

FOREST MANAGEMENT PLAN

FOR LAND BELONGING TO

THE FAIRLEE TOWN FOREST

in Fairlee, Vermont

Prepared by Redstart Forestry, Corinth, Vermont

April 2014

Landowner Address: c/o David Matthews
80 Skyline Drive
Fairlee, VT 05045

Town in which land is located: Fairlee
Span # 219-071-10205 / 10206

Access Description: Frontage along Lake Morey Road provides access to the Gravel Pit lot and Brushwood Road, Bald Top Road, and Knox Road provide access to the other parts of the property.

Grand List Description: 1,573 acres

Orthophoto Number: Series 5000, 172156, 172160, 176156, 176160; 2006

This 15-year forest management plan is to be used as a guide to forest management activities on the 1573-acre property belonging to the Fairlee Town Forest in Fairlee, Vermont. This plan conforms to the standards adopted by the Current Use Advisory Board for eligibility in Vermont's Use Value Appraisal (UVA) Program, even though this parcel is not eligible to be enrolled in UVA. This plan also meets criteria required by the Forest Stewardship Council (FSC) and the Tree Farm Program.

This property is to the west of Lake Morey and encompasses 1,573 acres of forest land that includes Bald Top Mountain. The forest has traditionally been broken into three

separate parts: the Lange Forest (in the southern portion), the Bald Top Forest (the northern portion), and the Gravel Pit Lot (in the northeastern portion bordering Lake Morey Road). A 148.4-acre parcel owned by Peter Ackerman is surrounded by town-owned land.

This property has three main access points. Bald Top Road provides the primary access to two log landings servicing the central and northeast portions of this property and to the Ackerman property. Knox Road provides access to the southern half of the property. The final access point is from Brushwood Road and Mill Pond Road, (both Class IV roads) to the north of the property. This provides the best access to the northwestern portion of the property. Access here is presently complicated due to flooding by beavers and the generally rough condition of Brushwood Road. Logging has been done periodically in most of the forest in the past and there are a number of internal woods roads. Many of the logging roads are used for recreation, including hiking, skiing, mountain biking, and motorized ATV and snowmobile use. The Fairlee Town Forest Board actively maintains these roads to minimize the impact of motorized recreation. The Cross Rivendell Trail is a well-used hiking trail that weaves through this property starting from the Gravel Pit Lot along Lake Morey Road. It reaches the summit of Bald Top Mountain and leaves the property near the southwestern corner onto the West Fairlee Town Forest.

For logging, this parcel generally has moderate to difficult access. Many of the truck roads are steep enough that trucking in the winter months is difficult or impossible. Soils are commonly shallow and become saturated during periods of excessive precipitation. Logging in much of the Forest should be done in late summer/early fall conditions or in the winter if trucking conditions allow.

Neighboring lands have been used during past logging operations in a number of places. The Board and the Forester will need to continue to be creative when working in parts of the forest that are either impossible or not economically feasible to access from the landing or town roads and be open to carrying out logging when competent contractors are working on adjoining parcels and if access is granted and feasible.

The terrain is mountainous and rolling. Elevations range from about 450 feet along the eastern edge closest to Lake Morey to 1,750 feet at the top of Bald Top Mountain. Excessive steepness is common in several areas, most notably just west of Lake Morey Road on the Gravel Pit Lot and on both the western and eastern flanks of Bald Top Mountain. Most of the stands have places that are excessively steep for logging. Soils in most of the forest range from moderate to shallow in depth to ledge. Wetness is

common in the depressions between ledge outcrops and rolling terrain.

Most of the forest drains into Lake Morey from Glen Falls Brook and a number of smaller drainages. Glen Falls Brook is significant and appears large enough to contain brook trout, at least in the eastern sections. Most of the small drainages will typically dry up during normal late summer conditions; while the larger streams and drainages remain wet year-round except during extreme droughts. Many of the streams or drainages in the Forest would typically be dry during normal late summer conditions. The very northwestern corner drains south to the Brushwood South Wetland complex in the Brushwood Community Forest. This complex is nicely described in a report by Brett Engstrom in 2013. This wetland complex also drains into Lake Morey through Big Brook. The very westerly edge of the forest drains to Blookbrook and to Lake Fairlee, which is part of the Ompompanoosuc River watershed.

Boundary lines are relatively well marked around the majority of the property with barbed wire, blazes, stone walls, and posters. Iron pins or stone markers were found at a number of the boundary corners. Some of the blazed lines have been recently painted thanks to volunteer efforts by the Fairlee Town Forest Board. Many of the blazes are very old and difficult to see. The boundaries indicated with a blank white line on the forestry map were not easily located. It is strongly recommended that the boundaries that are poorly marked be properly identified and painted. It is appropriate to contact abutting landowners before marking the boundaries.

There is an approximate 29 acre in the northwestern part of this parcel, bordering the West Fairlee Town Forest that is unclear which party owns. Tax map and recent mapping of the West Fairlee Town Forest contradict. A good portion of this area is wetland. Further investigation is needed.

Nearly this entire property is forested. The only open areas are the summit of Bald Top Mountain and the log landings, all of which have begun to regenerate to young trees. A number of wetlands are found in northwestern corner of the property, which is part of the Brushwood South Wetland complex.

Common forest types include hemlock, northern hardwoods, pioneer hardwood (paper birch and aspen), white pine, and red oak. Where the forest is well suited for timber management, the quality of the timber varies significantly. Hemlock is a significant component and although it is not generally considered a valuable timber species, it does have significant wildlife and ecological benefit. Red maple is a significant component of the forest, but its quality is generally poor as timber. White pine, oak, and northern

hardwoods (sugar maple, yellow birch, and ash) have the best long-term timber potential. In general, the best quality red oak and sugar maple are immature. Soil quality and drainage vary. Most of the property is on very shallow rocky soils. The better sites are on sandy loam that is moderate in depth and well-drained. Enrichment (the presence of calcium) appears limited. White pine and red oak are well suited for these soils and are the best species to grow for timber on this site.

Logging activity has been limited over the past decade. The most recent activity was done in the southern part of the property between 5-10 years ago. Mostly red maple pulp was removed and group selection openings were used to create gaps in the canopy. Logging over the entire forest appears to have been more extensive approximately 30 years ago.

The Town of Fairlee wishes to continue to manage this property for multiple uses, including timber, wildlife habitat, recreation, and soil and water conservation. One of the wildlife goals for this property is increase the amount of early successional habitat, with the goal of transitioning about 10 percent of the manageable forest land to early successional habitat. (Presently less than 1% of the parcel is in early successional habitat.) This property is well suited for these goals.

The Lange Forest was deeded to the Town under the agreement that it would be managed for deer, turkey, and snowshoe hare in perpetuity (approximately 770 acres).

Most of the Fairlee Town Forest is visible from the village of Fairlee and from Interstate-91. Heavier cuts should be avoided along the tops of ridges if they will cause adverse aesthetic impact. However, the top of Bald Top Mountain should be kept open.

Landscape setting: This property is in the western part of the Town of Fairlee. It is part of a considerable area (approximately 10,000 acres) of undeveloped woodland owned by both private and public entities that extends from VT Route 244 north to Brushwood Road. This region is commonly known as the Brushwood Forest and it includes both the Fairlee and West Fairlee town forests. The Brushwood Community Forest, formerly the West Fairlee Town Forest, is permanently protected with an easement held by the Vermont Department of Forest, Parks, and Recreation. This conservation project received funding through the US Forest Service Forest Legacy Program because of the Brushwood's conservation values and critical habitats.

Town road density in the Brushwood region is low. Development pressure appears low to moderate. In the past 10 years a number of camps and houses have been built on private land on the properties surrounding the Fairlee Town Forest.

This property is mapped by the State of Vermont as a part of a large area (144,900 acres) important to black bear. The Gravel Pit Lot along the eastern portion of the property is mapped as deer wintering habitat (315 acres). Other areas of the property also show significant deer sign and likely serve as wintering habitat even though they are not mapped. Tracks in the snow indicated that this property also supports moose, fisher, coyote, and turkey, among other wildlife species.

Several beaver ponds in the northwest corner of the property continue northwest into the West Fairlee Town Forest. These wetlands and beaver ponds provide significant habitat. A number of rare natural communities (wetlands) and plants have been documented in the Brushwood South Wetland. A 2013 report by Brett Engstrom lists and maps these features as they occur on both the Fairlee and West Fairlee town forests. A 2012 Vermont Natural Heritage Inventory identifies a heron rookery within 75 feet of the trail to Bald Top Mountain. Other significant features highlighted by the Vermont Natural Heritage Inventory include Ram's Head Lady's-slipper, last observed in 1921, and Broad Beech-fern last observed in 1919. Both these plants were found on Echo Mountain, which is just to the northeast of this property on land belonging to the Aloha Foundation. The Natural Heritage Inventory also identified a 15- to 20-acre old growth northern hardwood-hemlock forest about 600 meters southwest of Bald Top Mountain (See RTE Map). The old growth forest is quite steep and west facing.

Field data collection: Information was collected at 236 sampling points, taken at 8-chain intervals, in November and December 2013 for this plan. Basal areas and mean stand diameters are estimated from a random point sampling of trees. A 10-factor basal area prism was used to determine which trees to tally at each sampling point. Data, including basal area, tree species, diameter, crown position, and tree height were gathered at each sampling point and an assessment was made of the sawlog potential of each stem. It is from this information that the "Basal Area/Acre," "Number of Trees/Acre," "Mean Stand Diameter," and "Acceptable Growing Stock" figures were calculated. Site class is based on soils and site index information. The "Species Composition" percentages refer to percent of total basal area. The field data were processed using the NED (Northeast Decision Model) program. Acreage for the various forest types was calculated using ArcMap and is approximate.

Management units and treatment dates: Management units are delineated according to forest type, stand structure, and scheduled treatment. All scheduled treatment dates are

approximate and refer to a date plus or minus three years. (A treatment date of 2017 means that the work can be done between 2014 and 2020.) Actual activity will depend on the condition of the stand, logger availability, climate, weather, and market conditions.

STAND 1

This hardwood/pine/hemlock stand is in the very northern part of the property. There is a significant beaver pond complex west of this stand. Soils are rather shallow and rocky. Terrain is rolling, with some areas of steepness, especially in the eastern half. This stand is adequately stocked and moderately dense. It was harvested approximately 20-30 years ago and has the potential to grow quality timber, especially white pine and red oak.

Acres: 26 (7 sample points)

Forest Type: Hardwood/White Pine/Hemlock

Natural Community Delineation: Northern Hardwood-Hemlock Forest

Species Composition: Red maple (27%) white pine (16%), white birch (15%), hemlock (10%), and smaller amounts of yellow birch, red oak, white ash, beech, red spruce, black spruce, and striped maple. Regeneration is quite variable throughout the stand, with most in the sapling and pole stages. Regeneration plots indicate that there are approximately 2,286 stems per acre, consisting mainly of balsam fir (25%) and black cherry (25%) with striped maple, paper birch, hophornbeam, beech, and red maple filling out the remainder.

Total Basal Area/Acre: 97 sq. ft.

Acceptable Growing Stock (BA/Acre): 76 sq. ft.

Number Trees/Acre: 573

Basal Area/Acre (Stems >6" D.B.H.): 83 sq. ft.

Acceptable Growing Stock BA/Acre (Stems >6" D.B.H.): 64 sq. ft.

Number Trees/Acre (Stems >6" D.B.H.): 187

Merchantable Diameter: 11.5"

Volume/Acre: 4.369 MBF/acre; 14.1 cords/acre

Stocking: Understocked, just below the C-line stocking level for even-aged mixedwood stands containing 25 - 65% softwood. This stand would be considered overstocked at 170 sq. ft. (the A line) and understocked at below 85 sq. ft. (the C line). After thinning, ideal stocking is 105 sq. ft. (the B line).

Site Class: II (from soils)

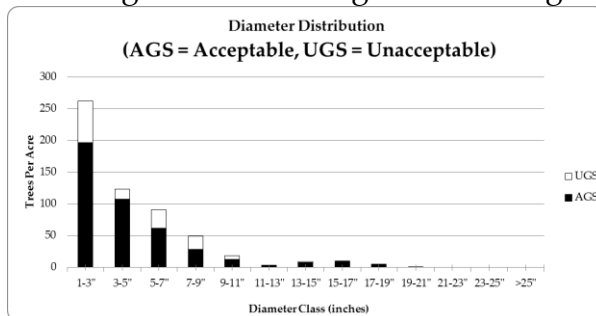
Soils Mapping Unit: Cabot, Tunbridge-Woodstock Complex, and Colrain soils underlie this stand.

Cabot soils are deep and high in natural fertility, but tend to form over fragipan, making them drain poorly, and thus they are not very productive.

Tunbridge-Woodstock Complex soils occur in patches that are too small to map independently. Tunbridge soils are quite productive, despite being extremely stony and poorly drained. Woodstock soils are less productive. They are classed as having medium natural fertility, but are even more apt to dry out during the heat of summer. These soils formed over glacial till on upland slopes.

Colrain soils are stony to extremely stony with medium fertility and moderately rapid permeability. These soils are quite rich and rather productive.

Stand Age: Transitioning to uneven-aged (q factor = 1.24, desired q factor = 1.50)



This stand is developing the reverse "J" diameter distribution of an uneven-aged stand.

It commonly takes decades of active management, natural mortality, and growth to achieve this distribution.

Stand History and Cultural Elements: The overstory appears to be about 70-80 years old. Some rather aggressive logging was done about 20-30 years ago.

Water Quality, Wetlands, and Riparian Zones: A significant wetland created by a series of beaver dams is just west of this stand. Logging should be minimized within 50-100 feet of the wetland to protect water quality.

Access Network: This stand can be accessed by two roads that run south from Millpond Road. The first road heads south through this stand to a log landing just west of the stand boundary. Recently, beaver activity has flooded this road between this stand and the landing. A second road runs through the northeast corner of this stand and crosses through the neighbor's property (Chris Long) before re-entering

this property in Stand 12.

Wildlife: Beavers have created an impressive wetland and their feeding has created a distinct edge around the wetland. This edge is primarily in the early stages of succession. This wetland and the early successional habitat are attractive to a variety of wildlife, including waterfowl, songbirds, deer, upland birds, amphibians, and moose, among many others.

Dead Trees/Acre: 36.1 standing dead trees/acre; an average of 0.86 pieces of downed coarse woody debris/sample point. Dead standing or downed trees have a lot of wildlife value and help build soils. These numbers are normal for this stand type.

Insects, Diseases, and Invasive Species: Some white pine weevil damage was found during the inventory. No invasive plants were found.

Longterm Objective: Manage for the production of mixedwood sawlogs using uneven-aged management techniques and selection harvests every 15-25 years. An uneven-aged forest has at least three age classes of trees. This all-aged condition is created by periodic selection harvesting every 15-25 years in any one part of the stand. Selection harvests typically are used to remove mature sawtimber and poor quality or diseased stems. Group selection, ranging from 5 trees to two acres, is an excellent way of removing bunches of poor quality stems. It is also effective at establishing or releasing desirable regeneration. Single-tree selection is also used to thin groups of densely stocked trees with good long-term potential. When using uneven-aged management techniques, the best quality, most healthy crop trees are grown to specific diameter objectives. Use the following diameter objectives as a guide to maturity: 20-24 inches for red oak and white pine; 16-20 inches for hemlock, white ash, and sugar maple; 14-16 inches for spruce, red maple, and yellow birch. Balsam should be harvested when in decline or when it has reached a height containing three 16-foot sawlogs. Remaining species should be left or harvested depending upon health, quality, stocking, and wildlife objectives.

Scheduled Treatment: No cutting treatment is needed for at least the next 15 years. Re-examine in 2028 for growth.

STAND 2

This northern hardwood stand is northeast of the summit of Bald Top Mountain. Soils are rocky, well drained and slightly enriched. Terrain is somewhat variable, but most of the stand is moderately steep and slopes are to the northeast. This stand is well stocked and the quality of the timber is quite good.

Acres: 102 (14 sample points)

Forest Type: Northern Hardwood

Natural Community Delineation: Northern Hardwood Forest

Species Composition: Sugar maple (26%), white ash (17%), white birch (10%), and smaller amounts of white pine, hophornbeam, butternut, red oak, hemlock, black cherry, pin cherry, aspen, black ash, beech, yellow birch, red maple, striped maple, and red spruce. Regeneration is variable throughout the stand, with some areas of significant white pine regeneration and some with greater amounts of mixed hardwood regeneration. Regeneration plots indicate that there are 2,429 stems per acre, with striped maple (35%) and hophornbeam (24%) saplings being the majority. Yellow birch, white ash, sugar maple, beech, and red spruce also contribute to the regeneration mix.

Total Basal Area/Acre: 108 sq. ft.

Acceptable Growing Stock (BA/Acre): 76 sq. ft.

Number Trees/Acre: 562

Basal Area/Acre (Stems >6" D.B.H.): 92 sq. ft.

Acceptable Growing Stock BA/Acre (Stems >6" D.B.H.): 70 sq. ft.

Number Trees/Acre (Stems >6" D.B.H.): 178

Merchantable Diameter: 12.3"

Volume/Acre: 6.845 MBF/acre; 13.3 cords/acre

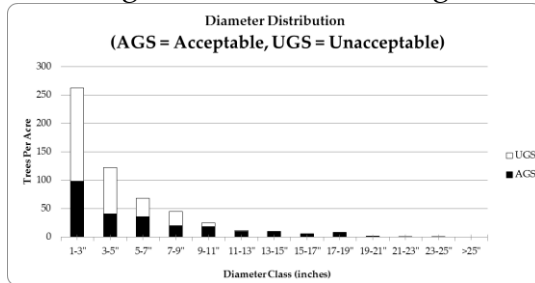
Stocking: Well stocked, between the A- and B-line stocking levels for even-aged northern hardwood stands. The stand would be considered overstocked at above 125 sq. ft. of basal area/acre (the A line) and understocked at below 47 sq. ft. (the C line). The suggested stocking level following a thinning (the B line) is 65 sq. ft.

Site Class: I-II (from soils)

Soils Mapping Unit: Colrain, Buckland, and Tunbridge-Woodstock Complex soils underlie this stand.

Buckland is a deep, moderately well drained and productive soil that holds moisture well.

Stand Age: Two-, transitioning to uneven-aged (q factor = 1.30 , desired q factor = 1.30)



This stand has good representation of all size classes. The majority of the trees are in the sapling to small diameter sawtimber size classes. The high percentage of unacceptable stems in the small diameter classes is concerning.

Stand History and Cultural Elements: Overstory trees appear to be 70-80 years of age. There is little evidence of past logging operations in this stand. No cultural elements were found.

Water Quality, Wetlands, and Riparian Zones: Glens Falls Brook acts as the eastern boundary for this stand. This brook flows southeast and drains into Lake Morey.

Access Network: The one main woods road that provides access to this stand runs east from the top of Bald Top Mountain before crossing Glens Falls Brook and entering Stand 12. Logging contractors will likely use both the log landing located south of Mill Pond Road and a landing in Stand 9 off Bald Top Road extension

Wildlife: Four ruffed grouse were flushed at one sample point during the inventory. Evidence of deer feeding was also noted. Beech and red oak are common. Both species periodically produce bumper crops of hard mast (nuts) that are rich in protein and fats. Many species of wildlife seek out hard mast when available.

Dead Trees/Acre: 11.4 standing dead trees/acre; an average of 0.86 pieces of downed coarse woody debris/sample point. These numbers are normal for this forest type.

Insects, Diseases, and Invasive Species: Signs of red ring rot was found on a couple of white pine trees. Beech bark disease is common. Some healthy, smooth barked beech can be found. These healthy beech may have some resistance to beech bark disease and should be preserved from cutting. No invasive species were found.

Longterm Objective: Manage for the production hardwood and mixedwood sawtimber using uneven-aged management techniques. Selection harvests should be carried out every 20-30 years. Use group selection (12 trees to two acres) to remove bunches of poor quality and/or mature trees. Use the following diameter objectives as a guide to maturity for crop trees: 20-24 inches for red oak and white pine, 18-22 inches for sugar maple and white ash, 14-16 inches for red maple, black cherry, yellow birch, and red spruce. Remaining species should be left or harvested depending upon health, quality, stocking, and wildlife objectives.

Scheduled Treatment: Carry out a selection harvest around 2021. Reduce the basal area/acre to approximately 70 sq. ft./acre. The goal is to harvest some mature trees, remove poor quality stems, and release potential crop trees. Trees with small live crowns, narrow forks, or general roughness should be targeted for removal. Products will include a modest volume of white pine and hardwood sawtimber and pulpwood. Dry or frozen logging conditions are recommended.

STAND 3

This hemlock stand is along the western boundary, down slope from Bald Top Mountain. The slopes are moderately steep to steep in areas. Soils are shallow and rocky with some large ledge outcrops. Steepness in this stand makes access difficult and intensive timber management impractical. Stocking levels are uniform and timber quality is acceptable. Hemlock dominates the overstory. About 7 to 10 acres of this stand has been identified as old growth northern hardwood-hemlock forest by the State of Vermont. The old growth area is in the southern and central parts. It is very steep and does not appear to have been logged in the past.

Acres: 46 (8 sample points)

Forest Type: Hemlock

Natural Community Delineation: Hemlock Forest

Species Composition: Hemlock (67%), red maple (10%), red oak (8%), sugar maple (6%), and smaller amounts of hophornbeam, white pine, beech, paper birch, and yellow birch. Regeneration is sparse and is limited to beech and hemlock saplings. Regeneration plots indicate 875 stems per acre, about 86% of which were beech saplings and the remainder were hemlock saplings.

Total Basal Area/Acre: 195 sq. ft.
 Acceptable Growing Stock (BA/Acre): 161 sq. ft.
 Number Trees/Acre: 583

Basal Area/Acre (Stems >6" D.B.H.): 184 sq. ft.
 Acceptable Growing Stock BA/Acre (Stems >6" D.B.H.): 155 sq. ft.
 Number Trees/Acre (Stems >6" D.B.H.): 335

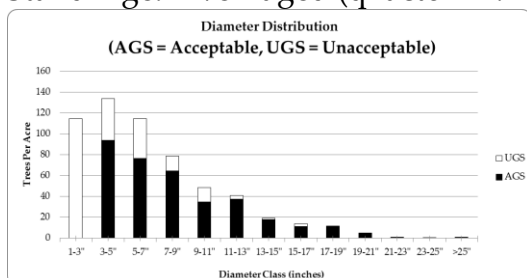
Merchantable Diameter: 12.4"
 Volume/Acre: 10.044 MBF/acre; 26.8 cords/acre

Stocking: Well stocked, above the B-line stocking levels for even-aged stands containing more than 30 percent hemlock in the overstory. There is no overstocked condition in hemlock stands, because hemlock, unlike most species, can grow productively at very high densities without serious consequence to stand health. It is recommended that the stocking not be reduced below the B-line stocking level, because hemlock is shallow rooted and susceptible to windthrow. The B-line stocking level is 125 sq. ft.

Site Class: II (from soils)

Soils Mapping Unit: Tunbridge-Woodstock Complex and Colrain soils underlie this stand.

Stand Age: Even-aged (q factor= 1.27, desired q factor= 1.50)



This diameter distribution shows a stand that is mostly even-aged. The smallest stems are typically suppressed and do not represent a significantly younger age class. Uneven-aged stands have a reverse “J” diameter distribution. In time, natural mortality will help this stand become more uneven-aged.

Stand History and Cultural Elements: Overstory trees appear to be about 80 years of age. A 7- to 10-acre section of this stand has been identified by the State of Vermont as old growth forest that contains both northern hardwood and hemlock trees. Some of the trees in this area exceed 150 years of age. This old growth area also includes some acres in Stand 7.

The northern part of this stand was logged around 30 years ago. The harvested wood went west onto the Rosensweig property.

Water Quality, Wetlands, and Riparian Zones: A small drainage runs west through the center of this stand towards Blood Brook Road. Logging should be reduced within 25-50 feet of the drainage to protect water quality. This drainage would typically be dry in the late summer months.

Access Network: Operability within this stand is poor. One main skid road leading to Brushwood Road does cross the northern corner of the stand. Another skid road on the western boundary leads to the Rosensweig property. The steep uphill terrain makes the area accessible from this road quite limited.

Wildlife: Signs of deer are common. This area is not mapped by the State of Vermont as being deer wintering habitat, but it does appear it's being used as such. Much of the regeneration has been browsed and deer beds were commonly seen during the inventory. Hemlock is the preferred species for wintering deer. Dense hemlock restricts snow accumulation in the understory and insulates deer during very cold winter nights. It is important that deer have browse, and mast producing trees such as oak and beech are also a desirable feature. This area is slowly losing its value as the crown heights increase and available browse decreases. An uneven-aged stand condition is the most valuable for the long-term. This stand is mapped by the State of Vermont as sustainable bear habitat.

Dead Trees/Acre: 54.4 standing dead trees/acre; an average of 2.0 pieces of downed coarse woody debris/sample point. Standing dead trees are higher than normal, but generally they are smaller diameter trees.

Insects, Diseases, and Invasive Species: In general, the health is acceptable. Hemlock trees with seams and/or swollen butts are likely to contain rot and ring shake (internal separation of the annual rings). Hemlock trees on steep westerly slopes typically have ring shake problems. Beech bark disease is common. No invasive plants were found; hemlock does a superb job of shading out regeneration, including invasive plants.

Longterm Objective: Manage this area primarily for wildlife habitat and partly as an old growth forest. Due to the access constraint and the old growth forest, we do not recommend managing most of this stand for timber.

Along the western boundary, in an approximate 5-10 acre area, where logging was conducted in the past, it would be acceptable to continue to manage for timber but the logging will likely need to coincide with work done on the Rosensweig property. Technically, use uneven-aged management techniques and selection harvesting every 20-30 years. Use a 20- to 24-inch diameter at breast height objective for white pine and red oak, and a 16- to 20-inch objective for hemlock. Remaining species should be left or harvested depending upon health, quality, stocking, and wildlife objectives.

Scheduled Treatment: No commercial treatment is recommended in most of this stand. Old growth forests are extremely rare in Vermont. It may be valuable to allow state or university ecologists to establish permanent inventory plots.

In the 5- to 10-acre area that is accessible to the Rosensweig property, a selection harvest should be carried out if access is granted. The goal is to harvest some mature white pine, hemlock, and hardwood and to release crop trees. Some group selections (up to ½ acre in size) should be created to establish a new cohort of trees.

STAND 4

This white pine/hardwood stand is north of the summit of Bald Top Mountain. Soils in this stand are shallow and rolling. Terrain is gradual with some areas of steepness, especially leading up to Bald Top. Stocking is variable. The quality of the timber is quite good amongst the hardwood species, but is rather inconsistent with the pine.

Acres: 69 (9 sample points)

Forest Type: White Pine/Hardwood

Natural Community Delineation: Northern Hardwood Forest

Species Composition: White pine (29%), sugar maple (26%), red maple (10%), yellow birch (10%), and smaller amounts of hophornbeam, butternut, red oak, hemlock, black cherry, white ash, beech, paper birch, striped maple, red spruce, and balsam fir. Regeneration is patchy, with some areas having better densities and diversity than others. Regeneration plots indicate that there are 3,556 stems per acre, with a good diversity of species, including striped maple (22%), sugar maple (22%), white pine (19%), beech (16%), and hophornbeam (13%) Paper birch and red maple round out the regeneration mix.

Total Basal Area/Acre: 128 sq. ft.

Acceptable Growing Stock (BA/Acre): 96 sq. ft.

Number Trees/Acre: 689

Basal Area/Acre (Stems >6" D.B.H.): 108 sq. ft.

Acceptable Growing Stock BA/Acre (Stems >6" D.B.H.): 83 sq. ft.

Number Trees/Acre (Stems >6" D.B.H.): 219

Merchantable Diameter: 12.1"

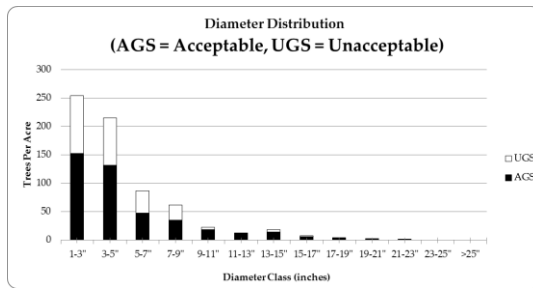
Volume/Acre: 7.259 MBF/acre; 15.9 cords/acre

Stocking: Well stocked, right at the B-line stocking level for even-aged stands containing 25-65% softwood in the overstory. The stand would be considered understocked at below 80 sq. ft. (the C line) and overstocked at above 170 sq. ft. (the A line).

Site Class: II (from soils)

Soils Mapping Unit: Colrain, Muck, Buckland, and Tunbridge-Woodstock Complex soils underlie this stand.

Stand Age: Transitioning to uneven-aged. (q factor = 1.25 , desired q factor = 1.50)



This graph shows a stand that is transitioning to an uneven-aged diameter distribution. This stand has good representation of all size classes.

Stand History and Cultural Elements: Overstory trees appear to be 70-80 years of age. This stand was cut approximately 30 years ago. No cultural elements were found.

Water Quality, Wetlands, and Riparian Zones: There is no visible surface water in this stand. The majority of this stand slopes to the north, where a portion of a beaver wetland is found, just over the northern property boundary.

Access Network: Two skid roads run south from a log landing in the northern tip of this stand. The first road heads in the direction of Bald Top. The second road branches from the first road and heads southwest before reconnecting near the summit. The truck road leading into the log landing is presently flooded by beavers.

Wildlife: Deer tracks were noted during the inventory. This stand has good vertical layering, which benefits songbirds. Beaked hazelnut is common in the transition to the wetland. Beaked hazelnut is an important bear food source as it produces protein and fat rich nuts annually.

Dead Trees/Acre: 65.4 standing dead trees/acre; an average of 1.35 pieces of downed coarse woody debris/sample point. The number of standing dead trees/acre is above average for this type of stand but most of the trees tallied were 5 inches DBH or less.

Insects, Diseases, and Invasive Species: Minor amounts of beech bark disease, sugar maple borer, white pine blister rust, and red ring rot in pine were found during the inventory. No invasive plants were found. The Brett Engstrom wetland report indicates that some non-native bush honeysuckle was found in the wetland edges.

Longterm Objective: Manage for the production white pine and hardwood sawtimber using uneven-aged management techniques. Selection harvests should be carried out every 20-30 years. Use group selection (12 trees to 3 acres) to remove bunches of poor

quality and mature stems. The following diameter objectives should be used as a guide to maturity for crop trees: 20-24 inches for red oak and white pine, 18-22 inches for sugar maple and white ash, 14-16 inches for red maple, black cherry, yellow birch, and red spruce. Remaining species should be left or harvested depending upon health, quality, stocking and wildlife objectives.

Scheduled Treatment: Carry out a selection harvest by 2020 and reduce the basal area to approximately 70 sq. ft./acre. The goal is to harvest some mature trees, remove poor quality stems, and release potential crop trees. Trees with small live crowns, narrow forks, or general roughness should be targeted for removal. Groups of poor quality white pine should be harvested to release crop trees and to encourage white pine regeneration. This harvest may shift this stand toward a hardwood stand technically (less than 25% softwood). Products will include a modest volume of white pine and hardwood sawtimber and pulpwood. The exact border of the Fairlee and West Fairlee Town Forests should be determined.

STAND 5

This young hardwood stand encompasses the summit of Bald Top Mountain, which is the highest point on the property at about 1,750 feet in elevation. Soils here are very shallow, and terrain is steep as you leave the summit of the mountain. This area provides spectacular views and is common destination for hikers as several trails, including the Cross Rivendell trail, reach the summit. [Markus-I just kind of made that up. Is it correct?] This stand has some of the only early successional habitat (trees less than 20 years old) on the property.

Acres: 8 (2 sample points)

Forest Type: Young Hardwood

Natural Community Delineation: Northern Hardwood Forest

Species Composition: Sugar maple (56%), red maple (28%), and smaller amounts of hophornbeam, red oak, white pine and yellow birch. Regeneration is primarily in the sapling and pole stages. Regeneration plots indicate about 2000 stems per acre; consisting of white pine (45%), sugar maple (45%), and smaller amounts of butternut, red maple, and striped maple.

Total Basal Area/Acre: 90 sq. ft.
Acceptable Growing Stock (BA/Acre): 70 sq. ft.
Number Trees/Acre: 803

Basal Area/Acre (Stems >6" D.B.H.): 60 sq. ft.
Acceptable Growing Stock BA/Acre (Stems >6" D.B.H.): 45 sq. ft.
Number Trees/Acre (Stems >6" D.B.H.): 115

Merchantable Diameter: 11.2"
Volume/Acre: 0.407 MBF/acre; 7.4 cords/acre

Stocking: Adequately stocked, just below the B-line stocking level for an even-aged hardwood stands. This stand would be considered overstocked at 130 sq. ft. (the A line), and understocked at below 50 sq. ft. (the C line). After thinning, the basal area should be around 70 sq. ft. (the B line).

Site Class: II (from soils)

Soils Mapping Unit: Tunbridge-Woodstock Complex and Colrain soils underlie this stand.

Stand Age: Even-aged to two-aged

Stand History and Cultural Elements: The majority of trees in this stand are under 20 years old, with a few scattered older trees throughout. It appears that this area has been regularly cut to maintain the views.

Water Quality, Wetlands, and Riparian Zones: No wetlands or riparian zones are found in this stand. However, there is a possible vernal pool in the adjacent stand to the west.

Access Network: Several skid roads converge in the middle of this stand. The best access is from the skid road leading north to Brushwood Road but trails leading from the Knox Road and two roads coming from Bald Top can take you to this stand. The Cross Rivendell Trail runs through this stand.

Wildlife: This stand provides some early successional habitat that may be used by a variety of wildlife. Early successional habitat is important for a number of songbird

species, especially the warblers.

Soft mast trees, including apple, hawthorn, and serviceberry can be found in this stand. Each of these species produces soft fleshy fruit that are desirable for most wildlife species. These species are shade intolerant and need to be released periodically from competition from taller forest trees.

Dead Trees/Acre: 14.3 standing dead trees/acre; an average of 1.0 pieces of downed coarse woody debris/sample point. These numbers are typical for this stand type. Some larger dead snags would be a great addition to the early successional habitat.

Insects, Diseases, and Invasive Species: In general, the trees are in good health, and growing vigorously. White pine weevil damage is common. The site is exposed to strong winds and the trees will suffer here in a droughty period.

This is the one place on the property that invasive plants are found in abundance. The bush honeysuckle, common buckthorn, and bittersweet here were likely introduced by birds or possibly black bear. The semi-open environment is ideal. This is a moderate infestation consisting of medium sized plants and the majority of them can easily be controlled using a foliar spray and/or cut stump application. These plants should be controlled as soon as possible to reduce the risk of further spread into the surrounding forest. The forester should be consulted on timing, techniques of control, and rules regarding the use of herbicides.

Longterm Objective: Manage this area to maintain recreational opportunities and aesthetics. This area provides great views and trees should be cut down or mowed with a brontosaurus machine every 10-20 years. Maintain butternut poles and soft mast trees for their wildlife value.

Scheduled Treatment: Carry out invasive plant removal in 2015. Following the invasive plant removal cut any trees necessary to maintain the view. Most trees cut will be of small diameter, and should be left to return nutrients to the soil. All brush near trails should be diced up to speed decay and enhance the aesthetics of the clearing. Revisit the site every 10 years and cut as necessary to maintain the view.

STAND 6

This white pine stand, just east of the summit of Bald Top Mountain, is on moderate to steep slopes on well drained rocky soils. Stocking levels are very high and there is little

evidence of past logging. This stand has decent timber potential, though live crown ratios are poor in the denser areas. Many of the largest trees established with a lack of competition and are rough quality as timber. This site is exposed to the elements, being high in elevation and facing to the east.

A few acres of this stand were recently marked for a harvest that would use the Ackerman property for access. Approximately 1 acre of dense, mediocre quality and poor live crown ratios was designated for a patch cut. This job was postponed in the summer of 2013 due to wetness.

Acres: 12 (1 sample points)

Forest Type: White Pine

Natural Community Delineation: Northern Hardwood Forest

Species Composition: White pine (95%) and red maple (5%). Regeneration is variable throughout the stand and consists of areas of dense white pine seedlings and areas with very little regeneration. The one regeneration plot was located in an area of dense regeneration and contains 14,000 stems per acre, 71% of which are white pine saplings and the remainder being striped maple poles.

Total Basal Area/Acre: 210 sq. ft.

Acceptable Growing Stock (BA/Acre): 200 sq. ft.

Number Trees/Acre: 470

Basal Area/Acre (Stems >6" D.B.H.): 210 sq. ft.

Acceptable Growing Stock BA/Acre (Stems >6" D.B.H.): 200 sq. ft.

Number Trees/Acre (Stems >6" D.B.H.): 470

Merchantable Diameter: 10.1"

Volume/Acre: 5.372 MBF/acre; 40.9 cords/acre

Stocking: Well above the B-line stocking level for an even-aged managed white pine stand. This stand would be considered overstocked at 250 sq. ft. (the A line) and understocked at below 100 sq. ft. (the C line). The recommended stocking following a thinning is 120 sq. ft. (the B line).

Site Class: II (from soils)

Soils Mapping Unit: Tunbridge-Woodstock Complex and Colrain soils underlie this stand.

Stand Age: Even-aged

Stand History and Cultural Elements: Overstory trees appear to be 50-70 years of age. Evidence of thinning 20 or more years ago was noted in some places. No cultural elements were found.

Water Quality, Wetlands, and Riparian Zones: This stand has no drainages or wet areas that present water quality issues. There is drainage just south of this stand at the base of the slope.

Access Network: The best access to this stand is from Bald Top Road. A skid road leading from the Ackerman property was planned as the main access point for the logging. Logging in this stand requires a long skidding distance. No significant erosion problems were found but the skid road is fairly rough.

Wildlife: Minimal amounts of wildlife sign were seen during the inventory. A large number of dead stems per acre provide habitat for woodpeckers and other cavity nesting birds. This stand is mapped by the State of Vermont as sustainable bear habitat.

Dead Trees/Acre: 439.3 standing dead trees/acre; an average of 4.0 pieces of downed coarse woody debris/sample point. These numbers are extremely high. The majority of the dead stems are small diameter trees of 5 inches or less. This stand is heavily stocked, and it has started to self-thin, with the small diameter suppressed trees dying back.

Insects, Diseases, and Invasive Species: Some pine has been moderately deformed by the white pine weevil. The largest pines tend to be rougher quality as they established in an open environment. White pine blister rust also has a presence in the stand. Over-crowding that has led to smaller live crown ratios is the largest health problem in this stand. Trees with poor live crown ratios are prone to being blown over and are more susceptible to red ring rot. No invasive plants were found but it would not be shocking if there is some as the concentration of invasive plants on Bald Top Mountain is nearby.

Longterm Objective: Manage for the production white pine sawtimber using even-aged or two-aged management techniques and an 80- to 100-year rotation and a diameter objective for the crop trees of 20 inches. Most of this stand should be thinned at least once more time in near future, allowed to grow for a decade, and then it should be regenerated using the shelterwood system. The one acre with trees with poor live crown ratios should be cut to create early successional habitat.

Scheduled Treatment: Carry out a combination intermediate thinning and one acre patch cut as soon as possible (2014). Reduce the basal area/acre to approximately 120 sq. ft. The goal is to release the crop trees. Trees with small live crowns, narrow forks, blister rust, or general roughness should be targeted for removal. Products will include a modest volume of pine sawtimber and pulpwood.

STAND 7

This hemlock/hardwood stand is to the south and west of Bald Top Mountain. Terrain tends to be moderately steep to steep with a westerly aspect in one half of the stand, and an easterly aspect in the other half. Soils are rocky and very shallow to ledge, with several ledge outcrops throughout the stand. Timber quality is variable, with most the value in the sugar maple sawlogs. About 7 to 10 acres of this stand is mapped by the State of Vermont as part of an old growth forest (same and part of the area found in Stand 3) that contains both northern hardwood and hemlock trees.

A few acres on the eastern edge of this stand were recently marked for harvest but delayed in the summer of 2013 due to wetness. Trees marked include a modest volume of mature white pine and hardwood pulpwood. Red oak poles will be released. The trail leading to Bald Top from the Ackerman land was going to be used.

Acres: 53 (6 sample points)

Forest Type: Hemlock/Hardwood

Natural Community Delineation: Hemlock-Northern Hardwood Forest

Species Composition: Sugar maple (36%), hemlock (28%), paper birch (9%), white ash (7%), and smaller amounts of hophornbeam, red oak, aspen, beech, yellow birch, red maple, striped maple, and red spruce. Regeneration is well established, and is primarily in the seedling and sapling stages. Regeneration plots indicated that there

are 6,333 stems per acre, consisting of beech (45%), striped maple (21%), paper birch (13%), red maple (11%), and smaller amounts of sugar maple, white pine, and hemlock.

Total Basal Area/Acre: 152 sq. ft.

Acceptable Growing Stock (BA/Acre): 100 sq. ft.

Number Trees/Acre: 673

Basal Area/Acre (Stems >6" D.B.H.): 137 sq. ft.

Acceptable Growing Stock BA/Acre (Stems >6" D.B.H.): 93 sq. ft.

Number Trees/Acre (Stems >6" D.B.H.): 314

Merchantable Diameter: 12.2"

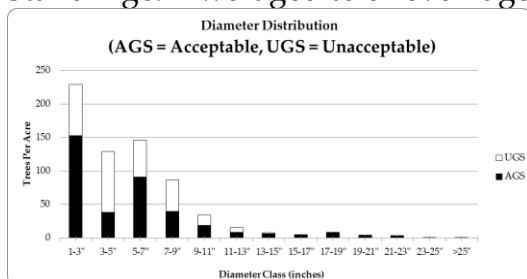
Volume/Acre: 5.996 MBF/acre; 18.7 cords/acre

Stocking: Fully stocked, between the A- and B-line stocking levels for even-aged mixedwood stands. This stand would be overstocked at above 170 sq. ft. of basal area/acre (the A line) and understocked at below 80 sq. ft. (the C line). The recommended stocking following a thinning is 108 sq. ft. (the B line).

Site Class: II (from soils)

Soils Mapping Unit: Tunbridge-Woodstock Complex and Colrain soils underlie this stand.

Stand Age: Two-aged to uneven-aged (q factor= 1.25, desired q factor= 1.50)



This diameter distribution shows a two-aged stand that is approaching uneven-aged.

This stand is developing the reverse "J" shaped diameter distribution of an uneven-aged stand. This stand has good representation of all diameter classes.

Stand History and Cultural Elements: Overstory trees appear to be about 80-90 years of age. A 7- to-10 acre section of this stand has been identified by the State of Vermont

as being part of the 15- to 20-acre old growth forest that contains both northern hardwood and hemlock trees.

Approximately 5 acres of this stand on the easterly edge were marked for harvest in 2013 but the cut was postponed due to wetness. The trees marked include mature white pine and hardwood pulp. The trail leading to Bald Top from the Ackerman parcel provides the best access. Most of this stand has not been logged for a very long time.

Water Quality, Wetlands, and Riparian Zones: A small drainage exits the center of the stand to the east. In addition, a possible vernal pool was found in the northern end of the stand, just down slope from Bald Top. Logging should be reduced within 50 feet of this drainage and the vernal pool to prevent degrading the soil and water quality.

Access Network: The main skid road leading to Brushwood Road runs across the top of this stand and provides the best access for logging the northern part of the stand. The eastern edge of the stand is best accessed from the Ackerman property and Bald Top Road. The southwesterly part of this stand is difficult to access for logging.

Wildlife: Numerous deer beds were found during the inventory. Although this area is not mapped by the State of Vermont as deer wintering habitat, evidence of browsing was noted, suggesting that deer are present here in the winter. This stand is mapped by the State of Vermont as sustainable bear habitat.

Dead Trees/Acre: 25.7 standing dead trees/acre; an average of 2.0 pieces of downed coarse woody debris/sample point. The number of standing dead trees is higher than normal, but generally these are smaller diameter trees.

Insects, Diseases, and Invasive Species: Sugar maple borer and beach bark disease are common throughout the stand. Some healthy smooth-barked beech were found during the inventory. These beech may have some natural resistance to beach bark disease, and should not be harvested. Hemlock with excessive bird peck, seams, or swollen are likely to contain rot or ring shake. Some larger common buckthorn plants were found nearing the top of Bald Top. These plants should be controlled as soon as possible to prevent further spread of the infestation.

Longterm Objective: Manage this area for the production of hardwood and mixedwood sawtimber, wildlife habitat, and partly as old growth forest. The 7 to 10 acres of old growth forest should be left untouched. In the remainder of the stand, use uneven-aged management techniques and selection harvests every 20-30 years in any one part of the stand. Single tree selection should be used to remove poor quality stems,

release crop trees, and harvest mature trees. Use group selection to remove bunches of mature or poor quality stems and as an attempt to regenerate red oak and white pine. The best quality, most healthy crop trees should be grown to the following diameter at breast height objectives before being considered mature: 18-20 inches for sugar maple; 16-18 inches for hemlock, white ash, and yellow birch; and 20-24 inches for white pine and red oak. Remaining species should be left or harvested depending upon health, quality, stocking and wildlife objectives. Leave 2-3 snags or cull trees per acre for woodpeckers and other cavity nesters. Whole tree harvesting is not recommended in this stand as the soils are shallow and will benefit from decaying wood.

Scheduled Treatment: Carry out the marked selection harvest on the eastern side of the parcel as soon as possible (2014). This will reduce the overall basal area/acre very little as the work will only be on a few acres. When logging is being done in adjacent stands, it would be appropriate to carry out additional work in this stand if the terrain allows.

The old growth area should be left untouched. Old growth forests are extremely rare in Vermont. It may be valuable to allow state or university ecologists to establish permanent inventory plots in this area.

STAND 8

This northern hardwood stand is to the south of Bald Top Mountain and has a south to southeasterly aspect with moderate slopes. Soils are shallow and rocky, with large ledge outcrops in the steepest areas. Sugar maple is predominant, but red oak, beech, and other species are well represented. Most of the stand is pole- to medium-sized sawtimber. The quality of the stand as timber is good, with the best potential being in the sugar maple and red oak.

Acres: 55 (8 sample points)

Forest Type: Northern Hardwood

Natural Community Delineation: Northern Hardwood-Hemlock Forest

Species Composition: Sugar maple (41%), beech (16%), red oak (11%), white ash (9%), red maple (9%), hemlock (7%), and smaller amounts of hophornbeam, white pine,

white oak, aspen, paper birch, and red spruce. Regeneration is well established, and is primarily in the sapling and pole stages. Regeneration plots indicate that there are 9,250 stems per acre; consisting of beech (46%), paper birch (16%), striped maple (12%), red maple (11%), white ash (5%), and smaller amounts of hophornbeam, hemlock, red oak, white pine, and sugar maple.

Total Basal Area/Acre: 127 sq. ft.
 Acceptable Growing Stock (BA/Acre): 88 sq. ft.
 Number Trees/Acre: 494

Basal Area/Acre (Stems >6" D.B.H.): 116 sq. ft.
 Acceptable Growing Stock BA/Acre (Stems >6" D.B.H.): 79 sq. ft.
 Number Trees/Acre (Stems >6" D.B.H.): 262

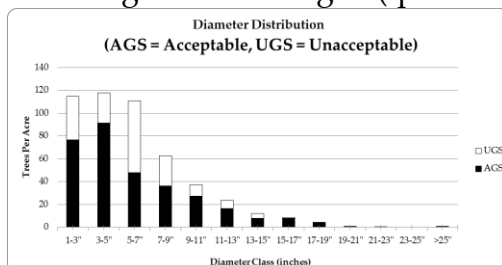
Merchantable Diameter: 11.5"
 Volume/Acre: 3.453 MBF/acre; 19.1 cords/acre

Stocking: Fully stocked, just below the A-line stocking level for an even-aged hardwood stand. This stand would be considered overstocked at 123 sq. ft. of basal area/acre (the A line), and understocked at 45 sq. ft. of basal area/acre (the C line). Following a thinning the basal area/acre should be 65 sq. ft. (the B line)

Site Class: II (from soils)

Soils Mapping Unit: Tunbridge-Woodstock Complex soils underlie this stand. This site has slight enrichment. Dead stalks of both maidenhair fern and blue cohosh were noted. These plants indicate calcium enrichment.

Stand Age: Uneven-aged (q factor= 1.28, desired q factor= 1.30)



This diameter distribution shows a stand that is nearly uneven-

Stand History and Cultural Elements: Overstory trees appear to be about 80 to 90 years

of age. This stand was very likely affected by the 1938 Hurricane. Parts of this stand were marked for harvest 10 years ago but the cut was not carried out. No evidence of recent logging was found.

Water Quality, Wetlands, and Riparian Zones: The majority of the water leaving this stand flows southwest toward Blood Brook. A small drainage flows east onto the neighboring property. Logging should be reduced within 25-50 feet of this drainage to protect water quality.

Access Network: The easiest access into this stand is from the West Fairlee Town Forest to the south. Two trails/old skid trails cross the boundary. The western trail is used by the Cross Rivendell Trail and the eastern portion is used by VAST.

Wildlife: The state of Vermont has mapped this stand as sustainable bear habitat. Deer and moose sign were abundant throughout the stand. A few sets of coyote tracks were also seen in the snow. A couple of grouse were flushed. **Dead Trees/Acre:** 56.6 standing dead trees/acre; an average of 3.0 pieces of downed coarse woody debris/sample point. The number of standing dead trees is higher than normal, but generally these are smaller diameter trees. Standing dead trees provide great habitat for cavity nesting birds.

Insects, Diseases, and Invasive Species: Sugar maple borer and beach bark disease are common throughout. Some healthy smooth barked beech were found during the inventory and these should not be harvested. Some exposed areas have experienced wind throw, and have a lot of blowdowns. No invasive plants were found.

Longterm Objective: Manage for the production of hardwood sawtimber using uneven-aged management techniques. Use selection harvests every 20 to 30 years. Single tree selection should be used to remove poor quality trees, release crop trees, and harvest mature trees. Use group selection (12 trees to a full acre) to remove bunches of mature or poor quality stems and in an attempt to regenerate red oak. The best quality, most healthy crop trees should be grown to the following diameter at breast height objectives before being considered mature: 18-22 inches for sugar maple and red oak; 16-18 inches for hemlock, red maple, white ash, and yellow birch. Remaining species should be left or harvested depending upon health, quality, stocking and wildlife objectives. Leave 2-3 snags or cull trees per acre for woodpeckers and other cavity nesters. Whole tree harvesting is not recommended in this stand, as the soils are shallow and will benefit from decaying wood.

Scheduled Treatment: Carry out the next selection harvest around 2019. Reduce the basal area/acre to approximately 75 sq. ft. Products will include a modest volume of sawlogs and firewood. Logging in this stand will require a long extraction distance. A forwarder logging system should be considered as it is preferable for long distances. The timing of cutting should possibly be coordinated with logging on the West Fairlee Town Forest.

STAND 9

This northern hardwood stand is composed of four sections in the northeastern part of the property. In general, this stand has an easterly aspect, with moderate slopes. Parts of the stand, especially around the gravel pit, are extremely steep. Water draining from this stand flows into Glens Falls Brook or directly into Lake Morey. This stand has well drained rocky soils. Ledge outcrops are common in the steepest areas. Beech, sugar maple, and red oak are the predominant species in. Timber quality is variable and the highest potential is in the sugar maple and red oak.

Acres: 130 (25 sample points)

Forest Type: Northern Hardwood

Natural Community Delineation: Hemlock-Hardwood Forest

Species Composition: Beech (28%), red oak (20%), sugar maple (16%), red maple (11%), aspen (9%), and smaller amounts of hophornbeam, white pine, hemlock, white oak, basswood, white ash, paper birch, yellow birch, and striped maple. Regeneration is primarily in the sapling stage. Regeneration plots indicate that there are 3,920 stems per acre; consisting of beech (54%), white pine (18%), striped maple (11%), hemlock (6%), and smaller amounts of red maple, red spruce, hophornbeam, balsam fir, paper birch, sugar maple, and yellow birch.

Total Basal Area/Acre: 130 sq. ft.

Acceptable Growing Stock (BA/Acre): 74 sq. ft.

Number Trees/Acre: 515

Basal Area/Acre (Stems >6" D.B.H.): 116 sq. ft.

Acceptable Growing Stock BA/Acre (Stems >6" D.B.H.): 73 sq. ft.

Number Trees/Acre (Stems >6" D.B.H.): 256

Merchantable Diameter: 11.3"

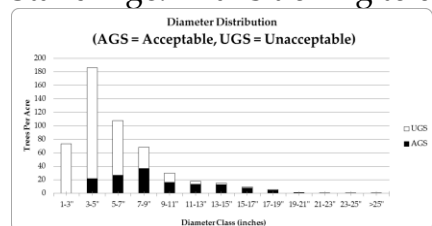
Volume/Acre: 4.131 MBF/acre; 20.6 cords/acre

Stocking: Fully stocked, just below the A-line stocking level for an even-aged hardwood stand. This stand would be considered overstocked at 123 sq. ft. of basal area/acre (the A line), and understocked at 45 sq. ft. of basal area/acre (the C line). Following a thinning the basal area/acre should be 65 sq. ft. (the B line).

Site Class: II (from soils)

Soils Mapping Unit: Tunbridge-Woodstock Complex and Colrain soils underlie this stand.

Stand Age: Transitioning to uneven-aged (q factor = 1.32, desired q factor = 1.30)



This diameter distribution shows an uneven-aged stand, but sapling-sized trees are underrepresented. This stand has a good representation of all size classes but the bulk of the smaller diameter trees are unacceptable quality beech.

Stand History and Cultural Elements: Some evidence of logging was found in the central and southwestern parts of the stand. It appears the logging took place 15 to 20 years ago. An old cellar hole was found in the southern part of the stand, just off the north side of the VAST trail (see map). A parking area is in the most easterly portion of this stand, at the Cross Rivendell trailhead.

Water Quality, Wetlands, and Riparian Zones: Glen Falls Brook borders this stand to the south, and flows east into Lake Morey. This brook is large enough to support brook trout most of the year. Several other smaller drainages flow through this stand into Glens Falls Brook. A possible vernal pool was found just off the east side of one of the skid roads in the central portion of the stand. Logging should be reduced within 50 feet of all these brooks, drainages, and vernal pool to protect water quality.

Access Network: This stand has very good access, and contains the two log landings accessed from Bald Top Road. Both landings are in the central part of the stand; one is on the upper truck road, and the other on the lower truck road. Skid roads provide access to all parts of this stand except the steepest section by the gravel pit. No erosion problems were found on any of these woods roads. Several of these roads are used for recreation, including the VAST trail and Cross Rivendell Trail.

Wildlife: The state of Vermont has mapped the western three quarters of this stand as sustainable bear habitat and the eastern half of the stand is mapped as deer wintering habitat. Several moose beds were found in the northwestern part of this stand. Deer and turkey sign were abundant throughout the stand. Coyote and fisher cat tracks were also found along the woods roads.

Dead Trees/Acre: 69.1 standing dead trees/acre; an average of 1.0 pieces of downed coarse woody debris/sample point. The number of standing dead trees is higher than normal, but generally these are smaller diameter trees.

Insects, Diseases, and Invasive Species: Sugar maple borer damage is common. Eutypella canker is abundant in many of the maples throughout this stand. Beech bark disease is the largest problem facing this stand. Most of the beech trees are infected and are in various states of decline. Some healthy smooth barked beech were found during the inventory; these trees should not be harvested. No invasive plants were found.

Longterm Objective: Manage for the production of hardwood sawtimber using uneven-aged management techniques. Carry out selection harvests every 15 to 25 years. Use single tree selection to remove poor quality trees, release crop trees, and harvest mature trees. Single tree selection could also be used to release quality oak trees for increased mast production. Group selection (12 trees to three acres) should be used to remove bunches of poor quality and mature stems and as an attempt to regenerate red oak and white pine. Grow the best quality, most healthy crop trees to the following diameter at breast height objectives: 18-22 inches for sugar maple; 16-18 inches for hemlock, red maple, white ash, and yellow birch; 20-24 inches for red oak and white pine. Remaining species should be left or harvested depending upon health, quality, stocking, and wildlife objectives. Leave 2-3 snags or cull trees per acre for woodpeckers and other cavity nesters. Whole tree harvesting is not recommended in this stand, as the soils are shallow and will benefit from decaying

wood.

Scheduled Treatment: Carry out the next selection harvest around 2017. This work will likely need to be broken into separate operations due to location and access. Reduce the basal area/acre to approximately 65-75 sq. ft. Products will include a modest volume of sawlogs and a more significant volume of hardwood pulp and firewood. Dry summer or frozen logging conditions are recommended.

In the central part of this stand, on south facing, dry soils, mature aspen and beech declining from beech bark disease dominate. These areas offer a good opportunity to create large group cuts (up to three acres) to diversify both the wildlife habitat and the regeneration mix. In some cases it may be advisable to plant inside of these group cuts the spring following the harvest.

STAND 10

This hardwood/white pine/hemlock stand is made up of several sections. The primary locations are along the northern boundary, another is in the Gravel Pit Lot, and another along the eastern boundary. The stand has shallow rocky soils, with moderate slopes. Terrain varies from flat to extremely steep. The flat areas tend to be poorly drained, and the steepest of areas are found in the Gravel Pit Lot. Most of the stand has an easterly aspect, and it also has some south facing aspects. Timber quality and stocking levels are variable. The highest potential is in the white pine, red oak, and sugar maple. White oak, though not common, is most abundant in this stand.

Acres: 162 (27 sample points)

Forest Type: Hardwood/White Pine/Hemlock

Natural Community Delineation: Hemlock-Hardwood Forest

Species Composition: Red oak (23%), white pine (20%), red maple (17%), hemlock (11%), sugar maple (8%), and smaller amounts of red pine, hophornbeam, white oak, black cherry, aspen, white ash, beech, paper birch, yellow birch, and red spruce.

Regeneration is well established, and ranges in size from seedlings to poles.
 Regeneration plots indicate that there are 4,444 stems per acre; consisting of beech (27%), white pine (25%), striped maple (20%), hophornbeam (12%), hemlock (5%), and smaller amounts of red spruce, sugar maple, white pine, balsam fir, black cherry, and red maple.

Total Basal Area/Acre: 137 sq. ft.
 Acceptable Growing Stock (BA/Acre): 98 sq. ft.
 Number Trees/Acre: 648

Basal Area/Acre (Stems >6" D.B.H.): 120 sq. ft.
 Acceptable Growing Stock BA/Acre (Stems >6" D.B.H.): 90 sq. ft.
 Number Trees/Acre (Stems >6" D.B.H.): 242

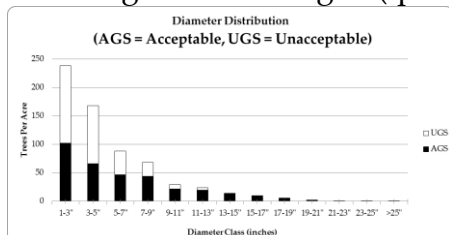
Merchantable Diameter: 12.0"
 Volume/Acre: 6.765 MBF/acre; 18.9 cords/acre

Stocking: Fully stocked, above the B-line stocking level for an even-aged mixedwood stand containing 25-65% softwood. This stand would be considered overstocked at a basal area/acre of 170 sq. ft. (the A line), and understocked at a basal area/acre of 75 sq. ft. (the C line). After thinning the basal area/acre should be around 110 sq. ft. (the B line).

Site Class: I to II (from soils)

Soils Mapping Unit: Tunbridge-Woodstock Complex, Buckland, and Colrain soils underlie this stand.

Stand Age: Uneven-aged (q factor= 1.27, desired q factor= 1.50)



This diameter distribution has the reverse “J” shape that characterizes an uneven-aged stand.

Stand History and Cultural Elements: The overstory trees appear to be about 90 years

of age. There is some evidence of logging within the last couple decades. The most recent logging appears to have been done within the last 10 years in the very northern part of the stand. A cellar hole is located on the northern edge of the southern part of this stand.

Water Quality, Wetlands, and Riparian Zones: A small drainage flows through a central portion of this stand and drains into Glen Falls Brook. All water from this stand either drains into Glen Falls Brook or directly into Lake Morey. A few wet spots exist, especially along the base of the slopes. Logging should be reduced within 50 feet of these drainages and wet areas to protect soil and water quality.

Access Network: With the exception of the Gravel Pit portion of this stand, access is very good. Skid roads have been developed into most parts. Wood can be skidded back to either of the two landings accessed from Bald Top Road. Water bars are in place where needed and no erosion problems were found.

Wildlife: Moose beds and tracks were very common in the northern portion of this stand. The State of Vermont has mapped the western half of this stand as being sustainable bear habitat, and this was confirmed by our findings of claw marks in a few beech trees. The State has mapped the eastern half as deer wintering habitat. Deer and turkey sign were prolific throughout the stand. Hare tracks were found in the southern part and a set of bobcat tracks were noted in the northern part of the stand.

Dead Trees/Acre: 53.3 standing dead trees/acre; an average of 1.2 pieces of downed coarse woody debris/sample point. The number of standing dead trees is higher than normal for this cover type. Standing dead trees provide great habitat for cavity nesting birds.

Insects, Diseases, and Invasive Species: White pine blister rust and white pine weevil are both present but neither is a big concern. Beech bark disease is abundant, but some healthy, smooth-barked beech can be found. No invasive plants were found.

Longterm Objective: Manage for the production of white pine and hardwood sawtimber using uneven-aged management techniques. Use selection harvests every 15-25 years. Single tree selection should be used to release crop trees, remove poor quality stems, or harvest mature trees. Use group selection (12 trees to 5 acres) to remove groups of poor quality and mature stems. Larger groups or patch cuts will

help create early successional habitat. The best quality, most healthy crop trees should be grown to the following diameter at breast height objectives before being considered mature: 18-22 inches for sugar maple; 16-18 inches for hemlock, white ash, and yellow birch; 20-24 inches for white pine and red oak. Remaining species should be left or harvested depending upon health, quality, stocking and wildlife objectives. Leave 2-3 snags or cull trees per acre for woodpeckers and other cavity nesters. Whole tree harvesting is not recommended in this stand, as the soils are shallow and will benefit from decaying wood.

Scheduled Treatment: Carry out the next selection harvest around 2023. Reduce the basal area/acre to approximately 110 sq. ft. The general goal of this harvest is to remove some mature sawtimber, release crop trees, and establish a new cohort of trees. Residual stocking will not be uniform. Products will include a modest volume of mixedwood sawlogs and hardwood and softwood pulp. Dry summer or frozen logging conditions are recommended.

This stand has a number of places which provide a good opportunity to create larger groups (up to five acres) to diversify wildlife habitat and the regeneration mix. In most cases it would be ideal to see the red and oak retained within the groups or on the edges.

STAND 11

This hemlock stand is in the north-central part of the property. Slopes are gentle to moderate and have an east facing aspect. This stand has well drained rocky soils that are shallow to ledge. Hemlock dominates the overstory, but red oak is a strong component. Stocking levels are uniform throughout, and timber quality is acceptable. The highest timber potential is in the red oak sawlogs. Although not mapped as a deer wintering area, this stand appears to be used at least to some degree by deer in winter.

Acres: 44 (6 sample points)

Forest Type: Hemlock

Natural Community Delineation: Hemlock Forest

Species Composition: Hemlock (62%), red oak (11%), red maple (10%), beech (7%), and smaller amounts of hophornbeam, white ash, paper birch, striped maple, and red spruce. Regeneration is well established for a hemlock stand. Regeneration plots indicate that there are 3,833 stems per acre; consisting of striped maple (48%), beech (30%), and hophornbeam (22%).

Total Basal Area/Acre: 158 sq. ft.

Acceptable Growing Stock (BA/Acre): 107 sq. ft.

Number Trees/Acre: 863

Basal Area/Acre (Stems >6" D.B.H.): 132 sq. ft.

Acceptable Growing Stock BA/Acre (Stems >6" D.B.H.): 103 sq. ft.

Number Trees/Acre (Stems >6" D.B.H.): 309

Merchantable Diameter: 10.5"

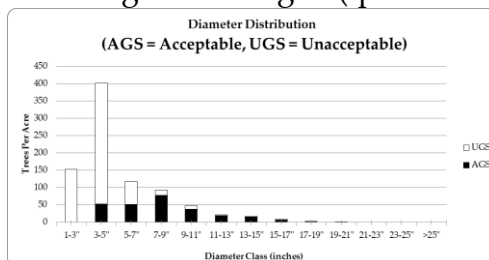
Volume/Acre: 4.057 MBF/acre; 20.0 cords/acre

Stocking: Adequately stocked, at the B-line stocking level for an even-aged stand containing more than 30 percent hemlock in the overstory. It is recommended that the stocking not be reduced below the B-line stocking level, because hemlock is shallow rooted and susceptible to windthrow. The B-line stocking level is 130 sq. ft.

Site Class: II (from soils)

Soils Mapping Unit: Tunbridge-Woodstock Complex and Colrain soils underlie this stand.

Stand Age: Even-aged (q factor= 1.31, desired q factor= 1.50)



This diameter distribution shows a stand that is even-aged. The smallest stems in the stand are typically suppressed and do not represent a significantly younger age class. Most of these suppressed stems are unacceptable quality for timber.

Stand History and Cultural Elements: The overstory trees appear to be about 80 years of age. This stand possibly established after the 1938 Hurricane. No evidence of recent logging activity was noted.

Water Quality, Wetlands, and Riparian Zones: A small drainage flows east across the northeastern corner of the stand. This stream feeds into Glen Falls Brook, which flows into Lake Morey. There are a few areas of wetness, especially at the bases of slopes, and in depressions through the stand. Logging should be reduced within 50 feet of this drainage and any wet areas to protect water quality, and minimize soil erosion.

Access Network: Access to this stand is good. A major skid road borders the southern portion of this stand, allowing wood to be skidded to either of the landings accessed from Bald Top Road. Water bars were in place, and no erosion problems were found on these woods roads

Wildlife: The State of Vermont has mapped this stand as sustainable bear habitat. Deer tracks were abundant and a couple sets of moose tracks were crossed during the inventory. Although this stand is not mapped by the State of Vermont as being deer wintering habitat, it does show significant signs of being used as a wintering area. Hemlock is the preferred species for wintering deer. Dense hemlock restricts snow accumulation in the understory and insulates deer during very cold winter nights. It is important that deer have browse, and mast producing trees such as oak and beech are also a desirable feature. This area will lose some of its value as a wintering area as the crown heights increase and browse decreases. An uneven-aged stand condition is the most valuable for deer over the long-term.

Dead Trees/Acre: 69.1 standing dead trees/acre; an average of 1.2 pieces of downed coarse woody debris/sample point. The number of standing dead trees is higher than normal, but generally these are smaller diameter trees.

Insects, Diseases, and Invasive Species: In general, the health is acceptable. There are a few areas that have a large amount of blow down. Hemlock trees with seams, swollen butts, and/or have excessive amounts of bird peck are likely to contain rot and ring shake. Hemlock on steep slopes typically has ring shake. Beech bark disease is common in the beech that is present in this stand. No invasive plants were found.

Longterm Objective: Manage primarily for wildlife habitat and partly for the production of red oak sawlogs using uneven-aged management techniques. Use selection harvests every 15-20 years, maintaining the basal area/acre between 120-140 sq. ft. Single tree selection should be used to release crop trees (red oak mostly), remove poor quality stems, or harvest mature trees. Group selection (12 trees to a full acre) can be used to remove groups of poor quality stems and to help establish regeneration. The best quality, most healthy crop trees should be grown to the following diameter at breast height objectives before being considered mature: 20-24 inches for red oak; 16-18 inches for hemlock, red maple, and white ash. Remaining species should be left or harvested depending upon health, quality, stocking and wildlife objectives. Leave 2-3 snags or cull trees per acre for woodpeckers and other cavity nesters. Whole tree harvesting is not recommended in this stand as the soils are shallow and will benefit from decaying wood.

Scheduled Treatment: Carry out the next selection harvest around 2025. Reduce the basal area/acre to approximately 130 sq. ft. Products will include a modest volume of hemlock and hardwood sawlogs and softwood pulp. Dry summer or frozen logging conditions are recommended.

STAND 12

This hemlock/hardwood stand in the east-central part of the property is the largest on the property . Soils are shallow, with some areas of wetness. Terrain varies from gradual to quite steep in places. Logging may not be feasible where steepness is excessive. The quality of the timber is average and typical of most hemlock/hardwood stands found in the Connecticut River Valley, but there are some pockets with above average quality hardwood and pine.

Acres: 362 (49 sample points)

Forest Type: Hemlock/Northern Hardwood

Natural Community Delineation: Hemlock Forest

Species Composition: Hemlock (40%), red maple (14%), red oak (14%), beech (12%), and smaller amounts of red pine, hophornbeam, white pine, white oak, aspen, black

ash, white ash, paper birch, yellow birch, sugar maple, and red spruce. Regeneration plots indicate 3,388 stems per acre, which is dominated by beech (44%) and striped maple (27%) saplings. Hemlock, red maple, white pine, sugar maple, red spruce, yellow birch, balsam fir, and hophornbeam also contribute to the regeneration mix.

Total Basal Area/Acre: 140 sq. ft.

Acceptable Growing Stock (BA/Acre): 104 sq. ft.

Number Trees/Acre: 567

Basal Area/Acre (Stems >6" D.B.H.): 127 sq. ft.

Acceptable Growing Stock BA/Acre (Stems >6" D.B.H.): 99 sq. ft.

Number Trees/Acre (Stems >6" D.B.H.): 262

Merchantable Diameter: 11.5"

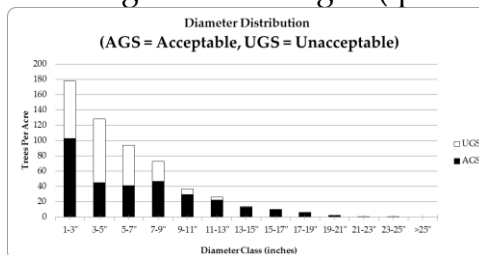
Volume/Acre: 6.882 MBF/acre; 19.5 cords/acre

Stocking: Well stocked, above the B-line stocking levels for even-aged stands containing more than 30 percent hemlock in the overstory. There is no overstocked condition in hemlock stands. The recommended basal area/acre following a thinning is 125 sq. ft. of basal area/acre (the B line).

Site Class: I-II (from soils)

Soils Mapping Unit: Buckland, Tunbridge-Woodstock Complex and Colrain soils underlie this stand.

Stand Age: Uneven-aged (q factor = 1.30 , desired q factor = 1.50)



This graph shows the classic reverse "J" diameter distribution of an uneven-aged stand.

Stand History and Cultural Elements: Overstory trees appear to be about 80-90 years of age. Two elements of historical importance have been found by the Vermont Fish and Wildlife Department on the neighboring Aloha property. In 1909, the state

discovered Broad Beech fern growing on Echo Mountain, which is just north of this stand. In 1921, approximately 30 Ram's Head Lady Slipper plants were also discovered on Echo Mountain. These two plants are quite rare and no specimens have been found in the most recent surveys. Evidence of some logging was found in the north-central part of this stand between the two branches of Glens Falls Brook. This logging appears to have been done in the last 10-15 years.

Water Quality, Wetlands, and Riparian Zones: Three possible vernal pools (see map) and a number of brooks are located in this stand. Glens Falls Brook, which acts as the main drainage, has two branches that run southeast towards Lake Morey. Prior to reaching the lake, these two branches join together and go over a series of impressive waterfalls. Two other, smaller brooks that act as tributaries to Glens Falls Brook are also found in this stand.

Access Network: There is an extensive network of woods roads and trails that provide access to this stand. The main truck road is connected to Bald Top Road and runs northwest-southeast. This road splits and follows the two branches of Glens Falls Brook. Log landings are located on each road soon after the main truck road splits. The Cross Rivendell Trail connects to this truck road and heads east towards Lake Morey. The Vermont Association of Snow Travelers (VAST) uses this same trail to provide public access for snowmobilers. This system of roads and trails is well maintained and no erosion problems were noted.

Wildlife: About a dozen turkeys were spotted scratching for acorns during the inventory. A significant number of deer and bobcat tracks were also noted. The northeastern section of this stand has a number of large, ledge outcroppings which may make good den sites for bobcats.

Dead Trees/Acre: 65.3 standing dead trees/acre; an average of 1.35 pieces of downed coarse woody debris/sample point. The number of standing dead trees is higher than normal, but generally these are smaller diameter trees.

Insects, Diseases, and Invasive Species: In general, the health of this stand is normal. Beech bark disease is all too common. Some pockets of beech are in very poor condition. No invasive species were noted.

Longterm Objective: This stand should be managed using uneven-aged management techniques. Selection harvesting should be done every 30-40 years in any one part of

the stand. When logging, aim to release quality oak stems to increase mast production. Group selection (12 trees to 3 acres) should be used to remove bunches of poor quality or mature stems. Larger groups will produce early successional habitat. Use the following diameter objectives as a guide to maturity for crop trees: 20-24 inches for white pine and red oak; 18-22 inches for sugar maple; 14-16 inches for hemlock, white ash, yellow birch, black cherry, and red maple. Remaining species should be left or harvested depending upon health, quality, wildlife and stocking objectives. Leave relatively large areas heavy to hemlock to protect deer wintering habitat.

Scheduled Treatment: No stand-wide commercial treatment is needed over the next 15 years. Re-examine this stand around 2028 for growth and health.

This is a very large stand and it would not be inappropriate to carry out both individual tree and group selection harvesting in small areas when working in bordering stands.

STAND 13

This large northern hardwood stand is broken up into two sections, both located in the southern third of the property. Soils are relatively shallow, with some richness. This stand slopes to the south with a few areas of steepness. The quality of the timber is quite good, especially the red oak and white ash. Sugar maple is the most dominant and valuable species in the overstory, but the quality is variable and average overall. This stand has a lot of species variation. Some areas are predominantly aspen and paper birch and are good places for large group selections or patch cuts. Stocking is uniformly dense.

Acres: 182 (30 sample points)

Forest Type: Northern Hardwood

Natural Community Delineation: Northern Hardwood Forest

Species Composition: Sugar maple (26%), red maple (16%), beech (14%), red oak (13%), and smaller amounts of hophornbeam, butternut, white pine, hemlock, black cherry, aspen, white ash, paper birch, yellow birch, and balsam fir. There is good diversity amongst the regeneration mix and regeneration plots indicate that there are approximately 4,100 stems per acre. Beech (54%) dominates, while striped maple (20%) and hophornbeam (12%) also add considerable numbers. Smaller amounts of red maple, sugar maple, paper birch, white ash, red spruce, white pine, and balsam fir are also found in the understory.

Total Basal Area/Acre: 124 sq. ft.
 Acceptable Growing Stock (BA/Acre): 79 sq. ft.
 Number Trees/Acre: 556

Basal Area/Acre (Stems >6" D.B.H.): 110 sq. ft.
 Acceptable Growing Stock BA/Acre (Stems >6" D.B.H.): 74 sq. ft.
 Number Trees/Acre (Stems >6" D.B.H.): 227

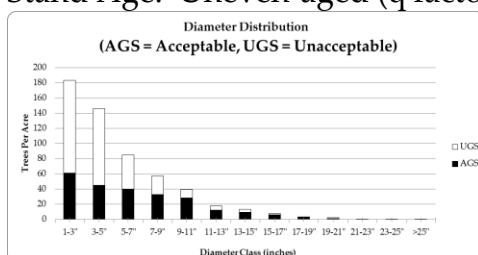
Merchantable Diameter: 11.8"
 Volume/Acre: 4.456 MBF/acre; 19.5 cords/acre

Stocking: Fully stocked, just under the A- line stocking level (125 sq. ft./acre) for even-aged northern hardwood stands. The stand would be considered understocked at below 47 sq. ft. (the C line). The suggested stocking level following a thinning (the B line) is 65 sq. ft.

Site Class: I-II (from soils)

Soils Mapping Unit: Colrain, Muck, Buckland, and Tunbridge-Woodstock Complex soils underlie this stand.

Stand Age: Uneven-aged (q factor = 1.28 , desired q factor = 1.30)



This stand has developed the reverse “J” diameter distribution of an uneven-aged stand. The largest percentage of unacceptable growing stock occurs in the smaller diameter trees. This is due partly to beech bark disease and because the smaller stems are more suppressed.

Stand History and Cultural Elements: Overstory trees appear to be 70-80 years of age. No evidence of recent logging was noted. Although a foundation was not found, a number of stone walls around the log landing in the center of this stand may be evidence of an old homestead.

Water Quality, Wetlands, and Riparian Zones: A relatively large brook runs east along the southern boundary of this stand and drains into Lake Morey. This brook will need to be crossed to log the central and northern parts of this stand.

Access Network: A small part of the Cross Rivendell Trail runs through the northwest corner of this stand before entering Stand 15. This trail appears to follow an old logging road. One skid road runs south from this trail system, through this stand until it connects to the VAST snowmobile trail in Stand 15. The VAST trail also runs through the eastern half of this stand and provides access to a log landing located to the south, along the main truck road connected to Knox Road.

Wildlife: One deer and a large flock of turkeys were spotted during the inventory. Signs of these animals were found throughout this stand. This stand has great southern exposure, which makes it an attractive place for wildlife. The presence of beech and red oak is ideal for wildlife.

Dead Trees/Acre: 65.4 standing dead trees/acre; an average of 1.23 pieces of downed coarse woody debris/sample point. The number of standing dead trees/acre is above average for this type of stand because most of the trees tallied were 4 inches D.B.H. or less.

Insects, Diseases, and Invasive Species: Minor amounts of beech bark disease, maple borer, and white pine blister rust were noted. The majority of the aspen in this stand appears healthy and possibly is sound enough for sawtimber. Aspen commonly starts to rot in the butt as it matures. Red maple in this stand is generally poor quality. Much of the red maple has lesions on the trunk caused by annual canker. Red maple is poor at compartmentalizing these wounds and rot and discoloration are commonly not far behind them. No invasive species were found.

Longterm Objective: Manage for the production white pine and hardwood sawtimber using uneven-aged management techniques. Selection harvests should be carried out every 20-30 years in any one part of the stand. Use group selection (12 trees to 5 acres) to remove bunches of poor quality or mature stems. This stand has good opportunities to create early successional habitat where aspen, paper birch, red maple, or poorer quality sugar maple are predominant. Where the quality of the sawtimber is better, use the following diameter objectives as a guide to maturity for crop trees: 20-24 inches for red oak and white pine, 18-22 inches for sugar maple and white ash, 14-16 inches for paper birch, red maple, black cherry, yellow birch, and red spruce. Remaining species should be left or harvested depending upon health, quality, stocking, and wildlife objectives.

Scheduled Treatment: Carry out a selection harvest by 2016. Reduce the basal area to approximately 70 sq. ft./acre. The goal is to harvest some mature trees, declining trees, reduce the amount of unacceptable stems, and release potential crop trees. Trees with small live crowns, narrow forks, or general roughness should be targeted for removal.

This stand provides good opportunities to create early successional habitat. Group selection harvests of up to 5 acres should be used where the stand is dominated by aspen, paper birch, red maple, or poorly formed white pine.

STAND 14

This small hemlock stand is in two sections, both in the southern half of the property. Terrain is moderate to steep, and the soils are shallow, well-drained, and rocky. Stocking levels are uniform and timber quality is marginal at best. Hemlock and red maple dominate the overstory. The best timber potential is in the few scattered red oaks. This stand has much greater wildlife potential than it does timber potential. [or... The value of this stand for wildlife is greater than its potential value as timber.]

Acres: 13 (3 sample points)

Forest Type: Hemlock

Natural Community Delineation: Hemlock Forest

Species Composition: Hemlock (65%), red maple (19%), red oak (9%), and beech (7%).

Regeneration is sparse and much of it has been browsed. The regeneration is in the seedling and sapling stages. Regeneration plots indicate that there are 1,666 stems per acre, all of which are beech seedlings and saplings.

Total Basal Area/Acre: 190 sq. ft.

Acceptable Growing Stock (BA/Acre): 123 sq. ft.

Number Trees/Acre: 479

Basal Area/Acre (Stems >6" D.B.H.): 183 sq. ft.

Acceptable Growing Stock BA/Acre (Stems >6" D.B.H.): 123 sq. ft.

Number Trees/Acre (Stems >6" D.B.H.): 373

Merchantable Diameter: 11.5"

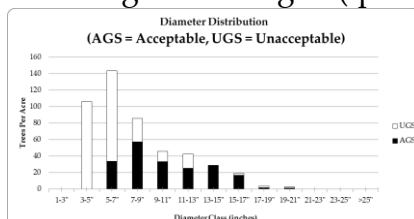
Volume/Acre: 7.923 MBF/acre; 26.7 cords/acre

Stocking: Fully stocked, well above the B-line stocking level of 120 sq. ft. per acre for even-aged stands containing more than 30 percent hemlock in the overstory. It is recommended that the stocking not be reduced below the B-line stocking level, because hemlock is shallow rooted and susceptible to windthrow. The B-line stocking level is 120 sq. ft.

Site Class: II (from soils)

Soils Mapping Unit: Tunbridge-Woodstock Complex soils underlie this stand.

Stand Age: Even-aged (q factor= 1.20, desired q factor= 1.50)



This diameter distribution shows a stand that is mostly even-aged. Most of the smallest stems in the stand are suppressed and are not good quality trees.

Stand History and Cultural Elements: The overstory trees appear to be about 80-100 years of age. No evidence of recent logging activity was seen.

Water Quality, Wetlands, and Riparian Zones: There are no drainages, wetlands, or riparian zones. **Access Network:** Access is good. A major skid road runs south through the center of this stand and it allows for wood to be easily skidded to the landing off Knox Road. No erosion problems were found. This section of the road is currently used by the Cross Rivendell Trail, and the VAST trail system.

Wildlife: The state of Vermont has mapped this stand as sustainable bear habitat. Deer sign was abundant throughout the stand. Although this stand is not mapped by the state of Vermont as being deer wintering habitat, it does show significant sign of being used as a wintering area.

Dead Trees/Acre: 46.2 standing dead trees/acre; an average of 0.33 pieces of downed coarse woody debris/sample point. The number of standing dead trees is higher than normal, but generally these are smaller diameter trees. Standing dead trees provide great habitat for cavity nesting birds. The amount of coarse woody debris is relatively low. Coarse woody debris provides many benefits to a forest, such as cover for small wildlife and returning nutrients back into the soil.

Insects, Diseases, and Invasive Species: Trees in this stand are struggling due to the exposed site conditions. Many of the hemlocks and red maples are poorly formed. Hemlock trees with seams, swollen butts, and/or with excessive amounts of bird peck are likely to contain rot and ring shake. Beech bark disease is common in the beech. No invasive plants were found.

Longterm Objective: Manage this area primarily for wildlife habitat and partly for the production of red oak sawlogs using uneven-aged management techniques. Use selection harvests every 20-40 years to maintain the basal area/acre between 110-130 sq. ft. Use single tree selection to release crop trees, remove poor quality stems, or harvest mature trees. Group selection can be used to remove groups of poor quality stems and to help establish regeneration. Small patch cuts could be used to remove larger areas of poor quality red maple and hemlock stems, and to establish early successional habitat. The best quality, most healthy crop trees should be grown to the following diameter at breast height objectives before being considered mature: 18-22 inches for red oak; 16-18 inches for hemlock, and red maple. Remaining species

should be left or harvested depending upon health, quality, stocking, and wildlife objectives. Leave 2-3 snags or cull trees per acre for woodpeckers and other cavity nesters. Whole tree harvesting is not recommended in this stand, as the soils are shallow and will benefit from decaying wood.

Scheduled Treatment: Carry out the next selection harvest around 2016. Reduce the basal area/acre to approximately 130 sq. ft. Products will include a modest volume of hemlock and hardwood sawlogs and softwood pulp. This work will need to be combined with work in Stand 13.

STAND 15

This hemlock/hardwood stand is in the southeast part of the property. For the most part soils are shallow and well-drained, but there are some areas of wetness. The terrain here is mostly rolling with some steepness. Logging is feasible in this stand with the exception of a few areas. The quality of the timber is average and there is great variation in the stand, as some areas are heavy to hemlock and others more lightly stocked with mixed hardwood species. Most of this stand has been logged in past 15 years.

Acres: 208 (30 sample points)

Forest Type: Hemlock/Hardwood

Natural Community Delineation: Hemlock-Northern Hardwood Forest

Species Composition: Hemlock (25%), red maple (24%), red oak (10%), and smaller amounts of red pine, hophornbeam, butternut, white pine, white oak, black cherry, aspen, white ash, beech, paper birch, yellow birch, sugar maple, red spruce, and balsam fir. Small patch cuts throughout the stand have helped to add diversity to the regeneration. Regeneration plots indicate 4,336 stems per acre, dominated by beech (37%) and striped maple (37%) saplings in most areas. Hophornbeam also contributes a considerable amount (14%) to the regeneration, while white pine, red spruce, sugar maple, paper birch, white ash, hemlock, and aspen account for smaller percentages.

Total Basal Area/Acre: 129 sq. ft.

Acceptable Growing Stock (BA/Acre): 89 sq. ft.

Number Trees/Acre: 442

Basal Area/Acre (Stems >6" D.B.H.): 117 sq. ft.

Acceptable Growing Stock BA/Acre (Stems >6" D.B.H.): 87 sq. ft.

Number Trees/Acre (Stems >6" D.B.H.): 233

Merchantable Diameter: 11.7"

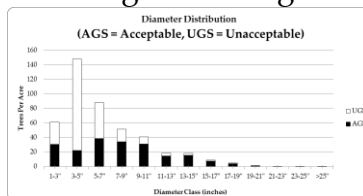
Volume/Acre: 5.489 MBF/acre; 18.6 cords/acre

Stocking: Fully stocked, above the B-line stocking level for even-aged mixedwood stands. This stand would be considered overstocked at above 170 sq. ft. of basal area/acre (the A line) and understocked at below 85 sq. ft. The suggested stocking level following a thinning (the B line) is 108 sq. ft.

Site Class: II (from soils)

Soils Mapping Unit: Buckland, Tunbridge-Woodstock Complex and Colrain soils underlie this stand.

Stand Age: Even-aged to two-aged (q factor = 1.34, desired q factor = 1.50)



This graph shows a stand transitioning to uneven-aged. Sapling-sized trees are underrepresented but are developing from the past logging.

Stand History and Cultural Elements: Overstory trees appear to be about 70-80 years of age. Some of this stand was logged within the last 10 years using a combination of single tree and group selection. Some of the groups are a couple acres in size and have helped to create diversity in both the wildlife habitat and the species composition of the regeneration.

Water Quality, Wetlands, and Riparian Zones: A relatively large brook runs east along the northern boundary of this stand and drains into Lake Morey. This brook originates in the northwestern part of this stand where a number of wet areas coalesce. A second, smaller brook runs south through this stand to a larger brook, located just south of the property boundary. Minimize logging within 50 feet of the

brooks to protect water quality.

Access Network: A major log truck road runs from the end of Knox Road to a log landing in the center of this stand. This road continues west past this landing as a VAST trail. Two skid roads branch off this main road. The first skid road runs south from this landing and gives access to a small part of Stand 13. The second runs north and connects to the Cross Rivendell Trail. A second VAST trail branches off the main road prior to this landing and runs north into Stand 13. A second, smaller log landing is also at this intersection. No erosion problems were noted.

Wildlife: A number of deer tracks and some coyote sign were found during the inventory. The larger group selection cuts are providing early successional habitat.

Dead Trees/Acre: 29.9 standing dead trees/acre; an average of 1.07 pieces of downed coarse woody debris/sample point. These values are average for this forest type.

Insects, Diseases, and Invasive Species: Lesions caused by annual canker are somewhat common on the red maple. Red maple is poor at compartmentalizing wounds and these lesions will reduce sawtimber yield. A minor amount of sugar maple borer damage is present. Paper birch and aspen is naturally starting to decline. Beech bark disease is all too common and quite significant in some areas. No invasive species were noted.

Longterm Objective: This stand should be managed using uneven-aged management techniques. Selection harvesting should be done every 20-30 years in any one part of the stand. When logging is done, aim to release quality stems, especially red oak and white pine. Use group selection (12 trees to 5 acres) to remove bunches of poor quality stems and to diversify regeneration and wildlife habitat. Use the following diameter objectives as a guide to maturity for crop trees: 20-24 inches for white pine and red oak; 18-22 inches for sugar maple; 14-16 inches for yellow birch, black cherry, hemlock, ash, and the occasional red maple. Remaining species should be left or harvested depending upon health, quality, wildlife objectives, and stocking objectives. It may be important to leave relatively large sections that are heavy to hemlock as these areas may provide some deer wintering habitat.

Scheduled Treatment: Most of this stand has been logged using individual tree and group selection harvesting over the past 10-15 years and needs no further treatment for the next decade. The very western part of the stand was not harvested and

additional work should be carried out around 2016 while working in Stand 13. The goal of this work is to promote crop trees by harvesting unacceptable or inferior growing stock. Several larger group selection cuts can be made here. Soils are damp in places and dry or frozen conditions are needed. Maintain B-line stocking levels over the entire stand. Hardwood pulp will be the largest component of the harvest.

STAND 16

This hemlock/hardwood stand is the southern tip of the property. Terrain is moderately steep to steep, with large ledge outcrops in the steepest areas. Soils are shallow and rocky, much like the rest of the property. Hemlock, sugar maple, and red oak dominate this stand. The south facing aspect makes this area particularly good for wintering habitat. Timber quality is acceptable and uniformly stocked. Intensive timber management appears impractical because of the lack of access.

Acres: 27 (7 sample points)

Forest Type: Hemlock/Hardwood

Natural Community Delineation: Hemlock-Northern Hardwood Forest

Species Composition: Hemlock (37%), sugar maple (20%), red oak (12%), red maple (11%), beech (10%), and smaller amounts of hophornbeam, white pine, black cherry, aspen, paper birch, and yellow birch. Regeneration is well established and is in the seedling and sapling stages. Regeneration plots indicate that there are 4,286 stems per acre; consisting of beech (53%), striped maple (27%), white pine (10%), and smaller amounts of hophornbeam and sugar maple.

Total Basal Area/Acre: 161 sq. ft.

Acceptable Growing Stock (BA/Acre): 109 sq. ft.

Number Trees/Acre: 622

Basal Area/Acre (Stems >6" D.B.H.): 150 sq. ft.

Acceptable Growing Stock BA/Acre (Stems >6" D.B.H.): 109 sq. ft.

Number Trees/Acre (Stems >6" D.B.H.): 394

Merchantable Diameter: 10.5"

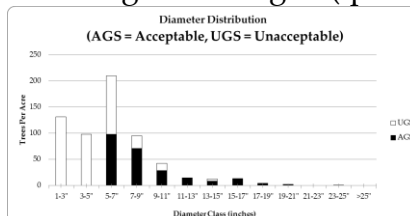
Volume/Acre: 5.362 MBF/acre; 21.1 cords/acre

Stocking: Fully stocked, well above the B-line stocking levels for even-aged hemlock/hardwood stands containing more than 30% hemlock. It is recommended that the basal area/acre should not be reduced below 90 sq. ft. of basal area/acre in a thinning (the B line).

Site Class: II (from soils)

Soils Mapping Unit: Tunbridge-Woodstock Complex soils underlie this stand.

Stand Age: Two-aged (q factor= 1.30, desired q factor= 1.50)



This diameter distribution shows a two-aged or bi-model stand. The smallest diameter classes are underrepresented for this to be a true uneven-aged stand. Smaller diameter trees are quite poor in quality.

Stand History and Cultural Elements: Overstory trees appear to be 80-90 years of age. No evidence of any previous logging was found during the inventory. This stand is difficult to access, which is likely the reason there is very little evidence of past uses here.

Water Quality, Wetlands, and Riparian Zones: No drainages, wetlands or riparian zones were found in this stand. There were some wet areas at the base of the steepest slopes. These areas should be avoided, if any logging is done in this stand.

Access Network: Steep terrain prevents access to this stand from the north. A small woods road enters the stand from a neighboring (Ludwig) property to the east. This woods road is the best possible access, though access from neighboring property to the southwest may also be possible.

Wildlife: Deer tracks were abundant and two deer were seen at the southernmost end of the stand. This area is not mapped by the State of Vermont as deer wintering habitat but it appears to be used to some degree as such. The State of Vermont has this stand mapped as being sustainable bear habitat.

Dead Trees/Acre: 43.4 standing dead trees/acre; an average of 1.29 pieces of downed coarse woody debris/sample point. The number of standing dead trees is higher than normal, but generally these are smaller diameter trees.

Insects, Diseases, and Invasive Species: Sugar maple borer and beach bark disease are common throughout the stand. Some healthy smooth barked beech were found; these trees should not be harvested. Hemlock with excessive woodpecker holes, seams, or swollen butts are likely to contain rot or ring shake. No invasive plants were found.

Longterm Objective: Manage this area primarily for wildlife habitat. Due to the access constraints and steep terrain, we do not recommend managing this stand for timber. Barring any major natural disturbance, this stand will develop into an uneven-aged stand.

Scheduled Treatment: No commercial operations are scheduled at this time. There is plenty of stocking in this stand to carry out harvesting. If access through neighboring lands becomes available, it would not be inappropriate to carry out individual trees selection harvesting work.

STAND 17

This stand is in the eastern portion of the property in what is known as the “Gravel Pit” portion of the Fairlee Town Forest. This stand is considered inoperable due to extreme steepness. Soils are shallow and rocky. The quality of the timber is average, but trees, especially the hemlock and white pine, are quite large. The stand is predominantly hemlock and regeneration is almost nonexistent due to the dense shade created by the overstory.

Acres: 38 (4 sample points)

Forest Type: Inoperable

Natural Community Delineation: Hemlock Forest

Species Composition: Hemlock (69%) and smaller amounts of red oak, white pine, aspen, white ash, bitternut hickory, paper birch, yellow birch, and red maple.

Regeneration plots indicated 0 stems per acre. This figure is not necessarily true of the entire stand, but most of the stand has little to no regeneration due to the dense overstory.

Total Basal Area/Acre: 153 sq. ft.

Acceptable Growing Stock (BA/Acre): 133 sq. ft.

Number Trees/Acre: 266

Basal Area/Acre (Stems >6" D.B.H.): 148 sq. ft.

Acceptable Growing Stock BA/Acre (Stems >6" D.B.H.): 130 sq. ft.

Number Trees/Acre (Stems >6" D.B.H.): 186

Merchantable Diameter: 15.3"

Volume/Acre: 16.270 MBF/acre; 18.5 cords/acre

Stocking: Fully stocked, above the B-line stocking levels for even-aged stands containing more than 30 percent hemlock in the overstory. The recommended basal area/acre following a thinning is 125 sq. ft. of basal area/acre (B line).

Site Class: II (from soils)

Soils Mapping Unit: Tunbridge-Woodstock Complex and Colrain soils underlie this stand.

Stand Age: Even-aged

Stand History and Cultural Elements: Overstory trees appear to be about 100 years of age. This stand shows little to no evidence of past logging due to steepness.

Water Quality, Wetlands, and Riparian Zones: There are no obvious surface waters in this stand. Lake Morey is just across the road from this stand.

Access Network: A small section of the Cross Rivendell Trail cuts through the very southern part of this stand.

Wildlife: Deer tracks and beds were found during the inventory. A number of very large snags may provide some good nesting habitat in the cavities they possess.

Dead Trees/Acre: 13.2 standing dead trees/acre; an average of 1.75 pieces of downed coarse woody debris/sample point.

Insects, Diseases, and Invasive Species: Soils are quite shallow to ledge in much of this stand. Shallow soils are prone to being droughty and trees are blown over more easily. No invasive species were noted.

Longterm Objective: This stand requires no management and should be left as it is. No logging should be carried out in this stand.

Scheduled Treatment: No commercial treatment is scheduled for the next 10 years. Re-examine for growth in 2024.

STAND 18

This wetland is located in the northwest corner of the property. It is part of a larger wetland system that extends north and west onto the West Fairlee Town Forest. This area is home to a number of beaver ponds which have flooded the access road off Brushwood Road. The State of Vermont has mapped this area as being good Great Blue Heron habitat. A 2012 Vermont Natural Heritage Inventory located a rookery within 75 feet of the trail to Bald Top Mountain. This wetland complex is described nicely in a report written by Brett Engstrom in 2013.

Acres: 31

Type: Non-productive/Wetland

Natural Community Delineation: Wooded Swamp and some Shallow Emergent Marsh

Longterm Objective: This stand is too wet for any timber harvest activities. In addition,

it provides excellent wildlife habitat and should be preserved. Wetlands should be monitored periodically for the presence of invasive plants. Eventually, logging will need to be conducted in Stands 2 and 4 and the flooded road will need to be reclaimed.

Scheduled Treatment: No treatment is scheduled and this stand should be left as a natural area.

SUMMARY

STAND	ACRES	FOREST TYPE	SCHEDULED TREATMENT
1	26	Hardwood/Pine/Hemlock	No treatment scheduled. Re-examine in 2028.
2	102	Northern Hardwood	2021: Selection harvest
3	46	Hemlock	Selection (5-10 acres only)
4	69	White Pine/Hardwood	2020: Selection harvest
5	8	Young Hardwood (Bald Top)	2015: Invasive plant control
6	12	White Pine	2014: Thinning, 1-acre patch cut
7	53	Hemlock/Northern Hardwood	2014: Selection harvest
8	55	Northern Hardwood	2019: Selection harvest
9	130	Northern Hardwood	2017: Selection harvest (some larger groups)
10	162	Hardwood/Pine/Hemlock	2023: Selection harvest (large groups or patch cuts)
11	44	Hemlock	2025: Selection harvest
12	362	Hemlock/Northern Hardwood	No treatment scheduled. Re-examine in 2028.
13	182	Northern Hardwood	2016: Selection harvest (some larger groups)
14	13	Hemlock	2016: Selection harvest
15	208	Hemlock/Northern Hardwood	2016: Group selection in western part
16	27	Hemlock/Northern Hardwood	No treatment scheduled. Re-examine in 2028.
All			2028: Update forest management plan.
	1,499	Total Productive Forestland	
17	38	Inoperable Land	No Treatment
18	31	Non-productive/wetland	Leave as natural
	1,568	Total Grand List	

