

# **Selectmen's Meeting**

**Wednesday, February 18, 2015**

**2:30PM**

**TOWN OF EASTHAM  
BOARD OF SELECTMEN  
WORK SESSION AGENDA  
Wednesday, February 18, 2015  
2:30 PM**

**REVISED 2/13/2015**

**Location:**        Timothy Smith Room

2:30PM            1651 Forest Advisory Committee – Steven Gulrich

3:00PM            Review of Budget Items and Warrant Articles  
                      a. Acceptance of Soldiers & Sailors Cemetery  
                      b. Layout/Acceptance of Portion of Hay Road  
                      c. Rooms Tax  
                      d. By Law for Police Fingerprinting for Certain Licensees  
                      e. Marijuana By Law

Minutes:	February 4, 2015	Work Meeting
	February 4, 2015	Executive Meeting
	February 9, 2015	Regular Meeting
	February 9, 2015	Executive Meeting

**EXECUTIVE SESSION** – To discuss strategy with respect to collective bargaining with Union Personnel when an open meeting may have a detrimental effect on the bargaining and litigating position of the public body and the chair is so declaring

**Upcoming Meetings**

<i>Monday, March 2, 2015</i>	<i>5:00 PM</i>	<i>Regular Meeting</i>
<i>Wednesday, March 4, 2015</i>	<i>2:30 PM</i>	<i>Work Session</i>

*\*Per the Attorney General's Office: The Board of Selectmen may hold an open session for topics not reasonably anticipated by the Chair 48 hours in advance of the meeting.*

*\*If you are deaf or hard of hearing or are a person with a disability who requires an accommodation, contact Laurie Gillespie-Lee, 5900 x207*

ADMINISTRATION

DEC 19 2014

RECEIVED

December 16, 2014

To: Sheila Vanderhoef, Town Administrator

Board of Selectmen

From: Steven Gulrich, Chair, 1651 Forest Advisory Committee  
Steven LaBranche, ConsCom. liaison, 1651 Forest Advisory Committee

Dear Ms. Vanderhoef and Board of Selectmen,

We are writing to you to express our objection to the Board of Selectmen's vote to disband the 1651 Forest Advisory Committee (FAC) on November 19, 2014.

Our concern is both in the process and in the rationale behind the decision. We also feel that the disbanding appears to have been made despite some obvious misstatements floating around and additionally, we question whether the BOS is permitted to act alone in dissolving the Committee. Please note that we have not as yet received any official notification of the vote and we both heard the news through a Cape Codder article on November 28 titled "Selectmen disband forest advisory committee" and subsequently, by reading the posted BOS minutes of November 19<sup>th</sup> on December 8, 2014. The meeting was not videotaped and the Committee was not invited to participate in the discussion. We now ask the BOS to reconsider the vote to disband the FAC and offer the following observations:

On November 29<sup>th</sup> there was an agenda item carried over from the 27<sup>th</sup> and listed on the minutes as "Appointment of Robert Cook as Liaison to the 1651 Forest Advisory Committee". From this intention, discussion apparently led to the vote to disband and we note the following errors in the minutes:

- "The 1651 Forest Advisory Committee is an ad hoc committee that has not been active in the past years." Also, "It does not meet on a regular basis and there are no minutes on the webpage since 2010."

With BOS appointments made and recorded for all members and a mission over 13 years, this is certainly not an "ad hoc" committee. Both of us have been members of the FAC for over three years, having been reappointed for our second three-year terms beginning July 1, 2014. Yes, Committee membership has fallen from the desired five down to two 15 months ago but we have had twelve meetings since 2011, for which there are recorded minutes with the town clerk (except for the last on October 21, 2014). FAC meetings have included Mike O'Connor of Natural Resources. Also, we had anticipated that the scheduled appointment would restore the Open Space liaison position on the Committee, vacant since July 1, 2014. Now, with the recent retirement of the 1651 Friends president, we would have anticipated a fourth member at the table.

Additionally, it is our opinion that the BOS may not act alone in disbanding the FAC. It is difficult for us to understand how the Forest Advisory Committee itself was not included in the discussion in the first place, along with Open Space, Conservation Commission and Natural Resources. On the Introduction page of the 1651 Forest Handbook is the statement that "The handbook was prepared by the 1651 Forest Advisory Committee in conjunction with the Eastham Natural Resource Office. It has been approved by the Eastham Conservation Commission, the Eastham Open Space Committee and the Eastham Board of Selectmen. No changes may be made to it without express consent from each of the forgoing bodies." As we see it, all parties involved in the 1651 Forest Handbook approval should be included in any proposed alterations to the project.

Finally, we note from the BOS minutes the final statement:

- "John Knight made a motion to disband the 1651 Forest Advisory Committee and to charge the Friends of the 1651 Arboretum with responsibility for the care of Wiley Park."

It is our understanding that, as a non-profit private corporation, the Friends cannot be given management responsibility for town owned property. According to the 1651 Forest Handbook flow sheet and plan outline, the Friends are to be the implementation arm of the project.

We feel there remains a need for the town to continue Forest Advisory Committee management oversight of the forest project. There have been instances where interpretation of the Handbook planting schedule, species utilized, maintenance issues and flexibility in the plan have been necessary. This is a planned 100 year project and there will be many people involved in the decades ahead with changes in the FAC, Friends and the Forest Handbook itself.

In light of the points mentioned in this letter, we ask the Board of Selectmen to reconsider their decision to disband the 1651 Forest Advisory Committee.

Signed:



Steven Gulrich, Chair, FAC



Steven LaBranche ConsCom. liaison, FAC

Cc: Open Space, Conservation Commission, Natural Resources, 1651 Friends

# 1651 FOREST HANDBOOK



## INTRODUCTION

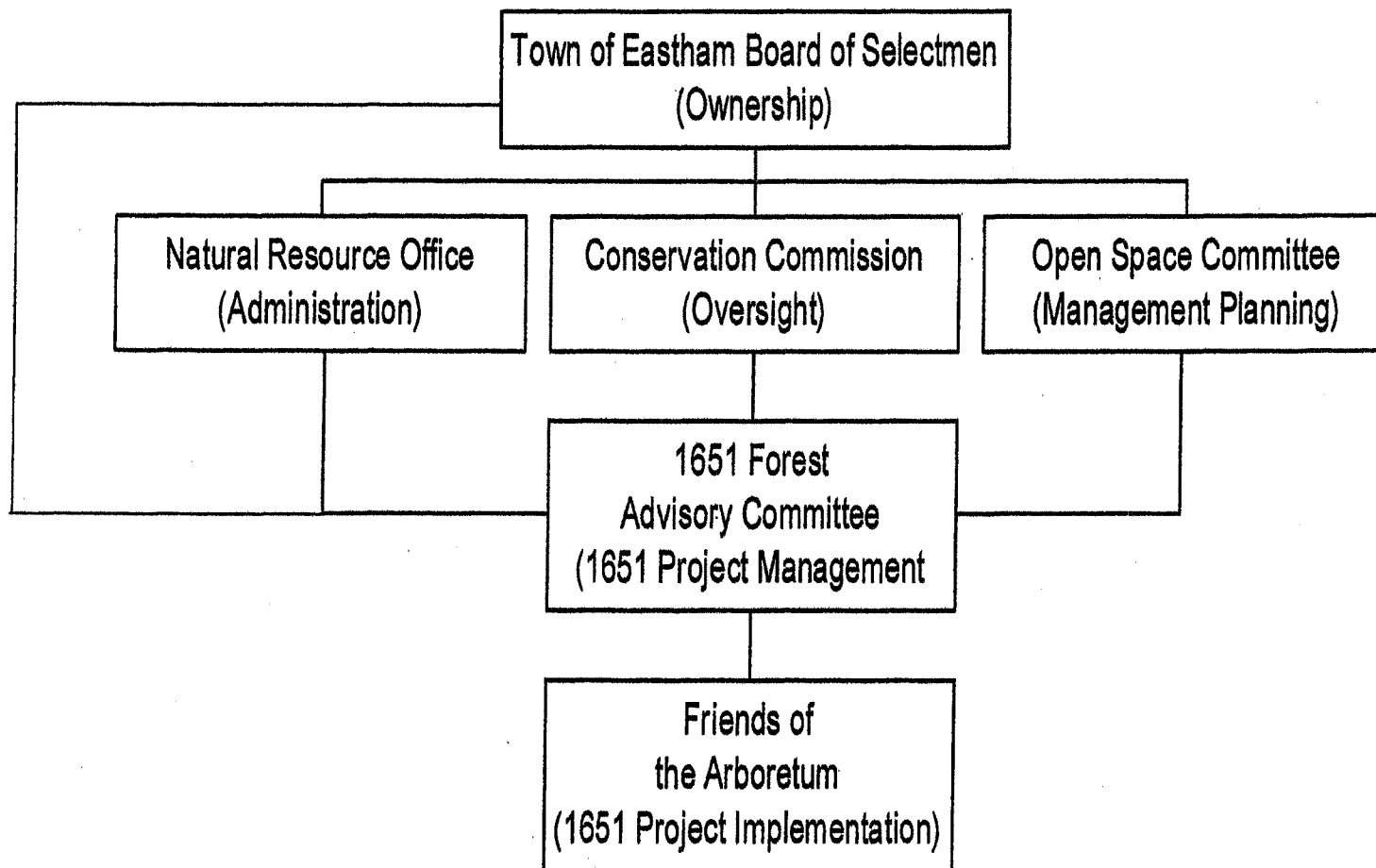
This handbook provides step by step guidance for implementing the project known as the 1651 Forest, situated in Wiley Park. The handbook was prepared by the 1651 Forest Advisory Committee in conjunction with the Eastham Natural Resource Office. It has been approved by the Eastham Conservation Commission, the Eastham Open Space Committee and the Eastham Board of Selectmen. No changes may be made to it without express consent from each of the forgoing bodies. The 1651 Forest Advisory Committee assumes the role of reporting to each of these groups on an annual basis, of maintaining and revising the manual as needed and of overseeing project implementation.

Two goals are expressed in this handbook. The first is to do no harm to the existing Wiley Park forest of oak and pitch pine. The second is to guide the natural succession process, by introducing a forest of indigenous trees known to exist here when the settlers first arrived in the 17th century.

To achieve both goals it is necessary to take a slow gradual approach and so the completion date is set at 100 years. In keeping with this, a time table is provided, showing specific plantings for each year for the next fifty years. The layout provides for a specific area of Wiley Park to be planted with trees for five years, then appropriate shrubs for five years and finally ground cover for five years. It is possible that situations may arise which require a reorganization of the time table. For example as pitch pines increasingly succumbed to turpentine beetles, it was decided to move white pines up the schedule. Such decisions can be made only by the Natural Resource Office.

The species to be planted are specifically indigenous to Cape Cod. Major traits that distinguish Cape Cod growing conditions from the rest of New England, include warmer climate, sandy soil, high winds and salt spray. Therefore it is a given that not all flora native to New England in general would have been here in the 17<sup>th</sup> century. This handbook provides a list of twelve trees, eleven shrubs and three ground covers that are appropriate to this forest. Again changes or additions to the list can be made only by the Natural Resource Office.

**1651 Forest Project Wiley Park  
Organization Chart**



## TABLE OF CONTENTS

MISSION STATEMENT	2
IMPLEMENTATION STEPS	3
ANNUAL TIME TABLE	4- 5
INVASIVE SPECIES LIST	6
NATIVE SPECIES LIST	7
PLANTING AND MAINTENANCE MATRICES	8- 9
PLANTING SCHEDULES: BY YEAR	10 -19
TREE AND SHRUB DESCRIPTIONS IN ALPHABETICAL ORDER	20 - 53
GROUND COVER	54 - 55
CLEARINGS	56
ALTERNATE TREE OPTIONS	
BIBLIOGRAPHY	57
PURCHASING SOURCES	58
GLOSSARY	60 - 61
APPENDICES:	
PLANTING INSTRUCTIONS	
MAP	
EVALUATION FORM	



## **MISSION STATEMENT**

A succession program will be created to approximate the forest primeval that blanketed Eastham in 1651. Strict attention will be paid to native species, natural density and ecological integrity. The existing Wiley Park forest will be nurtured and sustained while the new growth establishes itself.

## **DESCRIPTION**

Wiley Park will be planted with eight to ten species of native trees in separate groves as would have occurred naturally in 1651. Appropriate underbrush and ground cover will be planted around compatible trees. This handbook lists the species that are acceptable for planting as well as those invasive plants that need to be removed. The entire project will be accomplished with minimal disturbance of the existing forest habitat.

COMPLETION DATE: 2101

## IMPLEMENTATION STEPS

### PLANTING:

- . Research species to be planted
- . Locate sources for these species
- . Mark site, allow spread of 3 to 4 acres
- . Clear brambles and undergrowth only as needed for planting.
- . Pull invasives entirely
- . Install water system
- . Purchase garden soil, mulch
- . Prepare holes and have ready to accept trees
- . Procure trees via donation or purchase
- . Plant trees following guidelines for spacing, exposure, etc.
- . Document process: record age and size of trees. Add details such as bare root, source.

### MAINTENANCE:

- . Weed weekly
- . Water weekly (first year)
- . Mulch biannually
- . Clip suckers on new trees
- . Document growth and survival
- . Document problems.

### GENERAL MAINTENANCE:

- . Oak forest – thin annually
- . Clearing – mow once in early spring
- . Identify site for second clearing
- . Remove diseased/infested trees.
- . Clear and maintain paths
- . Post signs

### EVALUATION / REPORTING

- . Count survivors
- . Record growth
- . Enumerate non-survivors
- . List identifiable reasons for loss
- . Identify prevention steps for next year
- . Add lost count to next years planting plan
- . List incidental issues such as weed identification, invasives, traffic
- . Record data on evaluation form (see last page)
- . Prepare and deliver annual report to Advisory Board.
- . Report should include accomplishment of preceding year and specific plans for coming year
- . Secure Advisory Board agreement on plans

ANNUAL TIME TABLE

TASK	RESP	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
RESEARCH SPECIES	ADV BD	X	X										
LOCATE SOURCE	ADV BD	X	X										
MARK SITE	ADV BD			X	X								
CLEAR SITE	FRNDS			X	X								
PULL INVASIVES	FRNDS			X	X						X	X	
INSTALL WATER	FRNDS				X								
PLANT SPECIMENS	FRNDS					X	X				X		
WATER WEEKLY	FRNDS						X	X	X	X	X		
WEED WEEKLY	FRNDS							X	X	X			
CLIP SUCKERS	FRNDS						X						
MULCH	FRNDS						X					X	
DRAIN HOSES (Use air compressor)	FRNDS										X		
MAINTAIN CLEARING	FRNDS/ NRO			X									

1651 FOREST HANDBOOK  
Dec-03

TASK	RESP	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
THIN OAK FOREST	NRO/ FRNDS											X	X
REMOVE DEAD TREES	NRO												
MAINTAIN TRAILS	OPEN SPACE												
PUT UP SIGNS	NRO												
DOCUMENT PROGRESS	FRNDS	X	X	X	X	X	X	X	X	X	X	X	X
REPORT TO ADVISORY BOARD	FRNDS				X							X	
REPORT TO CONS COM	ADV BD					X							X
REPORT TO OPEN SPACE	ADV BD					X							X
REPORT TO B O S	ADV BD												X

## INVASIVE SPECIES LIST \*

### TREES

AUTUMN / RUSSIAN OLIVE  
BLACK LOCUST  
CHINESE CATALPA  
NORWAY MAPLE  
PRINCESS TREE  
THORNLESS HONEY LOCUST  
WESTERN CATALPA

### SHRUBS

BURNING BUSH  
COMMON BUCKTHORN  
GREENBRIAR  
HARDY KIWI  
JAPANESE BARBERRY  
MULTIFLORA ROSE  
ORIENTAL BITTERSWEET  
SHINING BUCKTHORN

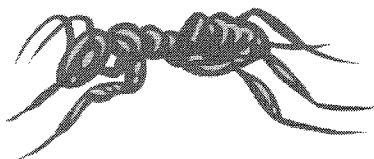
### ANNUAL / PERENNIALS

BISHOPS WEED (GOUTWEED)  
COMMON REED  
GARLIC MUSTARD  
PURPLE LOOSESTRIFE  
YELLOW IRIS

### GROUND COVERS

BLACK SWALLOWWORT  
ENGLISH IVY  
PORCELAIN BERRY

\* These plants should be removed entirely.



**NATIVE SPECIES LIST \***

**TREES**

AMERICAN BEECH  
AMERICAN ELM  
AMERICAN HOLLY  
ATLANTIC WHITE CEDAR  
EASTERN RED CEDAR  
MOCKERNUT HICKORY  
OAK:  
    Black Oak  
    Post Oak  
    Scarlet Oak (not red)  
    White Oak  
PITCH PINE  
RED MAPLE (SWAMP MAPLE)  
SASSAFRAS  
TUPELO (SOUR GUM)  
WHITE PINE

**SHRUBS**

BAY BERRY  
BEACH PLUM  
HIGH BUSH BLUEBERRY  
INKBERRY  
SCRUB OAK  
SHAD BUSH  
SHEEP LAUREL  
SPICE BUSH  
SWAMP AZELEA  
SWEET PEPPER BUSH  
WINTERBERRY

**GROUND COVER**

BEARBERRY  
PIPSISSEWA  
WINTER GREEN

\* Only species on this list should be planted in the forest.

### PLANTING AND MAINTENANCE:TREES

TREE	SEASON	NUTRIENT	EXPOSURE	SPACING	WATER	PRUNING	SPECIAL
AM BEECH	SP/FALL	GENERIC	SUN/SHADE	50 FEET	WEEKLY	NONE	
AM ELM	SP/FALL	GENERIC	SUN/PART SUN	50 FEET	WEEKLY	6 ' FROM GRD	DUTCH ELM DISEASE
AM HOLLY	FALL	GENERIC	SUN/LIGHT SHADE	20 FEET	WEEKLY	NONE	MALE/FEMALE
ATL WHITE CEDAR	FALL	GENERIC	SUN	25 FEET	2X WEEK	NONE	WETLAND
EASTERN RED CEDAR	FALL	GENERIC	SUN/PART SUN	30 FEET	WEEKLY	NONE	
MOCKERNUT HICKORY	SP/FALL	GENERIC	SHADE	30 FEET	WEEKLY	NONE	
OAK *	SP/FALL	GENERIC		30 FEET		THIN	EXTANT
PITCH PINE #	FALL	GENERIC	SUN/PART SUN	25 FEET	WEEKLY	NONE	TURPENTINE BEETLES
RED MAPLE	SPRING	GENERIC	SUN/LIGHT SHADE	50 FEET	WEEKLY	NONE	WETLAND
SASSAFRAS	SPRING	GENERIC	SHADE/PART SUN	25 FEET	WEEKLY	NONE	
TUPELO (SOUR GUM)	SP/FALL	GENERIC	SUN/PART SUN	30 FEET	WEEKLY	NONE	WETLAND
WHITE PINE	FALL	GENERIC	SUN/PT SUN	25 FEET	WEEKLY	NONE	

\* Extant today. Needs to be maintained. Acceptable varieties are listed on page 7.

# Infested with turpentine beetles. Needs to be removed and replanted after 10 years.

**PLANTING AND MAINTENANCE: SHRUBS**

<b>SHRUB</b>	<b>SEASON</b>	<b>NUTRIENT</b>	<b>EXPOSURE</b>	<b>SPACING</b>	<b>WATER</b>	<b>PRUNING</b>	<b>SPECIAL</b>
BEACH PLUM	SPRING	GENERIC	SUN	15 FEET	2X WEEKLY	NONE	
INKBERRY	SPRING	GENERIC	SUN/PART SUN	15 FEET	WEEKLY	NONE	NEAR RED MAPLE/TUPELO
HIBUSH BLUEBERRY	SPRING	GENERIC	SUN/SHADE	15 FEET	WEEKLY	NONE	NEAR RED MAPLE/TUPELO
SHADBUSH	SPRING	GENERIC	LIGHT SHADE/ SUN	30 FEET	2XWEEKLY	NONE	WETLAND
SHEEP LAUREL	SPRING	GENERIC	SUN/ LIGHT SHADE	20 FEET	WEEKLY	NONE	NEAR PITCH PINE/ OAK
SPICE BUSH	SPRING	GENERIC	PART SUN/ SHADE	20 FEET	WEEKLY	NONE	NEAR SASSAFRAS
SWAMP AZELEA	SPRING	GENERIC	SUN/LIGHT SHADE	20 FEET	2XWEEKLY	NONE	WETLAND
SWEET PEPPER BUSH	SPRING	GENERIC	SUN/LIGHT SHADE	25 FEET	2XWEEKLY	NONE	WETLAND
WINTERBERRY	SPRING	GENERIC	SUN/LIGHT SHADE	30 FEET	2XWEEKLY	NONE	WETLAND



**PLANTING SCHEDULE: 2003-2007**

**DECIDUOUS TREES**

YEAR	TREE	# NEW	# REPLACED	# TOTAL
2003	AMERICAN BEECH	5	0	5
	AMERICAN ELM	6	0	6
	SASSAFRAS	6	0	6
	HIBUSH BLUEBERRY	5		5
2004	AMERICAN BEECH			
	AMERICAN ELM			
	MOCKERNUT HICKORY			
2005	AMERICAN BEECH			
	AMERICAN ELM			
	SASSAFRAS			
2006	AMERICAN BEECH			
	AMERICAN ELM			
	SASSAFRAS			
2007	AMERICAN BEECH			
	AMERICAN ELM			
	SASSAFRAS			

**PLANTING SCHEDULE: 2008-2013**

**SHRUBS FOR DECIDUOUS TREES**

YEAR	SHRUB	ASSOC. TREE	# NEW	# REPLACED	# TOTAL
2008	SPICE BUSH / BLUBRY	SASSAFRAS/ ELM			
	SHEEP LAUREL	AMER BEECH			
	INKBERRY	MOCKERNUT			
2009	SPICE BUSH/ BLUEBRY	SASSAFRAS/ ELM			
	SHEEP LAUREL	AMER BEECH			
	INKBERRY	MOCKERNUT			
2010	SPICE BUSH/ BLUEBRY	SASSAFRAS/ ELM			
	SHEEP LAUREL	AMER BEECH			
	INKBERRY	MOCKERNUT			
2011	SPICE BUSH/BLUEBRY	SASSAFRAS /ELM			
	SHEEP LAUREL	AMER BEECH			
	INKBERRY	MOCKERNUT			
2012	SPICEBUSH/ BLUBRY	SASSAFRAS/ ELM			
	SHEEP LAUREL	AMER BEECH			
	INKBERRY	MOCKERNUT			

**PLANTING SCHEDULE: 2013-2017**

**GROUND COVER FOR DECIDUOUS TREES**

YEAR	GROUND COVER	ASSOC TREE	# PLANTED
2013	BEARBERRY	AMERICAN ELM	
	PIPSISEWA	BEECH/SASSAFRAS	
	WINTERGREEN	MOCKERNUT	
2014	BEARBERRY	AMERICAN ELM	
	PIPSISEWA	BEECH / SASSAFRAS	
	WINTERGREEN	MOCKERNUT	
2015	BEARBERRY	AMERICAN ELM	
	PIPSISEWA	BEECH / SASSASFRAS	
	WINTERGREEN	MOCKERNUT	
2016	BEARBERRY	AMERICAN ELM	
	PIPSISWA	BEECH / SASSAFRAS	
	WINTERGREEN	MOCKERNUT	
2017	BEARBERRY	AMERICAN ELM	
	PIPSISEWA	BEECH/ SASSASFRAS	
	WINTERGREEN	MOCKERNUT	

**PLANTING SCHEDULE: 2018 – 2022**

**EVERGREEN AND DECIDUOUS TREES**

YEAR	TREE	#NEW	# REPLACED	# TOTAL
2018	AMERICAN HOLLY			
	TUPELO (SOUR GUM)			
	WHITE PINE			
2019	AMERICAN HOLLY			
	TUPELO (SOUR GUM)			
	WHITE PINE			
2020	AMERICAN HOLLY			
	TUPELO (SOUR GUM)			
	WHITE PINE			
2021	AMERICAN HOLLY			
	TUPELO (SOUR GUM)			
	WHITE PINE			
2022	AMERICAN HOLLY			
	TUPELO (SOUR GUM)			
	WHITE PINE			

**PLANTING SCHEDULE: 2023 – 2026**

**SHRUBS FOR EVERGREEN AND DECIDUOUS TREES**

YEAR	SHRUB	ASSOC. TREE	# NEW	#REPLACED	# TOTAL
2023		AMERICAN HOLLY			
	INKBERRY	TUPELO (SOUR GUM)			
2024		AMERICAN HOLLY			
	INKBERRY	TUPELO (SOUR GUM)			
2025		AMERICAN HOLLY			
	INKBERRY	TUPELO (SOUR GUM)			
2026		AMERICAN HOLLY			
	INKBERRY	TUPELO (SOUR GUM)			
2027		AMERICAN HOLLY			
	INKBERRY	TUPELO (SOUR GUM)			

**PLANTING SCHEDULE: 2028 – 2031**

**GROUND COVER FOR EVERGREEN AND DECIDUOUS**

YEAR		GROUND COVER		ASSOCIATED TREE		# PLANTED
2028				AMERICAN HOLLY		
				TUPELO (SOUR GUM)		
2029				AMERICAN HOLLY		
				TUPELO (SOUR GUM)		
2030				AMERICAN HOLLY		
				TUPELO (SOUR GUM)		
2031				AMERICAN HOLLY		
				TUPELO (SOUR GUM)		

**PLANTING SCHEDULE: 2032 - 2036**

**EVERGREEN AND DECIDUOUS TREES**

YEAR	TREE	#PLANTED	#REPLACED	#TOTAL
2032	PITCH PINE			
	EASTERN RED CEDAR			
2033	PITCH PINE			
	EASTERN RED CEDAR			
2034	PITCH PINE			
	EASTERN RED CEDAR			
2035	PITCH PINE			
	EASTERN RED CEDAR			
2036	PITCH PINE			
	EASTERN RED CEDAR			

**PLANTING SCHEDULE: 2037 – 2041**

**SHRUBS FOR DECIDUOUS AND EVERGREEN TREES**

YEAR	SHRUB	ASSOC TREE	#PLANTED	# REPLACED	#TOTAL
2037		EASTERN RED CEDAR			
	SHP LAUREL	PITCH PINE			
2038	SHP LAUREL	PITCH PINE			
		EASTERN RED CEDAR			
2039	SHP LAUREL	PITCH PINE			
		EASTERN RED CEDAR			
2040	SHP LAUREL	PITCH PINE			
		EASTERN RED CEDAR			
2041	SHP LAUREL	PITCH PINE			
		EASTERN RED CEDAR			



**PLANTING SCHEDULE: 2042 – 2044**

**GROUND COVER FOR EVERGREEN AND DECIDUOUS TREES**

YEAR	GROUND COVER	ASSOC TREE	#PLANTED
2042	BEARBERRY	PITCH PINE	
		EASTERN RED CEDAR	
2043	BEARBERRY	PITCH PINE	
		EASTERN RED CEDAR	
2044	BEARBERRY	PITCH PINE	
		EASTERN RED CEDAR	

**PLANTING SCHEDULE: 2045- 2050**

# **PLANTING SCHEDULE: 2045 -2050**

## **WETLAND SPECIES**

YEAR	TREE	#PLANTED	#REPLACED	#TOTAL
2045	RED MAPLE (SWAMP)			
	SHAD BUSH			
	WINTERBERRY			
	WHT CEDAR			
YEAR	SHRUB	#PLANTED	#REPLACED	#TOTAL
2046	HIBUSH BLUEBERRY			
	SWAMP AZELEA			
	BEACH PLUM			
	SWEET PEPPERBUSH			
YEAR	GROUND COVER	#PLANTED		#TOTAL
2047				
2048	REPEAT 2045			2
2049	REPEAT 2046			
2050	REPEAT 2047			

**AMERICAN BEECH**     *Fagus grandifolia*  
**Family:** Fagaceae

**Zones:** 4-9 Native to rich woodlands, deciduous and mixed forests.

**Exposure:** Sun to shade

**Soil:** Moist

**Size:** Height: 50 – 70 feet, spread 25 – 50 feet.

**Leaves:** alternate, simple, ovate-oblong, 2-5” long, 1-2 “ wide. Coarsely serrate, glossy dark green above, light green and glabrous below or with tufts of hairs in the axils of the veins and along the midrib. Silky when unfolding.

**Leaf Color:** silvery green when opening, gradually changing to dark green in summer. Fall color is golden bronze and leaves often persist into winter.

**Buds:** imbricate, slender, 1 “ long, brown, shiny, apex sharp pointed.

**Flowers:** Monoecious: male and female separate on the same tree. Usually flowers in April to May with the emerging leaves.

**Fruit:** three winged nut, solitary or 2 to 3, partly or wholly enclosed by a prickly involucre about 1 in long. Nut is edible.

**Stem:** slender, somewhat zig-zag, smooth, shining, silver-gray.

**Bark:** gray, smooth to the eye and rough to the touch.

**Growth rate:** slow

**Wildlife:** Important mast species for small birds and mammals as well as deer, turkey and grouse. The larvae of the turquoise hairstreak and eastern oak dusky wing are known to feed on the leaves.

**Culture:** Transplant balled plant in the dormant condition.

Moist well drained soil, acid soil preferred (pH5.0-6.5). Will not withstand wet or compacted soils.

Soils with oxygen concentrations of less than 10 to 15 % are not suitable.

Does best in sun, but will withstand shade.

Prune in summer or early fall.

May take a couple of years to take hold before growth begins.

**Diseases and Insects:** Nothing serious. Leaf spots, powdery mildew, bleeding canker, leaf mottle, beech bark disease, cankers, aphids, brown wood borer, beech scale, beech mealybug, two-lined chestnut borer and caterpillars.

**Possible underbrush:** Sheep Laurel

**Ground cover:** Striped Pipsisewa (*Chimaphila maculata*)

**AMERICAN ELM** (*Ulmus Americana*)

**Family:** Ulaceae

**Zones:** 3 – 9

**Habit:** Native to floodplains and swamp forests, old fields and fencerows. Also known as White, Gray, Water or Swamp Elm.

**Exposure:** Sun to part sun.

**Soil:** Moist to moderately dry. (a characteristic tree of wet ground.)

**Size:** Height: 60 to 80 feet, width: 30 to 50 feet, with a characteristic vase or plume shape. The trunk is 20 ft long breaking up into sharply ascending main branches which droop at their tips.

**Leaves:** Egg-shaped, broadest at the middle, unequally divided by the midrib, tapering to a pointed tip, 3 to 5 inches long.

**Leaf Color:** Dark green above and paler beneath, smooth or slightly roughened on the upper surface. They turn yellow in fall.

**Buds:** Pointed ¼ in long, slightly flattened and against the stem, light reddish brown, smooth and shining.

**Flowers:** Borne in clusters of 8 to 20, produced before leaves expand in March/April. Long stalked, drooping, cup shaped, with 7 to 8 stamens. Greenish red, in fascicles of 3 or 4. Not showy.

**Fruit:** Rounded, notched, disc-shaped samara, ½ in long, in June before leaves have fully expanded. May have red tinge fringed with hairs. Not ornamental.

**Stem:** Zigzagged, slender, smooth or downy, but not rough. Round, red-brown, pubescent at first, becoming glabrous; leaf scars with 3 distinct bundle traces that result in a “cat face” configuration.

**Bark:** Dark gray, thick and corky, irregularly divided by deep fissures into broad ridges. Outer bark in cross section shows layers of a whitish-buff color alternating with thicker dark layers.

**Growth Rate:** Fast in young trees. Possibly 2 to 4 ft a year.

**Wildlife:** Primary food plant for the larvae of the question mark and comma angel wing butterflies.

**Culture:** Plant only disease resistant specimens, procured from the Elm Research Institute in Westmoreland, N.H. These are guaranteed for the life of the tree. Elms prefer moist, fertile soil and sun. Dig hole three times as wide and twice as deep. Fill with planting mix. Stake tree to three posts. Fence to protect from animals. On young trees, it may be necessary to prune lower branches to six feet, leaving the main branch to establish itself. Mulch for winter. Propagation is moderately easy from seed.

**Diseases and insects:** Dutch elm disease. Leaves turn yellow then brown and hang on dead branches. Grown discoloration of internal wood visible as well as beetles feeding galleries under bark. Wilting and dying of branches and leaves is caused by a fungus, which is spread from tree to tree by elm bark beetles. The danger period is late spring to early fall. **Treatment:** Destroy dead or badly damaged trees, including stumps; send to local incinerator or bury. Isolate root system to prevent spread of fungus to other trees. Do not store logs. In less severe cases, there may be a chance of saving the tree if diseased branches are removed. Use same treatment for removal of Elm Bark Beetles. If spraying is indicated call an arborist.

**Prevention:** Keep trees well watered. Feed in spring and fall to maintain vigor.

**Possible underbrush:** Spice bush or blueberry

**Possible ground cover:** Wintergreen or bearberry

**AMERICAN HOLLY (*Ilex opaca*)**

**Family:** Aquifoliaceae

**Zones:** 4-9

**Habit:** Woods and hedgerows along the Atlantic coast.

**Exposure:** Sun to light shade.

**Soil:** Moist, acidic

**Size:** Height: 15 to 40 feet; width: 8 to 15 feet.  
a small to medium tree, with relatively short  
horizontal branches forming a pyramidal  
crown. When grown in the open it is clothed  
with branches to the ground.

**Leaves:** Alternate on the twigs, elliptical, 2 to 4 inches long,  
widely separated spiny teeth on the margins.

**Leaf Color:** Varies from dull to dark yellow or olive green.  
can be dull, dark green above, paler below. The  
leaves are evergreen and persist on the plant for two  
to three years. (*Opaca*: dull, the leaves do not have  
the glossy surface of the English Holly)

**Buds:** Imbricate, ovoid about 1/6 " long, greenish brown,  
buds sit directly above leaf scar which is half moon  
shaped.

**Flowers:** Male and female flowers are borne on separate trees. The male flowers are borne in clusters of three to nine, the female are solitary or three together, appearing in late May or June. The flowers are small, about 1/3 inch in diameter with four white petals.

**Fruit:** Red fleshy berries which mature in October and persist on the trees sometimes until the following June, about 1/4 inch in diameter. Borne singly on 1/4 inch stalk.

**Stem:** Moderate, green when young, sparsely pubescent in youth, finally glabrous, older stems brown, rough, with circular raised lenticels; pith –solid, watery green.

**Growth rate:** slow; average is 6 inches a year.

**Wild Life:** The fruit is an important winter and early spring food source for a variety of birds.

**Culture:** Hollies are easily transplanted. Transplant into moderately fertile, moist, loose, acid, well drained soil. Partial shade or full sun is ok. Avoid extremely dry, windy unprotected places. Does not tolerate poor drainage. Requires both male and female plants to set fruit. Use one male tree for every two or three female. Prune in winter.

**Diseases and Insects:** This species is afflicted with many problems including holly leaf miner, bud moth, scales, beetles, whitefly, berry midge, southern red mite, tar spot, leaf spots, cankers, bacterial blight, twig die back, spot anthracnose, leaf rot, leaf drop, powdery mildew, spine spot (non-parasitic) and leaf scorch. Leaf miner and scale are particularly troublesome. Spittlebug, particularly in wet springs cause yellowing, distortion and death of leaves and branches.

**Note:** The largest recorded tree in Massachusetts is in Cohasset. It is 2 feet, nine inches in circumference and 40 feet tall.



**BAYBERRY** (*Myricaceae pensylvanica*)

**Family:** Myricaceae

**Zones:** 4-7

**Habit:** Dunes, pine barrens, dry forests and slopes, bog and swamp margins.

**Exposure:** sun to light shade

**Soil:** Moist to dry, acidic

**Size:** Ranges from 5 to 12 feet with 9 as an average. Width often equals height. Upright, rounded and dense. Tends to sucker and so forms colonies.

**Leaves:** Alternate, simple, deciduous to semi-evergreen. Almost always deciduous in the north. Obvate to oblong 1 ½ to 4 inches long and ½ inch wide. Lustrous dark green and pubescent above. Pubescent beneath, resin-dotted, leaves are aromatic when bruised.

**Buds:** small, solitary, sessile, subglobose or ovoid with 2 to 4 exposed, red brown scales. End bud absent.

**Flowers:** Male and female required. Flowers borne in catkins. Male is yellow green, consisting of varying number of stamens. The female has a one celled ovary with two stalkless stigmas. Sepals and petals are absent. Flowers in March to April before the leaves.

**Fruit:** Drupe, 1/5 inch across, grayish white, endocarp covered with resinous, waxy coating, effective from September through April and later. Borne in great quantities and usually covering the stems of female plants.

**Stem:** rounded or angular, stout, resin dotted when young: pith—small, angled, continuous, green.

**Wildlife:** Fruit and shelter for birds; foliage is eaten by the larvae of the red-banded hairstreak butterfly.

**Culture:** Thrives in poor, sterile, sandy soil has performed well in heavy clay soils as well. Full sun to one half shade, withstands salt spray. Chlorosis is a problem on high pH soils but can be corrected. Make sure plants were grown from northern seed sources if they are to survive in the north. Requires male and female plants for fruiting.

**Diseases and Insects:** Nothing significant.

**BEACH PLUM** (*Prunus Maritima*)

**Family:** Rosaceae

**Zones:** 4-8

**Habit:** Sand dunes and barrens along the Atlantic coast.

**Exposure:** Full sun

**Soil:** Sandy, well drained.

**Size:** Height 3 to 6 feet; width 3 to 6 feet. Rounded, dense, suckering shrub. Single trunked with sculpted twisting branches.

**Leaves:** Alternate, simple, ovate or elliptic, 2 – 3 inches long, 1 inch wide, cuneate, evenly and sharply serrate.. They hang stiffly on short petioles along spineless vertical shoots.

**Leaf Color:** Dull green and glabrous above, paler and soft pubescent below.

**Flowers:** White, single ½ inch across in May before the leaves emerge.

**Fruit:** Tart, red purple, sometimes golden, ½ to 1 inch in diameter. Ripens in August / September.

**Stem:** ¼ inch long, pubescent, often glandular.

**Wildlife:** Birds

**Culture:** Likes sandy soil, full sun. A suckering plant, it will spread on its own. A number of cultivars are available. “Eastham” has been selected for superior fruit quality.

**EASTERN RED-CEDAR** (*Juniperus virginiana*)

**Family:** Cupressaceae

**Zones:** 4 – 9

**Habit:** One of the few evergreens that does well near the sea.

**Exposure:** Sun to part sun.

**Soil:** Tolerant of adverse conditions. Poor gravelly soils, acid and high pH. Prefers deep moist loam on well drained subsoil.

**Size:** Height: 40 to 50 feet. Width 8 to 20 feet. Extremely variable. A small to medium tree with a long trunk. The crown is pyramidal, with ascending main branches, becoming broad, round topped and irregular in old age. Varies in the wild from columnar to broadly pyramidal.

**Leaves:** On young plants, and on vigorously growing shoots of old plants, leaves are awl-like, spreading from the twigs, 1/8 to 3/4 inches long. On older plants generally scale-like, with pointed or rounded tips, appressed to the twigs, usually with a gland on the back, about 1/16 inch long.

**Leaf Color:** Medium green, sage green to blue green in summer, often becoming bronze to yellow-brown in winter, variable from tree to tree.

**Buds:** Minute, covered by the overlapping scale-leaves.

**Flowers:** Cones. Usually dioecious, may have monoecious flowers on occasion; staminate yellow, pistillate green; interesting in late winter when the staminate yellow-brown cones are swelling and starting to release pollen. Male trees take on a yellow-brown color and are easily distinguished from female trees at this time of year. Female trees have an abundance of various colored cones, greenish blue to frosted blue.

**Fruit:** Berry like, nearly globose, pale green becoming dark blue with a grayish waxy coating in the fall, 1/4 to 1/3 inch in diameter.

**Stem:** Slender, four sided, at first covered by the overlapping scale-like leaves, green, later becoming red-brown.

**Bark:** Reddish brown which exfoliates in long narrow fibrous strips.

**Growth Rate:** Slow

**Wildlife:** Essential to birds for food and shelter. The needles are eaten by the larvae of the rusty orange, brown and gray cedar hairstreak butterfly, whose coloring echoes the bark of the tree.

**Culture:** Established plants are drought tolerant, but new trees need to be watered well the first season. They will not wilt to provide warning, but will dry up and die. They need full sun and good air circulation to help fend off various diseases. Pruning will severely weaken the tree. Will tolerate shade only when young and will then be crowded out by other trees.

**Diseases and Insects:** Cedar apple rust and bagworms.

**Note:** The largest recorded tree of the species in Massachusetts is in Westport. It is 7feet, 10 inches in diameter, 40 feet tall and has a spread of 22 feet. The wood of Eastern Red Cedar is used for fence posts, closets, chests and the casing for lead pencils.

**INKBERRY:** (*Ilex glabra*)

**Family:** Aquifoliaceae

**Zones:** 5 to 9.

**Habit:** Wooded swamps, low woods and thickets; mostly along the coast.

**Exposure:** Sun to light shade.

**Soil:** Wet to moderately dry, and sandy.

**Size:** Shrub. Height: 5 to 8 feet; width: 8 to 10 feet. Size varies with growing conditions. Upright, much branched, erect rounded evergreen shrub, somewhat open with age and often losing lower leaves. Tends to sucker and form colonies.

**Leaves:** Narrowly oval to ovate, with a nearly smooth margin.

**Leaf Color:** Evergreen dark green and lustrous. May become yellow green in summer and susceptible to foliage burn in severe winters.

**Flowers:** Male borne 3 or more together on a slender stalk; female solitary, each with 6 to 8 creamy petals. Flowers open May/June.

**Fruit:** Berry like black drupe, ¼ inch in diameter with 5 to 7 pyrenes, September through May. It is often hidden by the foliage. Ripens to black but starts in early fall as purplish red.

**Growth Rate:** Slow, average 6 to 8 inches a year.

**Wildlife:** Major nectar source for bees, producing a light clear honey. Fruits are important winter/spring food source for birds.

**Culture:** Prefers moist, acid soils and in the wild is common in swamps where it forms large colonies. Withstands heavy pruning and renewal of old plants is suggested. Avoid extremely high pH soils. Is quite shade tolerant, but does best in full sun with ample root moisture.

**Diseases and Insects:** Generally problem free in the northeast.

**MOCKERNUT HICKORY** (*Carya tomentosa*)

**Family:** Juglandaceae

**Zones:** 4 to 9

**Exposure:** Sun to part sun.

**Soil:** Moist to dry, well drained.

**Size:** Height: 60 to 80; width: 20 to 30 feet.

**Leaves:** Alternate, compound pinnate, 6 to 12 inches long, 7 to 9 leaflets, the upper pair 5 to 9 inches long, 3 to 5 inches wide; oblong to oblong-lanceolate, acuminate, serrate, densely pubescent and glandular below, fragrant when bruised.

**Leaf color:** Dark yellow-green above; deep golden in fall.

**Flowers:** Monoecious with the male borne in drooping three branched catkins and the female in few flowered terminal spikes, developing with the leaves in April/May.

**Fruit:** Hard shelled nuts, encased in a 4 valved husk. They ripen in October and drop from the trees to be disseminated by squirrels. The seed is edible.

**Bark:** Dark gray, thin with shallow furrows and narrow flat ridges forming a net-like, diamond pattern.

**Growth rate:** slow

**Wildlife:** For many animals, hickory nuts fill a gap left by the demise of the chestnut tree. The leaves feed a variety of insects, including the bizarre walking sticks, hickory tussock moth, and striped, hickory and banded hairstreak butterflies. .

**Culture:** Has an exceptionally deep tap root. The containers should be 3 inches across and 10 to 12 inches deep. The seedlings will take a few years to get rooted before starting to grow. Subsequent growth can be encouraged by removing adjacent plants and cutting the stem back to the ground in winter. The new sprouts will tend to have better form than the original.

**Diseases and Insects:** Many insects, animals and fungi feed on hickories which makes them important members of the forest community but there will also be much leaf and fruit drop.

**OAK** (There are 90 varieties of Oak, five of which are indigenous to Cape Cod: Black, Post, Scarlet, White and Scrub)

**BLACK OAK** ( *Quercus velutina*)

**Family:** Fagaceae

**Size:** 50 to 80 feet tall. A long trunk and widely spreading or ascending branches. The crown is rounded and becomes irregular from the death of some branches.

**Leaves:** Alternate leaves are oval-oblong in general outline, and deeply lobed, the sinuses reaching nearly to the midrib. The 7 lobes are usually each 3 lobed or toothed at the apex, each with a bristle tip. The leaves are 3 to 6 inches long, densely hairy when young and remaining scurfy until the middle of the summer. They persist on the tree into winter.

**Leaf Color:** Dark green above, lighter beneath. They turn dull red, yellow or brown in the fall.

**Buds:** Egg shaped, the upper buds are clustered about the terminal bud, hairy, yellowish gray, ¼ to ½ inch long.

**Flowers:** Male flowers borne in long lax catkins 4 to 6 inches long, produced from lateral buds or from the scales of the terminal bud. Female flowers generally borne 2 to 3 together on short hairy stalks, in the axils of the new leaves. Flowers are produced in May when the leaves are about 1/3 expanded.

**Fruit:** Acorns are borne singly or in pairs, maturing at the end of the second summer. They vary from hemispherical to cylindrical, are brownish, ½ to ¾ inch long.

**Stem:** Relatively stout, smooth and somewhat hairy, brownish.

**Bark:** Dark brown, nearly black, deeply fissured into rounded, scaly-topped ridges.

**Wildlife:** Mast species for ground feeding birds such as turkeys and grouse, many jays and mammals like deer, raccoons, squirrels, chipmunks and mice or voles. Also a remarkably long list of butterflies.

**Culture:** Black oak is extant in Wiley Park. Thinning and removal of invasives and dead limbs should prolong health.

**OAK – POST OAK** ( *Quercus Stellata*)

**Family:** Fagaceae

**Size:** Height 25 to 50 feet; width 20 to 30 feet with a round topped crown and stout, spreading branches.

**Leaves:** 4 to 6 inches long and 3 to 4 inches broad. leathery in texture, obovate in outline and usually 5 lobed. The two middle lobes are arranged opposite each other, are conspicuously larger than the other lobes and have squarish ends. Upper surfaces feel rough to the touch due to scattered star shaped hairs.

**Leaf Color:** Lustrous dark green on the upper surfaces. The lower surfaces are paler and coated with a tawny or rusty down. Fall color can be golden but not spectacular.

**Buds:** Imbricate, subglobose to broadly ovoid, 1/8 to 1/4 in Long, red brown, pubescent or glabrous.

**Fruit:** Acorn are sessile, with bowl shaped cups. The nuts are ovoid from 1/2 to 2/3 inch long, usually downy above and about 1/3 enclosed by the cups.

**Stem:** Stout, dirty gray-brown, tomentose, dotted with numerous lenticels.

**Bark:** Similar to White Oak, but darker, more red-brown in color and with more longitudinal ridges.

**Wildlife:** Ground feeding birds, forest animals and butterflies.

**Culture:** Extant in Wiley Park. Requires thinning, and removal of invasives and dead branches.

**Note:** Also known as Box White Oak and Iron Oak. Wood is heavy and strong and is used for posts, railroad ties, mine props and fuel.



**OAK – SCARLET OAK** (*Quercus coccinea*)

**Family:** Fagaceae

**Size:** 50 to 80 feet tall, 40 to 50 feet wide.

**Leaves:** Alternate, simple, oblong or elliptic with deep sinuses with rounded bases, which divide the leaf into 5 to 9 lobes that have 3 toothed tips, the middle tooth being the longer of the three. The leaves are 3 to 6 inches long and 2 ½ to 4 ½ inches wide.

**Leaf Color:** The leaves are red when they begin to expand, becoming dark green above and paler below. They turn bright scarlet in the fall.

**Buds:** Broadly egg shaped, those at the ends of the twigs are clustered about the terminal bud. They are hairy, dark brown, 1/8 to ¼ inch long.

**Flowers:** Male flowers are borne in long catkins 3 to 4 inches long, produced from lateral buds of the previous year, or among bud scales of the terminal bud. Female flowers are solitary or in groups of two or three on short stalks about ½ inch long, produced in the axils of the new leaves. They appear in May when the leaves are about half grown.

**Fruit:** Acorns borne singly or in pairs, sessile or stalked, ripening at the end of the second summer. Egg shaped brownish, ½ to 1 inch long, enclosed for 1/3 to ½ its length by the cup.

**Stem:** Slender, smooth, pale brown.

**Bark:** Dark brown, divided into irregular shallow ridges.

**Wildlife:** Ground feeding birds, forest animals and butterflies.

**Culture:** Extant in Wiley Park. Thin and remove invasives and dead limbs.

**Note:** Wood is used for construction, furniture and flooring. Common by the seashore.

**OAK – WHITE OAK** (*Quercus alba*)

**Family:** Fagaceae

**Size:** Height: 50 to 80 feet, width: 50 to 80 feet

**Leaves:** Alternate leaves are rounded-oblong in general outline, broadest above the middle and are deeply lobed, the sinuses reaching almost to the prominent yellow midrib. The 7 to 9 forward pointing lobes may themselves be obscurely lobed at the rounded tips. They are 5 to 9 inches long.

**Leaf Color:** Leaves are dull green above, paler below, turning purplish-red in the fall and fading to gray brown. They may persist on the tree into winter.

**Buds:** Egg shaped, alternate, those at the tip of the twigs clustered about the terminal bud, reddish brown about 1/8 inch long.

**Flowers:** Male flowers borne in long catkins 2 ½ to 3 inches long, produced from lateral buds of previous year or among bud scales of terminal bud. Female flowers solitary, borne in the axils of new leaves. Flowers are produced in May when new leaves are about half grown.

**Fruit:** A sessile or short stalked acorn, maturing at the end of the first summer. Egg shaped oblong, light brown, about ¾ inch long, with a cup about ¼ the length of nut.

**Stem:** stout, brown to purple, angled, sometimes covered with waxy grayish bloom.

**Bark:** Light gray, divided by irregular fissures into long irregular scales.

**Wildlife:** Ground feeding birds, forest animals and butterflies.

**Culture:** White Oak is extant in Wiley Park. Thin, remove invasive plants and dead limbs.

**Note:** Wood is used for furniture, flooring and barrel staves. Is long lived, lasting up to 200 years.

**PITCH PINE** (*Pinus rigida*)

**Family:** Pinaceae

**Zones:** 4 to 8

**Habit:** Mixes naturally with indigenous oak trees. Medium sized tree with short stout branches in whorls, forming a narrowly conical or almost cylindrical head, becoming irregular in old age.

**Exposure:** Sun / part sun

**Soil:** Well drained, acidic, moist to dry.

**Size:** Height 30 to 50 feet, width: 15 to 25 feet

**Leaves:** Needle like, in fascicles of three, rigid, slightly curved and twisted with hard points, 3 ½ to 4 ½ inches long, margins finely tuned.. The fascicle sheath is 1/3 to ½ inch long.

**Leaf Color:** Medium to dark yellow green

**Buds:** Egg shaped, the scales dark brown, with fringed margins, ½ to ¾ inch long. usually resinous.

**Flowers:** Monoecious, clustered; staminate red, pistillate light green tinted rose.

**Fruit:** Cones lateral in whorls of 3 to 5, seldom solitary, 2 to 3 inches long, 1 to 2 inches wide. Symmetrical, ovoid-conical, narrowing rapidly to the apex, light brown. Female cones mature in the fall of the second year. They do not open immediately, and persist on the trees for many years. There is a rigid sharp prickle at the end of each one. They are borne on the sides of new growth, erect on a short stalk, nearly globose, about  $\frac{1}{2}$  inch long. Male cones cluster at the base of the new growth, about  $\frac{3}{4}$  inch long.

**Stem:** Relatively stout, with many buds, green at first, becoming dull orange brown in the second year, prominently ridged.

**Bark:** Dark reddish brown, thick, divided by deep fissures into broad flat-topped ridges.

**Growth Rate:** Slow

**Wildlife:** Birds and mammals feed on seeds. Butterfly larvae feed on the needles.

**Culture:** An adaptable tree that prefers sun and acid soil. Will grow with local oak trees. If large plants have been properly root pruned they should be moved with no difficulty. If the top breaks off because of wind or snow, it will not grow back. Help the tree form a strong central trunk by removing weaker forks and persistent dead limbs.

**Diseases and Insects:** Root rot, dieback, tip blight, stem blister rust, canker, sawflies, pine webworm and turpentine beetles are just some of the problems.

**Note:** Used for lumber. In the 1840's and 50's Pitch Pines were planted on Cape Cod and tapped for turpentine. They are extant today in Wiley Park, but are infested with turpentine beetles and dying quickly. The infested trees can not be used for any purpose such as mulch or wood chips for the paths. They need to be removed from the park as quickly as possible. A number of years should pass before replanting Pitch Pines to be sure the insects are gone.

**RED MAPLE** ( *Acer rubrum*)

**Family:** Aceraceae

**Zones:** 3 to 9

**Habit:** Characteristic tree of wooded swamps, but also grows well on upland sites. In youth, often pyramidal or elliptical, developing ascending branches which result in an irregular, ovoid or rounded crown.

**Exposure:** Sun to light shade.

**Soil:** Wet to dry: prefers moist rich soil.

**Size:** Height: 40 to 120 feet. Trunk is long and the main branches are ascending. In young trees the crown is slender and rounded.

**Leaves:** Opposite, simple, 3 to 5 triangular, ovate lobes, with the middle lobe larger than the side lobes. Sinuses are irregularly toothed. The width of the leaf, 2 ½ to 4 inches, is equal to or slightly greater than the length. The leafstalk is 2 to 4 inches long, red or green.

**Leaf Color:** Emerging leaves are red tinged, gradually changing to dark green above with distinct gray cast beneath. Underside is also somewhat hairy. Autumn color is typically scarlet, but sometimes orange or yellow. It is one of the first to turn color.

**Buds:** Imbricate, obtuse, about 1/8 inch long, the outer scales thick and dark red, with hairs along the margins; spherical flower buds in clusters often encircling nodes.

**Flowers:** The flowers are scarlet or yellow-red, borne in small conspicuous, short stalked clusters in late March or April, before the leaves expand. Male and female flowers are borne in separate clusters, commonly on separate trees (but not always). The petals are minute,. The color is provided by the 5 to 8 stamens in the male flowers or the two styles of female flowers.

**Fruit:** The fruit is borne on drooping stalks 2 ½ to 4 inches long. They are red – brown with a wing about ¾ inch long. The seeds ripen in May or June and germinate as soon as they ripen.

**Stem:** Glabrous, lenticelled .Green at first, turning red and finally light gray, with elongate white dots.

**Bark:** Younger branches are smooth and light gray. On older branches and the trunk, it is dark gray or black, divided by longitudinal fissures into long scaly ridges.

**Growth Rate:** Fast when young.

**Wildlife:** Provides food and shelter to birds. Bees make honey from it.

**Culture:** Shallow rooted. Transplants readily as a small specimen bare root or balled in larger sizes. Move when dormant. Very tolerant of soils, but prefers slight acid, moist conditions. Will show chlorosis if pH is too high. Be sure to select plants of local provenance to insure adaptability.

**Diseases and Insects:** Leaf hopper will cause considerable damage; also borer that attacks young terminals and a petiole borer.

**Note:** The wood is hard, stiff and heavy, but not strong. It is called soft maple and is used for flooring, trim, furniture and agricultural implements and handles. It burns well with a hot flame. The sap may be collected in the early spring and boiled down to make sugar. However, the yield is much less than that from sugar maple. In the past, the bark was used as a source of a dark blue-purple dye or ink. The largest tree in Massachusetts is in Stowe, with a circumference of 12 feet, 3 inches. It is 65 feet tall and has a spread of 80 feet. It is also called Scarlet Maple or Swamp Maple.

**SASSAFRAS** (*Sassafras albidum*)

**Family:** Lauraceae

**Zones:** 4 to 9

**Habit:** Relatively long trunk and short, horizontal branches. The trunk breaks up into several spreading main branches, forming a rounded crown. Tends to sucker and form thickets.

**Exposure:** Sun / part sun.

**Soil:** Moist to moderately dry

**Size:** Height 30 to 60 feet; width 25 to 40 feet.

**Leaves:** Alternate, simple, ovate to elliptic. 3 to 7 inches long, 2 to 4 inches wide, acute or obtuse, cuneate at base. Glabrous and glaucous beneath, the margins entire or with one or two large lateral lobes,(mitten shaped)

**Leaf Color:** Bright to medium green in summer. They turn scarlet, yellow, purple or orange in the fall.

**Buds:** Terminal, solitary, ovoid, sessile, about 4 to 6 exposed scale, green tinged with red toward the tip, 1/3 inch long. Lateral buds are small, divergent, green; terminal is the flower bud.

**Flowers:** Usually dioecious, and weakly fragrant in late April/May just as leaves begin to expand. Produced in erect drooping racemes 1 to 2 inches long, apetalous, calyx about 3/8 inch long and wide, with 6 narrowly oblong lobes, 9 stamens in the male and 6 or aborted in the female. Usually male and female flowers are produced on different plants. The six petal-like calyx lobes in each flower are chartreuse.

**Fruit:** Drupe, ½ inch long, dark blue with a single large seed, set on a bright red fleshy stalk. Matures in September but falls quickly or is devoured by birds. Pedicel is sometimes mistaken for the fruit.

**Stem:** Sometimes downy at first, but soon becomes smooth, light green, often red where exposed to light. Glavrous and glaucous, spicey- aromatic when bruised. Sympodial branching.

**Bark:** Trunk develops an orange-brown alligator hide bark that is highly ornamental. Flat corky ridges are easily cut across with a knife. Has a spicy smell as do the roots.

**Growth Rate:** Medium to fast; 10 to 12 feet over a 5 to 8 year period.

**Wildlife:** Female trees can set a crop of oil rich fruit which will attract migrating birds. It is a primary larval host plant for the spicebush swallowtail and the laurel swallowtail butterflies.

**Culture:** In transplanting, be sure to get the root and not the sucker. Plant balled root in early spring into moist, loamy, acid, well drained soil. High pH will cause chlorosis. Wants full sun or light shade. If single trunk is desired, remove the suckers that develop. Prune in winter.

**Diseases and Insects:** Cankers, leaf spots, mildew, wilt, root rot, Japanese beetle, promethean moth, sassafras weevil and scales have been reported.

**Note:** A decoction of the bark of the roots is used to make a reputedly medicinal tea, though large quantities may produce unpleasant effects. The powdered, dried leaves impart a peculiar consistency and flavor to soups. The largest recorded specimen in Massachusetts is in East Taunton. It is 9 feet 10 inches in circumference, 56 feet tall and has a spread of 46 feet.



**SHADBUSH** (*Amelanchier aborea*)

**Family:** Rosaceae

**Zones:** 4 to 9

**Habit:** Multi-stemmed large shrub or small tree, with a rounded crown of many branches. Found in wooded swamps, low wet areas including floodplains, banks of water courses, and occasionally uplands.

**Exposure:** Light shade to sun.

**Soil:** Wet to moderately dry.

**Size:** Height: 15 to 25 feet with a variable spread. Can get bigger. National champion is 60 feet by 53 feet in Va.

**Leaves:** Alternate simple, generally obovate, less often ovate, elliptic or oblong, 1 to 3 inches long,  $\frac{1}{2}$  to  $\frac{3}{4}$  inch wide, acute or acuminate, usually cordate at base, sharply serrate. Densely tomentose beneath when young, less so above.

**Leaf Color:** Gray when emerging, changing to medium to dark green in summer. Fall color varies from yellow to apricot to dull rusty red. May color and drop early in the fall.

**Buds:** 5 to 7 scaled, laterals of similar size,  $\frac{1}{3}$  to  $\frac{1}{2}$  inch long, imbricate, narrowly ovate to conical, sharp pointed, greenish yellow, more or less tinged with reddish purple. Color is highly variable from green to maroon. Glabrous or with white silky hairs at apex and edges of scales, mostly appressed. Tend to show a slight spiraling.

**Flowers:** White, borne in pendulous racemes, 2 to 4 inches long. Appears in April-June as the leaves are emerging. Short lived and weakly mal-odorous.

**Fruit:** Berry like pome, orange-shaped, ¼ to 1/3 inch in diameter, changing from green to red and finally to purple-black. Bloomy, slightly sweetish, edible. Ripens in June, maturing over a three to four week period. A favorite of birds, they don't last long.

**Stem:** Slender, olive green to red-brown often covered with a gray skin, generally smooth, glabrous, with a slight taste of bitter almonds. Pith is green and small.

**Bark:** Grayish, smooth, but streaked with longitudinal fissures, often with a reddish cast, very ornamental. In extreme age, becomes ridged and furrowed and scaly.

**Growth Rate:** Medium: 9 to 10 inches in a 5 to 8 year period.

**Wildlife:** The twigs and fruits are eaten by beaver, skunk, chipmunk, red and gray squirrel, white-footed mice, whitetail deer and possibly red fox. The fruits are eaten by ruffed grouse, blue jay, Baltimore oriole, song sparrow, wood thrush, veery, tufted titmouse, cardinal, rose-breasted grosbeak, black-capped chickadee, brown thrasher and catbird. Robins and eastern kingbird use it for cover and nesting. It is a larval food plant for the dark-spotted palthis moth and the praeclara underwing moth and for the white admiral and the striped hairstreak butterflies.

**Culture:** Transplant balled or container grown plants into moist, well-drained acid soil. Will tolerate full sun or partial shade. Does not require pruning but older, weak stems should be removed when they start to show decline to prevent them from acting as reservoirs for disease. Is not tolerant of stress. [This variety is used interchangeably by nursery men with Amelanchier Canadensis. A. Canadensis (Shadblow Serviceberry) is a shrub with erect stems, spreading by means of sucker growths from the base. The tree is smaller, the flower petals are more uniformly obovate and smaller. The fall color is yellow and gold.]

**Diseases and insects:** Leaf spot, rusts and stem cankers. Nothing serious.

**Note:** The fruits are high in vitamin C and are used to prepare jams and jellies and pies. Also known as Downy Serviceberry or Juneberry.

**SHEEP LAUREL** (*Kalmia angustifolia*)

**Family:** Ericaceae

**Zones:** 1 to 7

**Habit:** Low growing, blue green, evergreen shrub of two forms.

One is a compact, tufted grower; the other thin and open. Can thrive in mountains and along the Atlantic coast, in cold bogs and dry upland woods. Scurfy, suckering from underground rhizome.

**Exposure:** Sun to shade.

**Soil:** Acidic – boggy wet to sandy-dry

**Size:** Height: 1 to 3 feet, width: 2 to 4 feet.

**Leaves:** Opposite or whorled, simple, leathery evergreen oblong to elliptic, 1 to 2 ½ inches long, ¼ to ¾ inch wide. Obtuse or sub-acute, entire, petiole—1/6 1/3 inch long.

**Leaf Color:** Blue-green above, red-brown beneath when young, later paler.

**Buds:** terminal or pseudo-terminal bearing elongated inflorescences; lateral buds hidden behind petiole and virtually imbedded in stem. Smallish.

**Flowers:** Usually rose pink to purplish crimson, ½ inch across in corymbs that can be up to 2 inches in diameter. Blooms June/ July.

**Fruit:** Brown, 5 valved, dehiscent capsule, ¼ inch across, persistent through winter.

**Stem:** Round, glabrous

**Bark:** gray brown, striated to lightly ridged and furrowed, gnarly, crooked branches.

**Growth Rate:** Slow, 4 to 8 feet over a 10 year period.

**Wildlife:** Leaves contain andromedotoxin which may be poisonous to livestock if eaten in large amounts. Deer are partially immune.

**Culture:** Easy to transplant because of fibrous root system. Requires acid, cool, moist, well drained soil, full sun or deep shade but flowers best in sunnier locations. Remove flowers immediately after fading. Mulch to keep soil moist..

**Diseases and Insects:** Leaf spot, blight, flower blight, whitefly, scale, lace bug, azelea borer and rhododendron borer.

**Note:** Wood is used for rustic furniture.

**SPICEBUSH** (*Lindera benzoin*)

**Family:** Lauraceae

**Zones:** 4 to 9

**Habit:** Multi-stemmed , understory shrub, rounded in outline, somewhat loose and open in the wild; full and dense in the sun.

**Exposure:** Full sun or half shade.

**Soil:** Moist, well drained grows well on both acidic and alkaline soils (pH5.0 to 7.5).

**Size:** 6 to 12 feet high with similar spread.

**Leaves:** Alternate, simple, oblong-obovate, 3 to 5 inches long, 1 to 2 ½ wide, acute or short acuminate, cuneate abase, entire, margins ciliate; petiole— ¼ to ½ inch long.

**Leaf Color:** Light green in summer, changing to yellow in fall.

**Buds:** Small, superimposed, upper collaterally arranged producing green ovoid, stalked flower buds, vegetative buds with 3 scales, end bud lacking.

**Flowers:** Dioecious, light yellow, fragrant, 1/5 inch diameter, April before the leaves, in axillary clusters. Small, five petals, with males and females on different trees. Male flowers have a cluster of stamens.

**Fruit:** Oval drupe, 1/3 to ½ inch long, bright scarlet, September, borne on pistillate plants.

**Stem:** Rounded, slender, green or olive brown with pale lenticels; pith – large, round, white, continuous.

**Bark:** Dark gray-brown that is smooth to the eye, but rough to the touch.

**Growth Rate:** slow to medium.

**Wildlife:** Good early season nectar source, excellent forage for birds. Preferred larval host of the white spicebush swallowtail butterfly. (Mint green caterpillars)

**Culture:** Difficult to transplant because of coarsely fibrous root system. Somewhat slow to reestablish. Moist, well drained soils.

**Diseases and insects:** None serious.

**Note:** All parts of the plant are aromatic when broken. National champion is 20 feet by 20 feet in Jefferson National Forest, Va.

**SWAMP AZALEA** (*Rhododendron viscosum*)

**Family:** Ericaceae

**Zones:** 4 to 9

**Habit:** Loose, open with numerous spreading, hispid branches. Found in swamps in the south and along fresh water ponds on Cape Cod. Forms multi-suckering clumps to form a rounded crown over a narrow base.

**Exposure:** Sun to light shade.

**Soil:** Moist to wet.

**Size:** Height: 4 to 15 feet; width: 3 to 5 feet.

**Leaves:** Small, lustrous green, sometimes with a glaucous cast below.

**Flowers:** Small flowers, white to pink, equipped with very long tubes seemingly out of proportion with the narrow corolla. Blooms in summer with a honeysuckle / clove fragrance. Anther filaments vary from white to rich purple-red.

**Wildlife:** Hummingbirds.

**Culture:** Use container grown plants in damp organic soil.

**Note:** There are over 900 species of *Rhododendrons*. Azaleas are included in genus *Rhododendron* but tend to be deciduous rather than evergreen. Azalea flowers have mostly 5 stamens, the leaves are frequently pubescent and never dotted with scales. Azalea flowers are funnel shaped rather than bell shaped. Swamp Azalea is also known as Stickybud Azalea

**SWEET PEPPERBUSH** (*Clethra alnifolia*)

**Family:** Clethraceae

**Zones:** 4 to 9

**Habit:** Oval round-topped, erect, dense leafy shrub, often suckering to form broad colonies.

**Exposure:** Partial shade / full sun

**Soil:** Moist, organic, acid

**Size:** 4 to 8 feet high and 4 to 6 feet wide. Varies with soil.

**Leaves:** Alternate, simple obovate-oblong, 1 ½ to 4 inches long ¾ to 2 inches wide. Acute to short acuminate, cuneate, sharply serrate, usually entire toward base, glabrous or nearly so on both sides. Can be woolly tomentose below. Petiole—1/8 to ¾ in.

**Leaf Color:** Lustrous medium to deep green in summer; pale yellow to rich golden in fall.

**Buds:** Small, loosely scaled solitary, sessile, ovoid, pubescent, brown.

**Flowers:** Perfect, white, 5 petals, fragrant, 1/3 inch across, July to August, lasting 4 to 6 weeks.

**Fruit:** Dry 3 valved, dehiscent, subglobose, pubescent, 1/8 inch diameter capsule, persisting through winter.

**Stem:** Brown, pubescent, rounded or obscurely 3 sided; pith—light brown.

**Growth Rate:** Slow to medium.

**Wildlife:** Bees and midsummer nectar plant for numerous birds.

**Culture:** Transplant balled or container grown plant into moist acid soil which has been supplemented with organic matter.

**Diseases and insects:** Crinkling of terminal leaves on young plants in summer indicates Eriophyid mites. Generally pest free.

**Note:** Also known as Summersweet and *Clethra*

**TUPELO** (*Nyssa sylvatica*)

**Family:** Nyssaceae

**Zones:** 4 to 9

**Habit:** Somewhat pyramidal when young with densely set branches, some of which are pendulous. One of the few trees that can withstand decades of flooding resulting from altered hydrology. It is adapted to a wide range of light conditions, thriving in shade or full sun, often becoming sub-canopy in mature Red Maple forests.

**Exposure:** Sun to light shade.

**Soil:** Moist to wet

**Size:** Height 30 to 60 feet, width: 20 to 35 feet.

**Leaves:** Alternate, simple, ovate, obovate or elliptic, 3 to 6 inches long, 1 ½ to 3 inches wide, entire or remotely toothed, acute or obtusish, cuneate or sometimes rounded at the base.

**Leaf Color:** Lustrous dark green in summer changing to fluorescent yellow to orange to scarlet to purple colors in the fall.

**Buds :**Imbricate, 1/8 to ¼ inch long, ovoid, varicolored, yellow-brown to red-brown, smooth or slightly downy at tip, usually brownish at tip of scales.

**Flowers:** Polygamo dioecious, appearing with the leaves, small, greenish yellow. Female borne in 2 to 4 flowered axillary peduncled clusters. The male in many-flowered penduncled clusters.

**Fruit:** Oblong drupe, 3/8 to 1/2 inch long, bluish black ripening late September through early October.

**Stem:** slender, glabrous or nearly so, grayish to light reddish brown, producing numerous short slow growing spurs; pith – chambered.

**Bark:** Dark gray, brown, brown-black and at times black, broken into thick irregular ridges which are checked across into short segments, giving it an alligator hide appearance. Much variation in bark color and appearance.

**Growth Rate:** Slow to medium, 12 to 15 feet over a 10 to 15 year period. Can be accelerated with adequate water and fertility.

**Wildlife:** The fruits are eaten by Gray squirrel, Opossum, Black Bear and Whitetail Deer if reachable. Among the heaviest feeding birds are Mallard, Wood Duck, wild Turkey, Robin, Mockingbird, Catbird, Common Flicker, Eastern Bluebird, Red-bellied Woodpecker, ruffed Grouse, Purple finch, Red-eyed Vireo and Wood and Swainson's Thrush. The fallen trunks become basking sites for Eastern Painted Turtles, Spotter Turtles and Northern Water Snakes. Bees love the flower which makes great honey.

**Culture:** Difficult to transplant because of taproot. Move balled tree or small size container grown in early spring to moist, well drained acid soil (pH 5.5 to 6.5). Does not tolerate high pH. Is ok in full sun or semi-shade. Prefers to be sheltered from wind. Diseases and Insects: Cankers, leaf spots, rust, tupelo leaf miner and scale, a summer leaf spotting results in irregular black lesions.

**Note:** Tree is fire resistant and water resistant, but can not tolerate high winds. Soft yet strong and light wood is used as yokes and rollers in glass factories, crates, pulp, gun stocks and wheel hubs. Water resistant, it is also used for wharf pilings. The word "Beetlebung" is associated with a special clump of these trees in Chilmark. The wood was used to make 'beetles' or mallets to pound in bungs or plugs to close barrels of whale oil. Fruits can be used to make jams and jellies. The Cherokee prepared bark teas to control diarrhea and intestinal worms. Also known as Black Gum, Sour Gum and Pepperidge.



**WHITE CEDAR** (*Chamaecyparis thyoides*)

**Family:** Cupressaceae

**Zones:** 4 to 9

**Habit:** Slender column in youth forming a narrow, spire-like crown at maturity, devoid of branches for  $\frac{1}{2}$  to  $\frac{3}{4}$  of its length. An Atlantic coast tree, characteristic of fresh water swamps and bogs, wet depressions or stream banks. Is rarely found except on such sites. Extensive pure stands are the rule, occurring on shallow peat covered soils underlain with sand.

**Exposure:** light shade to sun.

**Soil:** Moist to wet, acid

**Size:** Height: 20 to 50 feet, width: 10 to 20feet.

**Leaves:** 1/10 to  $\frac{1}{2}$  inch long, lateral pairs boat-shaped with sharp pointed, spreading tips.

**Leaf Color:** Bluish green, glaucous green to bright green. Leaves turn brown the second year, but may persist on the tree

**Flowers:** Monoecious, small, staminate red or yellow and abundant; pistillate, green, few.

**Fruit:** Cones on small branchlets, globose, small ½ inch across, green to bluish purple, bloomy; scales 4 to 5, rarely 6, acute often with a reflexed base; seeds 1 or 2 on each scale, oblong; wing narrow, as broad as the seed.

**Stem:** Branches slender, rather irregularly arranged (not flattened), spreading, not decurving, very thin; spray orientation dependent on cultivar with some highly irregular, others somewhat flattened.

**Bark:** Thin, on old trunks ¾ to 1 inch thick, ashy gray to reddish brown, ridged and furrowed, intricately irregular.

**Growth Rate:** Medium: 25 feet in 20 years, depending on seed provenance, rates may approach fast.

**Culture:** Moist sandy soil and high atmospheric moisture. Prefers full sun and cannot compete with hardwood species. A stand of White Cedar is already extant on the edge of Great Pond. This needs to be protected and nurtured and spread encouraged.

**Diseases and Insects:** None serious.

**Note:** Also called Atlantic White Cedar and False-cypress. National champion is 88 feet tall and 42 feet wide, in Brewton, Al. In the north, size is curtailed by snow and ice which damage the older crowns and leave them broken.

**WINTERBERRY** (*Ilex verticillata*)

**Family:** Illiciaceae

**Zones:** 3 to 9

**Habit:** Oval-rounded to broad-rounded with a similar spread. Hardy wetland shrub.

**Exposure:** Sun to light shade.

**Soil:** Moist to wet, acidic.

**Size:** Height: 6 to 10 feet; Width: 6 to 10 feet.

**Leaves:** Alternate, simple, 1 ½ to 3 inches long, ½ to 1 inch wide, elliptic or obovate to oblanceolate, acute or acuminate, cuneate, serrator double serrate. Petiole—1/4 to ½ “long.

**Leaf Color:** Dark green above, (varies) pubescent beneath at least on the veins. No significant fall color, sometimes yellow to purple tinged.

**Buds:** Imbricate, small 1/16 inch long, globose, brownish, smaller than leaf scar.

**Flowers:** Male in clusters of 6 or more in the leaf axils; Female flowers fewer, usually singly or in threes on Short peduncles.

**Fruit:** Berry-like rounded drupe, 2 to 7 pyrenes, bright red  $\frac{1}{4}$  to  $\frac{1}{2}$  across and often in pairs, ripening in late August-September and persisting into December to January.

**Stem:** Slender, angled, olive-brown to purplish brown, glabrous or finely pubescent, lenticelled. Second year stem develops an onion skin effect.

**Bark:** Dark gray to dark brown or black on old stems. Interesting architectural twist to the branches.

**Growth Rate:** Slow, can be induced to medium with fertilizer and water.

**Wildlife:** Fruits are important winter and spring forage for birds.

**Culture:** Requires male and female plants. Transplant balled or container grown plants to moist, acid (pH 4.5 to 6.5) high organic matter soils, in full sun or partial shade. Fruit will be best in full sun. Also check cultivars closely for size and color of fruit.

**Diseases and insects:** Tar spots, leaf spots and powdery mildew. Nothing serious.

**Note:** Choice of cultivars is important to the size and color of the fruit.

**WHITE PINE** (*Pinus strobus*)

**Family:** Pinaceae

**Zones:** 3 – 8

**Habit:** In youth a symmetrical pyramid. In middle age and later, the crown is composed of several horizontal and ascending branches, plume-like in outline.

**Exposure:** Sun to light shade.

**Soil:** Moist to dry, acidic.

**Size:** Height: 60 to 90 feet; width: 25 to 40 feet.

**Leaves:** Needle like, in fascicles of five, thin, flexible, drooping, 3 to 5 inches long. Margins finely toothed. The fascicle sheath falls away at the end of the first season. The needles turn yellow and drop off in the fall of the second season or the spring of the third.

**Leaf Color:** Light to bluish green. Greatly variable. Needles generally fall the second year in late summer or early fall and the interior of the tree harbors yellow-brown needles.

**Buds:** Ovoid with a sharp point, ¼ inch long, resinous, some scales free at the tips.

**Flowers:** Monoecious; staminate clustered, yellow; pistillate pink.

**Fruit:** Cones subterminal, pendent, 3 to 7 inches long by 1 ½ inch broad, stalked cylindrical, often curved, apex pointed, resinous and light brown; mature in autumn of second year.

**Bark:** Thin, smooth, grayish green when young, becoming darker with age; dark grayish brown on old trunks and deeply furrowed longitudinally into broad scaly, 1 to 2 inch thick ridges.

**Growth Rate:** Fast. 50 to 75 feet tall in 25 to 40 years.

**Wildlife:** Birds and mammals feed on the seeds and nest in the trunks.

**Culture:** Easily transplanted because of wide-spreading and moderately deep root system with only a vestige of tap root. Does best on fertile, moist, well drained soil. Wants sun and humid atmosphere. Can tolerate some shade. Is susceptible to sweeping winds and branches can be lost in strong storms. Is intolerant of air pollutants and may develop chlorosis in high pH soils. are it

**Diseases and insects:** Two serious pests include the White Pine blister rust, a bark disease which eventually kills the tree; and the White Pine weevil which kills the terminal shoots thus seriously deforming the tree and giving it a bushy look.

**Note:** Largest recorded individual in Massachusetts is in Monterey. It is 20 feet in circumference, 79 feet tall and has a spread of 81 feet. This is the only eastern member of the 5 needle group. It is the only Eastern species that once rivaled western trees in height and girth. The big specimens have been cut, many in the 18<sup>th</sup> century for use by the British Navy for which they were referred to as king's pines. The knotty white wood is prized for furniture and timbers.

## **GROUND COVER**

**BEARBERRY:** (*Arctostaphylos uva-ursi*)

**Family:** Ericaceae.

**Habit:** Low growing, glossy leaved evergreen; forms thick mats. Salt tolerant.

**Exposure:** Full sun or partial shade.

**Soil:** poor, sandy, infertile soils; pH4.5 to 5.5

**Size:** 6 to 12 inches.

**Leaves:** Alternate, simple, obovate.

**Leaf Color:** Lustrous dark green above, lighter underneath in summer, bronze in fall and winter.

**Buds:** Solitary, sessile, ovoid with about 3 exposed scales.

**Flowers:** Perfect, white tinged pink, small 1/6 to 1/4 inch long, urn-shaped, April to May, borne in nodding racemes.

**Fruit:** Fleshy drupe, lustrous bright red, 1/4 to 1/3 inch diameter, late July through August and persisting.

**Growth Rate:** Slow.

**Culture:** Full to part sun, sandy soil, pruning not necessary. Never fertilize.

**Diseases and Insects:** Black mildew, leaf galls and rust.

**Note:** Also called Kinnikinick, Mealberry, Hog Cranberry, Sandberry, Mountain Box, Bear's Grape. Already extant in Wiley Park.

**STRIPED PIPSISSEWA** (*Chimaphila maculata*)

**Family:** Pyrolaceae

**Habit:** Low, rhizomatous, suffrutescent, perennial herbs.

**Exposure:** Shade

**Soil:** Humus rich, acidic.

**Leaves:** Alternate, opposite or subverticillate, lanceolate, thick and shining, toothed.

**Leaf Color:** Dark green with white striations along the midrib and principal side veins.

**Flowers:** White or pink, few, in terminal umbels or corymbs on a long peduncle, rarely solitary, calyx 5-parted, petals 5, stamens 10.

**Culture:** Difficult to grow. They need to be shipped with substantial root systems and planted under mature trees into rich acidic soil.

**Note:** Also called Spotted Wintergreen, although there is no relation to Wintergreen.

**WINTERGREEN** (*Galutheria procumbens*)

**Family:** Ericaceae

**Habit:** Creeping evergreen ground cover.

**Soil:** Moist to dry upland woods.

**Size:** 6 inch, lying flat (*procumbens*)

**Leaves:** Alternate, simple, evergreen, oval to obovate, rare suborbicular,  $\frac{3}{4}$  to 1  $\frac{1}{2}$  inch long,  $\frac{1}{2}$  to  $\frac{7}{8}$  inch wide, obtuse and apiculate, crenate-serrate often with bristly teeth. Strong aroma of wintergreen when bruised.

**Leaf Color:** Lustrous dark green above, turn reddish with the onset of cold weather.

**Flowers:** Perfect, pinkish white,  $\frac{1}{4}$  inch long, nodding, solitary, borne May through September.

**Fruit:** A many seeded berry, enclosed by enlarged, fleshy hypanthium forming a mealy, red or white berry.

**Culture:** Difficult. Acid soil, moist, high organic matter. Be sure to acquire locally appropriate cultivars.

**Note:** Used to be used for making tea.



## CLEARINGS

Clearings increase the amount and variety of wildlife.

Clearings are a part of the natural landscape. They are caused by flooding, fire, windstorm, infestation and certain conditions of soil, rainfall and exposure.

Clearings create an opportunity for the sun to reach the ground and to encourage grasses and weeds to grow.

Clearings allow the trees at the edge to spread out, offering easily reached food and shelter for wildlife.

Clearings should be small, one half to one acre plots situated every quarter mile or so.

There is already one clearing in Wiley Park that should be maintained in its present state.

Lop upshoots annually.

Maintain the perimeter by keeping the forest from encroaching.

Leave grasses in place.

As possibilities arise, consider adding other clearings. For example it may not be necessary or desirable to replant all the pitch pines that die. Some area could be left as a clearing. South and west exposures are best.

## ALTERNATE TREE OPTIONS

This handbook does not contain a comprehensive list of all the species that were native to Cape Cod in 1651. The trees chosen represent a cross section of what was here. If substitutions are made, care should be taken to insure that the correct variety is selected. For example, Gray Birch is not the same as White Birch, (Canoe Birch) which is not indigenous to this area. Flowering Dogwood has so many disease and insect problems, that it is not a good introduction at this time. When a disease resistant strain is produced, as with the American Elm, than it may be worth pursuing. The following is a short list of other trees, considered but not included in this handbook.

Common Chokecherry (*Prunus virginiana*)

Flowering Dogwood (*Cornus florida*)

Gray Birch (*Betula populifolia*)

Pignut Hickory (*Carya glabra*)

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### **PURCHASING POINTS**

**American Beech:**

Dennis Murley  
Wellfleet Bay Wildlife  
Sanctuary

**American Elm**

Elm Research Institute  
867 Route 12 Unit 5  
Westmoreland, N.H. 03467  
(603) 358-6198

**American Holly:**

Local

**Bayberry:**

Local

**Beach Plum:**

Local

**Bearberry:**

Local

**Eastern Red Cedar:**

Local

**Highbush Blueberry:**

Local

**Mockernut Hickory:**

Reeseville Ridge Nursery  
512 South Main Street  
Reeseville, Wi 53579  
(920) 927-3291  
[rrn@charter.net](mailto:rrn@charter.net)  
(Wholesaler)

**Pipsissewa:**

1) Arrowhead Alpines  
(517)223-3581  
[arrowheadalpines.com](http://arrowheadalpines.com)  
2) Wildflower Nursery  
4920 N.E. 25-70  
Marshall, N.C. 28753  
(828) 656-2723

**Pitch Pine:**

Local

**Red Maple:**

Local

**Sassafras:**

The Garden In The Woods  
NE Wild Flower Society  
180 Hemenway Rd  
Framingham, Ma 01701  
(508) 877-7360  
[www.newfs.org](http://www.newfs.org)

**Shadbush:**

**Spicebush:**

**Swamp Azalea:**

Local

**Sweet Pepperbush:**

Local

**Tupelo:**

**White Cedar:**

Reeseville Ridge Nursery  
512 South Main Street  
Reeseville, WI 53579  
(920) 927-3291  
[rrn@charter.net](mailto:rrn@charter.net)  
(Wholesale)

**White Pine:**

Local

**Winterberry:**

Local

**Wintergreen:**

Local

**NOTES**

## **GLOSSARY**

**Acuminate:** Gradually tapering to a sharp point.

**Anther:** The pollen bearing part of the stamen.

**Apetalous:** Without petals.

**Appressed:** Pressed close against the stem.

**Axil:** Point where stem connects to leaf.

**Bristle:** A stiff hair.

**Bract:** A modified leaf, associated with, but not part of a flower.

**Calyx:** All of the sepals of a flower.

**Catkin:** Dense, scaley-bracted spike or raceme bearing many small apetalous flowers.

**Chlorosis:** Yellowing between veins.

**Ciliate:** Having a fringe of marginal hairs.

**Cordate:** Heart shaped, with the point facing upward.

**Corolla:** The petals of a flower taken as a group.

**Corymb:** Flat topped, contracted raceme with outer pedicels progressively longer than the inner.

**Cuneate:** Wedge shaped, attached at the narrow end.

**Deciduous:** Loses its leaves in winter. Not evergreen.

**Dioecious:** Male and female flowers borne on separate plants.

**Drupe:** Fleshy fruit with usually solitary seed enclosed in a stony endocarp.

**Entire:** A margin without teeth, lobes or divisions.

**Exserted:** Projecting beyond.

**Fasicle:** A close cluster.

**Filiment:** Stalk of the stamen.

**Glabrous:** Not hairy.

**Glacous:** Covered with a waxy bloom.

**Glandular:** bearing oil secreting organs.

**Glandular-pubescent:** glands and hair intermixed.

**Hispid:** With coarse, stiff, bristly hair.

**Husk:** Outer covering of seed or fruit.

**Imbricate:** Overlapped or shingled, vertically or spirally.

**Inflorescence:** Cluster of flowers.

**Involucre:** Collection of bracts beneath a flower or flower cluster.

**Lanceolate:** Lance shaped, much longer than wide, widest below the middle, tapering to the tip and tapered or rounded to the base.

**Lenticel:** A slightly raised corky area in the bark.

**Lobe:** A projecting part.

**Margin:** The edge of the leaf.

**Monoecious:** Both sex flowers on the same plant.

**Ob lanceolate:** Inversely lanceolate.

**Obtuse:** Blunt, rounded at the end.

**Obvoid:** Three dimensionally egg shaped.

**Ovate:** Having the outline of an egg.

**Perfect Flower:** having both functional pistils and stamens.

**Petiole:** The leaf stalk.

**Peduncule:** The primary stalk attaching a flower to the stem.

**Pith:** The spongy center of a stem.

**Polygamo:** Unisex and bi-sex flowers on the same plant.

**Pome:** Type of fleshy fruit.

**Pubescent:** Covered with short soft hairs.

**Raceme:** Unbranched cluster of pedunculate flowers.

**Samara:** Fruit bearing a wing.

**Scale:** A small, usually dried bract.

**Scurfy:** Covered with bran like particles.

**Sericeous:** Silky, covered with long, slender soft, hairs.

**Serrate:** With sharp, forward pointing teeth along the margin.

**Sessile:** Without a stalk, attached directly.

**Sinus:** The space or recess between two lobes.

**Staminate:** Imperfect flower with only functional stamens and no functional pistil.

**Tomentose:** Densely woolly, the hair soft and matted.

**Tomentulose:** Minutely tomentose.

**Unisexual Flower:** A flower having stamens or pistils, but not both.

**Vesicle:** A small bladdery sac or cavity filled with air or fluid.

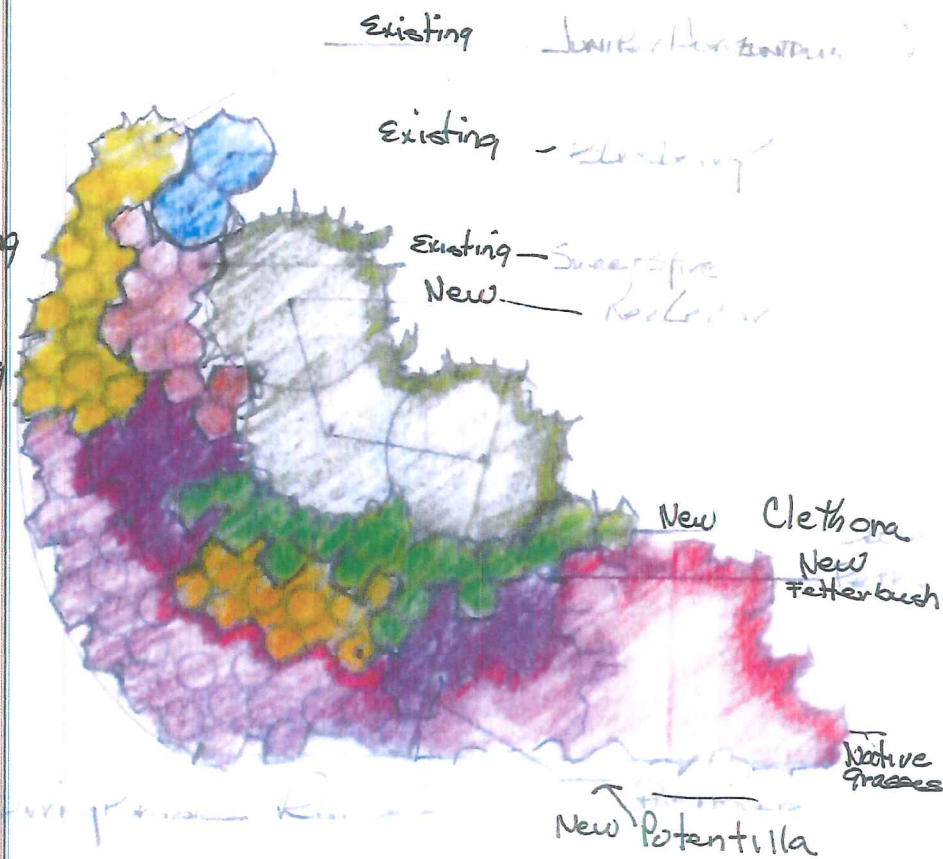
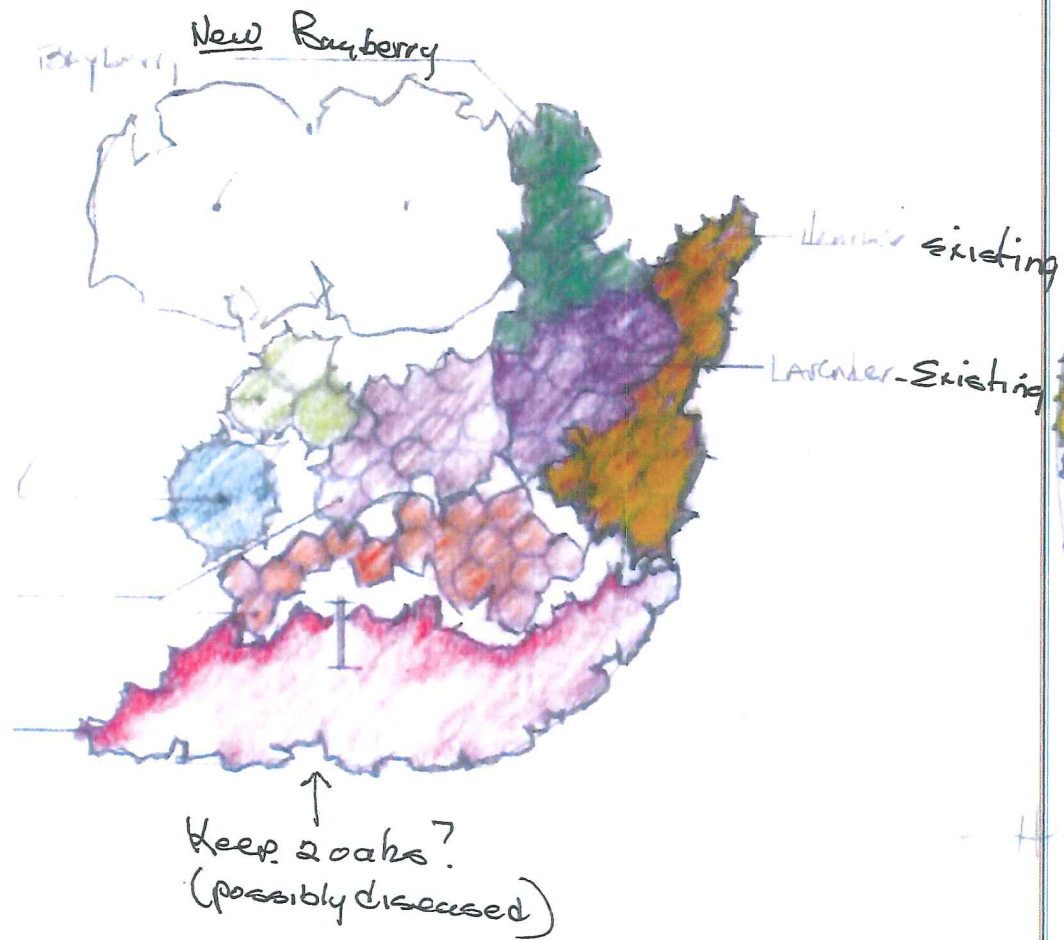
**Viscid:** Sticky or glutinous.

**Whorl:** Arrangement of three or more similar structures in a ring, arising from a single node.

**Zigzag:** Bent back and forth at the nodes.

Friends of the Eastham 1651 Arboretum  
Wiley Park Entrance

1. The entrance to Wiley park is not visible heading north on Herring Brook Rd until reaching entrance road —
2. 1651 Arboretum wishes to enhance the plantings on the south side of Herring Brook Rd. (right side of entrance).
3. See our professional planting scheme for this enhancement as shown on the Plan; a. to remove old pine (scrub) + Oak tree diseased.
4. After approval from C.C., D.S., F.A.C., and possibly the selectmen, we would then approach C.P.A. for funding.
5. After approval by C.P.A., (hopefully) then before the voters of Eastham for their vote, in May of 2015. Then we would have the winner of the bidding process begin the work in the fall of 2015, possibly in late October for a successful planting.
6. This has been worked on for 2 years.



Plan by Misty Hill  
mulching  
180 yds. loam  
Hydro seed wildflowers - in back  
+ native grasses - in front

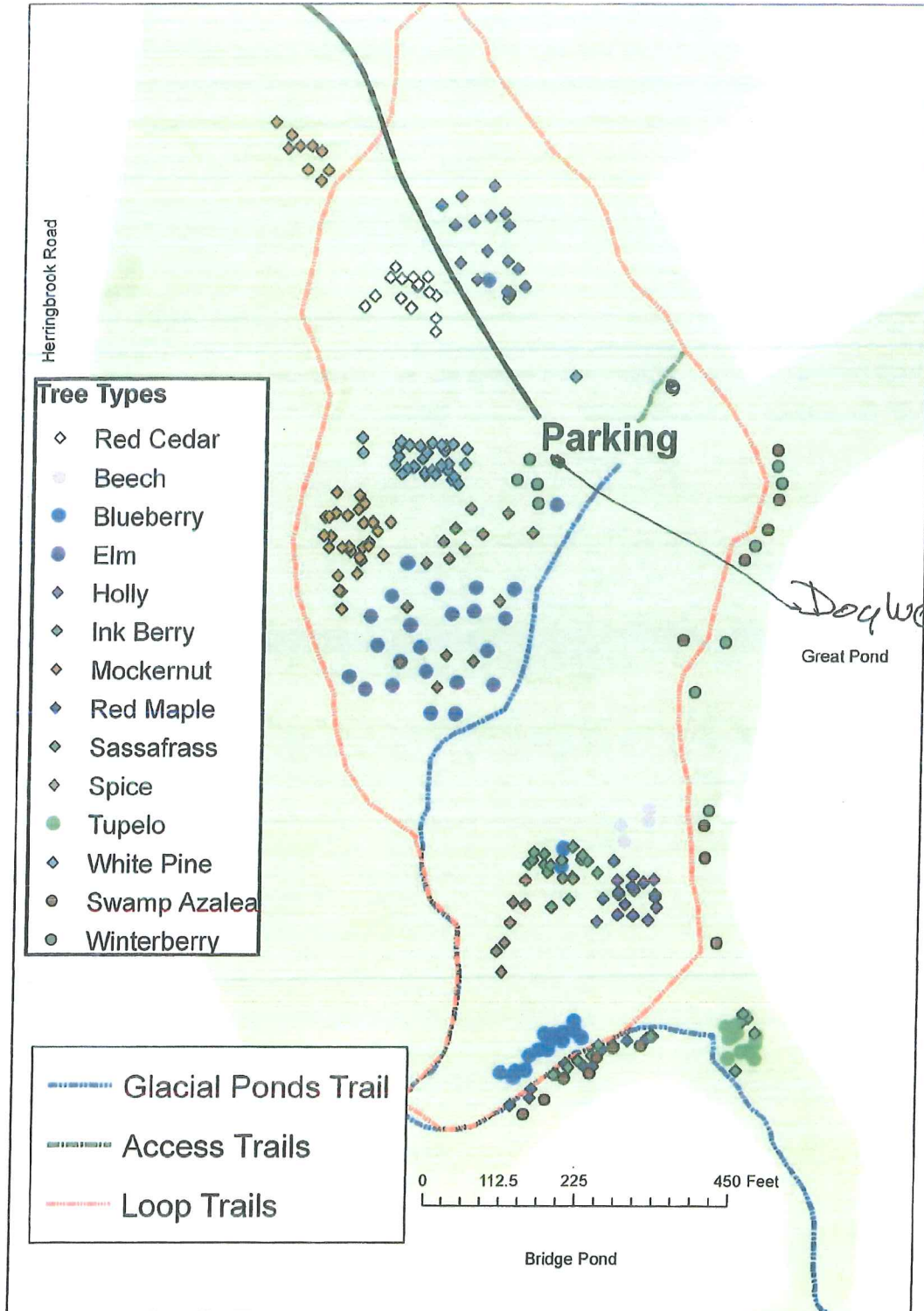
1. remove lg pitchpines
2. 1 white pine (damaged)
3. 1 oak (diseased)



## Friends of the Eastern 1651 Arboretum

- 1.) Plan for memorial planting of *Cornus florida* (dogwood) for 10-25-14 @ 10:00 A.M.  
In memory of Rex Peterson
- 2.) Map shows approximate site of the planting.

# 1651 Trees in Wiley Park



Updated June 3, 2014