Forest Stewardship Plan

For the land of:

Holden Town Forest

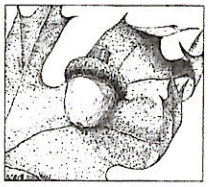
dcr
Massachusetts

FIELDSTONE
—NATURAL RESOURCES—

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

Administrative Box

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

OWNER, PROPERTY, and PREPARER INFORMATION

Property Owner(s) Town of Holden- Conservation Commission
Mailing Address 1196 Main Street Holden, MA. 01520 Phone 508 210 5535
Email Address _____

Property Location: Town Holden Road(s) Harris Street

Plan Preparer **Ross P. Hubacz** Mass. Forester License # 438
Mailing Address P.O Box 30 North Brookfield, MA. 01535 Phone 508 769 3021

RECORDS

Assessor's Map No.	Lot/Parcel No.	Deed Book	Deed Page	Total Acres	Ch61/61A 61B *Excluded* Acres	Ch61/61A 61B **Certified** Acres	Stewshp *Excluded* Acres	Stewshp Acres
107	3	2582	49	100	100	0	0	100
107	6	Probate	137156	15.17	15.17	0	0	15.17
108	1	5143	74	41.85	41.85	0	0	41.85
			TOTALS	157.02	157.02	0	0	157.02

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

HISTORY

Year acquired 1933 Year management began 2005

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. _____ treatment _____ reason _____
(if additional space needed, continue on separate page)

Previous Management Practices (last 10 years)

Stand #	Cutting Plan #	Treatment	Yield	Acres	Date

Remarks: (if additional space needed, continue on separate page)
The previous Forest Stewardship Plan for this property had expired at the time of the development of this plan.

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			X	
Other:				

*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: Provide a natural setting for the inhabitants of the Town of Holden where they can interact with the natural environment. Maintain the long-term health of the forest, create and enhance habitat and manage for key bird species as well as large and small animal species, maintain existing trails, create new trails and parking areas/kiosk to promote use by the public and mark property boundaries.

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:** _____

Owner(s) (print) _____

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

Property Description

The 157 acre Holden Town Forest is situated in the eastern portion of Holden between Harris Street and Interstate 190. The terrain of this property ranges from steep slopes to moderatly flat terrain. This property is comprised entirely of forestland made up of hardwoods and softwoods with two predominate age classes found. Access to the property is found off of Harris Street as well as Paul Street which is a gated road.

Regional Significance

The town of Holden was incorperated in 1741 containing 36 + square miles and is currently home to 15,000 residents according to recent Census data. Located just north of Worcester, with multiple major travel routes nearby, the town is an attractive bedroom community.

This property is within the Quinapoxet River watershed which is part of the larger Wachusett Reservoir watershed providing water to Boston and other commuities. The property is bounded on the West by the Quinapoxet river and abuts several DCR owned watershed lands. Other surrounding lands include active and former gravel pits, forests, fields, and housing. Holden has a significant amount of land under long term protection by the Town of Holden, DCR, Massachusetts Fish and Wildlife, The City of Worcester, Norco Sportsmens club, a Fox and Coon Club and other orginizations.

History (including disturbance)

Cultural History

Like the majority of the land in the Massachusetts, much of this land was likely cleared for agriculture. As the industrial revolution progressed and farms moved west thousands of acres of agricultural land were abandoned and naturally reverted back to forestland. As these forests developed and matured many were harvested for fuel wood, and lumber and have developed into the forests we see today. With the sandy, well drained soils found on much of the property, these lands were likely not highly productive as farmland and were likely some of the early farmlands to be abandoned.

A timber harvest was conducted in approximatly 2006/2007 with treatments which included patch cuts, commercial thinnings, and shelterwood systems. This evenaged management system resulted in a second age class becoming established in much of the forest, creating much needed verticle structure.

Please see the property history included in this plan for more information regarding the history of this property.

Forest Health and Soils

The soils in this stand are primairly well drained sandy loam or loamy sand. These soils are prone to drought and are not very fertile. This soil type provides a limited growth potential for trees. Oaks growing on this type of soil will typically be slow growing, short and contain many defects. Areas of

the property do contain more productive soils such as Paxton Fine Sandy Loam which is is evident by size, vigor and quality of the trees found in these areas. White pine is more well suited for these soils.

Forest health is fair with no major concerns noted.

USDA soil survey data was used to determine soil types. Please see the Soil Survey data included in this plan for a more detailed descriptiona and location of each soil type.

Fire
No evidence of recent fire was noted.

Recreation
This property provides excellent oppertunities for outdoor recreation including, walking/hiking, viewing wildlife, hunting and cross country skiing. Abutting, protected lands also allow for similar uses creating a larger network of oppertunities.

Biodiversity
Biodiversity on the site is excellent with the diverse cover types and structure of the vegetation. Previous land use such as timber harvesting has increased the diversity in forest sturcture creating multi-aged stands that provide excellent habitat and support a variety of species. A mix of tree species were observed on the property including various species of oak, hemlock, white pine, black birch, grey birch, soft maple, American chestnut, beech, hickory, yellow birch, and ash to name a few. Other plant speices noted include witch hazel, wintergreen, lowbush blueberry, sheep laurel and princess pine.

Wildlife
As part of the greater ecosytem in the area, this property provides valuable wildlife habitat to a host of species including deer, bear, moose, coyote, fox, racoon, turkey, and bobcat. A variety of birds such as barred owl, redtailed hawk, chickadee, veery, pileated woodpecker, yellow bellied sapsucker and downy wood peckers are come of the common species to utilize the site.

Birds

Bird Habitat Characteristics

When considering bird habitat characteristics, it is important to first establish the landscape context that a property sits in. Assessing habitat features and land uses within a one-mile radius of the property will help to determine what practices will or will not enhance habitat for desired species on a particular property. Bird species will vary in their preferences and requirements for their life cycles. While some species may do well in fragmented forest blocks, other species require large unfragmented blocks of forest. Determining where your property fits in the puzzle that makes up the larger landscape will help ensure your habitat work is cohesive, functional and successful.

The surround landscape is comprised of forest blocks, agricultural fields, sand pits, and residential developments. The majority of the forest blocks in the area are protected lands that are actively managed woodlands. Development in the immediate area consists of lower density housing with forest

cover nearby. This type of development retains a reasonable amount of tree cover results in less intense fragmentation. Agricultural fields in the area serve an important role for many species and are mainly on the edges of this larger forest block.

Past timber harvesting has created patches of young forest habitat to compliment the mature forest on site. Similar management is being conducted on protected watershed lands within this larger forest block. Approximately 11.4 acres, or 7% of the property is comprised of young forest habitat created in 2006/2007 through a series of small patch cuts. The remainder of the property is mature forest, mature forest with midstory enhanced structure, and riparian or wetland zones.

The excellent forest age class diversity, size of forest cover, understory vegetation, native species composition, proximity to water and wetlands and softwood inclusions all work together to form excellent bird habitat. As a minor note, fine woody debris would help provide more nesting, and perching sites. Areas of mature timber that were not treated in the previous timber harvest still have habitat value to species such as Wood Thrush, Veery, Eastern Wood-peewee and others. Additional snags, coarse and fine woody debris to simulate old growth characteristics would benefit the habitat type in these areas.

Rare and Endangered Species
Several Species of Special Concern are documented on the property including Eastern Wip-poor-will, Wood Turtle, Spine-crowned Clubtail, and Brook Snaketail. Certified and potential vernal pools are also found on the property.

Management Summary

Future management will seek to enhance forest resiliancy, health, vigor, wildlife habitat, biodiversity and recreational oppertunities. As a publicly owned property, with trails and recreational oppertuinites, this property will serve as an excellent example of good forest stewardship. Oppertunites for educational outreach to showcase forest management should be encouraged.

Boundaries
The boundaries on the property are relitively well documented with surveys, field evidence and monumentation.

History of Graham Town Forest

Attached picture is of George Graham and his wife. Female behind George is his daughter. Behind Mrs. Graham is Donald MacKay's mother. Don MacKay is on his great-grandmother's lap. George Graham is 90 years old in picture.

George Graham donated the property to the Town of Holden to be used by poor people who had problems paying for firewood. The wood was free. This use of the Graham Forest continued until about 1980. The change in the demographics of Holden decreased the use of the Forest as a firewood source.

Old farmhouse still in existence - currently Chester Marshall's sister resides there.

In Graham - Lewis Family, a book written by W. Everett Mason about the Graham and Lewis families, reference is made to the Graham Town Forest

"Mr. and Mrs. Graham gave a 102 acre tract of land on Harris Street in Holden, MA to the town of Holden. The following is a copy of the newspaper clipping reporting the acceptance of the gift by the town:

" Some debate took place on the question of acceptance of 100 acres of woodland on Harris Street from George Graham. Attorney Charles W. Proctor wanted to know where it was. ... T. Walter Howe, son-in-law of the donor said Mr. Graham was unable to be present, ...that he desired to say that there was considerable wood on it that might be used to aid the town's needy and that Mr. Graham believe in reforestation and hoped the town would some day plant trees there. He added that when the town decided to do that, Mr. Graham was ready to contribute $100.00 toward the expense. The town accepted the gift."

At the time this book was written, the town was contemplating selling the land to the Metropolitan District Commission. There was strong opposition among the descendant of the Grahams, and they were attempting to stop the sale.

The deed for George S. Graham to Town of Holdent was posted in Book 2582, page 49, Worcester County Registry of Deeds. Martha E. Graham, wife of George Graham, signed the deed.

Charles Sumner Graham was born in Holden, MA on 5 March 1870 son of George and Martha (Lewis) Graham. He was educated in the Holden public schools and graduated from Amherst Agricultural College at Amherst, MA, where he received a Bachelor of Science degree. Shortly after graduation, he was appointed Superintendent of the farm of the Lyman School in Westboro, MA, a position he held for nine years. He then bought the farm on Union Street in

*Provided by Town of Holden

Holden from the heirs of Fred Condon. This farm consisted of 84 acres of tillage and woodland, located at the corner fo Highland and Union Streets known as the old Abner Greenwood place. Mr. Graham, a prosperous farmer, had a large dairy and grew many varieties of apples, pears, peaches and grapes.

He was a Congregationalist and a Republic, a member and past master of the Holden Grange #78. He also belonged to Camp 122 Sons of Veterans of the Civil War, the Worcester Co. Beekeepers Assoc., and the Mass Fruit Growers Assoc. After they sold the farm in Holden to their son, they moved to Lowell, MA in 1939. Charles died on 4 October 1942 in the woods between Bullard and Wachusett Streets where he was looking for lot lines. Annie died in Lowell on 26 Sept. 1944. They are buried in Townsend, MA.

*Provided by Town of Holden

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Stand Summary Table

Stand	Acres	Forest/Habitat Type	Important Observations Regarding Bird Habitat
1	37.9	WH	Oaks providing wildlife habitat Riparian Zone Softwood inclusion Variable understory vegetation
2	11.4	WH	Early Successional Habitat High stem counts Species diversity
3	7.87	WH	Shelterwood Harvest preformed in 2006. Excellent midstory regeneration. Pocket of dense white pine in southern portion of the stand
4	7.3	RM	Riparian Zone
5	92.55	OM	Oaks providing excellent hard mast Generally closed canopy Variable understory vegetation Average deciduous leaf litter Few large diameter trees Containing wetland features
Total	157.02		

STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	1	WH	37.9	12.8"	80sq.ft	5.3mbf 4.1cds/ac	RO-70

This stand is comprised of red oak, black oak, white pine, red maple, hemlock, black birch, yellow birch and other associated species. Forest regeneration is fair following historical timber harvesting. This regeneration consists of black birch, red maple, white pine, black cherry and oak with other associated species. Mountain laurel can be found in the understory and is thick in places. Witch hazel, high bush blueberry and winterberry were noted in the understory. The overstory timber is of good quality and stocking.

A stream and associated bordering vegetated wetland (BVW) traverse this stand and eventually flow into the Quinapoxet River that bounds the property to the west. The Quinipoxet river is a tributary to the Wachusett Reservoir which supplies water to Boston and surrounding communities. This stream and wetland system provide excellent wildlife habitat as well. The BVW is more expansive near Harris street and contains more grasses, and willows. These aquatic areas provide exceptional habitat to a host of species including amphibians, turtles, multiple bird species, racoon, coyote, fox, bear, bobcat, deer and other species.

Forest health is good with no concerns noted. The primary soil type in this stand is Chatfield-Hollis Rock outcrop complex. This soil type is a well-drained, extremely stony fine sandy loam type soil. Areas closer to the stream and riparian zone are identified as Scarboro mucky fine sandy loam, Walpole sandy loam and Whitman Fine sandy loam. These soil types are poorly drained mucks over a sand or gravel. Soil data was determined using USDA Soil Survey Data.

The desired future condition of this stand is a healthy productive forest ecosystem that provides forest products, wildlife habitat, recreational opportunities, clean water, scenic beauty, and biological diversity.

Nest and den trees were noted in the stand. Large diameter decaying or declining trees often provide excellent opportunities for den and nest sites. Species that may utilize these sites include Porcupine, Squirrel, owls, Saw-Whet Owl and a host of other species. Species such as the Yellow-bellied sapsucker, Northern Flicker, Hairy Woodpecker and Brown Creeper will utilize these dead and declining trees for foraging as well as possibly nesting or may provide nesting opportunities for other species. 5 snag or cavity trees per acre often provides sufficient structure.

Coarse woody debris from previous timber harvesting provides habitat for multiple species by supporting insects that may be part of a diet for species as well as drumming sites for species such as the Ruffed Grouse. Fine woody material in the stand was limited and distributed. In order to obtain the greatest benefit from this material it should

be piled to provide perches, nesting sites and protective cover for species such as White-throated Sparrow and veery.

The rocky bottomed stream that traverses this stand may provide habitat for species such as the Louisiana Waterthrush or Canada Warbler. Softwoods surrounding the stream provide foraging opportunities and thermal protection for species such as the Blue-headed Vireo and the Black-throated Green Warbler. Hardmast such as acorns provides excellent feed for many species including deer, bear, and turkeys. Softmast such as blueberries provides feeding opportunities for the aforementioned species as well as birds such as the Veery.

The understory vegetation likely established following the 2006/2007 timber harvest provides structure important to many species for feeding, nesting and cover. Species such as the Canada Warbler may utilize this structure in areas close to the wetlands while species such as deer may forage thought the stand. Dense mountain laurel patches found here provides opportunities for species such as the Black-throated Blue Warbler. Leaf litter was found to be average for this stand type and provides a sufficient sub straight for species such as the Ovenbird to construct their nests.

Forest Habitat Component	**Action**	**Focal Birds that may benefit**
Snags and Cavity Trees	Girdle low quality trees >10" in diameter. Target 5 Snag or Cavity trees per acre.	Yellow-bellied Sapsucker, Northern Flicker, Hairy Woodpecker, Brown Creeper, Pileated Woodpecker, American Woodcock.

STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	2	WH	11.4	Sapling	-	-	WP-61

This stand is made up of multiple patch cuts that were created in 2006/2007. These patch cuts have regenerated with white oak, black oak, scarlet oak, grey birch, red maple, white pine, black birch, black cherry and other related species. Wintergreen, princess pine, low bush blueberry and sheep laurel were also noted in the understory. The density of the regeneration is variable in the patches and averages approximately 10,000 stems per acre.

The early successional habitat features of the stand provide excellent habitat for deer, moose, bear, and turkey who will use this habitat type for one or more of their life stages. The high stem count per acre provides cover for birds and nesting sites while also providing browsing opportunities for deer and moose.

The forest stand is healthy with no significant forest health concerns noted. The soils in this stand are primarily Hickley loamy sand that is excessively drained. This soil is comprised of a loamy sand over gravelly sand. The site index for these soils is low and is best suited for the growth of white pine. These sandy soils are prone to drought stress with low organic material composition.

Due to the low productivity of these soils, the trees will grow slower maintaining the early successional characteristics of the site for a longer period of time.

The desired future condition of this stand is a healthy productive forest ecosystem that provides forest products, wildlife habitat, recreational opportunities, clean water, scenic beauty, and biological diversity through early successional habitat.

This early successional habitat was established in 2006/2007. After 15-20 years, forests succession has developed past the point of young forest habitat and will transition into what would be considered a pole stand. After this phase, much of the habitat value of these young forests is lost. Stems per acre will continue to decline, soft mast, herbaceous species and other types of non-woody growth will decline as the trees form a dominant crown enclosure developing a more open and defined understory.

Early successional habitat is an extremely valuable habitat type for a suite of birds and other species. This valuable habitat type is lacking on the landscape across Massachusetts. Species such as Eastern Towhee, Chestnut-sided Warbler, Mourning Warbler, Ruffed Grouse, Brown Thrasher, Veery, and Wood Thrush are some of the bird species who benefit from these deciduous mixed forests. The dense vegetation of saplings, shrubs, forbs and herbaceous vegetation provides excellent nesting and

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX

feeding opportunities while providing cover from predators. The mix of species in the stand provides structural complexity and diverse foraging opportunities for birds. Coarse and fine woody debris in this stand is limited, however the dense stem count and diverse species types provide plenty of perching and nesting opportunities.

Hardmast such as acorns can be found adjacent to this stand and provide an excellent feed source for species such as deer, turkey, racoon and bear. Soft mast which is common in young forest habitat such as lowbush blueberry, rubus species, and cherry can be found in this stand. Snags, and cavity trees can be found in the surrounding stands along with wetland and riparian zones.

The stand is comprised of multiple patches that range from approximately 2 acres to .75 acres. The ideal patch size for this type of habitat is at least 2.5 acres with larger often being more desirable.

Forest Habitat Component	**Action**	**Focal Birds that may benefit**
Early successional Habitat	Forest Mowing or mulching of this stand will reset the habitat type as it ages out of its productive habitat values. Removing mature overstory trees between patches will reduce edges and increase the effective size of the patches.	Eastern Towhee, Chestnut-sided Warbler, Mourning Warbler, Ruffed Grouse, Brown Thrasher, Veery, American Woodcock and Wood Thrush

STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	3	WH	7.87	13.8"	100sq.ft	5.8mbf 6.8cds	WP-64

This stand combines stand 5 and stand 6 from the previous plan. The stand is comprised of red oak, white pine, hemlock, red maple and other related species. A timber harvest took place over much of this stand in 2006/2007. This shelterwood treatment reduced the overstory stocking to allow for more favorable growing conditions for desirable white pines and red oak. Forest regeneration became established following this harvest. The stocking in the stand varies throughout as harvesting took place in small groups creating a variable density. Forest regeneration includes red maple, black birch, oak, white pine and other related species. Mountain laurel, witch hazel and winterberry were noted in the understory. The current stocking level and quality of the overstory trees is good.

Overall forest health is good with no health concerns noted. Soils in this stand are classified as Marrimac fine sandy loam which is somewhat excessively drained and better suited for white pine.

The desired future condition of this stand is a healthy productive forest ecosystem that provides forest products, wildlife habitat, recreational opportunities, clean water, scenic beauty, and biological diversity.

The shelterwood harvest conducted in this stand was a moderate intensity harvest that created overstory gaps and group openings. These openings increased the understory vegetation and enhanced the vertical structure in the stand. Mast producing trees such as oaks and white pine were released allowing available sunlight, nutrients and water to become available to them. Birds that may benefit from this type of habitat include Chestnut-sided Warbler, Eastern Wood-pewee and Wood Thrush. Other species such as deer, moose, bear, racoon, turkey and many other species also benefit from the enhanced forest structure. The diverse mix of hardwood and softwood provides even more complexity for foraging and nesting. The stand is located adjacent to the Quinapoxet River and the associated floodplain which provides more habitat diversity.

Large diameter trees found in the stand provide nesting opportunities while coarse woody debris provides feeding and perching sites. There is not an abundance of fine woody debris but due to the complex vertical structure found in the forest understory, close to the ground, there are sufficient places for nesting and perching.

STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX

Forest Habitat Component	Action	Focal Birds that may benefit
Complex Forest Structure	Previous management activities have created excellent habitat values in this stand. No further action is needed at this time.	Eastern Towhee, Chestnut-sided Warbler, Mourning Warbler and Wood Thrush

STEW	4	RM	7.3	6.8"	80sq.ft	7.4cds	WP-65

This stand is located adjacent to the Quinapoxet River and is subject to flooding. Due to the poorly drained soils that are subject to flooding, growth potential and management opportunities of this stand are limited. Species such as red maple and hemlock will grow in parts of these soils but will have a limited growth potential. Wetland grasses, forbs will thrive in this stand. This is a valuable habitat type to a host of species such as deer, moose, racoon, Canada Warbler and other species.

Forest health is good with no concerns noted. The soils in this stand are classified as Limerick Silt Loam and Freetown Muck. Both of these soil types are poorly drained hydric soils. USDA Soil Survey Data was used to determine soil types.

The desired future condition of this stand is to maintain its current function.

Through the natural process of flooding, this stand is maintained in its current state. Wind storms create tipped up trees which will create coarse and fine woody debris for feeding and perching sites. Cavity trees formed in dead trees serve as a food source and nesting sites for Northern Flicker, Yellow-bellied Sapsucker, Owl, Hairy Woodpecker, Brown Creeper and other species. Species such as the Canada Warbler may utilize this site. Groundcover, debris, and crown cover provide excellent cover for nesting sites.

Forest Habitat Component	Action	Focal Birds that may benefit
Riparian Zone	No further action is needed at this time. The processes such as flooding, wind and storm events will naturally maintain and enhance this habitat type	Northern Flicker, Yellow-bellied Sapsucker, Owl, Hairy Woodpecker, Brown Creeper, American Woodcock and Canada Warbler

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 Holden Towns(s)Holden

STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	5	OM	92.55	8.4"	105sq.ft	.5mbf 12.9cds	WP-60

This stand is comprised of red oak, black oak, white oak, scarlet oak, and white pine with associates of red maple, birch and other species. A small wetland system can be found near Paul Street. The quality of the timber is mostly poor, mainly due to the soils found on site. Hardwood growth potential is limited because of the well drained sandy soils in the stand, however oaks will still be promoted due to their habitat value. Forest regeneration is limited due to the closed canopy in the stand and consists of white pine, red maple, black birch, and hemlock. Mountain laurel, lowbush blueberry, sheep laurel, witch hazel and princess pine were noted in the understory. The mountain laurel is extremely dense in some areas.

Forest health is good with no concerns noted. The primary soil types in this stand are classified as Merrimac fine sandy loam and Hinckley loamy sand. These soils are both well drained and better suited for the growth of white pine. UDSA soils survey data was used to determine soil types.

The desired future condition of this stand is a healthy productive forest ecosystem that provides forest products, wildlife habitat, recreational opportunities, clean water, scenic beauty, and biological diversity.

The oak structure of this stand has the ability to produce large volumes of hard mast which is a valuable source of food for species such as deer, bear, turkey, raccoon, mice, squirrels, chipmunks and other species. The soils in this stand are not likely to support the growth of large diameter trees which would provide habitat for species such as Owls and Pileated woodpeckers. The more fertile, and moist soils adjacent to wetlands could possibly support larger trees. White pine and hemlock are found mixed into the stand providing complex structure and species diversity which is beneficial to species such as the Black-throated Green Warbler and the Blue-headed Vireo. Coarse woody debris was found through the stand from overstory trees that have died or were damaged in storms. Fine woody debris was scattered and holds little habitat value. Soft mast such as lowbush blueberry is found through much of the stand. Non-native invasive species are not a current concern in the stand. Little understory vegetation is present.

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Owner(s)Town Of Holden Towns(s)Holden

STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX

Forest Habitat Component	**Action**	**Focal Birds that may benefit**
Interior Forest With enhanced complexity	Selection harvest. This treatment will enhance understory structure and add coarse and fine woody debris	Eastern Wood-pewee, Black-throated Green warbler, American Woodcock, Wood Thrush.

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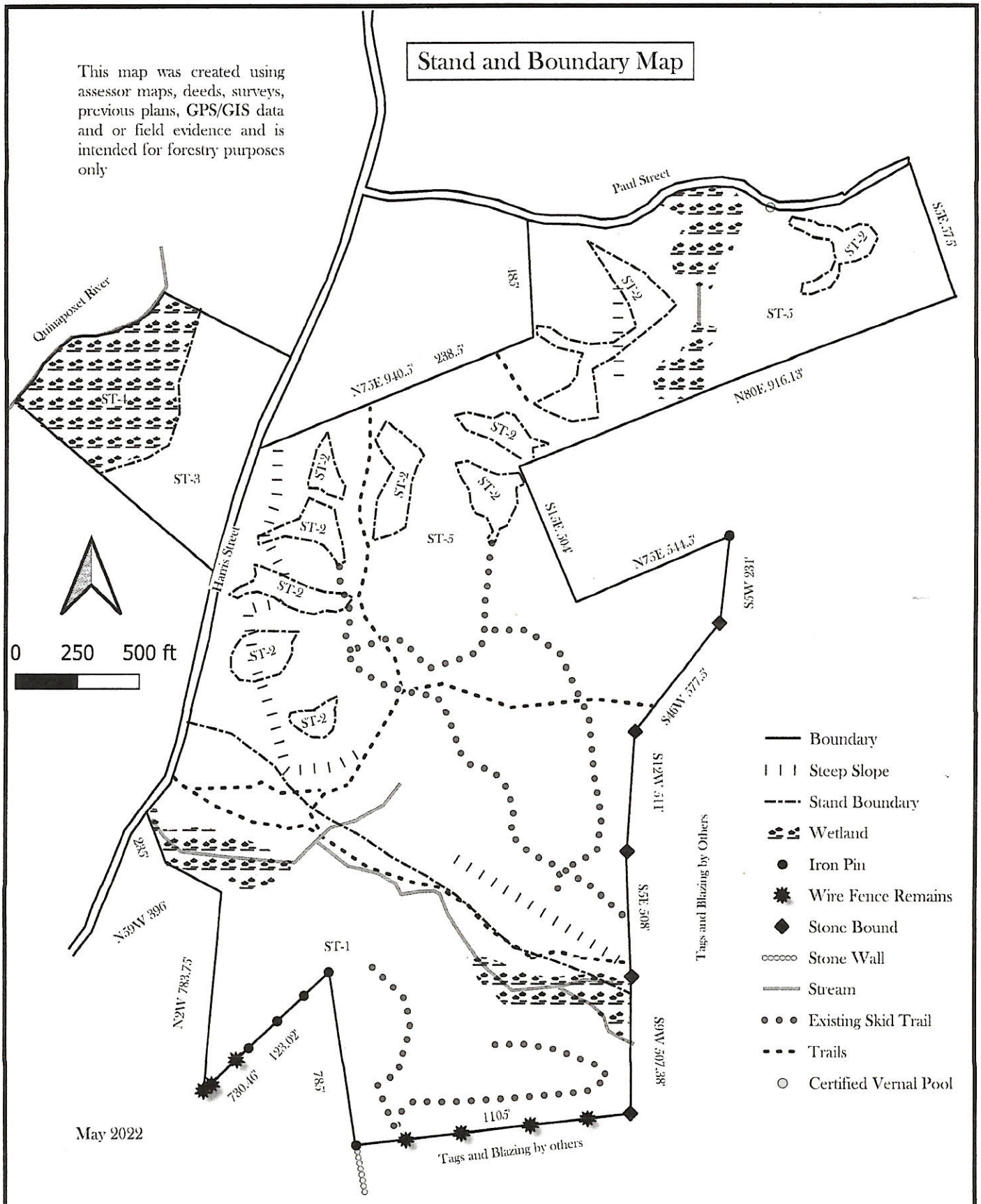
Owner(s)Town Of Holden Towns(s)Holden

Stand and Boundary Map

This map was created using assessor maps, deeds, surveys, previous plans, GPS/GIS data and or field evidence and is intended for forestry purposes only



Land of:
Town of Holden
Town Forest
Harris Street
Holden, MA.

FIELDSTONE
—NATURAL RESOURCES—

COMMONWEALTH OF MASSACHUSETTS
ROSS P. HUBACZ
NO. 438
REGISTERED
FORESTER

Prepared By:
Ross P. Hubacz
P.O Box 30
North Brookfield, MA. 01535
MALF #438

Management Practices Summary

Stand	Objective	Recommendation	Value/ Cost /Cost Sharing Opportunities	Acres	Timing
2	Stewardship	Early Successional Habitat Development	NRCS-EQIP funding to be applied for. DFW grant opportunities. Research any other funding sources.	11.4	2022-2032
5	Stewardship	Thinning/Selection	NRCS-EQIP funding to be applied for. DFW grant opportunities. Research any other funding sources.	92.55	2022-2026

MANAGEMENT PRACTICES
to be done within next 10 years

OBJ	STD NO	TYPE	SILVICULTURAL PRESCRIPTION	AC	TO BE REMOVED		TIMING
					BA/AC	TOT VOL	
STEW	2	WH	Early Successional Habitat Development	11.4	-	-	2022-2032

As this stand develops it will loose its early successional habitat features it will be necessary reset the stand to maintain this habitat type. Mowing/mulching with a Fecon style mower will cut down and or mulch the stems in the stand so that the stand will regenerate. With established root systems, forest regeneration is expected to sprout and develop quickly. Mowing's may be staggered to offset the age of the regeneration to provide a more diverse habitat structure. Areas with less growth and vegetation may be mowed later in this plan period while those patches that have developed more quickly will be mowed earlier. The stand will be monitored to determine when patches are declining in early successional habitat value.

Strips of overstory trees between existing patches will be removed to reduce the "edge" habitat. The boundaries of the patches will be thinned and mowed to create soft edges between mature and young forests. This treatment will overlap with the treatments prescribed for Stand 5.

NRCS Funding code 647 Early Successional Habitat Development will be considered for this treatment.

The desired future conditions achieved by this treatment will be established and maintained young forest habitat. Focal Birds that are expected to benefit from this include Veery, Northern Flicker, Chestnut-sided Warbler, Black-and-White Warbler, Canada Warbler, Ruffed Grouse, White-throated Sparrow and others.

This treatment will cost money and there may be grant money available to assist.

STEW	5	OM	Thinning/Selection	92.55 acres	30sq.ft	160cds	2022-2026

A thinning to release desirable crop and hard mast trees will enhance the wildlife habitat value of this stand while improving the quality of forest products. Crop trees should be of a desirable species such as white pine, red oak, black oak, red oak or white oak. Some areas will be treated with small group openings. This is to enhance the growth in the understory and midstory to create a more complex vertical structure for wildlife. Den, nest and snag trees will be identified and retained as needed to meet the desired number per acre. While this prescription applies to the entire stand, it is expected that some areas will be left untreated. Creating openings along wetland boarders will create a structurally complex understory to which will provide protection and foraging opportunities for wildlife. Snags may be created as needed. Some coarse woody debris will be retained on the forest floor. Fine woody debris should be piled to maximize its value as nesting or perching sites.

As mentioned in Stand 2, strips of mature overstory trees located between the existing young forest patches will be removed to maximize the size, reduce "edge", and optimize the habitat values of the stand. Areas surrounding stand two will be thinned to soften the transition between mature and young forest.

MANAGEMENT PRACTICES

to be done within next 10 years

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

Nesting boxes could be added in multiple areas of the property.

NRCS Funding Codes 645 Upland Wildlife Habitat Management, 649 Structures for Wildlife and or 666 Forest Stand Improvement should be considered for this treatment.

Both treatments should be conducted outside of nesting periods, ideally in the late fall or winter. NHESP has identified multiple Species of Special Concern on the property. Guidance from NHESP will be sought to protect these species.

The desired future condition of this treatment is a healthy, diverse mixed oak stand with a significant white pine component. A variable density overstory will provide a high functioning understory with seedlings, saplings, shrubs and other types of growth. This forest structure will provide excellent habit for a host of species. Focal birds that are expected to utilize this stand include Black-throated Blue Warbler, Canada Warbler, Veery, Wood Thrush, Oven Bird, Northern Flicker, Hairy Woodpecker, Brown Creeper, Yellow bellied Sapsucker, and Pileated Woodpecker.

This treatment will likely cost money and there may be grant money available to assist.

MASSWILDLIFE

DIVISION OF
FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581
p: (508) 389-6300 | f: (508) 389-7890
MASS.GOV/MASSWILDLIFE

May 2, 2022

Glenda Williamson
Conservation Agent
Town of Holden

Re: Data Release
Holden Town Forest – Holden, MA
NHESP Tracking Number: 22-40991

Dear Glenda Williamson,

Thank you for submitting a Natural Heritage Data Release Form to the Massachusetts Natural Heritage and Endangered Species Program of the MA Division of Fisheries & Wildlife. Our database indicates that the following MESA-listed species have been found in the vicinity of the site:

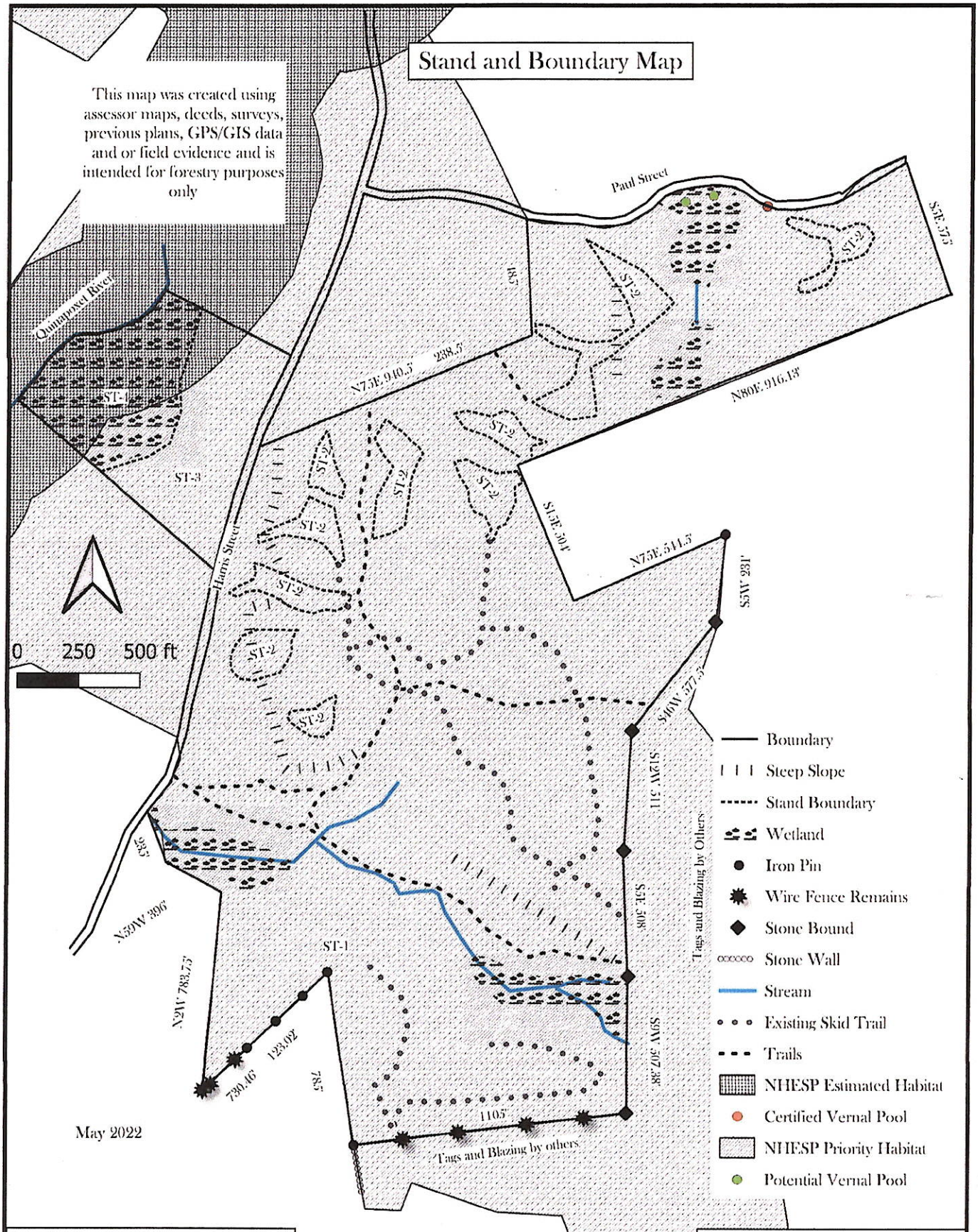
Scientific Name	Common Name	Taxonomic Group	MESA Status	Last Observation Year
Antrostomus vociferus	Eastern Whip-poor-will	Bird	Special Concern	2017
Glyptemys insculpta	Wood Turtle	Reptile	Special Concern	2021
Hylogomphus abbreviatus	Spine-crowned Clubtail	Dragonfly/Damselfly	Special Concern	2016
Ophiogomphus aspersus	Brook Snaketail	Dragonfly/Damselfly	Special Concern	2016

This evaluation is based on the most recent information available in the NHESP database, which is constantly being expanded and updated through ongoing research and inventory.

For any additional questions regarding this data release, please contact (508) 389-6360.

Stand and Boundary Map

This map was created using assessor maps, deeds, surveys, previous plans, GPS/GIS data and or field evidence and is intended for forestry purposes only

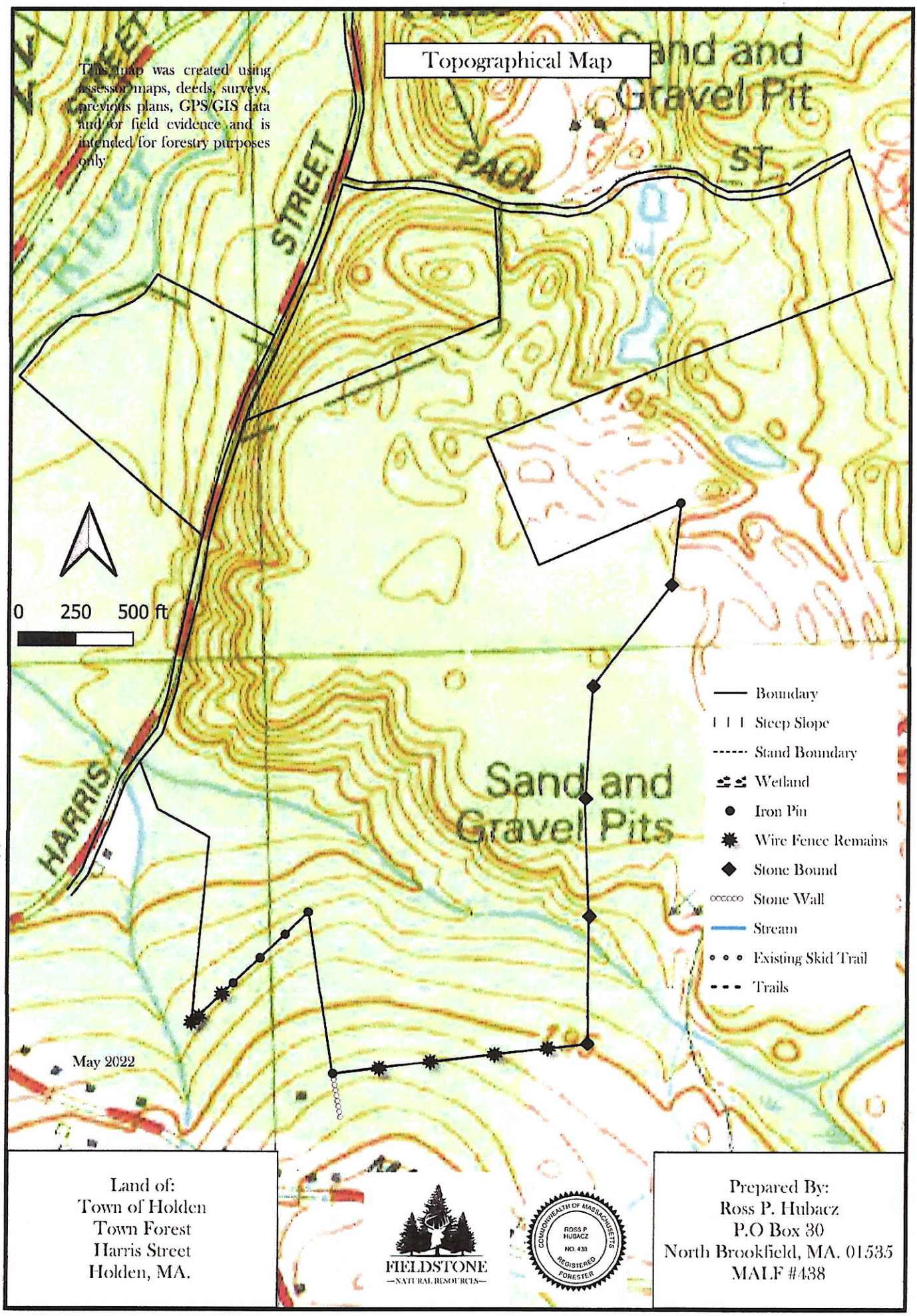


Land of:
Town of Holden
Town Forest
Harris Street
Holden, MA.

FIELDSTONE
—NATURAL RESOURCES—

COMMONWEALTH OF MASSACHUSETTS
ROSS P. HUBACZ
NO. 438
REGISTERED FORESTER

Prepared By:
Ross P. Hubacz
P.O Box 30
North Brookfield, MA. 01535
MALF #438



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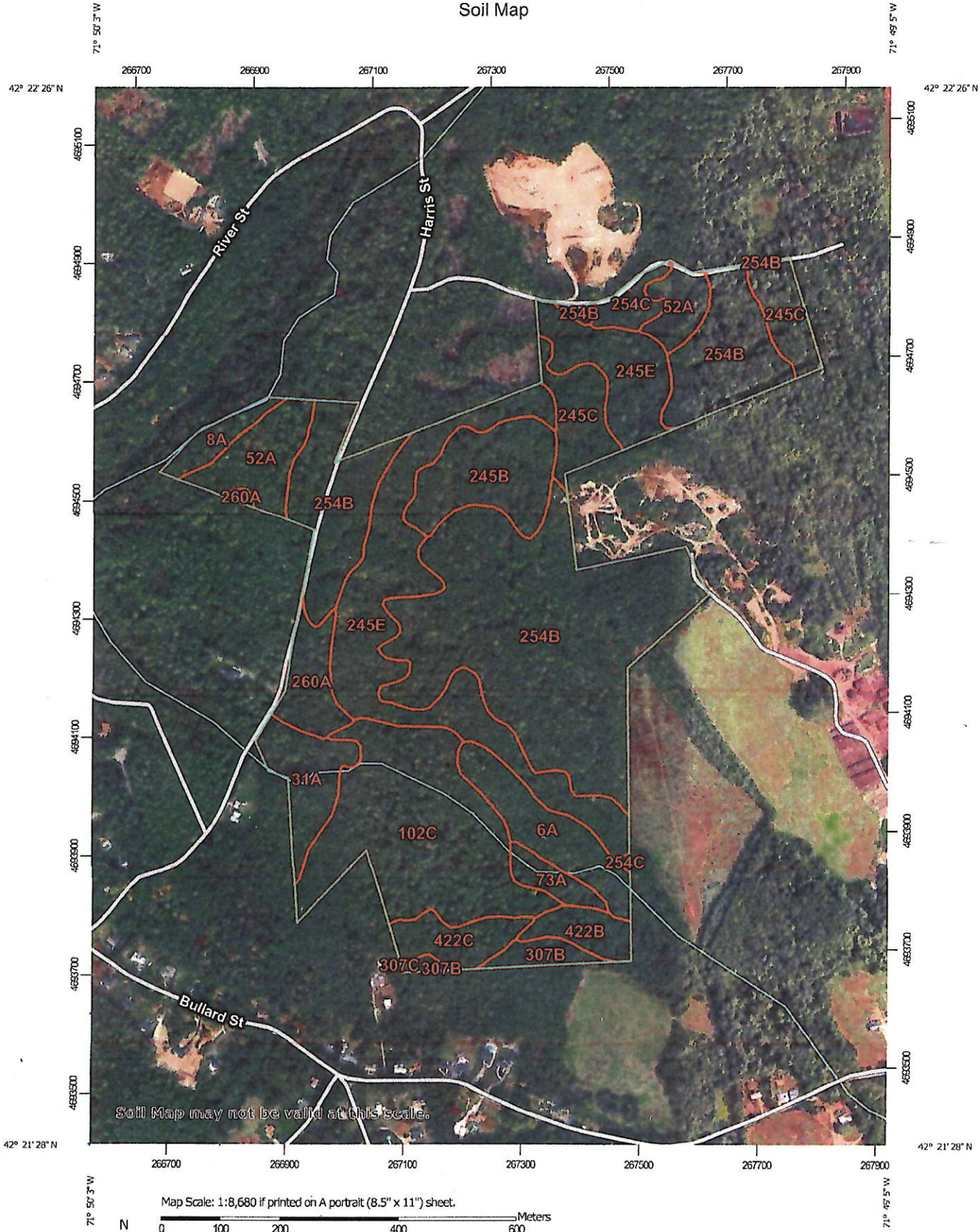
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71° 49' 5" W
42° 22' 26" N
42° 21' 28" N
266700
266900
267100
267300
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267700
267900
4695100
4694900
4694700
4694500
4694300
4694100
4693900
4693700
4693500
River St
Harris St
Bullard St
254B
254C
52A
245C
245E
8A
260A
245B
31A
102C
6A
73A
422C
422B
307B
307C
Soil Map may not be valid at this scale.
Map Scale: 1:8,680 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0 100 200 400 600
Feet
0 400 800 1600 2400
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
6A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	6.7	4.2%
8A	Limerick silt loam, 0 to 3 percent slopes, frequently flooded	2.1	1.3%
31A	Walpole sandy loam, 0 to 3 percent slopes	5.2	3.3%
52A	Freetown muck, 0 to 1 percent slopes	7.9	5.0%
73A	Whitman fine sandy loam, 0 to 3 percent slopes, extremely stony	2.0	1.3%
102C	Chatfield-Hollis-Rock outcrop complex, 0 to 15 percent slopes	21.8	13.7%
245B	Hinckley loamy sand, 3 to 8 percent slopes	8.5	5.4%
245C	Hinckley loamy sand, 8 to 15 percent slopes	7.5	4.7%
245E	Hinckley loamy sand, 25 to 35 percent slopes	26.6	16.7%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	55.7	35.1%
254C	Merrimac fine sandy loam, 8 to 15 percent slopes	2.0	1.3%
260A	Sudbury fine sandy loam, 0 to 3 percent slopes	4.2	2.7%
307B	Paxton fine sandy loam, 0 to 8 percent slopes, extremely stony	1.7	1.1%
307C	Paxton fine sandy loam, 8 to 15 percent slopes, extremely stony	0.3	0.2%
422B	Canton fine sandy loam, 0 to 8 percent slopes, extremely stony	2.7	1.7%
422C	Canton fine sandy loam, 8 to 15 percent slopes, extremely stony	3.7	2.4%
Totals for Area of Interest		**158.7**	**100.0%**

Worcester County, Massachusetts, Northeastern Part

6A—Scarboro mucky fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svky
Elevation: 0 to 1,320 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Scarboro and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scarboro

Setting

Landform: Drainageways, outwash deltas, outwash terraces, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy glaciofluvial deposits derived from schist and/or sandy glaciofluvial deposits derived from gneiss and/or sandy glaciofluvial deposits derived from granite

Typical profile

Oe - 0 to 3 inches: mucky peat
A - 3 to 11 inches: mucky fine sandy loam
Cg1 - 11 to 21 inches: sand
Cg2 - 21 to 65 inches: gravelly coarse sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (1.42 to 14.17 in/hr)
Depth to water table: About 0 to 2 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F144AY031MA - Very Wet Outwash
Hydric soil rating: Yes

Minor Components

Swansea

Percent of map unit: 10 percent
Landform: Bogs, swamps
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Wareham

Percent of map unit: 5 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Walpole

Percent of map unit: 5 percent
Landform: Deltas, depressions, outwash terraces, depressions, outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

8A—Limerick silt loam, 0 to 3 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2zvfn
Elevation: 50 to 500 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Limerick and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Limerick

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-silty alluvium

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 29 inches: silt loam
H3 - 29 to 60 inches: very fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 6 to 10 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very high (about 13.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D
Ecological site: F144AY015NY - Wet Silty Low Floodplain
Hydric soil rating: Yes

Minor Components

Winooski

Percent of map unit: 10 percent
Hydric soil rating: No

Saco

Percent of map unit: 10 percent
Landform: Alluvial flats
Hydric soil rating: Yes

31A—Walpole sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svkl
Elevation: 0 to 1,020 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Walpole and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Walpole

Setting

Landform: Depressions, outwash plains, outwash terraces, depressions, deltas
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip, talf
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Sandy glaciofluvial deposits derived from igneous, metamorphic and sedimentary rock

Typical profile

Oe - 0 to 1 inches: mucky peat
A - 1 to 7 inches: sandy loam
Bg - 7 to 21 inches: sandy loam
BC - 21 to 25 inches: gravelly sandy loam
C - 25 to 65 inches: very gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 4 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: B/D
Ecological site: F144AY028MA - Wet Outwash
Hydric soil rating: Yes

Minor Components

Sudbury

Percent of map unit: 10 percent
Landform: Outwash plains, deltas, terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Scarboro

Percent of map unit: 10 percent
Landform: Outwash plains, deltas, outwash terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave

Hydric soil rating: Yes

52A—Freetown muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2t2q9
Elevation: 0 to 1,110 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Freetown and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Freetown

Setting

Landform: Depressions, depressions, swamps, kettles, marshes, bogs
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Highly decomposed organic material

Typical profile

Oe - 0 to 2 inches: mucky peat
Oa - 2 to 79 inches: muck

Properties and qualities

Slope: 0 to 1 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 19.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F144AY043MA - Acidic Organic Wetlands
Hydric soil rating: Yes

Minor Components

Whitman

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Swansea

Percent of map unit: 5 percent
Landform: Bogs, swamps, marshes, depressions, depressions, kettles
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scarboro

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

73A—Whitman fine sandy loam, 0 to 3 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2w695
Elevation: 0 to 1,580 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Whitman, extremely stony, and similar soils: 81 percent
Minor components: 19 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Whitman, Extremely Stony

Setting

Landform: Drumlins, ground moraines, hills, drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope

Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 1 inches: peat
A - 1 to 10 inches: fine sandy loam
Bg - 10 to 17 inches: gravelly fine sandy loam
Cdg - 17 to 61 inches: fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 7 to 38 inches to densic material
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F144AY041MA - Very Wet Till Depressions
Hydric soil rating: Yes

Minor Components

Ridgebury, extremely stony

Percent of map unit: 10 percent
Landform: Drumlins, depressions, ground moraines, hills, drainageways
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scarboro

Percent of map unit: 5 percent
Landform: Drainageways, depressions, outwash terraces, outwash deltas
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Swansea

Percent of map unit: 3 percent
Landform: Marshes, bogs, swamps
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Woodbridge, extremely stony

Percent of map unit: 1 percent
Landform: Ground moraines, hills, drumlins
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

102C—Chatfield-Hollis-Rock outcrop complex, 0 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2w69g
Elevation: 0 to 1,540 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Chatfield, extremely stony, and similar soils: 39 percent
Hollis, extremely stony, and similar soils: 26 percent
Rock outcrop: 17 percent
Minor components: 18 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatfield, Extremely Stony

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 2 inches: fine sandy loam
Bw - 2 to 30 inches: gravelly fine sandy loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 0 to 15 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 20 to 41 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Hollis, Extremely Stony

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: gravelly fine sandy loam
Bw - 7 to 16 inches: gravelly fine sandy loam
2R - 16 to 26 inches: bedrock

Properties and qualities

Slope: 0 to 15 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 8 to 23 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Setting

Parent material: Igneous and metamorphic rock

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Runoff class: Very high

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Charlton, extremely stony

Percent of map unit: 12 percent
Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Sutton, extremely stony

Percent of map unit: 3 percent
Landform: Hills, ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Paxton, extremely stony

Percent of map unit: 2 percent
Landform: Ground moraines, hills, drumlins
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Hydric soil rating: No

Leicester, extremely stony

Percent of map unit: 1 percent
Landform: Ground moraines, hills, drainageways, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Hydric soil rating: Yes

245B—Hinckley loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svm8
Elevation: 0 to 1,430 feet
Mean annual precipitation: 36 to 53 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hinckley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Outwash deltas, outwash terraces, kames, kame terraces, moraines, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 8 percent
Landform: Outwash deltas, outwash terraces, moraines, eskers, kames, outwash plains, kame terraces
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Sudbury

Percent of map unit: 5 percent
Landform: Outwash deltas, outwash terraces, moraines, outwash plains, kame terraces
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Head slope, side slope, base slope, tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

Agawam

Percent of map unit: 2 percent
Landform: Outwash deltas, outwash terraces, moraines, eskers, kames, outwash plains, kame terraces
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

245C—Hinckley loamy sand, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2svm9
Elevation: 0 to 1,480 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Hinckley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Outwash deltas, outwash terraces, moraines, eskers, kames, outwash plains, kame terraces
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Outwash deltas, moraines, outwash plains, kame terraces, outwash terraces
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave, linear

Across-slope shape: Concave, linear
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landform: Moraines, eskers, kames, outwash deltas, outwash terraces, outwash plains, kame terraces
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Merrimac

Percent of map unit: 5 percent
Landform: Kames, outwash plains, outwash terraces, moraines, eskers
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

245E—Hinckley loamy sand, 25 to 35 percent slopes

Map Unit Setting

National map unit symbol: 2svmf
Elevation: 0 to 1,200 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Hinckley and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Outwash deltas, outwash terraces, moraines, eskers, kames, outwash plains, kame terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave

Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 25 to 35 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 10 percent
Landform: Moraines, eskers, kames, outwash deltas, outwash terraces, outwash plains, kame terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Merrimac

Percent of map unit: 3 percent
Landform: Kame terraces, outwash terraces, kames, outwash plains, moraines, eskers
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Sudbury

Percent of map unit: 2 percent

Landform: Outwash deltas, moraines, outwash plains, kame terraces, outwash terraces
Landform position (two-dimensional): Backslope, footslope, toeslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: No

254B—Merrimac fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyqs
Elevation: 0 to 1,290 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Merrimac and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Outwash plains, outwash terraces, moraines, eskers, kames
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Hinckley

Percent of map unit: 5 percent
Landform: Deltas, kames, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Sudbury

Percent of map unit: 5 percent
Landform: Deltas, terraces, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Windsor

Percent of map unit: 3 percent
Landform: Outwash terraces, dunes, deltas, outwash plains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Agawam

Percent of map unit: 2 percent
Landform: Outwash plains, outwash terraces, moraines, stream terraces, eskers, kames
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

254C—Merrimac fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2tyqt
Elevation: 0 to 1,030 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Merrimac and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Eskers, outwash plains, moraines, kames, outwash terraces
Landform position (two-dimensional): Backslope, footslope, summit, shoulder
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Hinckley

Percent of map unit: 5 percent
Landform: Deltas, kames, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Sudbury

Percent of map unit: 5 percent
Landform: Deltas, terraces, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landform: Outwash plains, dunes, deltas, outwash terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

260A—Sudbury fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: w3pq
Elevation: 0 to 2,100 feet
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 145 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Sudbury and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sudbury

Setting

Landform: Depressions
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Friable coarse-loamy eolian deposits over loose sandy glaciofluvial deposits

Typical profile

H1 - 0 to 9 inches: fine sandy loam
H2 - 9 to 18 inches: fine sandy loam
H3 - 18 to 25 inches: gravelly loamy sand
H4 - 25 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: F144AY027MA - Moist Sandy Outwash
Hydric soil rating: No

Minor Components

Agawam

Percent of map unit: 5 percent
Hydric soil rating: No

Ninigret

Percent of map unit: 5 percent
Hydric soil rating: No

Merrimac

Percent of map unit: 5 percent
Hydric soil rating: No

Walpole

Percent of map unit: 5 percent
Landform: Terraces
Hydric soil rating: Yes

307B—Paxton fine sandy loam, 0 to 8 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2w675
Elevation: 0 to 1,580 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Paxton, extremely stony, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton, Extremely Stony

Setting

Landform: Ground moraines, hills, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 10 inches: fine sandy loam
Bw1 - 10 to 17 inches: fine sandy loam
Bw2 - 17 to 28 inches: fine sandy loam
Cd - 28 to 67 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 20 to 43 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Woodbridge, extremely stony
Percent of map unit: 10 percent
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Charlton, extremely stony
Percent of map unit: 5 percent
Landform: Hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Ridgebury, extremely stony
Percent of map unit: 4 percent
Landform: Drumlins, drainageways, depressions, ground moraines, hills
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Whitman, extremely stony
Percent of map unit: 1 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

307C—Paxton fine sandy loam, 8 to 15 percent slopes, extremely stony

Map Unit Setting
National map unit symbol: 2w676
Elevation: 0 to 1,490 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Paxton, extremely stony, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton, Extremely Stony

Setting

Landform: Ground moraines, hills, drumlins
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 10 inches: fine sandy loam
Bw1 - 10 to 17 inches: fine sandy loam
Bw2 - 17 to 28 inches: fine sandy loam
Cd - 28 to 67 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 20 to 43 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Charlton, extremely stony

Percent of map unit: 8 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Woodbridge, extremely stony

Percent of map unit: 6 percent
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ridgebury, extremely stony

Percent of map unit: 1 percent
Landform: Drumlins, depressions, ground moraines, hills, drainageways
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

422B—Canton fine sandy loam, 0 to 8 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2w818
Elevation: 0 to 1,180 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Canton, extremely stony, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton, Extremely Stony

Setting

Landform: Moraines, hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 5 inches: fine sandy loam
Bw1 - 5 to 16 inches: fine sandy loam
Bw2 - 16 to 22 inches: gravelly fine sandy loam
2C - 22 to 67 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Charlton, extremely stony

Percent of map unit: 6 percent
Landform: Ridges, ground moraines, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Scituate, extremely stony

Percent of map unit: 6 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Montauk, extremely stony

Percent of map unit: 4 percent
Landform: Recessionial moraines, ground moraines, hills, drumlins
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Swansea

Percent of map unit: 4 percent
Landform: Marshes, depressions, bogs, swamps, kettles
Down-slope shape: Concave
Across-slope shape: Concave

Hydric soil rating: Yes

422C—Canton fine sandy loam, 8 to 15 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2w815
Elevation: 0 to 1,310 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Canton, extremely stony, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton, Extremely Stony

Setting

Landform: Moraines, hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 5 inches: fine sandy loam
Bw1 - 5 to 16 inches: fine sandy loam
Bw2 - 16 to 22 inches: gravelly fine sandy loam
2C - 22 to 67 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Scituate, extremely stony

Percent of map unit: 6 percent
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Charlton, extremely stony

Percent of map unit: 5 percent
Landform: Ridges, ground moraines, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Montauk, extremely stony

Percent of map unit: 5 percent
Landform: Recessionial moraines, ground moraines, hills, drumlins
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Hydric soil rating: No

Hollis, extremely stony

Percent of map unit: 4 percent
Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

ARRIS & TOWN FOREST

100 A±

APRIL 27, 1933

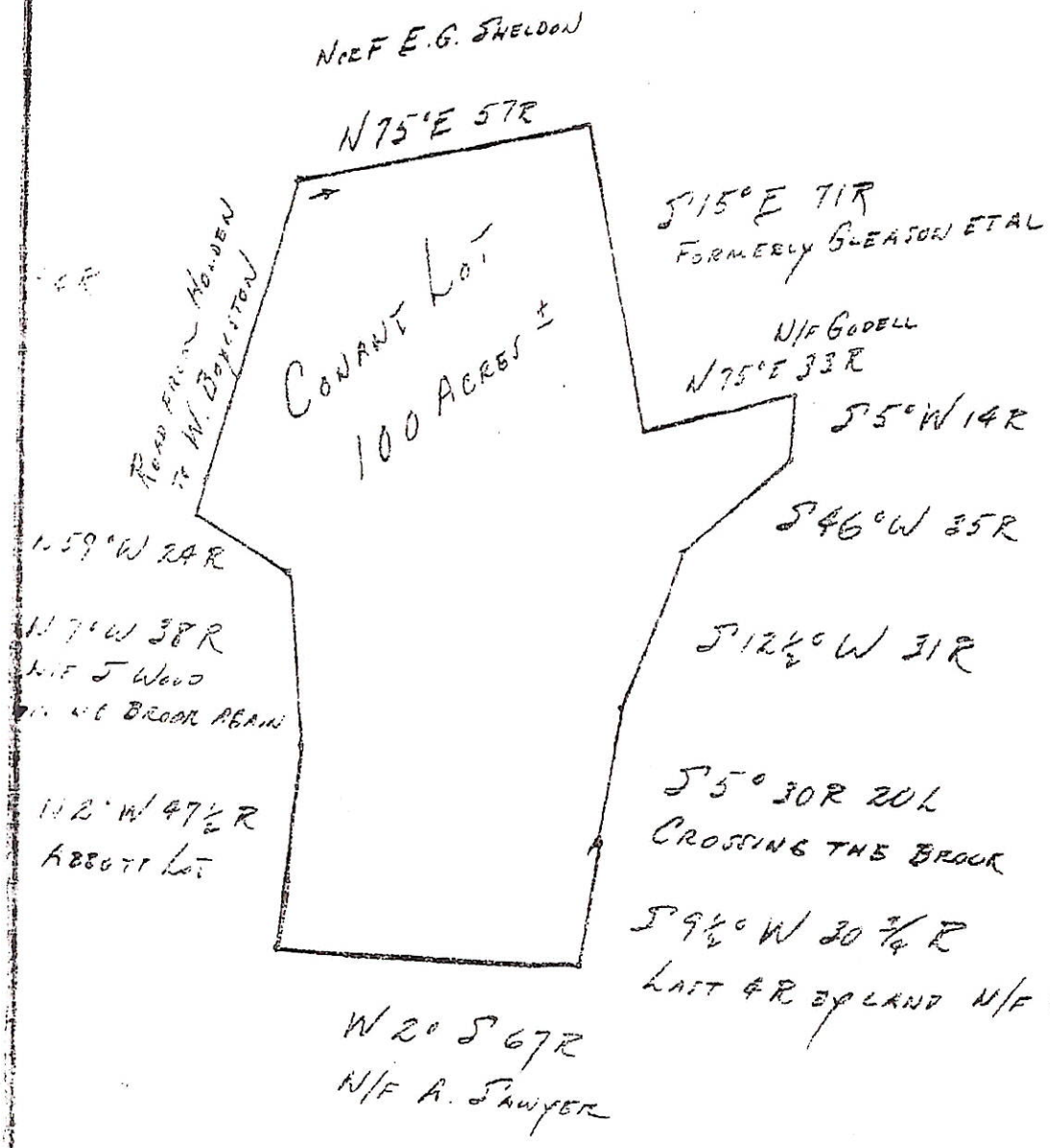
BOOK 2572 PAGE 49

GRANTOR:

GEO. S. GRAHAM

TO

TOWN OF HOLDEN



*Provided by Town of Holden

HOLDEN CONSERVATION COMMISSION
1204 Main Street, Holden, MA 01520

November 24, 1999

Mr. Al Futterman
Outreach Coordinator
NRWA
592 Main Street
Groton, MA 01450

Re: Town of Holden's Town Forest

Dear Al,

This parcel of land is referred to in the 1999 Open Space and Recreation Plan as Canada Mills/Town Forest, consisting of 141.87 acres, Map & Parcel: 107/3, and 3/1.

It is also described in the 1994 Open Space and Recreation Plan as 'the 100 acre Town Forest east of Harris Street and south of Paul Street. The front land contains a small pond constructed by the former Forestry and Parks Dept.'

On April 27, 1933, Mr. George S. Graham granted to the Town of Holden the "George S. Graham Town Forest", 100 + acres, Book 2582, Page 49.

The forest is located on the easterly side of Harris Street. The forest contains mainly hardwoods and does have a small brook passing through it. This small brook is perennial and flows eventually into the Quinapoxet River. There is very limited use of this area. Occasionally Boy Scouts have camped in these woods.

Information regarding logging has not been determined. Any other information I find on this parcel, I will either forward to you or bring it with me for our meeting on the 3rd of December.

Sincerely,

Nancy S. Rocheleau
Secretary

faxed 5:13pm 11/24/99

*Provided by Town of Holden

July 23, 1971

Mr. William Kennedy, Town Manager
TOWN OF HOLDEN
Town Hall
Holden, Massachusetts 01520

Dear Mr. Kennedy:

We have been advised by Town Counsel that they are ready to close the purchase of the 11.85 acres of Land from Mr. Buck.

The purchase price is $1200., of which $[illegible] has been paid as a deposit. Will you please see that a check is made out for $1,000. to Mr. Harry T. Buck, but sent to the Law Firm of Mirick, O'Connell, Demallie and Lougee
Mechanics National Bank Building
Worcester, Mass.

Attention: Mr. David Lougee

Thank you.

CONSERVATION COMMISSION

Hilda M. Appleton,
Chairman

HMA:ehn

5143

74

I, HARRY T. BUCK, JR.

of East Sandwich, Barnstable County, Massachusetts

being ~~*married*~~, for consideration paid, and in full consideration of Forty-two Hundred ($4200.00)

grants to THE INHABITANTS OF THE TOWN OF HOLDEN, through its Conservation Commission for administration, control, and maintenance under the provisions of General Laws, Chapter 40, Section 8C, as amended,
of ADDRESS: Town Hall, Main Street, Holden with ~~quitclaim covenants~~

the land in Holden, Massachusetts, in said County, easterly of Harris Street, bounded and described as follows:

[Description and encumbrances, if any]

BEGINNING at the northeast corner thereof by land now or formerly of Benjamin Bassett, on the southerly side of the road leading from Holden Meeting House to West Boylston, now or formerly called Paul Street;

THENCE southerly by land now or formerly of said Bassett to land now or formerly of Samuel Stowell;

THENCE westerly by land now or formerly of said Stowell and land now or formerly of Levi Goodell to land now or formerly of James Estabrook;

THENCE northerly by land now or formerly of said Estabrook to land now or formerly of E. G. Sheldon;

THENCE easterly by land now or formerly of said Sheldon to a corner;

THENCE northerly by land now or formerly of said Sheldon to said road;

THENCE easterly by said road to the place of beginning.

Containing about forty (40) acres, more or less.

Being the same premises conveyed to me by Harry T. Buck, et ux dated November 23, 1945 and recorded with Worcester District Registry of Deeds, Book 2978, Page 13.

Witness my hand and seal this Fourth day of August 19 71

Harry T. Buck Jr.
HARRY T. BUCK, JR.

WORCESTER 013573 COMMONWEALTH OF MASSACHUSETTS DEEDS EXCISE AUG 16 1971 AUG 16 '71 $10.26 R9,11039

The Commonwealth of Massachusetts

Worcester ss. August 4, 19 71

Then personally appeared the above named Harry T. Buck, Jr.

and acknowledged the foregoing instrument to be his free act and deed, before me

David L. Lougee
DAVID L. LOUGEE Notary Public ~~Justice of the Peace~~

My Commission Expires December 1, 19 72

Recorded Aug. 16, 1971 at 3h. 13m. P. M.

be regarded as part of the realty and shall not be subject to the lien of said mortgage, and that The Atlantic Refining Company may at any time enter upon said leased premises without any further consent from the undersigned or our executors, administrators or assigns and remove said property or part thereof, provided, however, that after the removal of the same, said The Atlantic Refining Company shall leave said leased premises in *good order and condition.*

Witness:
L. E. Wilson (Signed) First National Bank of Webster
By William A. Cash Cashier

Rec'd April 27, 1933 at 2h. 47m. P. M. Ent'd & Ex'd

* * * * * * *

Graham to Town of Holden

I, George S. Graham, of Holden, Worcester County, Massachusetts, for consideration paid, grant to Inhabitants of the Town of Holden, a municipal corporation located in said County of Worcester, with W A R - R A N T Y covenants the land in the northeasterly part of said HOLDEN, on the easterly side of the road leading from said Holden to West Boylston, being a tract of woodland containing one hundred two acres and thirty-one rods, more or less, and bounded and described as follows: Beginning at the northwesterly corner of the granted premises at a stake and stones on said road and at a corner of land formerly of E. G. Sheldon; thence by said Sheldon land N. 75° E. fifty-seven (57) rods to a stake and stones at a corner at land formerly of Gleason; thence S. 15° E. by said Gleason land and the Goodell lot seventy-one (71) rods to a stake and stones at a corner; thence by said Goodell lot N. 75° E. thirty-three (33) rods to a stake and stones at a corner; thence S. 5° W. fourteen (14) rods to a pitch pine stump with stones about it; thence S. 46° W. thirty-five (35) rods to a stake and stones; thence S. 12 1/2° W. thirty-one (31) rods to a stake and stones; thence S. 5° W. thirty (30) rods and twenty (20) links, crossing the brook to a stake and stones; thence S. 9 1/2° W. thirty and three fourths (30 3/4) rods to a stake and stones at a corner at land formerly of Alfred Sawyer; the last four lines being bounded by land formerly of Charles Chaffin; thence W. 2° S. by land formerly of said Sawyer sixty-seven (67) rods to stones at the end of the wall, at a corner; thence N. 2° W. by the Abbott lot forty-seven and one-half (47 1/2) rods to a red oak and stones; thence N. 7° W. by land formerly of Joseph Wood thirty-eight (38) rods, crossing the brook again, to a stake and stones at an angle; thence N. 59° W. twenty-four (24) rods to a stake and stones at the road aforesaid; thence in a northeasterly direction by the road ninety-four (94) rods to the place of beginning; or however otherwise the same may be bounded, measured or described.

Being the same premises conveyed by Edwin Conant to the Inhabitants of the Town of Sterling, dated July 17, 1884 and recorded with Worcester District Deeds, Book 1178, Page 642; and the same premises conveyed to me by several deeds, recorded with said Deeds.

The consideration for this deed is less than one hundred dollars.

I, Martha E. Graham, wife of said grantor, release to said grantee all rights of D O W E R and H O M E S T E A D and other interests therein.

W I T N E S S our hands and seals this 29th day of March 1933.

Witnesses to mark of G. S. G.
Waterman L. Williams
T. Walter Howe

George S. his + mark Graham (seal)
Martha E. Graham (seal)

The Commonwealth of Massachusetts

Worcester, ss. March 29, 1933. Then personally appeared the above named George S. Graham and acknowledged the foregoing instrument to be his free act and deed, before me

Waterman L. Williams Justice of the Peace
My commission expires November 12, 1938

Rec'd April 27, 1933 at 3h. 36m. P. M. Ent'd &rEx'd

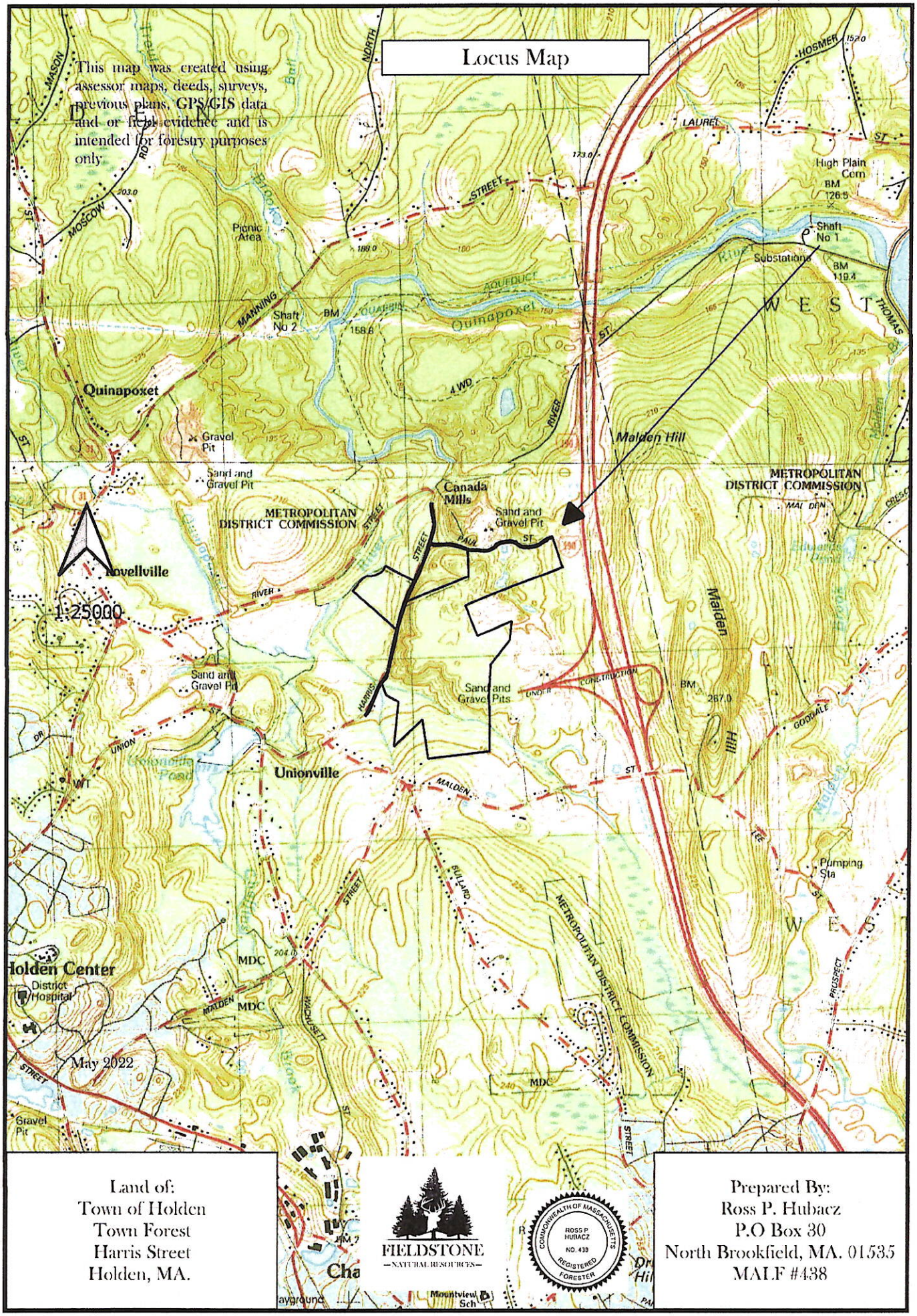
* * * * * * *

Laparl to Lafley

I, Leo F. Laparl of Worcester, Worcester County, Massachusetts for consideration paid, grant to Rose E. Lafley of Worcester with W A R - R A N T Y covenants a certain parcel of land with the buildings thereon, situated on the southerly side of Gilman Street in said WORCESTER, bounded and described as follows: Beginning at the northeasterly corner of the premises on said southerly line of Gilman Street; thence southerly one hundred (100) feet; thence westerly sixty (60) feet; thence northerly one hundred (100) feet to the southerly line of Gilman Street; thence easterly by the southerly line of Gilman Street sixty (60) feet to the place of be-

Locus Map

This map was created using assessor maps, deeds, surveys, previous plans, GPS/GIS data and or field evidence and is intended for forestry purposes only



Land of:
Town of Holden
Town Forest
Harris Street
Holden, MA.

FIELDSTONE
—NATURAL RESOURCES—

COMMONWEALTH OF MASSACHUSETTS
ROSS P. HUBACZ
NO. 438
REGISTERED FORESTER

Prepared By:
Ross P. Hubacz
P.O Box 30
North Brookfield, MA. 01535
MALF #438