Agenda Item VII.4

Forest Conservation Plan

Town of Bristol
Seth Hill Waterworks
Lincoln, Vermont

Prepared by:
David Brynn, Conservation Forester
Vermont Forester License # 148.0122162 exp. September 30, 2024
Vermont Family Forests, PO Box 254, Bristol, VT 05443

February 2024

VERMONT FAMILY FORESTS™

Forest Management Plan
For the lands of

The Town of Bristol
Seth Hill Waterworks
Lincoln, Vermont

For the 10 years beginning April 1, 2024

Prepared by David Brynn, Conservation Forester,
Vermont Family Forests

We certify that our forestland, exclusive of any house site or other developed portion, is at least 25 acres in size and is under active, long-term, forest management for a variety of purposes including the conservation of forest health and, when appropriate, growing and harvesting repeated forest products in accordance with minimum acceptable standards for forest management.

These management standards include following, to the maximum practical extent, the practices outlined in the booklet *Vermont Water Quality Acceptable Management Practices Manual for Logging Professionals* (VT 2019) to control soil erosion, stream siltation, and petroleum product discharges and to maintain natural water temperatures by retaining continuous cover of trees along streams and other water bodies.

By signing below, we understand we are signing our forest management plan and by doing so we agree to manage according to the current approved plan as well and as fully as possible.

(Printed Name, Signature, and Date)

Approved for Use Value Appraisal by _____
County Forester Date

PROPERTY DATA SUMMARY

Landowners' Name:	Town of Bristol
Street Address:	PO Box 249
Town/State/Zip:	Bristol, VT 05443
Phone Number:	(802) 453-2410
Town Where Land Is Located:	Lincoln
Grand List Description:	113 acres land
Total Land Enrolled for Use Value:	113 acres land
Orthophoto Numbers:	464183, 462183
SPAN Number:	354-109-10679

Forest Conservation Plan Overview:

The purpose of this document is to list the existing conditions, ownership objectives and planned conservation practices for the Town of Bristol's Seth Hill Waterworks Property located in the Town of Lincoln. This plan and the prescribed management activities have been designed to meet the owners' objectives while fulfilling the criteria of the Use Value Appraisal (UVA) Program and Vermont Family Forests. The planned conservation practices have been designed to achieve ownership objectives without undermining the ecological functions and processes by which forests sustain themselves over time. This plan shall be revised and updated as conditions change, and more information becomes available. This plan is an update of a plan written in 2014 by David Brynn. This document is a 15-year management plan that should be updated in 10 years as required by the UVA program.

Water in the Seth Hill Forest's History:

The Seth Hill Waterworks property is part of the long and interesting history of Bristol's municipal water supplies. According to the *History of Bristol 1762 – 2012*, the development of water supplies for residents of the village dates to at least 1811 when a company was incorporated to supply water for a portion of the village. In 1880 the Rock Spring Water Company piped water to the village from Hogback Mountain. In 1903, the Village of Bristol was incorporated, and an effort was made to bring more water to more of the Village. A ram was used to pump water from the New Haven River up to the village. It was a valiant but unsuccessful attempt. It was determined that a source of water that could supply high quality water to the village via gravity needed to be found. According to newspaper reports discovered by Reg Dearborn of Bristol, surveyors were employed in April of 1905 to identify various sources of supply. An available spring was located at about 1800 feet in elevation just east of Downingsville Road in Lincoln. In May of 1905 Bristol voted to issue $50,000.00 in bonds to fund the project. The woodlot where the spring was located is now known as *Bristol's Seth Hill Waterworks*. In 1905 a four-inch cast iron pipe was run from the spring at Seth Hill about four miles to a reservoir constructed for that purpose at the southern end of Hogback Mountain in Bristol. G.S. Farr managed the pipe laying. Much of this shovel work was accomplished by "a gang of Italians" who arrived in August of 1905. They were paid $1.65 per day. The work was hard and dangerous. Some of the workers went on strike in late September asking for $2.00 per

day. The contractor said the striking workers were no longer needed. The laying of pipes was completed without them in early November of 1905. On November 22, 1905, the Bristol Herald reported that the "Water was turned on at the intake of the village water system in Lincoln Tuesday afternoon and between 8 and 9 o'clock that evening it arrived at the pinnacle east of this village." The article went on: "It is putting it mildly to say that the advocates of the village water system feel like shouting the glorious fact that Bristol now has a water system that will furnish an abundant supply for all purposes." On December 1, 1905, the Middlebury Register reported that "The Italians, who have been at work on the water system, have all left town." The Register went on to report that "The construction committee, contractors and others celebrated the completion of the new water system Wednesday night by a banquet in the Republican club room in the Drake-Farr Block." In 2008 it was calculated that the spring could still supply 47- 80 gallons of water per minute year round. Although not actively serving the village any longer, the Seth Hill Waterworks still produces high quality water supplies all year round.

Natural Setting:

The property is in the Northern Green Mountain Physiographic Region. "The Northern Green Mountains are characterized by high elevations, cool summer temperatures, and acidic metamorphic rocks. Northern Hardwood Forests and the high elevation communities of the Spruce-Fir Northern Hardwood Forest Formation are also characteristic." (Thompson, Sorenson, and Zaino. 2019. *Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont.* The second edition was published by Vermont Fish and Wildlife Department, The Nature Conservancy, and Vermont Land Trust and distributed by Chelsea Green Publishing, White River Junction, Vermont.

Natural Community types found on the land include:

- Red Spruce-Northern Hardwood Forest
- Montane Yellow Birch-Red Spruce Forest
- Northern Hardwood Forest
- Hemlock-Northern Hardwood Forest

The bedrock is all typical Green Mountain schist with some albite and dolomite, which are calcium-rich and account for the abundant sugar maple and basswood trees lower in the property. The "ribbed" nature of the parcel has to do with the numerous streams that cut deeply through it creating the steep gorges that comprise most of Area 7. These streams start to become depositional in the lower part of the property due to the less severe slopes around the sugaring area and the field.

General Description of Property:

Location – The Town of Bristol's Seth Hill Waterworks Property is located east of Waterworks Road in the northeast corner of Lincoln.

Administration – The parcel is listed as 113.0 acres according to the grand list. All 113 acres are currently enrolled in the UVA program and no acres are excluded. Location: 04-02-04.000;

Parcel ID 42 04 0204.000. The parcel was enrolled in the Use Value Assessment Program on April 1, 2011.

Inventory – Starting in October of 2023, an inventory of the forest was conducted by Vermont Family Forests using a BAF 10 prism and Iphone GPS unit. A total of thirty-six variable area sample points were established randomly across the property. Areas were amended slightly from the 2014 inventory to expand riparian zone width particularly in steeper sections of the forest. Data included the basal area of trees in dominant, co-dominant, and intermediate canopy positions for each point, as well as tree species, diameter at breast height in two-inch classes, timber quality, and tree health. In addition, observations were made on invasive plant species encountered, regeneration type, extent, and condition, access road grade and condition, sugaring extent, wildlife use, and the condition of boundary marking.

Boundaries – The property lines are mostly blazed and painted red. There are iron pins in the corners. Some stretches of boundary have barbed wire fences. Some upgrades are required in some areas.

Topography – Elevation on the property ranges from about 1600 feet in elevation in the western portions of the parcel to about 2600 feet in the east. Slopes on the property range from 10 to 60%.

Landowner Objectives for Parcel

- Maintain full compliance with Vermont Use Value Assessment (UVA) Program.
- Restore degraded ecological functions and processes.
- Produce high quality forest products on a sustainable basis where feasible.
- Maintain a healthy forest.
- Maple sugaring is ideally suited for many areas.
- Collect non-timber forest products.
- Sequester carbon.
- Protect cultural resources.
- Maintain a forest in good condition for future generations.
- Monitor ecological change over time.
- Provide opportunities for area school children and others to actively explore natural resources and to monitor changes over time.
- Generate enough revenue to cover costs.
- Practice and demonstrate sustainable forest conservation and management.
- Protect and enhance scenic beauty.
- Protect water quality including maintaining protective strips, using proper stream crossing techniques, avoiding the use of synthetic pesticides, and using plant-based chainsaw bar and chain lubricants.
- Maintain site productivity especially by increasing organic matter.
- Protect biological diversity by locating and buffering spring seeps, vernal pools, and wetlands.
- Identify and protect cultural resources such as stone walls or piles.

- Have a place to find peace and solitude.
- Maintain opportunities for compatible, non-mechanized and non-equestrian recreation such as walking, hiking, cross-country skiing, bird watching, and hunting.

FOREST HEALTH SUMMARY

Conservation & maintenance of soil and water resources

Status--- According to the Soil Conservation Service's 1970 soil mapping, the soils of the Seth Hill Waterworks Property are Berkshire and Marlow extremely stony loams. There is also one small patch mapped as Colton gravelly sandy loam and another that is mapped as Salmon very fine sandy loam. The Salmon soil is one of the most productive soils in Addison County. Access to much of the property is severely restricted due to steep slopes, many deeply incised streams, and site wetness. Steep sections ought to be closed to prevent further erosion and to enhance the capacity of the forest to absorb peak flows from storm events. There are some opportunities to improve recreational and timber access, but this potential has not been evaluated as part of this inventory and planning process. A preliminary assessment of the access network revealed the following general conditions:

Water Quality Practices			
Satisfactory	Needs Work	Not Applicable at Present	
✓			Protective strips with minimal soil disturbance, complete canopy closure, and many large trees are maintained between the access network and surface water.
✓			There is little or no exposed soil in the protective strip.
	✓		Stream crossings have been properly restored and non-permanent structures have been removed.
	✓		Bridges and culverts are properly sized and installed at right angles across streams.

Access Network Practices			
Satisfactory	Needs Work	Not Applicable at Present	
	✓		The timber harvesting access network including truck roads, skid trails, and log landings is well located and occupies less than 10% of the area.
	✓		Truck road grades are 3% to 10% and any grades more than 10% are less than 300 feet in length.
	✓		Skid trail grades are 3% to 15% and any grades more than 15% are less than 300 feet in length.
	✓		Truck roads are properly drained according to the VT AMP's.
	✓		Skid trails are properly drained according to the VT AMP's.
	✓		Log landings are on nearly-level, stable ground; away from protective strips; have water diversions installed; and are properly graded to prevent erosion and sedimentation.

✓			Post-harvest use of the access network has been restricted to prevent erosion and site disruption.
	✓		Sediment from roads and trails is prevented from reaching streams by turn-ups and broad-based dips.
	✓		Drainage ditches do not feed directly into streams or other surface waters.

The most advanced soil erosion on:	Skid trail(s)	Truck road(s)	Log landing(s)
None to slight			
Rill (1-6" deep)			
Initial gully (6-12" deep)		✓	
Marked gully (12-14" deep)	✓		
Advanced gully (+24" deep)			
Not applicable			✓

Maintenance of forest ecosystem health

Status--- In general insects and disease appear to be within the range of historic variation. Maple leaf cutter damage was noted. Beech scale *nectria* are advanced. Remarkably, no populations of exotic plant species were detected in the inventory.

Satisfactory	Needs Work	
✓		Invasive exotic species do not pose a significant threat.
✓		Domestic animals have been prevented from grazing in the area.

FOREST USE SUMMARY

Maintenance of long-term socio-economic benefits

Maple Sugaring--- Don and Jody Gale of Lincoln, Owners, and Operators of Twin Maple Sugar Works, currently tap red and sugar maple trees in Areas 4, 5 and 6 each year. It is anticipated that about 800 taps will be installed in the 2024 season.

Firewood and Timber--- Areas 4 and 5 offer the greatest potential for timber and firewood removal. However, this will be a marginal operation due to access and very limited volumes of high quality sawtimber. These areas are best managed for maple sap.

Cultural Elements or Archeological Sites--- The area once served as a source of water for the Village of Bristol. Elements of the 1905 water system are still in place, but the spring house was damaged by Tropical Storm Irene in 2011 and has been removed. The remaining cultural elements could be explored in cooperation with the Bristol and/or Lincoln Historical Societies. Some stonewalls and piles are found in the lower elevations.

Recreation--- Existing recreational uses appear to be limited to hunting, Nordic skiing, and hiking. Except for the access trails and roads, there are no developed recreational facilities on the property. Recreation trails could be improved by closing wet and steep sections, and then relocating trails at grades of 10% or less and on drier sites. This would be an expensive proposition which may not be warranted or advisable.

SCHEDULE OF CONSERVATION ACTIVITIES

Management standards allow for conducting prescribed activities within three years of the treatment year. Conservation activities are described in more detail in the following sections.

Treatment Year	Area #	Conservation Activity	Silvicultural Guide or Tech. Reference, Prescription # or Letter, if appropriate
2027	All	Maintain boundary lines by painting existing monumentation.	
Ongoing	All	Install erosion control as needed and as funding permits to reduce soil erosion and stream sedimentation while slowing, spreading, and sinking storm flows.	*Vermont Water Quality Acceptable Management Practices Manual for Logging Professionals* (Vermont Dept. of Forests, Parks, and Recreation 2019)
Ongoing	4 & 5	Very light thinning could enhance maple production though stocking does not require it and sugaring infrastructure may limit operability.	Follow VT FP&R guidelines
2034	All	Re-examine.	

AREA 1 ~ PAPER BIRCH-RED SPRUCE-BALSAM FIR

Acreage:	13.02
Cover Type:	Paper Birch-Red Spruce-Balsam Fir
Natural Community Type:	Montane Yellow Birch-Red Spruce Forest

---OVERVIEW ---

Area Description and Land Use History--- This area occupies 13.02 acres of the property and is situated on southwesterly slopes that range from 10 to 35% grade. The area is sandwiched between two riparian zones both of which are steep and wet. Timber access likely will require crossing USFS lands to the south. In the past, timber was removed via steep skid trails that were very close to a first order, deeply incised stream. Though moderately steep, with-in area access potential exists, it would require excellent design, careful construction, and long term maintenance. The existing timber is low quality and/or over mature. Natural regeneration has accelerated since the inventories were conducted in 1997 and 2013. Old moose bark stripping of red maples and recent deer browsing of the area is heavy. No invasive plant species were encountered.

Soils and Site Productivity--- Soil drainage is variable, and operability is limited to frozen winter conditions.

Soil type: Berkshire & Marlow extremely stony loams.
Site index (Northern Hardwood): 53-58 (determined from soils – USDA SCS, 1971)
Value group: 5 (determined from soils – USDA SCS, 2003)

Conservation of biological diversity

There are several forest components that contribute to biological diversity. Species richness is moderately low with only five tree species dominating tallied. Canopy closure % is highly diverse due to recent wind events. There are numerous standing dead snags and overstory inclusions. There is abundant dead and down woody debris and waterside decaying logs. Mast and fruit trees including nut-bearing trees and fleshy fruit-producing trees and shrubs are limited.

Habitat Conditions		
Satisfactory	Needs Work and/or Time	
	✓	There are at least eight (4-21”+; 8-15”+ DBH) cavity and/or snag trees per acre.
	✓	There are at least eight (4-21”+; 8-15”+ DBH) down trees per acre.
	✓	There are at least six vigorous and wind-firm legacy trees (21”+ DBH)

Wildlife Use and Habitat Observations --- Bear use, deer browse, and old moose browse are common. The deer browse is heavy in the area with a high proportion of paper birch in the understory. The areas that were heavily browsed also seemed to have a higher proportion of spruce in the overstory. The area is very patchy. The deer may have created a system of "crop rotation" where they feed heavily on a patch until it becomes dominated by softwoods then let it lie "fallow" for a time.

Unique and/or Fragile Communities --- No unique communities noted.

Invasive/exotic species--- Invasive species such as Norway maple, Japanese and common barberry, glossy buckthorn, honeysuckle spp., and common buckthorn were not observed. This may be attributed in part to the remoteness of the area and the minimal logging disturbance, at least in recent years.

Maintenance of productive capacity

Forest products include wood products (i.e., timber, fuelwood, and pulpwood) and small woods; non-wood forest products (i.e., plants such a wild ramps and berries and plant products such as maple syrup); and forest ecosystem services such as clean water, carbon storage, and recreation.

Access Distance: less than 1 mile
BAF: 10 **Number of points:** 6 **Date of data collection:** October - November 2023

Present Age Class of Dominants and Co-Dominants: 80 years (estimate)
Dominant and Co-Dominant basal area per acre: 88 sq. ft.
Acceptable Timber Growing Stock basal area per acre: 48 sq. ft.
Quadratic Mean Stand Diameter: 11.8 inches
Number of Dominant and Co-Dominant trees per acre: 116

Species Composition:

Species	% of Total Basal Area of Dominants and Co- Dominants
White birch	30
Yellow birch	26

Spruce	22
Balsam fir	4
Red maple	13
Striped maple	6

Stand Age Class Structure: Being regenerated.

Timber Status: Low stand quality – acceptable growing stock basal area less than "C" level.

Uneven-aged Timber Stands:

Size Class Distribution		**Existing Basal Area** (square feet/acre)			
(name)	(inches DBH)	Total	AGS	UGS	Cull
Seedlings-Saplings	2-4"	0	0	0	n/a
Poles	6-10"	30	17	13	n/a
Mid-size	12-14"	30	20	10	n/a
Large trees	16"+	28	12	17	n/a
Elders and seedlings	24"+ and declining	0	0	0	n/a
Total		88	48	40	n/a

Timber Quality:

Dominant and Co-dominant Trees		
Quality	**Basal Area**	**#Stems**
	(square ft/acre)	(per acre)
Acceptable – USFS Tree Grade #2 or better	48	66
Non-acceptable – less than #2 but could be sold	40	50
Cull – no sawtimber potential	n/a	n/a
Mature –USFS Tree Grade #2 or better & at goal age or DBH	3	2
Total	88	116

Regeneration--- Red spruce, white birch, striped maple, red maple, hobblebush, and beech that is stunted due to browsing but very dense.

Primary Landowner Objectives for Area

- Maintain full compliance with Vermont Use Value Assessment (UVA) Program

- Restore degraded ecological functions and processes.
- Maintain a healthy forest.
- Protect water quality including maintaining protective strips, using proper stream crossing techniques, and avoiding the use of pesticides.
- Protect biological diversity by locating and buffering spring seeps, vernal pools, and wetlands.
- Maintain opportunities for compatible, non-motorized recreation such as walking and hiking, cross-country skiing, peace and solitude, bird watching, mountain biking and hunting.

--- SCHEDULE OF CONSERVATION ACTIVITIES ---

Long Range Vegetation Management Objectives and Approaches ---

Uneven-aged management:
Desired diameter (DBH) for principal species: 20 inches
Maturity age: 80 years
Stewardship cycle: 15 years
acres to regenerate: 2.44 acres per stewardship cycle

Conservation Activities ---

Based on *NE – 603: Silvicultural Guide for Northern Hardwood Types – Prescription H:* "This stand has too little quality growing stock for efficient even-aged management. Consider a long series of selection/ group selection to gradually improve the condition of the stand." The stand is in the process of being regenerated but heavy browsing is precluding establishment of suitable regeneration.

Year*	**Acres**	**Forest Conservation Practices**	
		Activity	Specifications
Ongoing	All	No vegetation treatment recommended.	Re-examine in 10 years.
2027		Close steep sections of skid roads as needed and funding permits.	Follow VT AMPs
Ongoing		Install erosion control on skid trails, truck roads, and/or landings as needed and funding permits.	Follow VT AMPs
2034	ALL	Re-examine.	

(* ± 3 years from this date)

AREA 2 ~ PAPER BIRCH-RED SPRUCE-BALSAM FIR

Acreage:	13.75
Cover Type:	Paper Birch-Red Spruce-Balsam Fir
Natural Community Type:	Montane Yellow Birch-Red Spruce Forest

---OVERVIEW ---

Area Description and Land Use History--- This area occupies about 13.75 acres of the property. It is situated on southwesterly slopes that range from 5 to 25% grade. Access to the area is limited to some degree by slope and wetness. Significant portions of the access crossing USFS lands is needed. Also, some of the best access goes through the most productive areas of commercial sugarbush on the property. The areas are moderately steep, but with-in area access potential under frozen winter conditions is good. The timber is low quality and/or over mature. Natural regeneration has accelerated since the inventories that were conducted in 1997 and 2013. Moose stripping of red maple trees is evident but not recent. Deer heavily browses the area. No invasive plant species were encountered.

Soils and Site Productivity--- Soil drainage is variable but there are many wet spots. Operability is limited to frozen winter conditions.

Soil type: Berkshire & Marlow extremely stony loams.
Site index (Northern Hardwood): 53-58 (determined from soils – USDA SCS, 1971)
Value group: 5 (determined from soils – USDA SCS, 2003)

Conservation of Biological Diversity

There are several forest components that contribute to biological diversity. Species richness is moderate with eight tree species tallied. Canopy closure % is highly diverse due to recent wind events. There are numerous standing dead snags and overstory inclusions. There is abundant dead and down woody debris and waterside decaying logs. Mast and fruit trees including nut-

bearing trees and fleshy fruit-producing trees and shrubs are limited. Beech trees make up 4% of the overstory.

Habitat Conditions		
Satisfactory	Needs Work and/or Time	
	✓	There are at least eight (4-21”+; 8-15”+ DBH) cavity and/or snag trees per acre.
	✓	There are at least eight (4-21”+; 8-15”+ DBH) down trees per acre.
	✓	There are at least six vigorous and wind-firm legacy trees (19”+ DBH)

Wildlife Use and Habitat Observations --- Bear use, deer browse, and old moose bark stripping are common. The deer browse is heavy in the area with a high proportion of paper birch in the understory. The areas that were heavily browsed also seemed to have a higher proportion of spruce in the overstory. The area is very patchy. The deer may have created a system of "crop rotation" where they feed heavily on a patch until it becomes dominated by softwoods then let it lie "fallow" for a time.

Unique and/or Fragile Communities --- No unique communities noted.

Invasive/exotic species--- Invasive species such as Norway maple, Japanese and common barberry, glossy buckthorn, honeysuckle spp., and common buckthorn were NOT observed. This may be attributed in part to the remoteness of the area and the minimal logging disturbance, at least in recent years.

Maintenance of Productive Capacity

Forest products include wood products (i.e., timber, fuelwood, and pulpwood) and small woods; non-wood forest products (i.e., plants such a wild ramps and berries and plant products such as maple syrup); and forest ecosystem services such as clean water, carbon storage, and recreation.

Access Distance: less than 1 mile
BAF: 10 **Number of points:** 6 **Date of data collection:** October 2023

Present Age Class of Dominants and Co-Dominants: 80 years (estimate)
Dominant and Co-Dominant basal area per acre: 77 sq. ft.
Acceptable Timber Growing Stock basal area per acre: 20 sq. ft.
Quadratic Mean Stand Diameter: 11.9 inches
Number of Dominant and Co-Dominant trees per acre: 100

Species Composition:

Species	% of Total Basal Area of Dominants and Co- Dominants
White birch	24
Yellow birch	26
Sugar maple	17
Spruce	7
Balsam fir	9
Red maple	7
American beech	4
Striped maple	7

Stand Age Class Structure: Being regenerated.

Timber Status: Low stand quality – acceptable growing stock basal area less than "C" level.

Uneven-aged Timber Stands:

Size Class Distribution		**Existing Basal Area** (square feet/acre)			
(name)	(inches DBH)	Total	AGS	UGS	Cull
Seedlings-Saplings	2-4"	0	0	0	n/a
Poles	6-10"	32	5	27	n/a
Mid-size	12-14"	32	7	25	n/a
Large trees	16"+	13	8	5	n/a
Elders and seedlings	24"+ and declining	0	0	0	n/a
Total		77	20	57	n/a

Timber Quality:

Dominant and Co-dominant Trees		
Quality	**Basal Area**	**#Stems**
	(square ft/acre)	(per acre)
Acceptable – USFS Tree Grade #2 or better	15	18
Non-acceptable – less than #2 but could be sold	57	79
Cull – no sawtimber potential	n/a	n/a
Mature –USFS Tree Grade #2 or better & at goal age or DBH	5	3
Total	77	100

Regeneration--- Red spruce, white birch, striped maple, red maple, and hobblebush, and beech that is stunted due to browsing but very dense.

Primary Landowner Objectives for Area

- Maintain full compliance with Vermont Use Value Assessment (UVA) Program.
- Restore degraded ecological functions and processes.
- Maintain a healthy forest.
- Protect water quality including maintaining protective strips, using proper stream crossing techniques, and avoiding the use of pesticides.
- Protect biological diversity by locating and buffering spring seeps, vernal pools, and wetlands.
- Maintain opportunities for compatible, non-mechanized recreation such as walking, hiking, cross-country skiing, bird watching, and hunting.

--- SCHEDULE OF CONSERVATION ACTIVITIES ---

Long Range Vegetation Management Objectives and Approaches ---

Uneven-aged management:
Desired diameter (DBH) for principal species: 20 inches
Maturity age: 80 years
Stewardship cycle: 15 years
acres to regenerate: 2.57 acres per stewardship cycle

Conservation Activities ---

Based on *NE – 603: Silvicultural Guide for Northern Hardwood Types – Prescription H:* "This stand has too little quality growing stock for efficient even-aged management. Consider a long series of selection/ group selection to gradually improve the condition of the stand." The stand is in the process of being regenerated but heavy browsing is precluding establishment of suitable regeneration.

Acres	**Forest Conservation Practices**	
	Activity	Specifications
2027	Close steep sections of skid trails to reduce erosion and stream sedimentation while slowing, spreading, and sinking storm flows if funding can be secured.	Follow VT AMPs
2027	Install erosion control on skid trails, truck roads, and/or landings as needed and funding permits.	Follow VT AMPs
2034	Re-examine.	

(* ± 3 years from this date)

AREA 3 ~ PAPER BIRCH-RED MAPLE

Acreage:	8.26
Cover Type:	Paper Birch-Red Maple
Natural Community Type:	Montane Yellow Birch-Red Spruce Forest

---OVERVIEW ---

Area Description and Land Use History--- This area occupies about 8.26 acres of the property and has a south-facing aspect with a 5-30% slope. This area is dominated by white birch and red maple.

Soils and Site Productivity--- Soils are very well drained and prone to drought due to soil depth, slope, and aspect. They are operable under winter and summer conditions.

Soil type: Berkshire & Marlow extremely stony loams.
Site index (Northern Hardwood): 53-58 (determined from soils – USDA SCS, 1971)
Value group: 5 (determined from soils – USDA SCS, 2003)

Conservation of biological diversity

Forest components that limit biological diversity in this area include low tree species richness; uniform closure %; no coniferous overstory inclusions; few dead trees boles; limited dead and down woody debris; and few if any mast and fruit trees including nut-bearing trees and fleshy fruit-producing trees and shrubs.

Habitat Conditions		
Satisfactory	Needs Work and or Time	
	✓	There are at least eight (4-21"+; 8-15"+ DBH) cavity and/or snag trees per acre.
	✓	There are at least eight (4-21"+; 8-15"+ DBH) down trees per acre.
	✓	There are at least six vigorous and wind-firm legacy trees (19"+ DBH)

Wildlife Use and Habitat Observations --- There were no observations of bear use, moose bark stripping, mast species, aspen clones, vernal pools, or spring seeps in this area. Deer browsing was very prevalent.

Unique and/or Fragile Communities --- No unique communities noted.

Invasive/exotic species--- None observed.

Maintenance of Productive Capacity

Forest products include wood products (i.e., timber, fuelwood, and pulpwood) and small woods; non-wood forest products (i.e., plants such as wild ramps and berries and plant products such as maple syrup); and forest ecosystem services.

Access Distance: less than 1 mile
BAF: 10 **Number of points:** 3 **Date of data collection:** October 2023

Present Age Class of Dominants and Co-Dominants: 60 years (estimate)
Dominant and Co-Dominant basal area per acre: 83 sq. ft.
Acceptable Timber Growing Stock basal area per acre: 37 sq. ft.
Quadratic Mean Stand Diameter: 12.9 inches
Number of Dominant and Co-Dominant trees per acre: 89

Species Composition:

Species	% of Total Basal Area of Dominants and Co- Dominants
White Birch	76
Red Maple	16
Sugar Maple	4
Yellow Birch	4

Stand Age Class Structure: Even-aged.

Timber Status: Low stand quality – acceptable growing stock basal area less than "C" level.

Even-Aged Timber Stands: Adequately stocked.

Timber Quality:

Dominant and Co-dominant Trees		
Quality	**Basal Area**	**#Stems**
	(square ft/acre)	(per acre)
Acceptable – USFS Tree Grade #2 or better	30	37
Non-acceptable – less than #2 but could be sold	47	51
Cull – no sawtimber potential	n/a	n/a
Mature –USFS Tree Grade #2 or better & at goal age or DBH	7	2
Total	83	89

Regeneration--- Beech, spruce, striped maple, and sugar maple that is heavily browsed and not well established.

Primary Landowner Objectives for Area

- Maintain full compliance with Vermont Use Value Assessment (UVA) Program.
- Maintain a healthy forest.
- Sequester carbon.
- Monitor ecological change over time.
- Protect and enhance scenic beauty.
- Protect water quality including maintaining protective strips, using proper stream crossing techniques, and avoiding the use of pesticides.

--- SCHEDULE OF CONSERVATION ACTIVITIES ---

Long Range Vegetation Management Objectives and Approaches ---

Uneven-age Management:
Rotation age: 120 years
Stewardship cycle: 15 years
acres to regenerate: 0.826 acres per stewardship cycle.

Conservation Activities ---

Based on *NE – 603: Silvicultural Guide for Northern Hardwood Types – Prescription H:* "This stand has too little quality growing stocking for efficient uneven-age management." The area could be left alone and allowed to regenerate naturally.

Year*	Acres	Forest Conservation Practices	
		Activity	Specifications
Ongoing	All	Increase the number of large cavity and snag trees.	Up to 8 low-quality trees per acres greater than 15" DBH could be girdled in this area to meet snag targets.
Ongoing	All	Increase the number of down trees.	Up to 8 low-quality trees greater than 15" DBH could be felled and left in this area to meet down tree targets.
Ongoing	All	Retain wind-firm "legacy" trees.	All vigorous and wind-firm legacy trees (21"+ DBH) should be retained in this area.
Ongoing		Improve grade on portions of skid trails, truck roads, and/or landings if funds are available.	Follow Vermont AMPs.
2034	ALL	Re-examine.	

(* ± 3 years from this date)

AREA 4. ~ NORTHERN HARDWOOD

Acreage: 14.98

Cover Type: Northern Hardwood

Natural Community Type: Northern Hardwood

---OVERVIEW ---

Area Description and Land Use History--- This area occupies 14.98 acres of the property and is situated on a 15 – 25% slope. This area is dominated by red maple (26%), beech (8%), yellow birch (35%), white birch (3%), black cherry (2%), white pine (2%), spruce (2%), and sugar maple (15%). Almost 50% of the basal area is maple and northern western sections that have the highest concentrations of maple are part of the maple sugaring operation.

Soils and Site Productivity--- Soil drainage is highly variable, and operability is limited to winter or dry summer conditions.

Soil type: Berkshire & Marlow extremely stony loams.
Site index (Northern Hardwood): 53-58 (determined from soils – USDA SCS, 1971)
Value group: 5 (determined from soils – USDA SCS, 2003)

Conservation of biological diversity

Forest components that contribute to biological diversity in the area include moderately high tree species richness; variable canopy closure %; coniferous overstory inclusions; tree boles of various conditions ranging from dead to live and hard to soft; midstory layer; shrub layer; ground cover vegetation %; dead and down woody debris: mast and fruit trees including nut-bearing trees and fleshy fruit-producing trees and shrubs; and spring seeps.

Habitat Conditions		
Satisfactory	Needs Work and/or Time	
	✓	There are at least eight (4-21"+; 8-15"+ DBH) cavity and/or snag trees per acre.
	✓	There are at least four (4-21"+; 8-15"+ DBH) down trees per acre.
	✓	There are at least six vigorous and wind-firm legacy trees (19"+ DBH)

Wildlife Use and Habitat Observations --- Deer browsing and old moose bark stripping were observed. Mast species include beech, serviceberry, and black cherry.

Unique and/or Fragile Communities --- No unique communities noted.

Invasive/exotic species--- None observed.

Maintenance of productive capacity

Forest products include wood products (i.e., timber, fuelwood, and pulpwood) and small woods; non-wood forest products (i.e., plants such as wild ramps and berries and plant products such as maple syrup); and forest ecosystem services.

Access Distance: less than 1 mile
BAF: 10 **Number of points:** 8 **Date of data collection:** January 2024

Present Age Class of Dominants and Co-Dominants: 90 years
Dominant and Co-Dominant basal area per acre: 81 sq. ft.
Acceptable Timber Growing Stock basal area per acre: 44 sq. ft.
Quadratic Mean Stand Diameter: 13.6 inches
Number of Dominant and Co-Dominant trees per acre: 82

Species Composition:

Species	% of Total Basal Area of Dominants and Co- Dominants
Red Maple	26
Beech	8
White Birch	3
Yellow Birch	35
Sugar Maple	15
Black Cherry	3
Serviceberry	3
White Pine	3
Spruce	3

Stand Age Class Structure: Uneven-aged.

Timber Status: Immature – more than 5 years to maturity, less than 50% of basal area is mature.

Uneven-aged Timber Stands:

Size Class Distribution		**Existing Basal Area** (square feet/acre)			
(name)	(inches DBH)	Total	AGS	UGS	Cull
Seedlings-Saplings	2-4”	0	0	0	0
Poles	6-10”	13	8	4	1
Mid-size	12-14”	29	18	9	3
Large trees	16”+	40	19	19	3
Elders and seedlings	24”+ and declining	0	0	0	0
Total		81	44	31	6

Timber Quality:

Dominant and Co-dominant Trees		
Quality	**Basal Area**	**#Stems**
	(square ft/acre)	(per acre)
Acceptable – USFS Tree Grade #2 or better	38	43
Non-acceptable – less than #2 but could be sold	31	30
Cull – no sawtimber potential	6	6
Mature –USFS Tree Grade #2 or better & at goal age or DBH	6	3
Total	81	82

Regeneration--- Beech, hobblebush, fir, serviceberry, and sugar maple. Scattered throughout. Generally, heavily browsed.

Primary Landowner Objectives for Area

- Maintain full compliance with Vermont Use Value Assessment (UVA) Program.
- Produce high quality forest products on a sustainable basis.
- Maintain a healthy forest.
- Expand maple sugaring if red maple is acceptable to producer.

- Maintain a forest in good condition for future generations.
- Generate enough revenue to cover costs.
- Protect water quality including maintaining protective strips, using proper stream crossing techniques, and avoiding the use of pesticides.
- Protect biological diversity by locating and buffering spring seeps, vernal pools, and wetlands.
- Maintain opportunities for compatible, non-motorized recreation such as walking and hiking, cross-country skiing, peace and solitude, bird watching, mountain biking and hunting.

--- SCHEDULE OF CONSERVATION ACTIVITIES ---

Long Range Vegetation Management Objectives and Approaches ---

Uneven-aged management:
Desired diameter (DBH) for principal species: 22 inches
Maturity age: 120 years
Stewardship cycle: 15 years
acres to regenerate: 0.1 per year or 1.5 per stewardship cycle

Conservation Activities ---

Based on *NE – 603: Silvicultural Guide for Northern Hardwood Types – Prescription E:* "This stand has suitable quality and structure to implement uneven-age management. But stand density is not critically high. Re-examine in 10 to 20 years.

Year*	**Acres**	**Forest Conservation Practices**	
		Activity	Specifications
Ongoing		Retain wind-firm "legacy" trees.	All vigorous and wind-firm legacy trees (19"+ DBH) should be retained in this area.
Ongoing		Install erosion control on skid trails, truck roads, and/or landings.	Follow VT AMPs.
2034	ALL	Re-examine.	

(* ± 3 years from this date)

AREA 5 ~ SUGAR MAPLE-BEECH-YELLOW BIRCH

Acreage:	13.25
Cover Type:	Sugar Maple-Beech-Yellow Birch
Natural Community Type:	Northern Hardwoods

---OVERVIEW ---

Area Description and Land Use History--- This area occupies 13.25 acres of the property and is moderately sloping with a southwestern aspect. This area is dominated by sugar maple, beech, and yellow birch. It currently provides about 600 taps with some opportunity to expand as the stand grows and matures.

Soils and Site Productivity--- Soil drainage is variable, and operability is limited to winter or dry summer conditions.

Soil type: Berkshire & Marlow extremely stony loams.
Site index (Northern Hardwood): 53-58 (determined from soils – USDA SCS, 1971)
Value group: 5 (determined from soils – USDA SCS, 2003)

Conservation of biological diversity

Forest components that contribute to biological diversity on the Area include moderately high species richness; variable canopy closure %; tree boles of various conditions ranging from dead to live and hard to soft; dead and down woody debris; and mast including nut-bearing trees.

Habitat Conditions		
Satisfactory	Needs Work and/or Time	
	✓	There are at least eight (4-21"+; 8-15"+ DBH) cavity and/or snag trees per acre.
	✓	There are at least eight (4-21"+; 8-15"+ DBH) down trees per acre.
	✓	There are at least six vigorous and wind-firm legacy trees (19"+ DBH)

Wildlife Use and Habitat Observations --- Deer browse, coyote and fox tracks, and small mammals observed. Mast species include American beech and black cherry.

Unique and/or Fragile Communities --- No unique communities noted.

Invasive/exotic species--- None observed.

Insects and diseases--- Beech bark disease and limited sugar maple borer observed.

Maintenance of Productive Capacity

Forest products include wood products (i.e., timber, fuelwood, and pulpwood) and small woods; non-wood forest products (i.e., plants such as wild ramps and berries and plant products such as maple syrup); and forest ecosystem services. Maple syrup is an ideal product for this portion of the forest.

Access Distance: less than 1 mile
BAF: 10 **Number of points:** 6 **Date of data collection:** January 2024

Present Age Class of Dominants and Co-Dominants: 85 years (estimate)
Dominant and Co-Dominant basal area per acre: 118 sq. ft.
Acceptable Timber Growing Stock basal area per acre: 55 sq. ft.
Quadratic Mean Stand Diameter: 12.0 inches
Number of Dominant and Co-Dominant trees per acre: 145

Species Composition:

Species	% of Total Basal Area of Dominants and Co- Dominants
Sugar Maple	55
American Beech	12
Yellow Birch	8
Red Maple	11
White Birch	3
Black Cherry	4
Hemlock	4

Stand Age Class Structure: Uneven-aged.

Timber Status: Immature – more than 5 years to maturity, less than 50% of basal area is mature.

Uneven-aged Timber Stands:

Size Class Distribution		**Existing Basal Area** (square feet/acre)			
(name)	(inches DBH)	Total	AGS	UGS	Cull
Seedlings-Saplings	2-4”	2	2	0	0
Poles	6-10”	23	12	8	3
Mid-size	12-14”	25	13	8	3
Large trees	16”+	55	40	10	5
Elders and seedlings	24”+ and declining	13	7	3	3
Total		118	73	30	15

Timber Quality:

Dominant and Co-dominant Trees		
Quality	**Basal Area**	**#Stems**
	(square ft/acre)	(per acre)
Acceptable – USFS Tree Grade #2 or better	55	83
Unacceptable – less than #2 but could be sold	30	39
Cull – no sawtimber potential	15	18
Mature –USFS Tree Grade #2 or better & at goal age or DBH	18	6
Total	118	145

Regeneration--- Sugar maple, American beech, yellow birch, and red spruce distributed but browsed and sparse.

Primary Landowner Objectives for Area

- Maintain full compliance with Vermont Use Value Assessment (UVA) Program.
- Produce high quality forest products on a sustainable basis.
- Maintain a healthy forest.
- Maple sugaring.
- Collect non-timber forest products.
- Sequester carbon.
- Maintain a forest in good condition for future generations.
- Provide opportunities for area school children and more to actively explore natural resources and to monitor changes over time.
- Generate enough revenue to cover costs.
- Practice and demonstrate sustainable forest management.

- Protect and enhance scenic beauty.
- Protect water quality including maintaining protective strips, using proper stream crossing techniques, and avoiding the use of pesticides.
- Maintain site productivity especially by increasing organic matter.
- Protect biological diversity by locating and buffering spring seeps, vernal pools, and wetlands.
- Identify and protect cultural resources such as stone walls or piles.
- Maintain opportunities for compatible, non-mechanized recreation such as walking, hiking, cross-country skiing, bird watching, and hunting.

--- SCHEDULE OF CONSERVATION ACTIVITIES ---

Long Range Vegetation Management Objectives and Approaches ---

Uneven-aged management:
Desired diameter (DBH) for principal species: 22 inches
Maturity age: 150 years
Stewardship cycle: 115 years
acres to regenerate: 1.325 per stewardship cycle

Conservation Activities ---

Based on *NE – 603: Silvicultural Guide for Northern Hardwood Types – Prescription D:* "This stand has suitable quality and structure to implement uneven-age management. Develop and apply marking guides to meet goals for residual basal-area structure, tree condition, and regeneration. Consider single tree selection."

Year*	**Acres**	**Forest Conservation Practices**	
		Activity	Specifications
Ongoing	All	Very light, single tree selection as needed to enhance maple growth and health. High wind area.	Minimum stand structure: 6-10 DBH = 30 sq. ft/acre; 12-14 DBH = 30 sq. ft/acre; 16+ DBH = 40 sq. ft/acre.
Ongoing	As needed	Install erosion control on skid trails, truck roads, and/or landings.	Follow Vermont AMPs.
Ongoing		Maple sugaring.	Follow FP&R guidelines for tapping.
2034	ALL	Re-examine.	

(* ± 3 years from this date)

AREA 6 ~ SUGAR MAPLE-BEECH-YELLOW BIRCH

Acreage: 6.01

Cover Type: Sugar Maple-Beech-Yellow Birch

Natural Community Type: Northern Hardwoods

---OVERVIEW ---

Area Description and Land Use History--- This area occupies 6.01 acres of the property and is moderately sloping with a southwestern aspect. This area is dominated by sugar maple (53%), beech (19%), and yellow birch (9%). It currently provides very limited taps with some opportunity to expand as the stand grows and matures.

Soils and Site Productivity--- Soil drainage is variable, and operability is limited to winter or dry summer conditions.

Soil type: Berkshire & Marlow extremely stony loams.
Site index (Northern Hardwood): 53-58 (determined from soils – USDA SCS, 1971)
Value group: 5 (determined from soils – USDA SCS, 2003)

Conservation of biological diversity

Forest components that contribute to biological diversity on the Area include moderately high species richness; variable canopy closure %; tree boles of various conditions ranging from dead to live and hard to soft; dead and down woody debris; and mast including nut-bearing trees.

Habitat Conditions		
Satisfactory	Needs Work and/or Time	
	✓	There are at least four (1-21"+; 4-15"+ DBH) cavity and/or snag trees per acre.
	✓	There are at least four (1-21"+; 4-15"+ DBH) down trees per acre.
✓		There are at least three vigorous and wind-firm legacy trees (21"+ DBH)

Wildlife Use and Habitat Observations --- Deer browse, coyote and fox tracks, and small mammals observed. The mast species include beech and black cherry.

Unique and/or Fragile Communities --- No unique communities noted.

Invasive/exotic species--- None observed.

Insects and diseases--- Beech bark disease and sugar maple borer observed.

Maintenance of productive capacity

Forest products include wood products (i.e., timber, fuelwood, and pulpwood) and small woods; non-wood forest products (i.e., plants such as wild ramps and berries and plant products such as maple syrup); and forest ecosystem services. Maple syrup is an ideal product for this portion of the forest.

Access Distance: less than 1 mile
BAF: 10 **Number of points:** 3 **Date of data collection:** February 2024

Present Age Class of Dominants and Co-Dominants: 85 years (estimate)
Dominant and Co-Dominant basal area per acre: 107 sq. ft.
Acceptable Timber Growing Stock basal area per acre: 60 sq. ft.
Quadratic Mean Stand Diameter: 13.5 inches
Number of Dominant and Co-Dominant trees per acre: 105

Species Composition:

Species	% of Total Basal Area of Dominants and Co- Dominants
Sugar Maple	53
Beech	19
Yellow Birch	9
Hemlock	6
White Birch	3
Red Maple	6
Spruce	3

Stand Age Class Structure: Uneven-aged.

Timber Status: Immature – more than 5 years to maturity, less than 50% of basal area is mature.

Uneven-aged Timber Stands:

Size Class Distribution		**Existing Basal Area** (square feet/acre)			
(name)	(inches DBH)	Total	AGS	UGS	Cull
Seedlings-Saplings	2-4”	0	0	0	n/a
Poles	6-10”	27	17	10	n/a
Mid-size	12-14”	23	13	10	n/a
Large trees	16”+	53	30	23	n/a
Elders and seedlings	24”+ and declining	3	0	3	n/a
Total		107	60	47	n/a

Timber Quality:

Dominant and Co-dominant Trees		
Quality	**Basal Area**	**#Stems**
	(square ft/acre)	(per acre)
Acceptable – USFS Tree Grade #2 or better	43	54
Non-acceptable – less than #2 but could be sold	47	25
Cull – no sawtimber potential	0	0
Mature –USFS Tree Grade #2 or better & at goal age or DBH	17	6
Total	107	105

Regeneration--- Sugar maple, beech, yellow birch, and red spruce distributed but browsed and sparse.

Primary Landowner Objectives for Area

- Maintain full compliance with Vermont Use Value Assessment (UVA) Program
- Produce high quality forest products on a sustainable basis.
- Maintain a healthy forest.
- Maple sugaring
- Collect non-timber forest products.
- Sequester carbon.
- Maintain a forest in good condition for future generations.
- Provide opportunities for area school children and more to actively explore natural resources and to monitor changes over time.
- Generate enough revenue to cover costs.

- Practice and demonstrate sustainable forest management.
- Protect and enhance scenic beauty.
- Protect water quality including maintaining protective strips, using proper stream crossing techniques, and avoiding the use of pesticides.
- Maintain site productivity especially by increasing organic matter.
- Protect biological diversity by locating and buffering spring seeps, vernal pools, and wetlands.
- Identify and protect cultural resources such as stone walls or piles.
- Maintain opportunities for compatible, non-motorized recreation such as walking and hiking, cross-country skiing, peace and solitude, bird watching, mountain biking and hunting.

--- SCHEDULE OF CONSERVATION ACTIVITIES ---

Long Range Vegetation Management Objectives and Approaches ---

Uneven-aged management:
Desired diameter (DBH) for principal species: 22 inches
Maturity age: 140 years
Stewardship cycle: 10 years
acres to regenerate: 0.12 per year or 1.2 per stewardship cycle

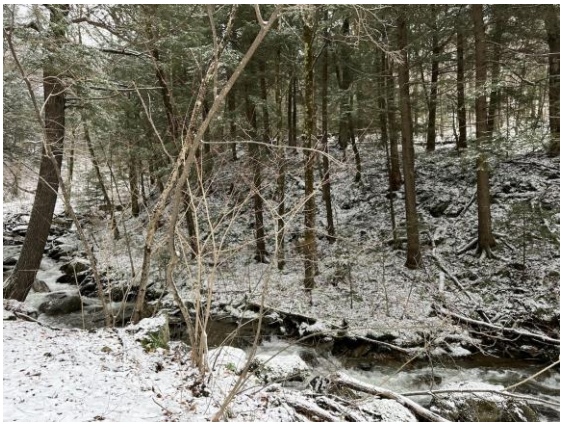
Conservation Activities ---

Based on *NE – 603: Silvicultural Guide for Northern Hardwood Types – Prescription D:* "This stand has suitable quality and structure to implement uneven-age management." But the site is wet and/or steep with tubing passing through portions. In the big scheme of things, density is not critically high. Re-examine in 10 years.

Year*	**Acres**	**Forest Conservation Practices**	
		Activity	Specifications
2017	All	No treatment needed but light thinning could be conducted to enhance maple growth and health.	Re-examine in 10 years.
Ongoing	As needed	Install erosion control on skid trails, truck roads, and/or landings.	Follow Vermont AMPs.
Ongoing		Continue maple sugaring.	Follow FP&R tapping guidelines.
2024	ALL	Re-examine.	

(* ± 3 years from this date)

MANAGEMENT AREA 7 ~ HEMLOCK-NORTHERN HARDWOOD



Acreage:	43.74
Cover Type:	Hemlock-Northern Hardwood
Natural Community Type:	Hemlock-Northern Hardwood

---OVERVIEW ---

Area Description and Land Use History--- This area occupies 43.74 acres of the property and is situated on moderate to very steep slopes with southwesterly aspects. This area is dominated by yellow birch, hemlock, sugar maple, beech, and spruce. Access is challenging due to wetness, proximity to first- and second-order streams, and steep slopes. However, there is access from adjacent areas that is suitable for winter timber harvesting. There is evidence of many spring seeps and some mass soil wasting.

Soils and Site Productivity--- Soil drainage is variable, and on-site operability is very limited due to steepness, wetness, and proximity to permanent streams. Some areas might be operated but only under frozen winter conditions.

Soil type: Berkshire & Marlow extremely stony loams.
Site index (Northern Hardwood): 53-58 (determined from soils – USDA SCS, 1971)
Value group: 5 (determined from soils – USDA SCS, 2003)

Conservation of Biological Diversity

Forest components that contribute to biological diversity in this area include moderately high species richness; variable canopy closure %; deciduous or coniferous overstory inclusions; tree boles of various conditions ranging from dead to live and hard to soft; dead and down woody debris; mast trees; and large legacy trees. Wetland components include permanent and ephemeral streams and riparian zones.

Habitat Conditions		
Satisfactory	Needs Work and/or Time	
	✓	There are at least eight (4-21"+; 8-15"+ DBH) cavity and/or snag trees per acre.
	✓	There are at least eight (4-21"+; 8-15"+ DBH) down trees per acre.
	✓	There are at least six vigorous and wind-firm legacy trees (21"+ DBH)

Wildlife Use and Habitat Observations --- Heavy deer browsing and limited moose bark stripping observed. Mast species include American beech. Spring seeps are common and limited mass soil wasting is present. Deer wintering area.

Unique and/or Fragile Communities --- No unique communities noted.

Invasive/exotic species--- None observed.

Insects and diseases--- Beech bark disease and sugar maple borer.

Maintenance of productive capacity

Forest products include wood products (i.e., timber, fuelwood, and pulpwood) and small woods; non-wood forest products (i.e., plants such as wild ramps and berries and plant products such as maple syrup); and forest ecosystem services.

Access Distance: less than 1 mile
BAF: 10 **Number of points:** 12 **Date of data collection:** October 2023 - January 2024

Present Age Class of Dominants and Co-Dominants: 95 years (estimate)
Dominant and Co-Dominant basal area per acre: 110 sq. ft.
Acceptable Timber Growing Stock basal area per acre: 51 sq. ft.
Quadratic Mean Stand Diameter: 12.2 inches
Number of Dominant and Co-Dominant trees per acre: 110

Species Composition:

Species	% of Total Basal Area of Dominants and Co- Dominants
Yellow Birch	57
Hemlock	36
Sugar Maple	24
American Beech	6
Spruce	9

Stand Age Class Structure: Uneven-aged.

Timber Status: Immature – more than 5 years to maturity, less than 50% of basal area is mature.

Uneven-aged Timber Stands:

Size Class Distribution		**Existing Basal Area** (square feet/acre)			
(name)	(inches DBH)	Total	AGS	UGS	Cull
Seedlings-Saplings	2-4”	0	0	0	n/a
Poles	6-10”	25	10	15	n/a
Mid-size	12-14”	47	25	22	n/a
Large trees	16”+	38	23	15	n/a
Elders and seedlings	24”+ and declining	0	0	0	n/a
Total		110	58	52	n/a

Timber Quality:

Dominant and Co-dominant Trees		
Quality	**Basal Area**	**#Stems**
	(square ft/acre)	(per acre)
Acceptable – USFS Tree Grade #2 or better	51	76
Non-acceptable – less than #2 but could be sold	52	58
Cull – no sawtimber potential	n/a	n/a
Mature –USFS Tree Grade #2 or better & at goal age or DBH	8	3
Total	110	136

Regeneration--- Beech, spruce, hemlock, yellow birch, and red maple. Well distributed but sparse and browsed.

Primary Landowner Objectives for Area

- Maintain full compliance with Vermont Use Value Assessment (UVA) Program
- Restore degraded ecological functions and processes.
- Maintain a healthy forest.
- Sequester carbon.
- Maintain a forest in good condition for future generations.
- Protect water quality including maintaining protective strips, using proper stream crossing techniques, and avoiding the use of pesticides.

- Protect biological diversity by locating and buffering spring seeps, vernal pools, and wetlands.

--- SCHEDULE OF CONSERVATION ACTIVITIES ---

Long Range Vegetation Management Objectives and Approaches ---

Uneven-aged management:
Desired diameter (DBH) for principal species: 22 inches
Maturity age: 140 years
Stewardship cycle: 20 years
acres to regenerate: 0.3 per year or 6.0 per stewardship cycle

Conservation Activities ---

Based on *NE – 603: Silvicultural Guide for Northern Hardwood Types – Prescription E:* "This stand has suitable quality and structure to implement uneven-age management. But stand density is not critically high. Re-examine in 10 to 20 years unless the possible loss of valuable high-risk trees warrants immediate harvest by the selection method." Large down wood is lacking and, with selective girdling and/or felling, this situation could be addressed with hydrologic, wildlife habitat, and enhanced regeneration benefits.

Year*	**Acres**	**Forest Conservation Practices**	
		Activity	Specifications
Ongoing		Wildlife habitat restoration	If funding can be secured, increase large snag and den trees by up to 3 trees per acre.
Ongoing		Aquatic ecosystem restoration.	If funding can be secured, increase large down wood by up to 2 low quality timber trees per acre by cross-slope felling of 15"+ DBH trees.
2034	ALL	Re-examine.	

(* $\pm$ 3 years from this date)

FORESTRY GLOSSARY

(by S. DeBonis and P. van loon, Vermont Land Trust)

Acceptable Growing Stock (AGS): Any potential crop tree to be retained and managed to meet the landowner's objectives. UVA guidelines (for sawlog production) describe AGS as trees of commercial species which have the potential to produce one 12-foot log or two non-contiguous 8-foot logs.

Acre: A standard unit of area measure. One acre equals: 43,560 square feet; 4840 square yards; 10 square chains.

Advanced regeneration: Natural regeneration that is established prior to a timber harvest.

Adventitious buds: Buds that form in an unusual spot on a tree, usually on the bole.

Age Class: One of the intervals, commonly 10-20 years, into which the age range of trees are divided for classification.

AMP's: Accepted management practices pertaining to logging operations developed by the Department of Forests, Parks and Recreation and outlined in the booklet titled "Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont."

Apical meristem: The growing tip of a tree stem or root.

Aspect: The direction towards which a slope faces.

Basal Area: The cross sectional area of the stem of a tree at 4.5 feet above the ground (dbh). The basal area of a stand is the summation of all the trees or classes of trees per unit area of land. Basal area is expressed in square feet per acre. Basal area is related to stand volume and density.

Biomass: The total weight of all harvestable vegetation from a stand. This term can also be used to describe a harvest that results in all material being processed into chips.

Board Foot: The volume of solid wood equivalent to a piece 12 inches long, 12 inches wide and 1 inch thick. A measure of standing or felled timber usually related to sawlogs.

Bog: A poorly drained, wet area with very acidic (ph 4.0 or less), peaty soil. Bogs receive little or no ground water influence and support vegetation such as sedges, mosses, orchids, and black spruce.

Bole: The stem of a tree.

Browse: Buds, leaves, and twigs of seedling and sapling regeneration that are utilized as a food resource by wildlife.

Canopy: The combined cover of individual tree crowns.

Chain: A measurement of horizontal distance, 66 feet. Areas expressed in square chains can immediately be converted to acres by dividing by 10.

Cleaning: The removal of competing vegetation to release desired regeneration for optimal growth.

Clearcut: A silvicultural method which removes all trees from a designated area at one time for the purpose of creating a new, even-aged stand. This management system is usually used to regenerate shade-intolerant tree species. Variations include patch and strip clearcutting.

Climax: An association of plants and animals that will prevail in the absence of disturbance.

Codominant: Trees with crowns forming the general level of the forest canopy and receiving full sunlight from above but comparatively little from the sides.

Crop Trees: Trees to be grown to the end of the rotation.

Crown: The branches and twigs of the upper part of a tree.

Cruise: A survey of forest stands to determine the number, size, and species of trees, as well as terrain, soil condition, access, and any other factors relevant to forest management planning.

Cull: Trees that have no current or potential commercial value.

Diameter at Breast Height (dbh): The diameter of a standing tree measured at 4.5 feet above the ground and expressed in inches.

Epicormic branching: Branches that sprout from adventitious buds on the bole of a tree, usually when it is stressed or is subjected to full sunlight.

Dominant: Trees with well developed crowns which are above the canopy and receive direct sunlight from above and partially from the side.

Even-aged: An age class description of a stand in which the age of the trees is close, usually within 20 years. Stands with two distinct age classes can also be referred to as even-aged.

Even-aged Management: Timber management that produces a stand of trees with relatively little difference in age usually 10-20 years. Even-age silvicultural systems include clearcut, seed-tree and shelterwood.

Forest Management Plan (FMP): A long range plan designed to identify a landowner's goals and objectives and the silvicultural methods that will be employed to achieve those goals. FMPs in Vermont are typically written for a 15 year period and updated every 10 years.

Forest Type: A natural group or association of varied species of trees which commonly occur together over a large area. Forest types are defined by one or more of the dominant species of trees in the type. Common commercial types in the northeast are beech-birch-maple; beech-red maple; mixedwood; spruce-fir; white pine.

Forestry: The art and science of growing and managing forests and forest lands for the continuing use of their resources.

Girdle: To destroy the conductive tissue of a tree in a ring around the bole.

Group Selection: An uneven-aged harvesting method designed to favor intolerant or intermediate species. Trees are removed in groups in areas ranging from 1/20-2 acres in size.

Habitat: The place where a plant or animal can live and maintain itself.

Hardwoods: Broad-leaved trees which lose their leaves in the fall.

Harvest: A silvicultural treatment that is intended to establish regeneration. A harvest is a higher level of cutting intensity than a thinning.

High-grading: A liquidation cut in which only the best quality, highest value trees are removed. Cuts of this nature are short sighted and exploitative and result in the degradation of the forest ecosystem.

Hydrologic Class: A measure of a bare soil's runoff characteristics. Group A soil has a high water infiltration rate and a low runoff potential. Group D soil has a slow rate of water infiltration and is prone to high runoff.

Improvement Cutting: A silvicultural treatment in which inferior quality and low value trees are removed to give the best trees more room to grow.

Individual Tree Selection: An uneven-aged harvesting method designed to favor tolerant species. Trees are removed individually to maintain a continuous and uniform crown cover. Also referred to as single tree selection.

Intermediate: Trees whose crowns reach the canopy level but receive little or no direct light from above and none from the sides.

Intermediate Treatments: Harvesting methods employed during even-aged management. The removal of trees from a stand between the time of establishment and the final harvest with the purpose of improving stand growth and/or species composition and/or health.

Intolerant Species: Trees unable to grow and develop in the shade of other species. Intolerant commercial species in Vermont include paper birch and aspen.

Landing: Any place where logs are assembled for further transport.

Liquidation Cutting: Removal of all merchanatable products from the forest with no regard for stand improvement or regeneration, usually preceding the sale of the land.

Log Rule: A table or formula showing estimated volumes, usually in board feet, for various log diameters and lengths.

Mast: Nuts, berries, and seeds utilized by wildlife as a food resource.

Maturity: Expressed in two ways: 1. Financial maturity occurs when a tree has reached the point where it has maximized value growth from the prospective marketplace; 2. Biological maturity occurs when a tree has reached the point where the energy costs of maintaining itself exceeds the energy input from photosynthesis. Financial maturity is reached long before biological maturity.

MBF: The abbreviation for one thousand board feet.

Mean Stand Diameter (MSD): The arithmetic mean diameter of the trees in a stand.

Medial Diameter (MDL): This is developed by determining by the sum of each diameter class multiplied by the basal area in that class and then dividing the result by the total basal area. MDL is useful in stands with a high proportion of saplings because it is less influenced by these small trees and more accurately the size of the crop trees.

Mixed Hardwoods: Timber stands characterized by a mixture of hardwood species.

Overmature: A stand of trees that is older than normal rotation age for the type.

Overstory: Those trees making up the main canopy.

Overstory: The upper crown canopy of the forest. The overstory is usually referenced as the larger trees in the stand.

Phloem: Tissue of the inner bark that conducts photosynthate from the leaves down to the roots.

Pioneer: Shade intolerant species that are the first trees to develop in an area after or the abandonment of a field or after a disturbance that covers a large area. Pioneer species include aspen and paper birch.

Pole or Pole Timber: A tree or trees greater than 4.0 inches dbh and less than 10.0 inches dbh.

Precommercial Thinning: An intermediate harvesting operation in a young stand that does not generate income.

Prescription: A course of action to effect change in a forest stand (harvest, planting, TSI).

Q-factor: A devise used to describe the structure of an uneven aged stand. The q-factor is the ratio of the number of trees in a diameter class divided by the number of trees in the next smaller diameter class. The lower the q-factor, the higher the proportion of large diameter trees.

Regeneration: Renewal of a tree crop by natural or artificial means.

Release: The freeing of well-established seedlings or saplings from surrounding growth.

Residual: Trees that are left to grow in a stand after a silvicultural treatment.

Rotation: The length of time required to grow an even aged crop of trees to a desired age.

Rotation Age: The age at which an even aged stand is considered ready for harvest.

Salvage Cut: The removal of dead, dying and damaged trees after a natural disaster or insect or disease infestation to utilize the wood before it loses all its commercial value.

Sanitation Cut: The removal of dead, dying or damaged trees to prevent or interrupt the spread of insects or disease.

Sapling: Trees taller than 4.5 feet but less than 5.0 inches dbh.

Sawlog: A log considered suitable in size and quality for producing lumber. Regional standards apply for diameter, length, and freedom from defect. Sawlog is also used to refer to a tree that has reached sufficient size to produce a sawlog. Small sawlog trees are 12-16 inches dbh, medium sawlog trees are 17-20 inches dbh, and large sawlog trees are 22 inches dbh or greater.

Sawtimber: Trees that have obtained a minimum diameter at breast height that can be felled and processed into sawlogs. Typical minimum size limits for commercial species in Vermont are 8 inches dbh for softwoods and 12 inches dbh for hardwoods.

Seedlings: Trees that are less than 4.5 feet tall.

Seed Tree: An even-aged silvicultural method in which most of the merchantable trees are removed in the first cut, leaving a few scattered trees of desirable species to serve as a seed source for the new stand. The seed trees are removed after successful regeneration has developed. The seed tree method is a regeneration cut used to create an even-aged stand of shade intolerant species.

Selection method: An uneven-aged silvicultural system where individual trees, or groups of trees, are removed from a stand to ensure a sustained yield from an uneven-aged stand.

Shade tolerance: The ability of trees to reproduce and grow in the shade of other trees. Tolerance ratings are very tolerant, tolerant, intermediate, intolerant, and very intolerant.

Shelterwood: An even-aged silvicultural system in which the mature trees are removed in a series of partial cuts that take place over a small portion of the rotation. The residual trees are left as a seed source and to provide shade and protection for the new seedlings. Three types of cuttings are used in this method:

1. The preparatory cut, in which the least desirable trees are removed to improve the quality and growth of the stand,

2. The seed cut, in which the regeneration is established,

3. The removal cut (or cuts) in which the mature trees are cut to release the regeneration.

Variations of this method include the group, irregular, strip, and uniform shelterwood.

Silviculture: Manipulation of the forest ecosystem to achieve specific goals and objectives.

Site Class: A measurement of the quality of the soil in terms of its potential productivity. A site class of 1 indicates that the soil is highly productive and a site class of 4 is considered non-productive, usually due to excessively wet, dry, or thin soil.

Site Index: A measure of the relative productive capacity of an area. Site index is species specific and is based on a comparison of tree age and height.

Skid Trail: Any path in the woods over which multiple loads of logs are hauled, usually by a skidder or tractor. Primary skid trails are the main pathways that enter the landing.

Skidder: A four wheel drive, tractor-like vehicle, articulated in the middle for maneuverability, with a cable or grapple on the back end designed to bring logs or whole trees to the landing once that they have been felled.

Slope: A relative measure of steepness of the ground. Slope can be computed by dividing the rise in elevation by the horizontal distance traveled. Slope is usually expressed in percent (rise ft /run) X 100. Slope can be derived automatically using various forest measurement tools.

Snag: A standing, dead tree.

Softwood: Coniferous trees, usually "evergreen" (the exception being tamarack), with needles or scale-like leaves.

Stand (Treatment Unit): A community of trees possessing sufficient uniformity regarding composition, constitution, age, spatial arrangement, or condition to be distinguishable from adjacent communities.

Stocking: An indication of the number of trees in a stand as compared to the optimum number of trees required to achieve some management objective, usually improved growth rates or increased timber values.

Stocking Level: Stocking levels are calculated by comparing either the basal area or the number of trees the site could support, if the growth potential of the land were fully utilized, to the basal area or number of trees on the site. UVA stocking categories include understocked, adequately stocked, or overstocked.

Strip Cut: A timber harvesting operation where all the merchantable trees are cut within a long narrow strip. An even-aged cutting method usually used to regenerate spruce and fir.

Stumpage: The value of timber as it stands in the woods just before harvest ("on the stump"). Loggers are usually bid on timber based on its stumpage value. Stumpage can also be used to refer to standing timber.

Succession: The orderly and predictable replacement of one plant community by another over time in the absence of disturbance.

Suppressed: Trees with crowns entirely below the general level of the forest canopy that receive no direct sunlight from above or the sides.

Thinning: A silvicultural treatment that reduces stand density to allow the best trees to grow with less competition. There are three kinds of thinning: crown thinning, low thinning, and free thinning.

Timber Stand Improvement (TSI): A non-commercial timber harvest conducted in stands of timber to improve the health, growth rate, and form of the remaining trees.

Tolerant Species: Trees that can grow satisfactorily in the shade of other trees. Tolerant species of commercial importance in Vermont include sugar maple, beech, red spruce, and hemlock.

Truck Road: A road capable of supporting a trailer truck that hauls logs from the landing to the mill.

Understory: Those plants growing under the main canopy.

Uneven aged: An age class description of a stand of trees that contains more than two distinct age classes and a variety of size classes.

Uneven-aged (All-aged) Management: Timber management that produces a stand composed of a variety of age classes. Harvesting methods used in uneven-aged management include individual tree and group selection.

UVA: Use Value Appraisal. A property tax incentive program offered by the State of Vermont to forest landowners who have at least 25 acres of contiguous forest land and agree to manage their land according to state standards under an approved FMP.

Vigor: The health and vitality of a tree. Vigor can most accurately be assessed by observations of foliage (density, width, and color) and percent live crown.

Volume Table: A table that utilizes tree dbh or log diameters and log length(usually 16 feet) to estimate board foot volumes according to a set of assumptions ("log rules") about how the log will be processed into boards.

Windthrow: A tree or trees that have been toppled by high winds. A common phenomenon along the edge of strip cuts and clearcuts.

Xylem: Vascular tissue of the outer wood that conducts water and nutrients from the roots to the upper part of the tree.

Yield: Total forest growth over a specified period, less mortality, unmarketable fiber, and cull.

Yield Table: A species-specific representation of the amount of useable wood fiber a forest can be expected to produce during a single rotation based on site index.

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