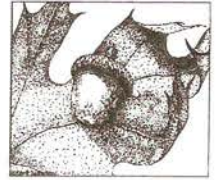


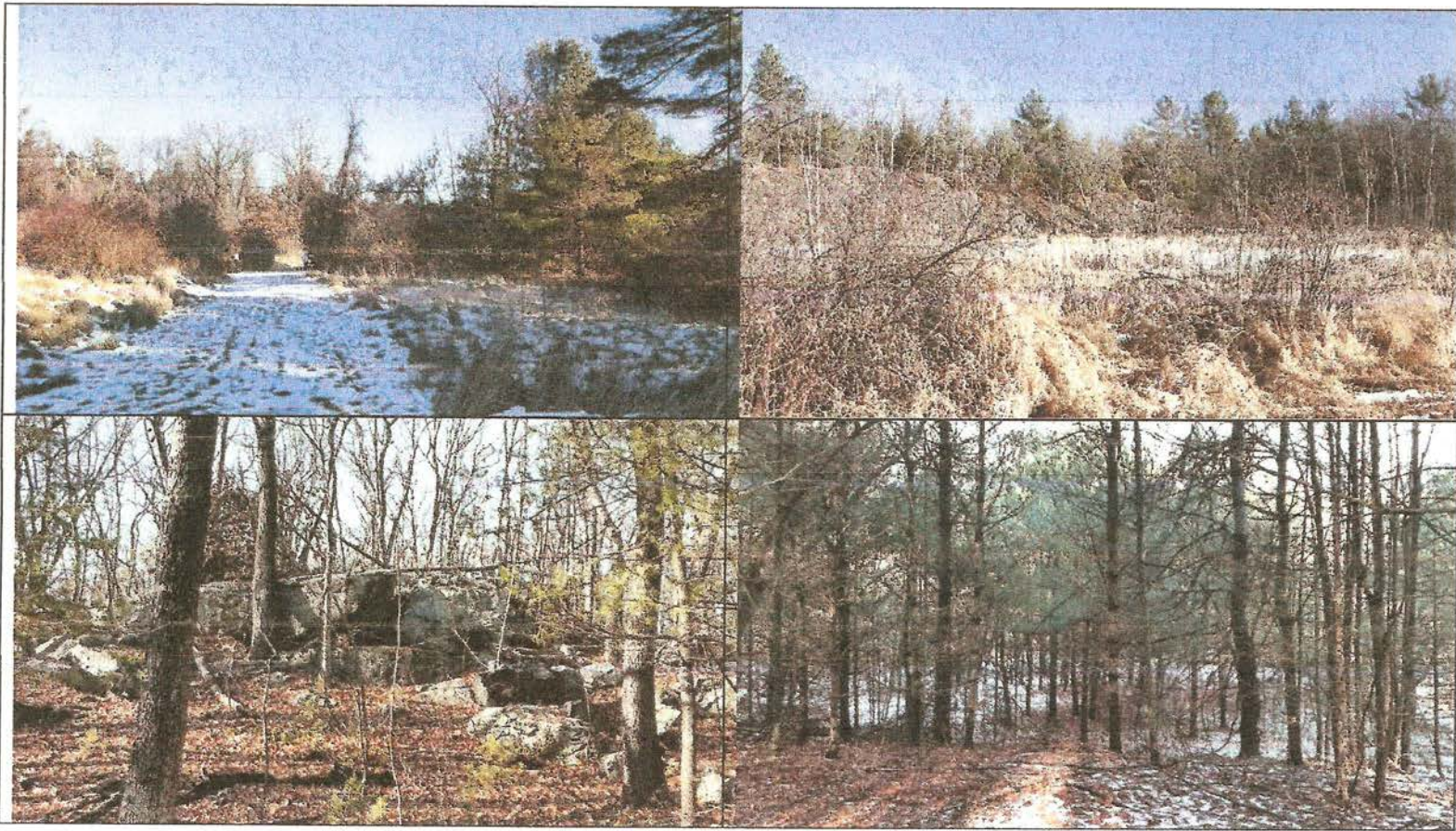


Final - submitted to DCR
copy 6/1/17



Woodland Enhancement Plan

DCR Working Forest Initiative



Rauscher Farm
Owned by the Town of Clinton
Located in Clinton, Massachusetts

Prepared by:



Michael Barry
468 South Mountain Road
Northfield, MA 01360

dcr



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. ☐ recert. ☐ amend. ☐	CH61A cert. ☐ recert. ☐ amend. ☐	CH61B cert. ☐ recert. ☐ amend. ☐	STWSHP new ☒ renew ☐ FSC ☐ Conservation Rest. ☐ CR Holder _____	C-S EEA ☒ Other ☐ Birds ☐
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 _____
	Concord _____

OWNER, PROPERTY, and PREPARER INFORMATION

Property Owner(s) Town of Clinton

Mailing Address Clinton Town Hall; 242 Church Street; Clinton, MA 01510 Phone (978) 365-4127

Email Address _____

Property Location: Town(s) Clinton Road(s) Clamshell Road

Plan Preparer Michael Barry and Eric Brown - BSFS Mass Forester License # 11

Mailing Address 468 South Mountain Road; Northfield, MA 01360 Phone (774) 364-4192

RECORDS

Assessor's Map No.	Lot/Parcel No.	Deed Book	Deed Page	Total Acres	Ch 61/61A 61B Excluded Acres	Ch.61/61A 61B Certified Acres	Stewshp Excluded Acres	Stewshp Acres
116	2752	43036	72	60.95	0	0	1.75	59.2
TOTALS				60.950	0.000	0.000	1.750	59.200

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

Excluded Area consists of 1.7 acres including buildings, parking areas and associated land uses at the entrance to the property. The location of these features is shown on the Forest Stand Map included in this plan.

HISTORY Year acquired 2008 Year management began 2008

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

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

stand no. N/A treatment _____ reason _____

(if additional space needed, continue on separate page)

Previous Management Practices (last 10 years)

Stand #	Cutting Plan #	Treatment	Yield	Acres	Date
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N/A

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

Landowner Goals

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

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

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

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

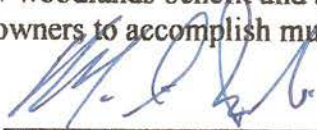
Improve & maintain plant & animal habitats, control invasive vegetation, support public access, and promote biodiversity through strategic management & maintenance.

Stewardship Purpose

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

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

Signature(s):



Date:

9/26/17

Owner(s) (print) Town of Clinton

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

Page 2 of 32



Property Overview, Regional Significance, and Management Summary

Rauscher Farm is located in Clinton, Massachusetts on Clamshell Road. The property was acquired by the town in June of 2008 to be conserved and protected from development. The property contains a substantial component of open space, very close to the urban center of Clinton. To assess the landscape in which this property occurs, the surrounding 1500 acres were considered. In this region, the most dominant land uses are forest land (~40%); developed land, including residential, urban and commercial uses (~38%); open water, including Wachusett Reservoir, Lancaster Millpond and Clamshell Pond (~15%) and non-forested wetlands (~6%). There were no other substantial grassland habitats or open fields observed in the landscape considered. In this landscape context, this property is very unique.

There is a substantial component of other protected open space in the vicinity. Protected watershed lands surrounding the Wachusett Reservoir consist of over 1500 acres. Other protected lands include the Wachusett Woodlands CR in Berlin, consisting of 158 acres; Garfield Woods, owned by the Sudbury Valley Trustees with almost 100 acres; and other lands in this vicinity under the control of the Berlin Conservation Commission, consisting of an additional 100 acres. This region contains a lot of development along with a good component of forest land. Protecting this natural resource in this context is especially important, as additional fragmentation and loss of natural spaces can have a serious impact in this type of landscape.

The property considered in this plan is 59 acres in size. For a property of this size, there is an extensive amount of diversity in the habitat types and conditions. The main forest types include white pine/hardwood, white pine/oak, white pine, and a small red pine plantation. Other areas include grassland habitats, abandoned pasture land, and a shallow marsh area. With the mosaic of these different conditions, this property provides a very interesting area for recreational users who hike on the trails and walk in the open areas.

The forested areas on this property are in fair health at this time. From the perspective of timber values, these areas are somewhat limited. Factors that contribute to the challenges of timber management on this property include the small total acreage of forest, somewhat difficult access, and a substantial component of trees with poor form or defects which reduce their value for forest products. Alternatively, these areas provide very good wildlife habitat characteristics, and have good potential for management for diversity of wildlife habitat.

The most substantial forest health issue on the property is the presence of exotic, invasive plants. Invasive plants are originally from other regions of the world, and have not evolved along with our native flora and fauna. As a result, these species are not the target of most native insect pests, so they tend to be more successful than native plants. In addition, invasive plants have characteristics that allow them to spread rapidly, especially in disturbed sites with bare ground and open sunlight conditions. Native plants have the ability to halt natural forest succession, and reduce the forest health by causing a decline in the diversity of vegetation in the ecosystem. Invasive plants that occur on this property include Oriental bittersweet, common buckthorn, glossy buckthorn, Norway maple, Japanese barberry and Japanese knotweed. While it can take an extensive effort, these plants can be kept in check with appropriate control strategies. This can take several years to implement, but the resulting natural communities that consist of native plants can be well worth the effort. Monitoring for new outbreaks is always important, as it is much easier to control a small, new infestation, than an extensive area of established invasive plants.



Property Overview, Regional Significance, and Management Summary

A number of factors across all levels of the woods affect how different birds will use a forest as habitat. On the forest floor, leaf litter is home to insects, mites, and spiders, important food sources for many birds. A thick deciduous leaf litter layer is important for ovenbirds to construct ground nests. Downed woody material, both coarse and fine, is also an important feature for woodland birds, providing perch sites for singing and courtship displays habitat for insects and other arthropods. In the understory, vegetation less than 5' tall provides nest sites, foraging substrates, and protective cover for a number of forest-dwelling birds such as Black-throated Blue Warbler and Wood Thrush. Sugar maple, American beech, hobblebush, red spruce, Rubus spp. (raspberry/blackberry), and striped maple are especially important. The midstory forest layer (between 5' and 30') is most commonly utilized for nesting by Wood Thrush, American Redstart, Black-throated Green Warbler, and Blue-headed Vireo. For both the mid and understory, the higher the density of stems, the more beneficial the habitat is. Forest canopy conditions such as canopy height, distribution, and composition play a role in what birds are able to use the site for habitat. Snags and cavity trees in the forest provide another important habitat feature. Yellow birches are an especially important species for forest birds, providing food directly (in the form of seeds), and indirectly (through the insects which live in the bark). Through well thought-out multi-resource forest management, it is possible to grow high quality sawtimber while simultaneously maintaining excellent habitat for birds and other wildlife species.

There are several features providing for good wildlife habitat conditions on this property. The differing forest types and open areas provide excellent conditions for many wildlife species. Where oak occurs on the property, it provides an excellent food source for small and large mammals in the form of hard mast (acorns). The streams and wetland areas provide a distinct change from the upland forest. In the transition areas between the forest and the open fields, wildlife diversity is quite high. There are many species that specialize in this "edge" habitat, and will benefit from these conditions on this parcel. While open grassland habitats are quite important, the areas on this property are somewhat limited in this benefit due their size. Management practices can be implemented to connect the smaller grasslands so that they are perceived as a larger single area by many of the bird species that are likely to utilize this habitat. Other management strategies can be implemented to enhance the forest habitat conditions as well. Practices such as the creation of snags (standing dead trees), creating brush piles, and felling and leaving trees to increase coarse woody material can provide significant benefits for many species.

There is substantial evidence on this property of the past land use. This property contains stone walls and wire fences both within the property and along the property boundaries. These feature show the agricultural history of this area. Agricultural use of this region hit its peak in the mid 1800's, when most of the land was cleared, and forests occurred mainly in small woodlots and areas difficult to access. More recent land use includes maintaining active hayfields and pasture areas that are still present and managed for wildlife habitat. As time goes on, it may be more difficult to observe the region's agricultural history, but the condition of the forest will always be a result of past land use decisions. In the same way, the management decisions that occur here at this time will impact the condition of the next generation of forest. By being good stewards of the land, we can help to ensure that the forest remains healthy and productive in the long term, and can provide the same benefits in the future that it does today.



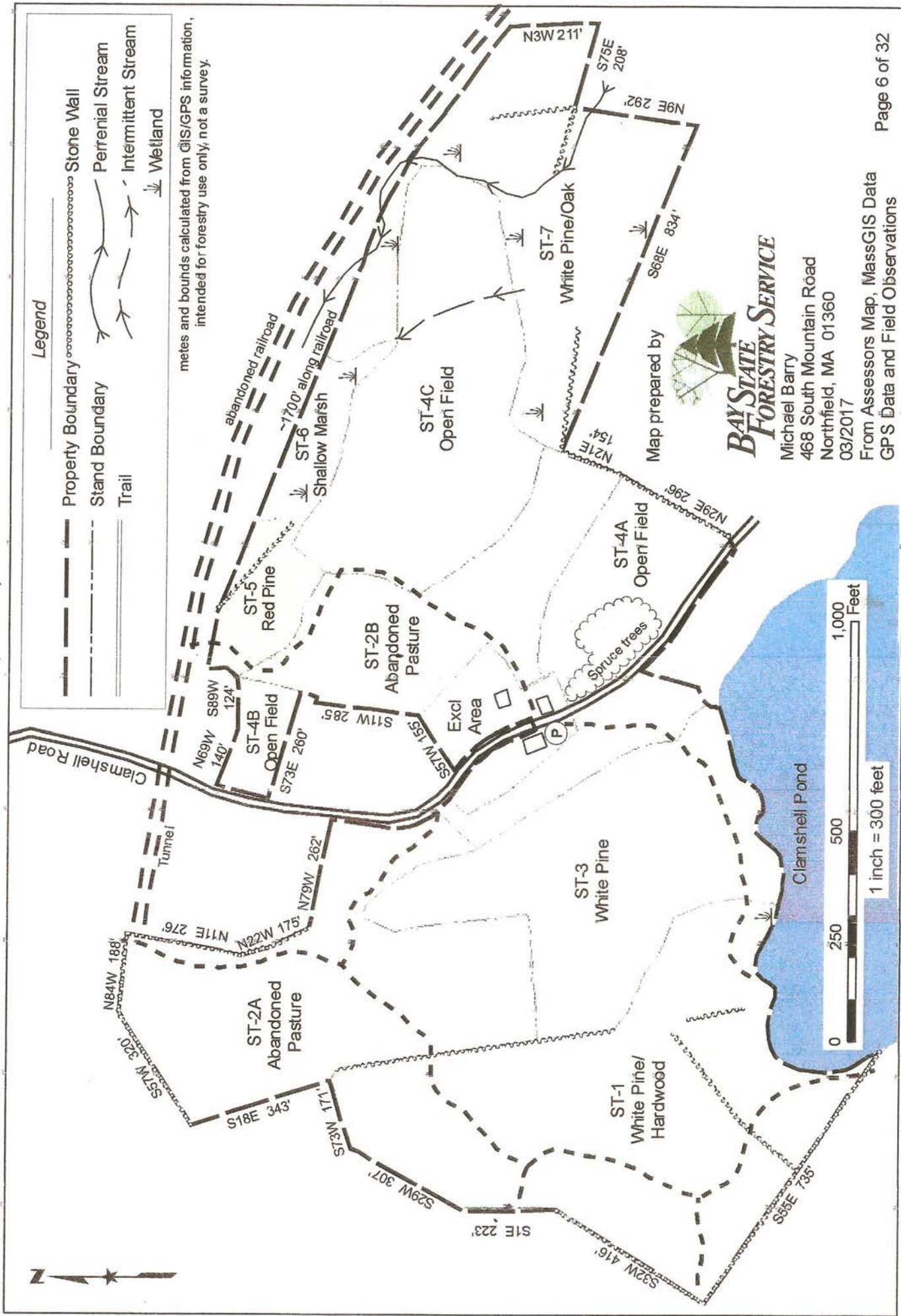
Property Overview, Regional Significance, and Management Summary

This property plays a significant role in protecting open space in the area. The lot is of moderate size by itself, but it is a part of a much larger natural landscape. Multiple ownerships in this area make up a substantial forested tract, which provides great value for wildlife habitats, recreation, aesthetics, and protection of water quality. Good stewardship of this property will allow for this area to continue to provide very good ecosystem services, as well as to provide excellent recreational opportunities for many people.

Management practices on this parcel include invasive plant control and enhancement of wildlife habitat conditions in the forest such as increasing coarse and fine woody debris; establishing snags; creating gaps in the forest canopy to enhance vertical structure; and establishing young forest habitat. Maintaining and enhancing trails will also be a primary goal in the stewardship of this land. Conducting these activities will allow the landowners to meet their goals for forest aesthetics, wildlife habitat, recreational opportunities and conservation of forest land. Conducting management activities in a conscientious manner will allow this property to serve as an example of the good work that can be done for the good of the forest and the community in the short and long term.

Property Boundary and Forest Stand Map

Rauscher Farm
Owned by the Town of Clinton
Located on Clamshell Road, Clinton, Massachusetts



Rauscher Farm
Owned by the Town of Clinton

This topographic map of Clinton, Massachusetts, features a yellow background with brown contour lines indicating elevation. The town boundary is outlined in a thick black line. Key landmarks include the Clinton High School, Elementary School, Library, and Armory in the north. The town is bordered by Woodlawn Corn to the northwest and West Berlin to the southeast. Notable hills include Burdett Hill, Reubens Hill, and Rattlesnake Hill. Water features include Coachace Pond, Glamschoh Pond, and the Carrille Brook. The map also shows various streets, a playground, and a pumping station. A scale bar at the bottom left indicates distances up to 4,000 feet, and a north arrow is located in the top right corner.

Map prepared by

BAY STATE FORESTRY SERVICE

Michael Barry
468 South Mountain Road
Northfield, MA 01360
03/2017

0 1,000 2,000 4,000 Feet

1 inch = 1,500 feet

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Forest Stands

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

Summary of the Forest Stands on your property

Stand	Forest/Habitat Type	Approx. Size (acres)	Notes
1	White Pine/Hardwood Forest	14.5 acres	Patchy pine and hardwoods with varying density/size class
2	Abandoned Pasture	2A: 8.6 acres 2B: 5.0 acres	Open grassland areas with islands and edges of hardwood forest
3	White Pine Forest	7.1 acres	Dense white pine stand on a knoll north of Clamshell Pond
4	Open Field/Grassland Habitat	4A: 4.7 acres 4B: 1.0 acres 4C: 7.8 acres	Open fields, previously used for hay/pasture, maintained in grassland habitat
5	Red Pine Plantation/ Hardwood Forest	1.5 acres	Mixed species forest with some plantation
6	Shallow Marsh	1 acre	Wetland area between the old railroad grade and the large fields (stand 9)
7	White Pine/Oak Forest	8 acres	Hardwood forest with some patches of white pine, eastern extent of the property

STAND DESCRIPTIONS

Stand 1: White Pine/Hardwood Forest

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	1	WH	14.5	10.0	115	3.0 MBF 9.6 CDS	60-WP

General Description

Stand 1 is a white pine/hardwood forest located in the western extent of the property. This area contains a variety of conditions, without enough distinction to break out into separate forest stands. In some areas, hardwoods such as red oak, black oak, white oak, poplar, black birch, paper birch and hickory are prevalent. In other areas, there is a moderate component of white pine in the overstory, along with the hardwood species mentioned. In the southern region of this stand, pole to small-sawtimber sized trees are common. In the northern region, small sawtimber is prevalent with occasional larger trees in the medium to large sawtimber size (16 to 24 inches in diameter). This stand has developed from abandonment of farmland at different points in time, resulting in the current mosaic of conditions. Beneath the main tree canopy, there are low densities of tree regeneration and shrub layer plants. Where tree regeneration occurs, it consists of white pine, black birch, oak, red maple, hickory, poplar and black cherry. Common shrubs and other vegetation includes low-bush blueberry, huckleberry, grape vines, green briar, and occasional apple trees. Since a lot of this forest area is a young, developing forest, it is expected that the understory composition is sparse, due to the closed canopy condition. In much of this stand there is a moderate component of invasive plants, including Oriental bittersweet, common buckthorn and glossy buckthorn. These plants have the ability to hinder desired tree regeneration, and can cause decline and mortality of forest overstory trees.

This stand occurs on gentle slopes (some moderate), with variable aspects. Some parts of this stand contain somewhat ledgy conditions, but this is not extensive to the point to prevent access for forest management activities. The soils have been classified as Chatfield-Hollis Rock Outcrop Complex in most of the stand, with a small area of Whitman loam in a damp area near Clamshell Pond. Generally, the stand contains very well drained soils that are moderately productive for tree growth. Oak and pine will be the most productive species in these conditions in the long term. This stand will be managed to maintain the current forest type, and to promote a healthy forest dominated by native tree and shrub species. Maintaining the mosaic character of this forest will help to keep wildlife diversity high, as well as to keep a resilient forest that is resistant to disease and forest health problems.

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

Owner(s) Town of Clinton

Towns(s) Clinton

STAND DESCRIPTIONS

Stand 1 (continued):

Current Habitat Conditions

Tree Canopy >60 in height, some areas 50-60' in height

>80% canopy closure, no canopy gaps

Midstory Variable, ranging from low to medium/high

Species present: white pine, black birch, hickory, black cherry, cedar, poplar, red oak, apple, common buckthorn

Understory Generally, low, some isolated dense patches

Species present: white pine, red maple, red oak, hickory, green briar

Coarse and Fine Woody Material

Coarse woody material density – low to absent

Drumming logs – occasionally present

Fine woody material density – low

Leaf Litter Generally present, consisting of mixed hardwood leaves and some pine needles

Soft Mast Low densities

Species present: black cherry, apple

Hard Mast Medium densities

Species present: oak, hickory

Streams and Wetlands – Wetlands present in the vicinity of Clamshell Pond, generally absent further north

Desired Stand Conditions

Condition	Action	Responsibility birds that may benefit
Increase component of coarse and fine woody debris	Girdle and/or fell medium/large trees and retain them on site	ruffed grouse, woodpeckers, yellow-bellied sapsucker, white-breasted nuthatch
Maintain softwood component	Promote pine growth in existing patches	blue-headed vireo,
Increase soft-mast producing species	Promote black cherry, high-bush blueberry, viburnums	cedar waxwing, scarlet tanager (migration)

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Owner(s) Town of Clinton

Towns(s) Clinton

STAND DESCRIPTIONS

Stand 2: Abandoned Field

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	2	AF	13.6	N/A	N/A	N/A	
	2A		8.6				
	2B		5.0				

General Description

Stand 2 consists of two areas of abandoned pastureland on the property. Stand 2A is located in the northwestern extent of the parcel, and stand 2B occurs on the east side of the excluded area, where the buildings and parking lot occur. These areas consist of some mowed grasslands, with islands and edges of tree and shrub growth. The forested portions of these stands are not large enough to consider for the purposes of density or timber volume calculations. Where trees occur, they are variable in composition. White pine, red oak, white ash, black cherry, hickory, sassafras and cedar are among the species that occur. Beneath the tree canopy, there can be a dense component of shrubs and tree regeneration, especially along the edges of the grassy pasture areas. Juniper, witch hazel and grape vines can be observed in these locations. A lot of the lower vegetation consists of invasive plants, a typical situation for historic agricultural lands. The most prevalent species here include Oriental bittersweet, common buckthorn, multiflora rose and Japanese barberry. While these plants provide very good cover for wildlife, they are limited in the food resources they provide.

These areas consist of variable terrain with mostly very well drained soil conditions. Portions of these stands consist of rocky terrain with gentle slopes. The southeastern portion of stand 2B contains less rocks, but it has steeper slopes than the rest of the stand. Soils in these areas have been classified as Chatfield-Hollis rock outcrop complex and Paxton, Woodbridge and Ridgebury fine sandy loams. The desired future condition of these areas consists of open grass and shrubland habitats, with maintained islands of maturing trees. Restoring native vegetation to these stands will help to increase the wildlife benefits provided, and will help to maintain good forest health throughout the property.

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Owner(s) Town of Clinton

Towns(s) Clinton

STAND DESCRIPTIONS

Stand 2 (continued):

Current Habitat Conditions

Tree Canopy No canopy in most of the stand, >60 feet tall where trees are growing
<30% canopy closure across the whole stand, consisting of forest edges and islands

Midstory Low densities

Species present: sassafras, cedar, white pine, red maple, invasive plants

Understory High densities

Species present: invasive plants, juniper, witch hazel

Coarse and Fine Woody Material

Coarse woody material density – Low

Drumming logs – Not generally present

Fine woody material density – Low to medium in forested pockets

Leaf Litter Absent in open areas, present in forested patches

Soft Mast Low to medium densities

Species present: black cherry, grape, juniper

Hard Mast Low densities

Species present: oaks, hickory

Streams and Wetlands Not present

Desired Stand Conditions

Condition	Action	Responsibility birds that may benefit
Maintain open areas along with forested islands	Late summer mowing in open areas, every 2 to 3 years	eastern towhee, eastern wood pewee, gray catbird
Establish larger area of grassland/shrubland habitat	Remove areas of tall trees to create connectivity between existing open fields	Bobolink, American kestrel
Restore native vegetation	Cut/Remove/Control Invasive plants	All native birds and wildlife in this area

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Owner(s) Town of Clinton

Towns(s) Clinton

STAND DESCRIPTIONS

Stand 3: White Pine Forest

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	3	WP	7.1	15.7	190	10.6MBF 14.8 CDS	60-WP

General Description

Stand 3 is a white pine forest located in the western portion of the property, to the south of the abandoned pasture (stand 2A). This area contains a dense stocking of white pine, with a minor component of hardwoods such as hickory, black oak, sassafras and black birch. The timber quality is limited in this stand, due to many trees containing crooks and forks, and somewhat large dead limbs in the main stem. Due to the dense overstory canopy, there is limited growth in the understory for tree regeneration, shrub composition and ground cover vegetation. Where plants do occur beneath the main canopy, they consist of black birch, hickory, white pine, green briar and low-bush blueberry. While these open conditions do not provide very good cover habitat or food resources for wildlife, areas such as this are a benefit for animals who are looking to escape harsh winter conditions. A dense softwood canopy such as this maintains a higher temperature in the winter, blocks strong winds, and has less snow depth than hardwood-dominated forests. There is a minor component of invasive plants in this stand, generally along the edges of the stand, where more sunlight reaches the forest floor. Oriental bittersweet and common buckthorn are the most common invasive plants in these areas.

This stand occurs on a knoll with moderate to steep slopes, facing to the south and east. On the top of the knoll, the terrain is flat. The soils in this stand are very well drained, and somewhat shallow to bedrock. The soil type classification is Chatfield-Hollis rock outcrop complex. The site conditions here are favorable for white pine growth, due to the limited soil moisture and nutrient availability. This stand will be managed to maintain the current forest type and density through the course of this management planning period. An additional objective for this stand is to limit the spread of invasive plants and to remove any non-native vegetation that occurs here.

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Owner(s) Town of Clinton

Towns(s) Clinton

STAND DESCRIPTIONS

Stand 3 (continued):

Current Habitat Conditions

Tree Canopy >60 feet in height

>80% canopy closure, no canopy gaps

Midstory Very low densities

Species present: white pine, red oak, red maple, hickory

Understory Very low densities

Species present: white pine, green briar, low-bush blueberry

Coarse and Fine Woody Material

Coarse woody material density – very low

Drumming logs – absent

Fine woody material density – low

Leaf Litter Moderate duff layer consisting of mainly pine needles

Soft Mast None observed

Species present:

Hard Mast Very low

Species present: oak and hickory, some too small to produce seed

Streams and Wetlands Clamshell Pond occurs along the south stand boundary

Desired Stand Conditions

Condition	Action	Responsibility birds that may benefit
Retain a dense tree canopy with open understory conditions	No action	Pileated woodpecker
Increase insect component	Girdle or partially girdle occasional trees	Woodpecker species
Restore native vegetation	Cut/Remove/Control Invasive plants	All native birds and wildlife in this area

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Owner(s) Town of Clinton

Towns(s) Clinton

STAND DESCRIPTIONS

Stand 4: Open Field

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	4	GF	13.5	N/A	N/A	N/A	
	4A		4.7				
	4B		1.0				
	4C		7.8				

General Description

Stand 4 consists of three distinct areas on the property that had been used for hayfields under the previous ownership. Each of these fields consists of somewhat different conditions, but they have been combined in this plan as they all currently provide open grassland habitat conditions. Stand 4A occurs along both sides of Clamshell Road, to the south of the excluded area and buildings on the property. Stand 4B is a small paddock area in the northern portion of the property, along the east side of Clamshell Road. Stand 4C is the largest grassland on the property, located in the eastern region. Stand 4A contains some planted spruce trees along the side of the road, but otherwise consists of open grassland habitat. The area is somewhat small for providing habitat for bird species that utilize this type of habitat. Stand 4B is also too small for providing a substantial habitat benefit. Stand 4C is large enough to support some grassland birds, such as bobolink, but is on the small end for this type of habitat. Portions of this field are quite wet, especially along the southeastern edge. Invasive plants are prevalent along the edges of these stands, where mowing has not been possible. Oriental bittersweet, common buckthorn, Norway maple, multiflora rose and climbing euonymus were observed in different regions of these stands.

The soil types in these stands include Woodbridge, Walpole, Paxton, and Ridgebury fine sandy loams, with small areas of Chatfield-Hollis rock outcrop complex and Whitman loam. Generally, the site conditions are appropriate for open grassland habitat. These areas will be maintained in open conditions for the benefit of this declining habitat condition in this region. The desired future condition is a mosaic of open habitat conditions that provide a more contiguous area of grassland and low-shrub habitats. Creating this condition will enhance the existing habitats and likely increase the bird and wildlife diversity on the property.

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

Owner(s) Town of Clinton

Towns(s) Clinton

STAND DESCRIPTIONS

Stand 5: Red Pine Plantation with Hardwoods

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	5	RP	1.5	12.7	110	6.0 10.4	60-RP

General Description

Stand 5 is a small forested area, located along the northern property line, between the old railroad, the open field (stand 4C) and the abandoned pasture area (stand 2B). This forest consists of some planted red pine along with hardwoods that have naturally seeded in. Hardwoods present include red oak, black cherry and hickory. Along the edge of this stand, near the open field, there are several large diameter oaks and white pines as well. These large trees are open grown, and contain limited timber potential, but they do provide very good benefit for wildlife by providing food resources in the form of seeds/acorns, and extensive perching and nesting site potential. Tree regeneration is somewhat sparse in this stand. Some white pine, red maple, cedar and sassafras occurs, but it is at low densities. Other understory vegetation observed includes spirea and poison ivy vines. Invasive plants occur at very high densities in this stand. Multiflora rose, Japanese barberry, Norway maple, Oriental bittersweet and Japanese knotweed all occur here.

This stand occurs on moderately well drained soils on gentle, east facing slopes. The soils have been classified as Paxton and Woodbridge fine sandy loams. The site conditions here are moderately productive for tree growth. While most tree species will do well in these conditions, it is expected that oaks and white pine will be the most reliable and long-lived tree species for this site. This is a small area to be managed for timber potential, so management decisions will be based more on wildlife habitat conditions and general forest health. A primary goal for this stand is to restore a native plant community by reducing or eliminating the composition of invasive plants that have become established.

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Owner(s) Town of Clinton

Towns(s) Clinton

STAND DESCRIPTIONS

Stand 5 (continued):

Current Habitat Conditions

Tree Canopy 50-60 feet in height

30-80% canopy closure, canopy gaps are common

Midstory Very low densities

Species present: white pine, cedar, Norway maple, poison ivy

Understory Medium to High densities

Species present: invasive plants (Norway maple, Japanese barberry, multiflora rose), sassafras, red maple, white pine, spirea

Coarse and Fine Woody Material

Coarse woody material density – mostly absent

Drumming logs – absent

Fine woody material density – mostly absent

Leaf Litter Moderate leaf litter, mixed deciduous leaves and pine needles

Soft Mast Low densities

Species present: rubus

Hard Mast Medium densities

Species present: oaks

Streams and Wetlands No streams or wetlands in this stand, wetland area occurs to the east of this stand

Desired Stand Conditions

Condition	Action	Responsibility birds that may benefit
Create young, developing forest area	Cut declining larger trees in all of this stand	chestnut-sided warbler, eastern towhee, brown thrasher, American woodcock
Create open conditions with a low stocking of mature trees	Retain occasional large oak trees for seed and aesthetics, cavity trees preferred	Yellow-bellied sapsucker, red-tailed hawk
Restore native vegetation	Cut/Remove/Control Invasive plants	All native birds and wildlife in this area

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Owner(s) Town of Clinton

Towns(s) Clinton

STAND DESCRIPTIONS

Stand 6: Shallow Marsh

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	6	MS	1.0	N/A	N/A	N/A	

General Description

Stand 6 is a shallow marsh located between the old railroad along the north boundary, and the open field (stand 4C). This area has become more saturated with water in recent years as can be observed by the vegetation present. There are multiple red maple snags (standing dead trees) in the open water. The maple trees established in this stand when there was less water present, and these trees had conditions where they could survive. This area is now much too wet to support any tree growth. Common vegetation in this area includes cattails, grasses and sedges, and some low shrub growth along the edges. A minor component of invasive plants is present along the field edge, including Oriental bittersweet and multiflora rose. While active management is not feasible or desired in this area, this wetland resource does provide a substantial benefit for the wildlife habitat conditions on the property. The open conditions with a water resource are especially beneficial in this proximity to the open grassland habitat.

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Owner(s) Town of Clinton

Towns(s) Clinton

STAND DESCRIPTIONS

Stand 7: White Pine/Oak Forest

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	7	WO	8.0	13.3	127	6.9 10.8	58-RO

General Description

Stand 7 is a mixed species forest located in the eastern extent of the property. The species composition is variable within the stand, generally containing white pine, red oak, red maple, black oak, white oak, hickory, poplar, white ash and black birch. The white pine component is more prevalent in the eastern extent of the stand, and red maple is a larger component in the southern end of the stand, where more damp soil conditions occur. Generally, the timber quality is fair, and the stocking level is moderate for this forest type and size class. Tree regeneration occurs at low to medium densities, consisting of white pine, red maple, red oak, white ash, yellow birch, black birch, hickory and chestnut sprouts. Several other understory plants are common, including witch hazel, high-bush blueberry, low-bush blueberry, winterberry, American hornbeam, several fern species and tree club-moss. In most of this stand, there were no invasive plants observed. Along the edge of the field, there is a component of common buckthorn, but it has not spread into this forested region.

This stand occurs on flat terrain with soils drainage ranging from very poorly drained to moderately drained. A stream runs through the stand, and wetland conditions occur along the southern boundary. In the northern part of this stand an isolated wetland feature exists that likely provides function as a vernal pool. The soils have been classified as Whitman loam and Chatfield-Hollis rock outcrop complex. Access to this stand is possible from the open field to the west, but any management in this stand should be conducted during very dry or frozen conditions, due to the sensitive soils. The goal for management in this stand is to maintain a healthy forest condition that enhances the wildlife habitat on the entire parcel. Management for long-term timber production will be difficult due to the size of the stand and the terrain conditions. A forest with a healthy overstory and dense understory and mid-story will provide excellent habitat for wildlife, and will be a resilient forest that can withstand natural disturbance or forest disease outbreaks.

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Owner(s) Town of Clinton

Towns(s) Clinton

STAND DESCRIPTIONS

Stand 7 (continued):

Current Habitat Conditions

Tree Canopy >60 feet in height

>80% canopy closure, few canopy gaps

Midstory Variable, low to high

Species present: witch hazel, white pine, yellow birch, red maple

Understory Medium

Species present: white pine, red maple, hickory, low-bush blueberry, high-bush blueberry, sassafras, chestnut, mountain laurel, yellow birch, red oak

Coarse and Fine Woody Material

Coarse woody material density – Low to Medium

Drumming logs – Usually present

Fine woody material density – Absent to Low

Leaf Litter Abundant, consisting of mixed deciduous leaves

Soft Mast Moderate

Species present: blueberry

Hard Mast Moderate densities

Species present: oaks

Streams and Wetlands Wetlands and a stream are present in this stand

Desired Stand Conditions

Condition	Action	Responsibility birds that may benefit
Increase composition of understory trees and shrubs	Create gaps in the main tree canopy to bring additional sunlight to the forest floor	American woodcock, black-and-white warbler, Eastern wood pewee, wood thrush
Increase coarse and fine woody material	Girdle and/or fell occasional trees when creating forest gaps, create brush piles	Yellow bellied sapsucker, mourning warbler, veery, pileated woodpecker

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Owner(s) Town of Clinton

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Management Recommendations

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

Summary of the Management Recommendations for your property

Stand	Object Code	Recommendation	Value/Cost/ Cost Sharing opportunities	Acres	Timing
ALL	STEW	Invasive Plant Control	MassWildlife Habitat Mgmt Grant Prog. (MHMGP)	30	2018-22
1,7	STEW	Girdle/Fell Trees	MHMGP	16	2018-20
2	STEW	Cut/Mow hedgerows, forest edges and islands	MHMGP	9	2018-19
5	STEW	Clearcut with Reserves	MHMGP	1.5	2018-19
6	STEW	Shrub Planting along Wetland Edge	MHMGP	500 linear feet	2018-20
7	STEW	Install kestrel boxes along field edges	Mass Wildlife / Volunteers		2018-20
ALL	STEW	Boundary Maintenance			2017, 2027

MANAGEMENT PRACTICES
to be done within next 10 years

OBJ	STD NO	TYPE	SILVICULTURAL PRESCRIPTION	AC	TO BE REMOVED	TIMING
Stew	ALL		Invasive Plant Control	30		2017-22

Invasive plants, including Oriental bittersweet, common buckthorn, glossy buckthorn, Norway maple, multiflora rose and Japanese barberry were observed in many parts of the property. Some areas contain moderate to heavy infestations, and other areas contain only low densities of invasive plants at this time.

Two approaches are described below, depending on the intensity of the current infestation. After completion of the work described below, it is important that a monitoring program be implemented to maintain good control of invasive plants. Without monitoring and further control, invasive plants can slowly become re-established on the landscape. Monitoring includes patrolling the property and removing any invasive plants found by either hand-pulling or with selective herbicide applications.

Treatment method 1 - Heavy infestations with tall vines or thick, dense shrubs (approximately 18 acres)

This treatment includes areas where there are tall vines growing into the trees, or the plants are over 10 feet tall or more than 15 feet wide. In the first growing season, two treatments will be conducted. The first treatment will include cutting the tall/large plants, and treating the cut stump with concentrated herbicide. As a part of this treatment, cutting lanes maybe necessary to create access for the second treatment. The second treatment will include a foliar herbicide application to control the smaller invasive plants in these areas. If commercial cutting or mowing work will be completed soon after the foliar application, it may be advisable to delay the spraying until the following growing season. Two follow-up foliar herbicide applications should be conducted in the next two growing seasons to control and re-sprouts and new individuals becoming established from the seed bank.

Treatment method 2 - Low to medium infestations, no plants over 10 feet in height (approximately 12 acres)

In areas with minor to moderate components of invasive plants, foliar herbicide applications can be very effective in obtaining good control. It is important to patrol all areas that have some invasive plants as well as a buffer around the infestation. This helps to prevent future re-invasions from a few missed individual plants. A foliar application will be conducted in years 1 and 2 to control the existing plants and re-sprouts and new seed germination. After year 2, the site should be assessed to determine if a third treatment is necessary. This can be conducted in year 3 or year 4, depending on how much new growth comes back.

For both treatment types described above, all herbicide applications should be completed by MA Licensed Pesticide Applicators. All herbicides used should be listed on the Massachusetts Sensitive Area Materials List for Rights of Way Treatments, unless there is a justified reason to use another material, and it can be demonstrated that there will not be a significant environmental impact from the use of such material.

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MANAGEMENT PRACTICES
to be done within next 10 years

OBJ	STD NO	TYPE	SILVICULTURAL PRESCRIPTION	AC	TO BE REMOVED	TIMING
Stew	1,7	WH/WO	Tree Felling/Girdling	16		2018-20

This management recommendation is proposed to create gaps in the forest canopy where tree regeneration and shrubs can become established. Individual trees or small groups of trees will be felled or girdled with the goal of enhancing wildlife habitat. This will enhance wildlife habitat conditions with better vertical structure in the forest. In addition, felled trees will provide coarse woody material, a very important component of the forest which benefits some bird species and many other forest animals. Tree tops can be left whole, as long as they do not present hazardous conditions. As an alternative, the tree tops can be lopped, and small logs and fine branches can be established into brush piles, another beneficial wildlife habitat feature. Trees should only be girdled if they are not near trails or other areas with a lot of foot traffic. Girdled trees will develop into snags, which attract many insect species. These insects become valuable food resources for birds and other wildlife species. Eventually, girdled trees will fall, becoming additional coarse woody material. The extent of this management practice can be variable depending on the existing conditions in different parts of these stands.

OBJ	STD NO	TYPE	SILVICULTURAL PRESCRIPTION	AC	TO BE REMOVED	TIMING
Stew	2	AF	Cut/Mow Hedgerows and Forest Edges and Islands	9		2018-19

Stands 2A and 2B contains some open grassland habitat, with hedgerows, islands, and forest edges consisting of trees and other forest vegetation. It is recommended that many of these areas be cleared in order to create better connectivity of the open field habitats on the property. In some parts of this treatment area, the forested condition can be converted to additional grassland habitat. In other areas, the terrain is difficult and rocky, and will not be feasible to maintain as grassland through maintenance mowing. In these areas, it is recommended that low shrub growth be promoted, to keep the tall vegetation from returning over time. To maintain good connectivity, vegetation should be kept low to maintain long sight distances within the grassland habitat. This management practice will include 1.5 acres in the north end of stand 3, where the trees will be removed to better connect stand 2A to stand 4A. It is also recommended that the planted spruce trees in stand 4A (along Clamshell Road) be removed to increase the size of the grassland habitat there. This management practice may produce some cordwood and possibly even a small volume of sawtimber, but the value of the trees to be cut will not be substantial, and this work will incur a significant cost.

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MANAGEMENT PRACTICES
to be done within next 10 years

OBJ	STD NO	TYPE	SILVICULTURAL PRESCRIPTION	AC	TO BE REMOVED	TIMING
Stew	5	RP	Clearcut with Reserves	1.5	8MBF / 15cds	2018-19

Stand 5 consists of planted red pine and other trees that have established through natural seeding. The stand is not in good condition at this time from the perspective of timber value and long-term health. This small section of forest will provide a much better habitat condition as a young, regenerating forest than in the current condition. This practice will include cutting of most of the mature trees in the stand, as well as small, suppressed trees in the understory. After the harvest, it can be expected that natural seeding will establish good quality tree regeneration. A few large oak trees will be retained in this stand, as seed trees and for wildlife habitat values. These large trees will provide perching and nesting sites, as well as the potential for large cavities as the trees become larger and older, and begin to decay.

OBJ	STD NO	TYPE	SILVICULTURAL PRESCRIPTION	AC	TO BE REMOVED	TIMING
Stew	6	MS	Wildlife Shrub Planting	500 ft		2018-20

In order to enhance the habitat conditions between the grassland habitat (stand 4B), and the shallow marsh, it is recommended that shrubs be planted along the wetland edge. Shrubs such as viburnums, elderberry, and high-bush blueberry will provide cover habitat and food resources in the form of soft mast. This work can be completed by volunteers if available and any necessary permitting has been approved by the conservation commission.

OBJ	STD NO	TYPE	SILVICULTURAL PRESCRIPTION	AC	TO BE REMOVED	TIMING
Stew	4	GF	Install kestrel boxes			2018-20

The existing grassland habitats on this property provide good conditions for American kestrel. Installing kestrel nest boxes will enhance the conditions for this species, and provide the opportunity for people walking on the property to observe these birds. Boxes can be installed on poles or on trees, near the edges of the existing grassland habitat areas. Boxes may be available from MassWildlife, and can be installed by volunteers.

OBJ	STD NO	TYPE	SILVICULTURAL PRESCRIPTION	AC	TO BE REMOVED	TIMING
Ch61	All		Boundary Maintenance			2015, 2025

Chapter 61 recommends that all property boundaries be kept visibly painted. Well-maintained boundaries help to prevent trespass issues and allow for more efficient management of the land. Currently, the boundaries of this property can be identified by evidence on the ground, including stone walls and wire fence. Most of the boundaries are not painted at this time. The property boundaries should be marked early in this management planning period. The status of the boundaries will be re-examined at the end of this management planning period to determine additional maintenance necessary.

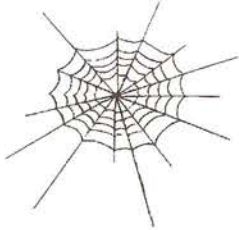
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Owner(s) Town of Clinton Town(s) Clinton

Note: The following 7 pages are educational materials supplied by the MA Forest Stewardship Program

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.

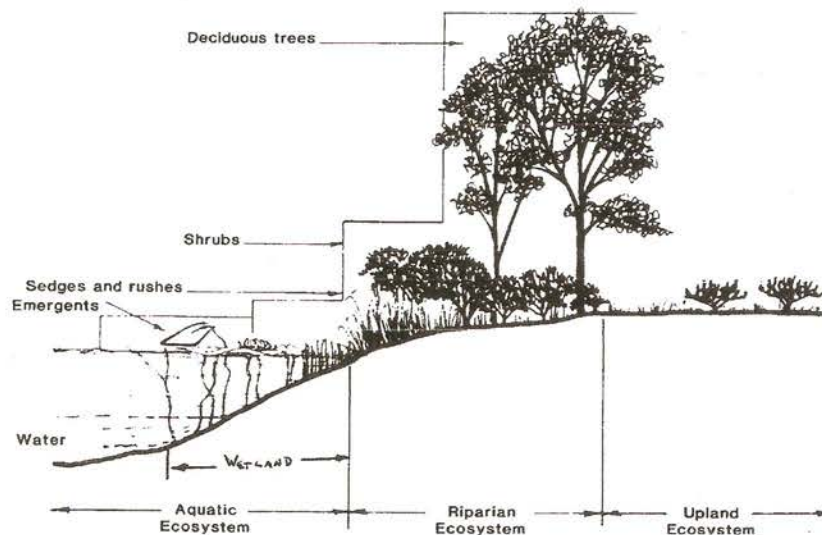


Figure 1: Example of a riparian zone.

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. DCR'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 DCR 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.



Invasive Species Management: Invasive species pose immediate and long-term threats to the woodlands of MA. Defined as a non-native species whose introduction does or is likely to cause economic or environmental harm or harm to human, animal, or plant health, invasives are well-adapted to a variety of environmental conditions, out-compete more desirable native species, and often create monocultures devoid of biological diversity. The websites of the Invasive Plant Atlas of New England, www.nbii-nin.ciesin.columbia.edu/ipane, and the New England Wildflower Society, www.newfs.org are excellent sources of information regarding the identification and management of invasive plants. Some of the common invasive plants found in MA are listed below.

- Oriental Bittersweet (*Celastrus orbiculata*)
- Glossy Buckthorn (*Frangula alnus*)
- Multiflora Rose (*Rosa multiflora*)
- Japanese Barberry (*Berberis thunbergii*)
- Japanese Knotweed (*Fallopia japonica*)
- Autumn Olive (*Eleaagnus umbellata*)

Early detection and the initiation of control methods soon after detection are critical to suppressing the spread of invasive species. Selective application of the proper herbicide is often the most effective control method. See the next section for information on the use of chemicals in forest management activities.



Pesticide Use

Pesticides such as herbicides, insecticides, fungicides, and rodenticides are used to control "pests". A pest is any mammal, bird, invertebrate, plant, fungi, bacteria or virus deemed injurious to humans and/or other mammals, birds, plants, etc. The most common forest management use of a pesticide by woodland owners is the application of herbicide to combat invasive species. MA DCR suggests using a management system(s) that promotes the development and adoption of environmentally friendly no-chemical methods of pest management that strives to avoid the use of chemical pesticides. If chemicals are used, proper equipment and training should be utilized to minimize health and environmental risks. In Massachusetts, the application of pesticides is regulated by the MA Pesticide Control Board. For more information, contact MA Department of Agricultural Resources (MDAR), Pesticide Bureau at (617) 626-1776

On MA Private Lands Group Certification member properties, no chemicals listed in CHEMICAL PESTICIDES IN CERTIFIED FORESTS: INTERPRETATION OF THE FSC PRINCIPLES AND CRITERIA, Forest Stewardship Council, Revised and Approved, July 2002, may be used.

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.

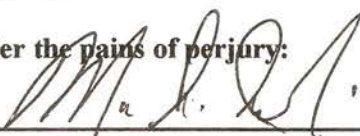
☐ **CH. 61/61A Management Plan** I attest that I am familiar with and will be bound by all applicable Federal, State, and Local environmental laws and /or rules and regulations of the Department of Conservation and Recreation. I further understand that in the event that I convey all or any portion of 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.

☐ **Green Certification.** I pledge to abide by the FSC Northeast Regional Standards and MA private lands group certification for a period of five years. To be eligible for Green Certification you must also check the box below.

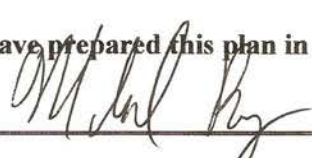
☐ **Tax considerations.** I attest that I am the registered owner of this property and have paid any and all applicable taxes, including outstanding balances, on this property.

Signed under the pains of perjury:

Owner(s)  Date 6/1/17

Owner(s) _____ Date _____

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

Plan Preparer  Date 5/20/17

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) _____ Town of Clinton _____ Town(s) Clinton