



Forest Management Plan

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



CHECK-OFFS

Administrative Box

CH61	CH61A	CH61B	STEWARDSHIP	Cost Share	Case No. <u>215-12262</u>	Orig. Case No. <u>new</u>
cert <input type="checkbox"/>	cert <input type="checkbox"/>	cert <input type="checkbox"/>	new <input checked="" type="checkbox"/>	EEA <input checked="" type="checkbox"/>	Owner ID <u>201415</u>	Add. Case No. <u>—</u>
recert <input type="checkbox"/>	recert <input type="checkbox"/>	recert <input type="checkbox"/>	renew <input type="checkbox"/>	Other <input type="checkbox"/>	Date Rec'd <u>6-23-22</u>	
amend <input type="checkbox"/>	amend <input type="checkbox"/>	amend <input type="checkbox"/>	Climate <input type="checkbox"/>	Birds <input checked="" type="checkbox"/>	Plan Period <u>2023-2032</u>	
Plan Change <input type="checkbox"/> to <input type="checkbox"/>			Conservation Rest. <input checked="" type="checkbox"/>		Rare Spp. Hab. <u>—</u>	
			CR Holder <u>DFW</u>			

OWNER, PROPERTY, and PREPARER INFORMATION

Property Owner(s) Town of Northborough CO Greg Young
Mailing Address 63 Main Street, Northborough, MA 01532 Phone 508-393-5015
Email Address younggr@yahoo.com

Property Location Town(s) Mt Pisgah Conservation Area Northborough Road(s) See attached
Plan Preparer James DiMaio #350
Mailing Address 96 Hunt Road, West Brookfield, MA 01585 Phone 774-200-9726

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
see attached								
TOTALS								

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

See attached

HISTORY Year acquired see attached Year Management began 1978

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 is needed, continue on separate page)

Previous Management Practices (last 10 years)

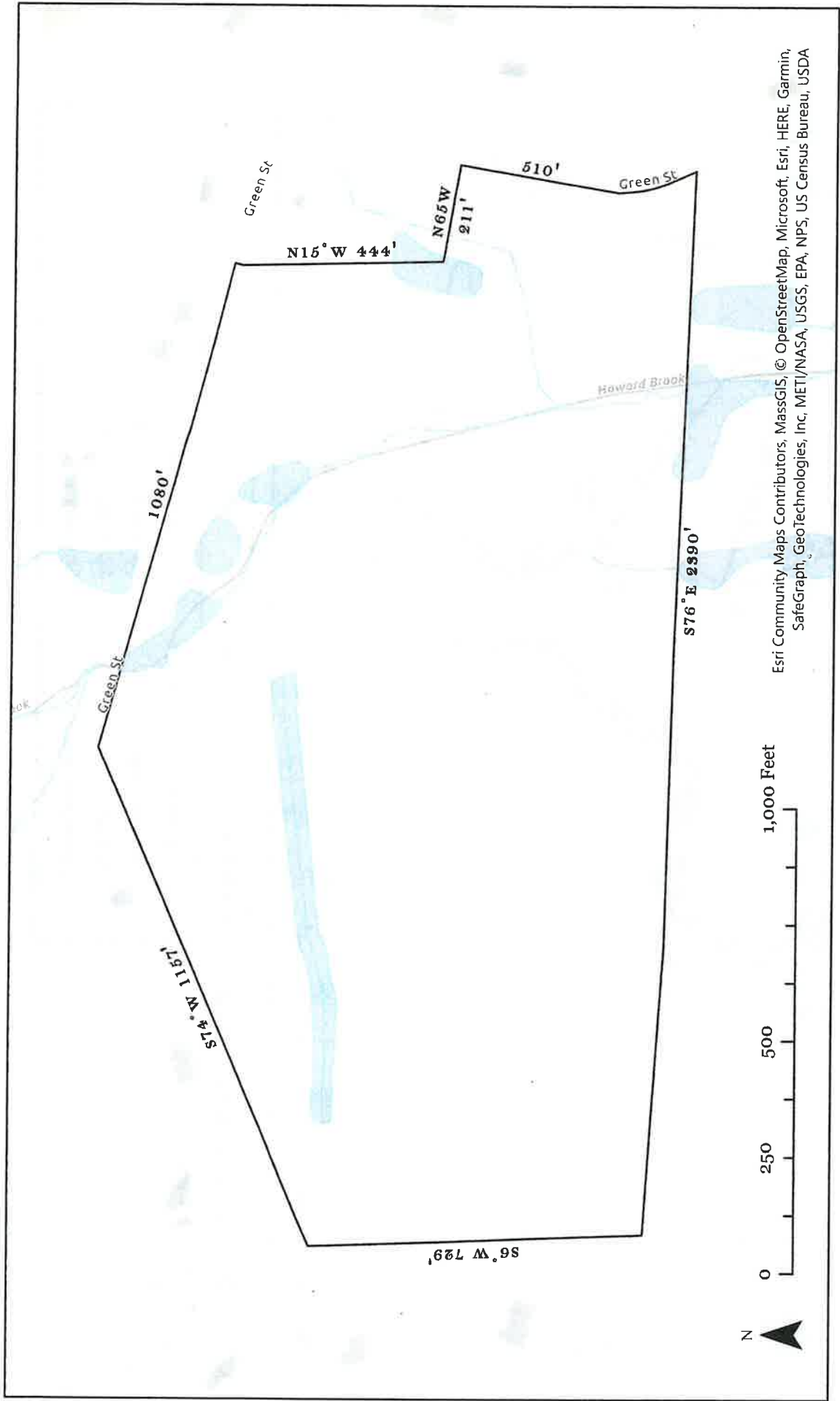
Stand #	Cutting Plan #	Treatment	Yield	Acres	Date
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NA

Remarks: (if additional space is needed, continue on separate page): The town of Northborough began acquiring the 291.61 acre Mt Pisgah Conservation Area in 1978. The Area is under a Conservation Easement-Restriction with the Division of Fisheries and Wildlife. There is an extensive well-maintained and used trail system throughout the property. In the winter of 2022, the Northborough Conservation Commission decided to prepare a Bird Habitat Assessment and Forest Stewardship Plan to better understand their resources, challenges, and opportunities. They submitted a Working Forest Initiative for three (3) separate properties that are associated known as Mt Pisgah Conservation Area. The Conservation Commission desires to assess and plan for the three properties because they are connected geographically (all in the same area) and to be cost effective One (1) plan vs three (3) plans. This is feasible due to the properties will not be enrolled in the MGL Chapter 61 program.

Edmund Hill Conservation Area

Street	Map	Parcel	Book-Page	Year Purchased	Total Acres	Ch61 Excluded Acres	Ch 61 Acres	Stew Excluded Acres	Stew Acres
0 Green Street	4	3	58912/56	2018	4.02	0	0	0	4.02
0 Smith Street	26	2	48554/269	2012	55.61	0	0	0	55.61
0 Smith Street	3	2	6633/40	1978	52.32	0	0	0	52.32
0 Smith Street	3	1	6633/38	1978	26.25	0	0	0	26.25
0 Smith Street	3	5	6633/40	1978	53.00	0	0	0	53.00
0 Smith Street	9	2	146581/153	1992	9.20	0	0	0	9.20
0 Smith Street	9	1	6633/38	1978	39.80	0	0	0	39.80
0 Smith Street	2	2	53658/249	2015	4.74	0	0	0	4.74
16 Smith Street	10	24	15499/61	1993	5.80	0	0	0	5.80
0 Howard Street	8	37	61631/1	2019	19.20	0	0	0	19.20
0 Howard Street	12	2	447621/43	2009	19.12	0	0	0	19.12
445 Howard Street	13	23	529541/156	2014	6.65	0	0	0	6.65
Total					291.69	0	0	0	291.69



Mount Pisgah Boundary Map B

Prepared by Sophie Argetsinger
for Jim Dimaio #550
June 7, 2022

LEGEND Scale: 1:3,500	
—	PROPERTY BOUNDARY
—	ROAD
—	WETLAND
—	STREAM

Landowner Goals

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

(goals may change over time and this table may be updated to reflect any changes)

Goal	Importance to Me			
	HIGH	MED	LOW	N/A, Don't Know
Improve access for walking/skiing/recreation	X			
Improve hunting or fishing	X			
Maintain or enhance privacy			X	
Preserve or improve scenic beauty	X			
Protect special features, including those of historical or person significance	X			
Enhance the quality and/or quantity of forest products*		X		
Practice agroforestry			X	
Produce income from timber products, or other products and services			X	
Produce firewood for personal use			X	
Enhance habitat for birds	X			
Enhance aquatic habitat in streams, ponds, and other wetlands	X			
Enhance habitat for wildlife	X			
Promote diversity of plant species and habitat types	X			
Increase forest resiliency	X			
Minimize damage from forest pests	X			
Protect water quality	X			
Sequester and/or store carbon to mitigate climate change	X			
Suppress or eradicate invasive plants	X			
Lower property taxes			X	
Protect land from development	X			

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

Owner(s) (print) Town of Northborough

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

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

"Manage our town forest as a special place for our residences and guests to enjoy an outdoor recreational experience in a forest that is aesthetically pleasing with large trees, composed of native species, an array of wildlife, high standards for water quality, and resilient over time to cope with climate events and insect and disease infestations"

Stewardship Purpose

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

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

Signature(s): 

Date: 6/21/22

Owner(s) (print) Town of Northborough

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

Property Overview, Regional Significance, and Management Summary

Property Description:

The Mount Pisgah Conservation Area (“**Mt. Pisgah**”) approximately 351.32-acre property is located on Green Street, Smith Street, and Howard Street in the town of Northborough. The property is part of a larger complex of land in the towns of Northborough, Boylston, and Berlin centered around Mount Pisgah, a peak 715 feet tall, making it the highest point in Northborough. The Northborough Mt. Pisgah property is owned by the Town of Northborough and is managed by the town’s Conservation Commission. The town purchased its first parcels of land at Mt. Pisgah in 1978 (171.37 acres total), subsequently adding on additional parcels in 1992, 1993, 2009, 2012, 2014, 2015, 2018, and 2019. Portions of the Mt. Pisgah Conservation Area are protected by a Conservation Restriction (CR) held by the Massachusetts Division of Fisheries and Wildlife. The CR was recorded on August 25, 2005 with the Worcester County Registry of Deeds at Book 44762 Page 21. The Purposes of the CR are to: protect the land in a natural and open condition for fish and wildlife conservation; wildlife habitat protection; and to allow public access for compatible forms of recreation including hunting. Forest management within the CR must adhere to standards described in detail at Exhibit B of the CR document in order to protect biological diversity.

Two smaller parcels, disconnected from the main property, are also part of the Mt. Pisgah property, including a 55.61-acre parcel to the south and a 4.02-acre parcel to the northwest. Public access is allowed and the main property is a popular local destination for birding, hiking, and walking, with well-maintained and well-marked trails. In the winter of 2022, the Town of Northborough decided to prepare a Bird Habitat Assessment and Forest Stewardship Plan to understand the resources, challenges, and opportunities present on the property. The Town of Northborough remains committed to high-quality land stewardship and improving wildlife habitat values.

Regional Significance:

During the recent past (last 100 years), the Massachusetts landscape was dominated by abandoned dairy and sheep farms and young emerging forests. In Worcester County, many fields and pastures bordered by stone walls and later barbed wire were reverting to forest, primarily composed of white pine and oak. The Northborough landscape was also once dominated by farms and associated forests. The land use changed as many of these farms were abandoned and the land reverted to forest, resulting in a landscape dominated by second-growth forests with scattered farms. The Northborough landscape is fairly populated and developed—the town serves primarily as a suburban residential area, with many residents commuting to Worcester and Boston for work. With a population density of 850 inhabitants per square mile, Northborough is home to 15,741 residents (as of the 2010 census) in 18.5 square miles. It should be noted that the town of Northborough supports and encourages forest as open and recreational space and works in cooperation with its Conservation Commission, residents, landowners, the Department of Fish and Game, and the Department of Conservation and Recreation to protect land from development. There are a number of working farms in the town, as well as an industrial park.

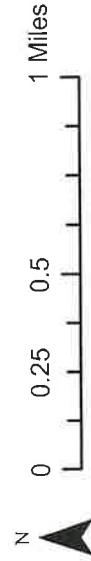
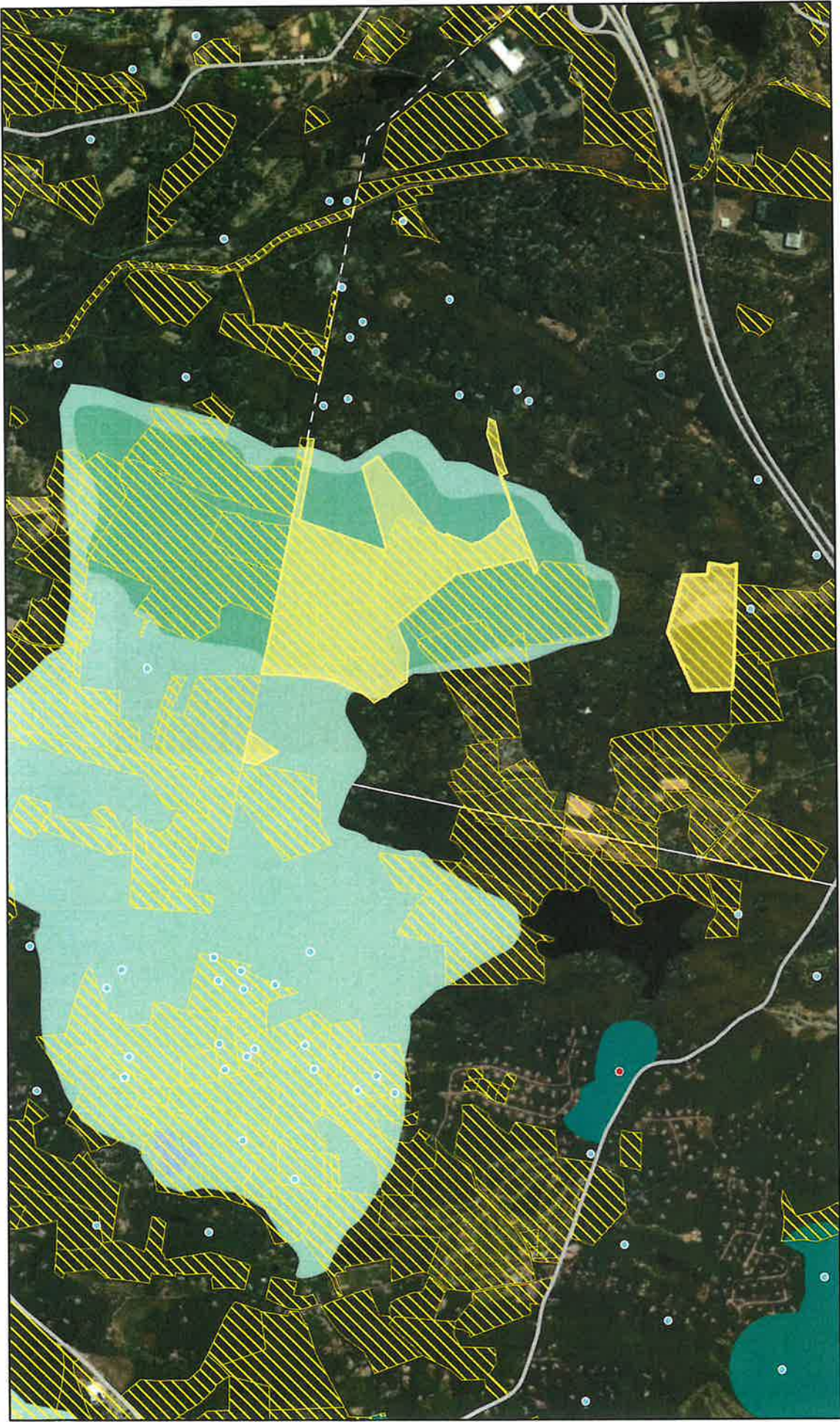
The town of Northborough is located northeast of Worcester along Interstate 290 and Massachusetts Route 20. It borders Boylston and Berlin to the north, Marlborough to the east, Westborough to the south, and Shrewsbury to the west. Northborough as a whole is approximately 47% forest, 19% water and wetlands, 5% cultivated land, and about 29% of the land is developed with residences, businesses, and industrial

development. Northborough has about 20% of its forest-based lands protected by MGL Chapter 61, conservation easements, or is state- or town-owned land.

The Mt. Pisgah property is surrounded by forest and scattered residential properties and is nearby dense residential areas. However, BioMap2 indicates Mt. Pisgah is located within a large area of Critical Natural Landscape and Forest Core; it helps make up a large area of forest that expands to the north and west of the property (see attached BioMap2). This large area is likely an important haven for wildlife in the region. No priority natural communities or rare species are located on or nearby the property.












The following land use information was calculated in ArcGIS using Mass GIS landcover data for an approximately 3400-acre area surrounding the Edmund Hill property (see map below).

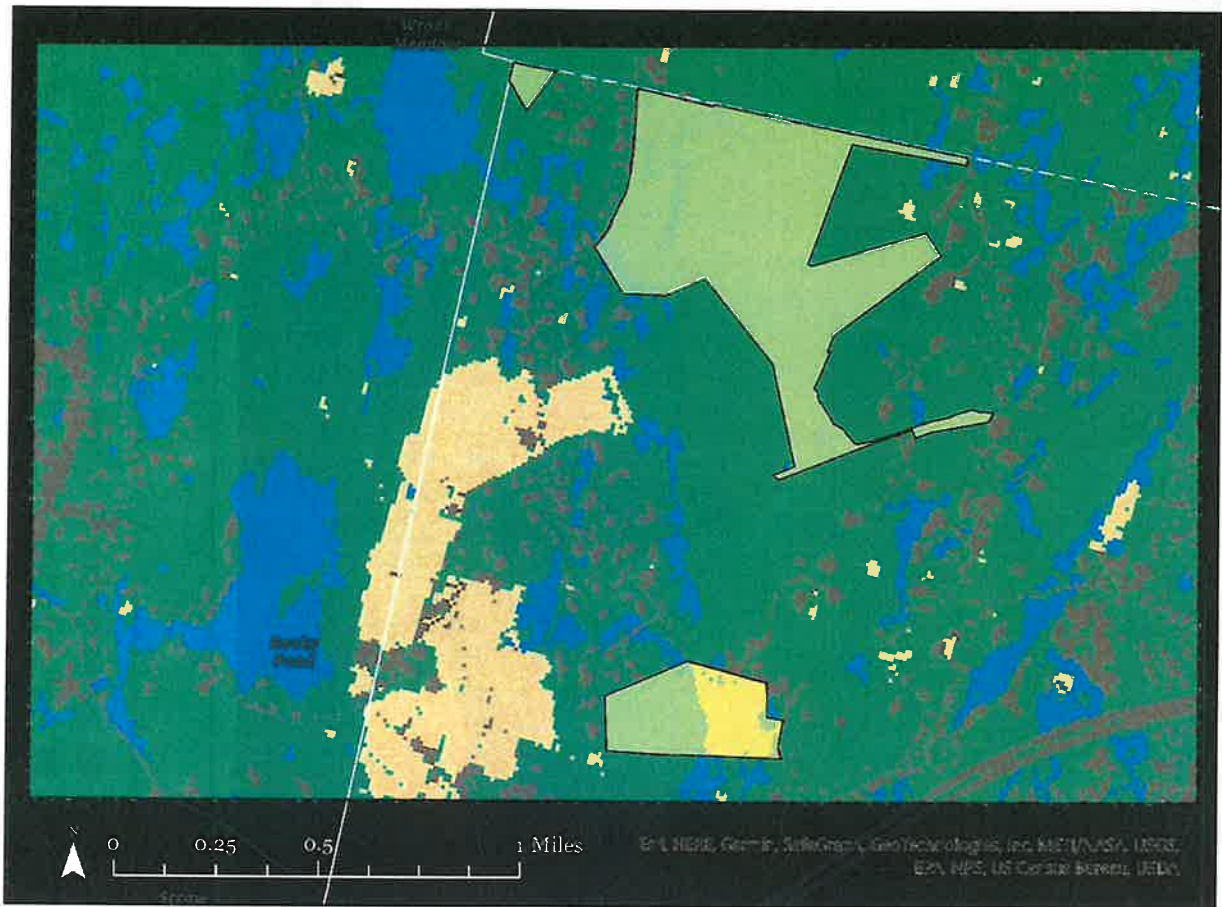
Land Use	Estimated Amount
Forest	69%
Residential, Commercial, and Industrial	11%
Water or wetland	13%
Cultivated	7%
Open Space (protected)	25%
Degree of Fragmentation	Medium
Mature Forest	99%
Early Successional Forest	1%



of SC
 Mt. Pisgah Property
 NHESP/TNC BioMap2
 Prepared by Sophie Argetsinger
 for Jim Dimaio #350
 June 8, 2022

LEGEND

- | | | | | | |
|---|--------------------|---|----------------------|---|-----------------------|
|  | PROPERTY |  | PRIORITY COMMUNITIES |  | CERTIFIED VERNAL POOL |
|  | OPEN SPACE |  | AQUATIC CORE |  | POTENTIAL VERNAL POOL |
|  | WETLANDS |  | FOREST CORE | | |
|  | CORE HABITAT |  | VERNAL POOL CORE | | |
|  | CRITICAL LANDSCAPE | | | | |



LAND COVER TYPE	% COVER
forest	69
wetland	13
cultivated	7
developed	11

History:

The Mt. Pisgah property is typical of Northborough forestland. Once farmland, it has reverted to forest composed primarily of white pine, red and white oak, and red maple in wetter areas. Numerous stone walls are an indication of its agrarian past—parts of the property are bordered by stone walls, and a number of interior stone walls are also present where fields and pastures once dominated the landscape.

Cultural Resources:

None present.

Soils and Forest Health:

Soil information was derived from the Natural Resource Conservation Service Web Soil Survey. Soils are mostly composed of stony, well-drained sandy loams, including Paxton fine sandy loam, Ridgebury fine sandy loam, Whitman loamy sand, Woodbridge fine sandy loam, and Canton fine sandy loam. Chatfield-Hollis-Rock outcrop complex is also a dominant soil type. Soils are very stable with no evidence of surface erosion and are moderate in productivity. Topography is flat to moderate, increasing to about a 30% slope in the steepest areas. The landscape has light to moderate amounts of exposed rock, lightly scattered amounts of down woody debris, and a light to moderate number of snags. Forest health in general is good and there appears to be low to moderate deer pressure on the forest. There is evidence of light oak mortality and crown damage due to spongy moth (*Lymantria dispar*) outbreaks and light blowdown and broken branches from wind. Native vegetation such as princess pine, blueberry, raspberry, partridgeberry, winterberry, wintergreen, star flower, Canada mayflower, maple-leaved viburnum, lily-of-the-valley, Jack-in-the-pulpit, skunk cabbage, ferns, and wild oats were identified during inventory. The main property has very little invasive plant species.

Invasive Species:

Invasive plant species are currently largely absent from the main property, although a few populations were observed along Smith Road. The isolated parcel to the south of the main property has moderate to dense invasive species within the forest, in riparian and wetland areas, and surrounding the fields. Invasive plant species observed include burning bush, multi-flora rose, Japanese barberry, oriental bittersweet, honeysuckle, and autumn olive. It should be noted that invasive species can suppress the growth of native vegetation and can degrade wildlife habitat, including forage, as their foliage and fruits are often not a preferred food source for native wildlife (see for instance, Tallamy, Douglas W., *Bringing Nature Home: How Native Plants Sustain Wildlife in Our Gardens*, Timber Press, 2007). It is suggested that the invasive species populations be treated with chemicals—at least 2 treatments may be necessary for effective control. Extra care should be taken to avoid the introduction of invasive plant species to the main property during all forestry operations. In the future, Mt. Pisgah should be regularly monitored for the presence of invasive species, which should be treated quickly if found. Prevention, monitoring, and treatment of invasive species populations is essential to ensure the persistence of native vegetation and quality habitat for wildlife.

Wildlife Habitat:

The Mt. Pisgah property currently provides valuable wildlife habitat due to the relative maturity of forest, the presence of hard and soft mast (oaks, hickory, cherry, blueberry, raspberry, winterberry), and the presence of wetland areas. Wetlands are valuable to a wide variety of wildlife, including birds, mammals, amphibians, reptiles, and insects. However, the forest as a whole is very over-stocked, and is lacking in wildlife habitat trees (snags and trees with significant cavities, broken tops and limbs), downed woody debris, structural and age class diversity, early successional habitat, and significant amounts of soft mast.

Bird Habitat Characteristics:

The ideal optimum bird habitat includes a complex ecosystem with grasslands and young shrub-forests in various stages surrounded by mature forests. Within the forest, a complex structure is ideal, including large-diameter trees, trees with cavities and dens, snags (standing dead trees), mid-story (pole size) layers (vertical diversity), canopy gaps with dense brush (horizontal diversity), soft- and hard-mast-producing trees and vegetation, and downed woody debris of various size classes including large logs.

The Mt. Pisgah property habitat strengths include a diversity of tree species, good overall forest health, the presence of both hard and soft mast-producing species, large and varied wetland areas (forested swamps, shrub swamps, marshes, and open water), and a low number of invasive plant species in the main interior forest. The following bird species were inventoried on the property by Wildlife Biologist Christopher Sturgeon on April 22 and May 3, 2022: American robin, American crow, white-breasted nuthatch, blue jay, northern cardinal, chipping sparrow, black-capped chickadee, tufted titmouse, wood duck, Louisiana water thrush, ovenbird, American goldfinch, eastern towhee, red-bellied woodpecker, pileated woodpecker.

To enhance bird and other wildlife benefits and improve forest health, it is suggested single-tree and small-group selection be employed in the majority of the forest, and that invasive plant species be treated. Small-group selection will create an uneven structure that will increase structural, age, and species diversity in the stand and create wildlife habitat gaps. Single-tree selection will improve forest health, concentrate growth on desirable trees, and speed up the development of old-growth characteristics in the forest. The retention of wildlife snags, trees with cavities, and downed woody debris will increase these characteristics. Treating the invasive plant species will promote the growth of native vegetation, which will support native wildlife and overall forest health. It is also recommended that the open fields be maintained through annual mowing (after August 15th) for the benefit of grassland-nesting birds.

The following birds might benefit from this management:

Annual Mowing / Open Fields	Small-Group Selection / Early Successional Forest	Single-Tree Selection / Late Successional Forest
Vesper sparrow Grasshopper sparrow Bobolink Eastern meadowlark	Eastern towhee Chestnut-sided warbler Mourning warbler White-throated sparrow American woodcock Ruffed grouse Northern flicker	Black-and-white warbler Black-throated green warbler Black-throated blue warbler Veery Wood thrush Eastern wood-pewee Canada warbler

Natural Heritage and Endangered Species:

State rare species information was gathered from the Massachusetts Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program Priority Habitats of Rare Species and Natural Communities GIS layers. There are no known federal or state-listed rare species or habitats of special concern on the property according to this resource.

Boundaries:

The boundaries have been located, flagged, and painted.

Forest Products:

In the spring of 2022, the property was inventoried using systematic variable plot sample and 20 basal area factor prism. The property was categorized into four (6) forest stands that had forty (40) plots established and measured. Stand were delineated based on site conditions and species composition, including tree size class and number of trees. The data obtained from the field inventory was entered into a "Two-Dog" computer software program that used International 1/4" Board Foot Volume by Number of Merchantable 16-foot Logs (Form Class 78) volume tables and cubic foot volume and trees per acre. Calculations were made on a plot and individual tree basis.

In addition, site index trees (most dominate trees) were specifically measured for height, age, diameter, and last ten years growth. The average site tree age and height were calculated for each stand and applied to the Site Index Curves found in the USDA Forest Service Timber Management Field Book. The Mean Annual Incremental Growth was calculated in board feet using the 1.26 Calculation for Growth Formula contained in the USDA Forest Service Timber Management Field Book.

A walk-through examination also took place documenting mid-story vegetation, impact from gypsy moth infestation, regeneration success and growth, duff and leaf litter layers, and other information to prepare the 2022 Bird Assessment and Stewardship Plan.

Stand information includes growth as well as forest commodity projections. Local, sustainably produced forest products have a beneficial effect on rural communities and to the landowner who desires to keep their land as forest and open space. Sawlogs and firewood are the primary forest products harvested by skilled labor. Firewood is very beneficial to landowners and others who desire to reduce their carbon footprint by reducing use of fossil fuels and either generate modest sources of income or reduce their heating bills. A well-managed, sustainable forest captures future mortality, increases growth on high quality trees, produces ecosystem and economic values and can be more resilient to climate (wind, snow, ice, drought) and forest health (insects and disease) potential threats.

Access:

The main property is accessible from Smith Road in Northborough, where a parking area is located. There are well-established, marked, and well-used trails throughout the property. The parcel to the south is accessible from Green Street, and a network of trails is present.

Forest Threats:

The following forest threats should be monitored:

- Gypsy moth oak damage and mortality
- White pine weevil damage to pines
- Wind, heavy snow, and ice events
- Drought and excess rain
- Deer browse of regeneration
- Invasive plant species

Management Summary:

The Mt. Pisgah property provides multiple forest values, including wildlife habitat, forest productivity, recreational opportunities, and scenic beauty. The management of the forest for many or all of these values simultaneously is referred to in various circles as eco-forestry, ecosystem management, "green" forestry or, more traditionally, multiple use management. The significance is that cutting or harvesting on such a property will not be done for the ultimate goal of selling timber without consideration of other forest values. Rather, opportunities will be taken to manipulate the forest to enhance any of the above forest values where a significant benefit would result and the change would not adversely impact the other values.

One noticeable difference from timber management is that some of the trees may be retained far longer if thrifty from a timber growing perspective. Trees may be allowed to decline or die in the woods, as many wildlife species depend on declining trees that form cavities for denning sites. For the most part, large-diameter cavity trees are more desirable than smaller trees. Under multiple value management, a tree with a particular wildlife value may be retained even if its retention has a negative impact on timber growth. In general, blanket prescriptions such as a maximum diameter at which all trees should be harvested are not used in multiple-value forestry.

Aesthetics deserve mention because the tidiness of a harvesting job does more to influence most observers' opinion of that job than any other factor. While the aesthetic impact of multiple-value forestry harvests will vary from job to job, a forester will weigh the effect of different aesthetic treatment options on other forest values in order to determine management strategy. For instance, chipping slash for aesthetics is rarely used as an option since it usually consumes more revenue than most timber sales would generate. In addition, chipping would negatively impact wildlife habitat by eliminating coarse woody debris on the forest floor, an important element of habitat for many species. An option that is often considered in order to reduce the negative aesthetic of harvesting is restricting the equipment used to a forwarder. A forwarder is a machine that carries, rather than drags logs out of the woods. Requiring a forwarder may result in a lower stumpage price to the landowner, since fewer operators have forwarders than have skidders. However, under the right conditions, it can result in less disruption to the forest floor and less damage to the residual trees. Requiring that slash be lopped low may also be a worthwhile investment in aesthetics by the landowner.

The management practices reflected in this document attempt to balance landowners' goals with both cost-share and revenue producing practices while enhancing wildlife and aesthetic values.

The following landowner objectives were developed:

- Keep the land protected from development
- Maintain a diversity of native wildlife and enhance native species habitat
- Sustain a well-managed forest
- Improve scenic beauty and recreational access
- Increase forest resiliency and minimize damage from pests
- Sequester and/or store carbon
- Suppress or eradicate invasive plants

These objectives should be achieved by implementing the following strategies to improve the forest, wildlife, and biodiversity conditions in a sustainable manner following Forest Stewardship Council Forest Certification and MGL 61 standards:

1. Conduct forestry practices to improve forest health and diversity, including small-group and single-tree selection.
2. Reserve selected wildlife snags, trees with cavities, and downed woody debris.
3. Treat the invasive species on the property.
4. Protect, maintain, and enhance the current trail system.
5. Mow fields annually, after August 15th (avoid nesting season).
6. Forest and wildlife management should follow Conservation Restriction Management Guidelines, MA Forestry Best Management Practices and Forest Cutting Practices Act, as well as associated Massachusetts' environmental laws such as Endangered Species Act, Wetland Protection Act, and Slash Law.
7. Monitor every 5 years for increases in invasive species population, treatment effectiveness, regeneration, and health of the forest and wildlife conditions.

Forest Stands

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

Summary of the Forest Stands on your property

Stand	Forest/Habitat Type	Approx. Size (acres)	Notes
1	White Pine-Hardwood	40.0	Even-aged, over-stocked stand dominated by white pine, with oaks, black birch, and pitch pine. Vernal pool, wetlands, streams, and seeps present. Small invasive species populations along road.
2	Oak-Hardwood	229.69	Even-aged, over-stocked red oak stand, with white pine, maple, aspen, and hickory. Wetlands, streams, and seeps present. No invasive species.
3	Black Cherry (forested wetland)	13.0	Even-aged forested wetlands complex with black cherry, maple, and white ash. No invasive species.

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 Northborough

Town(s) Northborough

4	Grasses & Forbs (open fields)	25.81	Open fields dominated by grasses and forbs with occasional trees and shrubs. Wetlands, streams, and seeps present. Invasive species concentrated at edges of fields and in wet areas.
5	White Pine-Hardwoods	29.8	Even-aged, overstocked white pine stand, with oak, maple, ash, cherry, hickory, and birch. Stream and seeps present. Moderate to dense invasive species.
6	White Pine-Hardwoods	4.02	Even-aged, overstocked white pine stand, with oak, maple, hickory, and birch. No wetlands present. No invasive species.

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

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STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	I	WH	40.0	12.6	207	21.5mbf/ 14.9 cords	WP 65

Stand 1: White Pine-Hardwood: The Northborough Mt. Pisgah property Stand 1 had 9 plots measured with a variable plot 20 basal area factor prism conducted in the spring of 2022. Dominant white pine site trees had age, height, and growth measured to determine site index.

Species	BA	DBH	TPA	BF/Ac	Cords/Ac
R Oak	7	14.0	6	398	0.3
B Oak	4	17.8	2	574	0
W Oak	16	13.0	16	1,057	1.1
S Maple	9	13.1	9	459	1.1
R Maple	29	10.4	46	546	5.8
B Birch	9	6.9	29	261	1.5
W Pine	124	15.3	78	17,581	3.5
P Pine	9	18.4	5	656	1.7
TOTAL	207	12.6	191	21,532	14.9

Species Composition: red oak, black oak, white oak, red and sugar maple, black birch, white pine, and pitch pine

Size: 12.6 average dbh

Height: 85 feet

Mid-story: height 20-40 feet; ~40% occupancy

Distribution: over-stocked and well distributed

Regeneration: Oak, maple, birch, white pine

Understory: princess pine, blueberry, winterberry, Canada mayflower, maple-leaved viburnum, lily-of-the-valley

Soft Mast: present (blueberry, winterberry)

Non-Native Species: none, except along road in a few light patches

Leaf Litter: ¼ to ½ inch

Coarse Woody Debris: light

Fine Woody Debris: light

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

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STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	1	WH	40.0	12.6	207	21.5mbf/ 14.9 cords	WP 65

Desired Stand Conditions

Conditions	Actions	Responsibility birds that may benefit
Improve habitat for young forest obligate bird species through the creation of small opening areas of early successional habitat; improve timber quality in stand	Single tree selection (thinning) Group selection (small patches ½ acre in size with reserve trees)	Eastern towhee, chestnut-sided warbler, mourning warbler, white-throated sparrow, American woodcock, ruffed grouse, northern flicker

Stand #1 is an even-aged forest with an overstory of mature oaks and pines (white and some pitch) and an approximately 30-year-old mid-story composed primarily of birch, red maple, and sugar maple. The stand overstory is stocked with a basal area of 207 square feet per acre, 191 trees per acre, and an average dbh of 12.6 inches for trees over 5 inches dbh. Regeneration consists of oak, red and sugar maple, birch, and white pine. Other vegetation found included princess pine, blueberry, winterberry, Canada mayflower, maple-leaved viburnum, and lily-of-the-valley. There is evidence of snow, ice, and wind damage to trees from recent weather events and oak mortality and damage from spongy moth (*Lymantria dispar*). A harvest has not taken place for some years.

The stand ranges from about 5 to 10% slope with light rock. There are light amounts of coarse woody debris, snags, and wildlife trees scattered throughout. There were no invasive species observed within the stand, except for small, isolated pockets of invasive species along the road (multi-flora rose, Japanese barberry, and oriental bittersweet). There is a vernal pool, wetlands, streams, and wet forested seep areas. There are no ponds within the stand. There are no known federal or state-listed rare, threatened, or endangered species or habitats of concern, according to the NHESP estimated habitat atlas.

The soils in Stand 1 consist of Chatfield-Hollis-Rock outcrop complex, a well-drained soil composed of friable, moderately deep coarse loamy basal till derived from gneiss over gneiss; and Paxton fine sandy loam, very stony, a well-drained soil composed of friable coarse-loamy eolian deposits over dense coarse loamy lodgment till derived from schist. The soil (site) productivity is moderate as indicated by the white pine site index 65. The growth is estimated at 1.6 inches of diameter growth per decade. There is no evidence of natural soil erosion.

There are numerous stone walls around the boundary of the property and within the stand.

There is a well-maintained network of well-used trails within the stand.

The short term desired future condition (next ten years) is to increase structural and species diversity in the stand and maintain a healthy, productive forest with gaps for wildlife habitat. This will be achieved through small-group selection on an approximately 20-acre area of the stand (5 acres total of 1/2-acre openings with reserve trees), combined with single-tree selection in the matrix forest and in the remainder of the stand (thinning from below and by spacing). The invasive species along the main road should also be treated to maintain native habitat. The trail system should be protected and maintained.

The long-term desired future condition (50 years from now) is to continue to treat additional portions of the stand for wildlife habitat and periodically conduct thinning to improve the growing stock and conditions. Treatments should be considered in 2040 and 2055. Treat invasive species if needed. Maintain the trail system.

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 Northborough

Towns(s) Northborough

STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	1	WH	40.0	12.6	207	21.5mbf/ 14.9 cords	WP 65

Monitoring should be focused on the increase in wildlife populations, regeneration, health, and growth of the forest, and the presence of invasive species populations and should be conducted every 5 years.

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 Northborough

Towns(s) Northborough

STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	2	OH	229.69	11.7	149	9.2.5mbf/ 15 cords	RO 60

Stand 2: Oak-Hardwood: The Northborough Mt. Pisgah property Stand 2 had 23 plots measured with a variable plot 20 basal area factor prism conducted in the spring of 2022. Dominant red oak site trees had age, height, and growth measured to determine site index.

Species	BA	DBH	TPA	BF/Ac	Cords/Ac
R Oak	110	12.4	124	7,466	8.7
B Oak	10	11.8	13	342	1.5
W Oak	3	9.8	5	117	0.3
S Maple	3	11.0	4	0	0.8
R Maple	6	12.1	7	51	1.7
Hickory	1	12.0	1	47	0.0
B Birch	2	7.0	6	0	0.4
W Pine	12	9.0	21	1,236	1.0
P Pine	1	12.0	1	0	0.3
Aspen	1	11.0	1	0	0.3
TOTAL	149	11.7	183	9,259	15.0

Species Composition: red oak, black oak, white oak, red and sugar maple, black birch, hickory, white pine, and aspen

Size: 11.7 average dbh

Height: 80 feet

Mid-story: height 20-40 feet; ~40% occupancy

Distribution: over-stocked and well-distributed

Regeneration: Oak, maple, birch, black cherry, white pine

Understory: princess pine, blueberry, winterberry, Canada mayflower, maple-leaved viburnum, lily-of-the-valley

Soft Mast: present (blueberry, winterberry)

Non-Native Species: none observed

Leaf Litter: ¼ to ½ inch

Coarse Woody Debris: light

Fine Woody Debris: light

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 Northborough

Towns(s) Northborough

STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	2	OH	229.69	11.7	149	9.2.5mbf/ 15 cords	RO 60

Desired Stand Conditions

Conditions	Actions	Responsibility birds that may benefit
Improve habitat for young forest obligate bird species through the creation of small opening areas of early successional habitat; improve timber quality in stand	Single tree selection (thinning) Group selection (small patches ½ acre in size with reserve trees)	Canada warbler, ruffed grouse, white-throated sparrow, chestnut-sided warbler, eastern towhee

Stand #2 is an even-aged forest with an overstory of mature oaks and hardwood species and a few scattered white pine trees, with an approximately 30-year-old mid-story composed primarily of birch, hickory, red maple, and sugar maple. The stand overstory is over-stocked with a basal area of 149 square feet per acre, 183 trees per acre, and an average dbh of 11.7 inches for trees over 5 inches dbh. Regeneration consists of oak, red and sugar maple, birch, and white pine. Other vegetation found included princess pine, blueberry, winterberry, Canada mayflower, maple-leaved viburnum, and lily-of-the-valley. There is evidence of snow, ice, and wind damage to trees from recent weather events and damage to oak trees as a result of a past fire. There is a very small amount of oak mortality and damage from spongy moth (*Lymantria dispar*). A harvest has not taken place for some years.

The stand ranges from about 5 to 30% slope with light rock. There are light amounts of coarse woody debris, snags, and wildlife trees scattered throughout. There were no invasive species observed within the stand. There are wetlands, streams, and wet forested seep areas. There are no vernal pools or ponds within the stand. There are no known federal or state-listed rare, threatened, or endangered species or habitats of concern, according to the NHESP estimated habitat atlas.

The soils in Stand 2 consist of Ridgebury fine sandy loam, extremely stony, a poorly-drained soil composed of friable coarse-loamy eolian deposits over dense coarse-loamy lodgment till derived from granite and gneiss; Chatfield-Hollis-Rock outcrop complex, a well-drained soil composed of friable, moderately deep coarse loamy basal till derived from gneiss over gneiss; Paxton fine sandy loam, very stony, a well-drained soil composed of friable coarse-loamy eolian deposits over dense coarse loamy lodgment till derived from schist; and Canton fine sandy loam, very stony, a well-drained soil composed of friable coarse-loamy eolian deposits over friable sandy basal till derived from granite and gneiss. The soil (site) productivity is moderate as indicated by the red oak site index 60. The growth is estimated at 1.4 inches of diameter growth per decade. There is no evidence of natural soil erosion, although the Division of Fisheries and Wildlife (MassWildlife DFW) have reported erosion on steeper portions of the trail system.

There are numerous stone walls around the boundary of the property and within the stand.

There is a well-maintained network of well-used trails within the stand (see above exception).

The short term desired future condition (next ten years) is to work with DFW to review their trail erosion areas of concern and develop a plan to fix and maintain the trail system to reduce or eliminate erosion, and to increase structural and species diversity in the stand and maintain a healthy, productive forest with gaps for wildlife habitat. This will be achieved through small-group selection on an approximately 40-acre area of the stand (5 acres total of 1/2-acre openings with reserve trees), combined with single-tree selection in the matrix forest and in the remainder of the stand (thinning from below and by spacing).

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 Northborough

Towns(s) Northborough

STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	2	OH	229.69	11.7	149	9.2.5mbf/ 15 cords	RO 60

The long-term desired future condition (50 years from now) is to continue to treat additional portions of the stand for wildlife habitat and periodically conduct thinning to improve the growing stock and conditions. Treatments should be considered in 2040 and 2055. Treat invasive species, if needed. Maintain the trail system.

Monitoring should be focused on the increase in wildlife populations, regeneration, health, and growth of the forest, trail environmental conditions, and the presence of invasive species populations and should be conducted every 5 years.

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 Northborough

Towns(s) Northborough

STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	3	BC	22.0	13.0	160	8.1mbf/ 17.5 cords	RM 50

Stand 3: Wetland Complex (Black Cherry with Associated Hardwoods): The Northborough Mt. Pisgah property Stand 3 had 1 plot measured with a variable plot 20 basal area factor prism conducted in the spring of 2022. Dominant red maple site trees had age, height, and growth measured to determine site index.

Species	BA	DBH	TPA	BF/Ac	Cords/Ac
S Maple	40	12.0	45	2,347	3.7
R Maple	80	13.3	81	2,972	13.8
W Ash	20	14.0	19	1,459	0.0
B Cherry	20	13.0	22	1,308	0.0
TOTAL	160	13.0	167	8,086	17.5

Species Composition: black cherry, red and sugar maple, white ash, hickory

Size: 13.0 average dbh

Height: 75 feet

Mid-story: height 30-40 feet; ~40% occupancy

Distribution: over-stocked and well-distributed

Regeneration: maple, birch, black cherry, white pine

Understory: skunk cabbage, ferns, blueberry, maple-leaved viburnum, lily-of-the-valley

Soft Mast: present (blueberry, black cherry)

Non-Native Species: none observed

Leaf Litter: ¼ to ½ inch

Coarse Woody Debris: light

Fine Woody Debris: light

Desired Stand Conditions

Conditions	Actions	Responsibility birds that may benefit
Maintain a healthy, forested, late successional wetland community	Natural processes	Black and White Warbler, Wood Thrush, Black-throated Green Warbler, Black-throated Blue Warbler, Veery, Eastern Wood-pewee, Canadian Warbler

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Owner(s) Town of Northborough

Town(s) Northborough

STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	3	BC	22.0	13.0	160	8.1mbf/ 17.5 cords	RM 50

Stand #3 is an even-aged forested wetland complex with an overstory of mature black cherry and hardwood species and an approximately 30-year-old mid-story composed primarily of birch and red maple. The stand overstory is over-stocked with a basal area of 160 square feet per acre, 167 trees per acre, and an average dbh of 13.0 inches for trees over 5 inches dbh. Regeneration consists of red maple and birch. Other vegetation found included skunk cabbage, ferns, blueberry, maple-leaved viburnum, and lily-of-the-valley. There is evidence of snow, ice, and wind damage to trees from recent weather events. A harvest has not taken place for some years.

The stand ranges from about 0 to 5% slope with light to moderate rock. There are light amounts of coarse woody debris, snags, and wildlife trees scattered throughout. There were no invasive species observed within the stand. There are no vernal pools or ponds within the stand. There are no known federal or state-listed rare, threatened, or endangered species or habitats of concern, according to the NHESP estimated habitat atlas.

The soils in Stand 3 consist of Ridgebury fine sandy loam, extremely stony, a poorly-drained soil composed of friable coarse-loamy eolian deposits over dense coarse-loamy lodgment till derived from granite and gneiss; Whitman sandy loam, extremely stony, a very poorly-drained soil composed of friable coarse-loamy eolian deposits over dense coarse-loamy lodgment till derived from metamorphic rock; Paxton fine sandy loam, very stony, a well-drained soil composed of friable coarse-loamy eolian deposits over dense coarse loamy lodgment till derived from schist; and Woodbridge fine sandy loam, very stony, a moderately well-drained soil composed of friable coarse-loamy eolian deposits over dense coarse loamy lodgment till derived from granite and gneiss. The soil (site) productivity is moderate as indicated by the red maple site index 50. The growth is estimated at 1.0 inches of diameter growth per decade. There is no evidence of natural soil erosion.

There are numerous stone walls around the boundary of the property and within the stand.

There is a well-maintained network of well-used trails within the stand.

The short-and long-term desired future condition (next ten years) is to maintain the trail system and a productive wetland forest through natural processes.

Monitoring should be focused on the function of the wetland, trail environmental conditions, and the presence of invasive species populations and should be conducted every 5 years.

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 Northborough

Towns(s) Northborough

STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	4	GF	25.81	NA	NA	NA	NA

Stand 4: Grass and Forbs: Open fields with associated streams, wetlands, open water, isolated wet areas, and occasional individual and small patches of trees. The Northborough Mt. Pisgah property Stand 4 had no plots measured. A walkthrough examination of the stand was conducted to evaluate the resources.

Species Composition: primarily grass and forbs with occasional black cherry, red maple, white ash, aspen, white pine

Size: 8.0 average dbh

Height: 45 feet

Mid-story: NA

Distribution:

Regeneration: maple, birch, black cherry, white pine

Understory: NA

Soft Mast: present (blueberry, black cherry)

Non-Native Species: heavy invasive species in wet areas and surrounding the fields, with light populations within the fields

Leaf Litter: NA

Coarse Woody Debris: NA

Fine Woody Debris: NA

Desired Stand Conditions

Conditions	Actions	Responsibility birds that may benefit
Open field conditions	Maintain field by mowing; treat invasive species	vesper sparrow, grasshopper sparrow, bobolink, eastern meadowlark, chestnut-side warbler, eastern towhee, northern bobwhite

Stand #4 is grass-forbs field with occasional individual and groups of trees. The field is mowed annually.

The stand ranges from about 0 to 5% slope with light rock. There were heavy populations of invasive species observed around the edges of the fields and within wet areas and light populations within the fields (Japanese barberry, oriental bittersweet, burning bush, multi-flora rose, and honeysuckle). There are small ponds (pools), wetlands, streams, and wet seep areas within the stand. There are no vernal pools within the stand. There are no known federal or state-listed rare, threatened, or endangered species or habitats of concern, according to the NHESP estimated habitat atlas.

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Owner(s) Town of Northborough

Towns(s) Northborough

STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	4	GF	25.81	NA	NA	NA	NA

The soils in Stand 4 consist of Raynham silt loam, a poorly-drained soil composed of soft coarse-silty lacustrine deposits; Chatfield- Hollis-Rock outcrop complex, a well-drained soil composed of friable, moderately deep coarse loamy basal till derived from gneiss over gneiss; Ridgebury fine sandy loam, very stony, a poorly-drained soil composed of friable coarse-loamy eolian deposits over dense coarse-loamy lodgment till derived from granite and gneiss; and Canton fine sandy loam, a well-drained soil composed of friable coarse-loamy eolian deposits over friable coarse-loamy basal till derived from granite and gneiss. The soil (site) productivity is moderate. There is no evidence of natural soil erosion.

There is a stone wall present along the stand border and within Stand 5.

The short term desired future condition (next ten years) is to treat the invasive species and maintain the fields primarily for wildlife habitat by mowing annually, preferably after August 15th (bird fledgling).

The long-term desired future condition (50 years from now) is to manage the fields for open grass early-successional wildlife habitat by treating the invasive species when necessary and maintaining the fields by mowing annually, preferably after August 15th (bird fledgling).

Monitoring should be focused on the condition of the fields and the presence of invasive species populations and should be conducted every 5 years.

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

Owner(s) Town of Northborough

Towns(s) Northborough

STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	5	WH	29.8	16.3	224	31.5mbf/ 10.4 cords	WP 65

Stand 5: White Pine-Hardwoods: The Northborough property Stand 5 had 5 plots measured with a variable plot 20 basal area factor prism conducted in the spring of 2022. Dominant white pine site trees had age, height, and growth measured to determine site index.

Species	BA	DBH	TPA	BF/Ac	Cords/Ac
B Oak	8	17.2	5	1,052	0.0
R Maple	8	8.3	20	0	1.6
W Ash	4	13.0	4	291	0.0
B Cherry	4	13.0	4	174	0.0
Hickory	4	13.0	4	291	0.0
Y Birch	4	10.0	7	0	0.9
B Birch	4	8.0	12	0	0.9
W Pine	188	21.0	76	29,730	7.0
TOTAL	224	16.3	132	31,538	10.4

Species Composition: white pine, black oak, red maple, yellow and black birch, black cherry, hickory, white ash

Size: 16.3 average dbh

Height: 85 feet

Mid-story: height 30-40 feet; ~40% occupancy

Distribution: over-stocked and well distributed

Regeneration: oak, maple, birch, white pine

Understory: poison ivy, hay-scented fern, Jack-in-the-pulpit, partridgeberry, blueberry, lily-of-the-valley, maple-leaved viburnum, raspberry, wintergreen

Soft Mast: present (blueberry, partridgeberry, black cherry, raspberry)

Non-Native Species: moderate to dense populations

Leaf Litter: ¼ to ½ inch

Coarse Woody Debris: light to moderate

Fine Woody Debris: light

OBJECTIVE CODE: CH61 = stands classified under CH61/61A/61B STEW= stands not classified under CH61/61A/61B
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Owner(s) Town of Northborough

Town(s) Northborough

STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	5	WH	29.8	16.3	224	31.5mbf/ 10.4 cords	WP 65

Desired Stand Conditions

Conditions	Actions	Responsibility birds that may benefit
Improve habitat for young forest obligate bird species through the creation of small open areas of early successional habitat; improve timber quality in stand	Single tree selection (thinning); Group selection (small patches ½ acre in size with reserve trees)	Canada warbler, ruffed grouse, white-throated sparrow, chestnut-sided warbler, eastern towhee

Stand #5 is an even-age forest with an overstory of mature white pine and small amounts of black oak, red maple, white ash, black cherry, and hickory and an approximately 30-year-old mid-story composed primarily of birch and red maple. The stand overstory is over-stocked with a basal area of 224 square feet per acre, 132 trees per acre, and an average dbh of 16.3 inches for trees over 5 inches dbh. Regeneration consists of oak, red and sugar maple, birch, and white pine. Other vegetation found included poison ivy, hay-scented fern, Jack-in-pulpit, partridgeberry, blueberry, lily-of-the-valley, maple-leaved viburnum, raspberry, and wintergreen. There is evidence of snow, ice, and wind damage to trees from recent weather events. A harvest has not taken place for some years.

The stand ranges from about 5 to 20% slope with light to moderate rock. There are light to moderate amounts of coarse woody debris, snags, and wildlife trees scattered throughout. There were moderate to dense amounts of invasive species observed within the stand (multi-flora rose, Japanese barberry, and oriental bittersweet). There is a stream and wet forested seep areas within the stand. There are no vernal pools or ponds within the stand. There are no known federal or state-listed rare, threatened, or endangered species or habitats of concern, according to the NHESP estimated habitat atlas.

The soils in Stand 5 consist of Chatfield- Hollis-Rock outcrop complex, a well-drained soil composed of friable, moderately deep coarse loamy basal till derived from gneiss over gneiss; and Paxton fine sandy loam, very stony, a well-drained soil composed of friable coarse-loamy eolian deposits over dense coarse loamy lodgment till derived from schist. The soil (site) productivity is moderate as indicated by the white pine site index 65. The growth is estimated at 1.6 inches of diameter growth per decade. There is no evidence of natural soil erosion.

There are numerous stone walls around the boundary of the property and within the stand.

There is a well-maintained network of well-used trails within the stand.

The short term desired future condition (next ten years) is to increase structural and species diversity in the stand and maintain a healthy, productive forest with gaps for wildlife habitat. This will be achieved through small-group selection on an approximately 20-acre area of the stand (5 acres total of 1/2-acre openings with reserve trees), combined with single-tree selection in the matrix forest and in the remainder of the stand (thinning from below and by spacing). The invasive species in the stand should also be treated to maintain native habitat. The trail system should be protected and maintained.

The long-term desired future condition (50 years from now) is to continue to treat additional portions of the stand for wildlife habitat and periodically conduct thinning to improve the growing stock and conditions. Treatments should be considered in 2040 and 2055. Treat invasive species, if needed. Maintain the trail system.

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 Northborough

Towns(s) Northborough

STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	5	WH	29.8	16.3	224	31.5mbf/ 10.4 cords	WP 65

Monitoring should be focused on the increase in wildlife populations, regeneration, health, and growth of the forest, and the presence of invasive species populations and should be conducted every 5 years.

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 Northborough

Town(s) Northborough

STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	6	WH	4.02	14.2	180	14.2mbf/ 11.9cords	WP 65

Stand 6: White Pine-Hardwoods: The Northborough Mt. Pisgah property Stand 6 had 2 plots measured with a variable plot 20 basal area factor prism conducted in the spring of 2022. Dominant white pine site trees had age, height, and growth measured to determine site index.

Species	BA	DBH	TPA	BF/Ac	Cords/Ac
R Oak	10	30.0	2	1,463	0.0
B Oak	20	16.2	14	2,068	0.0
R Maple	10	14.0	9	547	0.0
Hickory	10	14.0	9	547	0.0
B Birch	80	13.5	78	2,700	9.9
W Pine	50	14.1	37	6,866	2.0
TOTAL	180	14.2	149	14,191	11.9

Species Composition: red and black oak, red maple, white ash, hickory, black birch, white pine, black cherry

Size: 14.2 average dbh

Height: 80 feet

Mid-story: height 30-40 feet; ~35% occupancy

Distribution: over-stocked and well-distributed

Regeneration: oak, maple, birch, black cherry, white pine

Understory: ferns, blueberry, maple-leaved viburnum, lily-of-the-valley, star flower, wintergreen, wild oats, partridgeberry

Soft Mast: present (blueberry, black cherry, partridgeberry)

Non-Native Species: none observed

Leaf Litter: ¼ inch

Coarse Woody Debris: light

Fine Woody Debris: light

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 Northborough

Town(s) Northborough

STAND DESCRIPTIONS

OBJ	STDNO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
Stew	6	WH	4.02	14.2	180	14.2mbf/ 11.9cords	WP 65

Desired Stand Conditions

Conditions	Actions	Responsibility birds that may benefit
Maintain a mature, large-diameter forest with old-growth characteristics	Natural processes	Black-and-white warbler, black-throated green warbler, black-throated blue warbler, veery, wood thrush, eastern wood-pewee, yellow-bellied sapsucker

Stand #6 is a small, even-aged, isolated stand with an overstory of mature red and black oak, red maple, white ash, hickory, black birch, white pine, and black cherry and an approximately 30-year-old mid-story composed primarily of black cherry, birch, and red maple. The stand overstory is over-stocked with a basal area of 180 square feet per acre, 149 trees per acre, and an average dbh of 14.2 inches for trees over 5 inches dbh. Regeneration consists of oak, maple, birch, black cherry, and white pine. Other vegetation found included ferns, blueberry, maple-leaved viburnum, lily-of-the-valley, star flower, wintergreen, wild oats, and partridgeberry. There is evidence of snow, ice, and wind damage to trees from recent weather events. A harvest has not taken place for some years.

The stand ranges from about 0 to 5% slope with light rock. There are light amounts of coarse woody debris, snags, and wildlife trees scattered throughout. There were no invasive species observed within the stand. There are no wetlands, streams, wet forested seep areas, vernal pools, or ponds within the stand. There are no known federal or state-listed rare, threatened, or endangered species or habitats of concern, according to the NHESP estimated habitat atlas.

The soils in Stand 6 consist entirely of Paxton fine sandy loam, very stony, a well-drained composed of friable coarse-loamy eolian deposits over dense coarse loamy lodgment till derived from schist. The soil (site) productivity is moderate as indicated by the white pine site index 65. The growth is estimated at 1.6 inches of diameter growth per decade. There is no evidence of natural soil erosion.

There is a stone wall on the eastern boundary of the stand.

The short- and long-term desired future condition is to maintain a productive, mature, late-successional forest through natural processes.

Monitoring should be focused on maintaining the health of the forest and the presence of invasive species populations and should be conducted every 5 years.

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 Northborough

Town(s) Northborough

Management Recommendations

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

Summary of the Management Recommendations for your property

Stand	Object Code	Forest type	Recommendation	CPS Code	Value/Cost/ Cost Sharing opportunities	Acres	Timing
1	STEW	WH	Treat invasive species	314	~\$250 per treatment per acre	20.0	2023-24
			Small-group and single-tree selection	666, 647	Gross Revenue ~\$35,000 Cost share		
			Retain snags and cavity trees; retain and improve down woody debris	-	No cost or revenue involved		
			Maintain trails	655	No cost or revenue involved		
2	STEW	OH	Small-group and single-tree selection	666, 647	Gross Revenue ~\$97,000 Cost share	40.69	2023-24
			Retain snags and cavity trees; retain and improve downed woody debris	-	No cost or revenue involved		
			Maintain trails	655	No cost or revenue involved		

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Owner(s) Town of Northborough

Towns(s) Northborough

Stand	Object Code	Forest type	Recommendation	CPS Code	Value/Cost/ Cost Sharing opportunities	Acres	Timing
3	STEW	BC	Treat invasive species	314	~\$250 per treatment per acre	13.0	2023-24
			Retain snags and cavity trees; retain and improve down woody debris	-	No cost or revenue involved		
			Maintain trails	655	No cost or revenue involved		
4	STEW	GF	Treat invasive species	314	~\$250 per treatment per acre	25.81	2023-24
			Annual mowing	314, 645	Cost to landowner		
5	STEW	WH	Treat invasive species	314	~\$250 per treatment per acre	10.0	2023-24
			Small-group and single-tree selection	666, 647	Gross Revenue ~\$66,000 Cost share		
			Retain snags and cavity trees; retain and improve down woody debris	-	No cost or revenue involved		
			Maintain trails	655	No cost or revenue involved		
6	STEW	WH	NA	NA	NA	4.02	NA

Total approximate costs:	Approximately \$
Total approximate revenue:	Approximately \$198,000 plus grant cost share revenue

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Owner(s) Town of Northborough

Towns(s) Northborough

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	1	WH	Single-Tree & Small-Group Selection	20.0	100	451 Mbf/392 cords	2023-24

The forest growth for Stand 1 is estimated at approximately 559 board feet per acre per year.

Management Options and Considerations:

Small-group and single-tree selection is recommended for Stand 1, in order to create an uneven structure that will increase structural, age, and species diversity in the stand and create wildlife habitat gaps. The stand is currently lacking sufficient structural diversity, coarse woody debris, and wildlife habitat trees (snags and trees with significant cavities, broken tops and limbs, etc.) to benefit the responsibility (key) bird species. Small-group and single-tree selection is a silvicultural system that increases old-growth characteristics by enhancing structural, age, and species diversity, releasing advance regeneration, encouraging the development of large-diameter trees, and creating habitat for wildlife dependent on early successional habitat. Snags and trees with cavities or other wildlife features should be retained, and snags and coarse woody debris could be actively increased through girdling and felling and leaving selected trees. The guide *Silviculture with Birds in Mind: Options for Integrating Timber and Songbird Habitat Management* was designed to guide foresters and landowners in improving breeding habitat for responsibility species. The following options are compatible with the landowners' use of this property and provide some guidance on how to maximize positive benefits for breeding birds and general forest health.

Option 2B: Small-Group and Single-Tree Selection

Option 1E: Retain snags, cavity trees and downed woody debris

Bird species that are dependent on early-successional forest habitat that might benefit specifically from these treatments include: Eastern towhee, chestnut-sided warbler, mourning warbler, white-throated sparrow, American woodcock, ruffed grouse, and northern flicker.

Landowner Goals and Management Description:

Based on the landowner goals of managing the forest for bird and wildlife habitat, managing for native species, and enhancing the quality and quantity of timber products, small-group selection (10 1/2-acre gaps, 5 acres total) and single-tree selection (thinning from below and by spacing, 35 acres) is recommended for Stand 1, which is a highly over-stocked stand. The 1/2-acre gaps will be concentrated in a 20-acre area of the stand. In small-group selection areas, remove 180 square feet of basal area per acre for a total volume of 87Mbf. In single-tree selection areas, remove 100 square feet of basal area per acre for a total volume of 364Mbf. Remove a total volume of 451Mbf/392 cords in Stand 1.

In the 20-acre small-group selection area of the stand, 1/2-acre gaps should be created in order to encourage or release regeneration, remove clusters of high-risk, low-vigor, or low-value trees, and enhance mid-story and understory foraging opportunities for birds. These gaps may also encourage the establishment of pioneer species, such as poplar and birch, and will provide dense vegetative cover and an abundance of soft mast sources for birds and other wildlife. In parts of the stand where gaps are not created, single-tree selection (thinning from below) should be conducted: high-quality crop trees (particularly red and white oak, sugar maple, and white pine) should be selected for release though the removal of competing, lower-quality trees. This will concentrate growth on the crop trees, increasing their

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Owner(s) Town of Northborough

Towns(s) Northborough

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	1	WH	Singe-Tree & Small-Group Selection	20.0	100	451 Mbf/392 cords	2023-24

health, vigor, and size. Snags, wildlife trees, and downed woody debris should also be retained or increased during harvest in order to further benefit the responsibility bird species and other wildlife.

To promote the growth of native vegetation, the invasive plant species found along Smith Road should be treated with chemicals before any harvest is conducted. Trails should be protected from damage and maintained and at a very high level.

The long-term desired future condition (50 years from now) is to continue to treat additional portions of the stand for wildlife habitat and periodically conduct thinning to improve the growing stock and conditions. This will help to promote a mature, large-diameter forest with high quality trees and high diversity. Treatments should be considered in 2040 and 2055. These long-term management recommendations meet the landowner's objectives of maintaining a quality forest for the future, improving timber quality, and enhancing bird and other wildlife habitat. Any invasive plant species should continue to be treated before and after harvests, to encourage the persistence of native vegetation in the stand. The trails should be maintained.

Monitoring should be focused on the increase in wildlife populations, regeneration, health, and growth of the forest, and the presence of invasive species populations and should be conducted every 5 years.

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 Northborough

Towns(s) Northborough

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	OH	Single-Tree & Small-Group Selection	40.0	70	140Mbf/400 cords	2023-24

The forest growth for Stand 1 is estimated at approximately 352 board feet per acre per year.

Management Options and Considerations:

Small-group and single-tree selection is recommended for Stand 2, in order to create an uneven structure that will increase structural, age, and species diversity in the stand and create wildlife habitat gaps. The stand is currently lacking sufficient structural diversity, coarse woody debris, and wildlife habitat trees (snags and trees with significant cavities, broken tops and limbs, etc.) to benefit the responsibility (key) bird species. Small-group and single-tree selection is a silvicultural system that increases old-growth characteristics by enhancing structural, age, and species diversity, releasing advance regeneration, encouraging the development of large-diameter trees, and creating habitat for wildlife dependent on early successional habitat. Snags and trees with cavities or other wildlife features should be retained, and snags and coarse woody debris could be actively increased through girdling and felling and leaving selected trees. The guide *Silviculture with Birds in Mind: Options for Integrating Timber and Songbird Habitat Management* was designed to guide foresters and landowners in improving breeding habitat for responsibility species. The following options are compatible with the landowners' use of this property and provide some guidance on how to maximize positive benefits for breeding birds and general forest health.

Option 2B: Small-Group and Single-Tree Selection

Option 1E: Retain snags, cavity trees and downed woody debris

Bird species that are dependent on early-successional forest habitat that might benefit specifically from these treatments include: Eastern towhee, chestnut-sided warbler, mourning warbler, white-throated sparrow, American woodcock, ruffed grouse, and northern flicker.

Landowner Goals and Management Description:

Based on the landowner goals of managing the forest for bird and wildlife habitat, managing for native species, and enhancing the quality and quantity of timber products, small-group selection (10 1/2-acre gaps, 5 acres total) and single-tree selection (thinning from below and by spacing, 35.0 acres) is recommended for Stand 2, which is an over-stocked stand. The 1/2-acre gaps will be concentrated in a 40-acre area of the stand. In small-group selection areas, remove 127 square feet of basal area per acre for a total volume of 37Mbf. In single-tree selection areas, remove 49 square feet of basal area per acre for a total volume of 103 Mbf. Remove a total volume of 140Mbf/ 400 cords in Stand 2.

In the 40-acre small-group selection area of the stand, 1/2-acre gaps should be created in order to encourage or release regeneration, remove clusters of high-risk, low-vigor, or low-value trees, and enhance midstory and understory foraging opportunities for birds. These gaps may also encourage the establishment of pioneer species, such as poplar and birch, and will provide dense vegetative cover and an abundance of soft mast sources for birds and other wildlife. In parts of the stand where openings are not created, single-tree selection (thinning from below) should be conducted: high-quality crop trees (particularly red and white oak, sugar maple, and white pine) should be selected for release though the removal of competing, lower-quality trees. This will concentrate growth on the crop trees, increasing their

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Owner(s) Town of Northborough

Towns(s) Northborough

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	OH	Singe-Tree & Small-Group Selection	40.0	70	140Mbf/400 cords	2023-24

health, vigor, and size. Snags, wildlife trees, and downed woody debris should also be retained or increased during harvest in order to further benefit the responsibility bird species and other wildlife.

Trails should be protected from damage and maintained and at a very high level. In addition, it is recommended that the Town of Northborough work with the Division of Fisheries and Wildlife to review the DFW's trail erosion areas of concern and develop a plan to fix and maintain the trail system to reduce or eliminate erosion.

The long-term desired future condition (50 years from now) is to continue to treat additional portions of the stand for wildlife habitat and periodically conduct thinning to improve the growing stock and conditions. This will help to promote a mature, large-diameter forest with high quality trees and high diversity. Treatments should be considered in 2040 and 2055. These long-term management recommendations meet the landowner's objectives of maintaining a quality forest for the future, improving timber quality, and enhancing bird and other wildlife habitat. Any invasive plant species populations that may become established should be treated before and after harvests, to encourage the persistence of native vegetation in the stand. The trails should be maintained.

Monitoring should be focused on the increase in wildlife populations, regeneration, health, and growth of the forest, and the presence of invasive species populations and should be conducted every 5 years.

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Owner(s) Town of Northborough

Towns(s) Northborough

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	3	BC	NA	22.0	0	0	NA

The forest growth is estimated at approximately 249 board feet per acre per year.

Stand 3 consists of a wetlands complex of wooded swamps dominated by a mix of mature hardwoods including, black cherry, red maple, sugar maple, and white ash. Wooded swamps, including mixed hardwood swamps, are a common wetland type in Massachusetts. They may be fed through surface runoff, groundwater seepage, or stream or lake overflow. Red maple is often strongly dominant in the overstory, and blueberry and skunk cabbage are common in the understory. Wooded swamp areas provide nesting locations for thicket-dwelling birds, and the availability of dense understory cover and water make them attractive to many small mammal species. Reptiles, amphibians, and insects use forested swamps for feeding and breeding.

The presence of these wetland areas on the property likely currently provides a great deal of benefit to many species, including the responsibility (key) bird species. Wetland areas contribute habitat variation to the landscape, and the responsibility bird species would likely utilize and greatly benefit from the presence of these wetland area within the matrix of the surrounding forest. Additional target species that prefer less dense cover may also benefit from these areas. Benefits will likely continue to be present in the stand without any active management. The guide *Silviculture with Birds in Mind: Options for Integrating Timber and Songbird Habitat Management* was designed to guide foresters and landowners in improving breeding habitat for responsibility species. The following options are compatible with the landowners' use of this property and provide some guidance on how to maximize positive benefits for breeding birds and general forest health.

Option 0: Let it grow

Option 1E: Retain snags, cavity trees and down woody debris

Bird species that might benefit specifically from these treatments include: Black-and-White Warbler, Black-throated Green Warbler, Black-throated Blue Warbler, Canadian Warbler, Wood Thrush, Veery, and Eastern Wood-pewee.

Landowner Goals and Management Description:

Based on the landowner goals of managing for native forest species, maintaining wildlife habitat that will benefit responsibility species, and protecting water quality, no management is currently recommended for this stand. The desired conditions will likely be maintained over time through natural processes. The trails should be protected and maintained at a very high level.

The long-term desired future condition (50 years from now) is to maintain a healthy, mature, forested wetland area through natural processes. This meets the landowner's objectives of enhancing habitat for birds and small and large animals and protecting water quality.

Monitoring focused on the regeneration, health, and growth of the forest, and the presence of invasive species populations should be conducted every 5 years.

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Owner(s) Town of Northborough

Town(s) Northborough

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	4	GF	NA	25.81	0	0	NA

Stand 4 is an area of open fields dominated by grasses and forbs, with some scattered individual and small groups of trees and shrubs. There are numerous wetland areas in the stand, including streams, a wooded swamp, a shrub swamp, two marshes, and open water. Open fields are used by many vertebrate and invertebrate species for feeding, nesting, roosting, cover, and movement corridors. The presence of a variety of wetlands in the stand likely also provides a great deal of benefit to many species, including the responsibility (key) bird species. Wetland areas contribute habitat variation to the landscape, and the responsibility bird species would likely utilize and greatly benefit from the presence of these wetland areas. Marshes provide excellent habitat for muskrats, frogs, and salamanders (including leopard, pickerel, green, and bull frogs, as well as some vernal pool obligate species like wood frogs and spotted salamanders); marshes also provide food resources for marsh birds and nesting habitat for secretive water birds like rails and bitterns. Target bird species that prefer open, very early successional habitat (e.g., chestnut-side warbler, eastern towhee, and northern bobwhite) may utilize the open fields with scattered shrub and tree cover of this stand. Bird species that might specifically utilize the open fields (grassland-nesting birds) include: vesper sparrow, grasshopper sparrow, bobolink, and eastern meadowlark.

Landowner Goals and Management Description:

Maintaining Stand 4 as open field habitat through annual mowing could benefit grassland-nesting birds as well as other imperiled wildlife species such as butterflies and other insect pollinators and nesting turtles. Mass Audubon, in their report *Best Management Practices for Nesting Grassland Birds*, notes that the maintenance of fields of sufficient size (10 acres or larger) are a critical component of the recovery of imperiled species of grassland-nesting birds, including vesper sparrows, grasshopper sparrows, bobolinks, and eastern meadowlarks, species that have declined in the Northeast due to habitat losses. Importantly, mowing during the nesting season of these birds (June and July) is a major threat to these species, as mowing at these times destroys nests and eggs and kills nestlings.

It is strongly recommended that the Town of Northborough delay its annual mowing of these fields until after the breeding season (do not mow fields from May 15th through August 15th) to reduce egg, nest, and hatchling destruction and contribute to species recovery.

To promote the growth of native vegetation, the invasive plant species found along the edges of the fields should be treated with chemicals (at least 2 applications may be necessary). Invasive species treatment should also occur outside of the breeding season.

Wetland areas should be maintained through natural processes.

The long-term desired future condition (50 years from now) is to continue to manage the fields as open habitat through annual mowing after August 15th and treatment of invasive plant species when necessary. This meets the landowner's objectives of enhancing habitat for birds and small and large animals and protecting water quality.

Monitoring should be focused on the condition of the fields and the presence of invasive species populations and should be conducted every 5 years.

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Owner(s) Town of Northborough

Towns(s) Northborough

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	5	WH	Single-Tree & Small-Group Selection	20.0	100	175Mbf/101 cords	2023-24

The forest growth for Stand 5 is estimated at approximately 859 board feet per acre per year.

Management Options and Considerations:

Small-group and single-tree selection is recommended for Stand 5, in order to create an uneven structure that will increase structural, age, and species diversity in the stand and create wildlife habitat gaps. The stand is currently lacking sufficient structural diversity, large-diameter trees, coarse woody debris, and wildlife habitat trees (snags and trees with significant cavities, broken tops and limbs, etc.) to benefit the responsibility (key) bird species. Small-group and single-tree selection is a silvicultural system enhances structural, age, and species diversity, releases advance regeneration, encourages the development of large-diameter trees, and creates habitat for wildlife dependent on early successional habitat. Snags and trees with cavities or other wildlife features should be retained, and snags and coarse woody debris could be actively increased through girdling and felling and leaving selected trees. The guide *Silviculture with Birds in Mind: Options for Integrating Timber and Songbird Habitat Management* was designed to guide foresters and landowners in improving breeding habitat for responsibility species. The following options are compatible with the landowners' use of this property and provide some guidance on how to maximize positive benefits for breeding birds and general forest health.

Option 2B: Small-Group and Single-Tree Selection

Option 1E: Retain snags, cavity trees and downed woody debris

Bird species that are dependent on early-successional forest habitat that might benefit specifically from these treatments include: Eastern towhee, chestnut-sided warbler, mourning warbler, white-throated sparrow, American woodcock, ruffed grouse, and northern flicker.

Landowner Goals and Management Description:

Based on the landowner goals of managing the forest for bird and wildlife habitat, managing for native species, and enhancing the quality and quantity of timber products, small-group selection (10 1/2-acre gaps, 5 acres total) and single-tree selection (thinning from below and by spacing, 15.0 acres) is recommended for Stand 5, which is an over-stocked stand. The 1/2-acre gaps will be concentrated in a 20-acre area of the stand. In small-group selection areas, remove 190 square feet of basal area per acre for a total volume of 75 Mbf. In single-tree selection areas, remove 124 square feet of basal area per acre for a total volume of 100 Mbf. Remove a total volume of 175Mbf / 101 cords in Stand 5.

In the 20-acre small-group selection area of the stand, 1/2-acre gaps should be created in order to encourage or release regeneration, remove clusters of high-risk, low-vigor, or low-value trees, and enhance midstory and understory foraging opportunities for birds. These gaps may also encourage the establishment of pioneer species, such as poplar and birch, and will provide dense vegetative cover and an abundance of soft mast sources for birds and other wildlife. In parts of the stand where openings are not created, single-tree selection (thinning from below) should be conducted: high-quality crop trees (particularly red and white oak, sugar maple, and white pine) should be selected for release though the removal of competing, lower-quality trees. This will concentrate growth on the crop trees, increasing their

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Owner(s) Town of Northborough

Towns(s) Northborough

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	5	WH	Singe-Tree & Small-Group Selection	20.0	100	175Mbf/101 cords	2023-24

health, vigor, and size. Snags, wildlife trees, and downed woody debris should also be retained or increased during harvest in order to further benefit the responsibility bird species and other wildlife.

To promote the growth of native vegetation, the invasive plant species found within the stand treated with chemicals before and after any harvest is conducted (at least 2 treatments may be necessary). Trails should be protected from damage and maintained and at a very high level.

The long-term desired future condition (50 years from now) is to continue to treat additional portions of the stand for wildlife habitat and periodically conduct thinning to improve the growing stock and conditions. This will help to promote a mature, large-diameter forest with high quality trees and high diversity. Treatments should be considered in 2040 and 2055. These long-term management recommendations meet the landowner's objectives of maintaining a quality forest for the future, improving timber quality, and enhancing bird and other wildlife habitat. Any invasive plant species populations that may become established should be treated before and after harvests, to encourage the persistence of native vegetation in the stand. The trails should be maintained.

Monitoring should be focused on the increase in wildlife populations, regeneration, health, and growth of the forest, and the presence of invasive species populations and should be conducted every 5 years.

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 Northborough

Towns(s) Northborough

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	6	WH	NA	4.02	0	0	NA

The forest growth for Stand 6 is estimated at approximately 444 board feet per acre per year.

Management Options and Considerations:

Stand 6 is a small, relatively mature, white pine-hardwoods stand. Although the stand is currently lacking sufficient coarse woody debris and wildlife habitat trees (snags and trees with significant cavities, broken tops and limbs, etc.) to significantly benefit the responsibility (key) bird species, the stand is heading toward the desired future condition through natural processes. Currently, a low number of snags and wildlife trees are present in the stand, as well as a light amount of downed woody debris. These elements will continue to accumulate slowly over time through natural disturbances and tree senescence. The guide *Silviculture with Birds in Mind: Options for Integrating Timber and Songbird Habitat Management* was designed to guide foresters and landowners in improving breeding habitat for responsibility species. The following options are compatible with the landowners' use of this property and provide some guidance on how to maximize positive benefits for breeding birds and general forest health.

Option 0: Let it grow

Option 1E: Retain snags, cavity trees and downed woody debris

Bird species that are dependent on mature, late-successional forest that might benefit specifically from these treatments include: Black-and-white warbler, black-throated green warbler, black-throated blue warbler, veery, wood thrush, eastern wood-pewee, and yellow-bellied sapsucker.

Landowner Goals and Management Description:

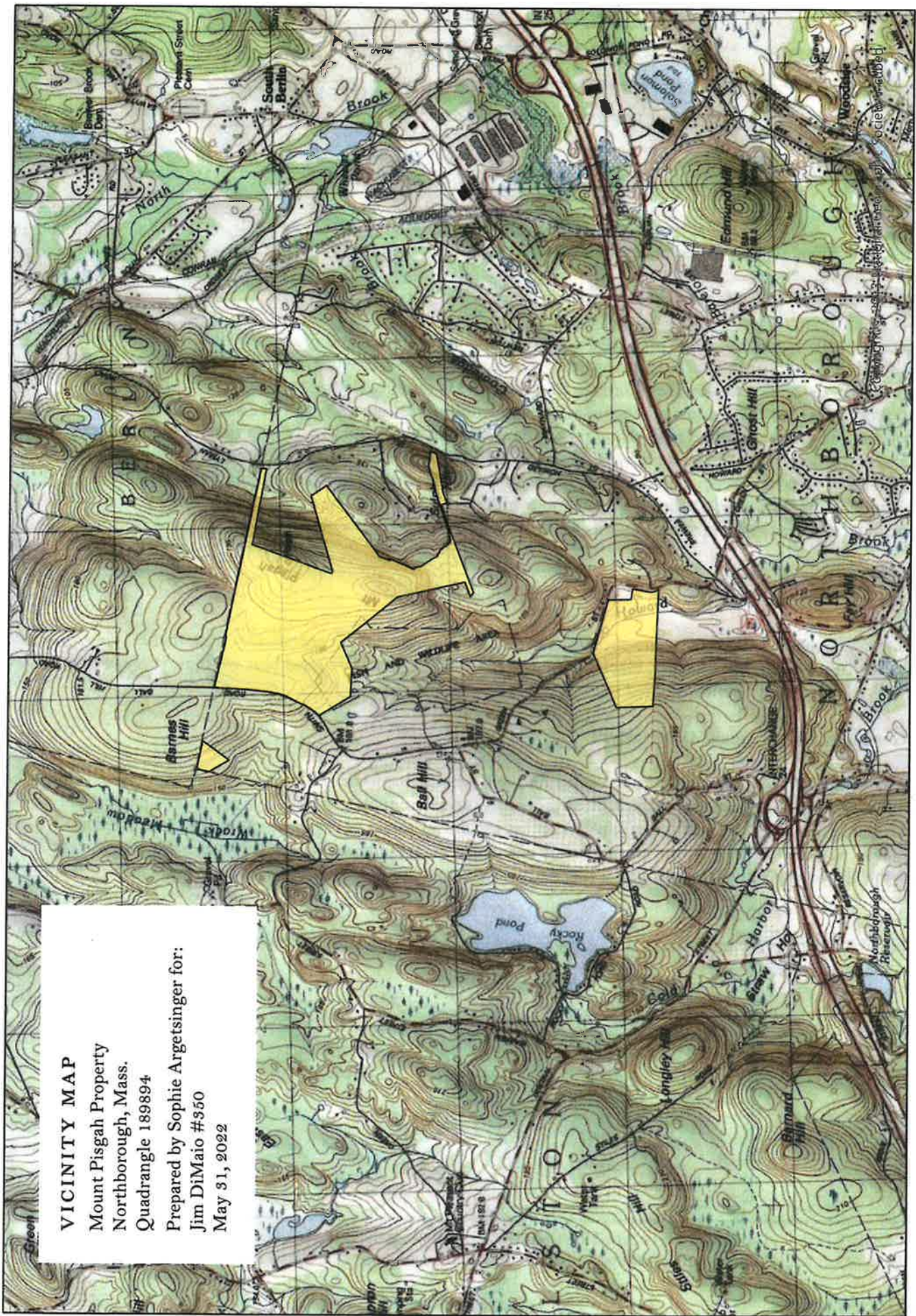
Based on the landowner goals of managing the forest for bird and wildlife habitat and native species, it is recommended that Stand 6 be managed through natural processes (no active management). It is recommended that the stand be regularly monitored for the presence of invasive plant species. If found, invasive plants should be treated as quickly as possible, as early treatment is the most efficient and economical method of control. These management practices meet the landowner's objectives of promoting native species and providing habitat for birds and other wildlife.

Monitoring should be focused on maintaining the health of the forest and the presence of invasive species populations and should be conducted every 5 years.

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

Owner(s) Town of Northborough

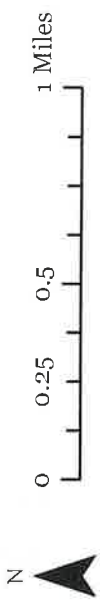
Towns(s) Northborough

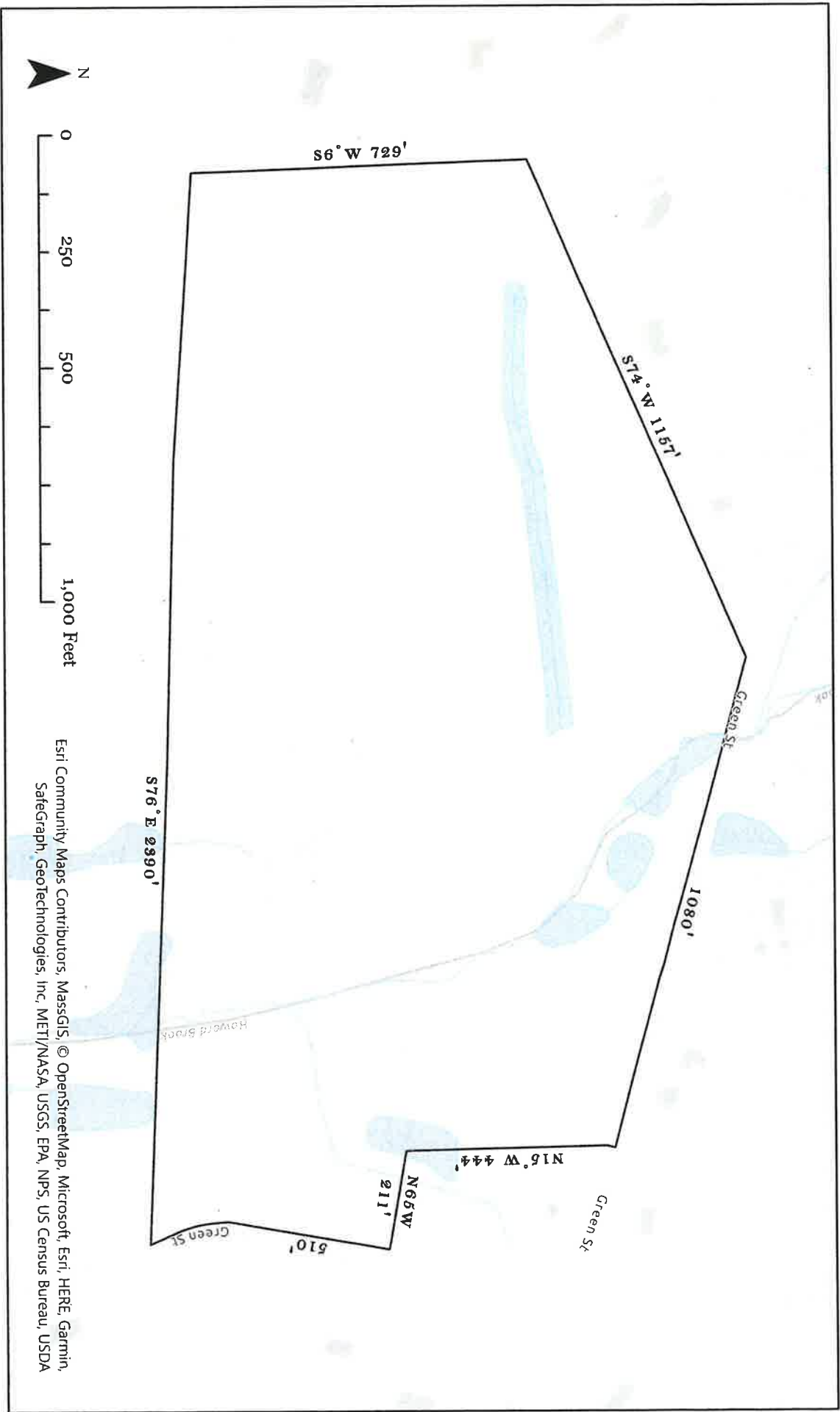


VICINITY MAP

Mount Pisgah Property
Northborough, Mass.
Quadrangle 189894

Prepared by Sophie Argetsinger for:
Jim DiMaio #350
May 31, 2022





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LEGEND Scale: 1:3,500

- PROPERTY BOUNDARY
- WETLAND
- ROAD
- STREAM

Mount Pisgah Boundary Map B

Prepared by Sophie Argetsinger
for Jim Dimaio #350
June 7, 2022



Mount Pisgah Boundary Map A

Prepared by Sophie Argetsinger
for Jim Dimaio #350
June 7, 2022

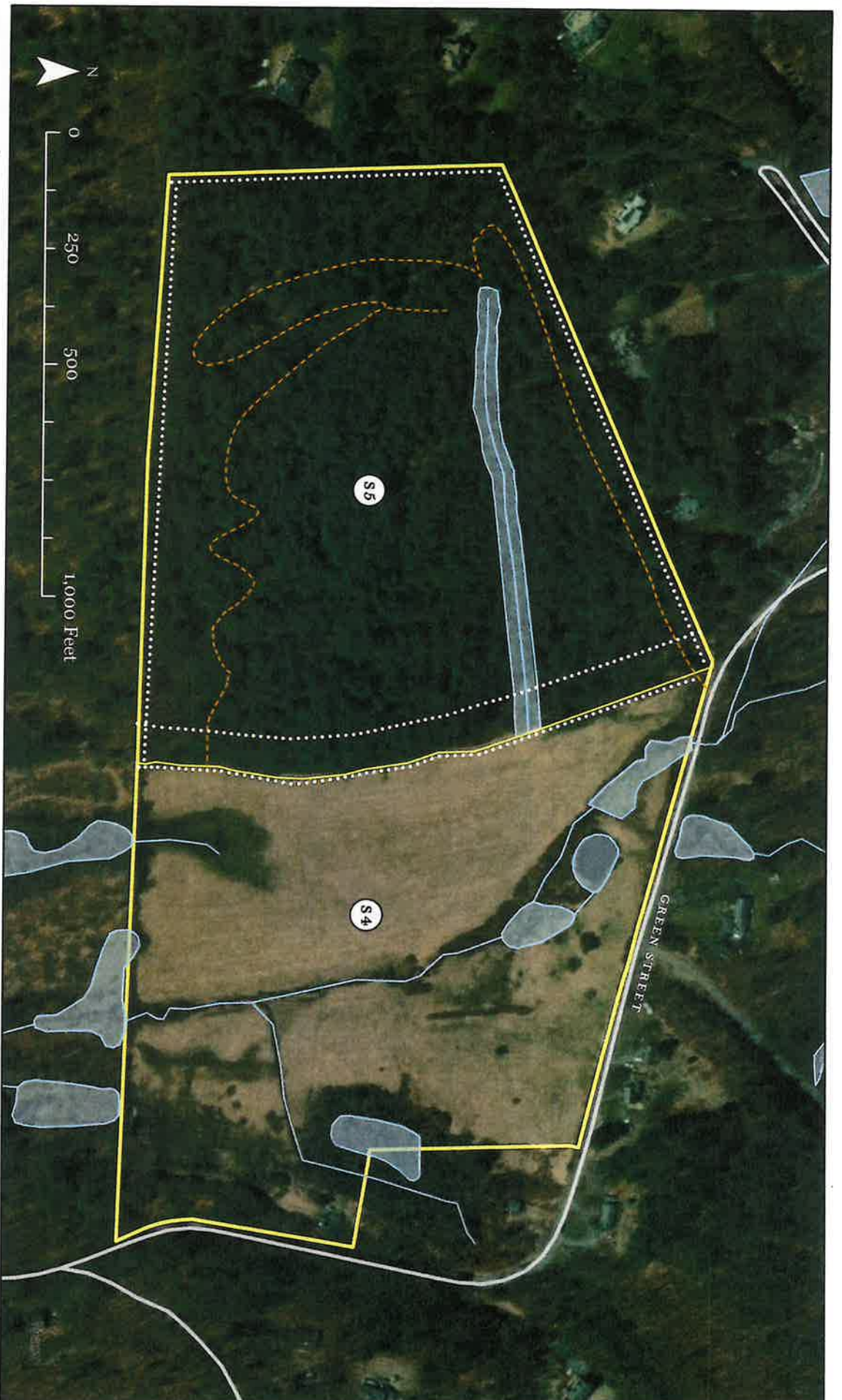
LEGEND Scale: 1:12,000

- | | | | | |
|-------|-------------------|------|---------------|---------|
| — | PROPERTY BOUNDARY | (DH) | DRILL HOLE | WETLAND |
| - - - | TOWN LINE | (RS) | RING OF STONE | STREAM |
| == | ROAD | (SB) | STONE BOUND | |
| (P) | PARKING AREA | (IP) | IRON PIPE | |

Prepared by Sophie Argetsinger
for Jim Dimairo #350



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LEGEND Scale: 1:3,500

- PROPERTY BOUNDARY
- STANDS 4-5 (S1)
- ROAD
- TRAIL
- STONE WALL
- WETLAND
- STREAM

Mount Pisgah Property Stand Map B

Prepared by Sophie Argetsinger
for Jim Dimaio #350
May 31, 2022



LEGEND

Scale: 1:2,000

PROPERTY/STAND BOUNDARY

ROAD

STONE WALL

WETLAND

STREAM

Mount Pisgah Property Stand Map C

Prepared by Sophie Argetsinger
for Jim Dimaio #350
May 31, 2022

Signature Page Please check each box that applies.

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

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

Signed under the pains of perjury:

Owner(s) Guy & Gary Date 6/21/22
Owner(s) _____ Date _____

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

Plan Preparer Jan Di M #350 Date 6/9/22

I attest that the plan satisfactorily meets the requirements of CH61/61A/61B and/or the Forest Stewardship Program.

Approved, Service Forester Laura Dwyer Date 7/20/22
Approved, Regional Supervisor Peter Church Date 8.8.22

In the event of a change of ownership of all or part of the property, the new owner must file an amended Ch. 61/61A/61B plan within 90 days from the transfer of title to insure continuation of Ch. 61/61A/61B classification.

☐ **Amendment**

Signed under the pains of perjury:

Owner(s) _____ Date _____
Plan Preparer _____ Date _____

Description of Amendment: _____

Approved, Service Forester _____ Date _____

Owner(s) Town of Northborough Town(s) Northborough