature Preserve	83	78	36	$92,669
North Falmouth Community Forest	49	49	26	$44,329
Community Park	119	45	26	$21,916
Pine Grove Park	29	29	81	$132,940
Town Forest	23	26	41	$50,600
Totals =	860	758	Total =	$1,106,705

II: Overview

There are eight town-owned forested lots addressed in this plan. They each have unique characteristics as described below.

The forest inventory has determined that most of the forest stands are well stocked to over stocked for vigorous tree growth. There have been modest amounts of forest management on these lots over the years. The original Blackstrap Hill Community Forest woodlot was cut fairly heavily about ten years ago, prior to its acquisition by the town. The Town Forest was last cut in 1972 or 1973. The Hadlock Community Forest evidently was cut 15 to 20 years ago. The Woods Road Community Forest appears to have had some light cutting done 10 or 15 years ago. Some small volumes of timber have been salvaged on Pine Grove Park. Other than these instances, it appears there has been very little harvesting done for over 40 years. There are numerous opportunities to thin and improve stands through the commercial harvest of timber. The timber is a valuable resource and its proper harvest would at the very least fund the management expenses of the land.

If the condition of the forest and timber growth were the primary concern, all of these lots should be treated with what foresters often refer to as improvement cuts. This is a commercial cut where treatment varies depending on what is needed. The goal is to remove the least desirable stems in the stands and “improve” the residual stand. Diseased, damaged, defective, over mature and overcrowded stems would be removed. Culturally, the cutting combines salvage, sanitation, thinning, selection and shelterwood treatments depending on what is needed. Wind damage is a concern in any forests that has not experienced any thinning. The trees have come to rely on each other for support. How much to thin and still leave a wind firm residual stand is some of the “art” of forestry. In many instances, it will not be possible to thin down to ideal levels for future growth. In these instances a shorter period of time between cuts is recommended to reduce stocking in a series of cuts until the residual stems grow root systems and stem form that will resist wind damage. In general almost all of the forest stands would benefit if stocking were reduced 25 to 30 percent.

The forest mostly provides medium quality habitat for species that utilize woodland. This simply means that wildlife has to travel to find different things they need in the forest. High quality habitat provides for all of a species needs in a fairly small area. Since there has been little cutting, understories tend to be thin, providing little cover. Red oak, beech and limited number of white oaks are found on most of the lots and provide good hard mast. The Woods Road Community Forest is recognized as a deer wintering area and evidence is that deer utilize it as such. There is a mature softwood stand over much of this lot that provides good winter cover. However, little browse can grow in the dense shade. Blackstrap Hill Community Forest and Community Park have some early succession brush/forest habitat, which is becoming less common throughout southern Maine.

All of the lots see some recreational use. Trails are established on all of them and people obviously use them for walking, skiing, hunting, ATV and snowmobile riding. Most of the trails are in good condition. However, if ATV use increases it is likely erosion will occur in some places if the trails are not hardened and soils stabilized.

It is not surprising that 350 years after European settlement of the area, and a sea trading history, that invasive plant species are common. Almost all of the lots have some infestations. Bittersweet, honeysuckle, barberry, multiflora rose, Japanese knotweed are some of the more common problem plants found. While some of these plants are attractive and provide some benefits to wildlife, they replace native plants and upset the natural ecology. In places they will dominate the site, making regenerating native trees impossible.

III: Description

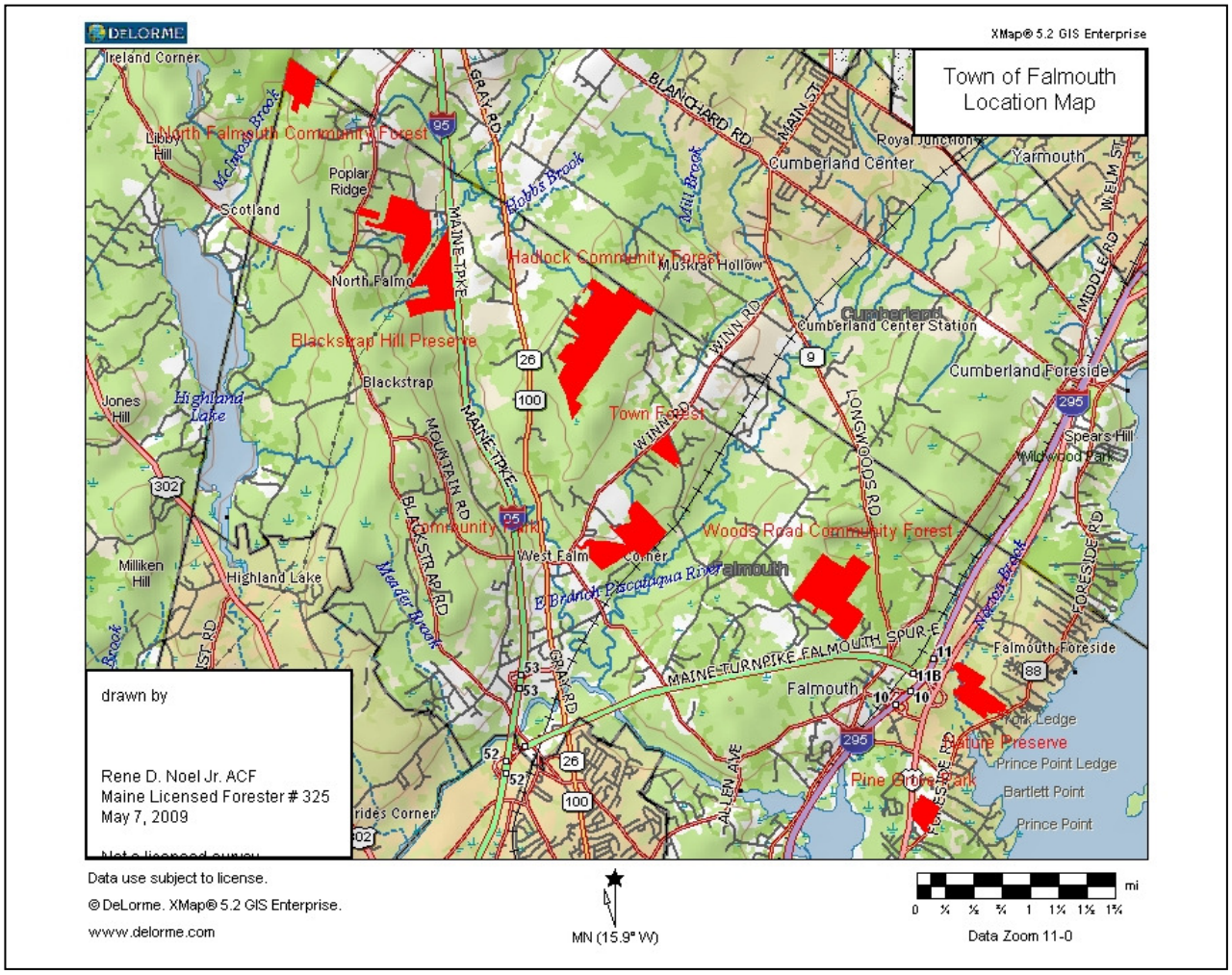
Blackstrap Hill Community Forest, 195 acres, has been assembled from numerous lots. As would be expected with a parcel that is a combination of several past ownerships, the forest stands vary widely depending on past land use and harvesting practices. Terrain also varies from fairly flat to some steep slopes down to the West Branch of the Piscataqua River. The property is bisected by a CMP power line, which also allows access to it from both Hurricane and Blackstrap Roads. A snowmobile trail enters the property from the east, extends up and across the power line, then exits the property to the north. Hikers can also use this trail. Another hiking trail, the Orange Trail, runs close to the river and extends into the abutting Blackstrap Hill Falmouth Land Trust property. That property is owned by the Falmouth Land Trust and protected by a conservation easement. Most of the Blackstrap Hill Community forest is also protected by a conservation easement held by the Department of Inland Fisheries & Wildlife.

Hadlock Community Forest, 227 acres, is another large assemblage of land. While there is some variation in the forest, it is a large stand and a mottling of differing forest types, which average out to be mostly a hemlock/hardwood forest. Terrain is flat to rolling. A stream runs along the westerly border of the property and extensive forested wetlands can be found in the northwest corner. One hundred five (105) acres of the property, along its eastern edge, will soon be protected by a conservation easement held by the Falmouth Land Trust.

Woods Road Community Forest, 135 acres, is appears to be made up of two lots, the old town dump and an adjacent lot acquired by the town at some point. The Department of Inland Fisheries and Wildlife holds an easement on this second parcel. The forest tends to be a mixed wood to softwood type with hemlock, white pine and red spruce being the most common species. These provide good winter cover for deer. Stands are quite dense and provide little browse. Terrain is fairly flat. A CMP power line allows access to this property by sportsmen, hikers and snowmobile users from the Falmouth Road.

Falmouth Nature Preserve is an 83-acre parcel in the Foreside part of town. From the evidence, this parcel has had a long history of conservation minded management. About 50 to 60 years ago much of the land was commercially clear-cut. Areas of steep ravines, wet soils or poor quality timber were passed over. The southerly side of the lot was abandoned pasture that was planted to white pine with some red pine about fifty years ago. Other than that, there doesn't seem to have been any other harvest treatments. The forest varies from plantation, middle age stands of hardwood and mixed wood, and old age stands of moderate to poor quality. Terrain is fairly flat in the southern part of the lot. Mill Creek forms part of the north boundary and passes through a section of the lot. This creek is tidal and there are some small salt flats on the property. Intermittent streams have cut steep gullies down to Mill Creek in this area. This property was the first in town to be protected by conservation easement.

North Falmouth Community Forest, 49 acres, is a back lot accessed by a right of way. Terrain, soils, and forest are typical of those found along a ridge that begins in Gray and runs through the Atherton Hill portion of Windham and south into this part of Falmouth. Soils are glacial origin and hemlock, red oak, beech and smaller numbers of white pine commonly make up the forest stands.


DELORME
XMap® 5.2 GIS Enterprise
Town of Falmouth
Location Map
Ireland Corner
North Falmouth Community Forest
Libby Hill
McKenzie Brook
Poplar Ridge
Scotland
Hobbs Brook
Mill Brook
Hadlock Community Forest
Muskrat Hollow
North Falmo
Blackstrap Hill Preserve
Blackstrap
Jones Hill
Highland Lake
Town Forest
Cumberland Center
Royal Junction
Yarmouth
Cumberland Center Station
Cumberland Foreside
Spears Hill
Idlewood Park
Woods Road Community Forest
West Falm
Corner
Milliken Hill
Highland Lake
Meader Brook
E Branch Piscataqua River
Falmouth
Falmouth Foreside
Nasons Brook
Fork Ledge
Nature Preserve
Prince Point Ledge
Pine Grove Park
Bartlett Point
Prince Point
drawn by
Rene D. Noel Jr. ACF
Maine Licensed Forester # 325
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Terrain is rolling and some intermittent streams drain the property. There are some small wetlands associated with these streams. There are no recreational trails on this property, except a small portion of the snowmobile trail that also crosses the Blackstrap Hill Community Forest. It does, however, abut the 325-acre Lowell Preserve in Windham, which does have an extensive trail network. The recent acquisition by the town of an additional 60-acres of forestland south of this parcel will open this property up for recreational use.

Falmouth Community Park, 119 acres, 45 forested, is a combination of agricultural fields, recreation area and woodland. The forest has basically two types of an early succession type that are fields or pastures that have recently reverted to brush/forest stage. The other type is a farm woodlot. It is mapped as a single type, but is a conglomerate of several small stands that became established when agricultural use was abandoned. In many places the stand is under stocked with many large open grown stems with a second age class of better quality stems. Some harvesting was done fifteen to twenty years ago on the west end of the forest, improving the stocking and quality as well as establishing desirable regeneration. The terrain is rolling with some steep sloped gullies. The northernmost 20-acres of the Park are protected by conservation easement, as are an additional 40 acres of recently acquired town-owned land abutting the property to the north.

Pine Grove Park, 29 acres, is a mature stand of forest found between Foreside Road and Route 1. There are deed restrictions that limit this lot to recreational use. The forest has numerous interesting large stems, but they are mature and showing signs of decline. Terrain is fairly flat along Foreside Road and slopes down to north and east where there are steeper banks. A network of established recreational trails are found on the property and are widely used.

Town Forest lot, 23 acres, is found at the corner of Winn Road and Field Road. It is an old field that has reverted naturally to forest. The older part of this forest was thinned in the early 1970's and there was some controversy about the quality of work done at the time. Much of the forest is now mature white pine. As is common with rough old-field white pine, many of the stems have structural defects and/or evidence of internal red rot. The previous harvest resulted in a shelterwood stand structure in many places, with abundant red oak saplings in the understory. Those saplings are in need of release. Terrain is flat. A loop trail circumvents the property and is used regularly by area residents.

Reports from Maine Natural Areas Program and the Maine Historical Preservation Commission do not indicate the presence of endangered species, significant wildlife habitat, and/or historic sites on the lots. The U.S. Fish & Wildlife Service does report the presence of several "priority trust species" (species in general decline) on a number of these properties, including red-shouldered hawks, American woodcock, black ducks, wood ducks, and field sparrows. These lots provide significant wildlife habitat for a wide variety of other species, including deer, turkeys, wood warblers, thrushes and other songbirds, and a wide variety of small mammals. The extensive size of the North Falmouth Community Forest, Blackstrap Hill Community Forest, Hadlock Community Forest and Woods Road Community Forest parcels, including abutting properties, greatly enhances their wildlife habitat value. All of these properties are areas of natural habitat surrounded by growing suburban residential development. There are artifacts of long human use on all of the properties.

The terrain on all the lots is for the most part gentle. Ranging from flat to rolling with occasional steep slopes. Soils are mostly upland sites, which are moderately well drained to well drained. There are several small brooks found on the properties and some wetland areas. The soils provide good to excellent sites for tree growth and wildlife habitat.

All of the lots, with the exception of the North Falmouth Community Forest, are served by public roads. Trails exist in and are passing through all of the lots. Access is good for recreational use and general maintenance of the properties is good because of adjacent roads and well-developed trail systems. Access for large trucks and heavy equipment is not developed. The access issue must be addressed for those properties on which forest products will be removed to manage vegetation.

IV. Forest History

During the late 1700's and 1800's, the properties were used for agricultural, residential and industrial purposes, such as cropland, hay land and even the most remote as pasture. Evidence of these past uses exists in form of stonewalls, old wire fences, stone foundations, trail and road remains, and old earth works. In the late 1800's to early 1900's, agricultural use of most of what is now forested land was abandoned. Stumps and remains of old trails are evidence of past harvesting activity. It appears fairly extensive harvesting of merchantable timber was done about 60 years ago. This coincides with World War II when much timber was utilized for war material and for crates and pallets used to ship material. Since that time less cutting has been done. A harvest was completed on the Town Forest in the early 1970's. The Hadlock Community Forest appears to have been cut in the late 1980's to mid 1990's period. Parts of the Blackstrap Hill Community Forest woodlot were cut fairly heavily about 10 years ago.

V. Management Objectives

Goals include providing educational and recreational opportunities, wildlife habitat, maintaining open space and a healthy vigorous forest. The production of forest products and achievement of cultural goals through commercial timber harvesting. These goals are mutually attainable though some are more important on some areas than others. Maintaining a healthy forest is an important part of all these goals.

VI. Property Tax Status

All of these properties are in public ownership and is not taxable.

VII. Pertinent Laws and Regulations

Shoreland zoning covers the areas adjacent to the Piscataqua River and Mill Creek. Both areas are in the regular shoreland zone. This allows timber harvest of 40% of trees over 6" diameter in a ten year period as long as a well distributed stand of trees remain. Before any harvesting is done in these areas current maps and regulations should be checked.

Woods Road Community Forest and Pine Grove Park are restricted by easements or deed covenants. See appendixes

Forest Practices Act: Clearcuts of five acres in size or greater are regulated by the state of Maine. Considering the city's goals, this is unlikely to affect management unless there is a natural disaster where clean up and salvage become necessary and that would be exempted.

Hiring a consulting forester to administer the sale of timber as recommended within the plan will ensure compliance with all Maine State laws. There are no city ordinances of which the author is aware that would affect the recommendations found in this plan.

VIII. Non-Timber Resources

Endangered species / Exemplary Communities: None are known to exist. However, the range of the New England Cottontail Rabbit is known to have extended into Falmouth. No sign of these animals was seen during the forest surveys done for this report. There may be opportunities to improve or create habitat for this rare animal, however. In particular along the Piscataqua River and in Community Park there are areas that could be treated to create or improve existing habitat.

Fish and Wildlife Habitats: Specific wildlife habitat management recommendations are found in each stand description. The forest management recommendations within this plan will positively affect habitat by creating conditions encouraging healthy, vigorous forest growth. A greater diversity in tree age classes, a multi-layered canopy, and more plant growth at the ground level will create better habitat conditions for more wildlife species.

Wildlife needs food, cover and water. As a forest matures, low growing vegetation becomes less common as less sunlight penetrates the canopy. If there is no disturbance for a long enough period of time, a park-like forest results with little vegetation growing between the main canopy and the ground. This condition provides sparse habitat except for those species that live their lives in the canopy layer or in the forest floor litter. At certain times food from mast or mushrooms may be plentiful, but by its nature a park-like forest has little to offer most species. Harvesting trees controls light reaching the ground and residual trees. More light penetration means more plant growth near the ground. This provides more food and cover to more species. Harvesting trees can provide differing habitats. A clear cut sets the forest back to its beginnings and provides early succession habitat. Selection cuts provide smaller openings and a mix of ages. Thinning does not create many openings but does space trees more widely so that light penetrates and maintains an understory. Any of the partial harvests methods if applied correctly will result in more vigorously growing residual trees. More vigorous trees produce bigger seed crops and more food for wildlife.

Water Quality and Wetlands: Piscataqua River and Mill Creek are the major water bodies found on the properties. There are numerous intermittent streams and small wetlands on all the properties. These wetlands are important for maintaining water quality. As water flows down these small watercourses and through wetlands sediments fall out, nutrients are absorbed, and the slowed flow helps prevents down stream flooding, allows water to penetrate the soil to recharge aquifers.

Cultural and Historical Sites: Maine Historic Preservation Commission list possibility several

historical or archeological sites identified on these properties. Extreme care should be taken when working near these areas. As previously mentioned, there are artifacts of long human use on all of the lots.

Recreation: Recreation is a very important use of the properties. Educational and recreational programs are part of the long-term goals for these properties. As previously noted, numerous trails are found through out the lots. Several teachers use parts of the properties as outdoor classrooms. The trails and property are open to the public and the town intends to maintain and expand the educational and recreational use of its woodlands.

Aesthetics; Managing the trees on the property will maintain a vigorous healthy forest stands of multiple age classes which will help maintain aesthetic quality of the stands. Actively managing the forest for the production of forest products in close proximity to a residential neighborhood in forest heavily used for recreation demonstrates responsible forest management and is compatible with recreational and abutting residential use. It will also provide opportunities to enhance recreational uses.

Large woody debris, a short-term by-product of forestry operations, should be mentioned. It is dead wood in the form of trunks, large branches and stumps and is an important component of habitat for many wildlife species. Such debris, known as slash, is often seen as waste or an eyesore by many people. This is an excellent educational opportunity to inform people that this debris is actually creates valuable wildlife habitat, especially for small mammals and other creatures low on the food chain. And while not aesthetically pleasing, is an important part of that habitat. Through the process of decay, this debris also enriches the soil and thus promotes the overall health of the forest.

IX. Timber Resource and Vegetation Management

All of the lots are stocked with high volumes of forest products. Little evidence was seen of any wood harvesting in recent years. Trees have value and many forest industries rely on woodlands of southern Maine to supply their raw material. Much of the cultural treatment recommended can be accomplished by the sale of trees to loggers. The income realized can be utilized to other treatments that will have a cost.

All forest management practices should conform to nationally recognized best practice standards, such as the standards promulgated by the American Tree Farm program.

Loggers are available from small chainsaw / tractor equipped contractors to those with large mechanized tree harvesting equipment. There are positives and negatives to the various equipment options. With a good definition of goals, it is possible to choose contractors with the right equipment to achieve the stated goals. Any selected contractor should meet Certified Professional Logger standards.

X. Invasive Species

It is not be surprising that, with over three hundred years as a human population center and seaport, that non-native, invasive plants are now components of area forests. By definition invasives regenerate vigorously and are aggressive in occupying new sites. Once established they often form dense stands and exclude native vegetation. Often they have few enemies that feed on them. Some provide wildlife habitat, but they also displace native species. Many have growth characteristics that make it difficult to use the forest.

Species that were most commonly seen during the fieldwork were bittersweet, Japanese knotweed, barberry, and Japanese honeysuckle. There are other species also found but these five are very common. The author recommends controlling these at every opportunity.

XI. Timber Inventory Procedure

The maps drawn for this plan were developed using information from several sources. Aerial photos were down loaded from the state's GIS web site. Property lines were located with GPS data and from digital data from the city tax maps. Aerial photos were used to identify prominent stand types. Stand type lines were further refined on field maps produced during fieldwork for the forest inventory.

Variable plot or point sampling was the method used for the timber inventory. Point sampling measures the relative density of trees rather than the actual number of trees on a fixed area (fixed area sampling). Point sampling assumes that there is an equal stocking expressed as basal area (square feet of stump area) for each tree measured regardless of size. Since large trees have more basal area large trees are more intensively sampled than small trees. Point sampling is desirable because larger more valuable trees are more intensively sampled and it is relatively quick and efficient to use. A 20 basal area factor (BAF) prism was used for this inventory

Inventory samples were systematically spaced. On the smaller parcels on a grid 200 by 200 feet apart; in the larger parcels samples were space on a 300 by 300 foot grid. All stands were inventoried down to the two-inch class for tree species. Regeneration, shrub and herbaceous species were noted around plot center.

Merchantable height was recorded in five-foot increments of cordwood to a four-inch top or the number of eight foot logs sections of saw or veneer logs based on the utilization standards for each species. Sample data was then calculated using Two Dogs brand software. All volumes are expressed in standard cords and thousand board feet (MBF), international ¼ inch scale. Desirable, young stems likely to produce high value saw logs or veneer in the future are identified as growing stock, although because of small diameter their current value is that of pulpwood or firewood. This distinguishes the volume from other stems of poorer quality that are likely to remain as pulpwood or other low value products.

Table II: Log utilization standards for standing trees.

Species	Diameter Breast Height in inches	Small end
Spruce and fir	8	6
White birch	8	7
Red oak	10	9
All other hardwoods	12	10
All other softwoods	10	8

XII. Silvicultural Treatments

For both short and long term management, a combination of the shelterwood and selection methods of silviculture is recommended with a cutting cycle of 10 years. That is, on the average each area should be cut every ten years. A fairly short cutting cycle allows more of the potential mortality to be salvaged and also allows for more conservative thinning. Also the visibility of regularly applied treatments will educate the public that the forest benefits from regular treatments and to expect that they will occur.

Forests in fast growing southern Maine towns are a unique asset. Cultural treatments are recommended that will maintain the health and vigor of the forest and assure that natural forests continue to exist for future generations. The production of forest products and income derived from the sale of those products are a crop, but also by-products of treating the forest for continued health. That said, the cutting of trees is a necessary cultural practice. Trees need to be cut to give growing room to more desirable stems, release existing regeneration, or to create conditions suitable for the establishment of regeneration, to remove hazardous trees, maintain wildlife habitat, and for many other reasons encountered in managing a forest.

Some may argue that these parcels be treated as wilderness. While large compared to city residential lots, they are small from a forest's perspective and cannot fill the ecological role of a wilderness. They are affected by land use of abutting property, invasive plants, and constant human and domestic animal traffic. Managing the vegetation – forest trees – in this situation would be proactive. A forest appropriate to its intended use can be developed. The alternative is reactive management dealing with trees which have become dangerous or have fallen do to natural events.

Large trees have an attraction of their own and it is recommended that some be grown to maximum size for the species and site. These may occur as single stems or groups of stems depending on what nature provides. Where these large stems occur or grow in the future, the area around them should be treated with periodic sanitation cuts to remove younger stems that are crowding these old slow growing relics. Depending on their location, these large stems should be examined regularly to determined if they have become hazardous and treated appropriately.

It should be pointed out that the recommendations are based on current conditions to attain the owner's current goals. Should conditions, such as markets, natural conditions, or the landowner's needs change, the recommendations should be modified to reflect those changes. For example, it makes no sense to sell high valued timber when markets for that timber are weak. Waiting will have little effect on forest growth, but could greatly increase the income realized. Alternatively, should the owner's needs change, there is timber available for cutting. Cutting sooner than planned may not maximize the timber value, but may be the owner's best financial choice and can be done without damaging the long-term productivity of the forest.

Forestry is defined as an art and a science. To assure that treatments are applied properly, it takes a skillful selection of trees to be removed and layout of trails to allow equipment access. Considering this I strongly recommend that a skilled and experienced forester be used when any silvicultural treatments or timber sales are applied.

XIII. Silvicultural Systems

Shelterwood

The shelterwood system is an even-age system of silviculture. That is, all of the trees in the forest stands are near the same age. In this system, the stands are thinned periodically until they are mature. Once mature, they are thinned in a manner that will encourage the establishment of seedlings of desirable species. These seedlings then develop under the “sheltering” overstory. As the seedlings develop, that sheltering overstory is removed in one or more harvest cuts.

By extending the removal period to two, three or more cutting cycles, a forest managed by a shelterwood system may take on the appearance of a forest managed under the selection system. The difference is somewhat academic, but does affect which trees are selected for cutting and when they are cut. Also, it results in forest stands that are composed of trees that are near the same age.

Selection

In the selection system, individual stems and groups of stems are selected for cutting. Thinning and harvest are combined in this system. Reproduction becomes established in openings created when groups are cut, and uneven or all-age forest stands result. If only small openings are made in the canopy, reproduction will be only of species that are tolerant of shade. Larger openings, at least as wide as the surrounding trees are tall, will allow some stems of intermediate and shade intolerant species to become established. A cutting cycle of ten years is recommended. In the most intensive applications of this system, pre-commercial thinning and weeding is conducted within groups of young stems. This is generally done following a commercial harvest and is restricted to those areas that do not have a competing overstory. The regeneration component in this forest is relatively young. Pre-commercial thinning is not likely to be needed as a cultural treatment within the time that this plan covers.