

FOREST STEWARDSHIP PLAN 2018



PREPARED FOR THE
PINGREE SCHOOL
IN HAMILTON, MASSACHUSETTS

BY

JOHN F. ROBBINS, CONSULTING FORESTER
59 WILSON RD., CONCORD, MA 01742

TABLE OF CONTENTS

INTRODUCTION - The Property Overview, Regional Significance And Management Summary	Page 2
FOREST MANAGEMENT PLAN - Background information	Pages 3-4
LANDOWNER GOALS - Checklist	Page 5
LOCUS MAP	Page 6
THE FOREST STANDS OF THE PINGREE SCHOOL	Page 7
FOREST STAND MAP	Page 8
FOREST STAND DESCRIPTIONS	Pages 9-10
FOREST MANAGEMENT OF THE PINGREE SCHOOL	Page 11
FOREST MANAGEMENT PRACTICES & MAP	Page 12, 12A
STEWARDSHIP ISSUES - General information	Pages 13-21
SIGNATURE PAGE	Page 22

The Property Overview, Regional Significance, and Management Summary



INTRODUCTION

The land of the 100 acre Pingree School consists of fields, meadows, pond, woodlands, and wetlands that surround the campus buildings. The property provides an important link in a chain of other large, undeveloped tracts of land in this part of Hamilton, including Bradley Palmer State Park and Brick Ends Farm across Highland Street, and Arbella Farms and Appleton Farms to north of the property. The forest and wetlands on the property also serve to protect Black Brook, a tributary of the Ipswich River which forms the boundary of the property on the south and east sides.

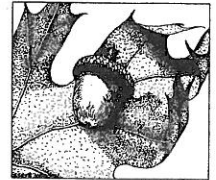
Historically, the land was once totally cleared and used for farming. The forest that grew back on abandoned farmland beginning over a century ago now occupies much of the property. The purpose of this Forest Stewardship Plan is to document the forest of the Pingree School, assess its condition, and make recommendations to manage the forest to meet the School's goals of sustaining biological diversity, enhancing wildlife habitat and recreational use, protecting wetlands and the water quality of Black Brook, and utilizing the land as an outdoor classroom for environmental education. Teaching sustainability and good stewardship of the natural resources on the School property is an important mission of the Pingree School.

Maintaining the trails, reconstructing the bridge at the outlet to the pond, maintaining the forest riparian zone to protect the pond and brook, controlling invasive species, and planting trees in non-forest areas will be the primary focus of recommended management activities.



FOREST MANAGEMENT PLAN

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



CHECK-OFFS

CH61 cert. <input type="checkbox"/> recert. <input type="checkbox"/> amend <input type="checkbox"/>	CH61A cert. <input type="checkbox"/> recert. <input type="checkbox"/> amend <input type="checkbox"/>	CH61B cert. <input type="checkbox"/> recert. <input type="checkbox"/> amend <input type="checkbox"/>	STWSHP new <input checked="" type="checkbox"/> renew <input type="checkbox"/> Green Cert <input type="checkbox"/> Conservation Rest. <input type="checkbox"/> CR Holder _____	C-S EEA <input type="checkbox"/> Other <input type="checkbox"/>
Plan Change: _____ to _____				

Administrative Box

Case No. _____	Orig. Case No. _____
Owner ID _____	Add. Case No. _____
Date Rec'd _____	Ecoregion _____
Plan Period _____	Topo Name _____
Rare Spp. Hab. _____	River Basin _____

OWNER, PROPERTY, and PREPARER INFORMATION

Property Owner(s) Pingree School

Mailing Address 537 Highland Street, South Hamilton, MA 01982

Phone (978) 468-4415

Property Location: Town(s) Hamilton

Road(s) Highland Street

Plan Preparer John F. Robbins, Consulting Forester

Mass. Forester License # 210

Mailing Address 59 Wilson Road, Concord, MA 01742

Phone (978) 369-3128

RECORDS

Assessor's Map No.	Lot/Parcel No.	Deed Book	Deed Page	Total Acres	Ch61/61A 61B Excluded Acres	Ch61/61A 61B Certified Acres	Stewshp Excluded Acres	Stewshp Acres
H13	4	8130	292	12.96			3.96	9.0
H13	5	6747	420	18.70			18.70	0
H21	1	5397	547	48.00			30.4	17.6
TOTALS				79.66			53.06	26.6

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

The excluded area consists on non-forest areas including the driveway, parking areas, school buildings, fields, marsh, and pond.

HISTORY Year acquired 1966-86 Year management began 2018

Are boundaries blazed/painted? Yes ☐ No ☒ Partially ☐

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

stand no. _____ treatment _____ reason _____

(if additional space needed, continue on separate page)

Previous Management Practices (last 10 years)

Stand #	Cutting Plan #	Treatment	Yield	Value	Acres	Date
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

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

New Forest Stewardship Plan

RECORDS (continued)

Assessor's Map No.	Lot/Parcel No.	Deed Book	Deed Page	Total Acres	Ch. 61/61A 61B <i>Excluded</i> Acres	Ch61/61A 61B Certified Acres	Stewshp <i>Excluded</i> Acres	Stewshp Acres
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
TOTALS				_____	_____	_____	_____	_____

EXCLUDED AREA DESCRIPTION (continued):**HISTORY** (continued):

The Pingree School, a coeducational independent day school for grades 9 through 12 was founded in 1960. The campus is situated on 100 acres of land in Hamilton, Massachusetts. The large mansion at the center of the property, built in 1933, was once the home of Mr. and Mrs. Sumner Pingree and their family. The Pingrees originally acquired the land from the Lamson family in the 1920s.

In the late 1950s, the Pingree family made the decision to establish the property as a day school for girls, which later became coeducational in the 1970s. The fields, woodlands, and wetlands surrounding the school are now used for environmental education, and practicing sustainability.

Owner(s) Pingree SchoolTown(s) Hamilton

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	X	
Improve Hunting or Fishing			X	
Preserve or Improve Scenic Beauty	X			
Protect Water Quality	X			
Protect Unique/Special/ Cultural Areas	X			
Other:				

* 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:

We wish to be good stewards of the land and to make the natural area part of the learning that happens!

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.

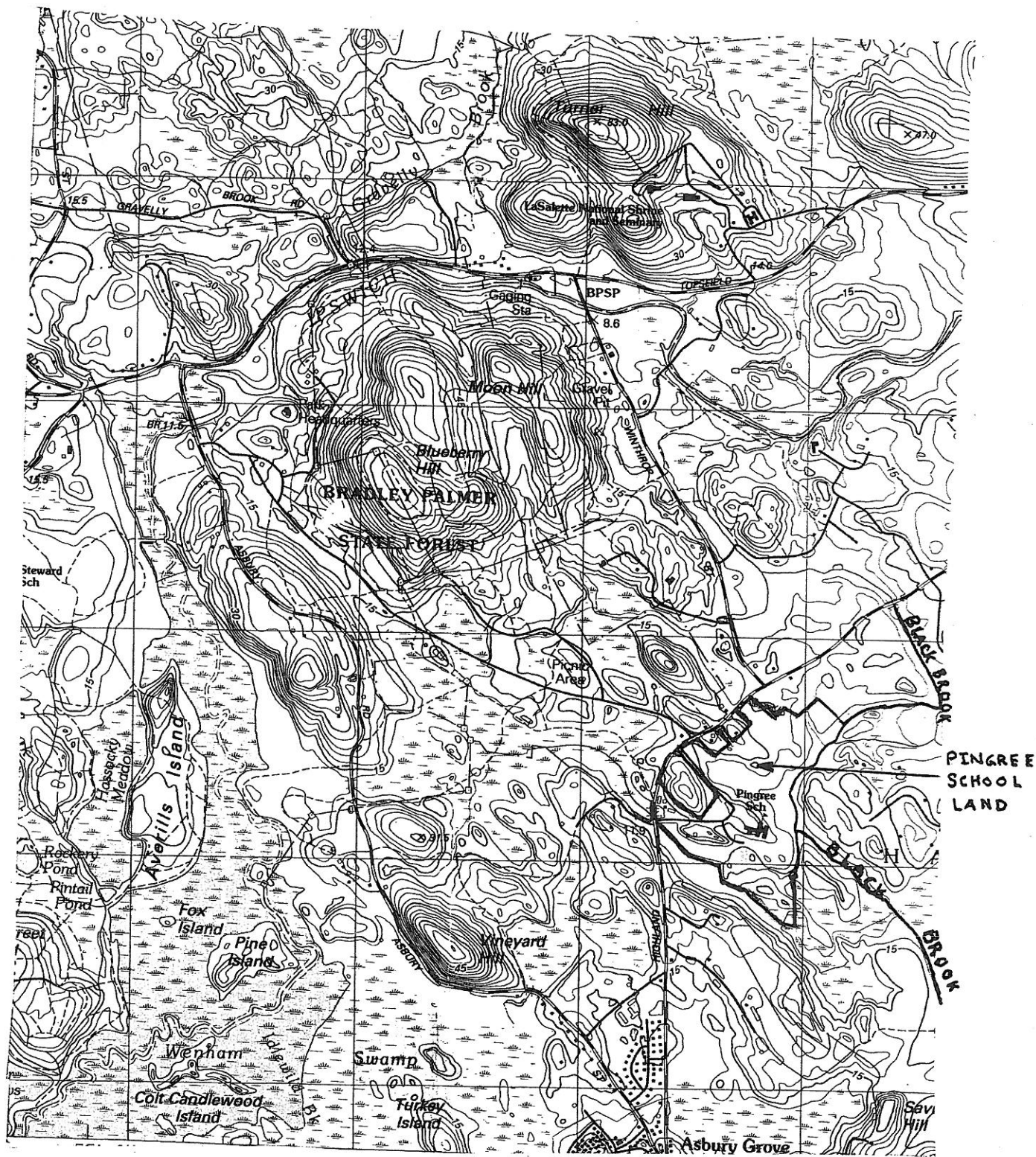
Signature(s): Don Mc

Date: 2/21/18

Owner(s) (print) JOHN BURNS, PINGREE SCHOOL CFO

(This page will be included with the completed plan.)
Page 5 of 22

PROPERTY OF THE
PINGREE SCHOOL
537 HIGHLAND STREET
SOUTH HAMILTON, MA 01982



FROM U.S.G.S. IPSWICH QUADRANGLE
SCALE: 1" = APPROX. 2000 FT.

THE FOREST STANDS
OF THE
PINGREE SCHOOL

The forest of the Pingree School property is composed of several forest types with trees of various species and age-classes. For the purpose of this plan, the forest has been divided into five forest stands based on forest type, location, age, and condition. These stands are White pine/hardwoods, Riparian zone, White pine/oak, Red maple, and Red oak. The Forest Stand Map on the next page shows the location of the forest stands. Stand characteristics are described on the following pages as well as some of the interesting features found in the forest.

Some of the terms used to measure stand characteristics include:

BA (Basal Area) - cross section area of trees 4.5' above ground level (an indicator of density).

MSD (Mean Stand Diameter) - tree diameter at 4.5' above ground level.

VOL (Volume) - in board feet for sawtimber and cords for fuelwood or pulpwood

Site Index - height of a particular tree species at 50 years of age (an indicator of growth potential).

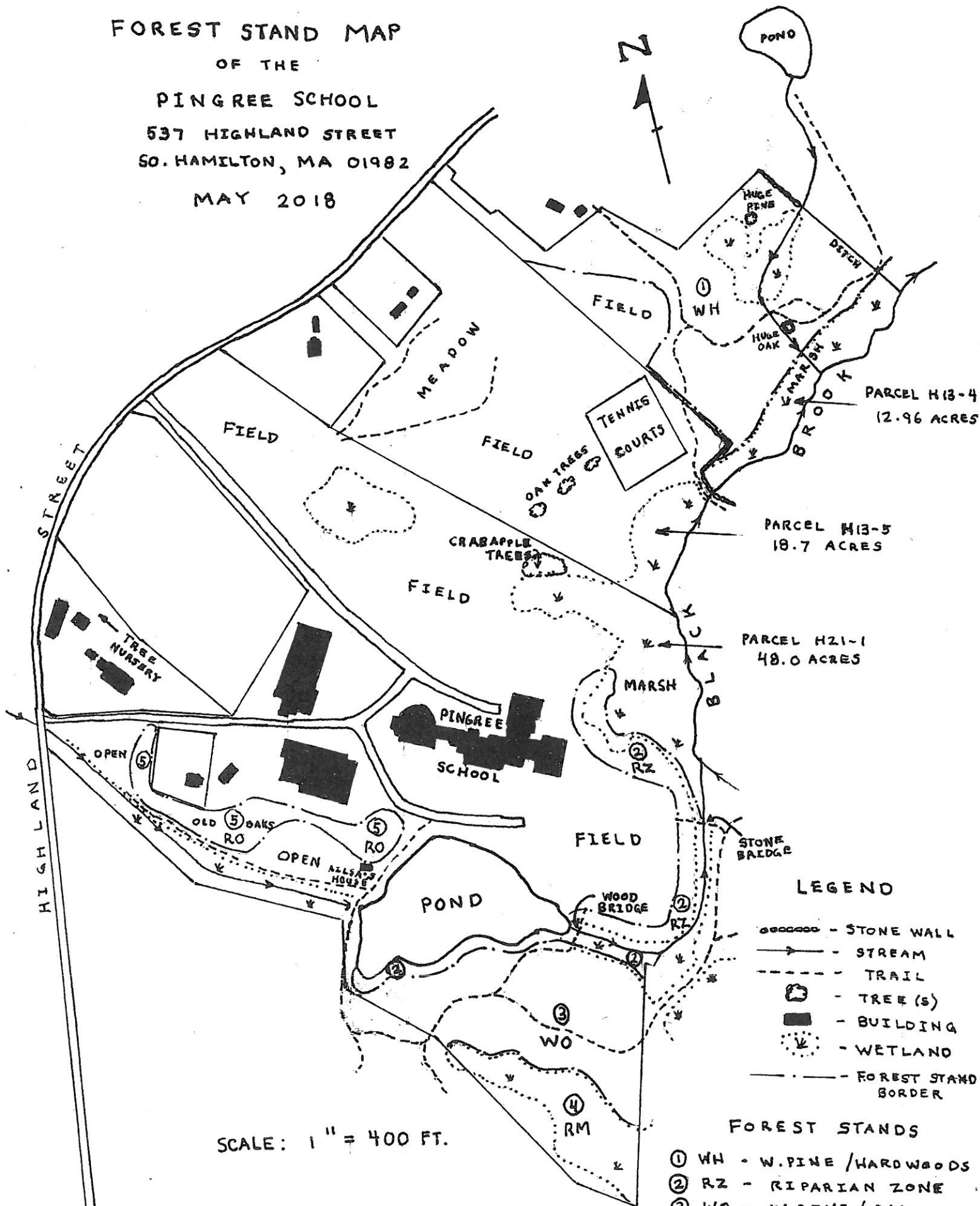
FOREST STAND MAP

OF THE

PINGREE SCHOOL

537 HIGHLAND STREET
SO. HAMILTON, MA 01982

MAY 2018



SCALE: 1" = 400 FT.

PREPARED BY
JOHN F. ROBBINS, CONSULTING FORESTER
59 WILSON RD., CONCORD, MA 01742

FOREST STANDS

- ① WH - W. PINE / HARDWOODS
- ② RZ - RIPARIAN ZONE
- ③ WO - W. PINE / OAK
- ④ RM - RED MAPLE
- ⑤ RO - RED OAK

STAND DESCRIPTIONS

OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
-----	--------	------	----	-------------------	-------	--------	------------

STEW	1	WH (W.PINE/HDS)	9 AC	13"	145 SQFT.	5.5 MBF & 43 CDS	65(W.PINE)
------	---	--------------------	------	-----	-----------	---------------------	------------

This mature stand of white pine/hardwoods is located at the north end of the property. It is bordered on the south side by the marsh along Black Brook. An intermittent stream flows south through the stand from a pond on the adjacent property. Very large, towering pines and oaks are the dominant trees in the stand. These forest giants originally grew up on abandoned pastureland at least 150 years ago. Other trees include red maple, beech, and hickory. There are trees of several age-classes growing in the stand. The youngest trees growing in the understory consist of sapling and pole white pine, beech, hickory, and Norway maple. Other understory species include witch-hazel, blueberry, and spicebush, as well as non-native European buckthorn and honeysuckle.

The soil types in this stand consist of Hinckley loamy sand in the well-drained upland areas, and Wareham loamy sand, a poorly-drained soil in the wetland areas. It is an excellent site for the growth of both pine and hardwood species. A trail enters this stand next to the tennis courts, and turns to the east to cross the intermittent stream and continues to the property boundary near Black Brook. This trail is used by students and others for cross-country skiing and passive recreation.

This impressive stand has all the characteristics of an "old growth" forest, with large decaying trees that provide dens and cavities for wildlife, abundant woody material on the forest floor for invertebrates and salamanders, and a diverse species and age structure. It is recommended that it be preserved in its natural condition for its biological diversity, wildlife habitat, and the opportunity for students to experience and study its special nature.

STEW	2	RZ (RIPARIAN ZONE)	4 AC	10"	110 SQFT. (VARIABLE)	12 CDS	55(R.MAPLE)
------	---	-----------------------	------	-----	-------------------------	--------	-------------

The forest riparian zone along the pond, stream, and marsh bordering Black Brook is composed of a variety of tree and shrub species. The forest vegetation bordering on the south side of the pond consists of white pine and several planted conifer species including Norway spruce, Scotch pine and arborvitae. A dense understory of rhododendron is growing beneath the larger trees. These thickly-growing evergreen species form a protective buffer, as well as habitat for wildlife at the pond edge, and a scenic backdrop behind the pond. A few of these larger trees were uprooted during the March 2018 nor'easter.

The riparian zone along the stream flowing from the pond is composed mainly of red maple and wetland shrubs. The soil type in this area is poorly-drained Scarboro mucky, fine sandy loam. Scattered oak and white pine are also growing among the maple on the drier portions of the area behind the baseball field. This riparian zone vegetation serves as a buffer and filter strip along the stream as it flows from the pond to Black Brook. Beavers have been active in this area in recent years, felling numerous small trees along the stream.

The riparian zone forest extends north to the edge of the marsh bordering Black Brook where red maple and wetland shrubs, and other vegetation provide a protective buffer. Wood ducks are frequently seen and heard in this part of the property. Preserving the riparian zone forest is important for filtering water entering the wetlands, pond, and brook, and as protective cover for wildlife. Planting additional trees and shrubs along non-forested areas bordering wetlands should be considered to expand the vegetated riparian zone.

STAND DESCRIPTIONS CONTINUED ON NEXT PAGE

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

Owner(s) Pingree School

Town(s) Hamilton

STAND DESCRIPTIONS

OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
-----	--------	------	----	-------------------	-------	--------	------------

STEW	3	WO (W.PINE/OAK)	6.6 AC	15.5"	125 SQFT.	5.8 MBF & 37 CDS	65(W.PINE)
------	---	--------------------	--------	-------	-----------	---------------------	------------

This mature stand of white pine/oak is located on an upland area to the south of the pond. The soil type is well-drained Hinckley loamy sand, a productive site for both pine and hardwoods. Huge white pine, red oak, and black oaks are the dominant trees in this stand which first grew up on an abandoned pasture 150 years ago or more. There are many trees 2-3 feet in diameter in the stand. Also growing in the stand is a younger age-class of red maple, hickory, beech, black locust, and Norway maple. The understory consists of white pine and hardwood saplings and poles, growing along with non-native European buckthorn.

A trail enters the stand after circling the pond and forks with one trail leading to the stream crossing at the outlet to the pond, and the other trail continuing to the east property boundary where it continues across a causeway and follows along the stream to Black Brook.

The age and composition of this forest stand is comparable to Stand 1, and has many of the same attributes of an "old growth" forest. This stage of forest offers biological diversity, wildlife habitat for birds and animals that depend on large decaying trees and snags, and impressive, old specimen trees for visitors to admire. Maintaining the trails and reconstructing the bridge at the pond outlet is recommended.

STEW	4	RM (RED MAPLE)	4 AC	10"	50 SQFT.	6 CDS	50(R.MAPLE)
------	---	-------------------	------	-----	----------	-------	-------------

This red maple stand occupies the wetland on the south end of the property. The soil in this area is classified as Freetown muck, a poorly-drained soil that remains wet throughout the year. Growing beneath the overstory maples is a dense thicket of blueberry, winterberry and other wetland shrubs that provides food and nesting sites for many species of birds. Tall pines border this wetland stand on both the north and south sides providing winter cover and perching sites for birds and other wildlife. This wetland drains to the southeast and eventually flows into Black Brook to the east of the Pingree School land. It serves as a valuable floodwater storage area and filter zone for water entering Black Brook, and should be left in its natural condition.

STEW	5	RO (RED OAK)	3 AC	18"	70 SQFT.	20 CDS	55(RED OAK)
------	---	-----------------	------	-----	----------	--------	-------------

This mature red oak stand is located on the upland slope above the stream flowing from Highland Street to the pond. The soil type in this area is classified as Chatfield-Hollis-Rock outcrop complex, which on this site is very productive for the growth of oak. The density of the overstory trees is variable throughout the stand. There are many huge, well-spaced majestic oaks growing on the central portion of the hillside that are probably more than 200 years old. Many invasive plants have grown up beneath the old oaks including multiflora rose and bittersweet vine. Some of the invasives have recently been cleared for recreational activities in this area.

Other parts of the stand are occupied by a younger age-class of oak, red maple, Norway maple, and locust. The east end of the stand borders an open area where bee hives are kept and "Ailsa's House", a replica of Thoreau's cabin is located. The large oaks at the west end of the stand next to the driveway suffered some storm damage from the March 2018 nor'easter which has been cut up for firewood.

A trail along the base of the hill passes between this oak stand and the marsh along the stream allowing walkers to view the massive oaks on the hillside for a memorable experience. Clearing the invasive plants and other vegetation from around these specimen trees would enhance this special place.

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

Owner(s) Pingree School

Town(s) Hamilton

FOREST MANAGEMENT OF THE PINGREE SCHOOL

The forest stands that make up the Pingree School forest are an interesting and diverse mosaic of forest types that offer habitats for a wide range of wildlife. The mature forest of Stands 1 & 3 provide a rare “old growth” condition with a multi-aged stand structure and biological diversity. Stands 2 & 4 are valuable forest buffer areas along, and within wetlands that serve to protect water quality through filtration, and provide cover for wildlife. Stand 5 offers a forested landscape and recreation area next to campus buildings that is exceptional for its ancient specimen oaks.

Maintaining access to these stands for recreation, enjoying nature, learning, and stewardship of the forest should be a top priority of forest management. Keeping trails clear and upgrading stream crossings will be an important part of making access easier and more inviting. Controlling invasive plants, where they are widespread, and in competition with native species is also of importance in managing the forest.

Finally, it is the goal of the Pingree School to offset the loss of forest during the past year to build a turf field by planting trees on school land. Adding to the existing forest and trees on the property by planting trees in appropriate locations will contribute to the many benefits provided by trees on the Pingree School landscape.

The following page lists the recommended management practices to maintain and enhance the Pingree School forest.

MANAGEMENT PRACTICES
to be done within next 10 years

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

RECOMMENDATION

STEW 1 WH TRAIL MAINTENANCE
(W.PINE/HDS)

REMARKS: Maintain the trail through this stand by clearing down trees and trimming back encroaching vegetation. Consider upgrading the trail at the stream crossing by installing a larger culvert and raising the trail.

STEW 2 RZ LEAVE IN NATURAL CONDITION
(RIPARIAN ZONE)

REMARKS: Maintain the natural condition of the riparian zone to protect the wetlands, filter water entering the pond and streams, and provide wildlife habitat. Consider expanding the forest riparian zone by planting trees.

STEW 3 WO TRAIL MAINTENANCE
(W.PINE/OAK)

REMARKS: Maintain the trail through this stand by clearing down trees and trimming back encroaching vegetation. Rebuild the wooden bridge at the pond outlet to enable a loop walk around the pond.

STEW 4 RM LEAVE IN NATURAL CONDITION
(RED MAPLE)

REMARKS: Maintain the natural condition of this red maple stand to protect the wetland, filter water entering Black Brook, and provide undisturbed wildlife habitat.

STEW 5 RO INVASIVE PLANT CONTROL
(RED OAK)

REMARKS: Control non-native, invasive plants, and clear vegetation from around the large oak trees.

OTHER PRACTICES: TREE PLANTING

REMARKS: Tree seedlings were purchased this year for planting on the property to offset the loss of forest from the turf field construction. The trees consist of 30 sugar maples, 30 red oak, 20 Norway spruce, and 4 chestnuts from the American Chestnut Foundation. These trees were put into pots in the nursery this spring to establish strong root systems and to become acclimated before being planted during the next two years.

Recommended locations for planting include:

- A areas along Highland Street for screening (Norway spruce)
- B expanding the forest riparian zone along wetlands bordering Black Brook (r.oak, N.spruce, s.maple)
- C along the perimeter of the turf field to screen neighboring houses (Norway spruce)
- D along the back of the meadow on the hill (r.oak, N.spruce, s.maple)
- E lining the driveway exit (sugar maple)
- F in the open areas next to Stand 5 (chestnut)

(See the map on the following page for the recommended planting locations)

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

Owner(s) Pingree School

Town(s) Hamilton

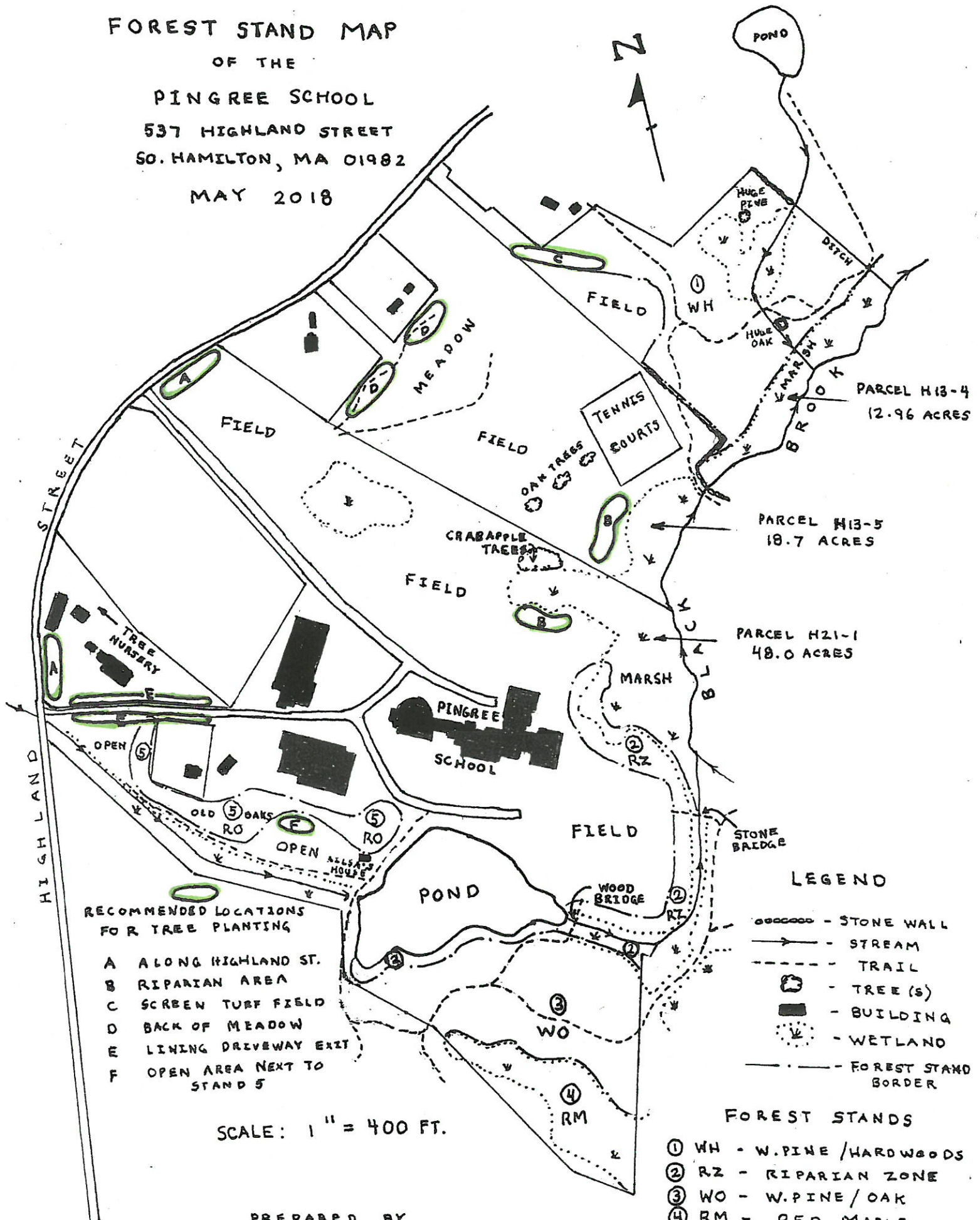
FOREST STAND MAP

OF THE

PINGREE SCHOOL

537 HIGHLAND STREET
SO. HAMILTON, MA 01982

MAY 2018

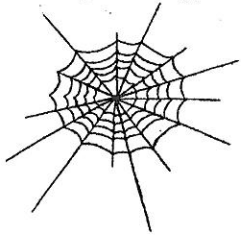


PREPARED BY
JOHN F. ROBBINS, CONSULTING FORESTER
59 WILSON RD., CONCORD, MA 01742

12A0F 22

Stewardship Issues

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



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

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

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



Rare Species: Rare species include those that are **threatened** (abundant in parts of its range but declining in total numbers, those of **special concern** (any species that has suffered a decline

that could threaten the species if left unchecked), and **endangered** (at immediate risk of extinction and probably cannot survive without direct human intervention). Some species are threatened or endangered globally, while others are common globally but rare in Massachusetts.

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

Indispensable to rare species protection is a set of maps maintained by the Division of Fisheries and Wildlife's Natural Heritage & Endangered Species Program (NHESP) that show current and historic locations of rare species and their habitats. The maps of your property will be compared to these rare species maps and the result indicated on the upper right corner of the front page of the plan. Prior to any regulated timber harvest, if an occurrence does show on the map, the NHESP will recommend protective measures. Possible measures include restricting logging operations to frozen periods of the year, or keeping logging equipment out of sensitive areas. You might also use information from NHESP to consider implementing management activities to improve the habitat for these special species.



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

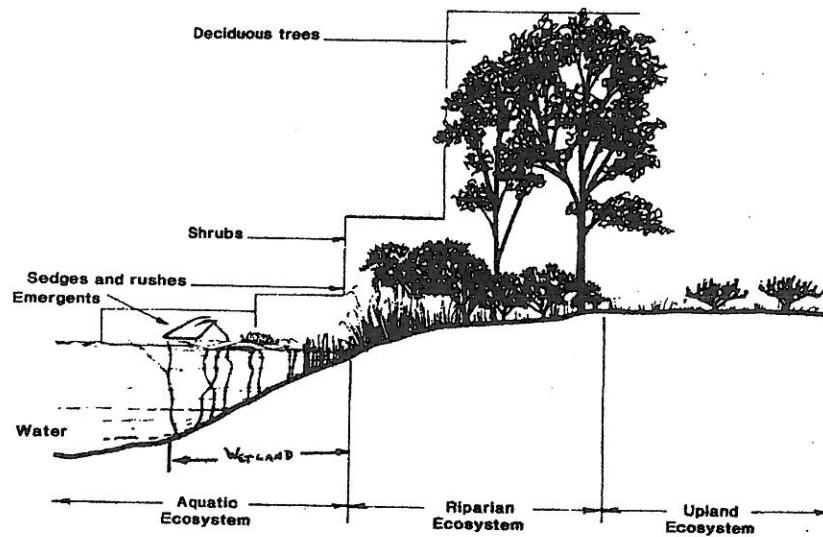


Figure 1: Example of a riparian zone

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

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

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

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

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

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

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



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

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

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



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

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



Fire: Most forests in Massachusetts are relatively resistant to catastrophic fire. Historically, Native Americans commonly burned certain forests to improve hunting grounds. In modern times, fires most often result from careless human actions.

The risk of an unintentional and damaging fire in your woods could increase as a result of logging activity if the slash (tree tops, branches, and debris) is not treated correctly. Adherence to the Massachusetts slash law minimizes this risk. Under the law, slash is to be removed from buffer areas near roads, boundaries, and critical areas and lopped close to the ground to speed decay. Well-maintained woods roads are always desirable to provide access should a fire occur.

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



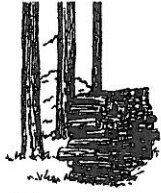
Wildlife Management: Enhancing the wildlife potential of a forested property is a common and important goal for many woodland owners. Sometimes actions can be taken to benefit a particular species of interest (e.g., put up Wood Duck nest boxes). In most cases, recommended management practices can benefit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

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

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

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

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



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

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

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



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

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



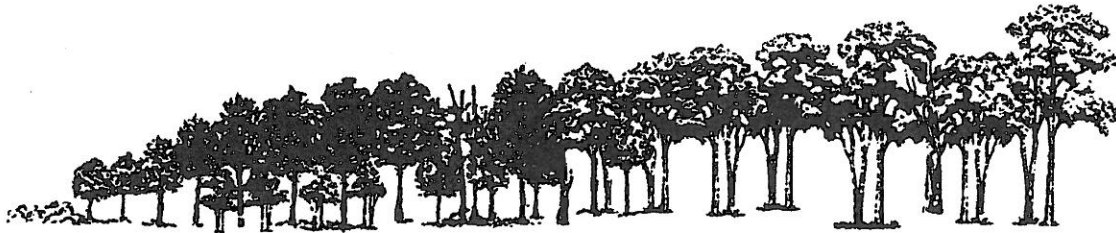
Recreation and Aesthetic Considerations: Recreational opportunities and aesthetic quality are the most important values for many forest landowners, and represent valid goals in and of themselves. Removing interfering vegetation can open a vista or highlight a beautiful tree, for example. When a landowner's 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.



Signature Page

Please check each box that applies.

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

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

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 John A. Robb Date 5/17/18

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.

Owner(s) Pingree School

Town(s) Hamilton