

WESTERN WOODS

ID	Assessor's Map No.	Lot/Parcel No.	Deed Book	Deed Page	Total Acres	Ch61/61A 61B <i>Exclude d Acres</i>	Ch61/61A 61B Certified Acres	Stewship <i>Exclude d Acres</i>	Stewship Acres
1	26	4	Unk		1.01			0.00	1.01
2	29	42	Unk		4.73			0.00	4.73
3	29	47	16343	504	6.65			0.00	6.65
4	29	51	16343	507	1.42			0.00	1.42
5	31	11	Unk		3.64			0.00	3.64
6	32	28	Unk		2.37			0.00	2.37
7	32	30	16343	501	10.07			0.00	10.07
8	32	104	Unk		0.05			0.00	0.05
9	32	137	Unk		1.11			0.00	1.11
10	62	6	3075	494	9.50			0.00	9.50
11	62	10	3075	494	2.60			0.00	2.60
12	62	11	6806	468	2.55			0.00	2.55
13	62	13	Unk		5.00			0.00	5.00
14	62	17	3075	494	4.06			0.00	4.06
15	62	24	3075	494	5.70			0.00	5.70
16	62	26	3075	494	1.45			0.00	1.45
17	62	28	4236	465	4.00			0.00	4.00
18	62	37	38818	72	12.00			0.00	12.00
19	62	38	6448	461	8.00			0.00	8.00
20	62	39	6340	384	6.00			0.00	6.00
21	62	40	5120	432	6.00			0.00	6.00
22	62	41	5756	60	3.78			0.00	3.78
23	62	42	5361	774	2.90			0.00	2.90
24	62	43	5739	550	2.50			0.00	2.50
25	62	44	5739	548	2.10			0.00	2.10
26	62	45	5567	219	4.00			0.00	4.00
27	62	46	3712	162	1.20			0.00	1.20
28	62	47	6448	461	2.75			0.00	2.75
29	62	48	6448	461	1.00			0.00	1.00
30	62	49	6448	461	1.68			0.00	1.68
31	62	50	6448	461	1.00			0.00	1.00
32	62	51	30150	52	2.00			0.00	2.00
33	62	52	5739	549	3.75			0.00	3.75
34	62	53	3075	494	2.00			0.00	2.00
35	62	54	3075	494	0.10			0.00	0.10
36	63	33	5361	775	2.62			0.00	2.62
37	63	34	14941	414	1.67			0.00	1.67
38	63	38	3075	494	1.65			0.00	1.65
39	63	39	6340	384	3.75			0.00	3.75
40	63	40	5120	424	2.00			0.00	2.00
41	63	41	6340	384	2.00			0.00	2.00
42	63	42	5120	425	2.00			0.00	2.00
43	63	43	4630	123	5.00			0.00	5.00
44	63	44	4630	122	2.50			0.00	2.50
45	63	45	5120	426	2.60			0.00	2.60
46	64	12	4630	112	2.17			0.00	2.17
47	64	20	5120	427	1.50			0.00	1.50
Western Woods				TOTAL S	158.13			0.00	158.13

 Owner: Town of Manchester-by-the-Sea

 Towns: Manchester-by-the-Sea

WILDERNESS AREA

ID	Assessor's Map No.	Lot/Parcel No.	Deed Book	Deed Page	Total Acres	Ch61/61A 61B <i>Exclude d Acres</i>	Ch61/61A 61B Certified d Acres	Stewshp <i>Exclude d Acres</i>	Stewshp Acres
48	60	50	Unk		39.13			0.00	39.13
49	60	57	Unk		0.88			0.00	0.88
50	60	64	Unk		1.00			0.00	1.00
51	61	3	Unk		15.23			0.00	15.23
52	61	14	Unk		9.90			0.00	9.90
53	61	18	4630	118	14.25			0.00	14.25
54	61	20	5558	79	4.00			0.00	4.00
55	61	21	Unk		3.03			0.00	3.03
56	63	7	5235	678	31.65			7.08	24.57
57	63	16	16050	67	0.18			0.11	0.07
Wilderness Area				Totals	119.25			7.19	112.06
All Properties				Totals	277.38			7.19	270.19

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Landowner Goals

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

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

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

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

Preserve environmental values to protect and enhance bio-diversity, habitat and resiliency while improving and promoting access for passive recreation.

Stewardship Purpose

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

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

Signature(s): _____

Date: _____

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How to use this report

When your consulting forester visited your property, they were documenting many things: (1) the current health and timber quality of the trees in your woods, (2) cultural resources such as stone walls and cellar holes, (3) presence/absence of exotic invasive species, (4) wetlands and terrain features, and, depending on the information you requested of your forester, (5) current forest bird habitat conditions, (6) climate change vulnerabilities, and/or (7) current levels of carbon uptake and storage. Taking that information into account, this report (1) identifies specific opportunities for protecting and/or enhancing timber quality, tree regeneration, bird habitat, climate resiliency, and/or carbon management goals, (2) suggests options for the stewardship of your property over a 10-year period. After reading this report you might consider some of the following steps:

Learn more about your forest. Maybe you're a seasoned birder, climate change ecologist, or all-around forest aficionado. Or, perhaps you're just beginning to think more about your forest. Either way, we hope that this report will show you something new about your property and encourage you to learn more. For example, to learn more about the birds that breed in Massachusetts, check out the Breeding Bird Atlas (www.massaudubon.org/birdatlas/bba2) and State of the Birds reports (www.massaudubon.org/soth). Check out the Caring for Your Woods series (<https://www.mass.gov/guides/climate-forestry>) for information on climate adaptation and carbon management.

Share this report with neighbors, friends, and family. Help us spread the word about the importance of our New England forests, from breeding bird habitat, to carbon sequestration and forest products. Teach your neighbors about trees and birds, the importance of stewarding our forests, and about the services being offered by Mass Audubon and the DCR Working Forest Initiative. By involving your neighbors in management planning you can maximize the impacts of your efforts by crossing property boundaries and increasing the amount of land you enhance. The benefits for birds, forest health, and resiliency will be worth the coordination effort.

Contact Mass Audubon or your DCR Service Forester with any questions when you're planning management activities. We would be happy to follow up with you, answer questions, and assist with any implementation of our recommendations.

- Mass Audubon – birdconservation@massaudubon.org; climateforestry@massaudubon.org
- DCR – DCR.Forestry@state.ma.us

Or *google*: MA DCR Service Forestry Program



Property Overview, Regional Significance, and Management Summary

Property Overview: The property of the Town of Manchester-by-the Sea that is addressed in this plan consists of 57 parcels containing 277.38 acres located within two areas known as the Western Woods (47 parcels, 158.13 acres) and the Wilderness Area (10 parcels, 119.25 acres). The properties have been acquired over many years as purchases, gifts and tax takings. They are under the control of the town Conservation Commission, with the exception of the town transfer station located within the Wilderness Area (see Map 13. Western Woods Town Parcel Map and Map. 14 Wilderness Town Parcel Map).

The Western Woods is a mostly undeveloped area of 542.55 acres located in the western part of town and bounded by Rte. 128 to the north, the towns of Wenham and Beverly on the west, and Pine St. on the east. The Manchester Essex Conservation Trust (MECT) owns 15 parcels containing 148.44 acres within the Western Woods. There are also 23 parcels in private ownership containing 159.29 acres and 7 parcels of unknown ownership containing 76.69 acres (see Map 1. Western Woods Ownership Map).

The Wilderness Area is an undeveloped area of 321.49 acres that is bounded by Rte. 128 on the south, the town of Essex on the north, Pine St. on the west and Old School St. on the east. The Manchester Essex Conservation Trust owns 14 parcels containing 196.76 acres within the Wilderness Area. The Trust also owns a large amount of adjacent land to the north of the Essex-Manchester town line. There are also 3 parcels in private ownership containing 2.98 acres and 1 parcel of unknown ownership containing 2.5 acres (see Map 2. Wilderness Area Ownership Map).

The town is developing this Forest Stewardship plan with bird habitat assessment to guide their management of these properties. They are exploring the possibility of gaining ownership of additional properties within the Western Woods. They also hope to coordinate management of their properties with those of the Manchester-Essex Conservation Trust.

In 2021 Manchester by the Sea updated their Open Space plan. This plan states:

“The Town of Manchester-by-the-Sea is known and beloved for its scenic beauty, unique natural features, and recreational resource areas. Improving and preserving Manchester’s parks, open space and natural resources is critical to the town’s character, environmental health, and social well-being.”

Additionally, the 2021 Seven Year Action Plan calls for the development of Land Management Plans for better stewardship of Manchester’s conservation areas. The OSRP Committee suggests that these plans focus on managing vegetation, removing invasive species, restoring ecosystems, and maintaining forest health. The plans should also include estimated budgets and identify potential funding sources.

The following summarizes the Resource Protection Needs of the town:

- Increase safeguards for the town’s water supply, especially in the Gravelly Pond/Round Pond watershed and the watershed of the Lincoln Street aquifer.
- Identify and protect important wildlife habitat and natural resource areas particularly, those areas identified in the BioMap2 (or Biomap3 when available).
- Proactively manage town-owned open space parcels.
- Improve the town’s open space parcels for walking, hiking, and environmental studies.

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- Increase public awareness of the town's open space parcels.

The following Open Space Plan Goals are relevant to this stewardship plan:

Goal 2: Protect land significant to drinking water protection, wildlife habitat, natural resource protection and climate change (for carbon storage)

Action 2.4: Maintain an ongoing inventory of parcels that need additional protection through acquisitions, dedications, or conservation restrictions. These include parcels that are important for water supply protection, wildlife habitat and natural resource protection. Reassess and update the inventory annually and apply it to Manchester's online mapping utility.

Goal 3: Manage existing town-owned or town-managed open space parcels for the purposes of safe and enjoyable public access and the protection of natural resources and wildlife habitat.

Action 3.1: Identify all town-owned or town-managed open space parcels that would benefit from: maintenance of existing trails; creation of new trails; clean-up of trash and garbage; new or improved signage; and management of trees and vegetation. Consider each for possible ADA improvements. Management of trees and vegetation would include identification and removal of invasive species; removal of dead or dying trees that pose a threat to the public; and restoration of degraded areas. Work with land trusts with adjoining properties to create management agreements.

Action 3.2: Prioritize those parcels identified in **Action 3.1** and create management plans for those identified as high priorities.

In addition to maintenance and improvement activities, the management plans should clearly define the appropriate uses for existing trails and parcels to avoid conflict between user groups and to protect sensitive natural resources. The plans should also include estimate budgets and identification of funding resources.

Action 3.3: Create a plan for the Western Woods for acquiring or protecting parcels, forest management, trail maintenance, creation of access and parking areas. Create a Western Woods webpage where all relevant information and documents can be posted.

Setting: The town of Manchester-by-the-Sea is located on Massachusetts' north shore approximately 32 miles north of Boston. It is bounded by Gloucester to the east, Essex and Hamilton to the north, Wenham and Beverly to the west, and the Atlantic Ocean to the south. The town contains 7.73 square miles, or approximately 5,000 acres. The town is 60% forested and 31% of the land area is developed. Most of the development is in the central part of the town and surrounding Manchester Harbor. The population as of the 2020 census is 5,395.

The town has long supported a fishing industry and formerly had a large cabinet making industry. It is now a largely residential town. Tourism is a valuable industry, with many people attracted to the seashore and the quiet wooded landscape. It sits at the base of Cape Ann, which includes Gloucester and Rockport, two major tourist destinations.

Topography: The landscape is punctuated by abrupt rocky hills surrounding narrow wetlands and stream channels. The area is extremely rocky with many surface boulders and ledge outcrops. Elevations in the Wilderness area range from 226 feet (69 meters) on Millstone Hill (on MECT property) to 49 feet (15 meters) at Cedar Swamp along the eastern boundary of the area. Elevations in the Western Woods range from 187 feet (57 meters) on Great Hill and Wyman Hill (both on MECT land) to 30 feet (9 meters) in the southwestern corner of the area (see Map 3. Western Woods Topographic Map and Map 4. Wilderness Area Topographical Map).

Watershed: The properties lie within the north coastal watershed. The southern boundary of the Western Woods is just slightly more than a half-mile from the Atlantic Ocean. The southern portion of the Western Woods drains toward Chubb Creek which drains into the Atlantic. Much of the northern part of the Western Woods drains across the northwest corner of the area into a series of ponds in Manchester, Wenham and Hamilton, including Gravelly Pond, which is a major source of drinking water for Manchester-by-the-Sea. From the ponds the water flows northeast into the Essex River and then into Ipswich Bay, a little more than 5 miles northeast of the Wilderness Area. Another drainage flows north across the northeast corner of the Western Woods into Maple Swamp, which is partially on the Wilderness area, and then north toward the Essex River. Prior to reaching the ocean the Essex River flows through a large area of tidal salt marshes that are important endangered species habitat and are designated as priority natural communities and BioMap2 Core Habitat and Critical Natural Landscape by the Natural Heritage and Endangered Species Program (NHESP).

Most of the Wilderness area drains into Cedar Swamp on the eastern edge of the property. Sawmill Brook flows out of the swamp to the east, south and southwest toward Manchester Harbor, less than two miles from the Wilderness Area.

Hydrology: The Western Woods contain some small ponds, numerous stream channels, and numerous wetlands, including wooded swamps, shrub swamps, and shallow and deep marshes. Many of the wetlands are narrow, confined by surrounding hills, but there is a large expanse of wetlands in the northwest corner of the area. The hydrology in this area is affected by beaver activity that has enlarged the wetland area and created some open water where there were formerly wooded wetlands (see Map 5. Western Woods Streams and Wetlands).

The Wilderness Area is bookended by Maple Swamp on the west and Cedar Swamp on the east, both large areas of open marsh. There are numerous small wooded wetlands and shrub swamps in the lower elevations. A stream runs north to south to the west of Millstone Hill and then toward Cedar Swamp (see Map 6, Wilderness Area Streams and Wetlands).

Biodiversity: There are approximately 4.4 acres on the Western Woods designated as BioMap2 Core Habitat, most of which is on town land (parcels 15, 22, 23 & 26). A 22-acre area surrounding this Core Habitat is designated as Critical Natural Landscape, and is mostly on town land (parcels 15, 19, 22, 23, 25, 26, 27, 32 & 33). The Core Habitat is a wetland core (wetland cores are the least disturbed wetlands in the state within undeveloped landscapes) and contains what the MA GIS DEP Wetlands layer calls a wooded swamp, but is now actually open water. The Critical Natural Landscape is a wetland core buffer. Both the core habitat and the critical natural landscape areas extend on to unprotected land in the town of Beverly (see Map 7. Western Woods Biodiversity Map).

Large portions of the Wilderness Area are designated as BioMap2 Core Habitat and Critical Natural Landscape. The Core Habitat is a forest core and a wetland core and includes two species of conservation concern, the four-toed salamander (*Hemidactylium scutatum*) and the spotted turtle (*Clemmys guttata*). These are both non-listed species that are included in the state's Wildlife Action Plan. Forest Cores are the best examples of large, intact forests that are least impacted by roads and development. Forest Cores support many bird species sensitive to the impacts of roads and development and help maintain ecological processes found only in unfragmented forest patches. This large area of Core Habitat includes portions of parcels 48, 49, 52 and 54. There is a second area of Core Habitat along the western edge of the Wilderness Area (parcel 56), which is for a species of conservation concern, the blue-spotted salamander (*Ambystoma laterale*) (see Map 8. Wilderness Area Biodiversity Map).

The Critical Natural Landscape is an aquatic core buffer, a coastal adaptation area, a landscape block and a tern foraging area. Both areas cover large areas and extend to the north into Gloucester, Essex and Hamilton. Town parcels with Critical Natural Landscape are parcels 48, 49, 51, 52 and 54.

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There are no designated priority habitats of rare or endangered species in the Western Woods. In the Wilderness Area there is a large block of priority habitat, parts of which fall on town parcels 48, 49, 51, 52 and 54.

There are no priority natural communities on either area.

NHESP has not certified any vernal pools on the Western Woods, but has identified two potential vernal pools, one of which is on town land on parcel 29. There are two certified vernal pools in the Wilderness area, both on MECT property. Eight potential vernal pools have been identified in the area. One is on or near the boundary of parcel 48 and another on or near the boundary of parcel 52.

The BioMap2 designations impose no regulatory constraints upon the landowner but are used to guide state policy and land protection efforts. If protected, these areas will provide habitat for wide-ranging native species, support intact ecological processes, maintain connectivity among habitats, and enhance ecological resilience to natural and human disturbances. For more information on BioMap2 see the website at:

<http://maps.massgis.state.ma.us/dfg/biomap2.htm>.

The Priority Habitat designation, however, does impose constraints and the landowner should consult with the town Conservation Commission and NHESP before undertaking any activity in the designated habitat. Although only a small area is protected habitat it should be assumed that the species of concern would use other areas on the property. The BioMap2 Town Report for the Town of Manchester-by-the-Sea contains the following information on the species of concern:

Four-toed Salamanders live in forested habitats surrounding swamps, bogs, marshes, vernal pools, and other fish-free waters that are used as breeding sites. Most breeding sites in Massachusetts are characterized by pit-and-mound topography with significant sphagnum-moss cover. Eggs are typically laid in mounds or patches of sphagnum moss that overhang water. Upon hatching, the larvae wriggle through the moss and drop into the water, where they will develop for several weeks prior to metamorphosis.

Strong populations of Spotted Turtles in good habitat -large, unfragmented, protected open space continue to be of interest for the conservation of this species. This small, dark-colored turtle with yellow spots on its carapace inhabits a variety of wetlands year-round and nests in nearby uplands during spring. Road kill and collection are the primary conservation concerns.

Adult and juvenile Blue-spotted Salamanders inhabit upland forests during most of the year, where they reside in small-mammal burrows and other subsurface retreats. Adults migrate during late winter or early spring to breed in vernal pools and fish-free areas of swamps, marshes, or similar wetlands. Larvae metamorphose in late summer or early fall, whereupon they disperse into upland forest.

Soils: Soils information was obtained from the USDA Web Soil Survey. Both the Western Woods and the Wilderness have similar soils. The most common soil classification on both areas is the Chatfield-Hollis-Rock outcrop complex, which underlies 78% of the Western Woods and 64% of the Wilderness Area. These well-drained, shallow soils and outcrops are found on the slopes and ridgetops and have a high percentage of surface rocks, boulders and outcrops. There are small areas of fine sandy loams (less than 10% of the area) that occupy outwash plains and terraces, moraines and eskers. Swansea and Freetown mucks occupy 31% of the Wilderness Area and 9% of the Western Woods. These are deep, poorly drained soils underlying wetland areas (see Map 9. Western Woods Soils Map and Map 10. Wilderness Area Soils Map).

The Chatfield-Hollis-Rock outcrop soils are rated as having a severe erosion hazard for roads and trails because of slope. A severe rating indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed. These soils are moderately suited to harvest equipment operation and are rated as medium for compactability. They are a moderately productive soil with a site index for northern red oak of 70. Observations indicate that this site index decreases significantly as elevation increases as the ridgetops and higher slopes have shallower soils, more ledge outcrops and less water available.

Access: Vehicular access to the Western Woods is limited. An extension of Crooked Lane loops around the northern and western portions of the area, merging with a residential driveway in the southwest that comes off of Brockwood Road. A spur of the road leads to Preston Place on the Beverly – Manchester-by-the-Sea boundary. The road condition is fair to good with some wet and puddled areas and small areas of erosion or rutting. There are gates at the end of Crooked Lane and at Preston Place. The main woods roads pass by or through several town parcels in the northern and western portions of the area but do not provide access to the parcels in the central and eastern part of the area. The road shows evidence of light to moderate use by off-road vehicles and mountain bikes. Water flows across the woods road at the gate location at Preston Place and there is evidence of erosion occurring there.

For forest harvesting access the Preston Place entrance would be most logical because of its proximity to a large block of town land. Preston Place, however, is a narrow, winding residential road not well suited to large trucks. Crooked Lane is also poorly suited for truck traffic. An alternate access should be looked for. Better access will serve safety and fire protection needs also.

There is an extensive trail system throughout the Western Woods that provides access for hiking and mountain biking to almost all of the town properties. Over their course they pass over MECT land and private properties. These trails are only partially marked with paint or signs. They appear to be in generally good condition (see Map 11. Western Woods Trails Map).

Recreational access is possible from Crooked Lane and Preston Place. Both of these locations have parking space for only a handful of cars. The trail system is accessible from the parking areas but because of the intricate web of intersecting trails and the lack of maps and markings, navigating the area can be confusing.

Vehicular access to the Wilderness area is also limited. There is a large parking area on town land (parcel 51) at the junction of School St. and Old School St. There is a gate at the end of Old School St. The road passes along the edges of town parcels 51, 53 and 55, which are almost all wetlands, until it meets the Old Manchester-Essex Rd. which passes along the southern boundary of parcel 55 before heading west toward Essex, passing by town parcels 49 and 54. There is no vehicular access to parcels 48, 52 and 56 (other than on to the transfer station). Pine St. forms the western boundary of parcels 56 and 57, but that is along swamp or DPW land. There is a wide spot on the east side of Pine St. where a car could park, and a trail enters the area at the junction of the Rte. 128 ramp and Pine St. (see Map 12, Wilderness Area Trails Map).

The trail system is easily accessible from the parking area on School St. A wooden boardwalk connected to Old School St. crosses Cedar Swamp on town parcel 53 and connects with the larger trail system. These trails pass through or near all of the town parcels. The trail system is maintained by MECT and it is in good condition. It is well-marked with paint and signs and most trail junctions are marked with directional signage and trail names. A trail map is available on the MECT web site.

Songbird habitat: This plan provides an assessment of the songbird habitat on the property and recommendations for the management of songbird habitat. This assessment considers habitat at three scales, going from the largest to the smallest:

1. The context of the ecoregion
2. The landscape surrounding the property
3. The stand level characteristics.

1. The properties are located within the Northeastern Coastal Zone. This is a large area that encompasses the eastern two-thirds of Massachusetts, except for the Cape and islands and the eastern part of Plymouth County. The forests in this area typically support oak-pine and oak-mixed hardwood stands. Soils are generally acidic but not xeric. This zone has a high density of human settlement and cities, and forest birds are highly dependent on the remaining tracts of forest. There is a high density of roads in the area, leading to a high level of forest fragmentation. Large tracts such as these are uncommon other than on state forest and wildlife land.

2. The properties are located in the northeast part of the state, just to the west of Cape Ann. They are located within one-half mile of Massachusetts Bay on the south and about 4.5 miles southwest of the northern coast of Massachusetts. Population density is moderate. The public drinking water supply for the town of Manchester-by-the Sea is located to the north and west of the properties. The forests in this area typically support oak-pine and oak-mixed hardwood stands. They are frequently subject to disturbance from coastal storms. The forests are largely mature with a small percentage of young forest. There is not a large amount of agricultural fields in the area. The soils are rocky with frequent outcrops. These properties can support species like Wood Thrush and Black-throated Green Warbler, who need large areas of forest. Opportunities to create young forest habitat on these properties would provide great conservation, and support declining species like Eastern Towhee and Chestnut-sided Warbler.

3. The forest stands were evaluated for the presence of habitat features utilized by songbirds. This includes the type and extent of canopy cover (vegetation over 30' tall), the amount and type of mid-story vegetation (between 5 and 30'), and the understory cover (below 5'). Also noted were the amount of dead standing trees (snags), piles of large and fine woody debris on the forest floor, the presence of soft mast (cherries, raspberries, grapes, etc.), the condition of the leaf litter and the presence and extent of non-native invasive plants. These factors will influence the number and type of birds that will utilize different areas of the forest. While focused on birds, these habitat features will also be utilized by other wildlife. For instance, large woody debris will also provide critical habitat for amphibians like the marbled salamander. These attributes are discussed in the stand descriptions.

In general the wooded areas fall into three categories. The most common is mature closed canopy mixed hardwood-softwood stands with a partial mid-story of hardwood and softwood trees and a mostly open understory. Also common are stands with a partial open mature canopy over a thick mid-story of hardwood and softwood trees and an open understory. Finally there are the mostly open areas of rock outcrops that have a light stocking of short hardwood and softwood trees and a light understory of blueberry and viburnum, usually located on slopes and ridgetops. In addition to these areas the open and wooded wetlands also provide valuable bird habitat.

There are good numbers of standing snags and downed woody debris across the area. Soft mast, primarily from black cherry and highbush blueberry is relatively rare. There is abundant hard mast from the oaks and beeches. Other than some stands of phragmites in wetland areas, no invasive plant species were observed.

What is lacking on these areas, as well as in the larger surrounding landscape, are areas of young, early successional vegetation. There is also a lack of low understory vegetation throughout the woodlands. The area

will not meet the needs of species needing these habitat components, but otherwise the areas provide a varied and healthy habitat. The habitat could be improved through cutting to create early successional openings or to thin canopies to allow more understory growth. More coarse woody debris could be added to areas along wetland edges.

Forest Health, Pests and Invasive Species: Our field work was conducted during a period of extreme drought in the summer of 2022. The black birch and some beech were dropping their leaves in early August in response to the drought. There should be no negative effects if precipitation levels return to normal in the next year, but long term drought could cause tree mortality, especially in the higher elevations because of the shallow, well drained soils. Dry conditions also increase the possibility of destructive wild fires.

The crowns of the hemlock trees were thin, especially smaller trees in the understory, indicating the presence of hemlock wooly adelgid. This pest can cause widespread death of hemlock trees.

Spongy moth has been present in the landscape for many decades, though it is declining in the area. There were large areas on Cape Ann defoliated as recently as 2018, but these town lands were not affected.

Damage from the white pine needle disease was observed in Beverly and Hamilton in 2021. This is a combination of pathogens that attack new growth on pine trees and weaken them. Symptoms are yellowing of needles and premature needle shedding. The pathogens don't usually kill the trees, but they can infect the new growth of the tree causing an annual cycle of infection which can create chronic stress that severely weakens the trees leaving them open to secondary invaders and possible mortality.

Beech bark disease and beech leaf disease are both present on these properties. Beech leaf disease is a newly described disease, first identified in Ohio in 2012. It was found in Manchester-by-the-Sea in 2022. The disease complex is associated with a foliar nematode species, *Litylenchus crenatae* and can be seen on European, American, and Oriental Beech. The disease causes damage to a tree's leaves, leading to reduced vigor and can eventually lead to tree mortality.

The invasive plant, the common reed (*phragmites australis*), was observed in wetlands on both the Western Woods and the Wilderness Area. This non-native invasive plant thrives along the edges of wetlands, forming thick stands that crowd out native vegetation.

No other invasive plants were observed in the Wilderness Area. In the northwestern part of the Western Woods several invasive plant species were observed along wetland edges. These included oriental bittersweet, multiflora rose, Japanese barberry and glossy buckthorn that are present in small numbers but are widespread throughout the larger landscape and can be expected to show up on town land eventually, especially following any disturbance. Removal of the invasive plants is recommended at this time and then the area should be regularly monitored for their presence. Once established these species are difficult to eradicate. The natural mechanisms that normally control these species in their home ranges don't exist here. As a result they can out-compete, displace, and kill native species, decreasing biodiversity and degrading wildlife habitat.

Forest History: These properties are believed to have never been cultivated, though it very likely they were cleared in the 19th century for lumber, firewood and possibly used as pasture. There are only a few stone walls on the properties. The rugged nature of the terrain and the lack of roads kept the areas in an undeveloped state. A piggery is said to have been on the Western Woods in the area near to Route 128. Areas in the northwest part of the Western Woods have been excavated for gravel, possibly for the building of Rte. 128. It is believed that the gravel roads provided access for fire protection to the area's woodlots, the piggery and the gravel excavation site.

An old stone foundation was observed on parcel 14 in the Western Woods.

Most of these areas were in private ownership up until the mid-twentieth century, when the town began acquiring parcels, mostly through tax takings. The Manchester-Essex Conservation Trust began acquiring and protecting properties in the area in the second half of the twentieth century and these efforts have continued through the present time.

Boundaries: The town properties consist of multiple parcels, not all contiguous, and many of relatively small size. Very few boundary markings were observed and there is a lack of good boundary information. Further research and field work is needed to properly locate and mark the boundaries.

Priority for boundary marking should be given to boundaries that abut private property, particularly residential properties, and to parcels where there will be any management practices applied, particularly those that involve tree cutting.

Any boundary monuments found, such as pins or stones, should be clearly marked with paint and blazed trees and a GPS location should be marked. Boundaries found should be marked with painted blazes and signs. Any boundary marking should be refreshed every ten years.'

Management Summary: The landowners have prioritized their goals for the property (see Landowner Goals, page 2). The following goals were rated of highest importance:

Promote Biological Diversity – Within the limits of the site and soils biological diversity can be promoted by protecting forest health, soil health and wetlands and waterways, including vernal pools. Areas designated as BioMap2 Core Habitat and as Priority Habitat of Rare and Endangered Species should be protected from destructive alterations.

Enhance Habitat for Birds – Bird habitat is discussed within the Stand Descriptions and Management Practices sections.

Enhance Habitat for Small and Large Animals – In general, practices that improve songbird habitat will also benefit other animals. Practices that protect soils, wetlands and water quality will also benefit wildlife. Management can be planned to enhance existing habitats or to create new habitat (such as the creation of early successional habitat). The protection of the habitat of the endangered amphibians and reptiles in the area is of greatest concern. Buffer areas along streams, vernal pools and wetlands should be maintained, where natural conditions are maintained and trails are limited.

Improve Access for Walking/Hiking/Skiing – There are extensive trail systems on both areas (see Trail Maps). On the Wilderness Area there is adequate parking and the trails are well marked. In the Western Woods there is limited parking and the trails are not well marked. Additional parking areas or improvements to existing parking could be made to accommodate more cars. The major trail system loops should be clearly marked and signage could be installed to aid in navigation.

Maintain or Enhance Privacy – The primary concern would be containing forestry activities to town land and recreational activities to town and MECT property. The current trail system on the Western Woods crosses private property. Permission to cross these properties should be obtained before trails are marked or signage is installed.

The delineation of property boundaries with blazes, paint and signs is important for maintaining good relations with neighbors and protecting property rights. The problem is that good boundary descriptions are lacking and boundary monuments are scarce. However, boundaries must be found and marked before any physical changes (tree cutting or trail creation) are made to town properties. This is particularly important where town land abuts private property. Where town land abuts MECT land it is possible that agreements could be made to allow activities without the need for delineating boundaries.

Preserve or Improve Scenic Beauty – The scenic beauty aspects of the property include wooded and wetland vistas as well as the numerous rock outcrops, exposed ledges and large boulders. Management activities should protect or enhance these scenic values, particularly along public roads and trails. The areas abut Rte. 128 on both the north and south, however, parcel 48 in the wilderness area is the only town-owned property with frontage on Rte. 128. There are town properties along the frontage of Pine St. and School St. in the Wilderness areas. Both of these roads are along large wetland areas that will remain untouched except for perhaps the control of phragmites, which would positively impact the scenic values.

Parcels 8, 9 and 46 in the Western Woods have frontage on Pine St. just opposite the off-ramp for Rte. 128. These are steep, heavily wooded parcels that have unique scenic value because of their location. There are large hemlock trees in this area that could succumb to the hemlock wooly adelgid, altering the view. Otherwise, management activities such as tree cutting should be avoided on these parcels.

Trails could be planned to guide hikers to areas with high scenic value such as vistas or rock outcrops.

Protect Water Quality – This is particularly important on areas within the watershed of the town water supply, but given the proximity to the Atlantic Ocean and to critical endangered species habitat, it is of no less importance on other parts of the properties.

The greatest threat to water quality is run-off from roads and trails. The Web Soil Survey says that the major soils on the properties have a high potential for erosion. If erosion from the trails enters streams and wetlands they will degrade water quality. No areas of concern were observed on the existing trail system, but it should be regularly monitored for problems, and improvements, such as water diversions, should be installed where needed. Also, use of the trails by motorized vehicles, mountain bikes and horses should be limited as these activities will cause more wear on the trails than foot traffic.

The increased occurrence of large weather events that is expected due to the changing climate can increase the erosion potential from roads and trails. All locations where trails and roads cross streams and wetlands should be monitored and evaluated. Where needed, culverts should be upgraded to accommodate larger flows and water diversions, retention ponds and armoring should be installed where needed. Paved public roads exist along the eastern (School St.) and western (Pine St.) edges of the Wilderness Area. These roads have the potential to add sediment and pollutants to the adjacent wetland areas. Runoff from these roads should be monitored and where necessary retention areas could be installed.

Within the forested parts of the properties, management activities that include the use of heavy equipment should be planned to utilize forestry best management practices to minimize soil compaction, soil disturbance and impacts to streams and wetlands.

Protect Unique/Special/Cultural Areas – The only cultural artifact observed were an old stone foundation on parcel 14 in the Western Woods. Additional known cultural areas should be identified and mapped. Forestry activities and trails should be planned to avoid disturbance to these areas.

The following goals were rated as low importance by the landowner:

Enhance the Quality/Quantity of Forest Products

Generate Immediate Income

Generate Long Term Income

Produce Firewood

Defer or Defray Taxes

Improve Hunting or Fishing.

Notes on Stand Descriptions:

Forest Types were mapped using a combination of aerial photo interpretation of 2021 Ortho Photos and field observations. The entire Wilderness Area and Western Woods were mapped and field checked while inventorying the town properties. Stand data was developed by variable plots using a 20-factor prism. Wetlands were mapped using the MA GIS DEP Wetlands layer edited and augmented through field observations. Table 1. Lists the forest types for the Western Woods. Table 2 lists them for the Wilderness Area. Maps 13 and 14 show the town parcels on each area and the forest types are shown on Maps 15 & 16.

Table 1. Western Woods Forest Types

Assessor			Forest Types										Total
Parcel	Map	Parcel	Acres	1-OH	2-OH	3-WH	4-WH	5-HH	6-RM	7-SS	8-MD	9-WA	
1	26	4	1.01	1.01									1.01
2	29	47	6.65	4.33				2.32					6.65
3	29	42	4.73	4.39					0.34				4.73
4	29	51	1.42	1.19					0.23				1.42
5	31	11	3.64	3.28					0.36				3.64
6	32	28	2.37	1.69				0.68					2.37
7	32	30	10.07	1.89		1.30		6.53		0.35			10.07
8	32	104	0.05		0.03				0.02				0.05
9	32	137	1.11		0.62				0.49				1.11
10	62	6	9.50	9.50									9.50
11	62	10	2.60	2.60									2.60
12	62	11	2.55	2.55									2.55
13	62	13	5.00	5.00									5.00
14	62	17	4.06	0.10		3.39			0.57				4.06
15	62	24	5.70	3.12	0.29	0.82		1.11	0.36				5.70
16	62	26	1.45					1.45					1.45
17	62	28	4.00	1.77		1.84			0.39				4.00
18	62	37	12.00	0.06	9.84	2.10							12.00
19	62	38	8.00		7.15	0.85							8.00
20	62	39	6.00		4.42					1.22	0.36		6.00
21	62	40	6.00		0.71	3.14			2.08		0.07		6.00
22	62	41	3.78		3.38	0.39			0.01				3.78
23	62	42	2.90		1.09				1.81				2.90

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24	62	43	2.50	1.78		0.72							2.50
25	62	44	2.10		2.10								2.10
26	62	45	4.00		1.48			0.39	2.13				4.00
27	62	46	1.20	1.00	0.20								1.20
28	62	47	2.75		0.15				0.83			1.77	2.75
29	62	48	1.00		0.35		0.02		0.63				1.00
30	62	49	1.68		0.67		0.46		0.55				1.68
31	62	50	1.00		0.89		0.11						1.00
32	62	51	2.00		1.45				0.55				2.00
33	62	52	3.75	3.05	0.70								3.75
34	62	53	2.00	2.00									2.00
35	62	54	0.10					0.10					0.10
36	63	33	2.62		1.25	1.27			0.10				2.62
37	63	34	1.67		1.67								1.67
38	63	38	1.65		1.46				0.19				1.65
39	63	39	3.75		3.41					0.34			3.75
40	63	40	2.00		2.00								2.00
41	63	41	2.00	0.35	1.65								2.00
42	63	42	2.00	0.03	0.03	1.80			0.14				2.00
43	63	43	5.00	0.20	1.35	1.75			1.50	0.20			5.00
44	63	44	2.50	2.04	0.46								2.50
45	63	45	2.60	2.07		0.53							2.60
46	64	12	2.17		2.17								2.17
47	64	20	1.50	0.47		0.74			0.17	0.12			1.50
		Totals:	158.13	55.47	50.97	20.64	0.59	12.58	13.45	2.23	0.43	1.77	158.13

Table 2. Wilderness Area Forest Types

		Assessor		Forest Types									
Parcel	Map	Parcel	Acres	1-WH	2-OH	3-HH	4-RM	5-SS	6-MS	7-WA	8-OP	Total	
48	60	50	39.13	30.09	1.19	0.00	7.85	0.00	0.00	0.00	0.00	39.13	
49	60	57	0.88	0.00	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.88	
50	60	64	1.00	0.89	0.00	0.11	0.00	0.00	0.00	0.00	0.00	1.00	
51	61	3	15.23	0.06	0.00	0.41	0.00	0.00	14.40	0.00	0.36	15.23	
52	61	14	9.90	4.03	4.71	0.00	0.00	1.16	0.00	0.00	0.00	9.90	
53	61	18	14.25	0.05	0.22	3.43	0.00	0.00	9.29	1.26	0.00	14.25	
54	61	20	4.00	2.24	0.91	0.85	0.00	0.00	0.00	0.00	0.00	4.00	
55	61	21	3.03	0.00	0.00	1.83	0.00	0.00	1.20	0.00	0.00	3.03	
56	63	7	31.65	4.86	0.00	4.00	0.00	0.00	15.71	0.00	7.08	31.65	
57	63	16	0.18	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.11	0.18	
		Totals:	119.25	42.22	7.91	10.63	7.85	1.16	40.67	1.26	7.55	119.25	

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MSD = mean stand diameter, or the diameter at 4.5 feet above the ground of the average tree in the stand.

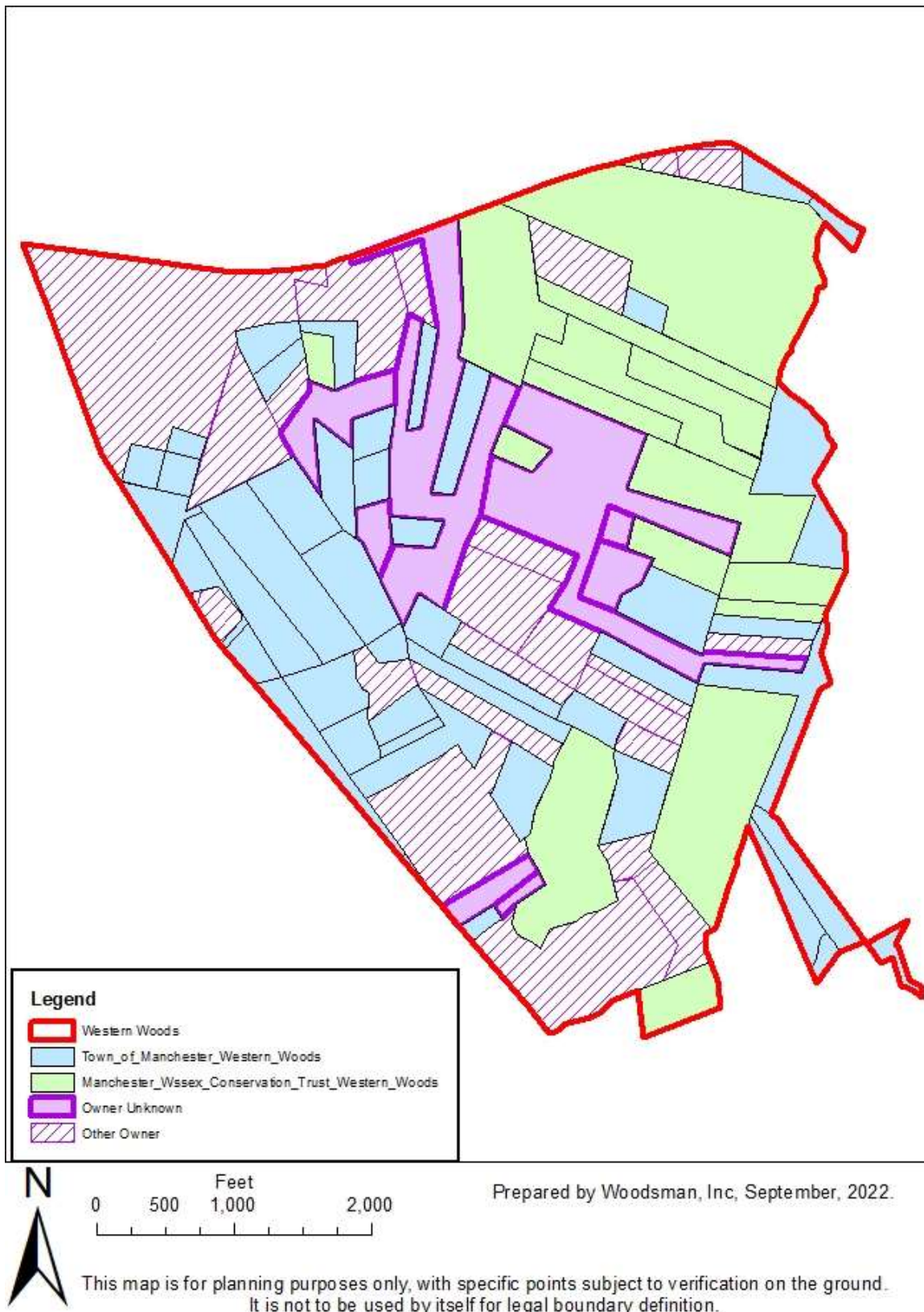
BA/AC = Basal area per acre. Basal area means the total area of the cross sections of the trees at 4.5 feet above the ground. Basal area per acre, along with average diameter, is used to determine the relative density of the trees within the stand.

Vol/AC = wood volume per acre. This is an estimate of the board foot (MBF = 1,000 board feet) and cord volumes present. It is an estimate based upon a limited survey sufficient for planning purposes. In the event of a timber sale a more accurate measurement would be needed. For the plan purposes the cordwood volume listed is only the volume of hardwood firewood present. I did not include softwood pulp.

Acceptable Growing Stock = Trees measured are rated as either acceptable or unacceptable growing stock as an aid in evaluating overall stand quality and management needs. Acceptable growing stock would be healthy trees of long-lived species that have good form and are generally lacking in defects in the wood. They are potential crop trees suitable for producing good quality lumber, but other factors, such as wildlife values, can be included in the evaluation.

Site Index = Site index is a measure of the sites ability to grow trees. It is based upon the estimated height of key species (listed next to the site index) at 50 years of age. Site indices on this plan were obtained from the NRCS Web Soil Survey. Site index is species specific. Certain sites may be very productive for one species and not for others. In this case WP = white pine and RO = red oak.

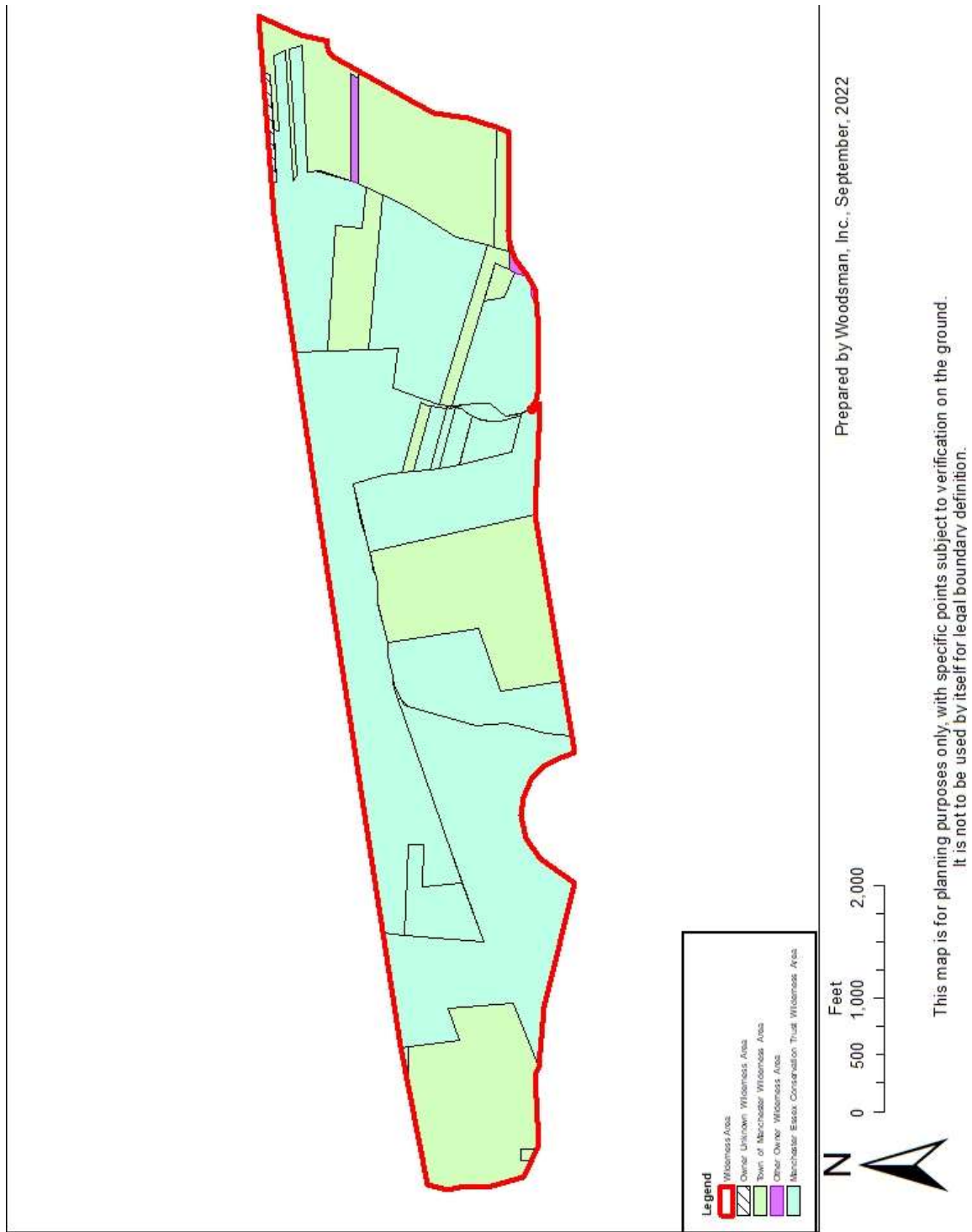
Map 1. Western Woods Ownership Map



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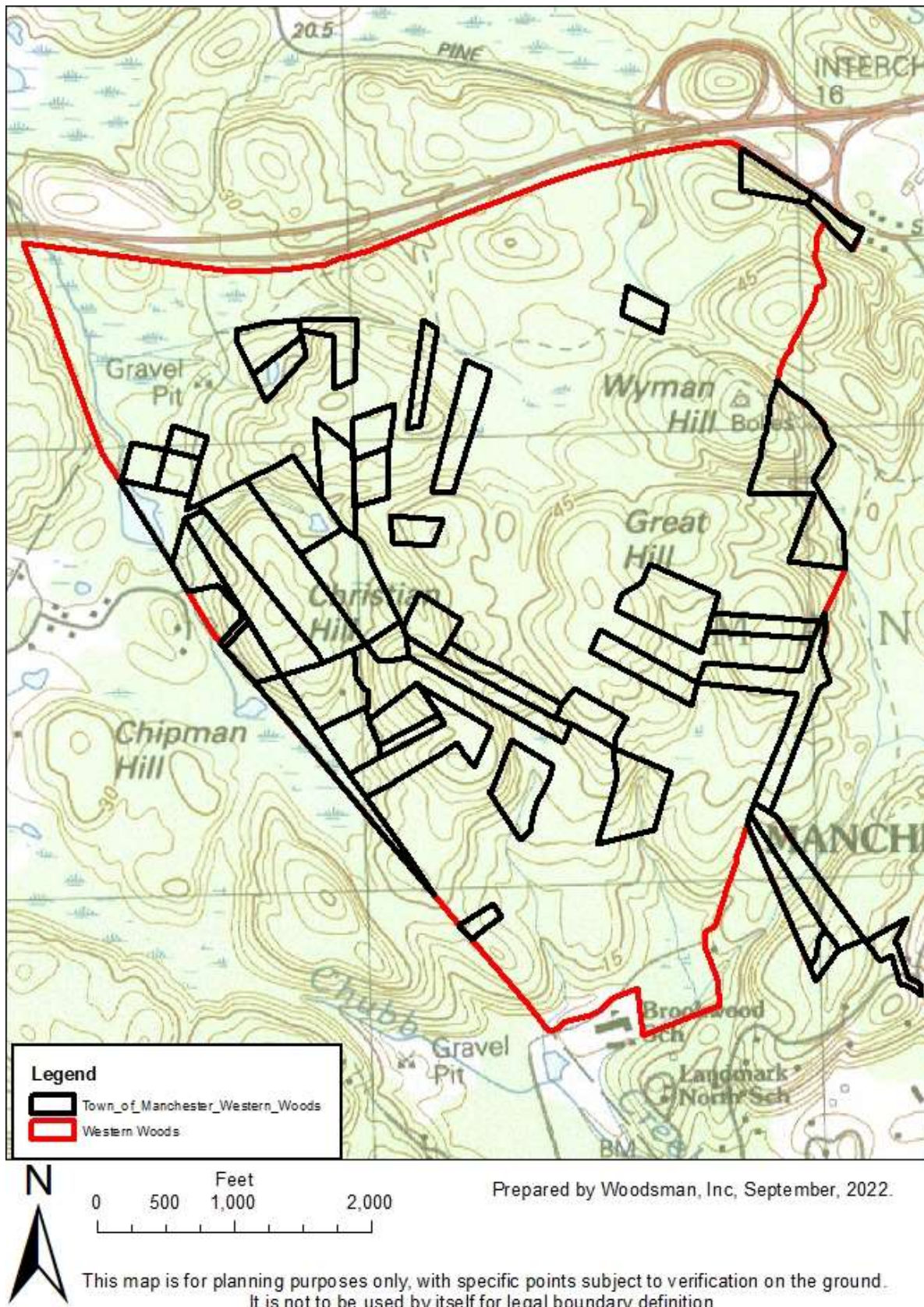
Map 2. Wilderness Area Ownership Map



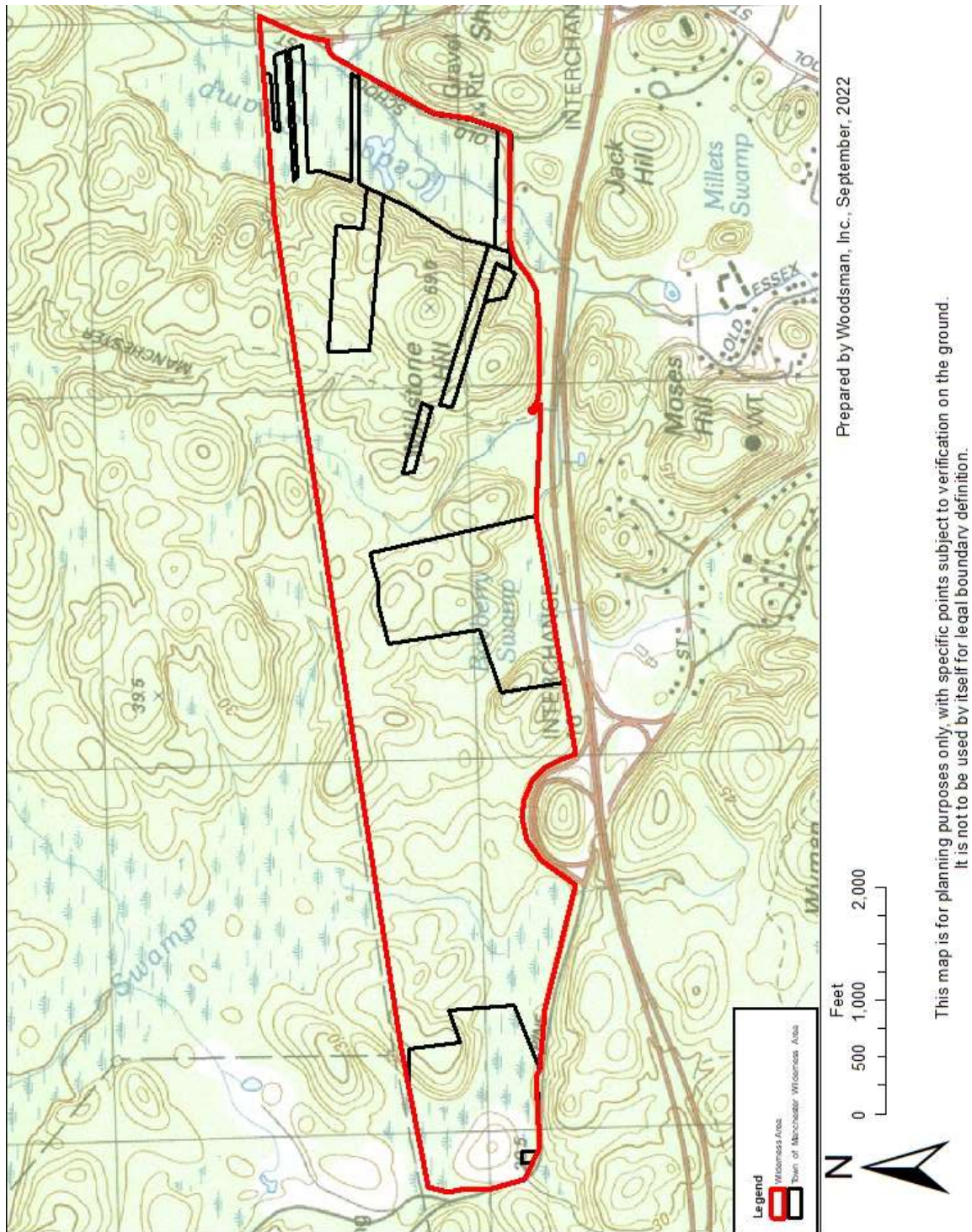
Owner: Town of Manchester-by-the-Sea

Towns: Manchester-by-the-Sea

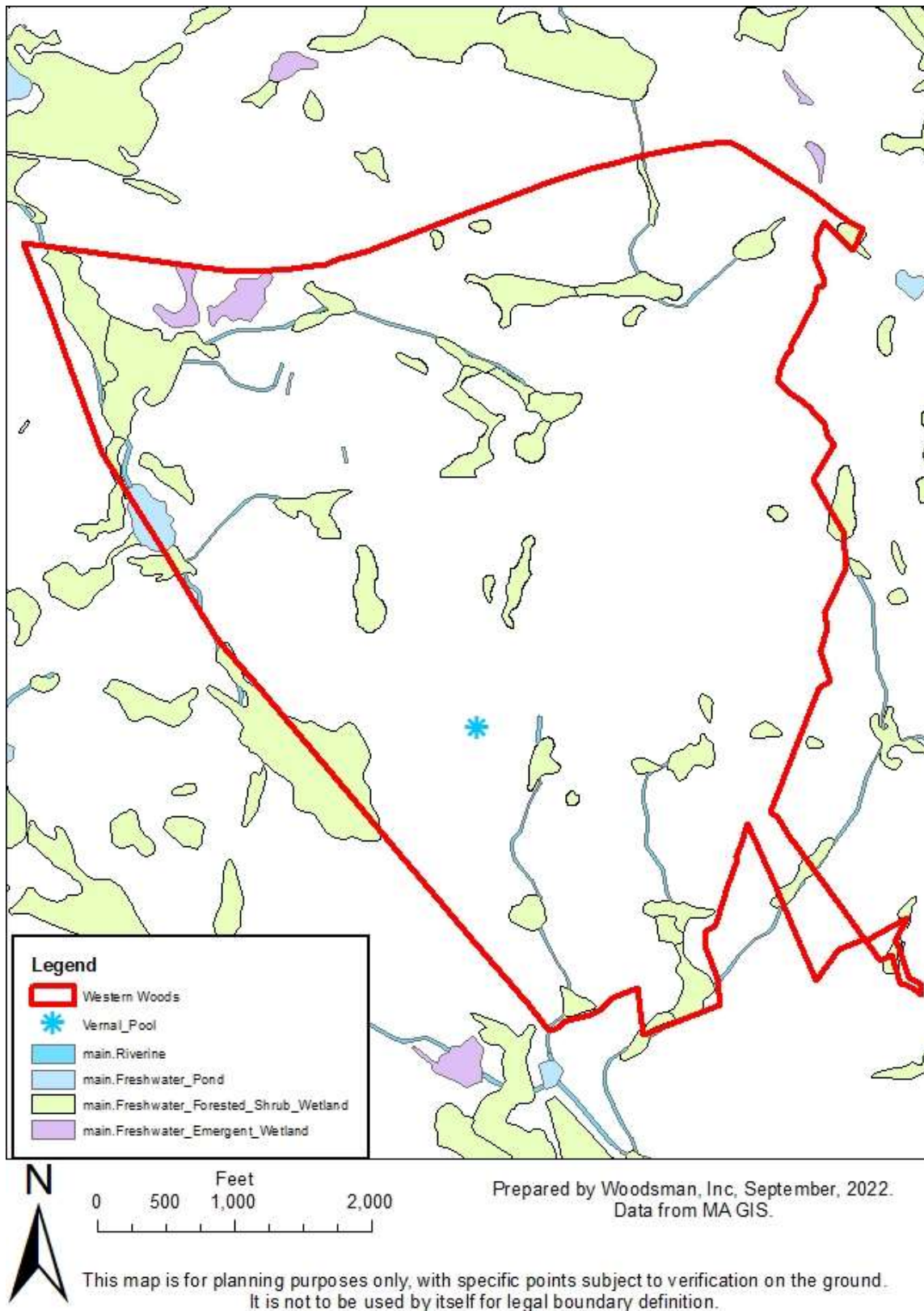
Map 3. Western Woods Topographical Map



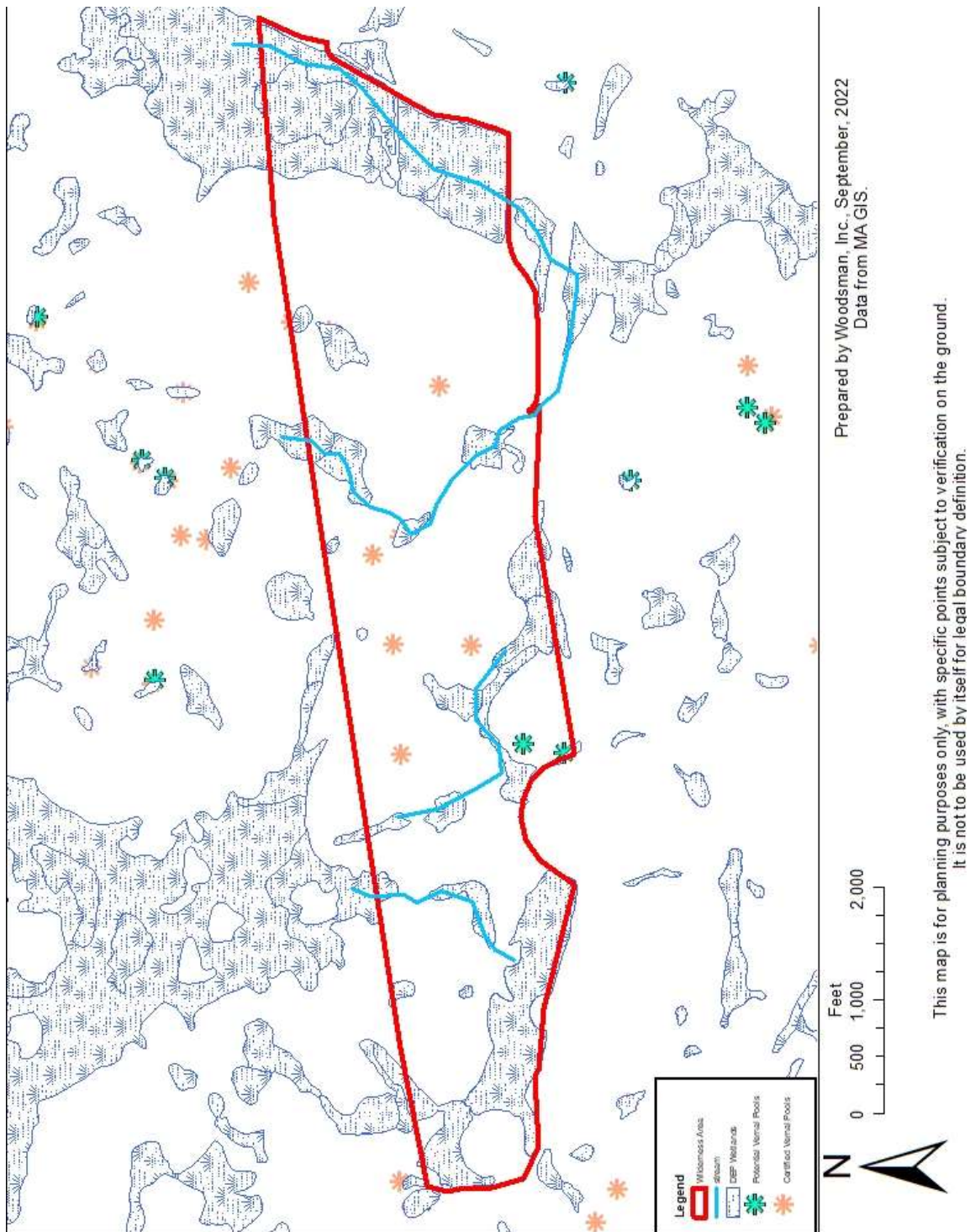
Map 4. Wilderness Area Topographical Map



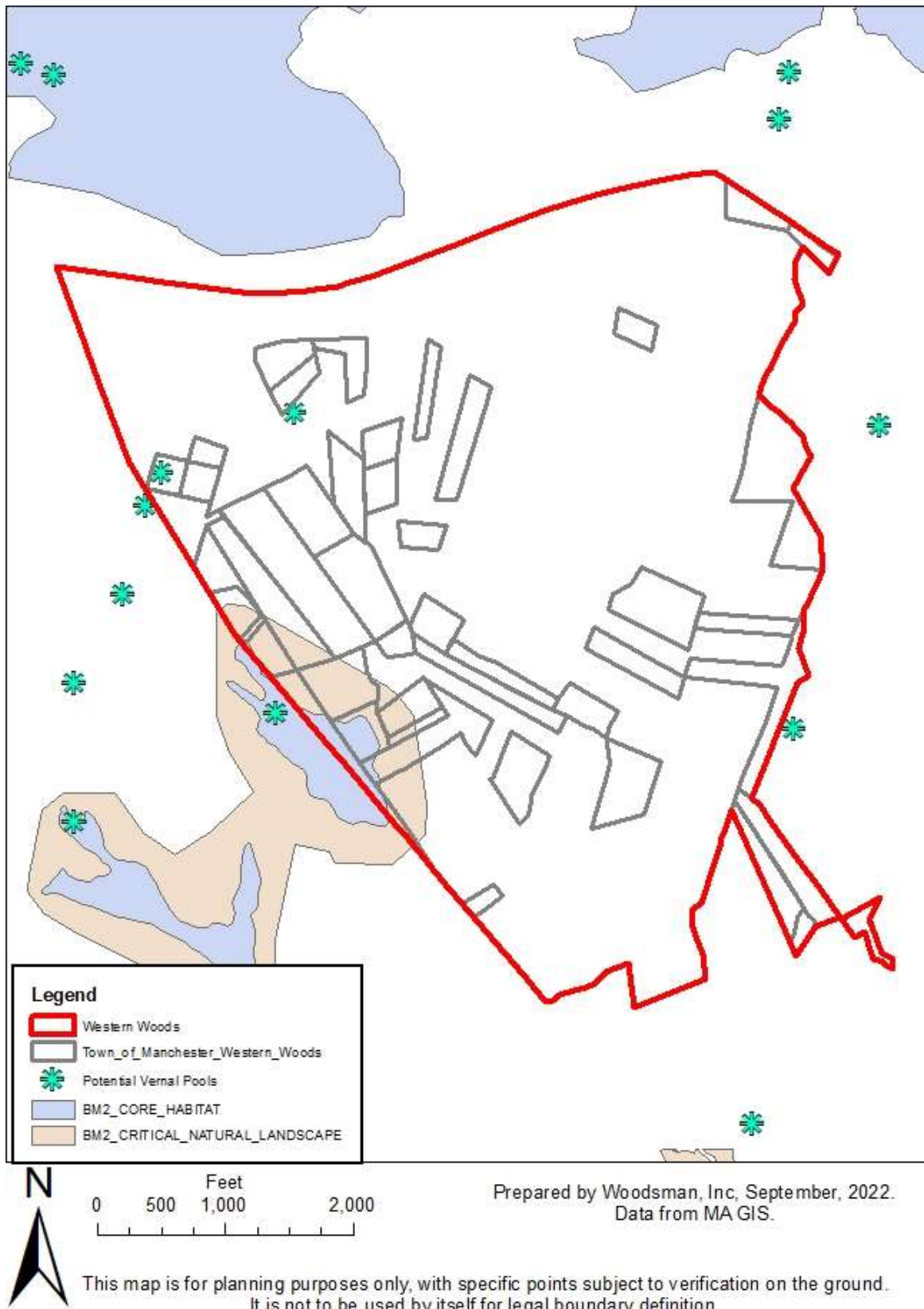
Map 5. Western Woods Streams and Wetlands



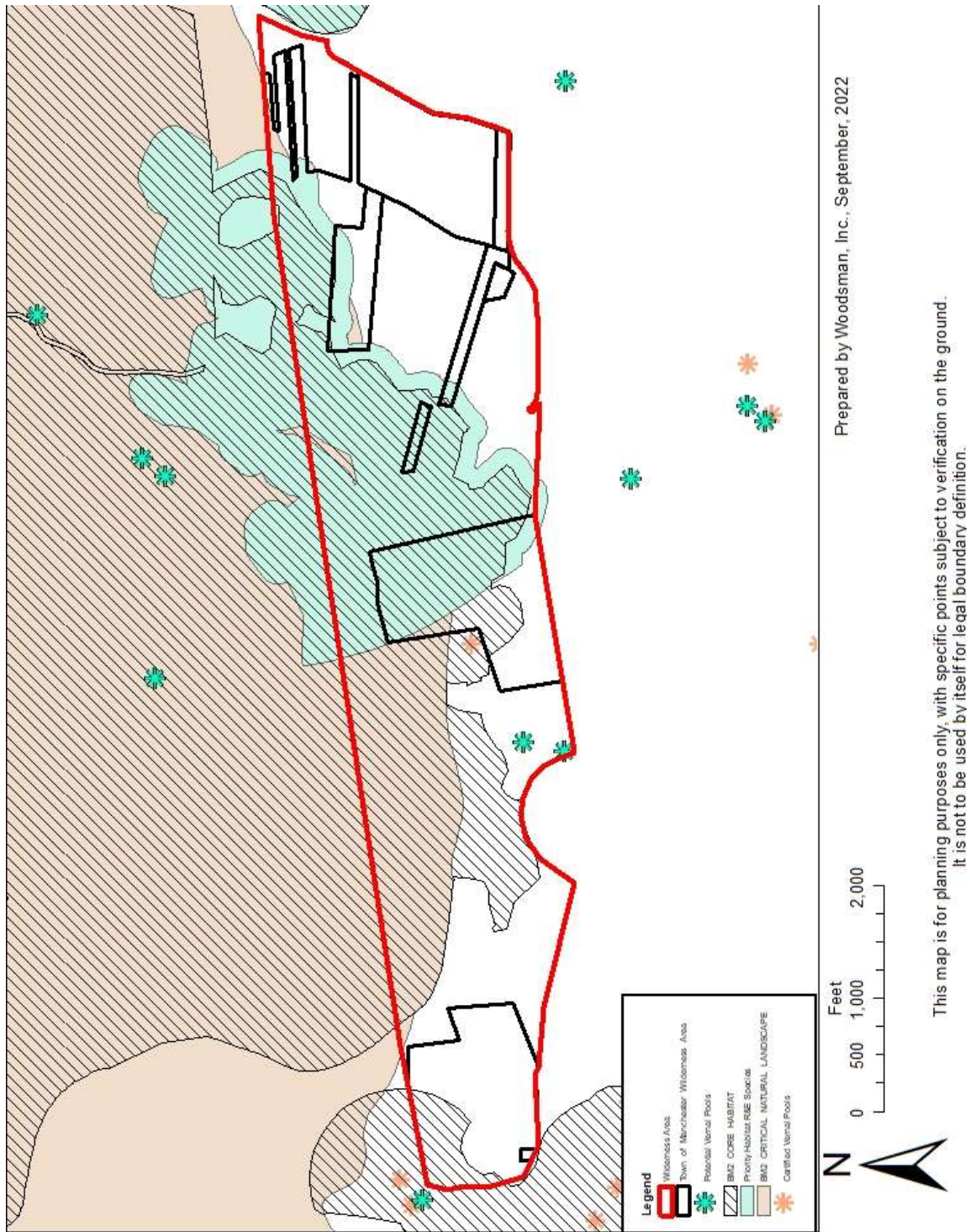
Map 6, Wilderness Area Streams and Wetlands



Map 7. Western Woods Biodiversity Map



Map 8. Wilderness Area Biodiversity Map



Map 9. Western Woods Soils Map
From USDA Web Soil Survey



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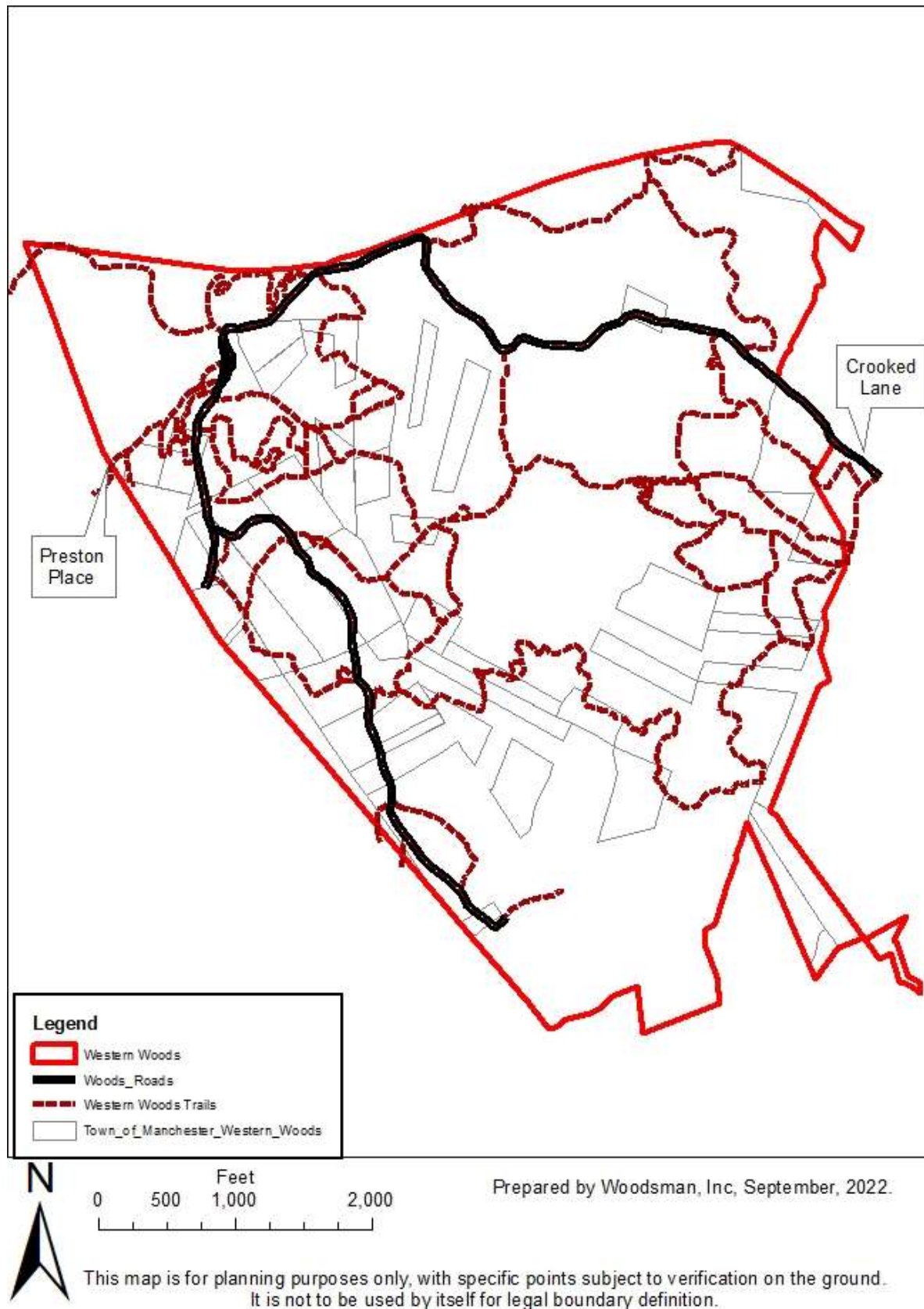
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Water	1.6	0.3%
12A	Maybid silt loam, 0 to 3 percent slopes	7.1	1.3%
43A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	0.8	0.1%
51A	Swansea muck, 0 to 1 percent slopes	8.0	1.4%
52A	Freetown muck, 0 to 1 percent slopes	40.4	7.3%
53A	Freetown muck, ponded, 0 to 1 percent slopes	3.8	0.7%
102C	Chatfield-Hollis-Rock outcrop complex, 0 to 15 percent slopes	62.6	11.3%
102E	Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes	332.4	59.8%
105D	Rock outcrop-Hollis complex, 3 to 25 percent slopes	39.2	7.1%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	9.5	1.7%
254C	Merrimac fine sandy loam, 8 to 15 percent slopes	9.3	1.7%
316C	Scituate fine sandy loam, 8 to 15 percent slopes, very stony	11.9	2.1%
600	Pits, gravel	22.0	4.0%
651	Udorthents, smoothed	6.9	1.2%
Totals for Area of Interest		555.6	100.0%

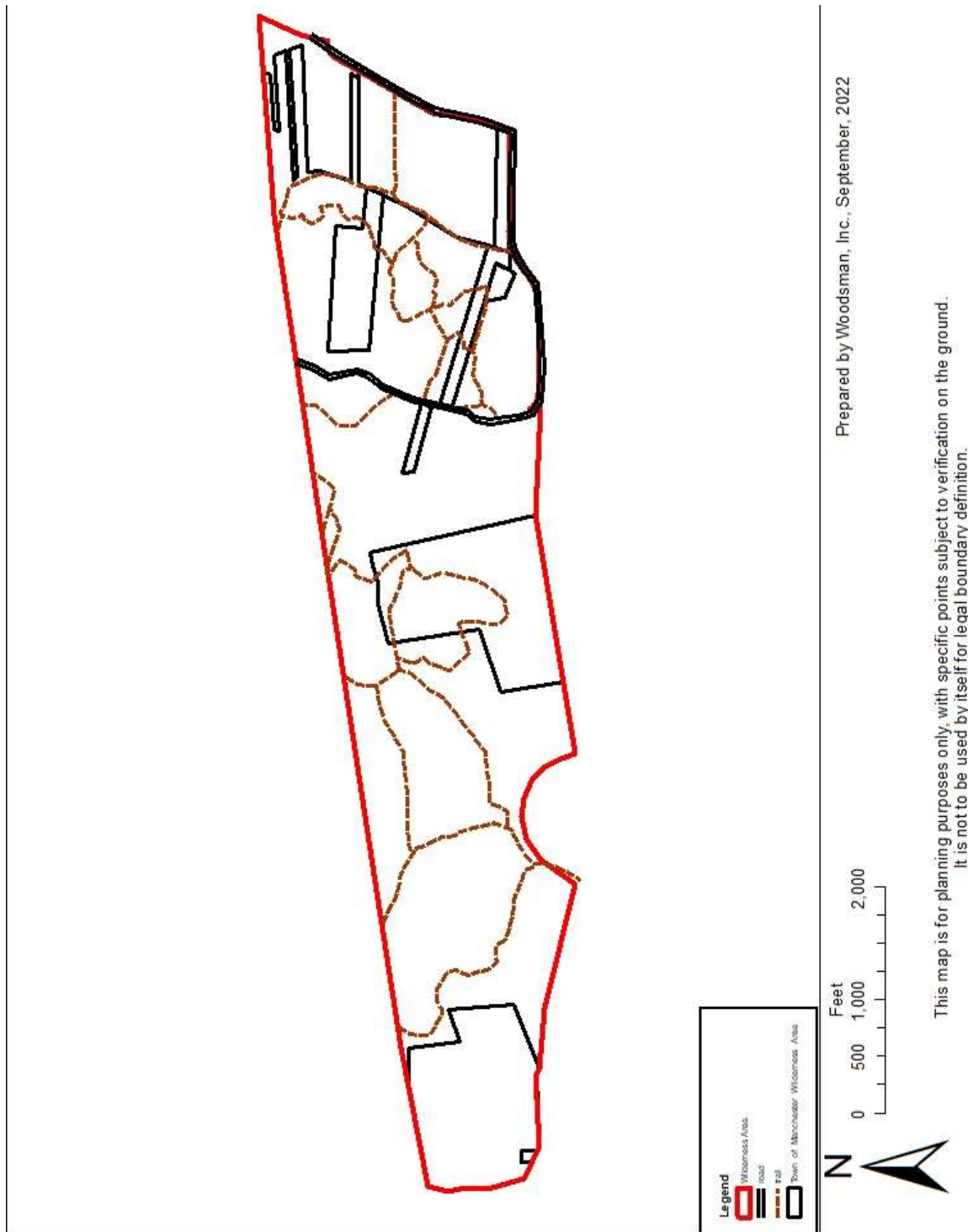
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Map Unit Legend

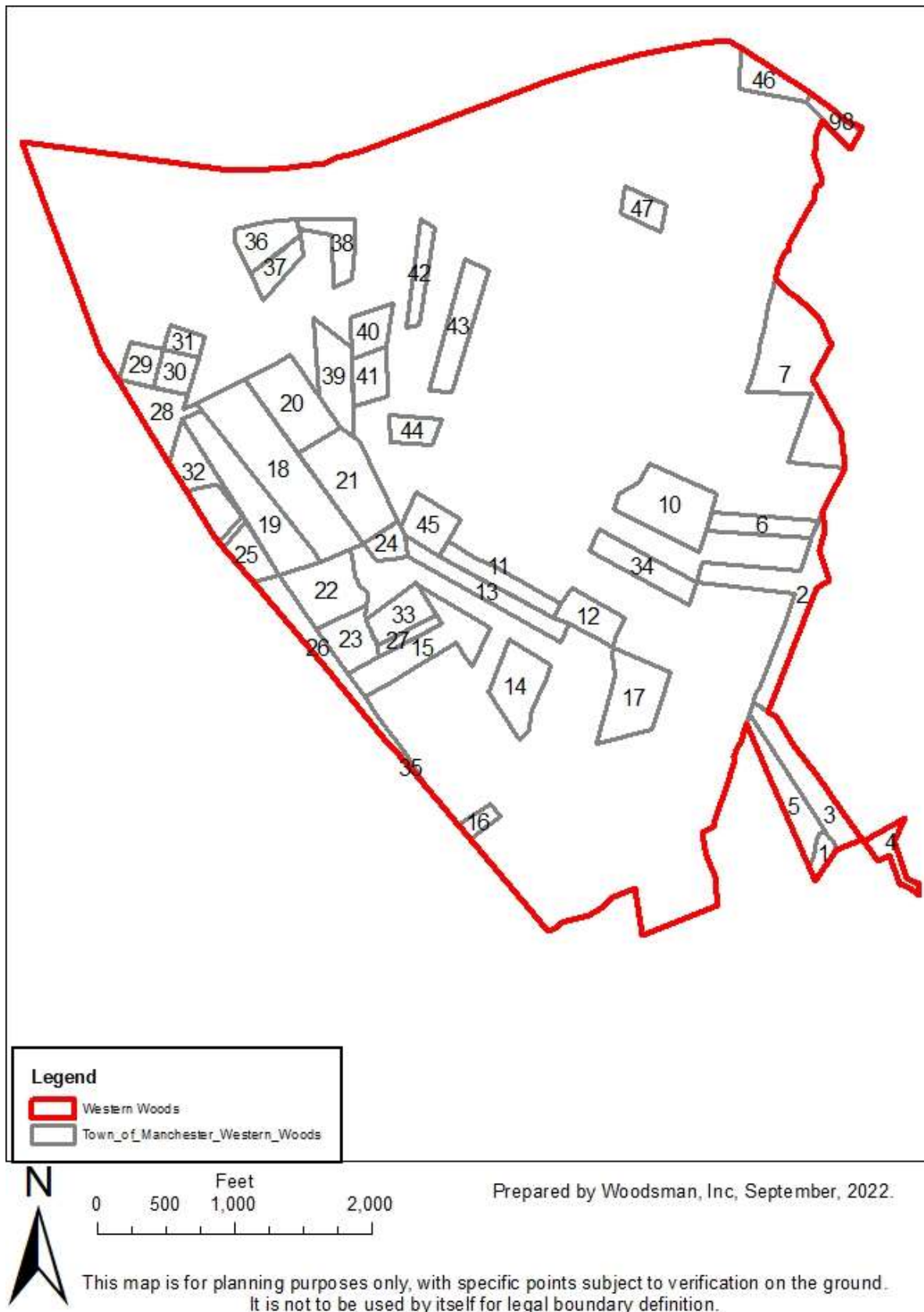
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Water	1.6	0.4%
32A	Wareham loamy sand, 0 to 3 percent slopes	2.5	0.6%
43A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	0.0	0.0%
51A	Swansea muck, 0 to 1 percent slopes	46.4	11.7%
52A	Freetown muck, 0 to 1 percent slopes	78.2	19.7%
73A	Whitman fine sandy loam, 0 to 3 percent slopes, extremely stony	1.5	0.4%
102C	Chatfield-Hollis-Rock outcrop complex, 0 to 15 percent slopes	0.0	0.0%
102E	Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes	214.5	54.1%
105D	Rock outcrop-Hollis complex, 3 to 25 percent slopes	38.0	9.6%
316B	Scituate fine sandy loam, 3 to 8 percent slopes, very stony	0.1	0.0%
422D	Canton fine sandy loam, 15 to 35 percent slopes, extremely stony	3.7	0.9%
651	Udorthents, smoothed	1.8	0.4%
652	Udorthents, refuse substratum	8.1	2.0%
Totals for Area of Interest		396.4	100.0%



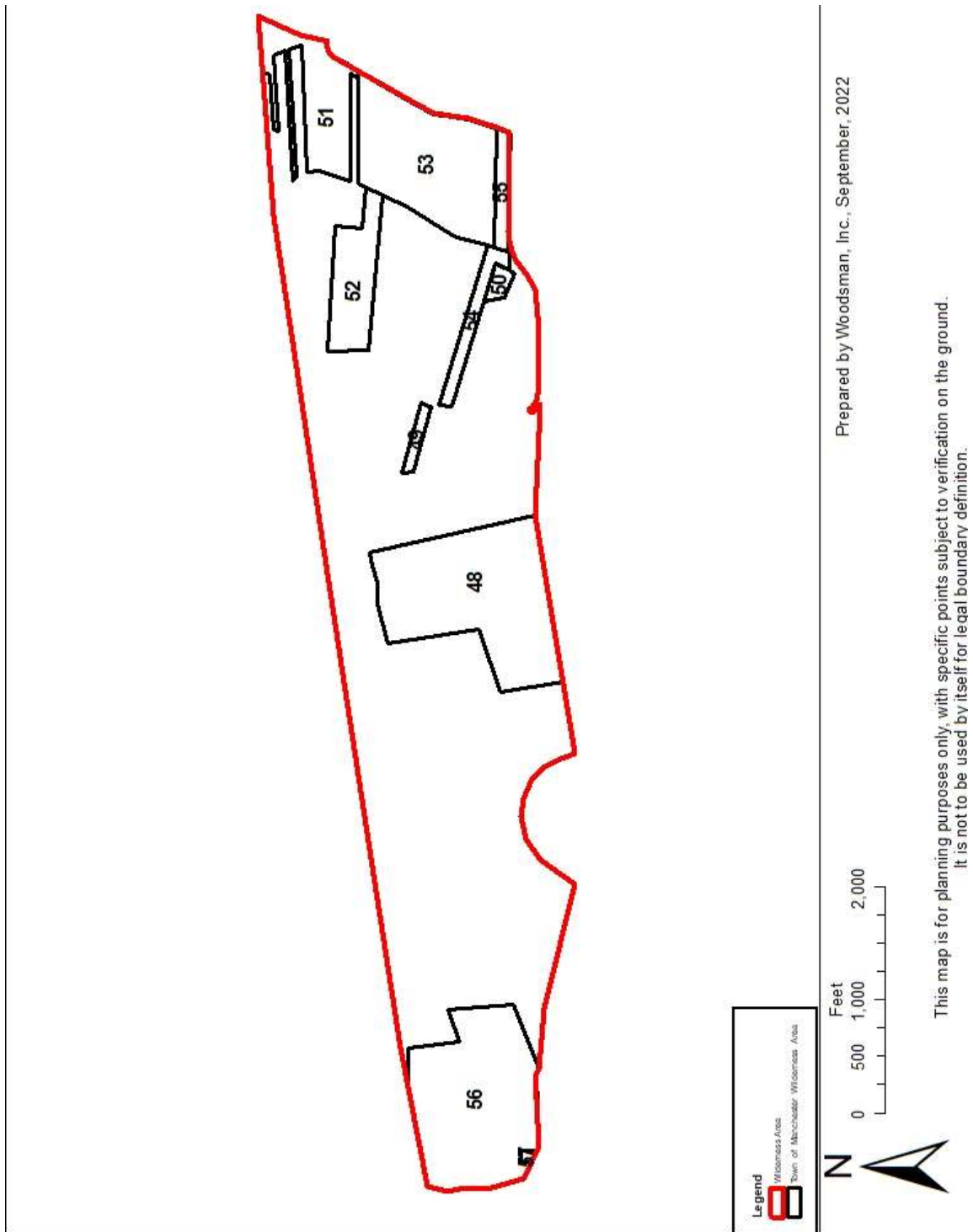
Map 12. Wilderness Area Trails Map



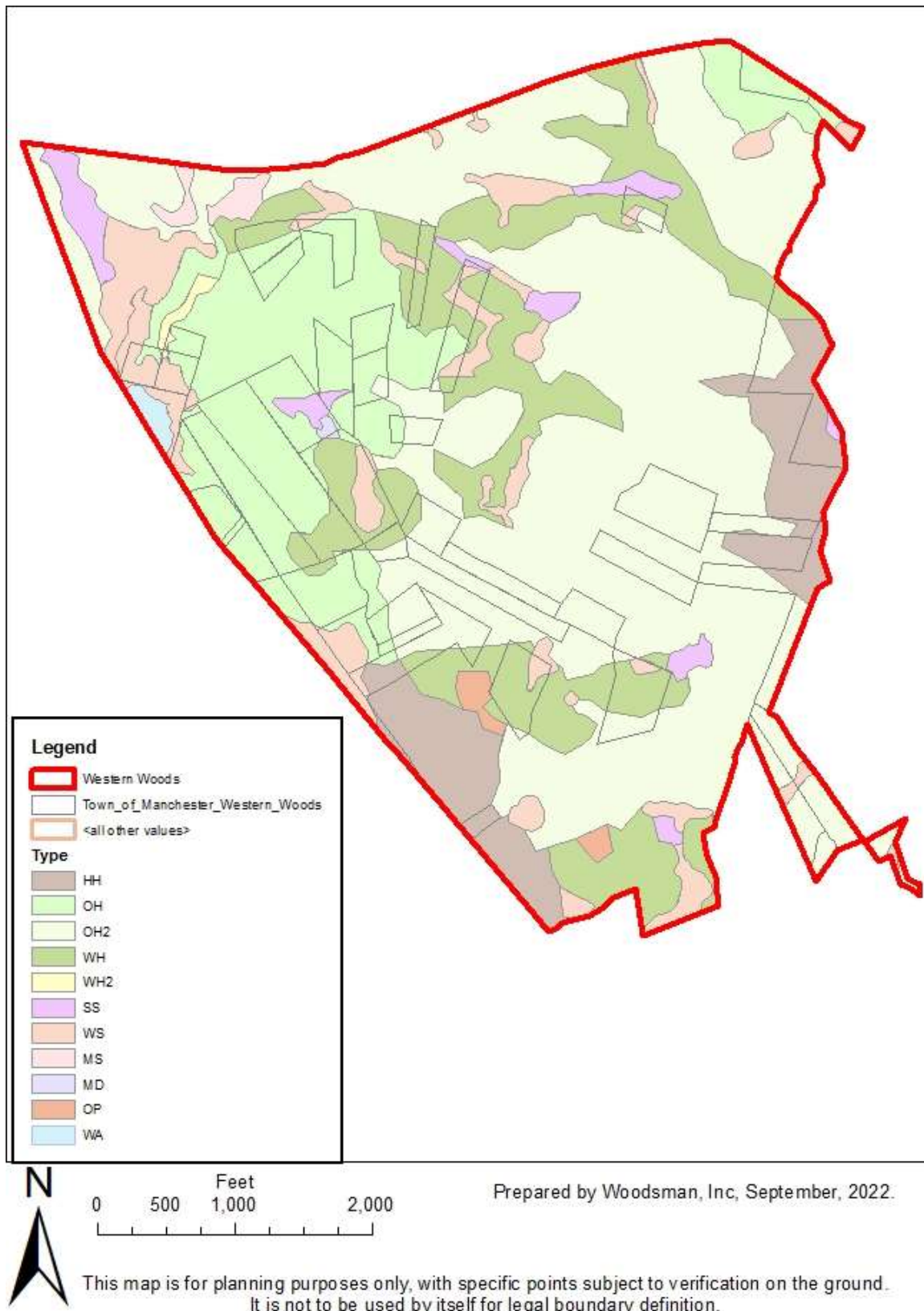
Map 13. Western Woods Town Parcels Map



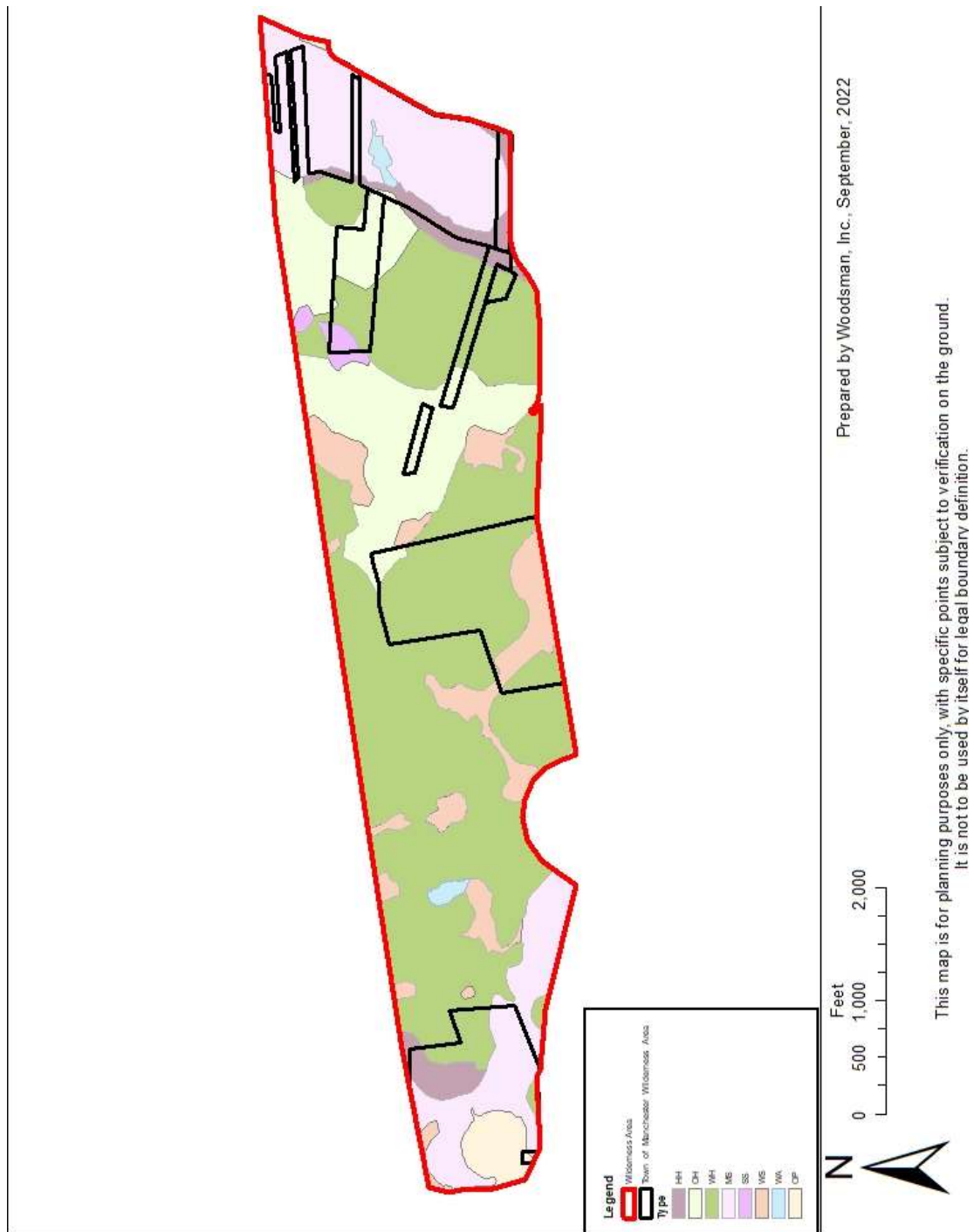
Map 14. Wilderness Area Town Parcels Map



Map 15. Western Woods Forest Type Map



Map 16. Wilderness Area Forest Type Map



STAND DESCRIPTIONS

Western Woods

Bird Habitat Stand Summary

Summary of the Forest Stands on your property

Stand	Acres	Forest/Habitat Type	Important Observations regarding Bird Habitat, Climate Change, Carbon Or Unique Features and Attributes
1	55.47	Oak - hardwoods	Characterized by a partial overstory (40% crown closure), a dense mid-story dominated by hardwood species and an open understory. Soils are shallow, rocky and have low productivity. Adequate amounts of snags, coarse woody debris and fine woody debris are present. Invasive plants are not an issue.
2	50.97	Oak-hardwoods	A mature oak-pine-hemlock overstory with 70 to 100% closure, a partial mid-story covering about 30 to 50% of the area, and an open understory. Soils are rocky but somewhat more productive. Adequate amounts of snags, coarse woody debris and fine woody debris are present. Invasive plants are present in small numbers along wetland edges.
3	20.64	White Pine-hardwoods	A mature pine-oak overstory with 67 to 100% closure, a partial mid-story covering about 30 to 60% of the area, and an open understory. Soils are rocky but somewhat more productive. Adequate amounts of snags, coarse woody debris and fine woody debris are present. Invasive plants are not an issue.
4	0.59	White Pine-hardwoods	Young, low density stand on disturbed ground. Areas of the understory are rock or mineral soil with little duff layer. There are no snags or woody debris. Invasive plants were not observed.
5	12.58	Hemlock - hardwoods	A mature hemlock-oak overstory with 75 to 100% closure, a variable mid-story covering about 10 to 80% of the area, and an open understory. Soils are rocky but somewhat more productive. Adequate amounts of snags, coarse woody debris and fine woody debris are present. Invasive plants are not an issue.
6	13.45	Red Maple (Wooded swamp)	Red maple-swamp hardwoods stands on muck soils. Low density overstory with an understory of wetland shrubs. Snags are numerous. Invasive plants species in low numbers were observed along wetland edges, particularly in the northwest part of the property.
7	2.23	Shrub swamp	Areas dominated by wetland shrubs on muck soils with no tree overstory.

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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8	0.43	Deep marsh	Deep marsh areas on muck soils dominated by emergent herbaceous vegetation with occasional trees and snags.
4	1.77	Open water	Open water adjacent to wetland areas and upland forest.

OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	1	OH	55.47	6	93	2.6 MBF	RO 47
						3.6 cd.	WP 55

This is an oak-hardwood type (labeled as OH2 on the Forest Stand map). It covers a broad area in the central and eastern parts of the Western Woods and is present on town parcels 1-7, 10-15, 17-18, 27, 33-34, 41-45 and 47. It occupies mid-slopes and ridgetops and is on the Chatfield-Hollis-Rock outcrop complex soils, mostly on the Hollis and rock outcrop components of that complex, with the rock outcrops being most evident in the higher elevations.

The stands in this type are characterized as having an open overstory of mature white pine, red oak or hemlock over a dense midstory of beech, red oak and pine. Overstory heights range from 50 to 80 feet with the shorter heights in the higher elevations. Overstory canopy closure averages about 40% while the mid story ranges from 50 to 100%. There is a light understory of pine and beech seedlings, saplings and sprouts, highbush blueberry, viburnum and pepperbush. The type includes many areas of rock outcrops and exposed ledges. Average annual growth in diameter and height is low. The general stem quality is above average.

Northern red oak is the most common tree species present, accounting for 28% of the stand's basal area, followed by eastern hemlock (18%), eastern white pine (14%) and black birch (14%). Other species present include beech, white oak, black oak, red maple, sassafras and paper birch. Beech is abundant in the mid-story and understory but is generally too small to have been picked up in the cruise. Hemlock, red oak and white pine account for 75% of the stand's timber volume. Most of the overstory trees are in the 12 to 18 inch diameter range.

There are on average 10 snags per acre and 1.5 cords per acre of coarse woody debris. There were on average two piles of fine woody debris per plot (20 per acre). Leaf litter is adequate and there were no invasive plants observed. The open understory is unfavorable for birds such as Canada warbler, ruffed grouse, veery and the eastern towhee, which use thick understories for nesting and cover. Increasing understory growth would require creating openings in the mid story and overstory, which is not recommended for this stand.

The desired future condition is to let the stand develop naturally. Some overstory trees will die over time and may be replaced by trees currently in the mid-story, but, barring any destructive event this stand should retain its current character for a while. Cutting for forest products or habitat enhancement is not recommended because of the erodible soils and the site's low productivity. Natural processes should provide for replenishment of snags and coarse woody debris. This stand is susceptible to damage from the beech bark disease, the beech leaf disease, the spongy moth, should it return to the area, drought and fire and should be monitored regularly for damage.

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: Town of Manchester-by-the-Sea

Towns: Manchester by-the-Sea

Desired Stand Conditions for Bird Habitat

Condition	Action	Birds that may benefit
Open overstory, dense mid-story and open understory.	None	Black and white warbler, northern flicker, eastern wood peewee
Adequate snags and coarse woody debris	None	Northern flicker

OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	2	OH	50.97	7	144	5.6 MBF	RO 70
						7.3 cd.	WP75

This is an oak-hardwoods type (OH on Forest Stand map). It is found in the northwestern part of the Western Woods (town parcels 15, 18-23, 25-33 and 36-44) and in the northeast corner (town parcels 8, 9 and 46). It mostly occupies lower elevations. The soils are the Chatfield-Hollis-Rock outcrop complex, mostly on the Chatfield component of the complex, which is a deeper, more productive soil. Steep slopes and rock outcrops do occur within this area, particularly in parcels 8 and 9.

The type is characterized as having a dense to closed overstory (70 to 100% crown closure) of red oak, beech, and hemlock over a mostly hardwood mid-story that occupies 30 to 50% of the area. There is an open understory with occasional pine or hardwood seedlings and saplings, and ferns are abundant in places.

Red oak is the most common species, accounting for 39% of the stand's basal area, with beech (25%), hemlock (14%) and red maple (8%) being the most common associates. The stem quality is good, with 57% of the trees rated as acceptable growing stock. Red oak and hemlock account for 70% of the stand's timber volume. Timber quality is good, particularly for the red oak, with overstory oaks mostly in the 15 to 20 inch diameter range.

There is an average of 10 snags per acre. Coarse woody debris averages over 2 cords per acre, which is very good. There are over 30 piles of fine woody debris per acre. The leaf litter density is good and invasive plants were observed on only one of five plots, along a wetland edge.

This type would be a good candidate for the creation of early successional habitat through small patch clearcuts. The portions on parcels 18 to 21 and 37-41 are on relatively flat ground and are somewhat accessible from the main woods road. Otherwise the desired future condition is to maintain the current stand structure, allowing mid story trees to replace overstory trees that die. This stand is susceptible to damage from the beech bark disease, the beech leaf disease, the spongy moth, should it return to the area, the hemlock wooly adelgid and fire and should be monitored regularly for damage.

Desired Stand Conditions for Bird Habitat

Condition	Action	Birds that may benefit
Lack of understory vegetation	Create early successional habitat through 0.5 to 2.5-acre patch cuts	Canada warbler, ruffed grouse, veery and the eastern towhee, black throated blue warbler, chestnut sided warbler

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Owner: Town of Manchester-by-the-Sea

Towns: Manchester-by-the-Sea

Adequate snags and coarse woody debris	Consider adding slash piles near wetlands	Northern flicker, Canada warbler, ruffed grouse, veery and the eastern towhee
Invasive plants present along wetlands	Invasive plant removal and control	Black and white warbler, Canada warbler
Part of a large track of forest (>250 acres)	Maintain forest cover and health. Limit roads and access.	Black throated blue warbler, black throated green warbler

OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	3	WH	20.64	11	162	14.5 MBF	RO 70
						3.9 cd.	WP 75

This is a white pine – hardwoods type (WH on the Forest Stand map). It is located mostly on lower slopes and areas of level terrain (town parcels 10, 17-18, 20-22, 24, 39, 45-46, 48 and 50). The soils are the Chatfield-Hollis-Rock outcrop complex, mostly on the Chatfield component of the complex, which is a deeper, more productive soil. Rock outcrops and steep slopes do occur within this area.

This type has a good quality overstory of large pines, red oaks and hemlocks, with canopy heights of 70 to 90 feet and crown closure ranging from 67 to 100%. There is a midstory of beech, oak, pine and hemlock that covers 30 to 60% of the area. The understory is open.

White pine (27%), hemlock (25%) and red oak (23%) account for 75% of the stand's basal area. These species make up most of the overstory and are of good timber quality, particularly the pines and oaks. Their diameters are mostly in the 15 to 25 inch range. White pine diameters of up to 29 inches were recorded. Beech and black oak are also occasionally found in the overstory. Red maple, beech, black birch, black oak, white oak and yellow birch mostly occupy the mid-story area,

There are over 10 snags per acre and over 2 cords per acre of coarse woody debris. There are abundant piles of fine woody debris. Hardwood leaf litter is lacking under areas of heavy pine overstory and in areas of rock outcrops, otherwise it is adequate. Invasive plants were not observed in this stand.

This type would be a good candidate for the creation of early successional habitat through small patch clearcuts. The small portions of this type on parcels 18 and 19 would be candidates for this treatment. Much of the balance of this type is on flat ground and is somewhat accessible from the main woods road. Otherwise the desired future condition is to maintain the current stand structure, allowing mid story trees to replace overstory trees that die. This stand is susceptible to damage from the beech bark disease, the beech leaf disease, white pine needle disease, the spongy moth, the hemlock wooly adelgid and fire and should be monitored regularly for damage.

Desired Stand Conditions for Bird Habitat

Condition	Action	Birds that may benefit
Lack of understory vegetation	Create early successional habitat through 0.5 to 1-acre patch cuts	Canada warbler, ruffed grouse, veery and the eastern towhee

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Owner: Town of Manchester-by-the-Sea

Towns: Manchester-by-the-Sea

Adequate snags and coarse woody debris	Consider adding slash piles near wetlands	Northern flicker, Canada warbler, ruffed grouse, veery and the eastern towhee
Part of a large track of forest (>250 acres)	Maintain forest cover and health. Limit roads and access.	Black throated blue warbler, black throated green warbler

OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	4	WH2	0.59	-	-	-	-

This is a partially open stand of white pine and hardwoods (WH2 on the Forest Stand map) occupying a disturbed area on town parcels 29, 30 and 31 in the northwest part of the Western Woods. The area was mostly likely mined for gravel and is now on the course of a dirt bike trail. A partial canopy, just 25 feet tall, covers only about 35% of the area. There is an understory of mostly sweet fern, with some hardwood seedlings, that covers 20% of the area. The balance of the area is mineral soil or exposed ledge.

The larger trees are mostly poorly formed white pine interspersed with some oaks and maples. There are no snags and very little coarse or fine woody debris. Leaf litter is lacking over most of the area. No invasive plants were observed in the stand.

The desired future condition is to let this stand develop naturally. It will take many years for the soils to be built back up through leaf and needle fall. Some areas will remain disturbed through bike use unless that activity is controlled. The larger pines will probably be of poor form due to white pine weevil damage and the open conditions, but they will provide some shelter for younger trees developing under them.

Desired Stand Conditions for Bird Habitat

Condition	Action	Birds that may benefit
Young forest with open canopy	Control dirt bike access	Woodcock, chestnut-sided warbler

OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	5	HH	12.58	6.5	155	7.6 MBF	RO70
						4.0 cords	

This is a hemlock-hardwoods stand (HH on the Forest STAND Map) located in two areas, one along the eastern boundary and another along the southwestern boundary, on town parcels 2, 6, 7, 15, 16, 26 and 35. It occupies hilltops, slopes and the level areas between hills. The soils are the Chatfield-Hollis-Rock outcrop complex. Rock outcrops and steep slopes do occur within this area.

Hemlock accounts for 35% of the stand's basal area, red oak 23%, and red maple and beech 13% each. Other species present include black birch, black cherry and white oak. The stem quality is fair to good, with 61% rated as acceptable growing stock. The overstory hemlock, red oak and black birch have diameters in the 12 to 19 inch range. Hemlock (61%) and red oak (27%) account for 88% of the stand's timber volume.

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The canopy height is about 80 feet and the crown closure varies from 75 to 100%. The mid-story is irregular, ranging from 10 to 80%, with the denser areas on the higher elevations and ridgetops and contains hemlock, beech, white pine, red oak and a mixture of other hardwoods. The understory cover ranges from 0 to 15% and contains ferns, sweet fern, highbush blueberry and green briar. There are almost 10 snags per acre and about 2 cords of coarse woody debris per acre. There are abundant piles of fine woody debris. Leaf litter is adequate except under dense areas of pure hemlock.

The desired future condition is to maintain the current stand structure, allowing mid story trees to replace overstory trees that die. The portions of this stand in parcel 7 are accessible from Crooked Lane, so it may be possible to do some single tree selection on the lower slopes in that area to try to establish a fuller understory. This stand is susceptible to damage from the beech bark disease, the beech leaf disease, the spongy moth, should it return to the area, and the hemlock wooly adelgid and should be monitored regularly for damage.

Desired Stand Conditions for Bird Habitat

Condition	Action	Birds that may benefit
Open understory	Single tree selection	Canada warbler, ruffed grouse, veery and the eastern towhee
softwood inclusions	Maintain individuals and groups of softwood trees	Black-throated green warbler
Part of a large track of forest (>250 acres)	Maintain forest cover and health. Limit roads and access.	Black throated blue warbler, black throated green warbler

OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	6	RM	13.45	6	40	-	RM55

These are wooded swamps growing on muck soils. They contain a mixture of red maple and swamp hardwoods. They are generally in isolated, inaccessible areas. Some of these areas on the western side of the Western Woods have been flooded by beaver, resulting in some tree mortality. This type is widespread, and is present on town parcels 3-5, 8, 9, 14, 15, 17, 21-23, 26, 28-30, 32, 36, 38, 42, 43 and 47.

The stems are generally poor quality and the soils are unproductive and not suited to management. These areas are important for the protection of water quality and flood control. They are also valuable wildlife habitat.

The canopy is low, under 50 feet, and generally open. There are areas of thick shrub growth. There are numerous snags. Invasive plants were observed along the wetland edges in the northwestern part of the Western Woods, including phragmites, glossy buckthorn, oriental bittersweet, multiflora rose and bush honeysuckle.

These stands should be maintained in their present condition. Removal and control of invasive plants is recommended. Beaver flooding may change some areas to open marsh.

Desired Stand Conditions for Bird Habitat

Condition	Action	Birds that may benefit
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Wooded wetland	none	Black and white warbler, Canada warbler, veery
Invasive plants present	removal	Black and white warbler, Canada warbler, veery

OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	7	SS	2.23	-	-	-	-

Shrub swamps are a type of wetland often found in transition zones between emergent marshes and wooded swamps on seasonally or temporarily flooded soils. They are found in isolated patches on town parcels 7, 20, 39, 43 and 47.

Shrub height is up to 15 feet, with a variable density, up to 100% in many places. The dominant shrubs include alders, meadowsweet, buttonbush, swamp azalea, silky dogwood, winterberry and arrowwood. There are occasional red maples and other swamp hardwoods present, but of small size.

These areas provide good breeding areas and cover for amphibians, and many species of migratory birds use the dense thickets as nesting habitat. In the winter, when the swamps are frozen, browsers, such as the New England cottontail, have easy access to the shrubs under the protection of the dense vegetation.

The desired future condition is to avoid disturbance to allow the natural development of these areas. The upland areas adjacent to the wetlands are ideal areas for the creation of snags and the addition of coarse woody debris. The areas should be monitored for the presence of invasive plants,

Desired Stand Conditions for Bird Habitat

Condition	Action	Birds that may benefit
shrub wetland	none	Black and white warbler, Canada warbler, veery

OBJ-	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	8	MD	0.43	-	-	-	-

This is an isolated wetland on town parcels 20 and 21, located adjacent to a shrub swamp.

Deep emergent marshes are generally flooded with 1 to 3 feet of water, though water depth may change seasonally. Vegetation is herbaceous or graminoid, with aquatic vegetation in flooded areas,

This area should be maintained in its current condition.

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Owner: Town of Manchester-by-the-Sea

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Desired Stand Conditions for Bird Habitat

Condition	Action	Birds that may benefit
Deep marsh	none	Canada warbler, migrating waterfowl, reptiles and amphibians.
Phragmites present	removal	Canada warbler, migrating waterfowl, reptiles and amphibians.

OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	9	WA	1.77	-	-	-	-

This is an area of open water on parcel 28 along the western boundary of the Western Woods. The open water extends on to the adjacent property to the west. The area should be maintained undisturbed with an uncut buffer maintained between it and any harvesting.

Desired Stand Conditions for Bird Habitat

Condition	Action	Birds that may benefit
Open water	none	migrating waterfowl

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Towns: Manchester by-the-Sea

Wilderness Area

Bird Habitat Stand Summary

Summary of the Forest Stands on your property

Stand	Acres	Forest/Habitat Type	Important Observations regarding Bird Habitat, Climate Change, Carbon Or Unique Features and Attributes
1	42.22	White pine - hardwoods	A mature pine-oak overstory with 40 to 85% closure, a partial mid-story covering about 30 to 75% of the area, and an open understory. Soils are rocky but productive. Adequate amounts of snags, coarse woody debris and fine woody debris are present. Invasive plants are not an issue.
2	7.91	Oak-hardwoods	A mature oak-pine-hemlock overstory with 65% closure, a partial mid-story covering about 20 to 65% of the area, and an open understory. Soils are rocky but productive. Adequate amounts of snags, coarse woody debris and fine woody debris are present. Invasive plants are not an issue.
3	10.63	Hemlock-hardwoods	A mature hemlock-hardwoods overstory with 70 to 85% crown closure, a partial midstory covering 50% of the area, and an open understory. Soils are rocky but productive. Adequate amounts of snags, coarse woody debris and fine woody debris are present. Invasive plants are not an issue.
4	7.85	Wooded swamp (red maple – swamp hardwoods)	Red maple-swamp hardwoods and pine stand on muck soils. Low density overstory with an understory of wetland shrubs. Snags are numerous. Invasive plants were not observed.
5	1.16	Shrub swamp	Isolated areas dominated by wetland shrubs on muck soils with no tree overstory.
6	40.67	Shallow marsh	Periodically flooded areas with emergent vegetation. Snags are scattered along the edges. Stands of phragmites are present.
7	1.26	Open water	Small open water area within Cedar Swamp.
8	0.36	Open (parking area)	Large parking area off School Street.

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OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	1	WH	42.22	8	163.33	11.3MBF	RO70
						3.3 cords	

This is a white pine – hardwood stand (WH on Forest Stand Map) that occupies most of the central part of the Wilderness Area between the large wetlands. It occurs on hilltops, slopes and level areas. The soils are mostly the Chatfield-Hollis-Rock Outcrop complex, which is a relatively productive soil for red oak and white pine. The type is found on town parcels 48, 50, 51-54 and 56.

White pine accounts for 47% of the stand’s basal area, Hemlock 20% and red oak 14%. Associated species are black birch, black oak and beech. Stem quality is generally good, with 61% being rated as acceptable growing stock. White pine, red oak and black oak make up most of the overstory. Pine diameters run from 15 to 25 inches and the oaks are in the 12 to 18 inch range. White pine accounts for 80% of the stand’s timber volume and red oak another 13%.

The canopy height is 60 to 80 feet and crown closure varies from 40 to 85%. The midstory occupies 30 to 75% of the area and is composed of hemlock, pine and hardwood poles and saplings. There are areas of thick white pine regeneration, particularly on parcels 48 and 56. The understory covers only 5 to 15% of the area and is composed of highbush blueberry, with pine, hemlock and hardwood seedlings. Snags are adequate, with about 8 per acre. There is about 1 cord per acre of coarse woody debris and 20 piles of fine woody material per acre. No invasive plants were observed.

The desired future condition is to allow the stand to develop naturally. White pine is a long-lived species that is suited to the site. There are adequate tree stems in the midstory to replace overstory trees that die. There is a patchy to poorly developed understory. Overstory removals would be needed to improve this situation. Greater amounts of coarse woody debris are needed, particularly adjacent to streams and wetlands. It is possible to fell selected overstory trees to allow areas of understory to develop and the stems could be used to build wildlife piles. The white pine needlecast disease, hemlock wooly adelgid, beech leaf disease, beech bark disease and the spongy moth are potential threats to the stand and the areas should be regularly monitored for signs of damage.

Desired Stand Conditions for Bird Habitat

Condition	Action	Birds that may benefit
Mature mixed forest with well developed midstory and open understory	Limited single tree selection	Wood thrush, black and white warbler, Canada warbler, white throated sparrow
Inadequate coarse woody debris	Create brush piles	Black and white warbler, Canada warbler, Veery
Part of a large track of forest (>250 acres)	Maintain forest cover and health. Limit roads and access.	Black throated blue warbler, black throated green warbler

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OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	2	OH	7.91	7	148	5.2 MBF- 6.0 cords	RO70

This is an oak-hardwoods stand (OH on the Forest Type Map) that occupies hilltops and slopes on the eastern half of the Wilderness Area. The soils are mostly the Chatfield-Hollis-Rock Outcrop complex, which is a relatively productive soil for red oak. There are areas of rock outcrops, particularly on the hill tops. This type is found on town parcels 48, 49, 52, 53, and 54.

The stand contains a broad mixture of species, with red oak and hemlock each accounting for 22% of the stand's basal area. Beech (16%), red maple (14%) and black birch and white pine (each 11%) are common associates. White and black oak were also observed in the stand. The average stem quality is good, with 59% of the trees rated as acceptable growing stock. Red oak and white pine make up most of the overstory, with occasional large hemlocks (most of the hemlock is in the midstory). The diameters of pine and oak overstory trees range from 12 to 24 inches. White pine, red oak and hemlock account for 94% of the stand's timber volume.

Canopy height ranges from 60 to 85 feet. Crown closure averages 65%. Midstory coverage varies from 25 to 65%, and is dominated by hemlock and beech saplings and poles, with some pines and black birch. There are areas of pine regeneration. The understory is mostly open but can range to 15%. It contains beech and hemlock seedlings, highbush blueberry and moosewood. There are about 10 snags per acre, with 2 cords of coarse woody debris per acre and 20 piles of fine woody material. The leaf litter is adequate. No invasive plants were observed.

The desired future condition is a healthy, mature oak-hardwoods stand that provides good midstory and closed canopy habitat. Some small openings could be created through single or group selection of overstory trees to try to encourage areas of understory vegetation. Downed wood could be left as coarse woody debris. The hemlock wooly adelgid is a pest that could alter the composition and visual character of this stand. Other potential threats include the beech leaf disease, the beech bark disease, the spongy moth, the pine needlecast disease and fire.

Desired Stand Conditions for Bird Habitat

Condition	Action	Birds that may benefit
Mature mixed forest with well developed midstory and open understory	Limited single tree selection	Wood thrush, black and white warbler, white throated sparrow
coarse woody debris	Create brush piles	Black and white warbler, Canada warbler, Veery
Part of a large track of forest (>250 acres)	Maintain forest cover and health. Limit roads and access.	Black throated blue warbler, black throated green warbler

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OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	3	HH	10.63	7	126.67	2.2 MBF	RO70
						5.4 cords	

This is a hemlock-hardwoods stand (HH on the Forest Stand Map), that is found in two distinct parts of the Wilderness Area. To the west, on parcel 56, it is along the eastern edge of a large wetland. To the east, on parcels 50, 51, 53, 54 and 55, it is along the western and southern edges of Cedar Swamp. It occupies level to gently sloping hillsides on mostly Chatfield-Hollis-Rock Outcrop Complex soils. There aren't any rock outcrops in this area. The soils along the southern part of Cedar Swamp are Wareham loamy sand.

Hemlock accounts for 42% of the stand's basal area. Beech, red maple and red oak are each 16% of the basal area. Paper birch yellow birch and black birch were also observed. The stem quality is good, with 79% being rated as acceptable growing stock. Hemlock, red maple and beech dominate the mostly closed overstory. There is a good midstory of hemlock, beech, red maple and birch. There is an open understory with areas of pepperbush and ferns. Overstory trees are in the 12 to 20 inch diameter range. Timber volume, mostly from the larger maples and hemlocks, is low.

The canopy is 70 to 80 feet tall, and the crown closure is 70 to 85%. The midstory occupies about 50% of the area and is composed mostly of tree saplings and poles. An understory is present on less than 5% of the area, though there are low shrubs along the edges of the wetlands. There are approximately 10 snags per acre and 1 cord per acre of coarse woody debris, and there are abundant piles of fine woody material. Stands of phragmites are present in the wetlands. No other invasive plants were observed.

The desired future condition is a healthy hemlock-hardwoods stand that provides protection for the adjacent marsh areas. The area will be allowed to develop naturally. The creation of snags along the marsh edge and the addition of coarse woody debris will benefit animals using or breeding in the marshes. The area is threatened by the hemlock wooly adelgid and the beech bark and leaf diseases, It should be monitored regularly for signs of damage.

Desired Stand Conditions for Bird Habitat

Condition	Action	Birds that may benefit
Mature hemlock-hardwoods stand along edges of wetlands	none	Black and white warbler, northern flicker, eastern wood peewee
Snags and coarse woody debris	Create snags and brush piles	Northern flicker, black and white warbler, veery

OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	4	RM	7.85	6	40	-	RM55

This is a large wooded swamp growing on Freetown Muck soils on town parcel 48. It contain a mixture of red maple, white pine and swamp hardwoods.

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Towns: Manchester by-the-Sea

The stems are generally poor quality and the soils are unproductive and not suited to management. These areas are important for the protection of water quality and flood control. They are also valuable wildlife habitat.

The canopy is low, under 50 feet, and generally open. There are areas of thick shrub growth. There are numerous snags.

This stand should be maintained in their present condition. Beaver flooding may change some areas to open marsh.

Desired Stand Conditions for Bird Habitat

Condition	Action	Birds that may benefit
Wooded wetland	none	Black and white warbler, Canada warbler, veery

OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	5	SS	1.16	-	-	-	-

This is located in the western part of parcel 52. There is another small area of shrub swamp to the north on Manchester-Essex Land Trust property. Both appear to be isolated from other wetlands.

Shrub height is up to 15 feet, with a variable density, up to 100% in many places. The dominant shrubs include alders, meadowsweet, buttonbush, swamp azalea, silky dogwood, winterberry and arrowwood. There are occasional red maples and other swamp hardwoods present, but of small size.

These areas provide good breeding areas and cover for amphibians, and many species of migratory birds use the dense thickets as nesting habitat. In the winter, when the swamps are frozen, browsers, such as the New England cottontail, have easy access to the shrubs under the protection of the dense vegetation.

The desired future condition is to avoid disturbance to allow the natural development of these areas. The upland areas adjacent to the wetlands are ideal areas for the creation of snags and the addition of coarse woody debris. The areas should be monitored for the presence of invasive plants,

Desired Stand Conditions for Bird Habitat

Condition	Action	Birds that may benefit
shrub wetland	none	Black and white warbler, Canada warbler, veery

OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	6	MS	40.67	-	-	-	-

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Owner: Town of Manchester-by-the-Sea

Towns: Manchester by-the-Sea

There are two large areas of shallow marsh (MS on the Forest Stand Map). One is along the eastern edge of the Wilderness Area (Cedar Swamp) on town parcels 51, 53 and 55, the other is along the western edge of the area on town parcels 56 and 57. A large part of this western marsh is categorized as wooded swamp on the DEP Wetlands layer from MA GIS, but changing water levels have killed the trees.

Shallow Emergent Marshes occur in broad, flat areas bordering low-energy rivers and streams (often in backwater sloughs), or along pond and lake margins. There is standing or running water during the growing season and throughout much of the year, with water depth averaging less than about 6 in. Shallow marshes commonly occur in abandoned beaver flowages. The substrate is typically a layer of well-decomposed organic muck overlying mineral material.

Short grasses, sedges, and rushes mixed with scattered forbs (broad-leaved herbaceous plants) dominate Shallow Emergent Marshes. Areas with more permanent open water often support floating-leaved plants like water-lilies and submerged plants like pondweeds

Shallow Emergent Marsh habitat supports many species of frogs and salamanders, especially leopard, pickerel, green, and bull frogs, and some vernal pool obligate species, such as wood frogs and spotted salamanders, may use areas of Shallow Emergent Marsh for egg-laying if they are fish free.

These areas will be allowed to develop naturally.

Desired Stand Conditions for Bird Habitat

Condition	Action	Birds that may benefit
Shallow marsh	none	migrating waterfowl, reptiles and amphibians.
Phragmites present	removal	migrating waterfowl, reptiles and amphibians.

OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	7	WA	1.26	-	-	-	-

This is a small area of open water (WA on Forest Stand Map) within Cedar Swamp on town parcel 53.

Desired Stand Conditions for Bird Habitat

Condition	Action	Birds that may benefit
Open water	none	migrating waterfowl

OBJ	STD NO	TYPE	AC	MSD OR SIZE-CLASS	BA/AC	VOL/AC	SITE INDEX
STEW	8	OP	0.36	-	-	-	-

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This is a parking area on School Street on the eastern edge of the Wilderness Area. The Manchester Essex Land Trust maintains a sign kiosk at this location. Old School Street, which begins at the parking area, provides hiking access to the area,

Desired Stand Conditions for Bird Habitat

Condition	Action	Birds that may benefit
Parking area and trail access	maintain	NA

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MANAGEMENT PRACTICES

to be done within next 10 years

The following are recommendations for management practices that would help meet the landowner's goals of promoting biodiversity, enhancing habitat for birds and animals, improving recreational access, maintaining privacy, preserving scenic beauty, protecting water quality and protecting unique and special cultural areas.

WESTERN WOODS

OBJ	STD NO.	TYPE	SILVICULTURAL PRESCRIPTION	AC	TO BE REMOVED		TIMING
					BA/AC	TOT VOL	
STEW	all	-	Recreational and forest management access	-	-	-	2023-2032

The Preston Place access needs to be improved with the installation of a culvert at the current gate location. All access locations should be blocked by gates or stones to discourage off-road vehicle entry. Space for additional vehicle parking should be considered at Crooked Lane and Preston Place.

OBJ	STD NO.	TYPE	SILVICULTURAL PRESCRIPTION	AC	TO BE REMOVED		TIMING
					BA/AC	TOT VOL	
STEW	all	-	Road and trail maintenance	-	-	-	2023-2032

Two or three main loop trails should be marked with paint or signs. Trail maps should be developed and made available to recreational users.

The woods road and trail systems should be surveyed for areas of existing or potential erosion. All culvert locations on the main woods road should be identified and evaluated. Those not sufficient for allowing increased flow expected from a changing climate should be upgraded and road beds should be armored at these locations. Water diversions to move water quickly off the road or trail surface should be installed.

OBJ	STD NO.	TYPE	SILVICULTURAL PRESCRIPTION	AC	TO BE REMOVED		TIMING
					BA/AC	TOT VOL	
STEW	2, 3	OH/WH	Early Successional Habitat Creation	7	135	40MBF, 40 cd	2025 - 2030

Create openings of ½ to 2.5 acre in size to create areas of early successional growth on town parcels 18, 19, 20, 22, 23 and 25. Retain some overstory trees singly or in small groups.

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OBJ	STD NO.	TYPE	SILVICULTURAL PRESCRIPTION	AC	TO BE REMOVED		TIMING
					BA/AC	TOT VOL	
STEW	5	HH	Single tree selection	8	5	-	2023-2032

Fell selected poor quality overstory trees singly or in small groups to create canopy openings to stimulate understory development. Leave felled trees for coarse woody debris and lop tops to develop brush piles.

OBJ	STD NO.	TYPE	SILVICULTURAL PRESCRIPTION	AC	TO BE REMOVED		TIMING
					BA/AC	TOT VOL	
STEW	2,6,8	OH, RM, MD	Brush Management (invasive plant control)	10	-	-	2023-2028

Remove and control invasive plants from wetland areas and wetland edges.

OBJ	STD NO.	TYPE	SILVICULTURAL PRESCRIPTION	AC	TO BE REMOVED		TIMING
					BA/AC	TOT VOL	
STEW	all		Boundary Maintenance	-	-	-	2023-2025

Critical boundaries should be researched, located and marked. Critical boundaries would be those bordering private residential land (parcels 3, 4, 7 and 32) and those along areas where forest management will occur (parcels 18, 22, 24, 25 & 26). Locations where trails pass into town land could also be marked. Marking would consist of blazing and painting trees along the boundary and would be enhanced by hanging signs identifying the town ownership.

. WILDERNESS AREA

OBJ	STD NO.	TYPE	SILVICULTURAL PRESCRIPTION	AC	TO BE REMOVED		TIMING
					BA/AC	TOT VOL	
STEW	all	-	Road and trail maintenance	-	-	-	2023-2032

The woods road and trail systems should be surveyed for areas of existing or potential erosion. All culvert locations on the main woods road should be identified and evaluated. Those not sufficient for allowing increased flow expected from a changing climate should be upgraded and road beds should be armored at these locations. Water diversions to move water quickly off the road or trail surface should be installed.

OBJ	STD NO.	TYPE	SILVICULTURAL PRESCRIPTION	AC	TO BE REMOVED		TIMING
					BA/AC	TOT VOL	
STEW	1,2	WH/OH	Single tree selection	5	5	-	2023-2032

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Fell selected poor quality overstory trees singly or in small groups to create canopy openings to stimulate understory development. Leave felled trees for coarse woody debris and lop tops to develop brush piles.

OBJ	STD NO.	TYPE	SILVICULTURAL PRESCRIPTION	AC	TO BE REMOVED		TIMING
					BA/AC	TOT VOL	
STEW	3	HH	Wildlife Structures	10	-	-	2023-2028

Create 3 snags per acre by girdling overstory trees on or near wetland edges, Create 6 brush piles within 300 feet of wetland edges.

OBJ	STD NO.	TYPE	SILVICULTURAL PRESCRIPTION	AC	TO BE REMOVED		TIMING
					BA/AC	TOT VOL	
STEW	6	MS	Brush Management (invasive plant control)	10	-	-	2023-2028

Remove and control phragmites within wetland areas.

OBJ	STD NO.	TYPE	SILVICULTURAL PRESCRIPTION	AC	TO BE REMOVED		TIMING
					BA/AC	TOT VOL	
STEW	all		Boundary Maintenance	-	-	-	2023-2025

The boundary of parcels 50 and 54 are along or near a cleared area on private land that is being used for the storage of organic materials. These boundaries should be found and clearly marked,

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Signature Page Please check each box that applies.

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

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

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

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

Signed under the pains of perjury:

Owner(s) _____ Date _____

Owner(s) _____ Date _____

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

Plan Preparer _____ Date _____

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

Approved, Service Forester _____ Date _____

Approved, Regional Supervisor _____ Date _____

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

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