

Forest Stewardship Plan
And
Current Use Forest Management Plan Amendment
Wolloch Forest
The Vermont Land Trust
Town of Elmore, Lamoille County, Vermont

731.2 Acres

October 2021

Town of Elmore: SPAN: #201-064-10612

Prepared by:

The Vermont Land Trust
Forester - David C. McMath
VT Lic: #148.0122279

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Signature Page

Wolloch Forest
The Vermont Land Trust

Town of Elmore, Lamoille County, Vermont

The Property will have a conservation easement held by the Vermont Department of Forests, Parks and Recreation through the Forest Legacy Program (FLP). The Vermont Department of Forests, Parks & Recreation working in conjunction with the USDA Forest Service is the State Lead Agency for Vermont's Forest Legacy Program. The following management plan is intended to meet the requirements for the FLP and the Vermont Use Value Appraisal (UVA or Current Use) Program.

- I have reviewed and approved this management plan and related maps.
- I authorize submission to the State of Vermont to meet the requirements of the Use Value Appraisal program and Forest Legacy Program.
- I affirm that the forest described herein is under active management in accordance with acceptable standards for forest management. These management standards include the practices outlined in the booklet, "*Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont*" in order to control stream siltation and soil erosion.
- This amendment will run through the remainder of the plan period of the original Forest Management Plan that is due to be updated by April 1, 2026.

DocuSigned by:

Christine McShea

12/20/2021

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Vermont Land Trust, Inc. - Its Duly Authorized Agent

Date

Prepared by:

DocuSigned by:

David McMath

12/17/2021

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The Vermont Land Trust Forester

Date

David C. McMath, VT Lic. #148.0122279

Approved by:

DocuSigned by:

Michael C. Sykes

12/22/2021

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State Forester - Vermont Department of Forests, Parks and Recreation

Date

DocuSigned by:

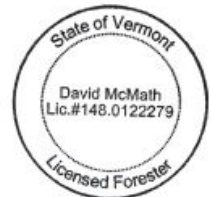
Sandy Potter

12/22/2021

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County Forester - Vermont Department of Forests, Parks and Recreation

Date



Property Data Summary

Landowner: The Vermont Land Trust, Inc.

Address: c/o Mr. Carl Powden
The Vermont Land Trust
8 Bailey Avenue
Montpelier, VT 05602

Phone: (802) 223-5234

Email: carl@vlt.org

Physical Address: Town of Elmore, VT Route 12

Orthophoto Base Maps: #148212, #148216, #152212, #152216, #144216, 144212, #148208

SPAN: #201-064-10612

Grand List Description/Acres: Town of Elmore: 731.2 ac

Legacy Easement Acres: 731.2 +/- GIS acres

UVA Acreage Chart

Wolloch Property -Town of Elmore

| | |
|-------------------------------------|---------------|
| Total acres in parcel (grand list) | <u>731.20</u> |
| Acres to be excluded | <u>0.00</u> |
| Acres to be enrolled in the program | <u>731.20</u> |
| Acres to be enrolled as measured | <u>727.63</u> |
| Factor to prorate map acres | <u>1.005</u> |

| Area | Site | Type | Map acres | Factor | Prorated acres |
|--------------------------------|----------|------------------|---------------|-----------|-------------------|
| <i>Non-productive 20% rule</i> | | | | | |
| | IV | Wetland | <u>55.00</u> | 1.005 | <u>55.27</u> |
| <i>Forestland</i> | | | | | |
| Stand 1 | II | Mixedwood | 39.84 | 1.005 | 40.04 |
| Stand 2 | II | Softwood | 8.40 | 1.005 | 8.44 |
| Stand 3 | II | Mixedwood | 36.84 | 1.005 | 37.02 |
| Stand 4 | I | N. Hardwood | 52.26 | 1.005 | 52.52 |
| Stand 5 | II | Mixedwood | 56.00 | 1.005 | 56.27 |
| Stand 6 | II | Mixedwood | 93.18 | 1.005 | 93.64 |
| Stand 7 | I | N. Hardwood | 109.00 | 1.005 | 109.53 |
| Stand 8 | II | Mixedwood | 147.67 | 1.005 | 148.39 |
| Stand 9 | II | Mixedwood | 23.44 | 1.005 | 23.56 |
| <i>Riparian ESTA</i> | II - III | Mixedwood | <u>106.00</u> | 1.005 | <u>106.52</u> |
| | | Total Forest: | 672.63 | Adjusted: | 675.93 |
| | | Total Map Acres: | <u>727.63</u> | Adjusted: | <u>731.20</u> |

Introduction

This document serves as a guide for managing and protecting the natural resources of the Wolloch property in accordance with principles of forest management, the landowner's desires, the Use Value Appraisal (UVA) Program of the State of Vermont and Forest Legacy Program for the remainder of the 10 year management period, through April 1, 2026. The Vermont Land Trust, is interested in long-term conservation of this large forested block and maintaining a healthy and productive forest ecosystem. In addition to its value to the timber economy and ecosystems services, this forestland is part of a large block of significant habitat that connects to other public and private protected parcels and eventually to the Green Mountain range to the west. The property is enrolled in the UVA program and will eventually be sold with a Conservation Easement limiting development and ensuring public access. The conservation easement is designed to protect the forest resources, biological diversity, wildlife habitats, and scenic and outdoor recreation resources.

Therefore, the main purpose of this Forest Stewardship Plan is to guide management decisions of current and future managers over time. The overall approach of this plan is to maintain ecological integrity while improving tree quality and health and the production of forest products. These goals will be accomplished using even-aged and uneven-aged silvicultural techniques.

Landowner Objectives and Management Goals

- Manage the woodlands to optimize ecosystem services while managing for long term sustainable production of forest products such as maple sap, sawlogs, pulpwood, and firewood
- Incorporate practices and silvicultural systems and harvest activity will that maintain the structure and function of the natural ecosystem.
- Protect water quality in all wet areas, and watercourses.
- Establish and improve access to and within the property.
- Include wildlife habitat considerations in management decisions with the goal of maintaining or improving habitat for a variety of fauna.

Property Ownership History

The property was owned by International Paper Realty Corporation. In 1983 property was acquired by Zygfryd B. Wolloch from International Paper. The property was enrolled in the Use Value Appraisal Program for Forest Land in 1987. The property was removed from the Use Value Appraisal Program for non-compliance of the requirement of annual submittal of a conformance report in 1998.

The children of Zygfryd wanted to honor their parent's wishes that the land be protected. In 2016, they sold the property to the Vermont Land Trust with the understanding that VLT will sell a Legacy-funded easement to the state and then market the property as a timberland investment parcel.

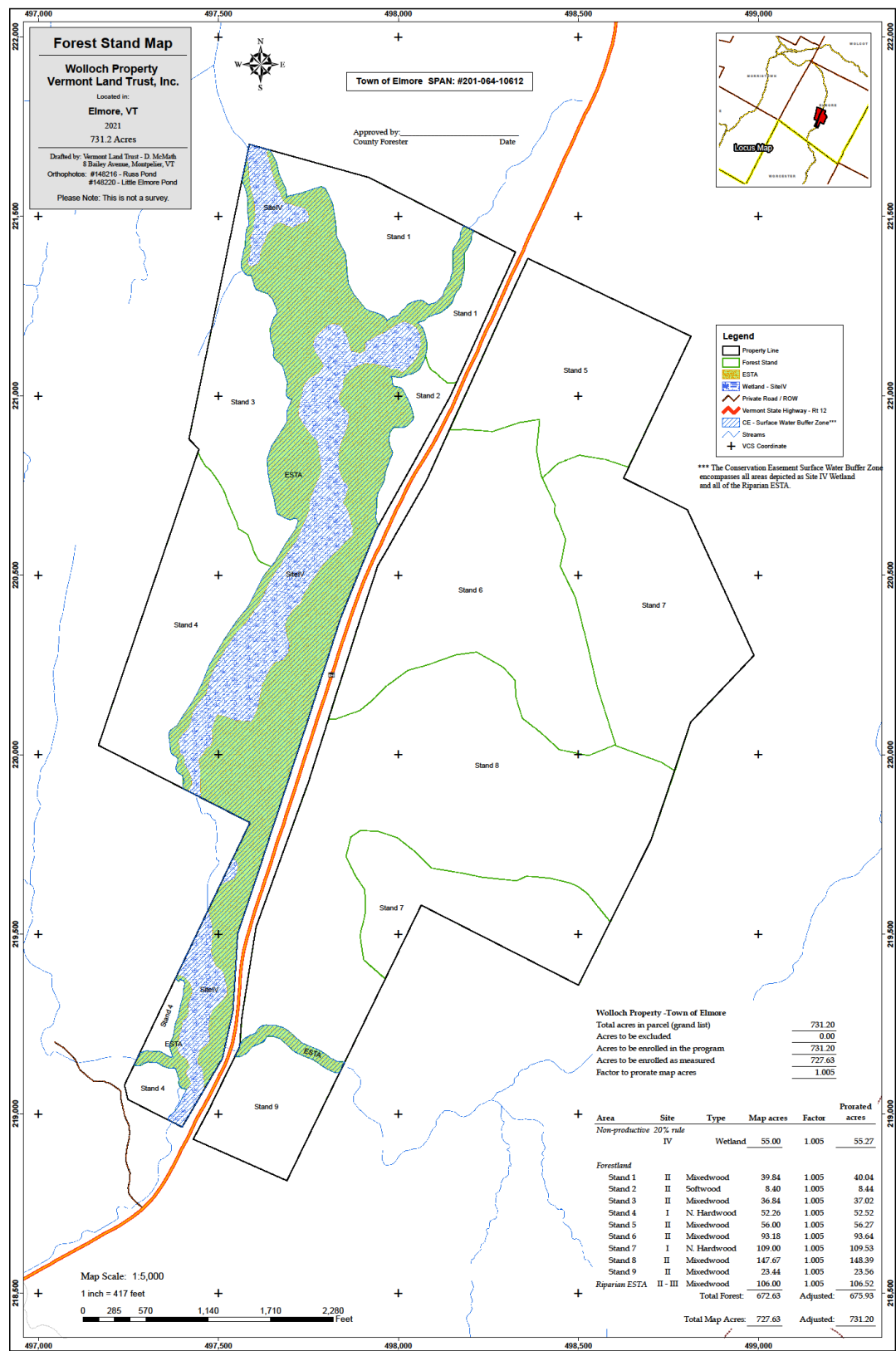
General Description of Property

The Wolloch property stretches over approximately 730 acres of forested slopes, an extensive headwater wetland complex, an early reach of the North Branch of the Winooski River, and other perennial streams on both sides of Route 12 in the Town of Elmore, situated in southeastern Lamoille County. Under the shadow of Elmore Mountain to the north, the eastern slopes of Mt. Worcester to the west, crossing the North Branch of the Winooski River along Rt. 12, to the western / southern slopes of Hardwood Flats hill, the land includes hydrologic, wetland, wildlife habitat, and natural community features (see Map 1). Rolling topography, streams, and wetlands all lie in a matrix of largely intact northern hardwood, and mixedwood forest. The parcel is divided by Route 12, the portion of the parcel located west of Route 12 supports a large wetland associated with the North Branch of the Winooski River. Across Route 12 to the east is sloping topography that was once agricultural land. The ironically named Hardwood Flats Hill is the dominant feature in the northeast corner with a ridge running to the south. The topography is defined by the North Branch of the Winooski River on the west side of Route 12. Land slopes up from the wetlands and river creating a bowl-like drainage pattern into the Winooski River. Elevations range from 1840' above sea level (asl) atop an unnamed ridge to 1220' asl where the river leaves the southern property boundary.

The overall stocking of the forest is medium to high with a range of tree quality. Stands on this ownership are overall even-aged, two-aged with small areas of uneven-aged. Species composition varies and is as a result of past harvesting and site quality. Better quality soils (sites) support a higher percentage of sugar maple, yellow birch, white ash and black cherry. Other areas support a higher percentage of red maple, spruce and fir. There has been no harvesting for the past 25 years and thinning opportunities exist across the ownership.

The property is in the eastern side of the Northern Green Mountains biophysical region adjacent to the Northern Vermont Piedmont biophysical region. The Green Mountains are part of the Appalachian Mountain chain that extends from Alabama north to Québec. The extensive, unfragmented forests of this region provide habitat for many species of wildlife that thrive in remote, interior forest conditions. Looking at surrounding ownership patterns, the property fits into a large block of other public, conserved and private properties. The property is on the eastern flanks of the Worcester Mountain range close to a relatively natural and unfragmented forest corridor. Of note is the CC Putnam State Forest to the south. The C.C. Putnam State Forest is the fifth largest State Forest in Vermont. Most of the 13,633-acre forest consists of one contiguous parcel 12,855 acres in size. The unique feature of this State forest is a total of 4,014 acres designated as Natural Area and left alone to grow. To the west the property is bordered by the former Atlas Property, a working woodlands ownership that is protected by a Vermont Land Trust conservation easement and a Forest Legacy easement. To the south is a 5,742 acre parcel of conserved working woodland. Its conservation advances the effort to conserve landscape connectivity and wildlife habitat corridors within large forested blocks in the Northern Appalachian ecoregion.

MAP 1 – Forest Stand Map



Access

The property has multiple legal access points via Rt 12 as well as a legal right-of-way (ROW). Landing sites used for past harvesting are found along Route 12, and can be reused with minor upgrades. Suitable locations for additional landing sites are somewhat limited by the topography along the highway. Access to the ownership west of Route 12 is restricted by wetlands and the North Branch of the Winooski River. A deeded ROW is located at the southern end of the property across the former Atlas Property. Near the northern boundary, the wetlands are intermingled with runs of well drained soils and harvesting access is possible under frozen conditions. The central and southern area, approximately 100 acres, have little option for access from Route 12 without skidding toward the north line and then across to Route 12, with a total distance of well over 1 mile. Within the woodland, old skid roads are evident in some locations. Many of these trails can be reused, however, there are sections located in poorly drained areas or down the fall line of a slope that would not be suitable for future use.

Property Lines

A comprehensive GIS mapping and ground checking with a Trimble sub-meter GPS unit was completed preparing this project by VLT. The property lines are marked with blazes, wire fence and/or stone walls. The property lines are in fair/good condition. Those boundaries in common with Atlas Timberlands Partnership and the Wesoloski's parcel have been maintained within the past 10 years and are in good condition. From Wesoloski's common northwest corner evidence becomes fair, with scattered barbwire and healed over blazes, though evidence was found on corners. The northern line, east of Route 12 consists of old blazing and faded blue paint.

Monitoring and Updating the FSP

Since the purchase, VLT staff have been the primary personnel in charge of overseeing the property. Because the property will be sold and there has been no active management, monitoring to date has focused on checking for unauthorized ATV usage, overall recreation usage, property line maintenance, general forest health and invasive species. The existing Forest Management Plan that meets the Current Use Program requirements was written in 2016 and will need to be updated again until 2026. This Forest Stewardship Plan is a comprehensive amendment to the currently approved Forest Management Plan. The purpose of the amendment is to meet the requirements of the Forest Legacy Program.

Resources Elements

Soil and Water Quality Protection

Preventing soil erosion and maintaining clean water are fundamental to forest management. Forestland plays an important role in providing clean water. More than 50 percent of the nation's freshwater resources originate from forests that cover about one-third of the United States. In addition to providing clean water, forests also absorb rainfall, refill groundwater aquifers, slow and filter storm water runoff, reduce floods and maintain watershed stability and resilience. The State of Vermont took a proactive approach to protecting water quality and soil in 1986. The Vermont Legislature passed amendments to Vermont's water quality statutes, Title 10 VSA Chapter 47: Water Pollution Control, which stated, "It is the policy of the state to seek over the long term to upgrade the quality of waters and to reduce existing risks to water quality." The "Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont"

(AMPs) first came into effect on August 15, 1987. The purpose of the AMPs is to provide measures for loggers, foresters, and landowners to utilize, before, during, and after logging operations to comply with the Vermont Water Quality Standards and minimize the potential for a discharge from logging operations in accordance with 10 VSA. §1259. All future harvesting on the protected property will meet or exceed the current State required AMPs.

Bedrock and Soils

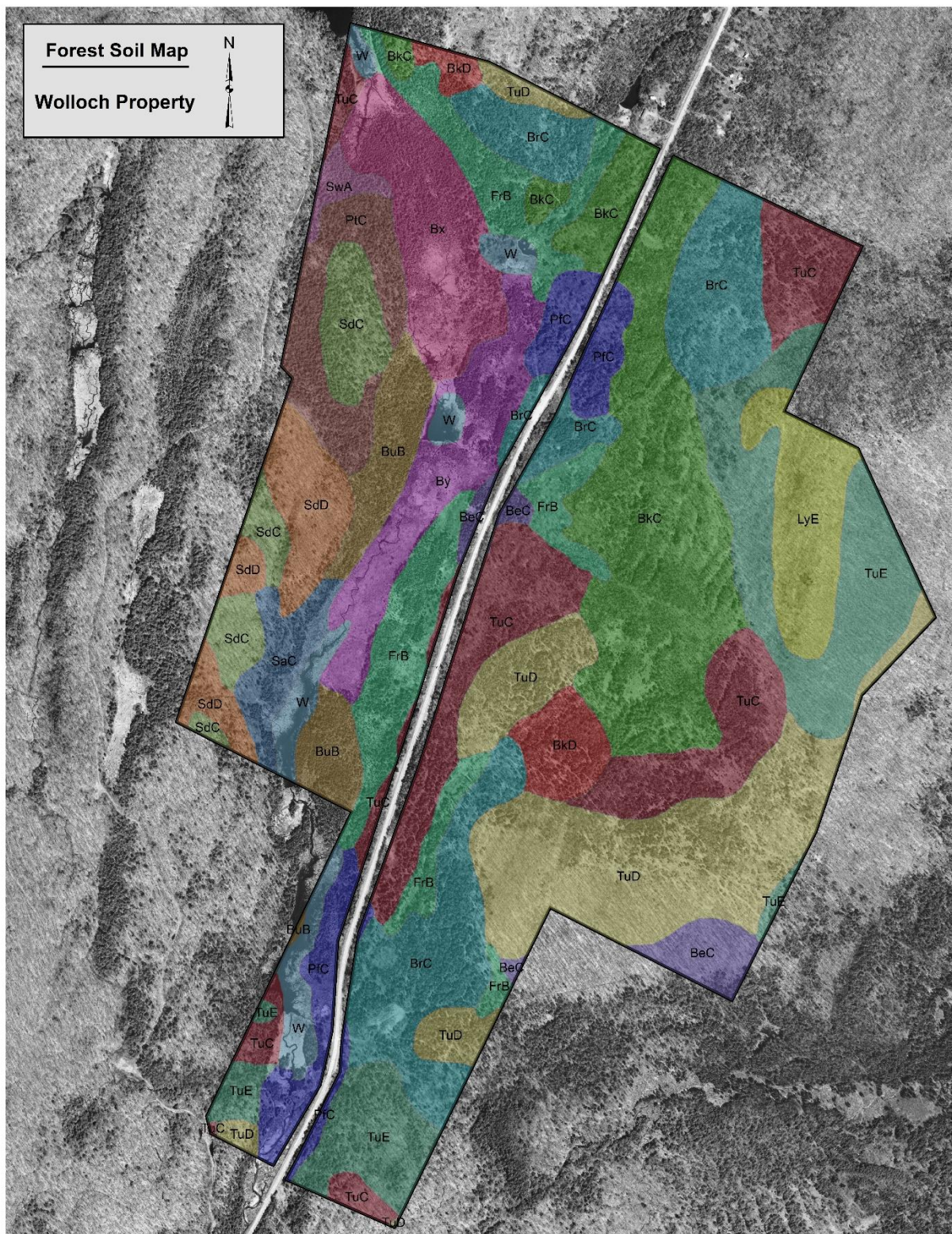
Identifying bedrock and soil characteristics are important in understanding the complex variation in flora and forest patterns and critical to forest management. Bedrock determines topography at both the site and broader landscape scales. Bedrock eventually breaks down into soil, which makes mineral nutrients available to plants and can determine natural community type.

Groundwater in contact with bedrock can also bring dissolved mineral nutrients to the surface. One bedrock formation, the Moretown Formation, has been identified across the ownership. This bedrock type ranges from relatively nutrient-poor schists and granitic bedrocks, which support plants and plant communities more tolerant of acidic conditions, such as spruce-fir forests and bogs, to limestone rich with higher amounts of calcium and magnesium. The soft limestone readily releases nutrients that support plants and plant communities such as rich fens and rich forests. Surficial geology and soils provide immediate substrate for plant growth and the mineral content, texture, pH and depth all contribute to plant community distribution. The predominant surficial geology on these properties is glacial till, a highly variable substrate, and wet areas of peat and muck.

Soils are formed by the interactions among parent material, climate, vegetation, slope, time, and human impact. Depending on these interactions and on physical, chemical, and biological properties, many different soils may form. The soils of Vermont have largely been developed by a series of up to 20 glacial episodes starting at the beginning of the Pleistocene era 1.8 million years ago and ending most recently at the close of the last ice age approximately 10,000 years ago. During the most recent period, the Wisconsinan glaciation, ice covered most of Canada, extending to Seattle, Chicago, and New York City. New England was completely covered by ice that exceeded one mile in depth and overrode all the mountains of Vermont and New Hampshire. Glacial recession and melting over the bedrock allowed for the deposits of deep glacial tills seen today. During this time, many of the fine textured sands, silts, and clays were deposited that make up the fertile farmland important to this area.






Eighteen different types of soils have been mapped on the property (See Soil Map 2). Soils are mostly loams, and wetland soils. Generally, softwood species grow well on these wetter soils. The soils offer a mix of sites for softwood and hardwood species. Growth rates based on soil quality vary, but overall are very good. Erosion is a hazard for most the soil types and future harvesting should be under frozen conditions or during a very dry summer.

MAP 2 – Forest Soils



Legend for Soil Map

Legend

| | |
|---|---|
|  | BeC - Berkshire fine sandy loam, 8 to 15 percent slopes |
|  | BkC - Berkshire very stony fine sandy loam, 8 to 15 percent slopes |
|  | BkD - Berkshire very stony fine sandy loam, 15 to 25 percent slopes |
|  | BrC - Berkshire-Tunbridge fine sandy loams, rocky, 8 to 15 percent slopes |
|  | BuB - Boothbay silt loam, 3 to 8 percent slopes |
|  | Bx - Borochemists, deep |
|  | By - Borochemists, moderately deep over loamy substratum |
|  | FrB - Cabot silt loam, 0 to 8 percent slopes, very stony |
|  | LyE - Lyman-Tunbridge-Rock outcrop complex, 25 to 60 percent slopes |
|  | PfC - Peru fine sandy loam, 8 to 15 percent slopes, very stony |
|  | PtC - Potsdam silt loam, 8 to 15 percent slopes |
|  | SaC - Salmon very fine sandy loam, 8 to 15 percent slopes |
|  | SdC - Salmon variant-Salmon very fine sandy loams, rocky, 8 to 15 percent slopes |
|  | SdD - Salmon variant-Salmon very fine sandy loams, rocky, 15 to 25 percent slopes |
|  | SwA - Swanville silt loam, 0 to 3 percent slopes |
|  | TuC - Tunbridge-Lyman complex, 8 to 15 percent slopes, rocky |
|  | TuD - Tunbridge-Lyman complex, 15 to 25 percent slopes, very rocky |
|  | TuE - Tunbridge-Lyman complex, 25 to 60 percent slopes, very rocky |
|  | W - Water |

Surface Water Resources

In addition to the North Branch of the Winooski River several perennial streams drain to the Winooski from the east (Barnes Brook) and west (unnamed). Special note is a small wetland found in the northwest corner of the property associated with Little Elmore Pond. The small wetland and associated streams are at a watershed divide and flow north into Little Elmore Pond, not southerly as the other drainages. The hydrologic features found on this ownership provide a variety of breeding and feeding habitats for a range of wildlife species and are ecologically important.

Protection of the ecological functions of the water resources will be given the highest priority. Those areas lying within 50' of each bank or shore of rivers, streams, ponds and wetlands are designated as Surface Water Buffer Zones ("SWBZ") in the conservation easement and enrolled in the Riparian Ecologically Significant Treatment Area (ESTA) category in UVA (See Forest Stand Map 1). Buffer zones provides an array of ecological benefits including, but not limited to:

- i. Protecting aquatic and wetland habitats,
- ii. Protecting water-quality,
- iii. Protecting terrestrial habitats and wildlife travel corridors, and
- iv. Providing organic matter, nutrients, shade, and large diameter coarse woody debris for the benefit of wetland, riparian, and aquatic systems.

Given the importance of these buffers, there are no plans to do any harvesting within the 50' buffers at this time. Any future harvesting must take into account the potential effects of such activities on water quality and the plant and wildlife habitat associated with such areas. When it is necessary to cross a stream the number and width of stream crossings within the SWBZ shall be the minimum number reasonably necessary and shall include the installation of all erosion control devices and employ, at a minimum, the AMPs.

Recreation and Aesthetic Quality

The property is open to public access for all types of non-commercial, non-motorized, non-mechanized, non-equestrian dispersed recreational purposes (including but not limited to bird watching, skiing, fishing, hunting, snowshoeing, trapping and walking). Under the terms of the conservation easement, public access for these activities is required.

Aesthetically, the terrain varies from gently sloping and poorly drained, to moderately well drained slopes, and hilltops. The features on the property that travelers can see along Route 12 are a pleasing, rolling terrain with hardwood and softwood trees in the canopy. The management prescribed in this plan will not alter the aesthetic of the property in terms of long-range views, as it maintains a more or less continuous forest cover.

Wildlife and Fish Habitat

Enhancement and protection of wildlife habitat is an objective that compliments silvicultural objectives on the property. In general, a more diverse flora means a healthier and more diverse fauna will be present. Wildlife habitat is the combination of four factors that are necessary for a species to survive: water, food, cover, and distribution. The property offers a variety of desirable habitat components utilized by many species. Important habitat components found on this property include; a large un-fragmented block of forestland, a mix of softwood and hardwood

tree species; wetland areas; intermittent drains, streams, and seeps; small open areas/edge community (old log landings) and hard and soft mast trees.

Large un-fragmented, undeveloped landscapes including a diversity of features (forest, wetland, stream, cliff, etc.) are essential for supporting robust populations of large animals such as black bear, bobcat, moose, and fisher. They also provide undisturbed forest interior habitat for a variety of songbirds, including the wood thrush, eastern wood-pewee, blue-headed vireo, white-throated sparrow, and several warblers. Landscapes that support the larger-scale movements and life cycles of these ‘umbrella’ species also support healthy populations of small mammals, reptiles, amphibians, and insects. These ‘porous’ landscapes have few barriers to animal movement.

The property lies in the southwestern part of the Staying Connected ‘Worcester Range to Northeast Kingdom’ linkage area, which encompasses nearly 1 million acres and three distinct biophysical regions. As previously mentioned the property lies adjacent to approximately 15,650 contiguous acres of conserved land, including the CC Putnam State Forest, former Elmore Atlas Timberland, Deer Lake and Elmore State Park: together, one of the larger blocks of intact forestland within this regional linkage area.

The forest has a diversity of hardwood and softwood species typically found in the northern climates. This diversity offers a range of habitat and food sources to a wide range of species. The current hardwood and mixed-wood forest conditions are suitable for a variety of birds, including ground and canopy nesters and foragers. Management of habitat attributes will occur with consideration of this larger landscape context. Across the ownership, management will strive to enhance interior forest conditions by creating multiple canopy layers and different age classes. Uneven-aged management is recommended to maximize different bird habitat requirements.

Wetland areas – Wetlands are vegetated ecosystems characterized by abundant water. Wetlands form essential habitat for animal species of all taxa and support many of our rare and uncommon plants and animals. They also provide important wildlife habitat and spawning and nursery habitat for fish species. These diverse and sensitive areas can serve as stream headwaters or localized water sources for their immediate surroundings. Wetlands also serve as reservoirs and contribute to a landscape’s flood resilience by catching water during times of heavy rainfall. Vermont’s wetlands range from small vernal pools and seeps to vast swamps and marshes covering large areas. There are mapped Class 2 wetlands on the property found on the State Wetlands layer that correspond with the Surface Water Buffer Zones (SWBZ), labeled Wetland/Riparian ESTA on the Forest Stand map. These wetlands are ecologically sensitive areas with organic, saturated soils and often have higher botanical diversity than surrounding upland areas. Sometimes they are small, in slight depressions, while in other places they are more extensive, such as along the numerous brooks and streams that pass through the property.

Fish habitat - The ecological integrity of an aquatic system is dependent on the condition of the watershed in which it occurs and the condition of the adjacent riparian area. The riparian habitat found along the North Branch and perennial streams provide a travel corridor, a water supply, and a food source for predators of amphibians, invertebrates, and small fish. These areas are important to a variety of wildlife. Many species, including beaver, otter, muskrat, star-nosed moles, and water shrews, spend their entire lives within riparian areas. Other large mammals use

riparian areas for cooling and foraging and as travel and habitat-connecting corridors. Surface Water Buffer Zones (SWBZ) as outlined in the conservation easement, (shown on Map 1 as the Site IV wetlands and the Riparian ESTA for Current Use) require vegetated buffers that will protect the buffer values articulated above and allow large trees and snags to fall naturally into rivers to provide critical cover and habitat for fish.

Small areas of *open/early successional/edge habitat* created from log landings and previous agricultural use offer habitat that is important to a variety of plant and animal species. Herbaceous vegetation found within these areas is an important spring and summer food source for grazers such as deer and hare. Openings provide nesting sites in shrubby growth, a high density of insects for forage, and cover from prey for songbirds, including the chestnut-sided warbler and the song sparrow. This habitat is also critical during the post-breeding season. Fruits such as blackberry, raspberry, elderberry, and cherry are often prolific in these areas, as are insects and other arthropods. Many songbirds feed on these resources to help provide them with the energy needed for the long fall migration. In addition, particularly for juvenile birds, the high density of saplings, shrubs, and herbaceous vegetation provides excellent concealment from potential predators. Raptors, foxes, coyotes, and other predators are drawn to these openings because of the increased population of rodents and other prey. These areas can be maintained by periodic mowing or chainsaw work to start the forest succession process over. In addition to maintenance of the existing early successional habitat, new areas can be created within the forested acres. For example, targeting areas with a high percentage of mature poplar will serve the dual purpose of creating early successional habitat and encouraging the poplar to sprout. Poplar sprouts are preferred forage for grouse. No large openings (greater than 3 acres) were found on the ownership but numerous old landings are scattered throughout the ownership. If possible, old landing areas should be kept in an early successional state to benefit wildlife.

On this property, *soft mast* noted includes wild apple, highbush cranberry, blackberry, raspberry and elderberry. Fruits and berries provide high energy in the form of sugars and carbohydrates and are usually available through the summer and fall. If resources are available, apple trees can be released/pruned when found. In addition, skid trails and openings created by recent harvesting are likely to first regenerate to berry bushes (raspberry and blackberry).

Hard mast includes seeds and buds from a variety of species including beech, yellow birch, oak and hophornbeam. Seeds from hophornbeam and yellow birch provide an important food source during the winter months for wild turkey, deer and grouse. The light seeds tend to fall during the mid-winter period when snow depths prevent access to other food sources. Beech trees produce beechnuts on a 2 to 8-year cycle after reaching the age of 40-60 years. Beechnuts provide an important source of hard mast in the fall as black bear ‘bulk up’ for the winter. Unfortunately, with the prevalence of beech bark disease in our forests, healthy mature specimens are few and far between. Individual beech trees which show resistance to beech bark disease will be retained through future harvests. Wildlife that can be expected to benefit from increase in hard mast includes bear, grouse, turkey, squirrels, chipmunks, fisher, fox, rodents and deer. All bear-scarred beech have been retained in harvests conducted during this ownership and will continue to be reserved from harvests. In addition, as discussed elsewhere in this plan, beech trees that show resistance to beech-bark disease (smooth-bark beech) will be retained.

The following wildlife management activities are suggestions for the property:

- Consider maintaining and enhancing any early successional habitat found through periodic (every 3–5 years) brush hogging, leaving small coppices of shrubs within the open area.
- Consider silvicultural options that will establish openings of up to 2-acres within the forest, for example areas which have a high percentage of poplar, to promote sprouting.
- Release and protect wild apple trees when found.
- Retain and promote the establishment of mast producing species including yellow birch, beech, hophornbeam and black cherry.
- Retain beech trees that show resistance to beech bark disease or have evidence of past use by feeding bears. Potential areas are located throughout the ownership.
- Promote vertical and horizontal structural diversity and create multiple age classes to preserve a variety of forest habitats which will enhance species richness.

Threatened and Endangered Species

A rare species is one that has only a few populations in the state and that faces threats to its continued existence in Vermont. Rare species face threats from development of their habitat, harassment, collection, and suppression of natural processes, such as fire. The Vermont Fish and Wildlife Department uses a ranking scheme that describes the rarity of species in Vermont. The range is from S1 (very rare) to S5 (common and widespread). Species are assigned a rank based on the number of known occurrences, the population size, and the degree to which the populations are threatened. For example, creeping juniper and lake sturgeon are S1 species, whereas sugar maple and raccoons are S5 species. Using this system, biologists and other experts assign an S1 rank to a species when it occurs in five or fewer populations in the state and/or when the species is threatened with extinction. Rare species with six to 20 populations are given an S2 rank; threats are also considered. Species with 21 to 100 populations are assigned a S3 rank and are generally considered to be uncommon or a watch-list species. The Vermont Non-game and Natural Heritage program (NNHP) part of the VT Fish and Wildlife Department, maintains an inventory of Rare, Threatened and Endangered (RTE) species in Vermont. In 2016 Allaire Diamond, VLT Conservation Ecologist, completed an ecological assessment of the area. Her report findings do not list any RTE species, but do include the following: in the northwestern corner, an open wetland with a population of the uncommon plant water bur-reed (*Sparganium fluctuans*) above Little Elmore Pond. Farwell's Water Milfoil is found in Little Elmore Pond. Over a gentle watershed divide south of this wetland, a broad, gently sloping basin holds a complex of open, shrub, and forested wetlands surrounding the North Branch and its tributaries. Shallow Emergent Marsh and Alder Swamp alternate with beaver-dammed ponds and softwood swamps, including a 20 acre +/-, state-significant area of Red Spruce-Cinnamon Fern Swamp / Spruce-Fir-Tamarack Swamp. Lowland Spruce-Fir Forest occupies the slightly higher areas of the basin. All of the wetland communities along this brook are interspersed and grade into each other. (See Map 3).

The following list is of Rare or Uncommon species that have been documented in the area, but not found on the property. Although not found within the Wolloch Property, these species may be present. Species include; Prickly hornwort, Lesser bur-reed, Dwarf mistletoe, Trailing stitchwort, Northern mountain-ash, American ginseng, Branching bur-reed, Small bedstraw, Boreal bedstraw, Blunt-leaf pondweed, Water-milfoil, Boreal bentgrass, Farwell's water-milfoil, Vasey's pondweed, Water bur-reed, Bog wintergreen, Pod-grass, White water-crowfoot, White adder's mouth, Lesser bur-reed, Handsome sedge, Rock-cress, Smooth woodsia, Hill's

pondweed, Straightleaf pondweed, Fries' pondweed, Ogden's pondweed, Purple clematis, Fragile rockbrake, and Large yellow lady's slipper. If RTE species are found on the property during future inventories, management will adapt to ensure protection of the resource.

Forest Health

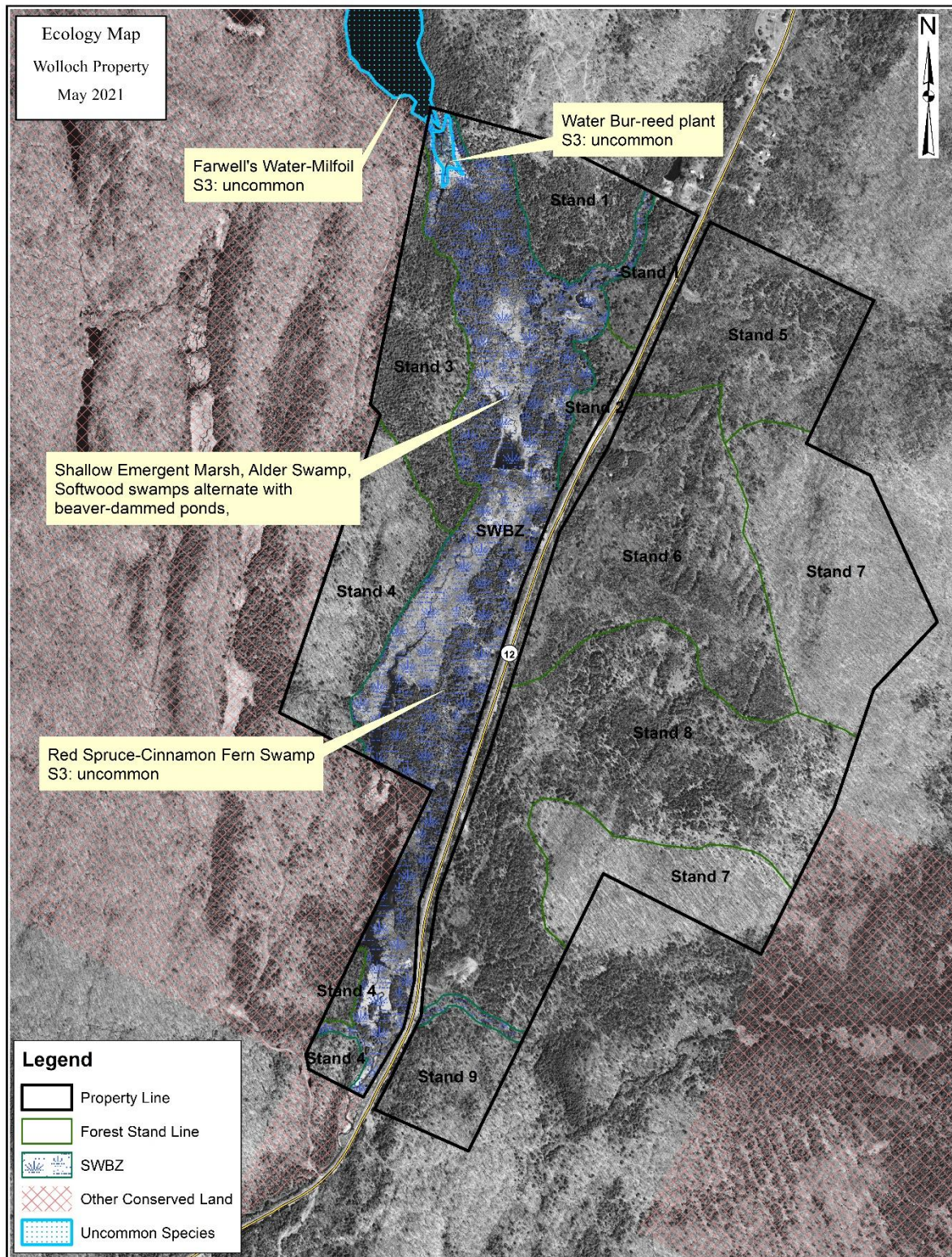
A healthy forest is the primary objective of management. Without a healthy forest, all other goals and objectives will be difficult to achieve. A healthy forest does not simply mean healthy trees. A healthy forest is an ecosystem that is able to support a wide variety of life and has sustainable nutrient, water, and life cycles. The trees on the property are relatively free of disease and insect problems. No uncommon pathogens were noted however, four specific diseases/pests noted on the property include:

Sugar maple borer - This insect affects sugar maple trees that are stressed from overcrowding or suppression in the understory. Damage is caused by the larvae of the insect as it feeds under the bark creating a ridged wound across the main stem. While this rarely kills the trees, it severely degrades timber quality and overall value of the tree. The best defense against the pest is to remove infected trees during associated work and maintain stocking levels that allow for optimum growth and vigor.

Eutypella canker - This canker is associated with a fungus that attacks pole and sawtimber sized maples. All maple species are affected, though sugar maple is the most common host. Once infected, the pathogen remains in the tree for many years, developing a large concentric, calloused canker that severely deforms the tree, often giving the affected portion of the stem a humped or cobra head looking form. The canker not only reduces timber quality but, like sugar maple borer, also creates a weak point, which can lead to stem breakage. The most effective control of this pathogen is harvesting infected trees from the stand to remove the source of inoculum and limit spread of the disease. As with most pathogens, the best defense is also to practice sound management that maintains a vigorous stand.

Beech bark disease - This disease is an insect/fungal association. The beech is first infected by a very small scale insect bores into the bark and exudes a white waxy substance that covers the insect and is readily visible to the naked eye on the tree. In a few years, the fungal associate of this disease complex enters the tree through the feeding wounds created by the insect. This fungus produces small red fruiting bodies that mature in the fall. Over time, a pock-marked appearance develops on the stem where callus tissue is produced to wall off the points of infection. As the fungus spreads it disrupts the vascular system of the tree. Mortality is slow and can take several years to a decade or two. The stress caused by this disease makes infected trees susceptible to attack from other diseases and forest pests. Some research indicates that extreme cold will kill the scale insect, which may explain why disease-free beech can be found in colder pockets. No control measure for this disease is known at this time. Diseased beech may be removed from the stand during associated treatments. Clean, healthy beech will be retained to the greatest extent possible.

MAP 3 - Ecology Map



Emerald Ash Borer - Emerald ash borer has been confirmed in Orange, Orleans, Washington, Caledonia, Bennington, Grand Isle, and Addison Counties in Vermont, and it's likely that additional confirmations will be made in the coming months and years. Emerald ash borer was first discovered in the Detroit, Michigan area in 2002, though it is believed to have arrived in the 1990's. EAB is now known to be established in 32 states and three Canadian provinces. The beetle is about one-half inch long and metallic green. Its larvae tunnel through the wood just under the bark of ash trees, killing the tree by cutting off the flow of nutrients. Healthy ash trees can die within 1-4 years of showing their first sign or symptom. All species of ash trees are susceptible. Emerald Ash Borer (EAB) evidence has not been found on the property yet, but we expect it to be found within the next 10 years. Ash is not a big component of the ownership (2.7% of the BA) but white ash is an important species on the landscape and important to the biodiversity and climate resiliency of this forest. To maximize opportunity for keeping ash on the landscape, where ash is being harvested an attempt will be made to regenerate it. Future harvesting will be done primarily using small canopy gap formation (0.2 – 0.5 acres) to promote establishment and recruitment of a new generation of ash into the main canopy. Gaps should be anchored on one or more female ash trees for seed dispersal (gender will need to be identified). Due to timing of flower development, more male ash trees should be retained (perhaps at a 5:1 ratio) to increase likelihood of female flower pollination. Additional information on EAB can be found at <https://vtinvasives.org/land/emerald-ash-borer-vermont>.

Invasive Species

Perhaps the greatest threat to forest health on the property comes from invasive species. Over forty percent of the endangered and threatened species in the US have declined, in part, due to invasive species and 18% owe the entirety of their decline to invasive. The woody invasive most common to the area are honeysuckle, non-native common reed (*Phragmites australis*), Japanese knotweed, buckthorn, and barberry. These are highly invasive species that can take over portions of the understory from native plants (greatly limiting long-term development of the stand), and thrive in open sunlight common to stand openings and edges. Invasive plants should be cut or pulled if they are encountered in the woods or open areas in the future. Japanese knotweed has been found in small amounts along the Winooski River, several patches honeysuckle and a small area of *Phragmites* was found during the cruise. Most of the honeysuckle was pulled when found. Due to the fact that the *Phragmites* is found in a wetland, options are being explored for removal. Ongoing monitoring continues and special attention is paid to the open areas, trails, and wooded edges, typical places where invasive plants gain a foothold.

Biological Diversity

Biodiversity refers to the range of life forms and species that exist within a given ecosystem and the ecological roles they perform. Forest biological diversity encompasses not just the trees but all of the plants, animals and micro-organisms found in the forest. Beyond species biodiversity are the complex interactions among and between species and the natural communities and ecosystems they form. It is useful to think of biodiversity on three levels: species diversity, genetic diversity and ecosystem diversity.

In managing the forest, the following will be considered in conjunction with the silviculture management;

- The overall goal is to move towards an uneven-aged system with 3 or more age classes. The goal over time is to retain a mix of age classes when possible as well as a diverse mix of species.
- Increase the number of potential snags (i.e., standing dead and dying trees) and large downed trees.
- Protect and retain important wildlife habitat features.
- Conserve native tree and plant communities. Management will always strive for a diversity of tree species but will be predominately northern hardwood species. On the less rich and poorly drained sites, the primary species managed for will be softwood species including spruce and balsam fir.
- Retain and promote mast production for wildlife.
- Protect aquatic and riparian areas by enrolling them in the Riparian ESTA category of Current Use.

Structural Diversity

A structurally diverse forest promotes biodiversity and climate resilience. For practical implementation, this means extending rotation periods, retaining trees with microhabitat features, increasing standing dead trees (snags) and downed woody material.

Snags - Standing snags provide important benefits for wildlife, including nest cavities, dens, concentrated prey, microclimate conditions, perches, and pathways for movement. These habitat elements tend to be lacking in forests that are heavily managed for timber or that were recently agricultural land and can take many years to reestablish. Current recommendations suggest retaining or recruiting a minimum of four secure snags or cavity trees per acre. These should include a diversity of diameters and sizes ranging from 5 to 6 inches to over 24 inches. Ideally, on each acre one snag over 24 inches should be retained or developed. Although snags are not present in these numbers on every acre, management will work to provide them over time.

Downed woody material (DWM): A study conducted in Maine found that DWM was important for food, cover and nursery habitat to 20% of the bird species, 50% of the mammals, 44% of the amphibians, and 58% of the reptiles found in the state. The ideal target will be to have three to five stems at least 18 inches in diameter and 10 stems at least 14 inches in diameter per acre. All should be at least 16 feet long. Recruitment of DWM will take time over many decades. Material can be recruited as part of harvesting activity by leaving and/or girdling large diameter, low quality trees. In addition, it is unrealistic to expect to meet large diameter goals in stands that naturally have smaller diameters, such as high elevation and softwood stands. Snags that are felled in tapped areas for safety reasons will be left on the ground to serve as additional DWM in these areas. Targets for snags and down woody material are based on those found in the 2015 publication *Voluntary Harvesting Guidelines for Forest Landowners in VT*. Future silviculture and harvesting will factor in practices to enhance structural diversity.

Cultural, Archeological, Historic resources

The property has a long history of timber management, as well as agricultural uses. The town of Elmore was incorporated just before the turn of the 19th century, and shortly thereafter logging became one of the area's most important industries, according to the Elmore Historical Society. The Historical Society website states "the earliest and main businesses of Elmore were

associated with lumbering.” Logging peaked in the area around the 1880s, with more than 10 sawmills operating within or immediately adjacent to the ownership. The population of the entire town of Elmore peaked at about 680 people, coincident with the peak of the timber industry in 1880. The peak of the timber industry was followed by a swift downturn, as the area had been almost completely stripped of its trees. A 1906 article in the local newspaper, *The News and Citizen*, remarked that “logging is getting to be a thing of the past in Elmore.” The mills began to close, and people left the area in search of employment elsewhere. As the timber industry waned, farming became the main source of income for the town, especially on the fertile soils close to Lake Elmore. Around this time and because of the excessive logging, damaging fires led to the construction of the fire tower atop Mount Elmore. By the beginning of the 20th century, much of the northwestern portion of the property was likely devoid of trees.

The ownership contains artifacts of its human history still visible on the landscape. Cellar holes and a barn foundation were found, stone piles from field clearing as well as some stone walls, and old apple trees. The cultural features will be buffered from timber harvesting activities and stone walls will be avoided to the greatest extent possible when transporting felled trees and laying out skid and access trails.

Today the forest is primarily two-aged with a range of stocking levels. Generally, it is comprised of an older residual age class, with a sapling/pole size understory and very scattered early successional areas.

Carbon Sequestration and Climate Resilience

Carbon stocks and climate resilience go hand in hand. Managing forest carbon stocks is critical for mitigating increasing atmospheric carbon dioxide concentrations that are responsible for changing climate conditions. In the northern hardwood forest, climate change is poised to change practices within the maple syrup industry, spread wildlife diseases and tree pests, and change timber resources. Land use decisions can have a profound impact on carbon stocks and mitigating the effects of climate change.

Forest conversion is one of the greatest threats to mitigating climate change. Forest conversion means not only a loss of carbon sequestration and storage but also a loss of all forest benefits, such as clean water and air. Having this ownership under a future perpetual Conservation Easement ensures that converting the forest to a non-forest use will not happen.

Forest management decisions can also have big impacts. It is difficult to know just how our changing climate will alter the forests of this property. With that in mind, the mantra for management will follow Aldo Leopold, who said, “To keep every cog and wheel is the first precaution of intelligent tinkering.” There are three ways to adapt to the changing climate when managing a forest and those are through promoting resistance, enhancing resilience, or working towards transition. Strategies that promote resistance and resilience help the existing forest survive better under the new climate regime. Transition, or response, strategies work to accelerate changes in the forested ecosystem to bring it to a state that more closely reflects what we expect in the future.

The problem with climate change adaptation planning is it is hard to predict and plan for all eventualities, which makes it hard to pick a future scenario on which to base management decisions. Resilience strategies will be utilized more often than not on this property, as they should result in a forest that is diverse enough to survive, regardless of the actual climate. That will involve doing things like maintaining or enhancing structural diversity. In layperson's terms, that means keeping the widest variety of growth forms in the forest. Management will promote big trees and small trees, young and old trees, tall trees and short ones, hardwoods and softwoods. But, a forest is not just trees so we will make plans for maintenance or enhancement of shrubs, ferns, grasses and herbs, where appropriate. There will be healthy, straight, tall trees for timber and other trees with holes for wildlife and dead snags to be used as perches for hawks. Standing trees will obviously be our preference, but we will also work to have dead, down trees to serve as habitat for insects, detritivores, and salamanders. Those same down trees will help maintain nutrient balance and water quality. The maintenance or enhancement of species diversity is also important. We don't want a simplified forest, we want a complex one. The holistic approach of this stewardship plan is to maximize the ecosystem services into the future while still meeting the economic realities of modern timber and sugaring operations.

Fire

The risk of naturally occurring fire on the property is relatively low. Historically, the area was impacted by fires, but that was the result of poor harvesting practices. With numerous access points off Route 12 and natural firebreaks (wetlands), if a fire did start containment would be possible. If fire was to occur, the local fire department would be contacted. There is no plan to use prescribed fire as a management strategy at this point.

Agroforestry

The USDA acknowledges five types of agroforestry; alley cropping, silvopasture, windbreaks, riparian buffers, and forest farming. The activities intended for this property are classified as forest farming; the harvest of crops below the forest canopy. While the primary focus is forest products, the owner may explore other non-timber forest products on a much smaller scale. This may include various mushrooms, nuts, berries, and herbs. Any small-scale collection will be of naturally occurring and native plants for which we wish to augment their presence, such as ramps and ginseng. If there is any desire to increase the scale of harvest for other crops in the future, this plan will be updated to acknowledge any unique and specific considerations for these other crops.

Range

Not applicable; this property will remain in a forested state.

Conservation-based Estate planning

Not applicable - This property will have a perpetual conservation easement held by the State of Vermont Department of Forest, Parks and Recreation through the Forest Legacy Program.

Forest of Recognized Importance

Not applicable; only one Forest of Recognized Importance has been identified in Vermont. That is the Marsh-Billings-Rockefeller National Historic Park in Woodstock.

Forest Management Plan Overview

This document is an update to the Forest Management plan done when the property was sold to VLT. Current growth and conditions of the forest were evaluated, and forest stand data were gathered for use in developing silvicultural prescriptions for the remainder of the 10-year planning period (2016–2026). The map of forest stands was adopted from the previous management plan and inventory measurements were made by establishing variable-radius plots using a 15-factor prism. A total of 99 plots were inventoried for development of this plan. Plots were systematically distributed using computer software, with each plot representing approximately 4.2-acres. The collected data were analyzed using a multicruise type processor developed by RJ Turner Company.

At each plot, tree species, dbh, and quality for sawtimber were measured. All overstory trees 5.5 inches dbh and greater were tallied. A tallied tree that did not have a #2 sawlog or the potential to grow into one was considered “unacceptable growing stock” (UGS) for the purposes of forest management. The relative amount of tree regeneration, site quality, and other notable features were also recorded.

A site quality classification system is also employed for this plan to rank the potential for tree growth based on soil conditions. The classes include: Site I – very good potential; Site II – good potential; Site III – fair potential; and Site IV – poor potential. Stands on this ownership are even-aged, or two-aged. Species composition varies and is a result of past harvesting and site quality. Better quality soils (sites) support a higher percentage of sugar maple, yellow birch, white ash and black cherry. Other areas support a higher percentage of red maple, spruce and fir.

Stem quality is generally good/fair. Across the ownership it appears that harvesting which occurred 20 to 30 years ago consisted largely of diameter limit and unregulated cutting. In areas created by selective harvesting, desirable regeneration has not established. Where patch cuts and strip cuts were implemented, regeneration response is good. Species composition in these areas supports a high percentage of softwood species. In both situations, the species composition of the regeneration is due in part to browsing pressure by deer and moose and in part to site quality. Management going forward will focus on establishing new age classes of desirable species that will have the opportunity to develop into high quality forest products. The overarching strategy is to create unevenaged conditions across the ownership. This will take several cutting cycles and may need to use interim evenaged treatments.

The remainder of this plan is focused on describing the forest stands found within the property and outlining further management to take place over the next few years until the property is sold and an amended Forest Stewardship plan is prepared to reflect the new owner’s desires.

STAND 1**40.05 ACRES****TYPE**

Mixedwood Forest

SAMPLING METHOD

Variable Radius (prism) Sampling: BAF 15

Number of Plots for this Stand: 7

Data Collected: 2016

STAND DATA

Natural Community Designation: Red Spruce-Northern Hardwood Forest

Quadratic Stand Diameter: 8.7"

Total Basal Area/Acre (BA): 146 ft²Acceptable Growing Stock Basal Area/Acre: 92.27 ft²

| | Basal Area | | | TPA | | | QMD |
|--------------------|------------|--------------|--------------|------------|--------------|--------------|------------|
| | Total | ags | ugs | Total | ags | ugs | |
| balsam fir | 64 | 33.8% | 10.3% | 232 | 49.0% | 16.6% | 7.1 |
| red spruce | 30 | 10.3% | 10.3% | 59 | 9.2% | 7.6% | 9.6 |
| red maple | 13 | 4.4% | 4.4% | 15 | 4.5% | 1.9% | 12.6 |
| yellow birch | 13 | 5.9% | 2.9% | 23 | 2.5% | 1.8% | 10.2 |
| sugar maple | 9 | 2.9% | 2.9% | 10 | 1.9% | 1.0% | 12.5 |
| hemlock | 6 | 4.4% | - | 4 | - | 1.3% | 16.8 |
| beech | 4 | - | 2.9% | 5 | 1.2% | - | 13.0 |
| white pine | 2 | - | 1.5% | 0 | 0.8% | - | 32.0 |
| aspen | 2 | 1.5% | - | 3 | - | 0.7% | 12.0 |
| paper birch | 2 | - | 1.5% | 2 | - | 0.1% | 13.0 |
| Stand Total | 146 | 63.2% | 36.8% | 354 | 69.0% | 31.0% | 8.7 |

Trees per Acre: 354

Current Volume/Acre: 5.3 mbf & 21.0 cds

MANAGEMENT

Age Class Distribution: Even-aged (2-age classes)

Target Age Class Distribution: Uneven Cutting - Cycle: 20 years

Desired Diameters: SM-20", YB-20", WA-18"

Desired Products: Sawtimber

Skid Distance: less than ½ mile

SITE CHARACTERISTICS

Site Class: 2-3 (field verification).

Soil Type: Berkshire sandy loam, Tunbridge-Lyman complex; Cabot silt loam.

MANAGEMENT STRATEGY

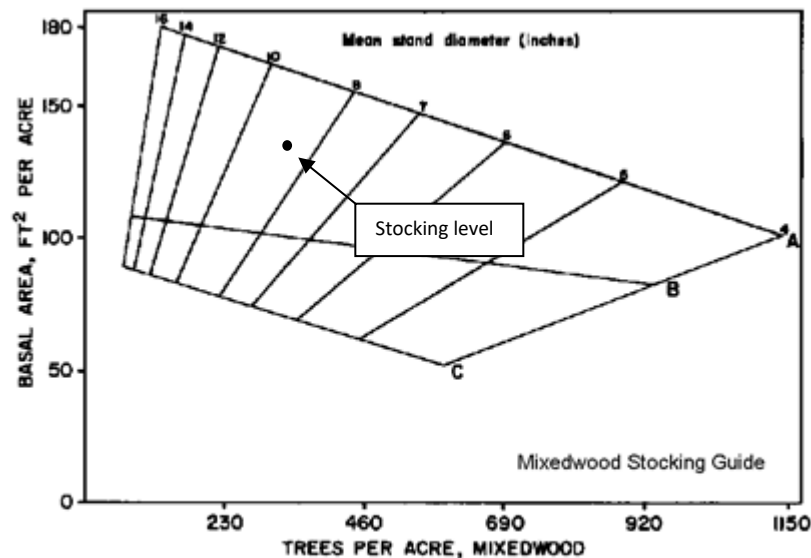
This stand will be managed for timber production, aesthetics and wildlife habitat. Over the long term, uneven-age silvicultural techniques will be utilized to promote and maintain a balanced distribution of multiple age classes while encouraging the establishment and growth of desirable regeneration.

STAND DESCRIPTION

This is a 50- to 70-year-old, even-aged, mixed composition stand that abuts the northern property boundary. Stocking conditions range from areas of spruce-fir saplings and poles averaging over 190 ft²/acre of basal area to areas of mixed hardwood and softwood trees in the small sawtimber size class, averaging 80- 90 ft²/acre.

STOCKING

Total stocking is between the A and B line on the mixedwood stocking chart. Stocking of AGS is below the B line. These data indicate a stand that is well stocked overall but slightly understocked of AGS. The stocking level is displayed graphically on the Stocking Guide below.



Source: Leak, Solomon and DeBald, *Silvicultural Guide for Northern Hardwood Types in the Northeast (revised)*, USDA Forest Service Research Paper NE-603, 1987

HISTORY

This stand has developed from abandoned pasture land in the late 19th century. Today the stand is dominated by balsam softwood with a hardwood component.

REGENERATION

Spruce and fir seedlings and saplings are present in a scattered distribution. Alder, witch hazel and fern occupy canopy gaps on the wetter sites.

FOREST HEALTH

No signs of insect or disease damage were noted in this stand.

INVASIVE SPECIES

No invasive species were seen in this stand.

HABITAT

This stand border the northern end of the SWBZ. The Water Bur-reed plant is found in the SWBZ and will not be impacted by future forest management in Stand 1. The area serves as a softwood/mixedwood habitat and features occasional snags and cavity trees. Future management will strive to provide a diversity of snag and cavity tree diameters ranging from 6 inches to over 24 inches. Ideally, on each acre one snag over 24 inches should be retained or developed. Existing snags will be retained. The ideal long-term target for down woody material is to leave three to five stems at least 18 inches in diameter and 10 stems at least 14 inches in diameter per acre. All should be at least 16 feet long.

ACCESS & OPERABILITY

Access to the stand will likely occur from existing landing locations off Rt. 12. One stream crossing will be required. Due to the close proximity to the wetlands and wet soils winter only logging under frozen conditions is required.

MANAGEMENT ACTIVITIES

Long-range goals:

- Over time, convert the stand to an uneven-aged condition. Age groups should be developed in patches rather than an equal distribution on every acre. This will minimize the potential for blow down and mimic natural stand disturbance common to areas dominated by spruce and fir.
- Maintain a component of northern hardwood.

Target Diameters: Northern hardwoods: 18", softwoods: 16"dbh.

Entry Cycle: 15-20 years.

SCHEDULED TREATMENT

At this point due to current stocking and optimum growth, no harvest is recommended.

STAND 2**8.44 ACRES****TYPE**

Mixedwood Forest – softwood dominating

SAMPLING METHOD

Variable Radius (prism) Sampling: BAF 15

Number of Plots for this Stand: 7

Data Collected: 2016

STAND DATA

Natural Community Designation: Red Spruce-Northern Hardwood Forest

Quadratic Stand Diameter: 6.9”

Total Basal Area/Acre (BA): 86 ft²Acceptable Growing Stock Basal Area/Acre: 55.81 ft²

| | Basal Area | | | TPA | | | QMD |
|--------------------|------------|--------------|--------------|------------|--------------|--------------|------------|
| | Total | ags | ugs | Total | ags | ugs | |
| balsam fir | 39 | 33.3% | 12.3% | 162 | 34.8% | 14.4% | 6.7 |
| red spruce | 23 | 26.3% | - | 97 | 29.6% | - | 6.5 |
| red maple | 5 | - | 5.3% | 12 | - | 6.4% | 8.3 |
| black ash | 5 | - | 5.3% | 21 | - | 3.6% | 6.3 |
| paper birch | 3 | - | 3.5% | 10 | - | 2.9% | 7.6 |
| black cherry | 3 | - | 3.5% | 9 | - | 2.7% | 7.8 |
| larch | 3 | 3.5% | - | 7 | 2.2% | - | 8.7 |
| hemlock | 2 | - | 1.8% | 1 | - | 1.7% | 14.0 |
| white pine | 2 | - | 1.8% | 0 | 1.0% | - | 30.0 |
| yellow birch | 2 | - | 1.8% | 3 | - | 0.4% | 9.0 |
| o. hardwood | 2 | 1.8% | - | 6 | - | 0.1% | 7.0 |
| Stand Total | 86 | 64.9% | 35.1% | 328 | 67.7% | 32.3% | 6.9 |

Trees per Acre: 328

Current Volume/Acre: 4.1 mbf & 8.7 cds

MANAGEMENT

Age Class Distribution: Even-aged (2-age classes)

Target Age Class Distribution: Uneven Cutting - Cycle: 20 - 30 years

Desired Diameters: YB-18”, RS and BF-16”

Desired Products: Sawtimber

Skid Distance: less than ½ mile

SITE CHARACTERISTICS

Site Class: 1-3 (field verification).

Soil Type: Berkshire sandy loam, Potsdam silt loam, Berkshire-Tunbridge fine sandy loam.

MANAGEMENT STRATEGY

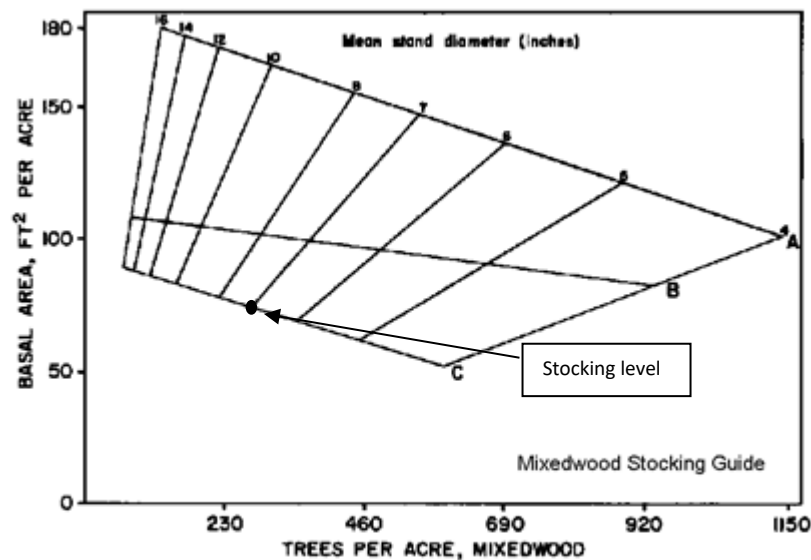
This small stand will be managed for timber production, aesthetics and wildlife habitat. Over the long term, uneven-aged silvicultural techniques will be utilized to promote and maintain a balanced distribution of multiple age classes while encouraging the establishment and growth of desirable regeneration.

STAND DESCRIPTION

Stand 2 is an uneven-aged stand dominated by spruce and fir which is found in several pockets along the river drainage. Stand conditions are highly variable and depend on soil drainage. Along the east side of the river there are areas of good quality red spruce, with basal areas averaging over 200 ft²/acre. Soils here are sandy loams. The cruise data is inclusive of the acreage that has now been pulled out and included in the riparian ESTA / SWBZ. The stand is now much smaller and will be re-evaluated during the next management plan update.

STOCKING

Total stocking is around the C line on the mixedwood stocking chart. Stocking of AGS is below the C line. These data indicate a stand that is marginally stocked overall and understocked of AGS. The stocking level is displayed graphically on the Stocking Guide below.



Source: Leak, Solomon and DeBald, *Silvicultural Guide for Northern Hardwood Types in the Northeast* (revised), USDA Forest Service Research Paper NE-603, 1987

HISTORY

This stand has developed from abandoned pasture land in the late 19th century. Today the stand is dominated by balsam softwood with a minor hardwood component.

REGENERATION

Scattered pockets of spruce-fir seedlings and saplings are found throughout the stand, however, the number and distribution of stems is inadequate to restock the stand. Alder, fern and other herbaceous plants occupy most of the canopy gaps.

FOREST HEALTH

No signs of insect or disease damage were noted in this stand.

INVASIVE SPECIES

No invasive species were seen in this stand.

HABITAT

This stand borders the SWBZ and a Red Spruce-Cinnamon Fern Swamp. The area serves as a transition from the SWBZ/wetland to more productive soils. Future management will strive to provide a diversity of snag and cavity tree diameters ranging from 6 inches to over 24 inches. Ideally, on each acre one snag over 24 inches should be retained or developed. Existing snags will be retained. The ideal long-term target for down woody material is to leave three to five stems at least 18 inches in diameter and 10 stems at least 14 inches in diameter per acre. All should be at least 16 feet long.

ACCESS & OPERABILITY

Access to the stand will occur from existing landing locations off Rt. 12. The close proximity to the wetlands and wet soils means winter only logging under frozen conditions is required.

MANAGEMENT ACTIVITIES

Long-range goals:

- Over time, convert the stand to an uneven-aged condition. Age groups should be developed in patches rather than an equal distribution on every acre. This will minimize the potential for blow down and mimic natural stand disturbance common to areas dominated by spruce and fir.
- Maintain a component of northern hardwood in the stand.

Target Diameters: Northern hardwoods: 18", softwoods: 16" dbh.

Entry Cycle: 20-30 years.

SCHEDULED TREATMENT

Due to current low stocking, no harvest is recommended.

STAND 3**37.03 ACRES****TYPE**

Mixedwood Forest

SAMPLING METHOD

Variable Radius (prism) Sampling: BAF 15

Number of Plots for this Stand: 9

Data Collected: 2016

STAND DATA

Natural Community Designation: Red Spruce/Hemlock -Northern Hardwood Forest

Quadratic Stand Diameter: 9.8"

Total Basal Area/Acre (BA): 132 ft²Acceptable Growing Stock Basal Area/Acre: 70.22 ft²

| | Total | <u>Basal Area</u> | | Total | <u>TPA</u> | | QMD |
|--------------------|------------|-------------------|--------------|------------|--------------|--------------|------------|
| | | ags | ugs | | ags | ugs | |
| red maple | 42 | 7.6% | 24.1% | 71 | 5.0% | 23.2% | 10.4 |
| hemlock | 25 | 10.1% | 8.9% | 34 | 16.0% | 5.6% | 11.5 |
| red spruce | 23 | 13.9% | 3.8% | 44 | 14.6% | 2.8% | 9.9 |
| yellow birch | 17 | 10.1% | 2.5% | 17 | 5.6% | 8.1% | 13.6 |
| balsam fir | 13 | 6.3% | 3.8% | 54 | 7.4% | - | 6.7 |
| black cherry | 5 | 2.5% | 1.3% | 6 | 5.6% | 1.0% | 12.5 |
| sugar maple | 3 | 2.5% | - | 7 | - | 2.7% | 9.5 |
| paper birch | 3 | - | 2.5% | 18 | 1.6% | 0.7% | 5.8 |
| Stand Total | 132 | 53.2% | 46.8% | 251 | 55.9% | 44.1% | 9.8 |

Trees per Acre: 251

Current Volume/Acre: 5.8 mbf & 22.1 cds

MANAGEMENT

Age Class Distribution: Even-aged (2-age classes)

Target Age Class Distribution: Uneven Cutting - Cycle: 20 - 30 years

Desired Diameters: RM- 20, YB-18", BF-16"

Desired Products: Sawtimber

Skid Distance: less than ½ mile

SITE CHARACTERISTICS

Site Class: 2-3 (field verification).

Soil Type: Boothbay silt loam, Salmon variant-Salmon very fine sandy loams, Potsdam silt loam, Swanville silt loam, Tunbridge-Lyman complex.

MANAGEMENT STRATEGY

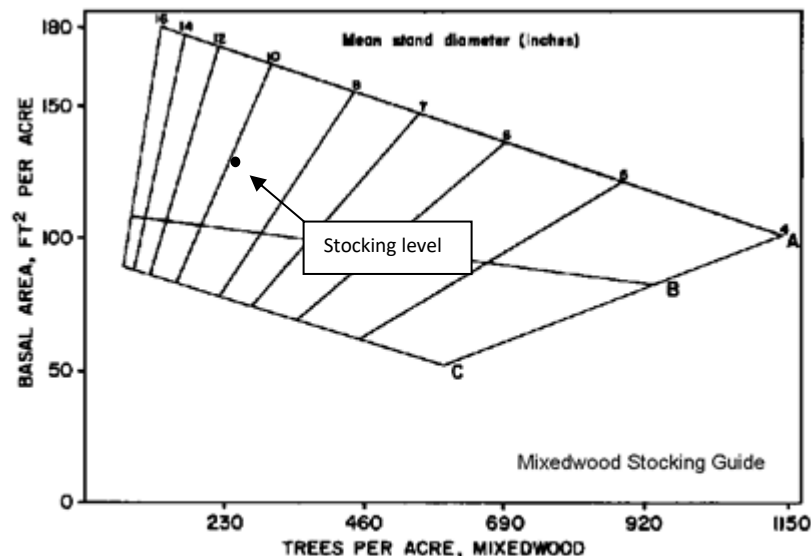
This stand will be managed for timber production, aesthetics and wildlife habitat. Over the long term, uneven-aged silvicultural techniques will be utilized to promote and maintain a balanced distribution of multiple age classes while encouraging the establishment and growth of desirable regeneration.

STAND DESCRIPTION

This is a 50- to 70-year-old even-aged stand dominated by red maple which sits against the west boundary. Topography consists of gentle to moderate east-facing slopes, with occasional intermittent drainages running toward the SWBZ and river.

STOCKING

Total stocking is between the B and A line on the mixedwood stocking chart. Stocking of AGS is below the C line. These data indicate a stand that is well stocked overall and below the B line of AGS. The stocking level is displayed graphically on the Stocking Guide below.



Source: Leak, Solomon and DeBald, *Silvicultural Guide for Northern Hardwood Types in the Northeast (revised)*, USDA Forest Service Research Paper NE-603, 1987

HISTORY

This stand has developed from abandoned pasture land in the late 19th century. Today the stand is a nice mix of softwood and hardwood species.

REGENERATION

Seedling and sapling spruce, fir and northern hardwoods are found throughout the stand in a patchy distribution. Witch hobble is abundant in many areas.

FOREST HEALTH

No signs of insect or disease damage were noted in this stand.

INVASIVE SPECIES

No invasive species were seen in this stand.

HABITAT

The eastern side of the stand serves as a transition from the SWBZ/wetland and features occasional snags and cavity trees. Future management will not negatively impact the SWBZ. Future management will strive to provide a diversity of snag and cavity tree diameters ranging from 6 inches to over 24 inches. Ideally, on each acre one snag over 24 inches should be retained or developed. Existing snags will be retained. The ideal long-term target for down woody material is to leave three to five stems at least 18 inches in diameter and 10 stems at least 14 inches in diameter per acre. All should be at least 16 feet long.

ACCESS & OPERABILITY

Access to the stand will occur from the ROW at the southern and western side of the property. The close proximity to the wetlands and wet soils winter only logging under frozen conditions is required.

MANAGEMENT ACTIVITIES

Long-range goals:

- Over time, convert the stand to an uneven-aged stand. Age groups should be developed in patches rather than an equal distribution on every acre. This will minimize the potential for blow down and mimic natural stand disturbance common to areas dominated by spruce and fir.
- Maintain a component of northern hardwood in stand stocking.

Target Diameters: Northern hardwoods: 18", softwoods: 16" dbh.

Entry Cycle: 15-20 years.

The previous plan recommended a thinning in 2022 using a small group system. Upon further inspection of the stand on the ground by a licensed forester, it was decided that giving the forest more years of growth would not be detrimental to the overall forest. The existing regeneration would benefit from more years of growth before getting released. The red maple which is the dominate species and of concern is overall poor quality but is still growing. Delaying the harvest will not improve the tree quality by growing larger but will increase fiber and carbon storage.

SCHEDULED TREATMENT

The Stand should be watched yearly for any signs of increase in mortality and re-evaluated in 2026 after the FSP update for scheduling a thinning. With any silvicultural prescription the timing is usually more important to us than a tree. Timing can be based on a number of criteria including; forest health/threats, markets, logger availability, and income desires to name a few.

STAND 4**52.53 ACRES****TYPE**

Northern Hardwood Forest

SAMPLING METHOD

Variable Radius (prism) Sampling: BAF 15

Number of Plots for this Stand: 7

Data Collected: 2016

STAND DATA

Natural Community Designation: Northern Hardwood Forest

Quadratic Stand Diameter: 9.5"

Total Basal Area/Acre (BA): 101.0 ft²Acceptable Growing Stock Basal Area/Acre: 32.21 ft²

| | Basal Area | | | TPA | | | QMD |
|--------------------|------------|--------------|--------------|------------|--------------|--------------|------------|
| | Total | ags | ugs | Total | ags | ugs | |
| red maple | 47 | 10.6% | 36.2% | 83 | 5.9% | 35.0% | 10.2 |
| sugar maple | 28 | 12.8% | 14.9% | 73 | 14.4% | 21.4% | 8.4 |
| yellow birch | 6 | 2.1% | 4.3% | 15 | 0.4% | 7.0% | 8.9 |
| black cherry | 6 | 2.1% | 4.3% | 9 | 4.4% | - | 11.6 |
| balsam fir | 4 | 4.3% | - | 9 | - | 4.3% | 9.4 |
| beech | 4 | - | 4.3% | 9 | 1.3% | 2.9% | 9.5 |
| hemlock | 4 | - | 4.3% | 6 | - | 3.1% | 11.2 |
| Stand Total | 101 | 31.9% | 68.1% | 203 | 26.3% | 73.7% | 9.5 |

Trees per Acre: 203

Current Volume/Acre: 2.6 MBF and 21.8 cords

MANAGEMENT

Age Class Distribution: Even-age

Target Age Class Distribution: Uneven - Cutting Cycle: 20 years

Desired Diameters: SM-20", YB-20", WA-18"

Desired Products: Sawtimber

Skid Distance: less than 1 mile

SITE CHARACTERISTICS

Site Class: 1 - 2 (field verification)

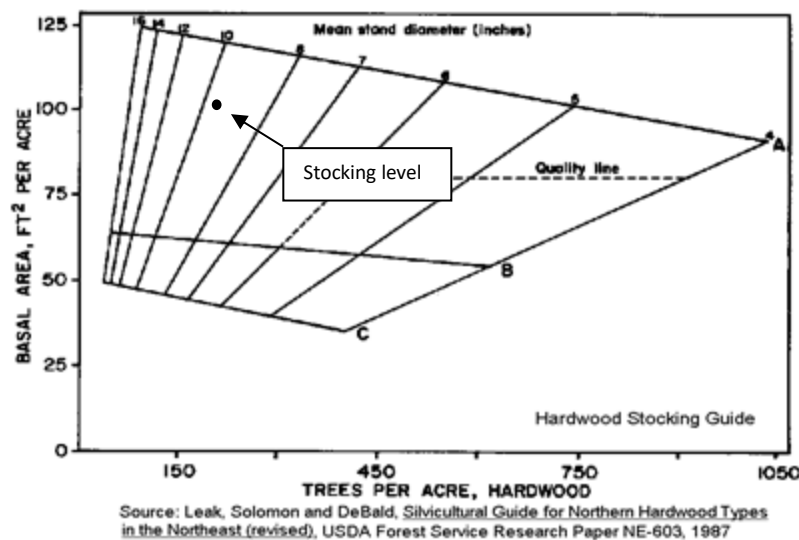
Soil Type: Salmon very fine sandy loam, Salmon variant-Salmon very fine sandy loams, Tunbridge-Lyman complex.

STAND DESCRIPTION

This is a 50- to 70-year-old even-aged, northern hardwood stand that sits in the southwest portion of the ownership. Species composition changes as one moves downslope, with upper slopes dominated by sugar maple and beech, while lower slopes support more red maple and yellow birch.

STOCKING

Total stocking is just below the A Line of the Northern Hardwoods stocking guide. Stocking of only those trees which will produce sawlogs (Acceptable Growing Stock or “AGS”) is below the C-line. These data indicate a stand that is sufficiently stocked overall but with mostly pulp quality trees. The stocking level is displayed graphically on the Stocking Guide below.



HISTORY

This stand is the result of agricultural abandonment and more recent selective high grading. No harvesting has been done in the past 25-30 years.

REGENERATION

A scattered stocking of hardwood saplings has established in canopy gaps created by past harvesting. Beech, yellow birch, and sugar maple are the most common species.

FOREST HEALTH

No signs of insect or disease damage were noted in this stand.

INVASIVE SPECIES

No invasive species were noted in this stand.

HABITAT

Similarly to Stand 3 the eastern side of the stand serves as a transition from the SWBZ/wetland and features occasional snags and cavity trees. Future management will strive to provide a diversity of snag and cavity tree diameters ranging from 6 inches to over 24 inches. Ideally, on

each acre one snag over 24 inches will be retained or developed. Existing snags will be retained. The ideal long-term target for down woody material is to leave three to five stems at least 18 inches in diameter and 10 stems at least 14 inches in diameter per acre. All should be at least 16 feet long.

ACCESS & OPERABILITY

Access to the stand is from the ROW across the former Atlas lands along the internal truck road. Stand soils in the western half of the area are well drained and operable under summer conditions. As one moves downslope, seeps and small wooded wetlands become more common.

MANAGEMENT ACTIVITIES

Long-range goals:

- Over time, convert the stand to an uneven-aged stand structure.
- Maintain cohorts of hemlock or spruce-fir within this predominantly hardwood stand.
- Target Diameters: Northern hardwoods: 16-18", softwoods: 14-16" dbh.
- Entry Cycle: 20-25 years.
- Retain scattered over mature northern hardwood and hemlock through subsequent harvests for snag recruitment.

This stand will be managed for high-quality timber production, aesthetics and wildlife habitat. Over the long term, uneven-aged silvicultural techniques will be utilized to promote and maintain a balanced distribution of multiple age classes while encouraging the establishment and growth of desirable regeneration. The stand is currently dominated by pulp quality saw timber-size trees.

Based on the high percentage of UGS, this stand would benefit from improvement work. A single tree and small group selection harvest is recommended to create conditions favorable for the establishment of a new age class of trees and retaining better quality trees.

The goal is to:

- Remove low quality single trees or micro groups preferably to release existing regeneration.
- Groups will be 1/8 to 2 acres in size and total approximately 10 acres (20% of the area).
- In larger groups 1-2 acres in size, 1-4 seed bearing trees should be retained inside the group.
- Limited thinning between groups will occur from active trails and will focus on releasing acceptable growing stock. Target residual basal area between groups is 70-80 ft²/acre.
- Important not to cover every acre of the stand but to leave some areas untouched regardless of tree quality.
- Based on the above recommendations start working towards the snag and downed woody material objectives.

SCHEDULED TREATMENT

The previous plan recommended an interim even-age treatment in 2022 using a shelterwood system. Upon further inspection of the stand on the ground by a licensed forester, it was decided that starting the forest to an uneven state could be implemented skipping the even-aged treatment. One of the concerns of the shelterwood system is continuing the evenage structure and

that beech will dominate the regeneration after creating a semi-uniform crown closure across the stand. Using an uneven-age, single tree/small group system will take longer to improve the overall tree quality across the stand and not maximize short term profit. But creating breaks in the canopy using different size groups, releasing pockets of desirable regeneration as well as cutting down advanced pockets of beech regeneration should add complexity to the stand maximizing the health as well as the wildlife and ecological benefits.

SCHEDULED TREATMENT

An improvement thinning should be implemented in 2026 with the understanding it can occur within 3 years before or after 2026 depending on operator availability, weather and market conditions to be compliant with UVA requirements. Combining work in this Stand as well as Forest Stand 7 would increase the financial viability of the future harvest.

STAND 5**56.29 ACRES****TYPE**

Mixedwood Forest

SAMPLING METHOD

Variable Radius (prism) Sampling: BAF 15

Number of Plots for this Stand: 9

Data Collected: 2016

STAND DATA

Natural Community Designation: Red Spruce-Northern Hardwood Forest

Quadratic Stand Diameter: 8.7"

Total Basal Area/Acre (BA): 125 ft²Acceptable Growing Stock Basal Area/Acre: 86.62 ft²

| | <u>Basal Area</u> | | | <u>TPA</u> | | | QMD |
|--------------------|-------------------|-------------|-------------|------------|-------------|-------------|------------|
| | Total | ags | ugs | Total | ags | ugs | |
| red maple | 47 | 16.0 | 21.3 | 89 | 35.8 | 1.8% | 9.8 |
| balsam fir | 27 | 18.7 | 2.7% | | 16.4 | 13.0 | 6.5 |
| red spruce | 17 | 12.0 | 1.3% | 35 | 10.6 | 1.0% | 9.3 |
| paper birch | 10 | 8.0% | - | 24 | 7.9% | - | 8.7 |
| white ash | 8 | 6.7% | - | 12 | 4.0% | - | 11. |
| yellow birch | 5 | 2.7% | 1.3% | 9 | 3.8% | - | 9.9 |
| sugar maple | 5 | 4.0% | - | 11 | 2.9% | 0.2% | 9.0 |
| o. hardwood | 3 | 1.3% | 1.3% | 7 | 1.0% | 1.2% | 9.5 |
| black cherry | 2 | - | 1.3% | 0 | - | 0.3% | 25. n |
| white pine | 2 | - | 1.3% | 1 | - | 0.2% | 20. |
| Stand Total | 125 | 69.3 | 30.7 | 304 | 82.3 | 17.7 | 8.7 |

Trees per Acre: 304

Current Volume/Acre: 4.8 mbf & 20.81 cds

MANAGEMENT

Age Class Distribution: Even-aged (2-age classes)

Target Age Class Distribution: Uneven Cutting - Cycle: 20 years

Desired Diameters: RM- 20, YB-18", RS/BF-16"

Desired Products: Sawtimber

Skid Distance: less than ½ mile

SITE CHARACTERISTICS

Site Class: 2-3 (field verification).

Soil Type: Berkshire very stony fine sandy loam, Berkshire-Tunbridge fine sandy loam, Tunbridge-Lyman complex.

MANAGEMENT STRATEGY

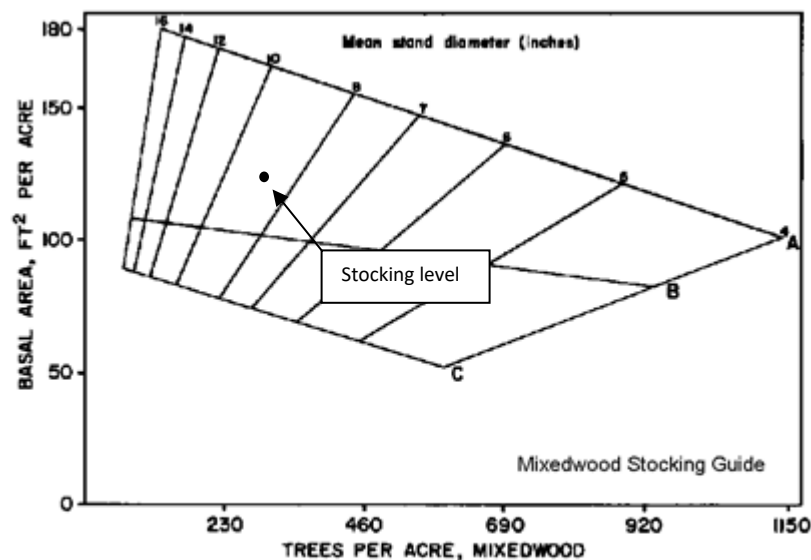
This stand will be managed for timber production, aesthetics and wildlife habitat. Over the long term, uneven-age silvicultural techniques will be utilized to promote and maintain a balanced distribution of multiple age classes while encouraging the establishment and growth of desirable regeneration.

STAND DESCRIPTION

This 50- to 70-year-old two-aged, mixed composition stand sits in the northeast corner of the property. The stand contains a component of scattered aspen (early successional species) which are mature and falling out of the stand's stocking, with trees already dead or broken off noted during the inventory. A mid-story of spruce and fir pole size stems is well established and accounts for 30% of the stand's AGS.

STOCKING

Total stocking is above the B line on the mixedwood stocking chart. Stocking of AGS is at the C line. These data indicate a stand that is stocked and growing well. The stocking level is displayed graphically on the Stocking Guide below.



Source: Leak, Solomon and DeBald, *Silvicultural Guide for Northern Hardwood Types in the Northeast (revised)*, USDA Forest Service Research Paper NE-603, 1987

HISTORY

This stand has developed from abandoned pasture land in the late 19th century. Today the stand is a nice mix of softwood and hardwood species. There has been no harvesting for the past 30 years.

REGENERATION

Spruce and fir seedlings and saplings are present in a patchy distribution.

FOREST HEALTH

Balsam fir decline is apparent throughout the stand. No other forest pests or disease of significance were noted.

INVASIVE SPECIES

No invasive species were seen in this stand.

HABITAT

There are no mapped habitats classified as “significant” by the State of Vermont within this stand. Future management will strive to provide a diversity of snag and cavity tree diameters ranging from 6 inches to over 24 inches. Ideally, on each acre one snag over 24 inches should be retained or developed. Existing snags will be retained. The ideal long-term target for down woody material is to leave three to five stems at least 18 inches in diameter and 10 stems at least 14 inches in diameter per acre. All should be at least 16 feet long.

ACCESS & OPERABILITY

Access to the stand will occur from Rt. 12. Soils range from dry and well-drained on mid and upper slopes, to somewhat poorly drain along Route 12.

MANAGEMENT ACTIVITIES

Long-range goals:

- Promote the development of mid-story softwoods, while retaining cohorts of good quality northern hardwoods.
- Over time, convert the stand to an uneven-aged condition. Age groups should be developed in patches rather than an equal distribution on every acre. This will minimize the potential for blow down and mimic natural stand disturbance common to areas dominated by spruce and fir.
- Maintain a component of northern hardwood in stand stocking.

Target Diameters: Northern hardwoods: 18”, softwoods: 16”dbh.

Entry Cycle: 15-20 years.

SCHEDULED TREATMENT

The stand is growing well and no thinning is recommended at this time.

STAND 6**93.66 ACRES****TYPE**

Mixedwood Forest

SAMPLING METHOD

Variable Radius (prism) Sampling: BAF 15

Number of Plots for this Stand: 13

Data Collected: 2016

STAND DATA

Natural Community Designation: Red Spruce-Northern Hardwood Forest

Quadratic Stand Diameter: 8.6"

Total Basal Area/Acre (BA): 122 ft²Acceptable Growing Stock Basal Area/Acre: 54.04 ft²

| | <u>Basal Area</u> | | | | <u>TPA</u> | | |
|--------------------|-------------------|--------------|--------------|------------|--------------|--------------|------------|
| | Total | ags | ugs | | ags | ugs | QMD |
| red maple | 63 | 18.9% | 33.0% | 149 | 14.4% | 34.6% | 8.8 |
| balsam fir | 20 | 9.4% | 6.6% | 56 | 9.9% | 8.7% | 8.0 |
| red spruce | 16 | 10.4% | 2.8% | 34 | 8.0% | 3.3% | 9.3 |
| yellow birch | 6 | 1.9% | 2.8% | 12 | 4.7% | - | 9.4 |
| black cherry | 6 | - | 4.7% | 11 | 0.8% | 3.1% | 10.0 |
| white ash | 3 | 0.9% | 1.9% | 8 | - | 3.9% | 8.7 |
| paper birch | 3 | 0.9% | 1.9% | 7 | - | 3.5% | 9.4 |
| beech | 2 | - | 1.9% | 12 | 1.9% | 0.8% | 6.0 |
| sugar maple | 2 | 1.9% | - | 14 | 0.4% | 2.0% | 5.4 |
| Stand Total | 122 | 44.3% | 55.7% | 303 | 40.2% | 59.8% | 8.6 |

Trees per Acre: 303

Current Volume/Acre: 3.7 mbf & 21.7 cds

MANAGEMENT

Age Class Distribution: Even-aged (2-age classes)

Target Age Class Distribution: Uneven Cutting - Cycle: 20 years

Desired Diameters: RM- 20, YB-18", BF-16"

Desired Products: Sawtimber

Skid Distance: less than ½ mile

SITE CHARACTERISTICS

Site Class: 2 (field verification).

Soil Type: Peru fine sandy loam, Berkshire very stony fine sandy loam, Berkshire fine sandy loam, Cabot silt loam, Berkshire-Tunbridge fine sandy loam, Tunbridge-Lyman complex.

MANAGEMENT STRATEGY

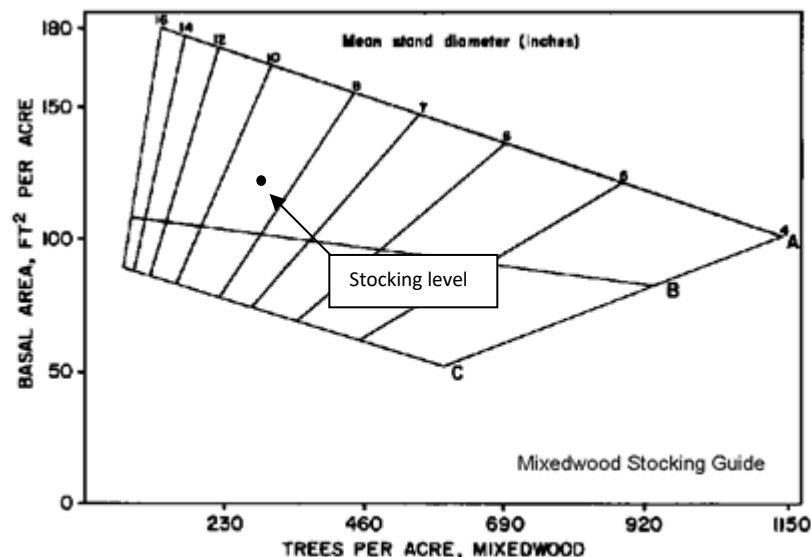
This stand will be managed for timber production, aesthetics and wildlife habitat. Over the long term, uneven-age silvicultural will be utilized to promote and maintain a balanced distribution of multiple age classes while encouraging the establishment and growth of desirable regeneration.

STAND DESCRIPTION

Stand 6 is 50- to 70-year-old, even-aged, of mixed species composition, and sits in the east-central woodland. Stem quality is generally poor, with 55% of the stems tallied as unacceptable growing stock. In comparison to Stand 5, this area supports a higher percentage of red maple in the mid-story. Stem damage from moose chewing is common on the red maple and contributes to the fact that these stems account for a majority of the UGS. A 2+/- acre plantation of Norway spruce is found within the stand and surrounds an old cellar hole and unique barn foundation not far from Route 12. Stocking in this area averages 160-180 ft²/acre. Several apple trees are found scattered through that portion of the stand near Route 12.

STOCKING

Total stocking is just above the B line on the mixedwood stocking chart. Stocking of AGS is below the C line. These data indicate overall a stand that is stocked and growing well unfortunately growing a high percent of pulp quality trees. The stocking level is displayed graphically on the Stocking Guide below.



Source: Leak, Solomon and DeBald, *Silvicultural Guide for Northern Hardwood Types in the Northeast* (revised), USDA Forest Service Research Paper NE-603, 1987

HISTORY

This stand has developed from abandoned pasture land in the late 19th century. Today the stand is a mix of softwood and hardwood species. There has been no harvesting for the past 30 years.

REGENERATION

Scattered groups and individual spruce and fir seedlings and saplings ranging from 3-10 feet in height are present throughout the stand. Patches of dense hay scented fern are also present. This native invasive fern can interfere with the establishment of regeneration. Control measures include manually cutting fronds or herbicide and are generally not practical for large ownerships.

FOREST HEALTH

As with Stand 5 Balsam fir decline is apparent throughout the stand. No other forest pests or disease of significance were noted.

INVASIVE SPECIES

No invasive species were seen in this stand.

HABITAT

Like Stand 5 to the north nothing significant was found in the stand but is being used. Numerous Moose tracks were noted during recent site visits. Future management will strive to provide a diversity of snag and cavity tree diameters ranging from 6 inches to over 24 inches. Ideally, on each acre one snag over 24 inches should be retained or developed. Existing snags will be retained. The ideal long-term target for down woody material is to leave three to five stems at least 18 inches in diameter and 10 stems at least 14 inches in diameter per acre. All should be at least 16 feet long.

ACCESS & OPERABILITY

Access to the stand is from Rt. 12. The central portion of the stand sits on abandoned farm/crop land, with gentle slopes and well-drained soils. Closer to Route 12, the ground becomes more rolling with small wetlands common. Old rutted trails are still visible in this area, with alders growing in the wetter sections.

MANAGEMENT ACTIVITIES

Long-range goals:

- Promote the development of mid-story softwoods, while retaining cohorts of good quality northern hardwoods.
- Over time, convert the stand to an uneven-aged condition. Age groups should be developed in patches rather than an equal distribution on every acre. This will minimize the potential for blow down and mimic natural stand disturbance common to areas dominated by spruce and fir.
- Maintain a component of northern hardwood in stand stocking.

Target Diameters: Northern hardwoods: 20", softwoods: 16" dbh.

Entry Cycle: 15-20 years.

SCHEDULED TREATMENT

The stand is growing well and no thinning is recommended at this time.

STAND 7**109.56 ACRES****TYPE**

Northern Hardwood Forest

SAMPLING METHOD

Variable Radius (prism) Sampling: BAF 15

Number of Plots for this Stand: 19

Data Collected: 2016

STAND DATA

Natural Community Designation: Northern Hardwood Forest

Quadratic Stand Diameter: 11.4"

Total Basal Area/Acre (BA): 111.0 ft²Acceptable Growing Stock Basal Area/Acre: 53.94 ft²

| | Basal Area | | | | TPA | | QMD |
|--------------------|------------|--------------|--------------|------------|--------------|--------------|-------------|
| | Total | ags | ugs | | ags | ugs | |
| sugar maple | 50 | 25.0% | 20.0% | 69 | 27.4% | 17.3% | 11.5 |
| white ash | 18 | 10.7% | 5.7% | 23 | 1.3% | 19.2% | 12.2 |
| yellow birch | 17 | 6.4% | 8.6% | 20 | 11.8% | 2.8% | 12.4 |
| beech | 17 | 1.4% | 13.6% | 32 | 5.3% | 7.5% | 9.8 |
| red maple | 5 | 2.1% | 2.1% | 5 | 2.5% | 1.3% | 13.7 |
| black cherry | 4 | 2.1% | 1.4% | 6 | 1.8% | 1.2% | 11.2 |
| paper birch | 1 | 0.7% | - | 1 | 0.8% | - | 11.0 |
| Stand Total | 111 | 48.6% | 51.4% | 155 | 50.8% | 49.2% | 11.4 |

Trees per Acre: 155

Current Volume/Acre: 5.7 MBF and 21.0 cords

MANAGEMENT

Age Class Distribution: Even-age

Target Age Class Distribution: Uneven - Cutting Cycle: 20 years

Desired Diameters: SM-20", YB-20", WA-18"

Desired Products: Sawtimber

Skid Distance: less than 1 mile

SITE CHARACTERISTICS

Site Class: 1 - 2 (field verification)

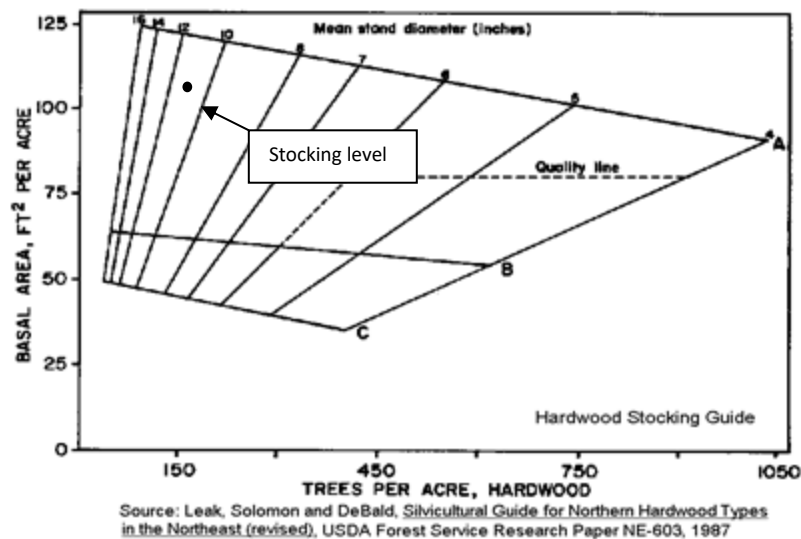
Soil Type: Lyman – Tunbridge – Rock outcrop complex, Tunbridge-Lyman complex, Berkshire fine sandy loam.

STAND DESCRIPTION

This is a 60 to 80 year-old even-aged northern hardwood stand that sits in two separate areas along the eastern property boundary. Both areas sit on moderate to steep slopes along the ridge. Soils are generally shallow and prone to drought on upper and mid slope positions, while lower slopes support deep, rich, well-drained soils. Scattered legacy trees are present, providing vertical diversity to the stand, but not lending much to the stand's stocking. Scattered beech which do not show evidence of beech bark disease were also noted.

STOCKING

Total stocking is below the A Line of the Northern Hardwoods stocking guide. Stocking of only those trees which will produce sawlogs (Acceptable Growing Stock or "AGS") is at the C-line. These data indicate a stand that is sufficiently stocked overall but with mostly pulp quality trees. The stocking level is displayed graphically on the Stocking Guide below.



HISTORY

This stand is the result of agricultural abandonment and more recent selective high grading. No harvesting has been done in the past 25-30 years.

REGENERATION

Through most of the stand beech and striped maple are the most common understory species ranging from 5-15 feet in height.

FOREST HEALTH

White ash on the ridge top, where soils are shallow, show some evidence of dieback. No other forest pests or disease of significance were noted.

INVASIVE SPECIES

No invasive species were noted in this stand.

HABITAT

There are no mapped habitats classified as “significant” by the State of Vermont within this stand. The area serves as an upland habitat and features occasional snags and cavity trees. Future management will strive to provide a diversity of snag and cavity tree diameters ranging from 6 inches to over 24 inches. Ideally, on each acre one snag over 24 inches will be retained or developed. Existing snags will be retained. The ideal long-term target for down woody material is to leave three to five stems at least 18 inches in diameter and 10 stems at least 14 inches in diameter per acre. All should be at least 16 feet long.

ACCESS & OPERABILITY

Access to the stand is from Rt. 12. Topography ranges from gentle to steep. Slab trails created for past harvesting provide access to some of the steeper areas. Additional trail construction would be necessary to access the entire stand. Uphill skidding is necessary for about 2/3 of the area and will likely increase the cost of harvesting. Harvesting under summer conditions is possible provided access through other stands would support this.

MANAGEMENT ACTIVITIES

Long-range goals:

- Over time, convert the stand to an uneven-aged stand structure.
- Target Diameters: Northern hardwoods: 18-20”.
- Entry Cycle: 20-25 years.
- Retain scattered over mature northern hardwood through subsequent harvests for snag recruitment.

This stand will be managed for timber production, aesthetics and wildlife habitat. Over the long term, uneven-age silvicultural techniques will be utilized to promote and maintain a balanced distribution of multiple age classes while encouraging the establishment and growth of desirable regeneration. The stand currently has a high percentage of pulp quality trees. Based on the high percentage of UGS, this stand would benefit from improvement work. A single tree and small group selection harvest is recommended. The goal is to:

- Remove pockets of low quality trees.
- Create conditions favorable for the establishment of a new age class of trees.
- Groups will be 1/2 to 2 acres in size and total approximately 20 acres (20% of the area-1% /year).
- In groups 2 acres in size, 1-4 seed bearing trees should be retained inside the group.
- Based on the above recommendations start working towards the snag and downed woody material objectives.
- Limited thinning between groups will occur from active trails and will focus on releasing acceptable growing stock. Target residual basal area between groups is 80-85 ft²/acre.

SCHEDULED TREATMENT

Similar to Forest Stand 4 the previous plan recommended an interim even-age treatment in 2022 using a shelterwood system. Upon further inspection of the stand on the ground by a licensed forester, with the overall goal of creating a unevenage system, it was decided that starting the

forest to an uneven state could be implemented skipping the even-aged treatment. One of the concerns of the shelterwood system is continuing the evenage structure and that beech will dominate the regeneration after creating a semi-uniform crown closure across the stand. Using an uneven-age, single tree/small group system will take longer to improve the overall tree quality across the stand and not maximize short term profit. But creating breaks in the canopy using different size groups, releasing pockets of desirable regeneration as well as cutting down advanced pockets of beech regeneration should add complexity to the stand maximizing the health as well as the wildlife and ecological benefits.

SCHEDULED TREATMENT

An improvement thinning should be implemented in 2026 with the understanding it can occur within 3 years before or after 2026 depending on operator availability, weather and market conditions to be compliant with UVA requirements. Combining work in this Forest Stand as well as Forest Stand 4 would increase the financial viability of the future harvest.

STAND 8**148.43 ACRES****TYPE**

Mixedwood Forest

SAMPLING METHOD

Variable Radius (prism) Sampling: BAF 15

Number of Plots for this Stand: 21

Data Collected: 2016

STAND DATA

Natural Community Designation: Red Spruce-Northern Hardwood Forest

Quadratic Stand Diameter: 8.7"

Total Basal Area/Acre (BA): 97 ft²Acceptable Growing Stock Basal Area/Acre: 45.69 ft²

| | BasalArea | | | | TPA | | |
|--------------------|-----------|--------------|--------------|------------|--------------|--------------|------------|
| | Total | ags | ugs | | ags | ugs | QMD |
| balsam fir | 31 | 21.3% | 10.3% | 100 | 30.5% | 11.7% | 7.5 |
| red maple | 29 | 10.3% | 19.1% | 63 | 8.6% | 18.1% | 9.1 |
| yellow birch | 10 | 2.9% | 7.4% | 11 | - | 9.4% | 12.7 |
| red spruce | 9 | 7.4% | 1.5% | 18 | 5.8% | 1.9% | 9.3 |
| beech | 9 | - | 8.8% | 22 | 1.0% | 3.8% | 8.4 |
| sugar maple | 3 | 1.5% | 1.5% | 4 | - | 2.2% | 11.1 |
| black cherry | 3 | 0.7% | 2.2% | 4 | 1.5% | 0.6% | 11.8 |
| hemlock | 2 | 2.2% | - | 2 | 1.1% | 0.7% | 13.0 |
| white ash | 1 | 0.7% | 0.7% | 5 | 0.5% | 1.1% | 7.3 |
| nc hardwood | 1 | - | 0.7% | 5 | 1.0% | - | 5.0 |
| paper birch | 1 | - | 0.7% | 1 | - | 0.5% | 11.0 |
| Stand Total | 97 | 47.1% | 52.9% | 236 | 50.1% | 49.9% | 8.7 |

Trees per Acre: 236

Current Volume/Acre: 3.6 mbf & 13.8 cds

MANAGEMENT

Age Class Distribution: Even-aged (2-age classes)

Target Age Class Distribution: Uneven Cutting - Cycle: 20 years

Desired Diameters: RM- 20, YB-18", BF-16"

Desired Products: Sawtimber

Skid Distance: less than ½ mile

SITE CHARACTERISTICS

Site Class: 2 (field verification).

Soil Type: Berkshire very stony fine sandy loam, Cabot silt loam, Berkshire-Tunbridge fine sandy loam, and Tunbridge-Lyman complex.

MANAGEMENT STRATEGY

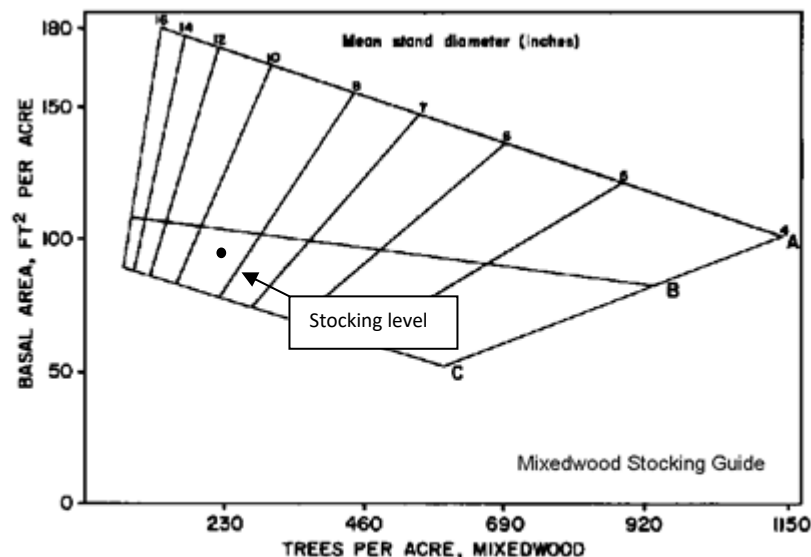
This stand will be managed for timber production, aesthetics and wildlife habitat. Over the long term, uneven-aged silvicultural techniques will be utilized to promote and maintain a balanced distribution of multiple age classes while encouraging the establishment and growth of desirable regeneration.

STAND DESCRIPTION

This is an uneven-aged, mixed composition stand located in the southeast portion of the woodland. Separate age classes have established as a result of past harvesting and agricultural abandonment, with areas supporting 40-60 year old early successional species, and areas dominated by 20+ inch hardwoods. This stand appears to have been harvested more aggressively and perhaps more recently. In general, the best trees were harvested and trees left appear to have been undesirable to harvest either because they were too small or of poor quality, resulting in a high percentage of unacceptable growing stock.

STOCKING

Total stocking is just below the B line on the mixedwood stocking chart. Stocking of AGS is below the C line. These data indicate overall a stand that is stocked and growing well, unfortunately growing a high percent of pulp quality trees. The stocking level is displayed graphically on the Stocking Guide below.



Source: Leak, Solomon and DeBald, *Silvicultural Guide for Northern Hardwood Types in the Northeast (revised)*, USDA Forest Service Research Paper NE-603, 1987

HISTORY

This stand has developed from abandoned pasture land in the late 19th century. It appears the

stand was harvested 20 – 25 years ago. Today the stand is a mix of softwood and hardwood species.

REGENERATION

Regeneration is patchy. Where present, spruce, fir and red maple are the most common species. Yellow birch has established in some of the old trails and shows evidence of severe browsing.

FOREST HEALTH

As with other stands on the east side of the Rt. 12, balsam fir decline is apparent throughout the stand. No other forest pests or disease of significance were noted.

INVASIVE SPECIES

No invasive species were seen in this stand.

HABITAT

There are no mapped habitats classified as “significant” by the State of Vermont within this stand but does border the SWBZ on the southern end. Future management will have no detrimental impact on the SWBZ and will strive to provide a diversity of snag and cavity tree diameters ranging from 6 inches to over 24 inches. Ideally, on each acre one snag over 24 inches should be retained or developed. Existing snags will be retained. The ideal long-term target for down woody material is to leave three to five stems at least 18 inches in diameter and 10 stems at least 14 inches in diameter per acre. All should be at least 16 feet long.

ACCESS & OPERABILITY

Access to the stand is from Rt. 12. Topography is rolling with moderate slopes and exposed ledge visible in several areas. Small wet areas are common between knolls. A landing developed for past harvesting is located within the stand. Trails radiating from this site are still visible. Many run through poorly drained areas and now support alder or, where drier, dense spruce-fir or yellow birch seedlings.

MANAGEMENT ACTIVITIES

Long-range goals:

- Over time, maintain the stand in an uneven-aged state and add age classes when possible. Age groups should be developed in patches rather than an equal distribution on every acre. This will minimize the potential for blow down and mimic natural stand disturbance common to areas dominated by spruce and fir.
- Maintain a component of northern hardwood in stand stocking.

Target Diameters: Northern hardwoods: 20”, softwoods: 16”dbh.

Entry Cycle: 15-20 years.

SCHEDULED TREATMENT

The stand is growing well and needs to continue to build stocking. No treatment is recommended at this time.

STAND 9**23.56 ACRES****TYPE**

Mixedwood Forest

SAMPLING METHOD

Variable Radius (prism) Sampling: BAF 15

Number of Plots for this Stand: 4

Data Collected: 2016

STAND DATA

Natural Community Designation: Hemlock Northern Hardwood Forest

Quadratic Stand Diameter: 10.1"

Total Basal Area/Acre (BA): 143 ft²Acceptable Growing Stock Basal Area/Acre: 86.64 ft²

| | <u>Basal Area</u> | | | <u>TPA</u> | | | QMD |
|--------------------|-------------------|--------------|--------------|------------|--------------|--------------|-------------|
| | Total | ags | ugs | Total | ags | ugs | |
| yellow birch | 45 | 21.1% | 10.5% | 86 | 27.5% | 6.4% | 9.8 |
| hemlock | 34 | 15.8% | 7.9% | 31 | 3.8% | 17.4% | 14.2 |
| red maple | 30 | 7.9% | 13.2% | 54 | 8.1% | 4.0% | 10.1 |
| red spruce | 11 | 7.9% | - | 10 | 10.8% | - | 14.2 |
| beech | 8 | - | 5.3% | 13 | 10.8% | - | 10.1 |
| black cherry | 8 | 2.6% | 2.6% | 5 | - | 5.3% | 17.3 |
| sugar maple | 4 | 2.6% | - | 28 | 4.0% | - | 5.0 |
| balsam fir | 4 | 2.6% | - | 28 | 0.6% | 1.2% | 5.0 |
| Stand Total | 143 | 60.5% | 39.5% | 254 | 65.7% | 34.3% | 10.1 |

Trees per Acre: 254

Current Volume/Acre: 6.8 mbf & 26.0 cds

MANAGEMENT

Age Class Distribution: Even-aged (2-age classes)

Target Age Class Distribution: Uneven Cutting - Cycle: 20 years

Desired Diameters: RM- 20", YB-20", BF-16"

Desired Products: Sawtimber

Skid Distance: less than ½ mile

SITE CHARACTERISTICS

Site Class: 2 (field verification).

Soil Type: Tunbridge-Lyman complex.

MANAGEMENT STRATEGY

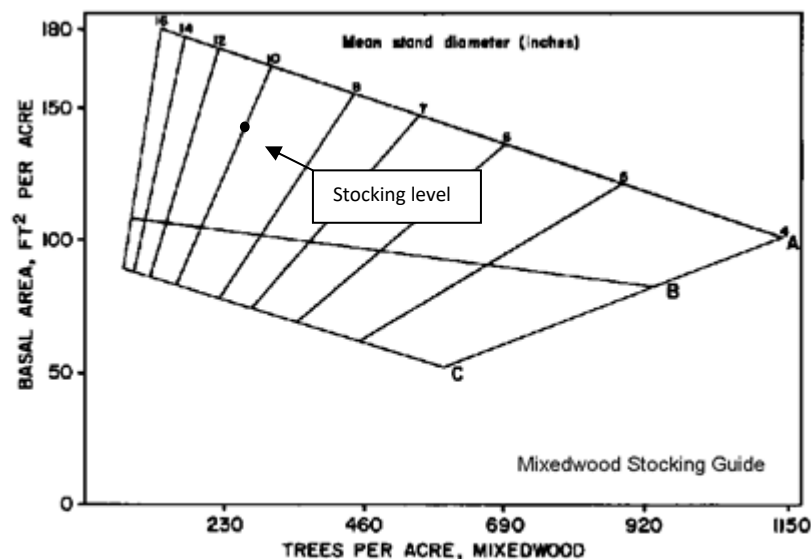
This stand will be managed for timber production, aesthetics and wildlife habitat. Over the long term, uneven-aged silvicultural techniques will be utilized to promote and maintain a balanced distribution of multiple age classes while encouraging the establishment and growth of desirable regeneration.

STAND DESCRIPTION

Stand 9 is another uneven-age, mixed composition stand and abuts the southern property boundary. This stand is unique in that hemlock rather than spruce and fir accounts for the primary softwood species. This stand also supports a higher than average percentage of acceptable growing stock and less red maple, in comparison to other stands. Average total stocking is within the range for best individual tree growth.

STOCKING

Total stocking is between the A and B line on the mixedwood stocking chart. Stocking of AGS is above the C line. These data indicate overall a stand that is stocked and growing well. The stocking level is displayed graphically on the Stocking Guide below.



Source: Leak, Solomon and DeBald, *Silvicultural Guide for Northern Hardwood Types in the Northeast* (revised), USDA Forest Service Research Paper NE-603, 1987

HISTORY

This stand has developed from abandoned pasture land in the late 19th century. No evidence of recent harvesting was found. Today the stand is a mix of softwood and hardwood species.

REGENERATION

Beech and striped maple saplings have established throughout the understory and average over 10 feet in height. Scattered red spruce and hemlock are also present, in low numbers.

FOREST HEALTH

No forest pests or disease of significance were noted.

INVASIVE SPECIES

No invasive species were seen in this stand.

HABITAT

There are no mapped habitats classified as “significant” by the State of Vermont within this stand but does border the SWBZ on the northern end. Timber harvesting will have no detrimental impact on the SWBZ and future management will strive to provide a diversity of snag and cavity tree diameters ranging from 6 inches to over 24 inches. Ideally, on each acre one snag over 24 inches should be retained or developed. Existing snags will be retained. The ideal long-term target for down woody material is to leave three to five stems at least 18 inches in diameter and 10 stems at least 14 inches in diameter per acre. All should be at least 16 feet long.

ACCESS & OPERABILITY

Access to the stand is from Rt. 12. Topography is rolling, with exposed ledge visible in several areas. Small wet areas are common between knolls.

MANAGEMENT ACTIVITIES

Long-range goals:

- Over time, maintain the stand in an uneven-aged state and add age classes when possible. Age groups should be developed in patches rather than an equal distribution on every acre. This will minimize the potential for blow down and mimic natural stand disturbance common to areas dominated by spruce and fir.
- Maintain a component of northern hardwood in stand stocking.

Target Diameters: Northern hardwoods: 20”, softwoods: 16” dbh.

Entry Cycle: 15-20 years.

SCHEDULED TREATMENT

The stand is growing well and needs to continue to build stocking, no thinning is recommended at this time.

Surface Water Buffer Zone and Riparian ESTA

The surface water buffer zone is a 161.79 acre area, made up of Site IV wetlands, streams, and an associated upland buffer. This area has special protections under the conservation easement to protect water quality and ecological values. The management of the Non-productive wetland acreage and the surrounding buffer, which is enrolled as a Riparian Ecologically Significant Treatment Area, will be managed as described below.

- Non-Productive – Wetlands - Site Class IV soils: **55.27 Acres**
- Riparian Ecologically Significant Treatment Area (ESTA): **106.52 Acres**

TYPE

Mixedwood with open wetlands.

MANAGEMENT

Protection of the ecological functions of the water resources on the property will be given the highest priority. Surface Water Buffer Zones (SWBZ), defined as those areas lying within 50' of each bank or shore of rivers, streams, ponds, and wetlands, including those areas within wetlands themselves (collectively referred to as "waters") will be enrolled under the non-productive category (for those areas of Site Class IV soils) and the remaining acreage of the SWBZ will be enrolled under the Ecologically Significant Treatment Area (ESTA) category of the UVA program. Within the ESTA and SWBZ, the protection of surface waters and wetlands will be achieved in part through the establishment and maintenance of a vegetated buffer.

Hydrologic features provide a variety of breeding and feeding habitats for a wide range of wildlife species. From vernal pools that provide essential breeding habitat for forest amphibians, to seepage wetlands whose early spring vegetation supports bears emerging from hibernation, to streams and ponds that support fish and their avian and mammalian predators, the hydrologic features on the property are diverse and ecologically important. In addition, as previously described, the property has many miles of streams which provide clean water downstream and flood resilience functions.

These riparian buffers provide a host of ecological benefits including, but not limited to:

- Protecting aquatic and wetland habitats;
- Protecting water-quality;
- Protecting terrestrial habitats and wildlife travel corridors; and
- Providing organic matter, nutrients, shade, and large diameter coarse woody debris for the benefit of wetland, riparian, and aquatic systems.

The ESTA and SWBZ buffer areas are a combination of hardwood, softwood, and mixedwood forest types and are a critical component of this property. Within them, the production of timber and other forest products is a secondary objective. Very little surface disturbance will happen within the ESTA and SWBZ, but where it does happen, for instance when creating a new stream crossing, AMPs will be strictly adhered to.

At this time, there is no plan to manage and no harvesting is prescribed in the wooded buffers that make up the ESTA and SWBZ. Any future management will incorporate up-to-date ecological knowledge and management practices necessary to maintain a high-quality buffer.

The areas will be reassessed when the property is sold and during future UVA management plan updates.

Schedule of Forest Management Activities

| <u>Stand No.</u> | <u>Year</u> | <u>Management Activity</u> |
|------------------|----------------------|---|
| ALL | Yearly* | Prepare and submit conformance report by February 1 (*only if activity has occurred). |
| ALL | Yearly | Inspection of tree health throughout the ownership. |
| ALL | In the next 10 years | Recommend boundary line maintenance. |
| Stand #4 & #7 | 2026 | Improvement thinning. |
| ALL | 2026 | Update Forest Management Plan |

Please Note: The conservation easement requires no fewer than fifteen (15) days prior written notice of Harvesting be provided to alert FPR that the approved harvest is about to commence. There is no additional approval associated with the 15-day notice provided that the harvesting is in accordance with the approved plan. Reminder is any revision to the management approved must be submitted by way of an amendment that needs written approval.