

**Orange Town Forest
Hannah Hill Block
Resource Assessment
and
Forest Management Plan
Orange, VT**

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Prepared By:
AJ Follensbee
Southern Caledonia County Forester



Contents

Introduction and Purpose	4
Property Description	4
Forest Block	6
Terrain	7
Operations	8
Trails and Recreation	8
History	9
Wildlife	11
Invasive Plants	12
Forest Health	13
Regional Forest Health Problems	14
Goals	15
Forest Inventory Design	15
Management Tactics & Objectives	16
Stand 1	19
<i>Silvicultural Management</i>	23
Stand 2	24
<i>Silvicultural management</i>	27
Stand 3	28
<i>Silvicultural management</i>	32
Stand 4	33
<i>Silvicultural management</i>	37
Stand 5	38
<i>Silvicultural management</i>	41
Stand 6	42
<i>Silvicultural management</i>	46
Stand 7	47
<i>Silvicultural Management</i>	50
Reserve Lands	51
<i>Reserve Management Strategy</i>	52
Schedule of Management Activities	53
Works Referenced	54
Glossary	55

Introduction and Purpose

This forest management plan was developed for the town of Orange at the request of the Orange Planning Commission and Orange Recreation Commission, by AJ Follensbee, Southern Caledonia County Forester. The intention of this plan is to describe the resources of the property, inform residents, the town committees, and the Select Board in making decisions about the management of the property. This assessment starts with a broad overview of the landscape level resources and then examines specific details about the property. The plan will also serve as a guide to forest management activities on the property and should be reviewed and approved by the Orange Selectboard, with input from the Public, the Planning Commission and Recreation Commission. Before management is implemented, input from the community should be gathered. When forest management activities are scheduled, they should be organized and supervised by a Vermont Licensed Forester, working in close coordination with the Town of Orange.

Property Description

There are three different town-owned parcels within a few miles of each other in the town of Orange. There is a 34ac lot that surrounds a cemetery. It also abuts the town hall and town clerk's buildings. Another is 39.5ac and is directly across the road from the elementary school. The third and largest parcel is the Hannah Hill Block, also known as the Orange Town Forest, and is 306ac in size. This plan will cover only the Hannah Hill Block. This parcel will be referred to as the Orange Town Forest in this plan.

The Orange Town Forest is located just east of Echo Valley Community Elementary School. It is between Gorge Street to the west, Route 302 to the south and Provencher Lane to the east. The Orange Town Forest has no road frontage. Access can be gained by a deeded right of way that uses a town designated trail called Beard Road. This trail is maintained by camp owners that use Beard Rd to access their camps. The right of way splits from this maintained trail about a half mile from a gate at the beginning of the Beard Road. The remaining quarter mile of the road is not maintained. This section of road is wet and needs significant improvements before it can be used for more than foot traffic.



The Orange Town Forest is a combination of three parcels. The Moulton parcel was acquired in May of 1940, the McQueen parcel was acquired in June of 1946, and the Drown Lot was acquired in September of 1979. Since 1951 the town has used foresters to manage the parcel. A combination of public and private sector foresters have advised the town in the stewardship and management of this forest. In the mid-80's the forest was nearly sold. Thankfully this attempt failed, and the decision was made to keep the property and to manage it for the best long-term interest of the community.

This parcel is nearly entirely forested. The main forest types in the Orange Town Forest are variations of northern hardwood types, Spruce fir forests, cedar-fir forests, and softwood plantations. Most of the forest was cleared in the early 1800's for agricultural purposes. Abandonment of these agricultural fields started at the end of the merino sheep boom in the 1860's. Since then, more and more areas were allowed to reforest. More deliberate measures of reforestation took place in 1952, when a field was planted to white pine and Norway spruce. This pattern of field abandonment and reforestation gives the current forest a patch work of different age structure and species diversity. The oldest trees in the forest can be found along the eastern base of Hannah Hill. Here the ground is full of large boulders which made the area hard to access for logging or clearing.

The Orange Town Forest sits in-between two of Vermont's largest [drainage basins](#), The Lake Champlain Basin and the Connecticut River Basin. Most of the water in the forest flows west towards Lake Champlain. This water flows through Baker Brook or to streams that flow into a large wetland. Both the wetland and Barker Brook flow into the [Jail Branch River](#). This river eventually flows into the Stevens Branch of the Winooski River and on to Lake Champlain. Some of the water flows east towards the Connecticut River. Foster Notch is located in the northeastern corner of the forest. From here water flows east towards the Waits River. Both basins provide vital ecological functions. All parts of the watershed are vital to improving and maintaining water quality, which include the streams and wetlands in the Orange Town Forest.



Barker Brook

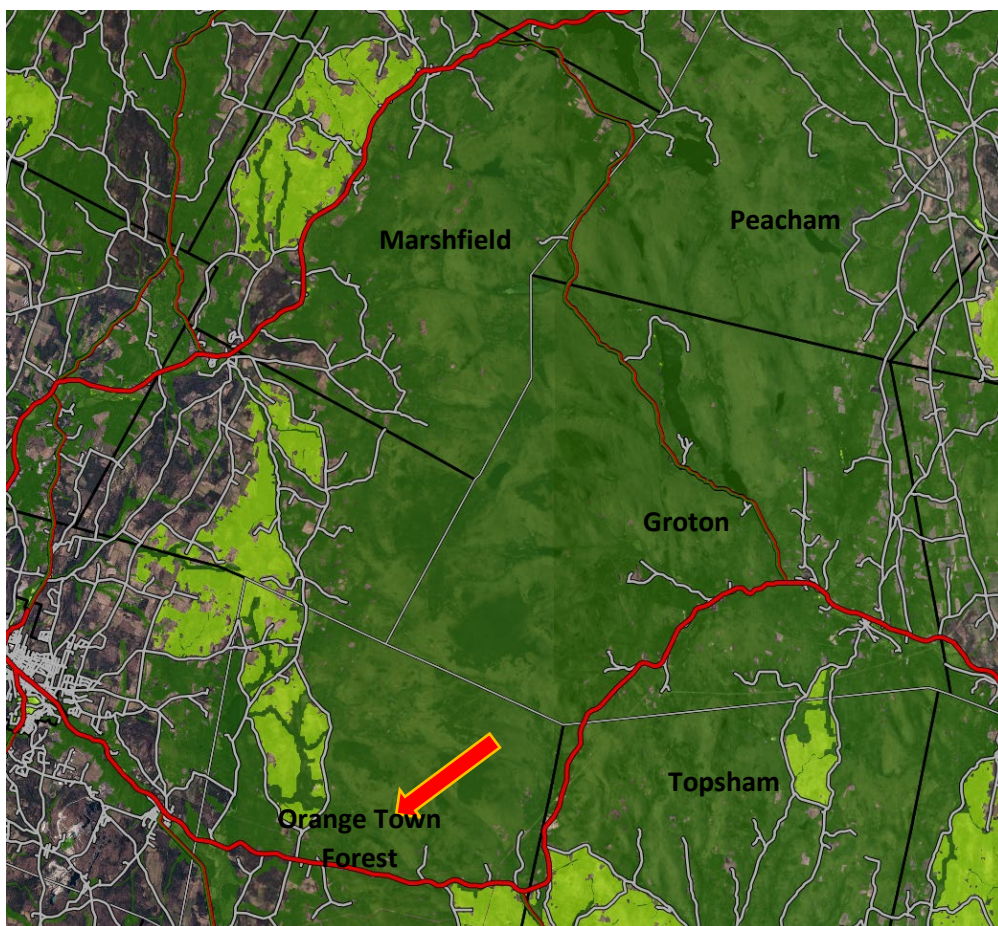
Vernal pools, seeps, and various wetlands can be found in the Orange Town Forest. These areas provide vital ecological functions and need to be protected. There are 28 acres of wetlands in the Orange Town Forest. The largest of which is in the southwestern part of the forest. There are three perennial streams that flow into this impressive wetland.

The parcel is located within Vermont's Northern Piedmont Biophysical Region. This is an area described in Wetland, Woodland, Wildland A guide to the Natural Communities of Vermont as: *A hilly region bisected by many rivers. The climate is moderate to cool. It has rich soils derived from calcareous bedrock. The most common forest type found in the region is Northern Hardwood. With hemlock-Northern Hardwoods and Hemlock Forests Commonly found on shallower soils. Both types were likely more common prior to European settlement. Because of the rich soils found in this region much of the forests were cleared for agricultural purposes in the 1800's. The forests have now regenerated, but the structure and species composition of the forest in this region have been altered due to past land use. This region is one of the most densely roaded regions in Vermont. The high amount of roads and fragmentation has an adverse impact on wildlife that require large blocks of continuous forests. However, common mammal*

species can be found in abundance in this region. Species like white-tailed deer, beaver, coyote, fox, otter, mink and squirrels. Turkeys are increasing in number and thriving here. The greatest concentration of nesting common loons in Vermont are found in remote lakes in this region.

Forest Block

When zooming out and looking at how this parcel fits in with the surrounding landscape you will find this parcel is part of a 72 square mile forest block. This block includes large private holdings, Groton State Forest, LR Jones State Forest and the Butterfield Block. This forest block is bounded by U.S. Route 302 to the south and the east, VT Route 232 to the east and north, U.S. Route 2 to the north and secondary roads in the east in Marshfield, Plainfield and Orange. Large forest blocks are extremely important ecologically. Large mammals like moose and black bears need large, forested blocks for every part of their life cycle. It is important to keep large blocks of forests unfragmented. A road, house, agricultural field, or other development splits forest blocks into smaller and smaller pieces. The smaller a block gets, the less beneficial they are ecologically. Every parcel in the forest block matters. The Orange Town Forest is an important piece of a larger forest block.



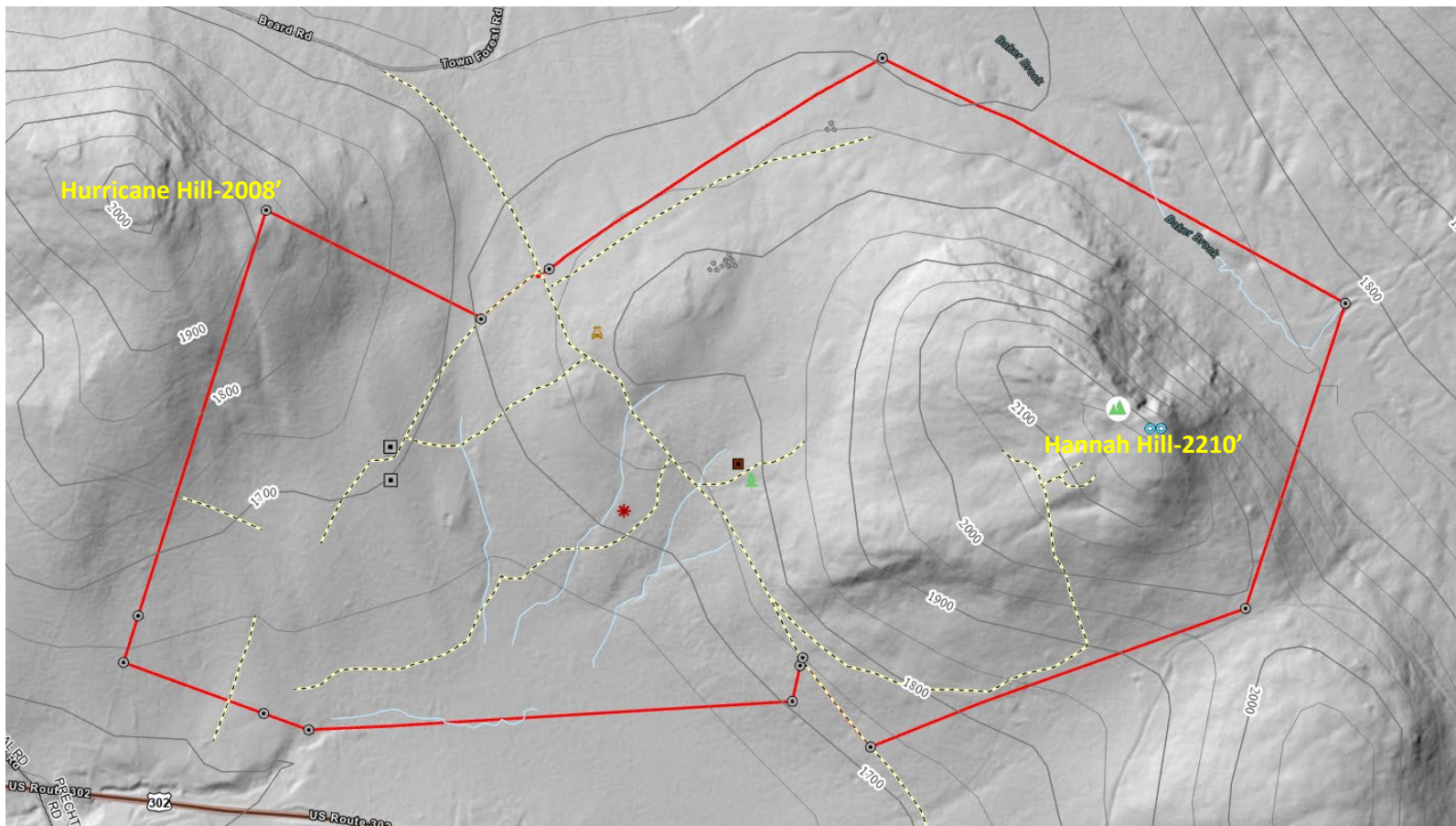
Map of the 72 square mile forest block in Orange., Groton, Plainfield, and Marshfield. Light green blocks are priority blocks, dark green blocks are high priority. Arrow points toward the location of the Orange Town Forest

When looking at this 72 square mile forest block through the lens of Vermont Conservation Design, a tool developed by VT Fish and Wildlife to help protect Vermont's ecological functions, this [Habitat Block](#) is providing [Interior Forest Habitat](#), [Wildlife Connectivity](#), [Riparian Connectivity](#), [Riparian and Surface Water Habitat](#), and [Geological Diversity](#). More information on forest blocks can be found at [Vermont Bio Finder](#).

Terrain

The elevation of the Orange Town Forest ranges from 1,600'-2,210'. The bulk of the forest sits between Hurricane Hill (2008') to the west and Hannah Hill to the east (2210'). Hurricane Hill is not within the boundaries of the forest. Hannah Hill is located entirely within the boundaries of the forest. The north slope of Hannah Hill is very steep and hard to navigate. The base of this steep slope is full of large boulders and eventually Baker Brook. The terrain in the center of the forest is moderate to gently sloping. This part of the forest has many drainages and wetlands with in it.

Below is a figure showing the elevation of the property with LIDAR imagery and contour lines. LIDAR imagery strips the ground of vegetation, showing what ground conditions look like.



Boundary Lines

The boundary lines of the property are generally not well defined. There is some evidence marking the boundary line, but there are sections of the line that need to be located. The boundary evidence that is present includes blazes, flagging, stone walls, and wire fencing. Efforts should be made to locate and mark all parts of the boundary. A well-marked boundary is the best way to stop mistakes from happening on either side of the line. The boundary should be investigated further to identify what section has little to no evidence.

Operations

Most parts of this forest are operable and conducive to timber management. The last time a harvest took place in the Orange Town Forest was in the 1980's. The trails that were used during this harvest can still be seen throughout the forest, even though many have grown in with trees and shrubs. The main trail that splits the property in half has some culverts installed that need attention. Some need to be cleaned out. Others need replacement.

Centrally located is a 0.75ac opening that has been historically used as a log landing. This landing is in a great location. It can be used for future logging. The biggest barrier to logging is access to the property. As previously mentioned, the forest has no road frontage. The deeded access is from Beard Road, which is not a town-maintained road. The right of way splits from Beard Road and heads south to the forest through private ownership. The right of way is in need of major repairs. There are drainage and erosion issues that will require an investment from the town to make the road usable.



Old Landing Site Roughly 0.75ac in size

Another option to access the property would be from the south. The central trail continues off the property and passes through private ownership to Route 302. Use of the trail south of the property is not deeded and would require permission from the neighbor. This stretch of trail will also need significant repairs to make it passable for truck traffic. It also does not intersect Route 302 at a good angle. If the community wants to access this forest from the south the town might consider purchasing a property with road frontage on Route 302. This would be a better and more permanent option. There are grants and organizations that provide funds to towns to purchase land. These should be looked into as an option to gain better access to the forest.

Trails and Recreation

Recreational trails can be found within the forest. Some of these trails use old skid trails and others are small single-track footpaths. A VAST trail that enters the forest from the right of way, cuts through the western part of the forest. Because the forest is hard to access it does not get a lot of use from the community. This forest has the potential of being a recreational destination. Hannah Hill, which is 2,210ft provides a great destination. With a few minor clearings there could be some great vistas to the north towards Knox Mountain, and to the west towards the Green Mountains and Camels Hump. A trail could also be established to access the area of older trees and Fosters Notch.



Camel's Hump From Hannah Hill

It is suggested the town develops a recreational plan for the forest to complement this forest management plan. Because there is not a lot of use right now, it is a good opportunity to determine the type of recreational use that will be allowed in the future.

History

The following is a timeline of the history of the Orange Town Forest. It begins when the town purchased the Moulton Farm parcel in 1940. It is based on the information available in the County Forester records. The timeline does not include the history of the farms prior to town ownership. This information might be found with the town's historical society.

The timeline also does not include the history of this area before it was settled by Europeans. This forest was likely used and stewarded by the Abenaki people. The closest known tribe being the Cowasuck. These people use forests for hunting, building material, heat and much more. Black Ash in wetlands would have been used for basket making and white birch used for wigwam construction. Forests were also considered important spiritual places. The Abenaki were active stewards of the forest and shaped the forests of Vermont as we know them.

Timeline of Orange Town Forest since Town ownership:

1940 The town acquired the Moulton Farm

1946 The town acquired the McQueen Farm

1951 Forest management plan written by Jim Wilkonson, Orange County Forester. This was the first plan of record for the Town Forest

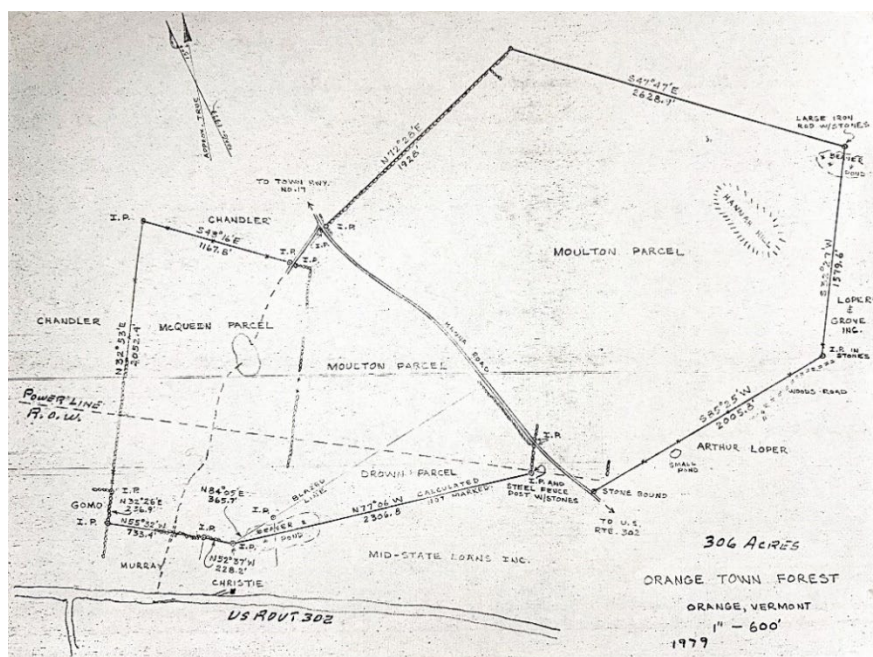
1952 Jim Wilkonson marked a harvest of spruce and hardwood. This harvest was sold to Flint Brothers Lumber. They cut 40MBF of spruce and a small amount of hardwood sawlogs. The hardwood was "too poor" to harvest all that was marked.

1953-1954 White pine and Norway spruce was planted in two fields near the road that bisects the forest. Five acres of field were planted.

1963 The town acquired the Drown lot. This acquisition completed the Orange Town Forest as we know it today.

1980 Boundary lines painted and blazed

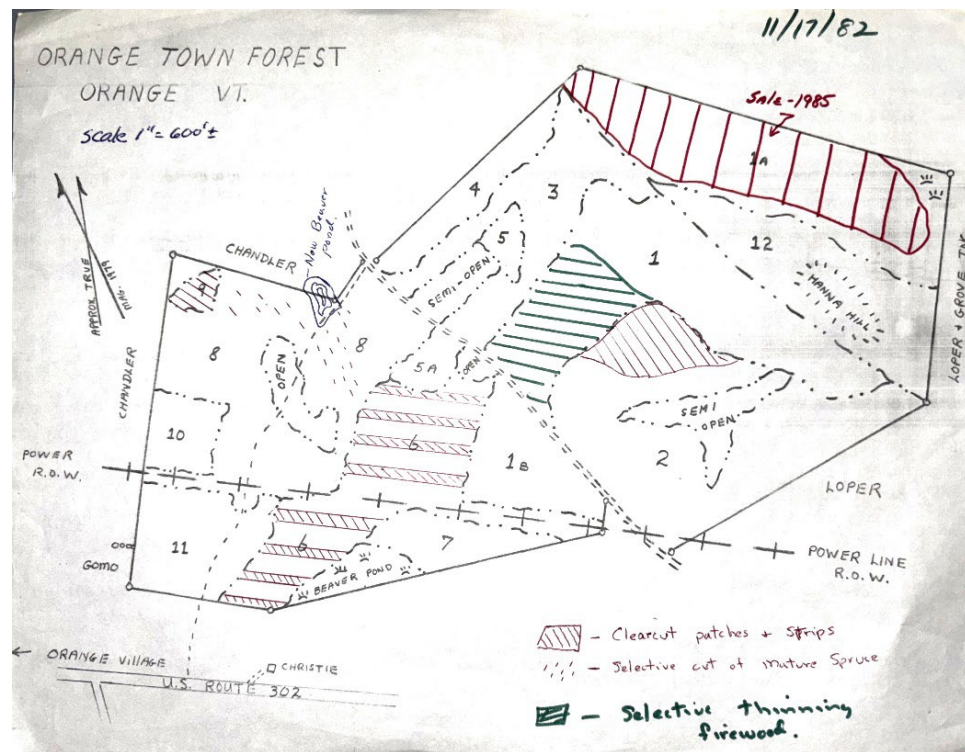
1980-1981 A firewood harvest was marked on 15ac in the east central part of the forest. A total of 97 cords were marked. It is unclear if these trees were cut and if so, who cut them. During this time the town was allowing residents to cut cordwood on the town forest. This is likely how these trees were cut.



1982 Russ Barrett, Orange County Forester wrote an updated forest management plan. This plan recommended treatments in many parts of the forest.

1982-1984 Russ Barrett and other Forests, Parks and Recreation Foresters marked and laid out a harvest. This harvest implemented many of the treatments recommended in the 1981 forest management plan. This harvest included strip cutting in spruce fir, clear cuts in areas of poor-quality pioneer species, selective thinning in hardwood and spruce.

A total of 92.5MBF of sawlogs, 129 cords of pulp and 135 cords of firewood were marked to be cut. Royce Lussier, a logger from Williamstown won the bid to cut this harvest with a bid of \$8,149. This sale finished in 1984.



1984-1986 Paul Harwood, Orange County Forester and other Forests, Parks and Recreation Foresters marked a thinning in the northeastern part of the forest. A total of 23.52MBF of sawlogs and 175 cords of firewood were marked to be cut. Bruce O'Meara was the high bidder. The County Forester's records do not include what Bruce paid the town. Guy Miller was subcontracted as the logger to do the work.

The records are not clear after the 1986 harvest. At this time the town was considering selling the forest. The town also transitions from using Forests, Parks and Recreation foresters to using private consulting foresters to help manage the Orange Town Forest. Two plans were written during this time.

1987 Jim Wilkinson (former Orange County Forester) was chosen through a bid process to write a forest management plan. This plan called for many different treatments to take place in the early 90's. It is unclear if any of these treatments were implemented.

1999 Nelson Blackburn, a consulting forester from Plainfield wrote an updated plan. This is the last plan written for the parcel. This plan notes moderate crown damage from the 1998 Ice Storm in the higher elevations near Hannah Hill.

Wildlife

Throughout the forest there are mast bearing trees. These trees provide an important food source for birds and mammals. Mast trees are trees like red oak, beech, butternut, and black cherry. Maintaining a variety of mast bearing trees will increase the amount of wildlife on the property that rely on this food source. In this forest the most common mast bearing tree is beech.

There are several old, large trees on the property, many of which have holes and cracks. These cavity trees are very important to different species of birds and mammals. Northern Long Eared Bat, a federally listed threatened species rely on trees with cracks and cavities to roost in during the summer months.

Interior forest songbirds can be heard throughout the spring and summer. They are often neotropical migrants that rely on larger, diverse forest blocks in Vermont for their breeding habitat. Oven birds, red eyed vireos, scarlet tanagers and both black-throated green and black-throated blue warblers are just some of the birds that use interior forest habitats like those in the Town Forest. Some of Vermont's forest songbird populations are declining due to development in their Caribbean and Central and South American winter habitats. Making sure their summer breeding habitat is the best it can be is an important way to help these species. Improvements to forest structure, including keeping tall older trees, providing mid-story and understory layers of vegetation, and even creating patches of dense young trees are all activities that provide habitats for these often-very habitat-specific forest birds. Removing invasive plants and reducing forest fragmentation are also important ways to help our forest songbirds. More information on forest songbirds can be found at [Vermont Audubon](#).

There are sections of the forest with thick softwood cover. These areas are often important winter deer habitat. Softwood stands help keep relatively warm air from radiating out on frigid nights and keep snow from falling to the ground. Deer wintering areas are so important to winter deer survival that The Vermont Fish and Wildlife Dept. has mapped deer wintering areas statewide. A small area of the forest is mapped as a deer wintering area near the large wetland. This is the only area Vermont Fish and Wildlife as mapped as deer wintering area. Deer use is prevalent throughout the property, especially in the softwood stands.



Example of large cavity tree



Example of winter deer beds

The Orange Town Forest has great black bear habitat. It is part of a large, remote forest block. It has a variety of available food, like mast bearing beech and oak trees. Black bears have a large range, females have a home range of 10-25 miles, while males can roam up to 50 miles. Signs of bear can be found throughout the forest.

The variety of forest types in the forest and in the surrounding landscape provide good habitat for Vermont's largest wild animal, moose. Moose have a range of 8-16 square miles. Optimal habitat for a moose would be comprised of 40% young forest for feeding, 40% mature mixed forest for food and cover, 10% winter cover comprised of dense softwood cover, and 10% wetlands for summer feeding and cooling. All these forest conditions can be found either within the Orange Town Forest or surrounding landscape. Many fresh moose prints were noticed while the inventory was being conducted.



Bear track found on Right of way Trail

Invasive Plants

Non-native invasive plants are plants not native to the ecology of an ecosystem. They were generally brought into our region from Europe or Asia and used as ornamental plants. These plants do not have any of their native competitors or pathogens here, so they grow well. They can quickly outcompete native plant species for sunlight and nutrients. Some can even alter the soil chemistry of an area, making it impossible for other plants to grow, which can create a monoculture.

During the inventory honeysuckle was found. This plant was found in stands 1 and 5, near the three-quarter acre opening. The plants that were found were small to medium in size. The infestation level where these plants were found is light to moderate. Mechanical removal of these plants is a viable option to achieve control. The property should be monitored annually for invasive plants. Any plants found should be dealt with promptly.

Harvesting done in the forest will increase the sunlight available to the understory. This could increase the likelihood of invasive plants becoming established. Any harvesting done in the forest will have to be mindful of this. Areas harvested should be monitored annually for invasive plants. If any plants are found, they should be dealt with immediately through hand pulling. It is very important to the health and ecology of the forest that invasive plant levels remain low.

Forest Health

Overall, the forests of The Orange Town Forest are healthy. There were a few common forest health issues that occur throughout Vermont found in the forest. The following is a list of the forest health issues found in the Orange Town Forest.

Beech Bark Disease

Beech Bark Disease is unfortunately a common occurrence in the forests of Vermont. It was introduced in Nova Scotia in the early 1900's from Europe. It has worked its way west from there. The pathogen affects the vigor of beech and will eventually lead to mortality. Beech Bark Disease is caused by an attack of a beech scale insect and an associated fungus in the *nectria* genus. Beech trees infected with Beech Bark Disease will have cankers on the bark. Some beech trees are resistant to this disease and should be protected and managed for. Genetic resistance is the best way to manage this disease.

Ash Yellows and Ash Decline

Ash trees in the region are experiencing decline. The decline is due to ash yellows and to some extent site and environmental issues. Ash yellows is a disease caused by *Candidatus Phytoplasma fraxini*, a microorganism. This disease can kill infected ash trees within 5-10 years, some trees can survive the disease with only their growth being affected. Decline in ash can also come from environmental factors such as drought, poor soils, fungus and other factors.

Emerald Ash Borer

Emerald ash borer (EAB) is a beetle native to northern Asia. This insect was first discovered in Detroit in 2002. It has spread rapidly east since then, mostly being moved by humans. EAB will kill infected ash trees by effectively girdling the tree. The larva of EAB feeds over the winter in the cambium layer of ash trees. Infested trees will normally die within 5 years. EAB kills 95-99% of the trees it infects. Native ash trees have very little resistance. EAB was found in Vermont in February of 2018 in the town of Orange, within 5 miles of the Orange Town Forest. Since then, it has been found in more and more towns in Vermont. EAB was found in many of the ash trees in the Orange Town Forest. Mortality from EAB will start to become more apparent as the beetle infects more trees.

Red Rot

Red rot is a fungal disease caused by *Phellinus pini*. Red rot is a common disease in temperate forests, affecting softwood trees. This disease leads to decay within the stem of a tree. The fungus is introduced through wounds or dead stems. It can greatly affect the quality of trees when they are sold for lumber. Highly stocked stands are more susceptible due to competition for resources. Reducing the density of softwood stands is one way to manage this pathogen.

Sugar Maple Borer

Sugar Maple Borer damage is caused by the larva of long-horned wood boring beetle, *Glycobius speciosus*. This beetle is 25mm in length and has yellow and black coloring, with a distinctive "W" design on the wing cover. Sugar Maple Borer is a native beetle. It rarely causes mortality on its own. The damage is done by the larvae of the beetle once the eggs hatch. The larvae bores it's

way through the cambium layer. This damage reduces the value of the tree as well as its structural integrity.

White Pine Needle cast

White pine needle cast is a relatively new pathogen. This disease was first noticed throughout the northeast in 2010 and has been affecting white pines year after year since. This is a fungal pathogen caused by three different fungi. A healthy white pine has three years' worth of needles. This fungal pathogen affects the second-year needles of pine turning the needles brown in June when these needles are dropped. This leaves the infected trees with only one set of needles. The lack of viable needles decreases the growth and vigor of trees affected.

White pine weevil

White pine weevil is an insect, *Pissodes strobi* that attacks the top leaders of conifers. It lays its eggs in the previous year's leader. Once the eggs hatch the grubs tunnel inwards towards the center of the leader, feeding on it. The leader is eventually girdled by the feeding of the grubs, killing the leader. The response of the tree is to develop multiple leaders to replace the dead leader. This ruins the form and quality of the attacked tree and gives the tree a bush like appearance. Weevil infestation rarely results in mortality. Norway spruce, Colorado blue spruce, jack pine, red pine, Scotch pine, mugho pine and native spruces are susceptible to white pine weevil.

Regional Forest Health Problems

The following forest health issues are currently found in the state but were **not** found in the Orange Town Forest. These are significant issues that should be monitored for. If found their impact will be significant.

Hemlock Woolly Adelgid

Hemlock Woolly Adelgid (HWA) is an introduced insect from Asia. It was first found in the Pacific Northwest in the 1920's, then found in northern Virginia in the 1950's. It is currently in southern Vermont, slowly spreading north. HWA can be identified by the cotton like frass at the bottom of hemlock needles. HWA feeds on young twigs causing needles to dry out and fall off the tree prematurely. If infested, a hemlock tree can die within 4 to 6 years. Some trees can survive but have reduced live crowns making the tree less valuable to wildlife that depend on hemlock.

Oak Wilt

Oak Wilt is a fungal pathogen caused by *Bretziella fagacearum*. This fungus grows in the sap wood of an infected tree. This causes a reaction from the infected tree which clogs conductive tissue further. Eventually the tree can no longer translocate water which causes the tree to wilt. This pathogen often leads to mortality. For a tree to become infected the stem must first become damaged. Something as simple as a small saw cut or axe graze is enough for the fungus to enter the tree. Oak Wilt has become a major pest in the central and eastern United States. No known occurrence has been found in Vermont or New England, the closest infestation is in New York state.

Goals

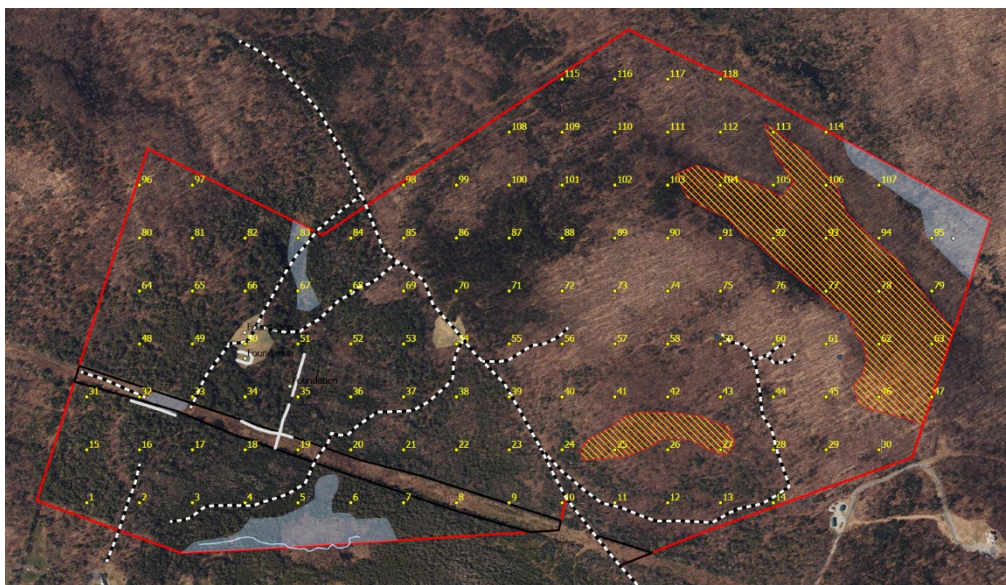
The principal management goals of the Orange Town Forest are to maintain a healthy, diverse, and resilient forest that can be used for outdoor recreation, natural resource education, natural beauty and to enrich the Orange community. Timber management is a tool that can be used to achieve these goals but is not a principal goal in itself.

During this planning cycle priority will be given to the following goals.

- Improve public access to the forest
- Increase biodiversity through active management and planting
- Maintain wildlife connectivity
- Education through demonstration
- Increase and maintain old forests
- Increase climate change resiliency by managing for warm climate species
- Increase recreational opportunities within the forest
- Protect and maintain water quality and hydrology

Forest Inventory Design

The forests on the property have been split up into stands. Stands are groups of trees. The trees in these stands normally have something in common, like species composition, age, topography and operability. Lumping groups of trees together makes it easier to assess the forest and to make management decisions. The Orange Town Forest has been split into 7 different forest stands and reserve areas. These stands were separated mostly based on forest type and management history.



Cruise map developed for 2024 inventory

A forest resource inventory was done in the fall and winter of 2024 by AJ Follensbee. A total of 118 randomly assigned points were set using Arc Pro. The data was gathered using a 10-factor prism. Basal area, diameters, merchantable heights, tree regeneration coverage, species and coarse woody debris information were gathered at each point. The data was then processed in the State of Vermont's FOREX forest inventory analysis program. Downed woody material information was gathered ocularly and given a rating based on the amount at each point, low 1-3 pieces, moderate 3-5 pieces and high 6 + pieces. Tree regeneration information was gathered ocularly at each point.

Management Tactics & Objectives

Before each stand is described in detail and prescriptions for each stand are recommended, it is important to discuss what the overarching management philosophy and desired future conditions will be for the property. Any prescribed treatments will take the following into consideration.

Carbon Management

Trees and plants sequester carbon from the atmosphere, storing it in biomass (wood and plant material). This carbon is found in both living and dead biomass in the forest, and a large portion of it can be found in forest soils. Globally, forests are a major carbon “sink,” absorbing and storing large amounts of carbon. Forests can be managed to maximize their carbon sequestration and storage by avoiding large-scale disturbances (such as clearcutting), encouraging the accumulation of dead biomass in the forest, and performing management activities that support the increased health and resilience of the forest, such as the encouragement of structural diversity.

The Orange Town Forest should be managed to support and improve carbon sequestration and storage in the forest whenever possible. Carbon sequestration and storage priorities:

- Avoid creating large-scale disturbances (openings larger than 5 acres).
- Minimize soil disturbance in the course of forest management activities to an extent dictated by responsible silvicultural practices.
- Retain dead biomass in the form of dead-standing and fallen trees and as much coarse and fine woody debris as possible during forest management.
- Retain biological legacy trees of a variety of species throughout the forest.
- Employ uneven-aged and low-impact silvicultural techniques as much as possible to encourage a healthy, diverse, resilient forest.
- Encourage the development of large trees throughout the forest. Allow for some of these large trees to naturally live out their life cycle in the forest.
- Managed for high quality timber that can be turned into durable wood products when removed from the forest.

Species and age diversity

Forests are complex. The forest management done in the Orange Town Forest will embrace these complexities and enhance them. Not just one or a group of certain species will be managed for, instead all native plants species will be managed for and promoted where appropriate. This will make the forest more resilient.

Attaining a natural forest structure will be a long-term management objective. This will be accomplished using uneven aged management techniques. Uneven aged management strives to maintain a minimum of 3 age cohorts of trees in a stand. The forest will be managed in a way so that very old trees can be found in a stand along with very young trees. This will create a diverse and complex structure throughout the forest.

Old Forests

Most of the forests in Vermont are considered second-growth forests. These are forests which became established after intensive human disturbance. The age of most of the forests in Vermont are 50-120 years. Vermont has very little true old growth forests. This condition is extremely rare, about 0.10% of all the forests in New England are considered true old growth forests. These are forests that were never influenced by intensive human land use. These old growth forests are extremely important ecologically. They take thousands of years to develop and cannot be recreated. We can promote and create old forests. Old forests are forests which have many of the characteristics of old growth forests and are just as ecologically beneficial as old growth forests.

Time can be an important factor when determining when a forest becomes an old forest. Just as important are the significant ecological characteristics that can be restored and managed for in a forest. These traits are generally lacking from second growth forests. The characteristics of an old forest include:

- Having large trees (>20”) that are also old trees throughout a forest
- Variable tree densities and tree size throughout a forest
- Abundant downed deadwood in different sizes and stages of decay. A northern hardwood forest should have 7-9 cords per acre of downed dead wood on the forest floor
- Large dead standing trees throughout a forest. A northern hardwood forest should have 12-20 standing dead trees > 20” in diameter per acre.
- An abundance of new tree growth in various stages of development
- Abundant native plant communities
- Thick multi-layered canopies that diffuse the light reaching plants below

Achieving these characteristics can be done through passive management or through active management. Passive management involves reserving sections of the forest as areas where no significant management will take place. These forest reserves would be allowed to develop naturally and achieve old forest characteristics on their own. Not all forests are good candidates for passive management. There are forests which have been heavily influenced by humans which currently may not be able to achieve the characteristics of old forests without some intervention. Forests with high densities of invasive plants, forest with health issues and plantations are examples of forests that may need some intervention before they are set aside as reserves. In the Orange Town Forest, 50.7ac of the forest are being set aside as a reserve. These areas will be allowed to mature and develop naturally into an old forest. See the stand map for the location of these reserves.

The other approach to achieving old growth forests is through thoughtful active management. This approach develops the structure and values associated with old forests quicker than a passive approach. This is because active management does not rely on natural disturbances to make changes to the composition of a forest. Instead, those disturbances are introduced into a stand purposely, mimicking natural disturbances. This approach allows trees to increase in size more quickly by increasing the growing space within a forest. There are a variety of management decisions that can be made to increase old forest characteristics depending on the current conditions of the forest. This is an approach that can be implemented in the Orange Town Forest

Legacy Trees

Legacy trees will be retained in any treatment done. These are trees that will be left to complete their life cycle naturally. Trees that will be retained for this purpose will be long-lived trees that are healthy and vigorous or ecologically significant. This will ensure large trees can be found in the future at the Orange Town Forest. These large trees will provide many important ecological functions as they remain in the forest. A process for identifying and marking these trees will have to be developed to protect these trees when management is done. This could be in the form of tags, paint, or GPS points.

Invasive plant management

Prescribed forest management will be mindful of the risks of invasive plants. Following logging activities, areas treated will be monitored for new infestations of invasive plants. Any plants found will be dealt with promptly. In areas where established plants are present prior to harvest, invasive plant control, either through mechanical or chemical methods must be part of any larger silvicultural treatment. In areas where herbicide treatment is necessary to achieve control, a licensed pesticide applicator should be contracted.

Water quality

There are many water resources on the property. These include wetlands, streams, vernal pools and seeps. All the water resources on the property will be protected during forest management activities. This will be done through logging in only frozen conditions or very dry summer conditions, buffering water resources and following Vermont Acceptable Management Practices (AMPs). [The Vermont Water Quality Acceptable Management Practices Manual for Logging Professionals](#) will be followed. All roads and trails used during logging operations will be closed out to the standard of the AMP manual.

Ash Management

In 2018 Emerald Ash Borer was found in the town of Orange, close to the Orange Town Forest. During the 2024 inventory EAB was found in many of the white ash trees in the forest. White ash is a significant component of the Orange Town Forest. There are 4 stands where white ash makes up 14% or more of the overall overstory. In stand 7 nearly a quarter of the overstory trees are white ash. If it has not already, EAB will start to kill white ash trees in the forest. Losing white ash from this forest will have a major impact on the composition of the forest. The management of ash going forward will adhere to the following management principles:

- **Maintain ash as a component throughout the forest.**
- **Promote a diverse mix of native species.**
- **Conserve the economic value of ash**
- **Slow the spread of EAB in the region.**

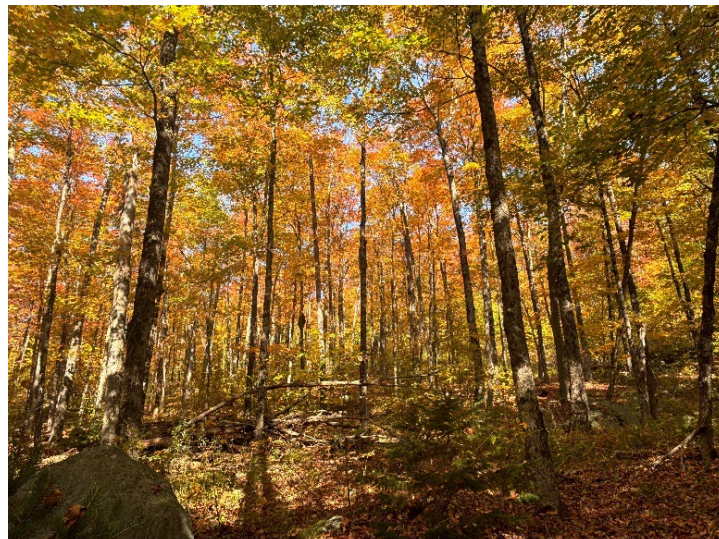
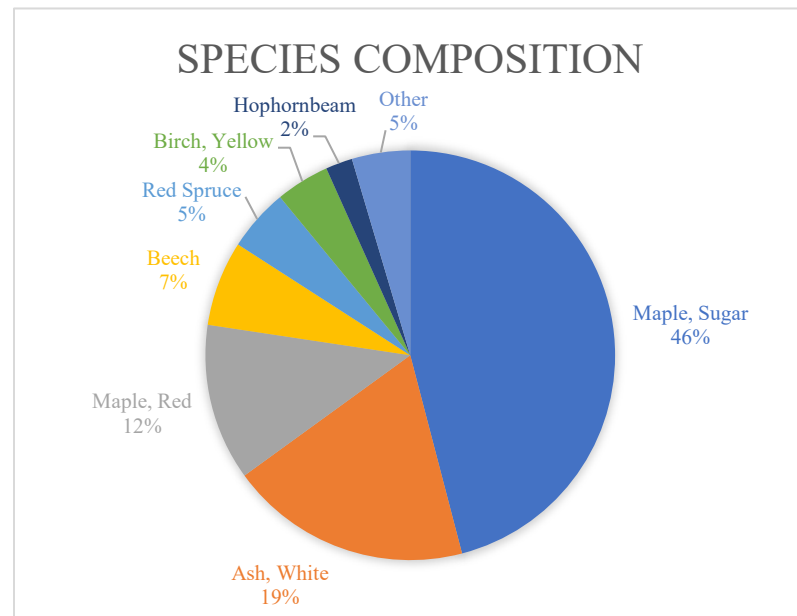
Stand 1

65.3 acres

Points Sampled: 22

Description

This is the largest stand in the Orange Town Forest. It is located in the eastern half of the forest and includes the western slope of Hannah Hill and its peak. Stand 1 is a northern hardwood forest dominated by sugar maple, white ash and red maple. The quality of the trees as saw timber is mixed. Roughly half of the trees in this stand are considered good quality for sawtimber. The other half are considered low quality for sawlogs and would be sold as firewood or pulp trees. There are some sections of the stand with large mature trees and other areas where the trees are pole to small sawlog sized. The variation in tree size is likely due to past logging operations. It is a beautiful stand aesthetically, especially in the fall. A roughed in trail can be found here. This trail climbs to the peak of Hannah Hill.



Stand 1 in the Fall

Stand statistics

Quadratic Mean Stand Diameter: 9.7"

Volume: 5,256bf/ac 11.81 cords/ac

Basal Area: 129 ft²/ac

AGS BA: 63 ft²/ac

UGS BA: 66 ft²/ac

Trees per Acre: 250

Snag:

Snags < 12"	Snags 12-16"	Snags > 16"	Total
13/ac	1.85/ac	1/ac	15.85/ac

Terrain

The terrain in stand 1 is gently to moderately sloping and the operability of the stand is not affected by the terrain. The terrain slopes towards the west. The peak of Hannah Hill is in the stand, which is also the highest point in the forest at 2210'. There are some skid trails found in this stand. The trail that goes to the peak uses a combination of old skid trails and new single-track trails. Currently, this trail is hard to locate and follow. Another way to reach the peak is by following the main trail southeast to a fork in the trail. Then follow the upper fork through stand 2. This trail is easy to follow until it reaches the height of land where it becomes overgrown.

Downed Woody Material

The amount of downed woody material (DWM) found in this stand is Low. Out of the 22 points sampled in this stand, most reported low or no DWM. As this stand develops more DWM will accrue throughout the stand. Downed woody material are pieces of trees or whole trees on the forest floor. This material is very important for wildlife, erosion control, carbon storage and soil health. It also helps to protect tree regeneration.



Cache at the summit of Hannah Hill

Regeneration

In general, this stand is lacking viable regeneration. Most points had no or very little established regeneration. Species that were present in the understory included sugar maple, balsam fir, striped maple, red spruce, beech, black cherry, and white pine.

History

This stand has a history of active management. Firewood was cut in the 1950's by Flint Brothers Lumber. In 1980-81 firewood was removed by members of the community. A commercial selection harvest was done in 1982. This stand was affected by the 1998 ice storm, the 1999 forest management plan classified the damage as moderate.



Example of regeneration in stand 1

Soils

There are two soil complexes found in this stand, Tunbridge-Woodstock, 25-50% slopes and Tunbridge-Woodstock very rocky fine sandy loams, 8-25% slopes. These soils are moderately deep, somewhat excessively drained to well drained, and very productive. The site class of these soils is a 1 out of 4, with 1 being the most productive and 4 being the least productive. (see the soil report for more details)

Forest Health

Emerald Ash Borer was found in this stand. Beech Bark Disease is present in this stand. With most of the beech showing little resistance to the disease. Some of the sugar maple have old maple borer damage. Near the height of the land some canopy trees have signs of old ice damage.

There is a light infestation of honeysuckle in the southern section of this stand, near the 0.75ac opening. These plants should be removed before the infestation gets worse.

Species Composition and Volume Table

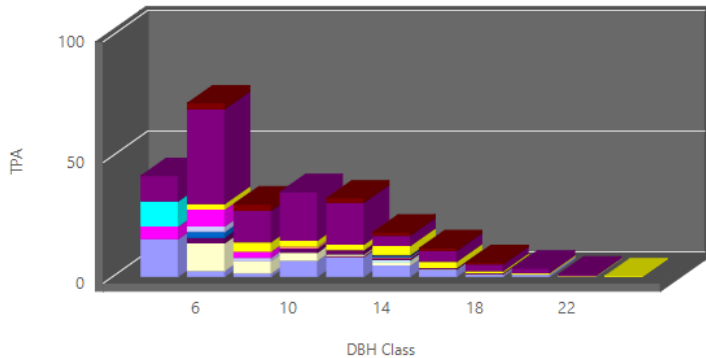
Species	Basal Area	Basal Area Percentage	Trees Per Acre	Quadratic Mean Stand Diameter (inches)	Relative Density	Percent AGS	Per Acre Board Foot Volume	Per Acre Pulp Volume (Cords)
Maple, Sugar	59.09	45.93	114.19	9.74	48.97	30.37	2406.55	4.42
Ash, White	24.55	19.08	43.07	10.22	20.1	35.54	1636.31	1.55
Maple, Red	15.91	12.37	18.97	12.4	12.76	9.17	456.29	2.9
Beech	8.64	6.72	22.44	8.4	7.38			1.23
Red Spruce	6.36	4.94	9.42	11.13	2.3	8.05	347.67	0.71
Birch, Yellow	5.45	4.24	7.73	11.37	4.43	30.77	227.04	0.55
Hophornbeam	2.73	2.12	14.76	5.82	2.56			0
Birch, Paper	1.36	1.06	1.18	14.54	1.3	22.22	110.1	0.13
Maple, Striped	0.91	0.71	10.42	4				
Fir, Balsam	0.91	0.71	3.62	6.79	0.51	1.11		
Cherry, Black	0.91	0.71	2.74	7.8	0.79	5.88	36.36	0
Cedar, N.W.	0.91	0.71	1.26	11.51	0.43	1.03	36.36	0.06
Hemlock	0.45	0.35	0.43	13.85	0.21			0.15
Aspen, Spp.	0.45	0.35	0.58	11.93	0.21			0.11
[TOTAL]	128.64	100	250.79	9.7	101.94	48.2	5256.67	11.81

Stand Structure

This stand is a two aged stand. Meaning this stand has two distinct age classes. This stand will eventually develop into an uneven aged stand which is a more natural state. This can happen faster with active management.

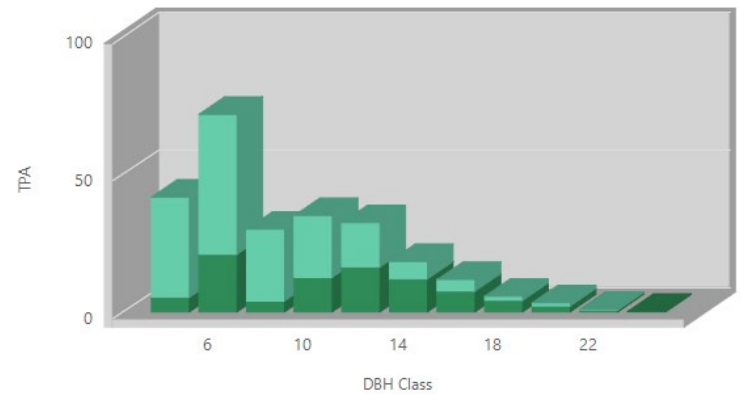
Trees Per Acre by DBH Class & Species

Red Spruce, Maple, Red, Fir, Balsam, Birch, Yellow, Aspen, Spp.,
Maple, Sugar, Hophornbeam, Cherry, Black, Birch, Paper, Ash, White,
Maple, Striped, Hemlock, Cedar, N.W., Beech



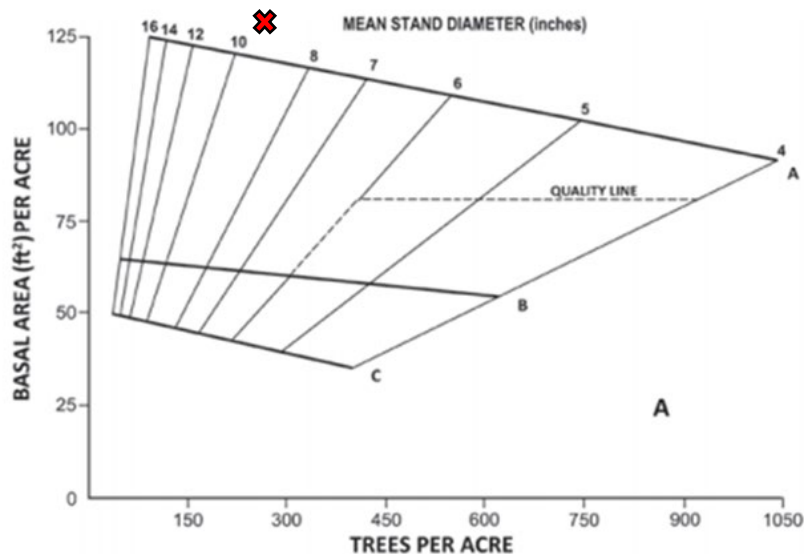
Trees Per Acre by DBH Class & Quality

UGS, AGS



Stand density

This stand is above the A-line in the northern hardwood stocking guide. This indicates the stand is overstocked, meaning there are too many trees growing in this stand for optimal growth. The B-line on this chart is considered the optimal stocking density for a northern hardwood stand. At the B-line trees have plenty of space to grow and will have increased growth and vigor.



The "X" shows where the stand density charted out on the hardwood stocking guide according to Silvicultural Guide for Northern Hardwood Types in the Northeast.

Silvicultural Management

The trees in this stand are crowded and would benefit from more growing space. Increasing the growing space will give the remaining trees increased growth and vigor. With more growing space the white ash in the stand will have more energy stores to combat EAB. This stand is lacking viable tree regeneration. Providing opportunities for sunlight to reach the forest floor will stimulate growth in the understory. The amount of sunlight hitting the forest floor will dictate what trees become established. More sunlight or larger openings equals less shade tolerant species. Less sunlight or smaller opening equals more shade tolerant species.

EAB is in this stand. It will likely kill many of the white ash here. White ash makes up 19% of the overstory trees. If these trees all die at once it will have a major impact on this stand. Through active management the impacts of EAB can be mitigated. The number of ash trees can be reduced. By doing this the remaining ash will have more growing space. Regenerating new young ash trees should also be a priority. EAB does not attack trees smaller than 1". Having young trees in the understory will ensure white ash is part of this forest in the future.



Treatment

Single Tree and Group Selection -2026

This single tree and groups selection will focus on regenerating parts of the stand while releasing trees to increase growth and vigor. It will help move the stand further toward an uneven aged state. The groups should be no larger than 1.0ac in size, with most groups being 0.5ac. No more than 20% of the area treated should be in groups, which is about 12.5ac in groups. Groups should be in areas of poor quality, areas of established desired regeneration or groups of white ash trees.

In-between the groups, implement a single tree selection harvest that will the reduce basal area to 90-80ft². The selection cut should focus on releasing desirable growing stock and removing poor quality trees. Primary trees to be managed in this stand are sugar maple, yellow birch, red maple, resistant beech and white ash, though all species should be considered for retention to promote species diversity.

Climate Adaptation Planting in Groups-2027

Following the harvest plant seedlings in groups cut. Aim to plant around 200 seedlings per acre. The spacing of the seedlings should be around 2m x 2m. The number of groups to plant will be up to the town, but planting around half to groups cut would be a good target. This would mean about 6ac would be planted requiring about 1,200 seedlings. Species that should be considered for the planting include, red oak, white oak, bitternut hickory, Shagbark hickory, red spruce, white pine and resistant chestnut if a source can be found. This will require many volunteers to complete.

Stand 2

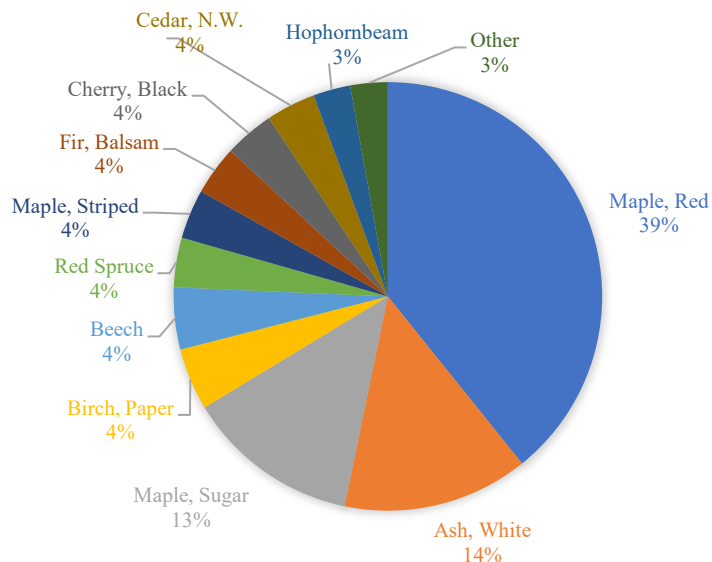
31.0 acres

Points Sampled: 11

Description

Stand 2, located in the southeastern part of the forest, is a relatively young forest. The trees are generally pole or small sawlog sized. The central part of the stand was still semi open 40 years ago. Other areas were clearcut as part of the 1982 harvest. This past management created a vigorous northern hardwood stand composed of red maple, sugar maple, white ash and a variety of other species. Roughly 2/3 of the trees in this area are considered undesirable. Many of the red maples in this stand are stump sprouts from trees cut in the 80's. There is a well-established trail that runs through the southern portion of this stand.

SPECIES COMPOSITION



Stand statistics

Quadratic Mean Stand Diameter: 6.7"

Volume: 1,321bf/ac 6.4 cords/ac

Basal Area: 97ft²/ac

AGS BA: 36ft²/ac

UGS BA: 61ft²/ac

Trees per Acre: 398

Snags:

Snags < 12"	Snags 12-16"	Snags > 16"	Total
18.18/ac	11.81/ac	0/ac	29.99/ac

Terrain

The terrain in this stand ranges from gently rolling to moderately steep. Most of this stand can be accessed by the well-established trail and is considered operable. A reserve steep area is in the center of this stand. Due to access issues in this section of the stand, it is best left alone to develop on its own. It is unlikely a trail could be built here that would meet AMP standards.

Regeneration

Due to the relatively young age of this stand there is very little tree regeneration here. This stand is in the stem exclusion stage of development. At this stage trees are still competing for their place in the canopy. Very little light hits the forest floor during stem exclusion. Once trees begin to fall out of the overstory more sunlight will begin hitting the understory. Then trees will begin to become established. Also affecting the development of the understory are patches of thick fern growth along with heavy deer browsing.

Downed Woody Material

The amount of downed woody material (DWM) found in this stand is Low. Out of the 11 points sampled in this stand, most reported low or no DWM. As this stand develops more DWM will accrue throughout the stand.

History

This stand developed from either a clearcut implemented in 1982 or on old pastureland. Most of the trees in the stand are 40 years old.

Soils

There are two soil complexes found in this stand. They are the same complexes that are found in stand 1, Tunbridge-Woodstock, 25-50% slopes and Tunbridge-Woodstock very rocky fine sandy loams, 8-25% slopes. These soils are moderately deep, somewhat excessively drained to well drained, and very productive. The site class of these soils is a 1 out of 4, with 1 being the most productive and 4 being the least productive. (see the soil report for more details)

Forest Health

This stand is full of young vigorous trees. The beech in this stand are being affected by Beech Bark Disease. There is evidence of sugar maple bore in some of the sugar maple. The ash are under threat from Emerald Ash Borer

No invasive plants were noticed during the inventory.



Red Maple Saplings in Stand 2

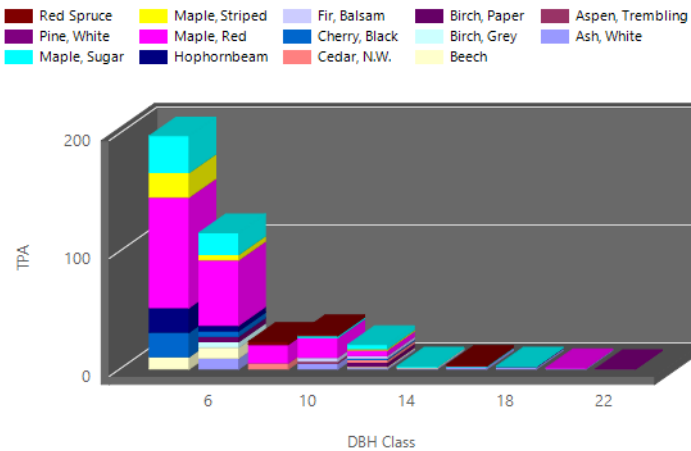
Species Composition and Volume Table

Species	Basal Area	Basal Area Percentage	Trees Per Acre	Quadratic Mean Stand Diameter (inches)	Relative Density	Percent AGS	Per Acre Board Foot Volume	Per Acre Pulp Volume (Cords)
Maple, Red	38.18	39.25	186.66	6.12	35.04	17.43	139.81	1.84
Ash, White	13.64	14.02	20.6	11.02	11.07	5.79	680.14	1.11
Maple, Sugar	12.73	13.09	56.93	6.4	11.46	2.8	72.71	1.5
Birch, Paper	4.55	4.68	8.62	9.84	4.26			0.69
Beech	4.55	4.68	21.68	6.2	4.14			0.51
Red Spruce	3.64	3.74	5.57	10.95	1.36	1.15		0.47
Maple, Striped	3.64	3.74	26.62	5.01				
Fir, Balsam	3.64	3.74	5.65	10.87	1.42	3.33	155.42	0.12
Cherry, Black	3.64	3.74	26.62	5.01	3.55			0.16
Cedar, N.W.	3.64	3.74	7.52	9.42	1.69	3.09	139.81	0
Hophornbeam	2.73	2.81	25.46	4.43	2.82			
Pine, White	0.91	0.94	0.34	22.15	0.31	1.64	133.73	0
Birch, Grey	0.91	0.94	4.63	6	0.82			
Aspen, Trembling	0.91	0.94	1.67	10	0.42			
[TOTAL]	97.3	100	398.58	6.69	78.37	37.01	1321.64	6.4

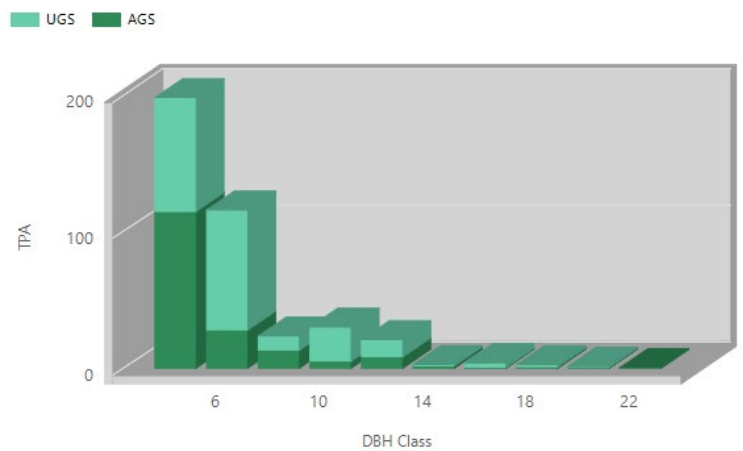
Stand Structure

This stand is even aged. Meaning this stand has one distinct age class. The stand is young but given enough time, this stand will develop into an uneven aged stand. Which is a more natural state. This process can be sped up with active management.

Trees Per Acre by DBH Class & Species

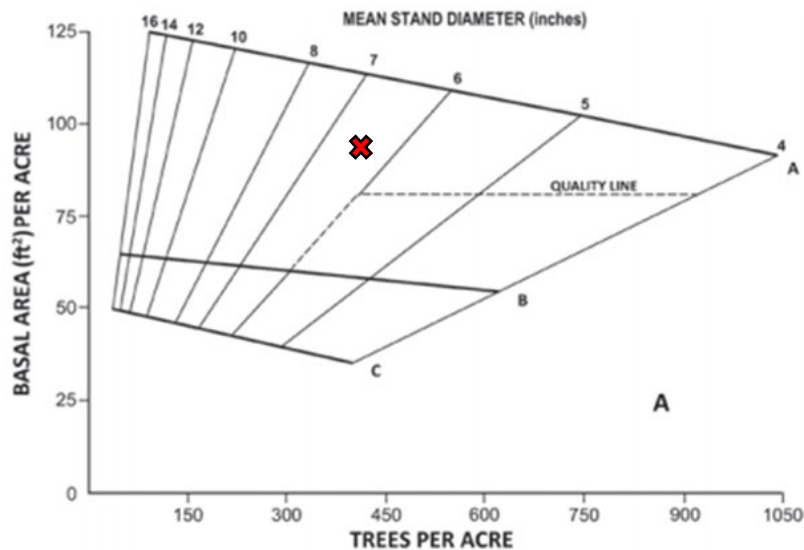


Trees Per Acre by DBH Class & Quality



Stand density

This stand is just above the mid A-B stocking lines. The trees in this stand still have growing space in the canopy. As this stand continues to develop the density in this stand will become overstocked. For now, the trees in this stand have plenty of room to grow.



The "X" shows where the stand density charted out on the hardwood stocking guide according to Silvicultural Guide for Northern Hardwood Types in the Northeast.

Silvicultural management

The tree quality in this stand is not on a good trajectory. Just about two thirds of the trees in this stand are considered poor quality and could not be sold as a sawlog. There are a few reasons for this, but the main reason is the high amount of stump sprouted red maple. Stump sprouted red maple tend to be multi-stemmed, twisted and have many branches. It is not all bad in this stand. Because of where this stand is developmentally there is double the number of trees that will be here in 40 years. Mixed in with the poor-quality stems are high quality well-formed trees. If these trees are released from



competition now, it will ensure they will be here long term. When given more growing space these young vigorous trees will have a significant increase in growth rate.

There is a high amount of white ash in this stand. The size of the ash averages about 11” in diameter, larger than most of the trees in this stand. White ash tends to grow faster than most northern hardwood trees. Although on the smaller side, the ash in the stand are merchantable. With EAB in this forest these trees are likely not going to be in the stand the next time a harvest is done 10-15 years from now.

Treatment

Crop Tree Release- 2026

While harvesting in stand 1, implement a crop tree release. This treatment will release trees of good quality and form. All species should be targeted for release. This will ensure the stand remains diverse. Around 30-50 trees per acre should be targeted for release. Crop trees must be released on at least 3 sides; ideally, they are released on all 4 sides.

White Ash Salvage

In combination with the crop tree release, salvage the merchantable white ash in this stand. Only trees that are 12” and bigger should be targeted for removal. Not all white ash that meets the size requirement should be removed. All vigorous female ash should remain in this stand regardless of their size and should be released from competition.

Stand 3

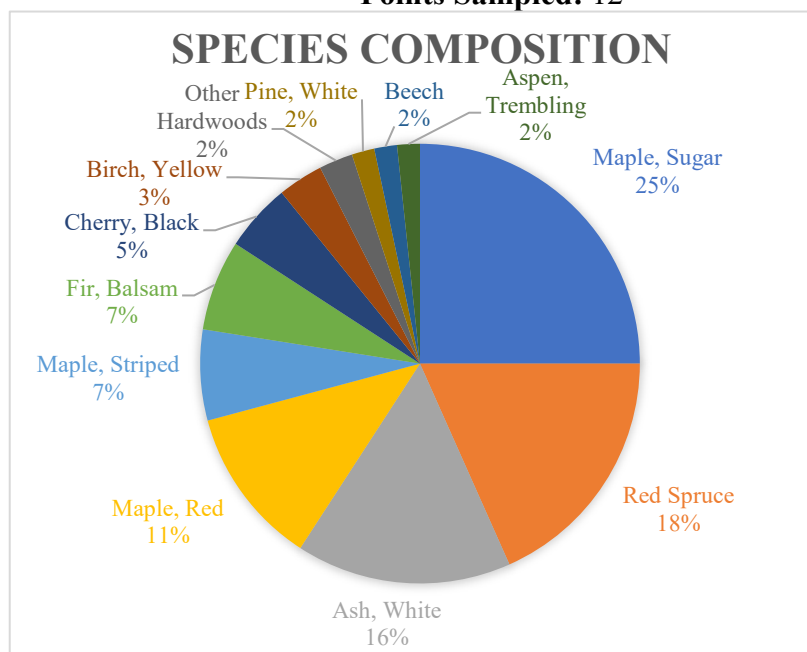
27.3 acres

Description

Stand 3 is a spruce-hardwood stand located in the north central part of the forest. Sugar maple, white ash and red maple dominate the areas of hardwood in this stand. The quality of these hardwood trees in this stand tends to be poor, most are firewood quality. The spruce in this stand tends to be in pockets.

These pockets are found throughout the stand. Normally they are in areas which are poorly drained. These pockets of spruce are growing densely and have some live balsam fir mixed with them. Many of the fir have died in this stand. Likely from age related mortality or environmental factors like strong winds. Most of the snags in this stand are balsam fir trees. In the northern part of the stand there is a stone wall and some rock piles. The remnants of an old car can be found in the southern part of the stand near the main trail.

Points Sampled: 12



Stand statistics:

Quadratic Mean Stand Diameter: 7.54"

Volume: 2,842bf/ac 10.0 cord/ac

Basal Area: 100 ft²/ac

AGS BA: 45 ft²/ac

UGS BA: 55 ft²/ac

Trees per Acre: 322

Snags:

Snags < 12"	Snags 12-16"	Snags > 16"	Total Snag/Acre
24.28	4.74	5.97	34.99

Terrain

The terrain in this stand is gently sloping and does not affect the operability of this stand. There are some wet areas that will have to be avoided when logging here. An overgrown trail was found in the northwestern part of the stand. This trail can be tough to find and follow at times. The main trail enters the property in the southern part of this stand.



Snags and blow downs in stand 3

Regeneration

There is established tree regeneration in stand 3. Common species found in the understory are sugar maple, striped maple, balsam fir, red spruce, black cherry and yellow birch. Browse damage was noted at some of the inventory points.

Downed Woody Material

The amount of downed woody material (DWM) found in this stand is moderate. Out of the 12 points sampled in this stand, most reported moderate to high amounts of DWM. Most of the DWM was from balsam fir and red spruce blow downs



Browes Damage in Stand 3

History

The records are unclear as to the last time this stand was harvested. It was likely harvested during the 1951 Flint Brothers Logging operation. The harvest removed 40MBF of spruce. It was not cut in either logging operation in the 80's. There was no evidence of harvesting occurring more recently.

Soils

There is one soil complex found in this stand, Buckland loam 8-25% slopes, very stony. This complex is moderately deep, moderately well drained, and productive. The site class of these soils is a 2 out of 4, with 1 being the most productive and 4 being the least productive. (See the soil report for more details)

Forest Health

Overall, this stand is healthy. Age related decline was noticed in balsam fir. Some blow down is occurring in the wetter section of this stand. White ash in this stand is likely being affected with EAB.

No invasive plants were noticed during the inventory. This stand should be monitored annually for invasive plants.

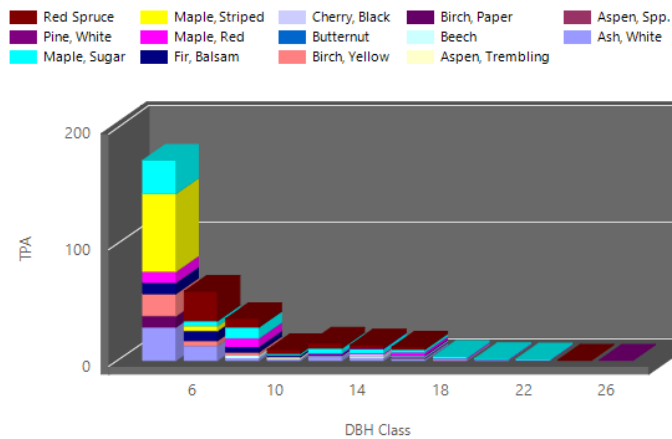
Species Composition and Volume Table

Species	Basal Area	Basal Area Percentage	Trees Per Acre	Quadratic Mean Stand Diameter (inches)	Relative Density	Percent AGS	Per Acre Board Foot Volume	Per Acre Pulp Volume (Cords)
Maple, Sugar	25	25	57.62	8.92	20.82	4.67	537.38	3.97
Red Spruce	18.33	18.33	44.32	8.71	7.95	16.09	682.68	0.84
Ash, White	15.83	15.83	53.46	7.37	13.72	9.92	559.57	0.97
Maple, Red	11.67	11.67	22.58	9.73	9.59	9.17	688.07	0.64
Maple, Striped	6.67	6.67	71.09	4.15				
Fir, Balsam	6.67	6.67	26	6.86	3.44	3.33		0.76
Cherry, Black	5	5	4.28	14.64	3.95	5.88	138.55	1.43
Birch, Yellow	3.33	3.33	25.73	4.87	3.31	7.69		0
Pine, White	1.67	1.67	1.01	17.41	0.6	3.28	236.3	0
Beech	1.67	1.67	3.17	9.83	1.39			0.28
Aspen, Trembling	1.67	1.67	2.31	11.51	0.76			0.57
Butternut	0.83	0.83	0.6	15.93	0.68			0.32
Birch, Paper	0.83	0.83	9.55	3.99	0.83			
Aspen, Spp.	0.83	0.83	0.6	15.93	0.38			0.32
[TOTAL]	100	100	322.3	7.54	67.39	45	2842.56	10.09

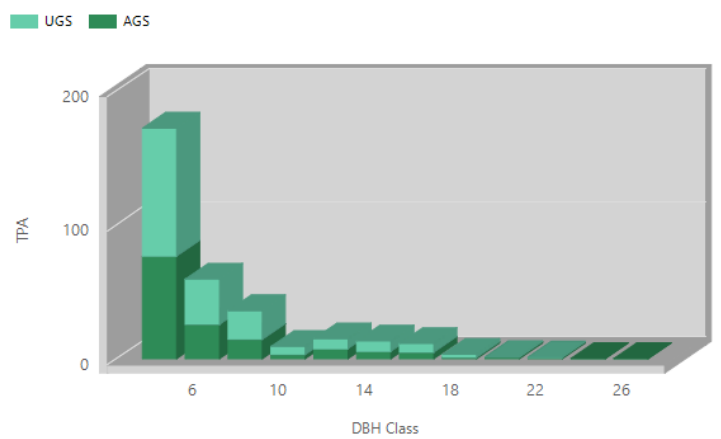
Stand Structure

This stand is even aged. Meaning this stand has one distinct age class. Over time this stand will eventually develop into an uneven aged stand which is a more natural state. With active management this process can be sped up.

Trees Per Acre by DBH Class & Species

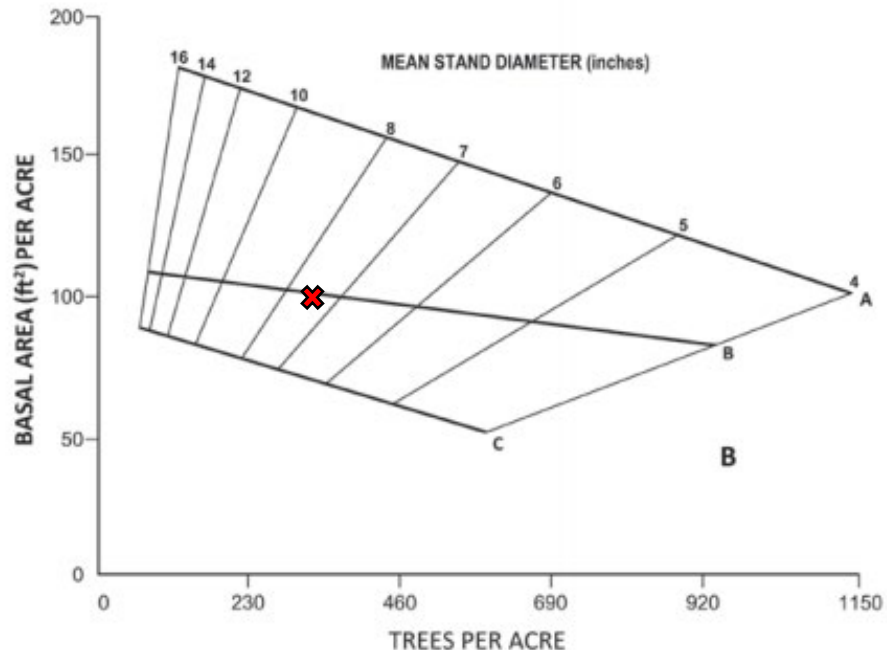


Trees Per Acre by DBH Class & Quality



Stand density

When comparing the stand density to the mixedwood stocking guide, the density of the stand is right at the B-line. According to this chart the stand is adequately stocked. At this density level trees have space to grow.



The "X" show where the stand density charted out on the mixed wood stocking guide according to Silvicultural Guide for Northern Hardwood Types in the Northeast.

Silvicultural management

This mixedwood stand is on a good trajectory. As the balsam fir has died, it has provided more growing space to overstory trees and created opportunities for new trees to become established. The current density of the stand is at an optimal level for growth. The new trees in the understory are a diverse mix.

Another wave of mortality is likely to happen in this stand as white ash begins to die from EAB. As the white ash dies there will be more growing space for the residual trees. White ash makes up 16% of the trees in the overstory. The white ash in this stand averages 7" in diameter. The quality of white ash is relatively low also. Based on these factors and where the stand is developmentally it does not make sense to salvage the ash in the stand. It is a good place to allow the white ash to express resistance if they have any. In neighboring stands more active measures are being taken to mitigate EAB.



Treatment

No treatment during the next 10 years.

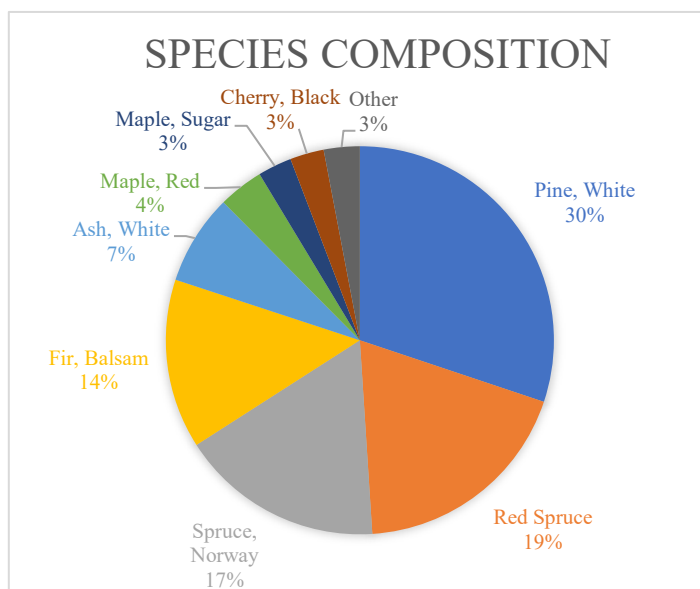
Stand 4

35.6 acres

Points Sampled: 8

Description

Stand 4 is a combination of plantations that were planted in the early 50's and areas that have developed naturally on former pasture lands. It is located near the center of the forest. Due to past treatments done in these plantations the boundary between the species planted is not as distinct as it once was. The areas that have developed from old pasture are made up of red spruce, balsam fir and white pine. The plantations and other areas have been well managed. There are high quality stems throughout this stand. The white pine in this stand are impressive. They are tall and large. The main trail bisects this stand. In the northern part of this stand there are a series of rock piles. These are places where rocks were piled when an adjacent area was cleared for crop land. A small wetland is located just north of the 0.75ac opening. This is a forested wetland that is roughly 1.75ac in size. Another wetland is in the central part of the stand. This wetland is 1.5ac in size. It has open water and the remnants of beaver activity.



Stand statistics

Quadratic Mean Stand Diameter: 11"

Volume: 8,574bf/ac 11.5 cords/ac

Basal Area: 132ft²/ac

AGS BA: 82ft²/ac

UGS BA: 50ft²/ac

Trees per Acre: 201

Snags:

Snags < 12"	Snags 12-16"	Snags > 16"	Total
19.12/ac	8.28/ac	1.79/ac	29.19/ac

Terrain

The terrain here is generally gently rolling and operable. A well-established trail runs through this stand. This trail is an active VAST trail. A western trail exists, but due to beaver activity is no longer usable. The only limiting factor for operations are wet areas found in the stand. These areas should be avoided during logging operations.



The Assistant County Forester in the Central Wetland

Regeneration

Regeneration in stand 4 is mixed. There are some areas with excellent established regeneration comprised of balsam fir, white ash, red spruce, sugar maple and red maple. In other areas where the canopy is denser there is very little established regeneration

Downed Woody Material

The amount of downed woody material (DWM) found in this stand is low. Out of the 8 points sampled in this stand, most reported low amounts of DWM.

History

White pine and Norway spruce was planted on 5ac of fields in 1953 and 1954. The southern portion of the stand was thinned in 1982.



White Pine Plantation

Soils

There are two soil complexes found in this stand. One is Buckland loam 8-25% slopes, very stony. These soils are moderately deep, moderately well drained, and productive. This complex is located north of the main trail. The other complex, which is located south of the main trail is Cabot silt loam, 3-15% slopes very stony. These soils are shallow, poorly drained and fairly productive. The site class of these soils is 2-3 out of 4, with 1 being the most productive and 4 being the least productive. (See the soil report for more details)



Rock Piles in Stand 4

Forest Health

Some age-related decline was noticed in the mature balsam fir. Red rot fruiting bodies were noticed on a few white pines.

This stand was inventoried during snow cover. At that time no invasive plants were found in this stand. This stand should be monitored annually for invasive plants.

Species Composition and Volume Table

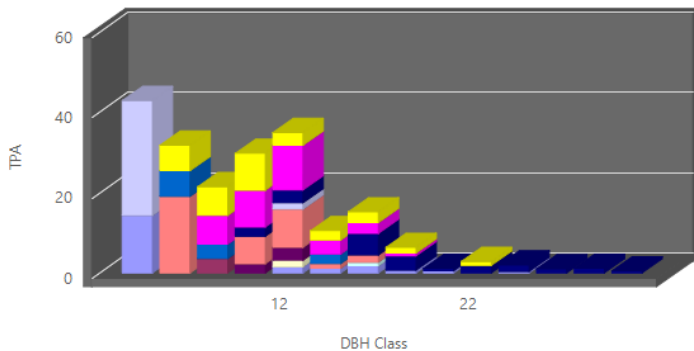
Species	Basal Area	Basal Area Percentage	Trees Per Acre	Quadratic Mean Stand Diameter (inches)	Relative Density	Percent AGS	Per Acre Board Foot Volume	Per Acre Pulp Volume (Cords)
Pine, White	40	30.19	21.15	18.62	14.22	42.62	5019.94	1.96
Red Spruce	25	18.87	34.37	11.55	9.13	11.49	1278.64	2.2
Spruce, Norway	22.5	16.98	33.27	11.14	8.14	38.89	473.19	4.53
Fir, Balsam	18.75	14.15	38.48	9.45	7.73	10	844.77	1.13
Ash, White	10	7.55	20.55	9.45	8.18	5.79	659.27	0.48
Maple, Red	5	3.77	12.29	8.64	4.24	1.83	99.98	0.42
Maple, Sugar	3.75	2.83	30.24	4.77	3.72	0.93		0
Cherry, Black	3.75	2.83	5.48	11.2	3.07	11.76	96.12	0.29
Cedar, N.W.	1.25	0.94	0.9	15.96	0.59	1.03	102.82	0
Birch, Yellow	1.25	0.94	1.59	12.01	1.01			0.29
Birch, Grey	1.25	0.94	3.58	8	1.13			
[TOTAL]	132.5	100	201.89	10.97	61.17	61.89	8574.73	11.3

Stand Structure

This stand is a two aged stand. Meaning this stand has two distinct age classes. This stand will eventually develop into an uneven aged stand which is a more natural state. This process can happen faster with active management

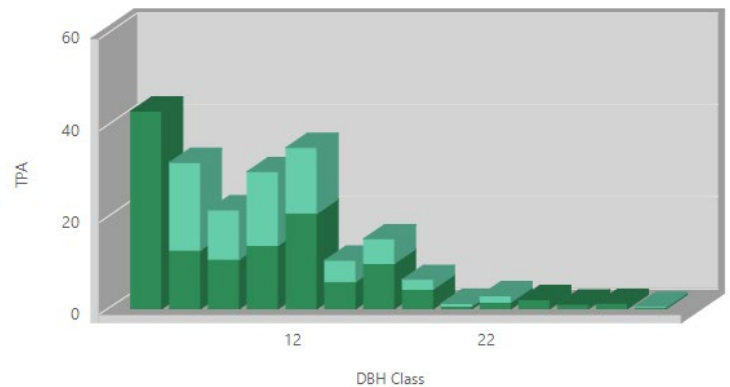
Trees Per Acre by DBH Class & Species

■ Spruce, Norway ■ Maple, Sugar ■ Fir, Balsam ■ Cedar, N.W. ■ Birch, Grey
■ Red Spruce ■ Maple, Red ■ Cherry, Black ■ Birch, Yellow ■ Ash, White
■ Pine, White



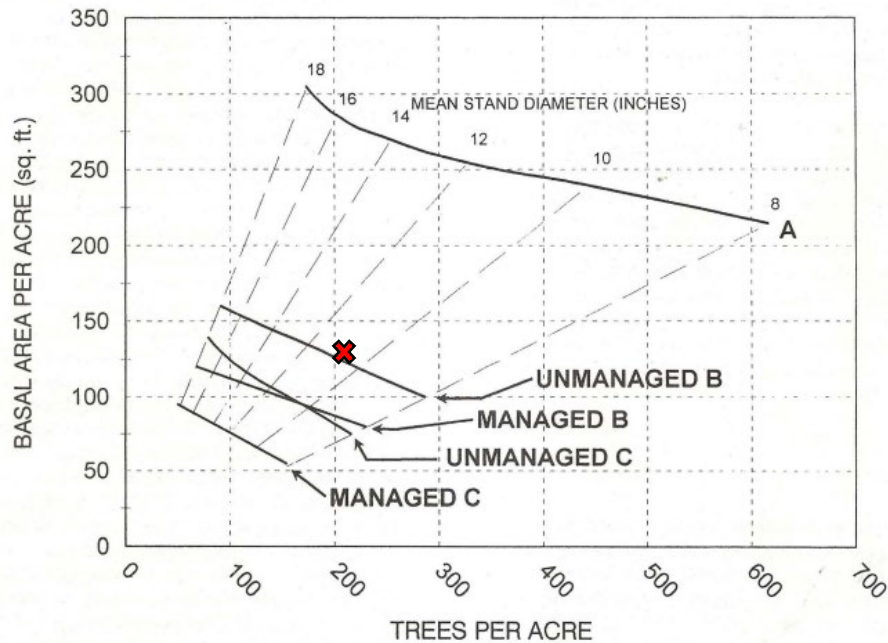
Trees Per Acre by DBH Class & Quality

■ UGS ■ AGS



Stand density

There is not a perfect stocking guide to compare this stand to. Because white pine is the most dominant species in this stand the white pine stocking guide is being used. When comparing the stand density to the white pine stocking guide the stand is above the B-line. Which according to the chart means this stand is adequately stocked.



The "X" show where the stand density charted out on the white pine stocking guide according to revised white pine stocking guide for managed stands

Silvicultural management

Stand 4 has the most sawlog volume per acre of any stand in the Orange Town Forest. It also is in the least natural state of any other stand due to past land use. Most of the trees in this stand were planted. There is natural tree regeneration established in parts of this forest that would benefit from more sunlight. Some areas of this forest have a higher density than average. Here the trees are competing for growing space. There is also very little sunlight getting to the forest floor. Which is suppressing understory development.



Treatment

2026: Two stage shelterwood with reserves

Remove 30-40% of the overstory in the first stage of a two stage shelterwood, residual basal area of 90-100ft². Trees that are suppressed, showing signs of decline or are of poor quality, should be targeted for removal. High quality dominant trees with healthy crowns should be retained.

2034-2036: Implement the second and final stage of shelterwood. This treatment will release established regeneration. Traditionally this cut would normally be a complete removal of the overstory. To keep large trees as part of the landscape and increase the structural diversity in this stand, this final cut of the shelterwood will implement reserve trees, removing 50-60% of the overstory. This will leave the stand with roughly 50ft²-40ft² of basal area post-harvest. Trees left as reserves should be healthy and vigorous with live crown ratios of at least 30%. These remaining trees will be retained long term and will live out their natural life cycle. The treatment following this second cut will be focused on the developing trees that regenerate in this stand. The timing of this treatment should be based on the development of the understory after the first harvest. Once enough trees become established in the understory than this treatment should be implemented.

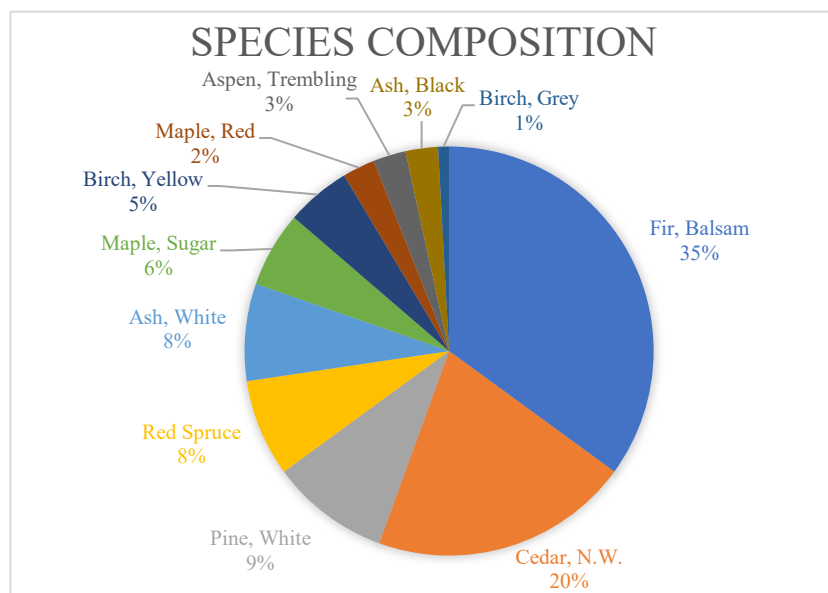
Stand 5

35.2 acres

Points Sampled: 11

Description

Stand 5 is a young softwood stand dominated by balsam fir and northern white cedar. This stand is located centrally in the eastern part of the forest. It is split by the power line right of way. South of the right of way is wetter and has more cedar mixed with the balsam fir. North of the right of way is drier, and hardwood is mixed with balsam fir. Generally, the trees in this stand are younger. This is due to past treatments. Strip cuts and clearcuts were implemented in 1982. A large 13ac cedar wetland abuts this stand to the south. Any treatment done in the southern part of the stand must protect water quality and the functions of this wetland.



Stand statistics:

Quadratic Mean Stand Diameter: 6.5"

Volume: 2,910bf/ac 4.7 cord/ac

Basal Area: 106 ft²/ac

AGS BA: 68 ft²/ac

UGS BA: 38 ft²/ac

Trees per Acre: 460

Snags:

Snags < 12"	Snags 12-16"	Snags > 16"	Total Snag/Acre
14.69	0.00	0.00	14.69

Terrain

The terrain in this stand is gently sloping and will not affect the operability of this stand. Some wet areas will have to be avoided during logging operations. A skid trail runs through the center of this stand, running from the west to the northeast and connecting to the 0.75ac opening. The southern part of the trail is very wet and can only be used for logging during frozen conditions.

Regeneration

Due to this stand's age and where it is developmentally, there is very little established regeneration. There are some areas full of pole sized hardwoods. Trees like red maple, white ash and yellow birch can be found in these areas.



Dense Balsam Fir in Stand 5

Downed Woody Material

The amount of downed woody material (DWM) found in this stand is low. Out of the 11 points sampled in this stand, most reported none or low amounts of DWM.

History

In 1982 a series of strip cuts were implemented in this stand. These strips targeted declining spruce and fir.

Soils

There is one soil complex found in this stand, Cabot silt loam, 3-15% slopes very stony. This complex is shallow, poorly drained and fairly productive. The site class of these soils is a 3 out of 4, with 1 being the most productive and 4 being the least productive. (See the soil report for more details)

Forest Health

Overall, this young stand is healthy. Decline was noticed in some parts of the stand due to competition for resources.

Invasive honeysuckle was noticed in the northeastern part of the stand. The plants were small and scattered. The infestation level would be considered light. The removal of these plants should be a priority before they spread into new areas. Removal can be done through hand pulling.



Hardwood in Northern Section of Stand 5

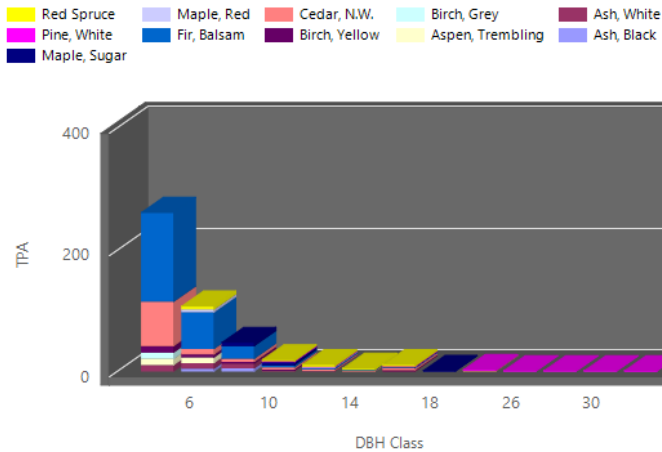
Species Composition and Volume Table

Species	Basal Area	Basal Area Percentage	Trees Per Acre	Quadratic Mean Stand Diameter (inches)	Relative Density	Percent AGS	Per Acre Board Foot Volume	Per Acre Pulp Volume (Cords)
Fir, Balsam	37.27	35.04	234.02	5.4	23.36	32.22	280.4	0.48
Cedar, N.W.	21.82	20.52	98.83	6.36	10	20.62	718.09	0.53
Pine, White	10	9.4	6.14	17.28	3.61	14.75	1282.81	0.69
Red Spruce	8.18	7.69	12.26	11.06	2.98	5.75	339.83	1.08
Ash, White	8.18	7.69	30.97	6.96	7.27	4.96	69.91	0.47
Maple, Sugar	6.36	5.98	11.38	10.12	5.28			1.11
Birch, Yellow	5.45	5.12	20.62	6.96	4.81	11.54	149.55	0
Maple, Red	2.73	2.57	6.44	8.82	2.3	1.83	69.91	0.3
Aspen, Trembling	2.73	2.57	19.68	5.04	1.32			
Ash, Black	2.73	2.57	9.84	7.13	2.43	33.33		
Birch, Grey	0.91	0.86	10.42	4	0.9			
[TOTAL]	106.36	100	460.58	6.51	64.26	63.93	2910.5	4.65

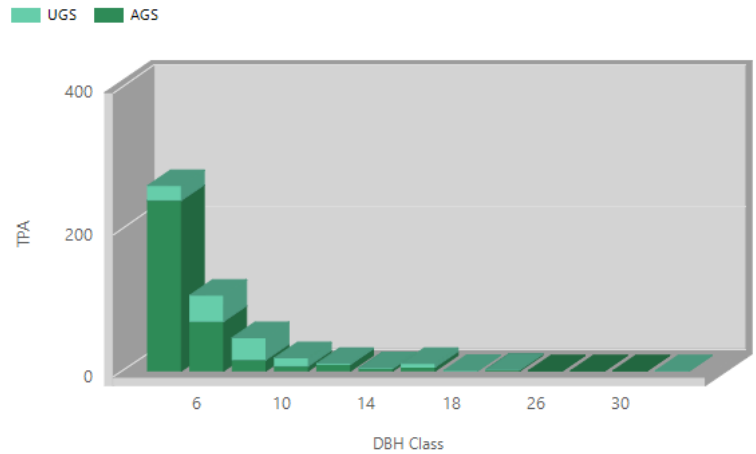
Stand Structure

This young stand is even aged. Meaning this stand has one distinct age class. Over time this stand will eventually develop into an uneven aged stand which is a more natural state.

Trees Per Acre by DBH Class & Species

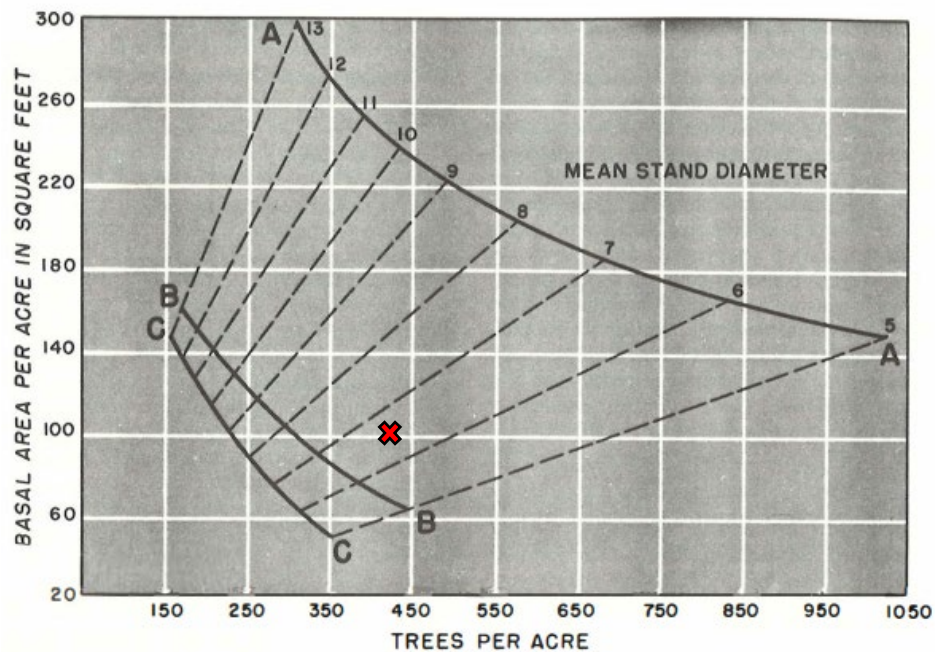


Trees Per Acre by DBH Class & Quality



Stand density

When comparing the stand density to the spruce-fir stocking guide the density of the stand is above the B-line. Which according to the chart means this stand is adequately stocked. At this density level the trees have space to grow.



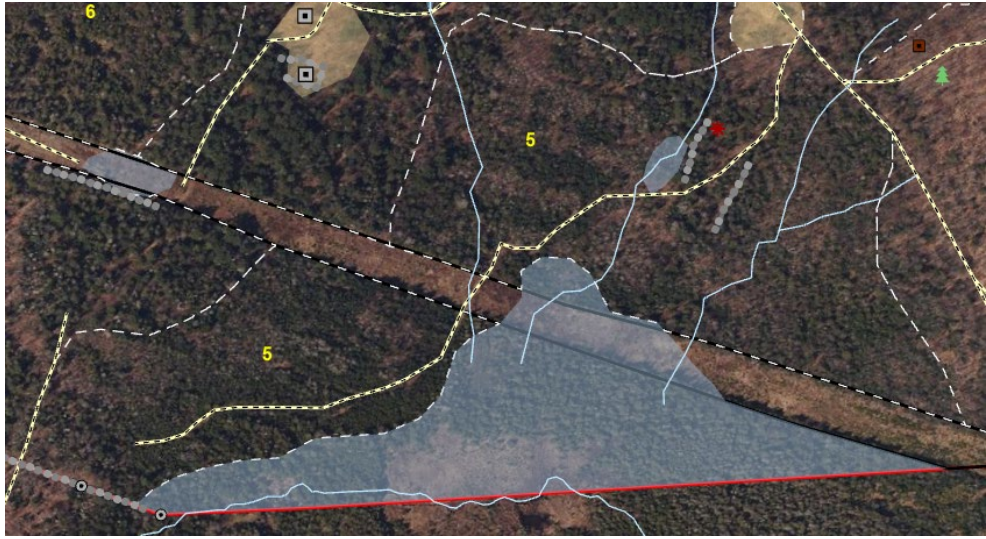
The "X" show where the stand density charted out on the mixed wood stocking guide according to Silvicultural Guide for Spruce-Fir in the Northeast.

Silvicultural management

This fir-cedar-spruce stand is still developing from the cutting done 40 years ago. It could benefit from some pre-commercial crop tree release work. This type of treatment would release trees from competition. This will happen naturally as the stand develops too. When the plan is updated in 10 years this stand will likely be ready for treatment.

Treatment

No treatment during the next 10 years.



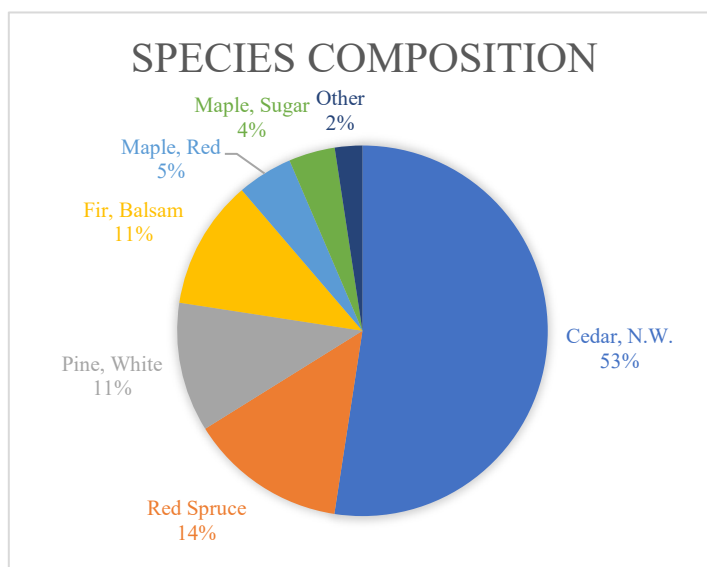
Stand 6

23.5 acres

Points Sampled: 9

Description

Stand 6 is in the southwestern corner of the Orange Town Forest. This stand is dominated by northern white cedar, red spruce and white pine. The cedar found in this stand are impressive. These trees are generally large and of good quality. Over 50% of the cedars in this stand are considered good quality for sawlogs. As a comparison 11% of the red spruce are considered of good quality. The cedars are also large. With some of the cedars measuring over 20" in diameter. As this stand has developed and trees have fallen out of the canopy areas of dense softwood regeneration has become established, making some areas tough to walk through.



Stand statistics:

Quadratic Mean Stand Diameter: 12"

Volume: 8,016bf/ac 9.1 cord/ac

Basal Area: 138 ft²/ac

AGS BA: 117 ft²/ac

UGS BA: 61 ft²/ac

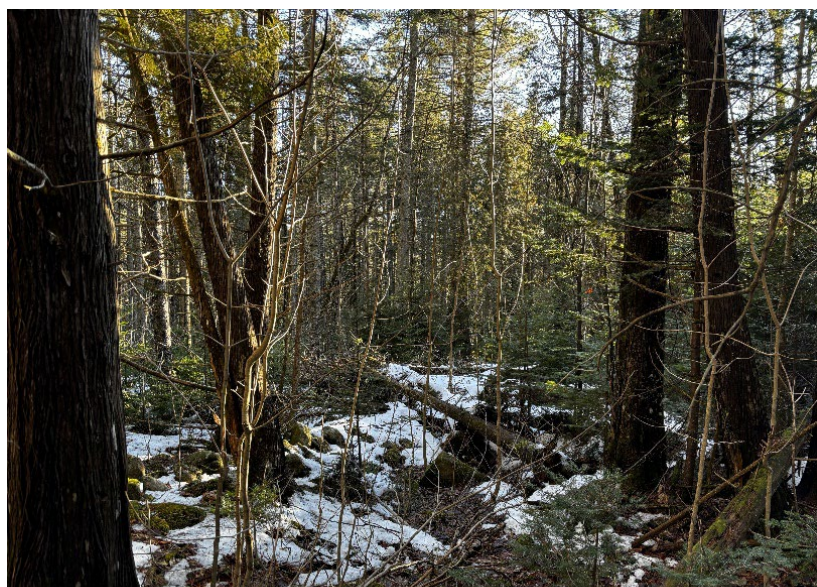
Trees per Acre: 179

Snags:

Snags < 12"	Snags 12-16"	Snags > 16"	Total Snag/Acre
5.22	5.28	1.10	11.60

Terrain

The terrain in this stand is gently sloping and will not affect the operability of this stand. There are some spots in the northern part of the stand that have large boulders and exposed ledge. This makes accessing this part of the stand difficult. Some wet areas will have to be avoided during logging operations, particularly in the center of the stand. There is one overgrown trail that runs between this stand and stand 5. With a bit of wandering the northern part of this trail can be followed to the power line.



Cedar in Stand 6

Regeneration

Throughout the stand there are areas of well-established softwood regeneration, comprised mostly of balsam fir and some red spruce. Young sugar maple, red maple and white ash can be found in this stand too. Deer browse is a concern here. There are areas of heavily browsed hardwood regeneration.

Downed Woody Material

The amount of downed woody material (DWM) found in this stand is high. Out of the 11 points sampled in this stand, most reported moderate to high amounts of DWM. Most of the DWM was from balsam fir, cedar and red spruce blow downs.



Regeneration in Stand 5

History

The 1998 forest management plan states “over the past decade, this area has been treated using a combination of thinning, shelterwood cutting and patch cutting.” Exactly where these treatments took place is unclear, but during the inventory it was apparent this stand was harvested at some point in the past 30 years. The results of this treatment should be judged as a success. The trees in this stand are large and there is an abundance of tree regeneration.

Soils

There are two soil complexes found in this stand. One is Buckland loam 8-25% slopes, very stony. These soils are moderately deep, moderately well drained, and productive. The other complex is Cabot silt loam, 3-25% slopes very stony. These soils are shallow, poorly drained and fairly productive. The site class of these soils is 2-3 out of 4, with 1 being the most productive and 4 being the least productive. (See the soil report for more details)

Forest Health

Overall, this stand is healthy. Age related decline was noticed in balsam fir. Some blow down was occurring in the wetter sections of this stand.

This stand was inventoried during snow cover conditions. At that time no invasive plants were noticed. This stand should be monitored annually for invasive plants.

Species Composition and Volume Table

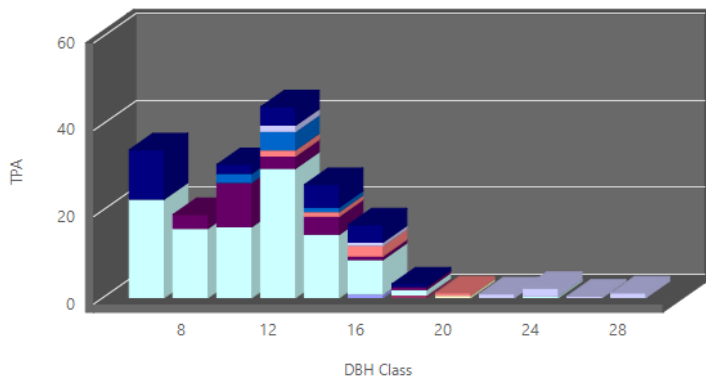
Species	Basal Area	Basal Area Percentage	Trees Per Acre	Quadratic Mean Stand Diameter (inches)	Relative Density	Percent AGS	Per Acre Board Foot Volume	Per Acre Pulp Volume (Cords)
Cedar, N.W.	72.22	52.42	108.67	11.04	33.9	54.64	4345.79	1.7
Red Spruce	18.89	13.71	27.4	11.24	6.74	10.34	888.24	1.65
Pine, White	15.56	11.29	6.16	21.52	5.32	18.03	2003.04	1.1
Fir, Balsam	15.56	11.29	21.78	11.45	5.73	3.33	267.65	1.82
Maple, Red	6.67	4.84	5.35	15.12	5.24	1.83	251.52	1.3
Maple, Sugar	5.56	4.04	7.32	11.8	4.51	1.4	259.76	0.34
Birch, Yellow	1.11	0.81	0.51	19.98	0.85			0.36
Aspen, Trembling	1.11	0.81	0.63	17.97	0.5			0.42
Ash, White	1.11	0.81	0.8	15.95	0.87			0.43
[TOTAL]	137.78	100	178.61	11.89	63.67	65.32	8016	9.12

Stand Structure

This stand is two aged. Meaning this stand has two distinct age classes. Over time this stand will eventually develop into an uneven aged stand which is a more natural state. Which can happen faster with active management.

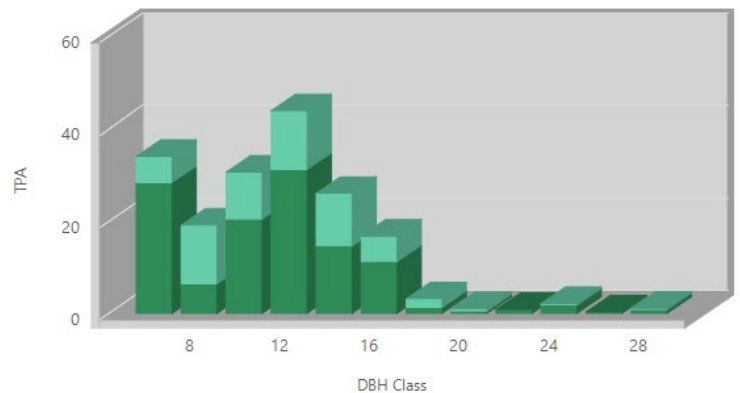
Trees Per Acre by DBH Class & Species

■ Red Spruce ■ Maple, Sugar ■ Fir, Balsam ■ Birch, Yellow ■ Ash, White
■ Pine, White ■ Maple, Red ■ Cedar, N.W. ■ Aspen, Trembling



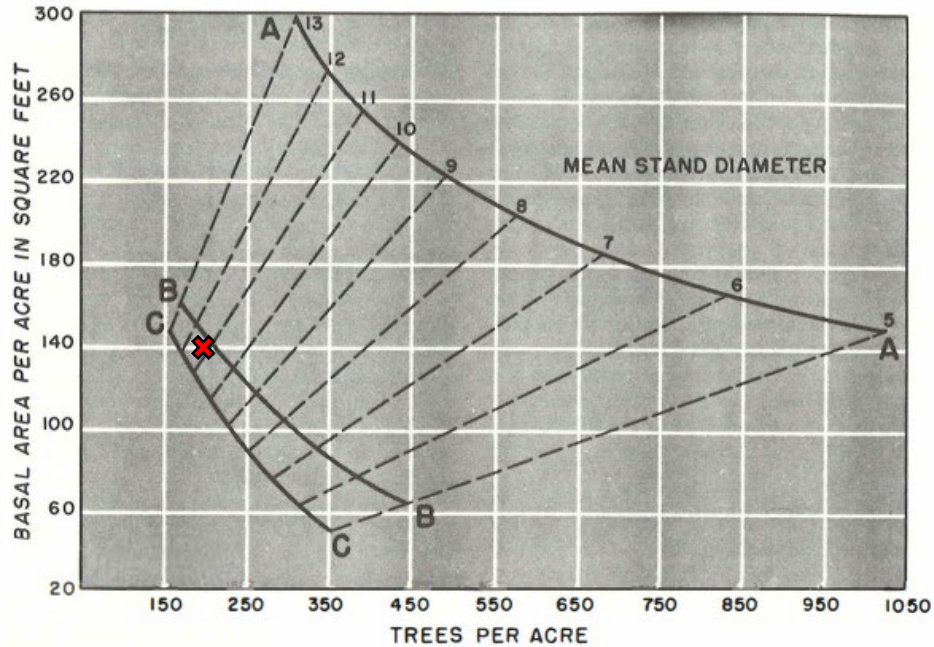
Trees Per Acre by DBH Class & Quality

■ UGS ■ AGS



Stand density

There is no stocking chart for cedar. To have something to compare the tree density to, the spruce-fir stocking chart can be used. The density of the stand is just below the B-line. Which according to the chart means this stand is adequately stocked. At this density level the trees have space to grow.



The "X" show where the stand density charted out on the spruce-fir stocking guide according to Silvicultural Guide for Spruce-Fir in the Northeast.

Silvicultural management

This stand is in good shape. The trees in the overstory have room to grow. There is well established regeneration which is free to grow in many places. Because of these factors no management is needed during the next 10 years.

Treatment

No treatment during the next 10 years. If cedar is needed at some point by the town, it would be appropriate to harvest the volume needed from this stand. Small groups of less the 0.25ac should be cut and lots of woody material should be left in the groups to encourage cedar regeneration.



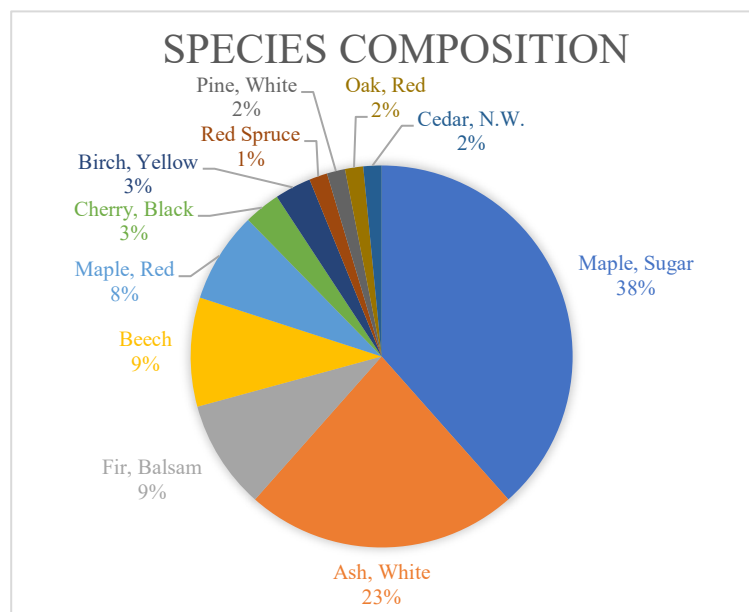
Stand 7

12.3 acres

Points Sampled: 5

Description

This stand is located on the eastern slopes of Hurricane Hill. Stand 7 is a northern hardwood forest dominated by sugar maple and white ash. Those two species make up over 50% of the composition of the overstory. Both species here tend to be large but of poor quality. Only 4% of the maple in this stand are of good quality for sawlogs and 8% of the white ash. Overall, 36% of the trees in this stand are of good quality. It is likely a combination of factors that has left this stand with a high amount of poorer quality stems. Factors like past land use, prior harvesting, the elevation of this stand and soils can all affect a tree's growth and the quality of their form. There are quite a few red oaks scattered around this stand. This would be a great tree to manage for in the future.



Stand statistics

Quadratic Mean Stand Diameter: 9.8"

Volume: 4,147bf/ac 18.5 cords/ac

Basal Area: 130 ft²/ac

AGS BA: 48 ft²/ac

UGS BA: 82 ft²/ac

Trees per Acre: 250

Snag:

Snags < 12"	Snags 12-16"	Snags > 16"	Total
20.4/ac	0.0/ac	2.0/ac	22.4/ac

Terrain

The terrain in stand 7 is moderately sloping towards the east. Generally, the operability of the stand is not affected by the terrain. There are some areas of exposed ledge and large rocks that can make getting to some areas difficult. Most of this stand is above 1800' in elevation. No trails were located during the inventory.

Downed Woody Material

The amount of downed woody material (DWM) found in this stand is Low. Out of the 5 points sampled in this stand, most reported low or no DWM. As this stand develops more DWM will accrue throughout the stand.

Regeneration

The regeneration in this is mostly well-established, particularly in areas that were treated in 1982. Species that were present in the understory include balsam fir, striped maple, red spruce, beech, black cherry, and white pine.

History

This stand was treated in 1982 with a combination of groups and thinning. It has not been treated since.

Soils

There is one soil complex found in this stand, Buckland loam complex 25-50% slopes very stony. These soils are deep, moderately well drained, and productive. The site class of these soils is a 2 out of 4, with 1 being the most productive and 4 being the least productive. (see the soil report for more details)

Forest Health

Emerald Ash Borer was found in some of the white ash in this stand. It can be assumed more will begin to show signs of this pest. Beech Bark Disease is present in this stand. With most of the beech showing little resistance to the disease. Some of the sugar maple have old maple borer damage. Near the height of land some canopy trees have signs of old ice damage.

No invasive plants were noticed during the inventory. This stand was inventoried during snow cover conditions. This stand, like the others in this forest, should be monitored for invasive plants annually.



White ash in stand 7 with EAB

Species Composition and Volume Table

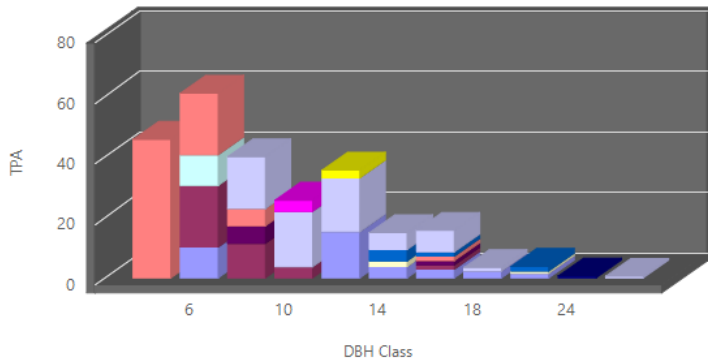
Species	Basal Area	Basal Area Percentage	Trees Per Acre	Quadratic Mean Stand Diameter (inches)	Relative Density	Percent AGS	Per Acre Board Foot Volume	Per Acre Pulp Volume (Cords)
Maple, Sugar	50	38.46	67.8	11.63	40.57	3.74	1341.67	7.58
Ash, White	30	23.08	35.85	12.39	24.05	7.44	2068.81	3.65
Fir, Balsam	12	9.23	73.37	5.48	7.34	5.56	164.51	0
Beech	12	9.23	36.93	7.72	10.46			0.77
Maple, Red	10	7.69	6.69	16.56	7.79	0.92	273.9	3.17
Cherry, Black	4	3.08	7.16	10.12	3.31			0.77
Birch, Yellow	4	3.08	2.63	16.7	3.11			1.53
Red Spruce	2	1.54	2.55	11.99	0.72			0.68
Pine, White	2	1.54	3.67	10	0.92			
Oak, Red	2	1.54	0.64	23.94	1.69	100	298.58	0
Cedar, N.W.	2	1.54	10.19	6	0.91			
[TOTAL]	130	100	247.46	9.81	100.87	36.92	4147.47	18.15

Stand Structure

This stand is a two aged stand. Meaning this stand has two distinct age classes. This stand will eventually develop into an uneven aged stand. This can happen faster with active management.

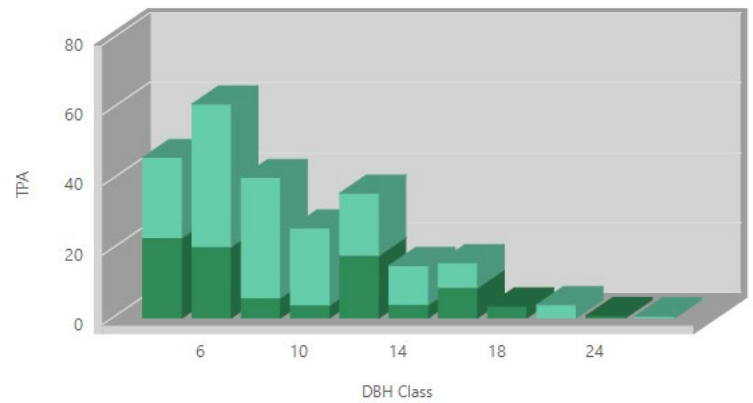
Trees Per Acre by DBH Class & Species

Red Spruce Maple, Sugar Fir, Balsam Cedar, N.W. Beech
Pine, White Maple, Red Cherry, Black Birch, Yellow Ash, White
Oak, Red



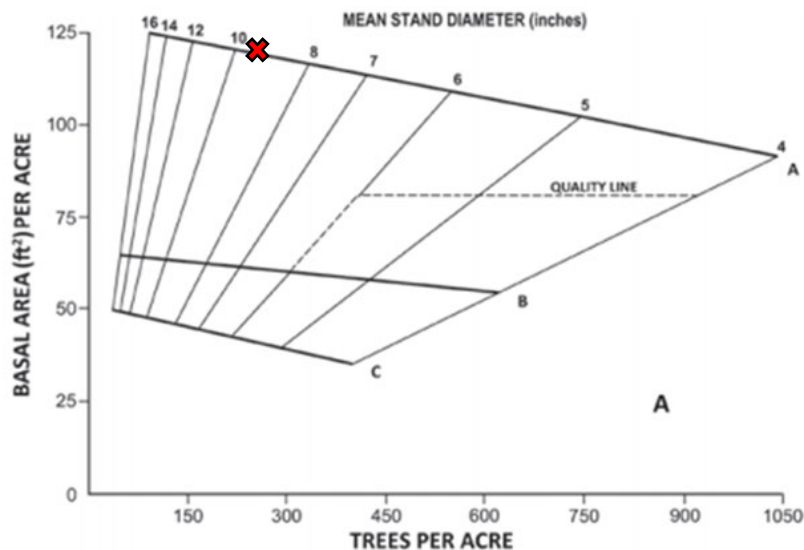
Trees Per Acre by DBH Class & Quality

UGS AGS



Stand density

This stand is above the A-line on the northern hardwood stocking guide. This indicates the stand is overstocked, meaning there are too many trees growing in this stand and the trees do not have enough growing space. The B-line on this chart is considered the optimal stocking density for a northern hardwood stand. At the B-line trees have plenty of space to grow and will have increased growth and vigor.



The "X" show where the stand density charted out on the hardwood stocking guide according to Silvicultural Guide for Northern Hardwood Types in the Northeast.

Silvicultural Management

The overall quality of the trees in this stand is poor. The plan in 1986 depicts this stand as having a high amount of poorer quality stems as well. The quality of the stems in this stand could be from a combination of factors. Factors like past land use, elevation and soil all can contribute to a tree's form. Active measures can be taken to tip the balance of the stand towards better formed trees. Removing groups of poorly formed trees to regenerate new trees and releasing better formed trees currently growing in the stand can both help improve the quality of this stand.

EAB is in this stand and will likely kill many of the white ash. White ash makes up 23% of the overstory trees. If these trees all die at once it will have a major impact on this stand. Through active management the impacts of EAB can be mitigated and new young ash trees can be regenerated which will ensure white ash is in this forest long term.



Treatment

Single Tree and Group Selection -2026

This single tree and groups selection will focus on regenerating parts of the stand while releasing trees to increase growth and vigor. It will help move the stand further toward an uneven aged state. The groups should be no larger than 1.5ac in size, with most groups being 0.75ac. No more than 20% of the area treated should be in groups, which is about 2.5ac in groups. Groups should be in areas of poor quality, areas of established desired regeneration or groups of white ash trees.

In-between the groups, implement a single tree selection harvest that will reduce the basal area to 70-65ft². The selection cut should focus on releasing desirable growing stock and removing poor quality trees. Primary trees to be managed in this stand are sugar maple, yellow birch, red maple, resistant beech and white ash, though all species should be considered for retention to promote species diversity.

Climate Adaptation Planting in Groups-2027

Following the harvest plant seedlings in the groups that are cut. Aim to plant around 200 seedlings per acre. The spacing of the seedling should be around 2m x 2m. How many of the groups that will be planted will be up to the town, but with only 2.5ac planned to be in groups, planting all the groups could be considered. This will require about 500 seedlings. Species that should be considered for the planting include, red oak, white oak, bitternut hickory, Shagbark hickory, red spruce, white pine and resistant chestnut if a source can be found. This work will require volunteers to complete.

Reserve Lands

Total forest in reserve: 50.7ac

There are parts of the Orange Town Forest that are best held in reserve and not managed for timber. These areas are mapped on the forest management map. There are 2 types of areas being held in reserve, steep slopes and old forest areas.

Steep Slope-36.0ac

There are two sections of the Orange Town Forest that are classified as steep slope reserves. Both are in the eastern part of the forest near Hannah Hill. These are areas over 35% slopes. The largest of the two is the eastern slope of Hannah Hill. This is a very steep area, with slopes greater than 60% in some places. At the base of the slope large bolder fields can be found. The second area is surrounded by stand 2. This area has around 40% slopes.



Eastern Slope of Hannah Hill

Old Forest-14.7ac

At the base of the eastern slope of Hannah Hill there is a small area full of large trees. This area was likely only lightly harvested in the past due to the large boulders found here. There are a couple dozen large sugar maples here. These maples are tall, straight and large. Heading further northeast from this area is Foster Notch and Baker Brook. This is a riparian forest that likely had some harvesting take place in 1985. Both of these areas are best left to develop into an Old Forest. This area is not an old growth forest. To qualify as an old growth forest this area would have to have been completely untouched. The history of this parcel indicates that this area was likely logged in 1986 and cleared for pasture at some point before then.

It is up to the community to decide if further areas are to be held in reserve to develop into an old forest on their own. Through active management, old forest characteristics can be achieved as well. Using this approach a forest would develop these features faster.



Large Tree in Old Forest Area



Baker Brook

Reserve Management Strategy

All the areas held in reserve will be allowed to develop naturally. This approach will allow these areas to develop old forest characteristics passively. There may be some circumstances when management activities will occur in these reserves. Invasive plant control will take place in all areas where necessary. There is also an opportunity for trails to be established in some of the areas held in reserve.

Schedule of Management Activities

(Timing of specific activities may be shifted)

Stand	Activity	Scheduled Year	Priority	Cost	Partner
All	Improve access to forest	2025	High	Estimate unknown, will be expensive but necessary.	County Forester, VT UCF other conservation partners
All	Locate Boundary	2026	High	Variable, some areas may require a surveyor to re-establish the line	Volunteers/ County Forester, Surveyor
All	Boundary line maintenance	Annual (10-year cycle)	High	\$120-\$150 for paint	Volunteers/ County Forester
All	Monitor for invasives plants	Annual	High	None	Volunteers, County Forester,
All	Invasive plant removal	Annual	High	Low to medium depending on how they are treated	Volunteers
All	Improve trails for recreation	Annual	High	Variable	Volunteers, VYCC, Trail user groups
Wetlands	Plant assessment	2026-2036	Low	None	Volunteers
1	Single tree and groups selection	2026	Medium	None, revenue positive	County Forester
2	Crop tree release and white ash salvage	2026	Medium	None, revenue positive	County Forester
4	1 st stage of a shelterwood	2026	Medium	None, revenue positive	County Forester
7	Single tree and groups selection	2026	Medium	None, revenue positive	County Forester
1&7	Climate resilience planting in groups	Post-harvest 2027	Medium	\$1,000-\$3,000 Depending on the amount planted	Volunteers / County Forester
4	Overstory removal with reserves	2032-2036	Medium	None, revenue positive	County Forester

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Glossary

AGS: Acceptable Growing Stock (AGS) is a classification given to trees in a stand which are considered healthy and capable of producing a sawlog sometime in the future.

Age Class: See “Cohort.”

Cable Skidder: A skidder which uses a cable winch to drag trees out of the forest. These skidders are generally smaller and lighter than skidding equipment used by whole-tree logging crews.

Cohort: A group or generation of trees of generally the same age, often initiating from the same disturbance event.

Composition: The proportion of trees of different species present in a given forest or stand.

Cover Type/Forest Type: A classification given to a stand based on the dominant tree species present at a given moment in time.

Cut to length system: A method of logging where trees are processed at the stump into log lengths. Normally this system uses a forwarder to the haul logs to landing.

DBH: Diameter at Breast Height – the diameter measurement of the trunk of a tree 4.5’ above the ground. DBH is the standard system for measuring tree diameter in forestry.

Even-Aged: A stand comprised of trees of a single age class (cohort), usually resulting from a single disturbance event.

Forwarder: Logging equipment used to haul logs to landing. This equipment grabs logs and places them in a log bunk.

Harvest: The process of cutting trees to extract a forest product from the woods.

Intermediate: The canopy position of trees who have been over-topped by other stems but are still receiving some direct light from above. These stems are generally higher in quality than suppressed trees, and in the case of shade-tolerant species may be healthy, but overall, they are poor in condition.

Group Selection: This treatment system involves harvesting all stems in a small area, usually no greater than 2 acres in size. These areas in which all trees are harvested are called “groups,” and may be as small as 2-3 trees in size. The goal for these groups is to regenerate a new cohort of trees or to release existing regeneration. Usually, these groups will regenerate a portion of a stand in proportion to the frequency of cutting and the rotation age of the stand. For instance, in a stand with a cutting cycle (frequency) of 20 years and a target rotation age of 100 years, 20% of the stand would be regenerated using groups each time cutting is done. This way, by the time the full rotation age has passed, all areas have been regenerated and there are 5 age classes of trees in the forest. In reality, a fully-balanced age-class distribution would be next to impossible to achieve, but this is the general goal of this system.

Landing: A cleared area where logs are yarded or skidded to for loading onto trucks for transport to the mill.

Midstory: Trees with a canopy position below the overstory, but above the understory in a stand. The midstory of a forest usually consists of suppressed and intermediate stems and/or slow growing or shade tolerant species.

Natural Community: An assemblage of biotic/abiotic factors in an environment, and the processes that govern them. Natural communities consist of all levels of biota in a forest, and consider how forest composition and structure changes over time.

Overstory: The highest canopy position of trees in a forest. Overstory trees are generally those whose crowns are exposed to full or nearly full light.

Pole Sized: An immature tree generally 4"-10" DBH

Prescription: A silvicultural strategy for how to manage a stand to achieve a desired result. A prescription will detail exactly how to harvest a forest, including providing metrics for the residual stand, and a detailed description of trees to be cut and those to be retained.

Release: The process of removing trees from competition, allowing them to grow more freely.

Regeneration: Young trees and plants (usually less than 4" DBH) in the forest, often growing in response to a human-caused or natural disturbance event.

Sapling: An immature tree generally 2-4" DBH.

Stem: A word used in forestry to refer to a tree.

Silviculture: The art and science of managing a forested stand, generally using timber harvesting as a tool.

Single Tree Selection: This treatment harvests trees of all age classes in a stand to encourage the growth of higher quality stems and the establishment of regeneration of shade-tolerant tree species. This treatment can also be used to ensure that there is an even distribution of trees of different species throughout the stand. This treatment is often employed between groups as part of uneven-aged management.

Skidder: A tractor-like machine, used to drag or "skid" trees out of the forest.

Stand: An area of forest in a similar enough condition, with regards to structure, composition, history and other factors, to be managed as a single unit.

Structure: In a forestry context, structure describes the presence of different age classes and canopy heights within a stand. Vertical structure is comprised of trees of different heights interspersed throughout an area, whereas horizontal structure described the presence of pockets of trees of different ages. In uneven-aged management, single tree selection usually encourages the creation vertical structure, whereas group selection creates horizontal structure. Structure may also describe the arrangement of dead wood across in a forest.

Succession: The process by which trees in a forest move from one generation and condition to the next. "Early successional" stands are those that establish following a disturbance, stocked by shade-intolerant and pioneer species, while "late-successional" (sometimes used interchangeably with "old-growth") stands, occur when stands have developed into older forest types, often stocked by larger, older trees of shade-tolerant species and a more complex, uneven-aged structure.

Suppressed: Trees which have been completely overtopped by overstory stems, receiving little to no direct sunlight, are considered "suppressed." Except in the cases of very shade-tolerant species, suppressed trees are often stunted and poor in quality.

Timber: Timber is used to describe the forest products (sawlogs, pulp, firewood, etc.) located inside the standing trees present in the forest. This word is sometimes also used to describe these products after the trees have been cut but before they have been processed or milled.

Treatment: A silviculturally planned and executed timber harvest.

Two-aged: A stand which is comprised of two distinct age classes. This is a common condition in managed forests, as the overstory is often targeted for logging, regenerating a new understory cohort while retaining some overstory trees.

UGS: Unacceptable Growing Stock (UGS) is a classification given to unhealthy trees unlikely to live long or to produce a sawlog in the future.

Uneven-aged: A stand comprised of three or more distinct age classes of trees. This forest type is common in undisturbed and “old-growth/late successional” forests.

Uneven-age management: This management system seeks to emulate natural disturbance regimes and natural forest growth patterns by establishing and maintaining multiple age classes of trees within a single stand.

Understory: Trees located at the lowest canopy positions in the forest, usually consisting of very young stems less than 10’ in height.

Whole-Tree Logging Crew: A type of logging crew that utilizes large, mechanized machinery to process trees from the stump up. Trees are processed on the landing into a variety of products, and tree tops and limbs are chipped.