WESTMORE TOWN FOREST

Forest Management Plan for the Westmore Town Forest located at 1121 Long Pond Road: November, 2025

Forest Management Plan prepared for the Westmore Selectboard

Jared Nunery
Orleans County Forester
VT Licensed Forester
148.0122274

Forest Management Plan Approval

This Forest Management Plan was prepared by Jared Nunery, Orleans County Forester at the Request of the Westmore Selectboard and Westmore Tree Warden.

Printed Name	Signature	Date
Jared Nunery		12/15/2025

We certify that we have read and approve of the 2025 Westmore Town Forest Long Pond Road Management Plan and agree to implement this plan to the best of our abilities. This Forest Management Plan includes the application of silvicultural practices and the best available applied ecological research, as well as the full implementation of the "Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont" to control stream siltation and soil erosion.

Printed Name	Signature	Date
David Stevens, Chair		
Peter Hyslop, Vice Chair		
Miriam Simonds		
William Perkins		
Isaiah Casey		

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Purpose of Forest Management Plan

The purpose of the following Forest Management Plan is to provide information and guidance to be used by the Westmore Selectboard for the management of the 294-acre forest owned by the Town of Westmore off Long Pond Road. This plan provides management guidance for a ten-year period beginning in 2026. The plan should be updated in 2036, including the completion of a new forest inventory. The information in this plan combines ecological, economic and social information to help the Westmore Tree Warden and Westmore Selectboard make informed decisions based on long-term management objectives for this land.

This report combines a comprehensive summary of information from the bottom (bedrock and soils) to the top (trees) and everything in between within the forest. This plan is written to be used as both a guidance document for the Westmore Selectboard as well as a potential tool for community members interested in better understanding the tremendous asset owned by the people of Westmore that are the Municipal Forest lands. Much of the general information included in this plan is applicable to the forests of the Town of Westmore and will also be applicable to the many private forestland owners in the Town.

This plan is meant to build on the 2017 Forest Management Plan prepared by Jayson Benoit of NorthWoods Stewardship Center. General information from the 2017 Forest Management Plan regarding the parcel is integrated into this plan, to retain this valuable information moving forward. ***Where information from the 2017 plan is included, a note is made to clearly identify this original text.***

Location

The Westmore Town Forest is located near Lake Willoughby, approximately 1.1 miles east of the junction of Route 5A and Long Pond Road, heading up Long Pond Road, with access directly off Long Pond Road from a bridge developed to cross Mill Brook to access the town gravel pit located on the property. This is the sole access point, and the bridge is currently gated, restricting both vehicular and pedestrian access across the brook.

Management goals and objectives

On August 19th, 2025, a public meeting was held to gather input on management goals and objectives for the Town Forest. Thirteen community members attended the public session to learn more about the town forest and share their thoughts on management goals and objective. Below are the goals identified following input collected at the public meeting.

- Promote a healthy forest, offering a range of habitat needs for wildlife species and protecting water quality of Mill Brook and associated headwater streams and other water resources on the property.
- Provide dispersed recreational opportunities for use by town residents.

- Provide periodic income to the Town through the sustainable harvest of forest products and non-timber forest products (i.e. maple sap).

The report below provides both a comprehensive background of the Westmore Town Forest, as well as a complete overview of the current conditions and a pathway forward for the next 10 years to help achieve the goals above. This report is intended to be a useful tool for all residents of the Town of Westmore, as much of the information included in this report is also relevant to adjacent private landowners within the Town.

Included in the report below is specific information on the potential for maple sap production in the Westmore Town Forest. It should be noted that only Stand 1 is suitable for maple sap production, so additional inventory data on maple within this stand is included in the Stand 1 section below.

Parcel Overview

The following text is carried forward from the 2017 Forest Management Plan.

The parcel is located in Vermont's rural Northeast Kingdom region and near the center of the town of Westmore (Orleans County). This site is only 16 miles south of the Canadian border, and roughly 20 miles west of the Connecticut River and New Hampshire. The nearest village is Westmore – located just one mile northwest of the property, while larger village centers are found at Barton (7 miles west) and Newport (15 miles northwest).

The parcel falls within the Northeastern Highlands Biophysical Region, a part of the state characterized by a cool climate, abundant lakes, granite hills, and extensive forests of northern hardwoods mixing with boreal softwood species. At the broad landscape level, it occupies an upper side slope position between Lake Willoughby valley to the west and higher elevation ridgelines to the north, east, and south - capped by Bald Mountain's 3,314 foot elevation summit.

The parcel is rectangular in shape and is bisected near its southwest end by Long Pond Road, a Class 3 town road that provides access to a small number of camps and residences at Long Pond before continuing as Class 4 road on to the town of Newark. Several stream valleys occur in the southern part of the site, draining into Mill Brook – which exits at the property's lowest elevation of 1,550 feet near the west corner. Just upstream of this point, the properties only improved access road extends from Long Pond road north over Mill Brook a short distance to a roughly 9-acre town gravel pit area. With the exception of this area, the entire site is forested. From Mill Brook, a sugar maple-dominated forest climbs steadily on mostly southwest-facing slopes to a high point along the northeast property line of 2,450 feet elevation.

Forests across the property are dominated by northern hardwood species, most notably sugar maple, with lesser amounts of yellow birch, red maple, paper birch, beech, and other minor species. Softwoods – particularly balsam fir and red spruce – are also found in moist lowland

areas in the south part of the site and become the dominant cover type in the upper elevations at the northeast ridge. Dominant age class and stocking are variable, following a history of partial logging, but overall stocking is fairly high. Soils are also variable, but include extensive acreage with excellent potential for sustainable high quality timber production, as well as other values such as wildlife habitat and public recreational access. Notable features of the site include its high quality streams and seeps, extensive hardwood forest (including valuable wildlife food sources and some enriched soils), a unique high elevation spruce-fir-hardwood forest type, excellent views to the south and west, and relative scarcity of invasive exotic plants.

Historical Background

Historic Land Use

The Westmore Town Forest has been forested for many years, with limited impact of recent agricultural use. Review of aerial imagery from the 1960s show the forest fully intact, in a similar condition as exists today. During the forest inventory, no signs of agricultural use were observed on the property (old cellar holes, stone walls, barbed wire, etc.). Although all of the forest has likely been managed in some form over the last century, scattered legacy trees exist throughout the forest, particularly along the upper slopes of Stand 1. These legacy trees offer a glimpse of the potential longevity of trees on these sites.

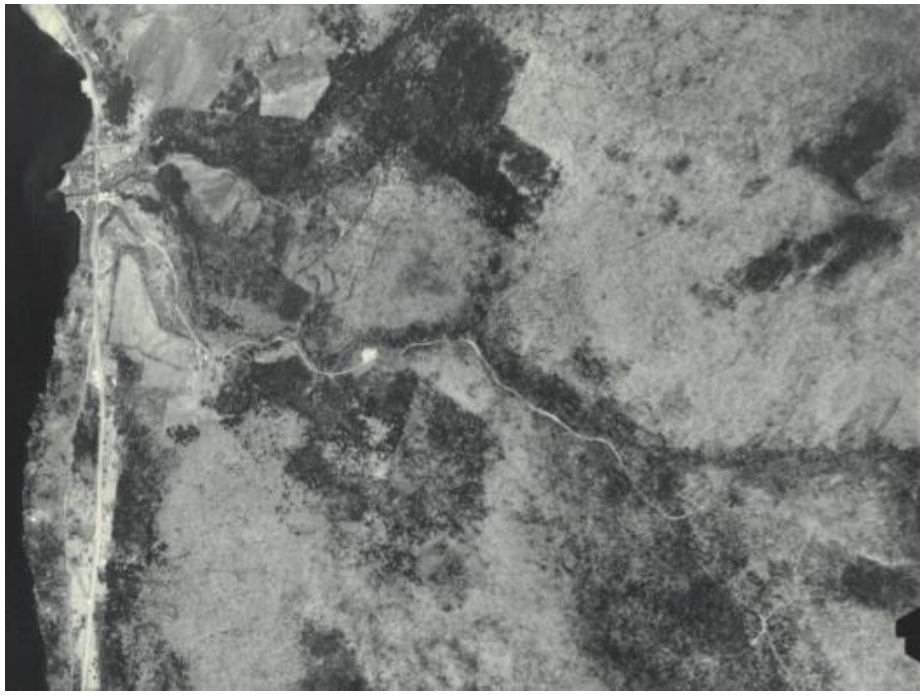

Figure 1: Aerial imagery from 1963. The eastern shore of Lake Willoughby can be seen in the far left of the image, and Long Pond Road crosses the center of the image, heading east from the lake. The dark area on the far top right of the image includes Stand 2

Historical Timber Management

Most recent harvest activities occurred approximately 30 years ago. At this time, portions of Stand 1 closest to the existing gravel pit were harvested with a unregulated thinning of the mid-slopes of Stand 1, and a more intensive harvest occurring in the 5-10 acres closest to the gravel pit. The upper slopes of Stand 1 show no signs of recent management, with the most recent

entry estimated at the 1960-70's. Stands 2 and 3 show little evidence of recent activity. Historic skid trails bisect Stand 1, however access is limited throughout Stands 2 and 3.

Boundary Line Status

Figure 2: Example of old blaze along the eastern property line.

Across the property, the evidence along the boundary is fading rapidly. A complete inspection of the property boundary was not completed as part of the plan development; however notes were made wherever evidence was observed. The eastern boundary is the most clearly marked, with both blazes and blue paint identified on trees. This boundary line should be maintained before evidence fades further. The western property line was not easily identified. It is suggested that a more complete review of the current boundary is completed within the next 3 years, and a regular maintenance schedule is developed to maintain parcel boundaries moving forward.

Ecological Background

The forest inventory of the Town Forest was completed in summer of 2025. Moose, bear, deer, and coyote sign were all observed during the inventory. The riparian corridor along Mill Brook provides an excellent travel corridor for a variety of wildlife. The Town Forest is imbedded in the western edge of a 15,336-acre habitat block, that stretches northeastward through contiguous forest to the Junction of Route 105 and 114 just west of Island Pond, connecting to the much larger habitat blocks located in Essex County. The location as part of a key connecting block between the Northern Green Mountains and the Northeast Highlands, makes consideration of habitat connectivity of great importance for the management of this Town Forest.

Geologic Information (bedrock and soils)

The following text is carried forward from the 2017 Forest Management Plan.

Bedrock affects forest land-use through its influence on access, water movement, and the long term soil nutrient budget. Especially where bedrock is relatively shallow, gradual breakdown of the rock supplies nutrients critical to tree growth and health – and the rate and quality of

nutrients supplied depends in part upon bedrock type. The bedrock beneath the Town of Westmore parcel is entirely granitic, part of the patchwork of large granite masses underlying much of northeastern Vermont, and contains mostly quartz and feldspar. This rock yields little calcium, magnesium or other minerals important for plant growth due to the nutrient composition of its minerals and their hardness, which slows weathering. Another consequence of low calcium content is a reduced ability to buffer the acids that are created by decomposition and rainfall, resulting in somewhat acidic soils.

The effects of bedrock can sometimes be masked or offset by the overlying soils, particularly when soils are deep or include an impenetrable hardpan layer. This layer (also known as “dense basal till”) was formed by the intense compressive force of the glaciers that covered Vermont 13,000-25,000 years ago. Loose unsorted sediments (also known as ablation till) were then dropped over this hardpan when the glaciers receded, providing the parent material of many of our existing upland soils.

Soils across the Town of Westmore parcel are mostly well drained to moderately well drained (86% of the total area), though areas with seasonally high water tables are widespread and poorly drained soils occur in the southern area. More detailed soil information for the site is

16D & E, Dixfield sandy loam, 15 to 60 % slopes, very stony (22% of parcel)

This soil is moderately well drained and moderately deep to hardpan and very deep to bedrock. A seasonally high water table occurs at 1.5-2.5 feet below the surface and erosion hazard is severe due to slope and erodibility. This type commonly supports Northern Hardwood and Red Spruce- Northern Hardwood Forests.

59B & C, Cabot silt loam, 0-15 % slopes, very stony (7% of parcel)

These soils are very deep to bedrock but shallow to hardpan, with poor drainage resulting and seasonally high water tables at or near the surface. Textures vary from silts in the upper

horizons to fine sandy loams below. These soils are poorly suited to equipment use because of wetness and support Lowland Spruce-Fir and other varieties of swamp forest types.

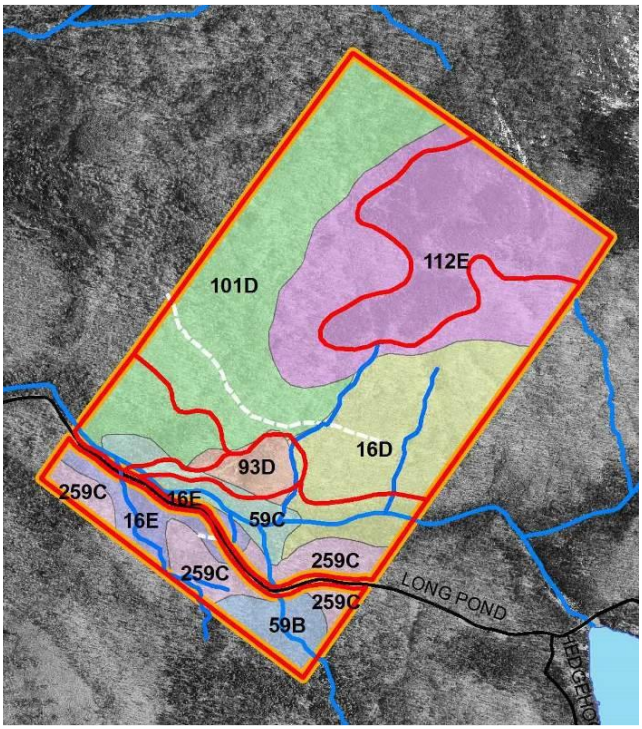

Figure 3: Soils map for the Westmore Town Forest from 2017 FMP.

93D, Monadnock fine sandy loam, 15-35 % slopes, very stony (3% of parcel)

A very deep and well drained soil, with fine sandy loam textures in the upper horizons overlying gravelly subsoils. Poorly suited to roads, with severe erosion hazard due to slopes and erodibility. Northern Hardwood Forest and the Beech-Red Maple-Hemlock-Northern Hardwood Forest Variant are common forest types.

101D, Tunbridge-Dixfield Complex, 15-35 % slopes, very stony (29% of parcel)

These soils are very deep and moderately well drained to well drained. Textures are fine sandy loams and sandy loams, with Dixfield soils having a seasonally high water table 1.5-2.5 feet below the surface. These soils are poorly suited to roads and have severe erosion hazard due to slopes and erodibility. They support Northern Hardwood Forest, Beech-Red Maple-Hemlock- Northern Hardwood Forest Variant, and Hemlock-Northern Hardwood Forest natural communities.

112E, Hogback-Rawsonville Complex, 35-60 % slopes, very rocky (32% of parcel)

These soils range from shallow to moderately deep and are well drained. They generally occur above 2,000 feet in elevation. Textures range from gravels to fine sandy loams to sandy loams. These soils are poorly suited to roads and have severe erosion hazard due to slopes and erodibility. They support unique Vermont natural communities; Montane Yellow Birch-Red Spruce Forest, Boreal Outcrop, and Boreal Talus Woodland.

259C, Colonel-Cabot Complex, 8-15 % slopes, very stony (7% of parcel)

These soils are shallow to hardpan and very deep to bedrock and are somewhat poorly to poorly drained. Seasonally high water tables are found from the surface to 16” deep. Textures vary from silts in the upper horizons to fine sandy loams or gravelly fine sandy loams below. Suitability for equipment use, erosion hazard and road suitability all range from moderately

good to poor within this complex. Natural community types include Northern Hardwood Forest, Red Spruce-Northern Hardwood Forest, and Lowland Spruce-Fir Forest. summarized below.

Watershed

The following text is carried forward from the 2017 Forest Management Plan.

The property is located in a headwaters region of the Barton River, which drains north to Lake Memphremagog and then on via the Magog and St. Francis Rivers to the St. Lawrence River and the Atlantic Ocean. On a more local level, surface waters from the Town of Westmore parcel all drain to Mill Brook *(photo below)*, which crosses the southern part of the site. This brook is also fed by Long Pond and Mud Pond (also known as Negro Pond) to the southeast and south. Just over one mile downstream (west) of the property, Mill Brook deposits into Lake Willoughby, a deep-water lake recognized for its unique size, geology, and other characteristics as a designated National Natural Landmark. As noted in the 2013 Westmore Town Plan, because the Long Pond watershed drains directly into Lake Willoughby, "…precautions in this area of town are especially important."

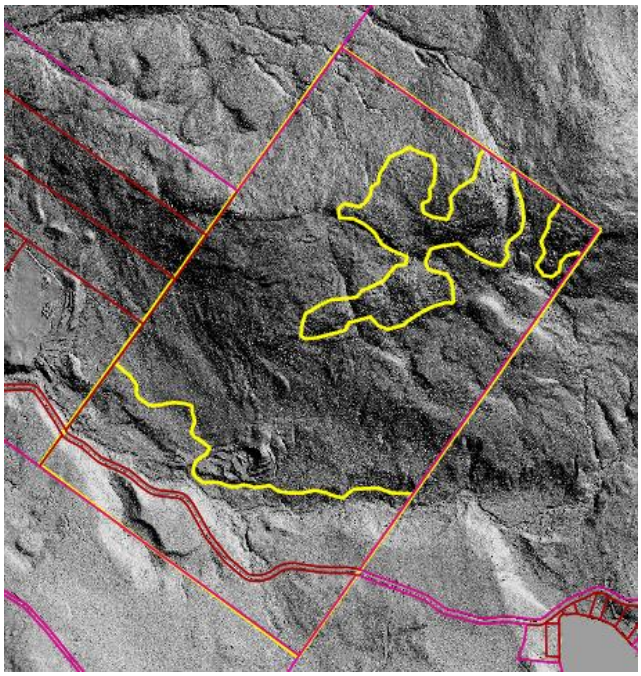

Figure 4: LiDAR imagery showing numerous drainages of Westmore Town Forest into Mill Brook. Water on this parcels flows in nearly every cardinal direction across the forest. Yellow lines on the map represent the stand boundaries (see Appendix A below).

Though Mill Brook and the stream draining Mud Pond are the only topographic "blue line streams", several other perennial streams can also be found crossing the forests both south and north of Long Pond Road, including one with a substantial valley in the southwest part of the site. All of these streams appeared to be in good to excellent condition at the time of the fieldwork for this plan in October, 2015, with cobble or rocky substrates, moderate amounts of coarse woody material, and relatively diverse macro-invertebrate populations.

Wetlands

The following text is carried forward from the 2017 Forest Management Plan.

No wetlands are mapped by the Vermont Significant Wetland Inventory (VSWI) as occurring on the site, though a number of seeps were observed – mainly in the lower elevations of the site in association with the Mill Brook or other stream valleys. These provide important habitat values and are particularly sensitive to damage from heavy forest management equipment. In general, seeps, springs, and streams are best protected by maintaining an intact forest buffer at least 50

feet back on all sides (depending on slope and sensitivity) and by keeping logging-related slash and equipment out of these areas. Moist soil areas should only be logged in frozen ground conditions and skid trails should be frozen in to avoid rutting, soil compaction, root damage, and erosion.

Wildlife

The following text is carried forward from the 2017 Forest Management Plan.

The home ranges of animals vary widely (only four square feet for a spring peeper to over 60 square miles for a male black bear), so the habitat values of a property should be considered at both the macro and micro levels. The Town of Westmore parcel is bordered to the east by a large private ownership – recently conserved from future subdivision and development by a Vermont Land Trust easement. Beyond this ownership to the east and south are other large properties, including state lands such as the Willoughby State Forest and the Bald Hill Wildlife Management Area, which in turn connect to one of the largest undeveloped areas in the state. Together these parcels offer habitat connectivity and a protective travel corridor for far ranging species like moose, bobcat, black bear, and fisher, as well as hosting a wide diversity of natural communities, flora, and fauna.

Within the property itself forested habitat types dominate, with northern hardwood forest in two age classes (15-25 and 60-90 years) being most widespread. This forest type and structure provides preferred habitat for species like red-eyed vireo, ruffed grouse, scarlet tanager, ovenbird, wood thrush, least flycatcher, red-backed salamander *(photo right)*, and black bear. Spruce-fir forest becomes more prevalent in the upper elevation areas in the north and – to a lesser extent – in the stream valley areas in the south, with a bit more structural variation resulting from individual tree blowdowns and resulting regeneration. These forest types support species like slate-colored junco, blue-headed vireo, black-throated green warbler, hermit thrush, Swainson's thrush, snowshoe hare, and moose. In general, the forest structure tends to be even or two-aged and trees in the youngest (<15 years) and oldest (>150 years) age classes are uncommon.

Figure 5: Black throated blue warbler nest found in Stand 1 during the 2025 forest inventory.

Habitat features of interest on the site include:

Streams and Seeps– A small wetland type found among upland forests, small seeps occur in various parts of the site – most notably in the south along the various stream valleys. Seeps serve as specialized habitats with distinct plant communities and offer critical seasonal wildlife values. During the depths of winter and early spring when food resources are at their lowest point, the constant groundwater temperature of 47° F at seeps often maintains an opening in the snow and a patch of live vegetation. These are important sources of food for black bear and wild turkey and are also home to amphibians like northern dusky and northern two-lined salamanders.

Open Habitat – The only significant open canopied habitat type is that of the gravel pit, located in the south-central area. Although highly disturbed from active excavation, and impacted by small infestations of invasive exotic plants, this open habitat benefits some wildlife species that solid forest does not. An example could be whippoorwhil, a very unique upland shorebird species that has declined in recent years and that is listed as a species of Special Concern in Vermont. As areas of the pit are left to grow back, they will support a flush of herbaceous plants and shrubs that are beneficial to a distinct guild of wildlife species than those supported by the site's forests. Examples include butterflies and other invertebrates and the many species that feed upon them, as well as meadow voles, northern shrike, American woodcock, American kestrel, red-tailed hawk, red fox, Lincoln's sparrow, indigo bunting, American goldfinch, and common yellowthroat. Efforts to maximize these benefits can include periodic mowing to prevent forest regrowth, seeding of preferred forage plants, and monitoring to prevent the establishment of aggressive invasive exotic plants like the bush honeysuckles, Phragmites, and Japanese knotweed.

Mast Producing Trees and Shrubs - "Mast" refers collectively to the nuts, seeds, buds, or fruits of woody plants that are consumed by wildlife. Certain trees and shrubs are considered high value mast producers due to the volume or quality of mast produced, and/or the number of wildlife species known to benefit from them. The most notable mast producing species found on the site are beech, black cherry, yellow birch, hophornbeam, serviceberry, and American mountain ash.

Though not abundant, beech is found in the site's hardwood forests, including trees scarred by bears repeatedly climbing to harvest beech nuts. These are a critical fall food source for black bears preparing for winter denning and bears will travel many miles to a preferred beech stand. Beech has also become much less common across the landscape due to beech bark disease. General management practices to promote this resource include culling trees that are notably weakened by the beech bark disease (>50% canopy dieback), retaining and releasing healthy beeches with evidence of use by bears (scarring and bunched canopy branches), and uneven-age management that encourages beech over shade-intolerant species.

Figure 6: American beech observed during the 2025 forest inventory, with scars from past climbing of the tree by black bears to access abundant beech nuts in the tree canopy.

Legacy Trees- Very large trees (>20"diameter at breast height - DBH) with extensive canopies offer unique wildlife values, such as vertical structure, abundant nesting and foraging sites, prodigious mast (and seed source), cavities, and future large coarse woody debris. Some tree species are particularly favorable - for example sow black bears prefer the rough bark of large diameter white pine and hemlock for their "babysitter trees" – places to send their cubs to escape danger, and large aspen and paper birch are preferred by woodpeckers for nest cavities, because they are soft and easier to excavate. Legacy trees are currently uncommon across the site, due to its active logging history, but those found here (located mainly in the upper elevation areas) include several yellow birch >34"dbh. It is important to recognize the non-timber value of these large trees and to retain, or recruit, them in future management operations.

Snags and Cavity Trees- Dead trees (snags) and cavity trees serve as important forage sites for woodpeckers; shelter for bats, cavity nesting birds, porcupine, and fisher; and open perches for raptors. When large snags fall, they benefit the forest for many years by contributing organic matter to soils, carbon and water storage, sites for nitrogen-fixing bacteria and mycorrhizal fungi, and nurse logs for tree seedlings. A small number of cavity trees were observed during the fieldwork, but large diameter snags were found in varying amounts. A general goal for basic wildlife needs is at least three snags or cavity trees 15-24" and one >24" per acre (Flateboet al. 1999). For optimal snag and cavity tree density, future management should focus on retaining existing cavity trees, while recruiting additional large diameter trees of mixed species distributed across the site to serve as future cavity trees, snags, and large logs.

Rare Threatened and Endangered Species and Significant Natural Communities

No rare, threatened or endangered (RTE) species were identified during the forest inventory. A review of the Vermont Department of Fish and Wildlife's database also confirmed that there are no know occurrences of RTE species on this parcel.

Forest Health

In general, no significant forest health issues were observed during the 2025 field inventory. Very few non-native invasive species were identified beyond a small population of phragmites (common reed) in the active gravel pit. This plant was likely brought to the site in soil either in the tracks of equipment, or soil deposited on site. Control of this plant now will prevent further spread onsite, as well as limit the potential spread to other areas of Westmore when town equipment is sed off site. Detailed identification and information on management of this species can be found at www.vtinvasives.org.

Management Considerations

Recreational Use

Recreation use on the site is currently limited to dispersed use, likely primarily during hunting season. Evidence of angler use along Mill Brook was observed, as well as limited ATV access along the western property line, however, in general very limited evidence of recreational use was observed during the forest inventory.

Figure 7: Views to the east from the height of land within the Town Forest.

During the public meeting held on August 19th, several participants expressed an interest the potential use of the Town Forest for hiking. No trails currently exist that access the height of land within the Town Forest, however several views can be gained for anyone willing to travel off trail. The primary access point to the town forest is the bridge across Mill Brook used to access the gravel pit. This bridge currently is blocked by a fenced gate which restricts both vehicle and pedestrian access. If pedestrian access is to be encouraged, an alternative gate should be considered that would allow for pedestrian access when the gate is closed.

Forest Inventory and Stand Delineation

For the purposes of forest management, areas within the forest of similar age, species and structure are delineated as Forest Stands. Dr. David Smith in his text "The Practice of Silviculture: Applied Forest Ecology"[1] defines a stand as a "*contiguous group of trees sufficiently uniform in species composition, arrangement of age classes, site quality, and condition to be a distinguishable unit"*. In comparison Dr. Ralph Nyland[2] defers to the Society of American Foresters definition when delineating a stand which states "*communities or groups of trees that grow together at a particular place, and that foresters can effectively manage as a unit"*. Both of these definitions include trees; however, one looks more holistically at the stand, age and structure of the forest. This is a critical difference, as the success of all future management practices is directly correlated to the site conditions as well as historic land use of a given piece of land. For the purposes of this report, stands were based not only on similar species arrangements, but also common abiotic features within the forest (i.e. the soils and hydrology) and how these features interact with the biotic features (i.e. the trees). This type of delineation within a forest is commonly referred to as a *Natural Community.* In the stand information below you will also see Natural Communities for each stand identified. The Natural Community is an interacting assemblage of organisms, their physical environment, and the natural processes that affect them.[3]

Applying silviculture in this forest

Management of the forest is conducted at the stand level through the application of *Silvicultural Treatments*. This extensive body of collective knowledge of how forests grow and function is aggregated and distilled into applied science through the practice of Silviculture. The U.S. Forest Service defines silviculture as "*the art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis*."[4] In general this is a decent definition, however, it lacks the recognition of the incredible complexity of the multitude of variables that must be considered when practicing silviculture . A more common simplification of this complexity is the fact that silviculture is not rocket science, it is far more complex. It is for this reason that when implementing the silvicultural treatments outlined within this report, the Town is strongly encouraged to employ the services of a Licensed Forester. Additionally, it is also encouraged that any work completed under the guidance of this plan is shared with the broader community, to help demonstrate applied silvicultural practices, as well as educate residents on the benefits of such practices.

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[1] Smith, D.M., B.C. Larson, M.J. Kelty, and P.M.S. Ashton: The Practice of Silviculture: Applied Forest Ecology, (1997) 9th edition. John Wiley & Sons Inc.

[2] Nyland, R.D.: Silviculture: Concepts and Application, (1996). McGraw-Hill Companies Inc.

[3] Thompson, E.H., and E.R. Sorenson: Wetland, Woodland, Wildland: A guide to the Natural Communities of Vermont, (2005). The Nature Conservancy and the Vermont Department of Fish and Wildlife

[4] Helms, J.A., ed: The dictionary of forestry. (1998) Society of American Foresters. P.210.

Forest Inventory

An inventory of the entire parcel was completed during the summer of 2025 by the Orleans County Forester. Variable radius point sampling was completed using a 10 Basal Area Factor prism. Point sampling is a method of selecting trees to be tallied based on their sizes rather than by their frequency of occurrence[5]. Sample points, analogous to plot centers, are located along a grid generated in ArcPro (a computer mapping program). Once a grid is generated, points are located using a georeferenced map and the Avenza mapping application, which is used to navigate to each point. Within a variable radius plot, the probability of tallying a given tree is based on the cross-sectional area (at 4.5 feet above the forest floor), and the sighting angle (in this case a prism) used. For all inventory work, a 10 Basal Area Factor prism was used, and Vermont State Lands Inventory Protocol was used[6]. Data was collected using a handheld tablet and processed and stored using the Vermont State FOREX Inventory Database System.

In all cases within this report, AGS refers to Acceptable Growing Stock. Acceptable Growing Stock Basal Area (AGS BA) consists of that portion of trees tallied as total basal area that are of commercial species and have the potential to produce sawlog-quality or better material now or in the future. Commercial species are those tree species that are commonly acceptable as being commercially valuable. UGS refers to Unacceptable Growing Stock. Unacceptable Growing Stock Basal Area (UGS BA) consists of that portion of trees tallied as total basal area that are NOT of commercial species, or do not have the potential to produce sawlog or better quality material now or in the future. Non-commercial species typically include such species as alder, apple, chokecherry, ironwood, gray birch, hawthorn, striped maple, pin cherry and willow spp. AGS and UGS Basal Area (BA) are presented in the following pages to describe stocking of overstory trees within each stand.

Below is a table showing the general summary statistics as well as the number of sample points included in each stand.

Stand	Mapped Acres	Points	Basal Area	Trees Per Acre	Acceptable Growing Stock	QMD (in)
1	185.9	44	78.0	104.7	34.3	11.7
2	36.9	10	62.0	129.0	28.0	9.4
3	75.0	15	86.7	168.5	41.3	9.7

Figure 8: This table shows the general summary statistics for each stand as well as the number of sample points in each stand. All basal areas are presented in square feet/acre and QMD represents the quadratic mean stand diameter at breast height for each stand.

Management Summary

A stand-level management activity summary is provided below.

[5] Avery, T.E., and H.E. Burkhart: Forest Measurements. (1975) McGraw-Hill Inc.
[6] Vermont Department of Forests, Parks and Recreation: Timber Cruise Manual v1.1. (2014)

Year	Activity
2026-29	Complete property boundary inspection
2027	Stand 1 – Continuous Cover Irregular Shelterwood
2036	Re-inventory all stands and update Forest Management Plan
Annually	Monitor for invasive species in all stands

Beyond the stand-level management actions the following parcel-wide management actions should also be addressed:

- Introduced invasive species: A small population of introduced invasive common reed was located within the gravel pit area located on the parcel. These plants should be removed as soon as possible to prevent further spread. Your County Forester is available to assist you in contracting with a licensed certified pesticide applicator to remove these plants.
- Sugarbush Management: If Stand 1 is to be management for maple sap production, best management practices for sugarbushes should be followed (see Stand 1 description below for more detail). **Additionally, the prescribed silvicultural treatment in Stand 1 should be completed prior to tubing installation.**
- Recreational management: During the August 2025 Public Meeting, interest was expressed in exploring recreational opportunities in the Town Forest. The first step in enhancing public access to this parcel is to assure pedestrian access can be gained across the access bridge from Long Pond Road. To enhance public access, the current gate should be modified to allow pedestrian access across the bridge. Further enhancement of recreational access might include hiking trail development along Mill Brook or travelling though the eastern portion of Stand 1 uphill to access the rocky outcrops on the eastern edge of Stand 2 where views to the east are found.
- Community education: Any forest management activities should be completed under the supervision of a licensed forester. Additionally, community outreach and educational opportunities should be considered when implementing forest management activities. These are excellent opportunities to host community forest walks to educate residents on the benefits of forest management. Your County Forester is available to assist in the implementation of any forest management activities and hosting educational tours.

Forest Stand 1

Stand description: This 185.9 acre northern hardwood forest comprises the majority of the Town Forest. Elevation ranges from approximately 1,675' at the southern extent of the stand, traveling uphill at a constant grade to just over 2,400' near the height of land on the Town Forest. The stand straddles a gentle ridge that bisects the stand, with the northern western portion of the stand falling toward the west, and the eastern portion of the stand falling to the southeast. This stand is dominated by sugar maple, with an estimated 56 tappable trees (>10" diameter at 4.5' from the ground) per acre. This is the only stand that has seen recent management activities, however most recent management was limited to the lower third of this stand, with the upper two thirds of this stand on either side of the saddle that bisects the stand, having seen no recent management activity. Most recent harvest focused on the removal of the highest quality trees in the lower third of the stand. This harvest resulted in the establishment of a new cohort of trees, resulting in a two-aged stand where management occurred. Future management activities should focus on enhancing forest health, resilience, and diversity within this stand.

Figure 9: Legacy tree identified on the upper slopes of Stand 1.

Inventory: Data collected during the summer of 2025. A total number of 44 inventory points were taken in Stand 1.

Soils and site quality: Site II quality – primary soils include Tunbridge-Peru complex, Peru fine sandy loam, and Hogback-Rawsonville complex.

Stocking Data:

	BA	TPA
Mean	78.0	104.7
St. Dev	28.0	59.5
AGS	34.3	43.1
UGS	43.6	61.6
80% Range	(72.5-83.5)	(93.0-116.4)

Snags<12"	Snags 12-16"	Snags>16"	Total Snags/Acre

1.07	3.80	0.93	5.80

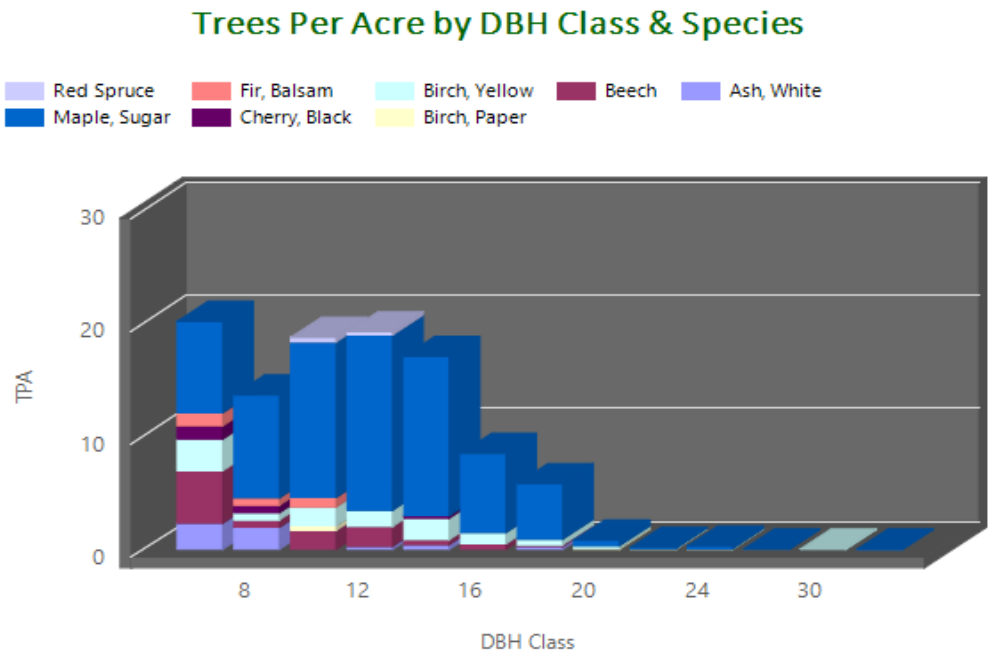


Figure 10: Trees Per Acre (TPA) and Diameter Class Distribution (DBH = Diameter at Breast Height which is measured at 4.5 feet from the ground)

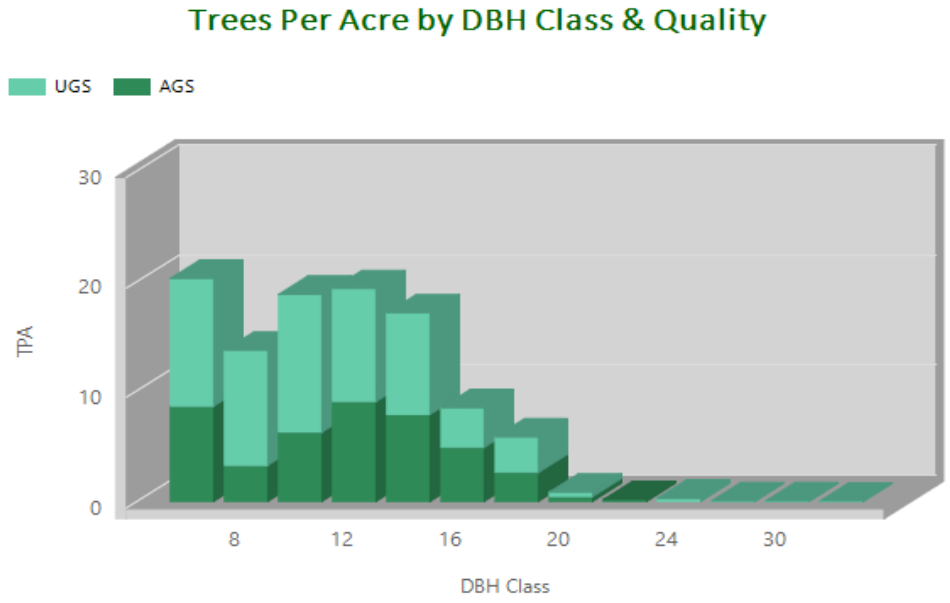


Figure 11: Trees Per Acre (TPA) and Diameter Class Distribution showing tree quality (AGS = Acceptable Growing Stock; UGS= Unacceptable Growing Stock)

Overstory Species Composition:

Species	BA	%BA	TPA	QMD	Rel Density	BF Vol	Pulp Vol
Ash, White	2.27	2.95	5.24	8.91	1.92	17.48	0.31
Beech	4.77	6.19	9.73	9.48	3.98		0.61
Birch, Paper	0.45	0.58	0.52	12.60	0.43	19.38	0.03
Birch, Yellow	8.18	10.62	10.43	11.99	6.58	145.31	0.91
Cherry, Black	0.68	0.88	2.02	7.86	0.59		0.03
Fir, Balsam	0.91	1.18	2.64	7.95	0.44		0.06
Maple, Sugar	60.23	78.22	73.41	12.27	48.44	1977.29	5.90
Red Spruce	0.45	0.58	0.71	10.78	0.18	33.93	0.00
Totals	77.94	101.20	104.70	11.68	62.56	2193.39	7.85

BA = Basal Area; TPA = Trees Per Acre; QMD = Quadratic Mean Diameter; Rel Density = Relative Density; BF Vol = Board Foot Volume; Pulp Vol = Pulpwood volume

Additional Sugar Maple Inventory by size class: During the initial discussions with the Town, as well as during the August 19th public meeting, questions regarding the viability of the Town forest for the production of maple sap was identified. To the right is a map showing the stocking variability (in Basal Area - square feet per acre) for each inventory point in Stand 1. As sugar maple comprise nearly 78% of the stocking in this stand, this correlates closely with the stocking density of maple across the stand. Below is a diameter distribution from the 44 inventory points taken across Stand 1. The average sugar maple tree in Stand 1 is 12.3 inches in diameter at breast height (4.5 feet from the ground). Sugar maple represents over 77.3% of the basal area in this stand, with a total

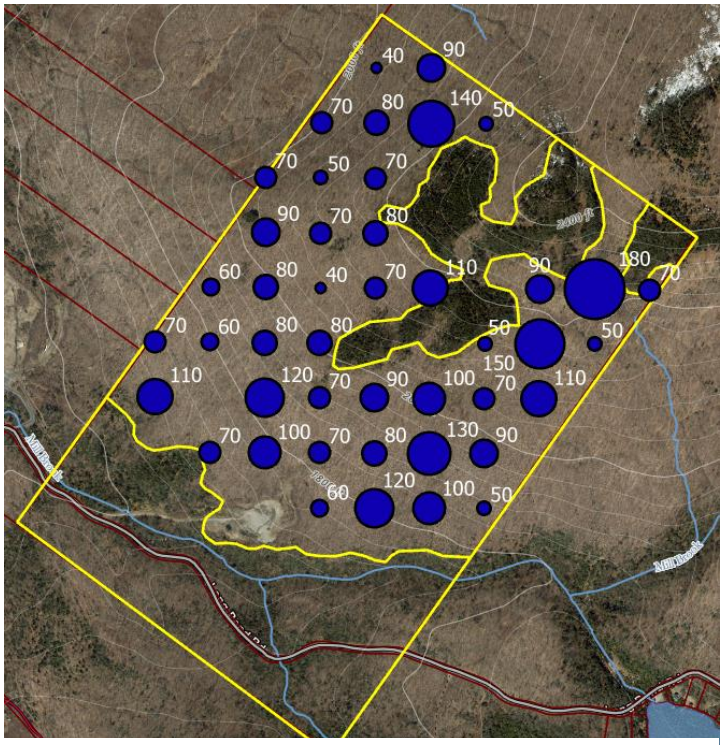


Figure 12: Stocking variability in Stand 1 represented by Basal Area. Larger dots represent more densely stocked inventory points.

estimate of 56 sugar maple trees per acre of tappable size (>10" DBH). Stocking varies considerably across the stand, however in general the stand is fairly uniform in structure, age and distribution of maple. Highest stocking of sugar maple was identified in the northern eastern portion of Stand 1 towards the higher elevations within this stand.

DBH Class	Trees Per Acre	Species
6	8.10	Maple, Sugar
8	9.12	Maple, Sugar
10	13.76	Maple, Sugar
12	15.50	Maple, Sugar
14	14.09	Maple, Sugar
16	7.00	Maple, Sugar
18	4.93	Maple, Sugar
20	0.52	Maple, Sugar
22	0.09	Maple, Sugar
24	0.22	Maple, Sugar
28	0.05	Maple, Sugar
36	0.03	Maple, Sugar
Total TPA >10"	56.19	

Understory Species*:* In general understory was lacking throughout the stand, with limited established regeneration growing under the closed canopy. Shrub species noted include hobblebush, alternate-leaf dogwood, mountain maple and elderberry. Limited seedlings were noted throughout much of the stand.

Natural Community Designation: Northern Hardwood Forest or Red Spruce Northern Hardwood Forest.

Forest Health: No significant forest health issues were observed during the inventory.

Silvicultural Long-term Objectives: The stand is currently an even-aged stand, with limited established regeneration due to the closed canopy. Scattered large legacy trees exist throughout the stand. Of note was one large yellow birch cavity tree with a hollow interior. This same tree was observed in 2017 by Jayson Benoit, and is still standing nearly a decade

later, serving as a home to a variety of wildlife over the years. This stand currently has two age cohorts, with a well-established younger age class in the southern portions of the stand. Overtime, management should strive to develop several more age classes, managing toward an uneven-aged structure.

Figure 13: Large yellow birch legacy tree identified in 2017 left (Photo credit J. Benoit), and 2025 right.

Silvicultural prescription: Current stocking in this stand is not critically high, however the stand would benefit from continued development of additional age classes. **If this stand were to be managed for maple sap production, it is suggested that the prescribed treatment below is completed before the installation of tubing**. Additional age classes will be developed through the use of a continuous cover irregular shelterwood. Removal will focus on removal of unacceptable growing stock, specifically sugar maple, to also increase the stand species diversity.

Rotation age: 120 years (current stand age ~80-90 years)

Residual Basal Area for stand: 65 ft^2

Desired species objectives: Primary species will for removal will be sugar maple to enhance overall stand diversity (current stocking is comprised of 82% sugar maple). Retention of yellow birch, red spruce and red maple should be prioritized during marking. Marking will focus on portions of the stand where stocking exceeds 95 ft^2.

Entry interval: 15-20 years (if Stand will be managed for maple sap production moving forward, subsequent entries should be timed with tubing replacement).

Diameter Distribution:

Diameter Class	Current Total BA (ft^2/ac)	Current AGS BA (ft^2/ac)	Target Residual BA (ft^2/ac)
6-10 inch	19.0	6.2	15
12-14 inch	33.4	15.5	28
16-20 inch	24.0	12.3	20
22 inch plus	2.0	0.4	2
Total	**78.3**	**34.5**	**65**

Prescribed management activity: Continuous Cover Irregular Shelterwood in 2027. Potential management as a leased sugarbush bush following the completion of the prescribed harvest. The proposed harvest will reduce the total number of tappable sugar maple in Stand 1, however completing this work will help establish regeneration currently lacking the stand, and improve overall stand health prior to restricting management access with the installation of tubing – thus ultimately increasing the potential health of the sugarbush in the decades to come.

Any sugarbush management practices should adhere to best management practices such as the Vermont Sugarbush Management Standards and Tapping Guidelines for Forestland in Use Value Appraisal (full standards are available here: https://fpr.vermont.gov/sites/fpr/files/Forest_and_Forestry/Your_Woods/Library/UVA_Sugarbush_Standards_%2010-8-14%20%28final%29_03-19-15%20%28corrected%29.pdf).

The following tapping guidelines are extracted from the Vermont Sugarbush Management Standards and Tapping Guidelines for Forestland in Use Value Appraisal. These tapping guidelines (in addition to the standards referenced above) should be adhered to and integrated into any lease developed to manage Stand 1 for maple sap production.

	Standard Spout (5/16")	***Large Spout (7/16")***
0 taps	Less than 10" diameter (less than 29" circumference)	Less than 12" diameter (less than 35" circumference)
1 tap	10-14" diameter (29-47" circumference)	12-18" diameter (35-60" circumference)
2 taps	16-20" diameter (47-66" circumference)	20" & over, diameter (60"+ circumference)
3 taps	22" & over, diameter (66" & over circumference)	Prohibited
4+ taps	Prohibited	Prohibited

Forest Stand 2

Stand Description: This 36.9 acre Montane Spruce Fir forest comprises the highest elevations of the Town Forest. Portions of this stand are comprised of talus slopes, with very thin soil. Moose sign was observed throughout this stand, as well as areas of windthrow from frequent disturbance. These pockets of windthrow and talus slope have limited stocking, resulting in the low basal area noted in the forest inventory. This stand has developed an uneven-aged structure over time, due to regular mortality caused by windthrow and individual tree mortality. Historic management in this stand has been limited due to challenging access. Large legacy sugar maple and yellow birch were noted along the transition point between Stand 1 and 2, particularly on the steeper eastern slopes. Several rocky outcrops towards the height of land offer excellent views to the east of Bald Mountain.

Figure 14: Views to the east from height of land in Stand 2.

Inventory: Data collected during the summer of 2025. A total number of 10 inventory points were taken in Stand 2.

Soils and site quality: Site III quality – primary soils include Hogback-Rawsonville complex.

Stocking Data:

	BA	TPA
Mean	62.0	129.0
St. Dev	20.4	50.7
AGS	28.0	54.6
UGS	34.0	74.3
80% Range	(53.1-70.9)	(106.8-151.2)

Snags<12"	Snags 12-16"	Snags>16"	Total Snags/Acre
10.82	6.62	3.35	20.79

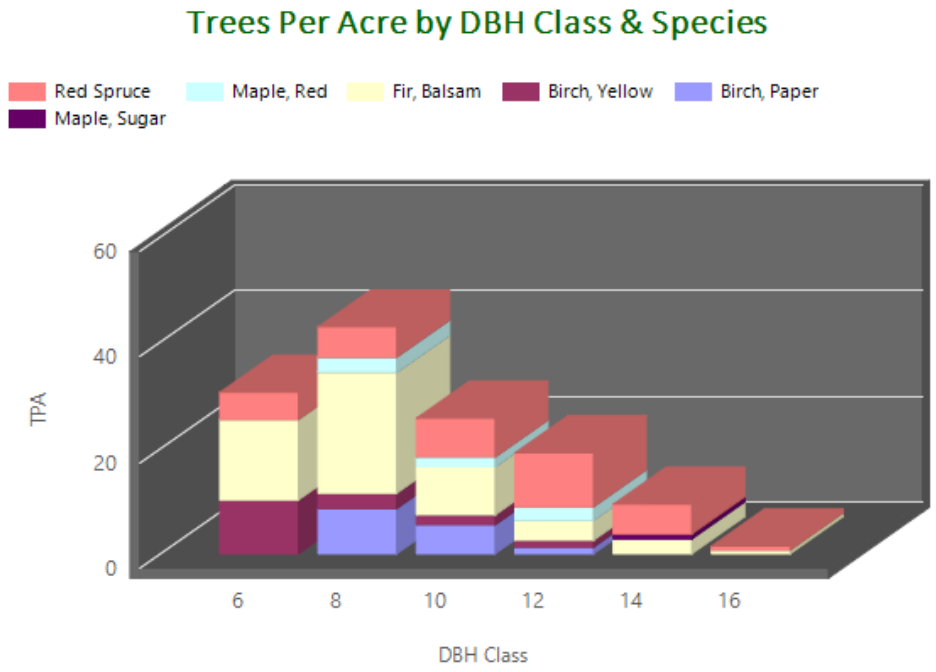


Figure 15: Trees Per Acre (TPA) and Diameter Class Distribution (DBH = Diameter at Breast Height which is measured at 4.5 feet from the ground)

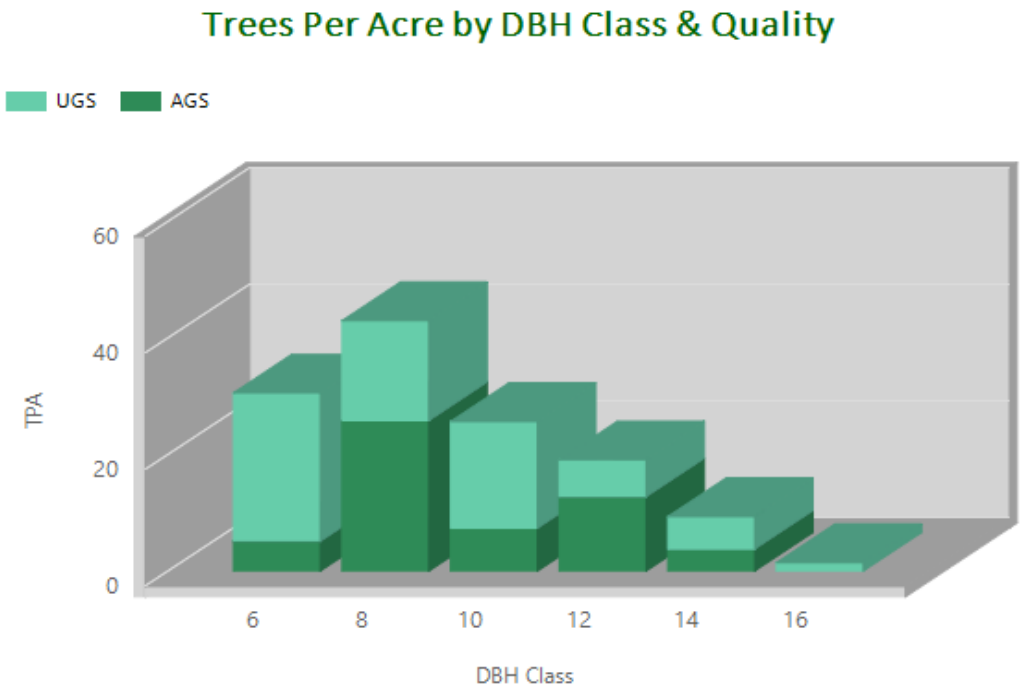


Figure 16: Trees Per Acre (TPA) and Diameter Class Distribution showing tree quality (AGS = Acceptable Growing Stock; UGS= Unacceptable Growing Stock)

Overstory Composition:

Species	BA	%BA	TPA	QMD	Rel Density	BF Vol	Pulp Vol
Birch, Paper	7.00	11.29	15.37	9.14	6.42		0.66
Birch, Yellow	5.00	8.06	16.16	7.53	4.39		0.20
Fir, Balsam	23.00	37.10	54.71	8.78	10.26	520.24	1.30
Maple, Red	4.00	6.45	7.25	10.06	3.33	19.15	0.56
Maple, Sugar	1.00	1.61	0.94	13.97	0.79		0.17
Red Spruce	22.00	35.48	34.67	10.79	8.40	830.85	1.86
Totals	62.00	99.99	129.10	9.38	33.59	1370.24	4.75

BA = Basal Area; TPA = Trees Per Acre; QMD = Quadratic Mean Diameter; Rel Density = Relative Density; BF Vol = Board Foot Volume; Pulp Vol = Pulpwood volume

Natural Community Designation: Montane spruce fir forest, Boreal Talus Woodland

Figure 17: American beech mortality in Stand 2.

Forest Health: No significant forest health issues were observed. One small patch of dead American beech was observed on the western edge of Stand 2 where the stand begins to transition to the northern hardwood forests of Stand 1. These trees were likely impacted by Beech Bark Disease (BBD), combined with drought stress associated with the well-drained soils of Stand 2. Additional mortality was observed in paper birch throughout the stand, however this is likely due to natural succession occurring within the forest, as the paper birch that was established during a significant disturbance 60-80 years prior, is now beginning to die and transition towards spruce and fir.

Regeneration: Regeneration is highly variable throughout this stand. Areas where recent windthrow have occurred have dense regeneration dominated by balsam fir with some red spruce. Moose browse was observed throughout these areas as well.

Silvicultural Long-term Objectives: Uneven-aged management

Silvicultural prescription: Given the low site quality and difficult access to this stand, this area is not well suited for the management of forest products. As such, no silvicultural treatment is

suggested in this stand for the planning period. If recreational trails were to be developed, a trail travelling through the eastern portion of Stand 1 could provide access to the rocky outcrops on the eastern edge of Stand 2 that offer excellent views to the east.

Prescribed management activity: None for the next 10 year period.

Forest Stand 3

Stand Description: This 75-acre stand includes the greatest variability across the Town Forest. This area was previously identified as Stands 1, 2A, and 2B in the 2017 Forest Management Plan. Due to similar hydric soils across these three areas, they have been merged into one stand in the current Forest Management Plan. This stand is bisected by both Mill Brook as well as Long Pond Road. Most recent management activities within this stand occurred on the north side of Long Pond Road. The riparian area along Mill Brook is intact, with limited disturbance, providing shade for the brook, helping to keep the water cool and maintain water quality. Healthy riparian forests such as Stand 3 are critically important to maintaining water quality in Lake Willoughby. A small northern white cedar swamp can be found in the southeastern corner of this stand along the outlet of Mud Pond. Several large cedars can be found in this area. Although it is too small to be identified as a unique stand, this area is worth noting, as northern white cedar is uncommon throughout much of the remainder of the Town Forest.

Figure 18: Small seep in northeastern portion of Stand 3 - an indicator of the hydric soils common in this stand.

Inventory: Data collected during the summer of 2025. A total number of 15 inventory points were taken in Stand 3.

Soils and site quality: Site II-III quality – primary soils include Cabot silt loam, Peru fine sandy loam, and Colonel-Cabot complex.

Stand History: Much of this stand was has seen recent management over the last 50 years, resulting in the variable stocking across the stand. Regeneration response has been slow due to the hydric soils found across the stand.

Stocking Data:

	BA	TPA
Mean	86.7	168.5
St. Dev	33.3	62.9

AGS	41.3	82.6
UGS	45.3	85.9
80% Range	(75.1-98.3)	(146.7-190.3)

Snags<12"	Snags 12-16"	Snags>16"	Total Snags/Acre
15.39	6.06	4.35	25.80

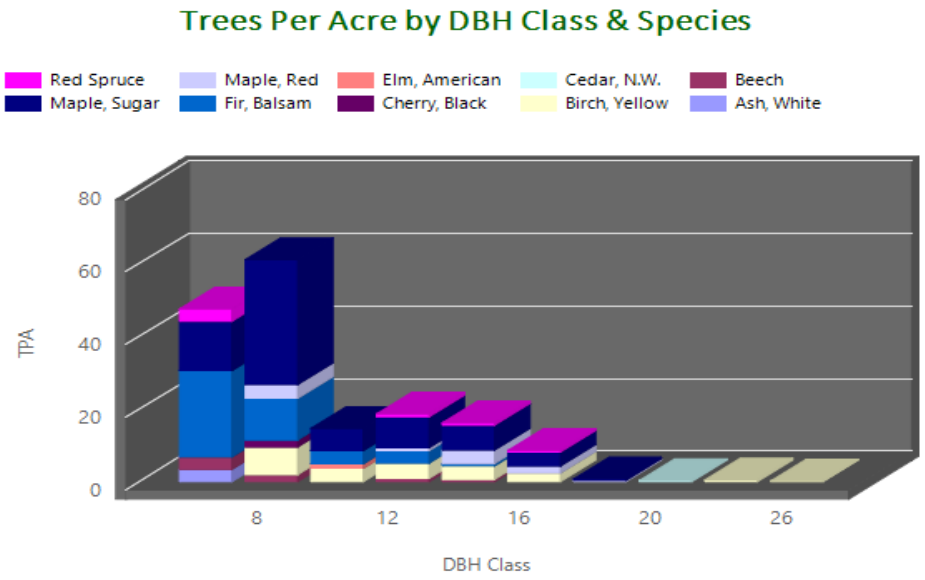


Figure 19: Trees Per Acre (TPA) and Diameter Class Distribution (DBH = Diameter at Breast Height which is measured at 4.5 feet from the ground)

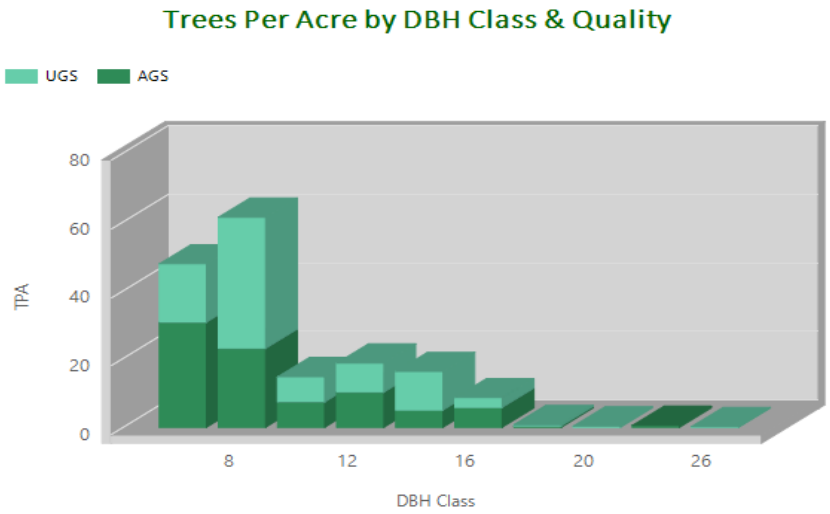


Figure 20: Trees Per Acre (TPA) and Diameter Class Distribution showing tree quality (AGS = Acceptable Growing Stock; UGS= Unacceptable Growing Stock)

Overstory Composition:

Species	BA	%BA	TPA	QMD	Rel Density	BF Vol	Pulp Vol
Ash, White	0.67	0.78	3.40	6.01	0.62		
Beech	2.67	3.10	6.78	8.50	2.27		0.33
Birch, Yellow	17.33	20.15	22.36	11.92	14.00	546.65	1.61
Cedar, N.W.	0.67	0.78	0.31	19.91	0.32		0.11
Cherry, Black	0.67	0.78	1.91	8.02	0.58		0.10
Elm, American	0.67	0.78	1.22	10.03	0.31		0.09
Fir, Balsam	14.00	16.28	42.91	7.73	6.89	470.96	0.62
Maple, Red	9.33	10.85	10.70	12.64	7.48	217.83	1.33
Maple, Sugar	38.00	44.19	73.61	9.73	31.65	724.40	4.92
Red Spruce	2.67	3.10	5.34	9.57	1.06	230.68	0.00
Totals	86.68	100.79	168.54	9.71	65.18	2190.52	9.11

BA = Basal Area; TPA = Trees Per Acre; QMD = Quadratic Mean Diameter; Rel Density = Relative Density; BF Vol = Board Foot Volume; Pulp Vol = Pulpwood volume

Natural Community Designation: Northern Hardwood Forest, Lowland Spruce-Fir Forest

Forest Health: No significant forest health issues were observed throughout this stand.

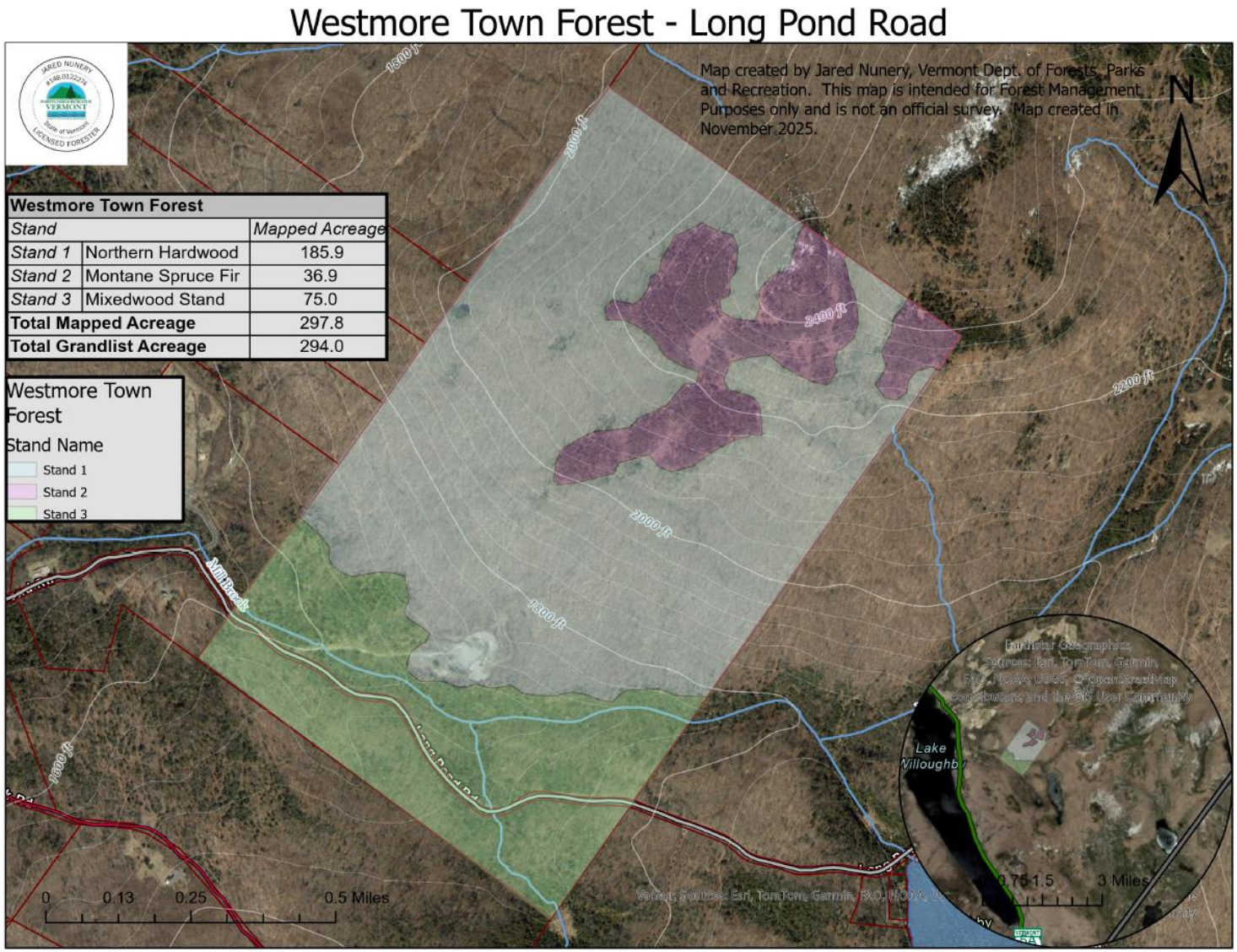
Regeneration: Regeneration was limited across this stand. Areas in the northwestern portion of the stand on hydric soils have responded slowly to the most recent logging of ~30 years ago. Areas with closed canopy south of Long Pond Road have limited regeneration.

Silvicultural Long-term Objectives: Uneven-aged management. This stand is currently a two-aged stand. Management should strive to develop additional age cohorts over time, to develop this stand into an uneven-aged forest.

Silvicultural prescription: Much of this stand is still responding from the most recent management activities that occurred 30-40 years ago. Hydric soils on the north side of Long Pond Road will support a forest comprised predominantly of balsam fir, yellow birch, red maple and red spruce. Current stocking is below optimal stocking for this mixedwood forest. As such this stand should be allowed to grow for the next 10 year period.

Prescribed management activity: None for the next 10 year period.

Appendix 1: Town Forest Stand Map



Westmore Town Forest		
Stand		*Mapped Acreage*
Stand 1	Northern Hardwood	185.9
Stand 2	Montane Spruce Fir	36.9
Stand 3	Mixedwood Stand	75.0
Total Mapped Acreage		297.8
Total Grandlist Acreage		294.0