

## Table of Contents

1 PLAN PURPOSE AND DESIGN .....	3
2 PROPERTY LOCATION AND BRIEF DESCRIPTION .....	3
Woodlot History .....	4
3 LANDOWNER GOALS AND OBJECTIVES .....	6
4 GEOLOGIC ATTRIBUTES .....	6
Topography and Aspect .....	6
Brooks, Ponds, and Wetlands .....	7
Soils .....	10
5 NATURAL COMMUNITIES .....	11
Rare Species and Unique Natural Communities .....	12
6 WILDLIFE HABITAT CONDITIONS .....	12
7 RECREATIONAL and EDUCATIONAL OPPORTUNITIES .....	15
8 FOREST CONDITIONS .....	17
Forest Types .....	17
Age and Age Class Distribution .....	18
Growth Rates .....	18
Tree Quality and Tree Health .....	18
Forest Management Approach .....	20
Applied Silviculture .....	21
Access .....	23
Operability .....	24
Property Boundary .....	25
FOREST DATA .....	27
Stand 1    Hemlock-White Pine-Hardwood 4B/HE-H 1-2BC 111.0 acres .....	29
Stand 2    Beech-Red Oak-Hemlock 234A/Beech 12B 25.2 acres .....	37
Stand 3    Hemlock-White Pine-Red Maple4A 9.0 acres .....	45
Stand 4    Hemlock-Red Maple-White Pine 3B 35.6 acres .....	51
Stand 5    Red Maple-White Pine-Beech 2A 17.8 acres .....	59
TOTAL FOREST TIMBER AND PULP VOLUME .....	74
10-YEAR TREATMENT SCHEDULE .....	76
APPENDIX A: SOILS MAP .....	78



## **WEARE – FERRIN POND FOREST MANAGEMENT PLAN**

### **1 PLAN PURPOSE AND DESIGN**

The purpose of this forest management plan is to provide the Town of Weare and the resource manager with a comprehensive description of the property and proposed management activities. It is meant to be a “User’s Guide” that reflects Weare’s objectives and will remain flexible as changes in the property condition or objectives change through time. A 10-year management schedule can be found at the end of this plan and used as a quick reference to the timing and areas with scheduled management.

Management planning on the Weare ownership is a threefold system including a master plan, forest management plans, and pre-harvest planning. The master plan covers broad property descriptions, ownership objectives, and management strategies. Forest management plans, such as this one, are the second piece of this threefold system. They cover specific property descriptions and management activities intended to span a 10-year period. Forest management plans are stand-alone documents. The third part of this system involves pre-harvest plans, detailing even more specific management concerns and objectives particular to individual harvests. As their name indicates, pre-harvest plans are prepared prior to a scheduled harvest.

### **2 PROPERTY LOCATION AND BRIEF DESCRIPTION**

Ferrin Pond Forest includes a large contiguous tract with 254.2 acres (199 forested)<sup>1</sup> referred to in this plan as the Ferrin Pond main tract, and several smaller, non-contiguous tracts to the north and south. The main tract is located on an unmaintained portion of Mountain Road, roughly .3 miles west of the intersection of Mountain Road and Mountain School Road. Interior to this main tract is a privately owned outlot, and two other small, town-owned Conservation Lots.

The tracts to the north, referred to the Jewett Road lots in this plan, include 4 separate lots, totaling about 44 acres, and are a mix of forest and wetland accessible from and with frontage on Jewett Road, and unmaintained town road. The southernmost lot shares a common corner with the main Ferrin Pond tract. The southern lots, referred to as Marsh Ridge Road lots in this plan, located on unmaintained town Marsh Ridge Road, total approximately 25 acres in 7

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<sup>1</sup> Mapped acres, 10/2011

different lots. These small southern lots are entirely forested and were part of the Husky subdivision.

In general, the forest type is typical of the area, dominated by a mix of hemlock, red oak and white pine, with other hardwoods, mainly red maple, American beech, and white birch. The dominant trees in the forest are roughly 60 to 90 years old, with a younger age-class coming in the understory. The terrain is variable, but generally includes moderate to gentle slope with generally east and south facing slopes. Two exceptional water features are found on this tract, including Ferrin Pond and a large, unique fen. Ferrin Pond, which is easily accessible by foot, provides a quiet, remote recreational opportunity for swimming, paddling, and fishing. The large fen provides another easily accessible opportunity to observe wildlife and vegetative habitats unique to this uncommon wetland system. A well maintained trail system provides access to the interior of the forest. A Trail Guide brochure describing the history and natural features of the forest north of Mountain road is available via the Weare, NH website (<http://www.weare.nh.gov/WCC/FerrinPond.html>).

### **Woodlot History**

Ferrin Pond Forest has a rich history. According to the “Ferrin Pond Conservation Area Trail Guide”, the pond was named after a Revolutionary War soldier who farmed the surrounding lands in the mid-to late 1700’s. The agricultural history of the forest is vividly apparent by the presence of miles of stone walls. These walls delineated pasture areas, likely for sheep during the sheep craze of the early 1800’s, then for dairy and beef cows. Piles of stone can be found interior to the walls, and were created when rock was removed to improve pasture and crop land quality.

Weare had a prosperous agricultural history, which peaked in the mid to late 1800’s. This agricultural use of the land came to a halt early last century when many farmers in New England abandoned their agrarian lifestyles and once open-land has since become reforested.

Pine often is the first forest type to occupy abandoned agricultural land, especially old pasture land, as the cattle or sheep typically browsed any hardwood that came into the field and left the pine alone. Abandoned crop land quite commonly was planted with either white or red pine or a mix of spruce, but natural pine succession occurred as well.



Over 3 miles of stone walls were mapped on the Ferrin Pond Forest. The large wall pictured on the left is a good example of a double wall filled with smaller rock on the interior- an impressive and effective method for getting large amounts of small rock out of the way.

After reforestation, periodic timber harvesting has occurred on the forest, more intensively south of Mountain Road. The stumps that exist are fairly old; it appears the last entry into the forest was perhaps 20-25 years ago. Old skid trails are visible, and young trees have grown up in areas where patches of the overstory were removed. It appears mostly white pine was harvested.

This pine stump appears to be 20-25 years old, cut during the last timber entry into Ferrin Pond Forest. Some more intensive cutting south of the fen, resulted in roughly 10 acres of young forest that regenerated as a result of the cutting.



Because of the remote location of the forest and the easy road access to it, it had become a popular “party spot” in the 1980’s. A concerted effort was made by the town of Weare in conjunction with the Piscataquog Watershed Association to clean up the forest. Since then, recreational trails have been created, making a loop around Ferrin Pond. These trails seem to be well-used and are well-maintained. Vandalism and trash can still be found on the forest though, as some people continue to disrespect the efforts made to clean this area up.



Trash and camping debris has been left at the height of land on adjacent town-owned Conservation Land south of the Fen. This area is easily accessible by old roads, and is remote. Nails have been hammered in many trees in this area, potentially eliminating commercial value because of the risks posed to mill equipment and workers when sawing logs with nails and other unknown hardware in place.

### **3 LANDOWNER GOALS AND OBJECTIVES**

As stated in Weare's forest master plan, goals and objectives of management on the Town of Weare forestlands are:

1. The first goal of stewardship is to maintain the diversity of plant and animal life in the Town Forests so as to sustain ecological processes.
2. The second objective is to maintain a healthy and vigorous forest that can sustainably yield forest products.
3. Hunting, fishing, hiking, botanical observation, and wildlife observation are important functions of the Town Forests. The properties will be managed to maintain and enhance these recreational opportunities.
4. Maintain Tree Farm status

### **4 GEOLOGIC ATTRIBUTES**

#### **Topography and Aspect**

The Ferrin Pond Forest ranges from 760 to 1100 feet in elevation. The ground is in generally gentle to moderate slope. Two small, isolated areas of steep ground exist on the tract; the first is located on the western bank of Ferrin pond going from the height of land to the pond shore. The second is in the southwest corner of the tract, and is a small area dropping off the east of the old agricultural fields that have now reverted to white pine at the height of land. The aspect is east and south-east.

## **Brooks, Ponds, and Wetlands**

As the name indicates, Ferrin Pond is a major water feature of the Ferrin Pond Forest. Approximately 13 acres of this +/-20 acres pond lie on the Ferrin Pond Tract. Like most water features in New England, this pond was created by glacial activity during the last ice age, approximately 10,000 -15,000 years ago. At 948 feet in elevation, it is the second highest pond in southern New Hampshire. The water from Ferrin Pond drains into Ferrin Brook, and travels approximately ½ mile and dropping approximately 185 feet in elevation to a second, un-named pond on the forest. This second pond, of which 23 acres are located within the Forest Boundary, is surrounded by high-bush blueberry shrubs and white pine and is primarily fed by Buxton Brook, which also feeds the wetland system associated with the Jewett Road lots.

But easily the most interesting water feature of the forest is the large 15 acre fen, located almost entirely within the boundary of the tract. A fen is a wetland similar to a bog, but with greater water exchange and therefore lower acidity levels and higher nutrient levels. Despite this difference, fens are generally acidic enough to have a peat mat formation, and harbor acid-loving plants. The fen on Ferrin Pond is likely a Medium Fen, which is mid-way between a poor fen (more acidic, less nutrients) and a rich fen (lower acidity, high nutrients). Fens are unique and important wetland communities, and provide habitat for a variety of plants that are uniquely adapted to the specific conditions of the fen, and often are not found in any other community, therefore supporting increased biodiversity. Biodiversity is an important measure of ecosystem health, essentially the greater the biodiversity, the better able a system is able to withstand disease, pests, and extreme weather conditions. There are other smaller forested wetlands within the Ferrin Pond Forest, as well as vernal woodland pools.

All ponds and mapped wetland systems would benefit from a protective buffer during management. Within this buffer harvesting would be allowed, but at least 65-70% canopy cover should be maintained. The buffer area for Ferrin Pond is the entire Stand 3. For the other pond and wetland systems, the buffer width is 100 feet.



The large, 15 acre, fen found on Ferrin Pond Forest is an uncommon wetland feature that harbors distinctive vegetative communities providing habitat for a greater diversity of wildlife. The map above shows the topographic features of the fen. Notice the raised center of the wetland- this is created by an accumulation of peat that is very slow to break down because of the acidic conditions of the water here.



Ferrin Pond (top left) is a high-elevation glacial-formed lake for which the tract is named. A large, medium fen is located almost entirely on the tract, and provides unique habitat for specially adapted plants (upper right). A second pond, fed by both Ferrin Brook and Buxton Brook, is located on the tract in the southwest corner. Other wetland features include a small, recently abandoned, forested beaver pond (lower right) and a large wetland system also fed by Buxton Brook in the northern tracks

## Recommended Actions to Improve and Manage the Wetland and Water Resource of the Ferrin Pond Forest<sup>2</sup>:

### Riparian and Stream Ecosystems:

- Establish riparian management zones along streams, rivers, ponds, and lakes. These are not intended as no-harvest zones. Forest management systems, such as single-tree or small-group selections cuts, that retain relatively continuous forest cover in riparian areas (65-70 percent canopy cover) can help maintain biodiversity by protecting water quality, providing shade, supplying downed woody material and litter, and maintaining riparian wildlife habitat conditions.
- No-cut zones of 16 to 100 feet are recommended by several management guides on river or pond shores containing wet seeps, shallow or poorly drained soils, or area with slopes greater than 8 percent. Limited single-tree cutting can occur on other sites within this zone,

<sup>2</sup> Riparian and Stream Ecosystem management recommendations from the publication Biodiversity in the Forests of Maine; Flatebro, Gro, Foss, Carol, and Pelletier, Steven, 1999, UMCE Bulletin #7147

with cabling from outside the zone suggested.

- Consider management at the watershed-level as an approach to avoiding stream channel degradation from excessive runoff.
- Road construction, stream crossings, skid trails, log landings, and all phases of timber-harvesting operations should conform to Best Management Practices

#### **Springs and seeps:**

- Avoid leaving slash in woodland seeps, springs, or associate wildlife trails.
- To the extent feasible, avoid interruption groundwater flow above or below seeps and above springs. When seeps and springs can't be avoided, minimize flow interruption by strictly adhering to appropriate Best Management Practices for water crossings.
- Where feasible, use woodland seeps and springs as nuclei for uncut patches to retain snags, cavity trees, and other site-specific features.

### **Soils**

The upland soils were derived from glacial till and are primarily moderately well drained stony fine sandy loam soils. The dominant soil type is Monadnock stony fine sandy loam, a well-drained soil suited for best growth of less nutrient demanding species such as white birch and red oak. More nutrient rich soils with higher moisture content are also found on the tract, but in lesser amounts. These soils support best growth of high quality hardwood, especially sugar maple, white ash, yellow birch, as well as red oak and include smaller pockets of Becket stony fine sandy loam, Marlow stony loam, Peru stony loam and Skerry stony fine sandy loam. A small bit of Lyme stony loam exists, supporting best growth of softwoods such as balsam fir and spruce. Other minor soils include Lyman-Tunbridge rock outcrop complex, whose physical limitations make forest management more difficult and costly. The wetland soils are Borochemists, ponded.

Recommended Actions to Improve and Manage the Soil Resource of the Ferrin Pond Forest<sup>3</sup>:

#### **Forest soils, forest floor and Site Productivity:**

- Avoid whole-tree removal, particularly on low-fertility sites (i.e., shallow to bedrock soils, coarse sands, wetlands, and area with high water tables), unless replacement of nutrients and organic matter is considered
- Conduct harvest operations during the season of the year that is most appropriate for the site. Operating on snow or frozen ground, whenever possible, minimizes effects of the soils and forest floor.
- Choose harvest equipment to suit the site and minimize disturbance. For example, in dry conditions, and in some wet conditions, consider using tracked vehicles to reduce rutting.
- Minimize skid-trail width using techniques such as bumper trees when appropriate.
- Establish skid trails that follow land contours where possible rather than directed straight uphill.

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3 Soil management recommendations from the publication Biodiversity in the Forests of Maine; Flatebro, Gro, Foss, Carol, and Pelletier, Steven, 1999, UMCE Bulletin #7147

- When possible, conduct whole-tree harvests of hardwoods during dormant leaf-off season to retain nutrients on site.
- Avoid or minimize practices that disturb the forest floor, remove the organic soil or cover it with mineral soils, except as necessary to accomplish silvicultural goals and to regenerate certain tree species.

## **5 NATURAL COMMUNITIES<sup>4</sup>**

As written in the book *Natural Communities of New Hampshire* by Daniel Sperduto and William Nichols, “Natural communities are recurring assemblages of plants and animals found in particular physical environments. New Hampshire has a fascinating and complex variety of natural communities, from tidal marshes to alpine meadows, river banks to mountain forests, and streams to lakes. Each type of natural community has a unique set of environmental conditions that support certain species adapted to those conditions.”

“Just as individual organisms can be classified into species, plant assemblages can be classified into natural community types. Classifying natural communities is a useful way of viewing the landscape because it allows us to distill the broad range of complex interactions between species and their environments into a limited number of units that share certain key features.”

“Natural community types are usually defined in terms of plants because they are easy to study, often compose the physical structure to which most other organisms respond, and are sensitive indicators of physical and biological factors that influence many types of organism.”

“The need to classify natural communities is fundamentally pragmatic: People need a way to sort out, understand, and communicate about nature’s complexity on order to be good stewards.”

Determining natural community types can be a challenge because it is uncommon to find land that has not been influenced by human intervention. Past agricultural and silvicultural practices often change the plant communities that you would find on any given acre naturally. Identifying natural communities then becomes a process of understanding the past management activities, the physical conditions of the site, and the plant communities currently found there and determining to the best of our ability what community would occupy that site without human intervention. The natural community types found on Weare forestland has been identified on a broad level to the best of our ability. A more comprehensive and detailed study by an ecologist would be required to determine natural community types on a more fine-grained and certain basis.

The dominant natural community type found on the Ferrin Pond Forest is hemlock-beech-oak-pine forest. Hemlock-beech-oak-pine is a common, broadly defined community occupying

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4 All information on Natural Communities referenced from the publication: [Natural Communities of New Hampshire](#), Daniel Sperduto and William Nichols, NH Natural Heritage Bureau and The Nature Conservancy, 2004.

glacial till and terrace soils of low to mid elevations in central and southern New Hampshire. Hemlock and beech tend to be the late successional species present. But where this community has been disturbed, either through natural disturbance regimes or timber harvesting, this community tends to be dominated by early to mid-successional species including red oak, white pine, red maple and black or paper birch. This community tends to fall on the less nutrient rich soils, dominated by Monadnock stony fine sandy loam. On the richer sites, the community type tends towards sugar maple-beech-yellow birch forest, a common hardwood forest type in New Hampshire. Sugar maple and beech are the late successional species, with yellow birch tending to dominate disturbed areas.

### **Rare Species and Unique Natural Communities**

An in-depth flora and fauna survey was not within the scope of this plan. There were no endangered plants or animals knowingly encountered while collecting the data for this plan. The Natural Heritage Bureau was contacted for a search of their data records involving rare species/exemplary natural communities within the entire Weare Town Forest(s) ownership. The only record of significance is a Black gum-red maple basin swamp on the Eastman Forest. If rare and species exist, they would likely be associated with the fen wetland system, and special concern should be given to protect this system from disturbance.

## **6 WILDLIFE HABITAT CONDITIONS**

Wildlife require shelter, food, water, and space. Ferrin Pond Forest provides a variety of habitats for wildlife, but is dominated by dense pine-hemlock-oak forestland and a diversity of wetland types. Food is available in many forms. Browse exists, primarily in the form of beech saplings and tends to grow in dense pockets. Hard mast (nuts and seeds) are fairly abundant as acorns and white pine cones. Soft mast is more limited, with some *Rubus* sp. available in the powerlines and wild blueberry scattered through the woods and along wetland edges. Water is abundant.

A black bear sow with two cubs was seen during the June, 2011 inventory, and bear sign was abundant throughout the forest. Though there is a greater density of deer on the property, deer sign was not abundant, and browse levels were in general low.

The combination of the powerline and open edge along the wetland communities provides a fair amount of open space that tends to provide a plethora of food, primarily in the form of herbaceous plants and soft mast. In fact, the sow bear and cubs were spotted feeding on the succulent plant growth on the edge of the fen. Wetlands also provide an important source of food. They tend to be one of the first places to "green up" in the spring, providing a much needed

source of herbaceous browse early in the year. They also tend to produce vast amounts of browse and mast almost year round, as some mast producing shrubs retain their fruit long into the winter.



Abundant wildlife habitat observed on the Ferrin Pond Forest includes bear sign heavily marking a red pine (top left). Bear mark their territories with visual scratch and bite marks as an “avoidance tactic” meant to prevent confrontation between male bears. Red pine is a preferred tree species for marking because it is pitchy and tends to hold bear scent. Bear claw marks from climbing a beech tree (top right) to harvest beech nuts for mast were seen in multiple areas of the forest. Painted turtles (bottom left) were seen on land, likely traveling to lay eggs near the shore of wetlands. And many cavity trees (bottom right) can be found throughout the forest, created largely by woodpeckers searching for grubs inside dead or dying trees. These same cavities are often used as nesting sites for “cavity nesting birds” such as chickadees.

The forestland does vary and offers some structural diversity. Previous timber harvesting and past natural disturbances have created pockets of young seedlings and saplings surrounded by mature (and sometimes intermediate aged) trees. Large snags near these openings offer perching sites for raptors. Residual woody material created by logging has contributed some large debris. As this woody debris decays, it houses numerous insects, invertebrates, small mammals, amphibians, birds and larger mammals. As many as 40 different types of songbirds use standing

dead trees with cavities as part of their habitat requirements. Down logs are a crucial part of amphibian habitat as they provide cool moist, shady conditions necessary for their survival. Because of their importance as habitat components, snags and down logs will be managed for throughout the property.

Releasing existing understory trees, especially mast producers, will improve the wildlife habitat. Early successional habitat is minimal here; creating more will be one goal of silviculture.

The New Hampshire Wildlife Action Plan includes mapping of significant wildlife habitats as they occur throughout the state and provides strategies for the management of wildlife that occur on these habitats, especially as they relate to threatened and endangered species, but also including information on common wildlife species. According to their delineation, a variety of habitat types can be found on Ferrin Pond Forest and on adjacent lands. Hemlock-Hardwood-Pine dominates the site, with pockets of Appalachian-oak-pine mixed in. Marsh and peat wetlands are fairly abundant on the Ferrin Pond Forest and on adjacent lands. A summary of these habitat types and the wildlife species found there is in Appendix D in the Master Plan.

Recommended actions to improve and manage the wildlife habitat of Ferrin Pond Forest<sup>5</sup>:

**Snags, cavity trees, and down logs:**

- Avoid damaging existing downed woody material during harvesting, especially large (16"+) hollow logs and stumps.
- Leave downed woody material on site after harvest operations when possible.
- Leave several sound downed logs well distributed on the site, where possible. Especially important are logs >12 inches dbh and > 6 feet long. Hollow butt sections of felled trees are also good choices.
- Create additional snag trees by girdling large cull pine where possible. Attempt to retain or create a minimum of 4 secure cavity or snag trees per acre, with one exceeding 24" dbh and three exceeding 14" dbh. In areas lacking cavity trees, retain live trees of these diameters with defects likely to lead to cavity formation.
- Retain as many live trees with existing cavities and large unmerchantable trees as possible.
- When possible, avoid disturbing cavity trees, snags, and upturned trees roots from April to July to avoid disrupting nesting birds and denning mammals.
- Retain trees with cavities standing dead trees, downed logs, large trees, and large super canopy trees in the riparian management zone to the greatest extent possible.

**Habitat Connectivity:**

- Avoid harvests that isolate streams, ponds, vernal pools, deer wintering areas, or other sensitive habitats
- Maintain the matrix of the landscape in relatively mature, well-stocked stands. Where even-aged management is practiced, consider the cumulative effects of multiple cuts and

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5 Wildlife habitat management recommendations from the publication Biodiversity in the Forests of Maine; Flatebro, Gro, Foss, Carol, and Pelletier, Steven, 1999, UMCE Bulletin #7147

include wider habitat connectors as necessary.

- Consider opportunities for coordinating habitat connectivity with other, on-going land-management efforts that maintain linear forested ecosystems, such as hiking trail corridors and natural buffer strips retained to protect water quality. This may require expanding the physical size of the connector habitat and increasing structural values to fulfill multiple management goals. Also consider the potential for effects that may arise because of incompatible uses (e.g., heavily-used ATV or snowmobile routes around and through deer yards).

#### **Deer Wintering Areas:**

- Identify dense stands of mature softwood as potential DWAs, particularly in riparian ecosystems.
- Whenever possible, schedule harvests in DWAs are during December through April.
- Protect advance conifer regeneration during timber-harvesting operations.
- When conducting harvests in coniferous forest adjacent to watercourses, maintain an unbroken conifer canopy along shorelines to protect riparian travel corridors.
- When planning harvests within any DWA, (strive to) maintain a closed-canopy coniferous overstory over at least 50 percent of the area at any given time. Avoid constructing major haul roads within DWAs.

#### **Vernal Pools:**

- Identify and mark vernal pool edges in spring when they are filled with water to prevent damage during harvests conducted when pools are difficult to detect
- Avoid any physical disturbance of the vernal pool depression.
- Keep the depression free of slash, tree tops, and sediment from forestry operations.
- Maintain a shaded forest floor, without ruts, bare soil, or sources of sediment that also provides deep litter and woody debris around the pool. Avoid disturbing the organic layer or drainage patterns within the pool watershed.
- Whenever possible, conduct harvests when the ground is frozen or snow covered.

## **7 RECREATIONAL and EDUCATIONAL OPPORTUNITIES**

### **Recreation**

The Ferrin Pond Forest provides an excellent recreational and educational resource. A guided hiking trail and educational feature map exists and is available to the public via the Town of Weare website.

The trails on Ferrin Pond Forest are in general in good condition, but could be improved in select areas, especially concerning soil erosion and “trail braiding” around wet spots. *Best Management Practices* provide trail construction and maintenance guidelines that will help prevent soil erosion. Excellent signage exists outlining proper trail use and respect of the land benefits the condition of the trails and surrounding forest, as well as provide educational opportunities. Regular upkeep of signs and trail maintenance is important as it demonstrates integrity of the leadership and clubs involved.



Signs identifying the boundary and ownership are easily found at Ferrin Pond, as well as yellow blaze signs designating hiking trails (left). An interpretive trail system is also in place, with numeric signs identifying interesting ecological features that correspond to a Trail Guide Map (right).



Recommended Actions to Improve and Manage the Recreational Resource of the Ferrin Pond Forest:

- **Improve existing signage.**
  - Post a Welcome sign to the land that identifies the owner and what is allowed or encouraged on the land. This is not the best place to detail what is not allowed.
  - Post signs at all property corners and at intervals along the boundary identifying the landowner.
  - Improve informational signage about use of trails, explaining what is allowed and what is not allowed. For example:
    - Stay on the trail
    - Carry in and Carry out
    - Avoid trails if conditions are muddy
- **Clearly identify what trails are open to motorized and non-motorized use**
  - Post a map of the trails and allowed uses.
- **Locate and maintain trails to prevent erosion<sup>6</sup>**
- **Locate trails** so they avoid sensitive areas or valuable wildlife habitat such as vernal pools and deer wintering areas.
- **Create additional foot traffic trails** for hiking and snowshoeing to more remote areas of the forest and to vista sites
- **Create vistas** overlooking views and significant natural features of the forest

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<sup>6</sup> Two good resources include: *Lightly on the Land*, *The SCA Trail-Building and Maintenance Manual* by Robert C. Birkby and [Best Management For Erosion Control During Trail Maintenance and Construction](#) by New Hampshire Department of Resources and Economic Development, Division of Parks and Recreation, Bureau of Trails

## Education

Educational opportunities are limitless on Ferrin Pond. Forest management operations provide educational opportunities in the form of public workshops to see timber harvesting in action or school field trips focused on management of renewable natural resources or to learn more about what land ownership and management can be about. Interpretive signs put in place during forest management operations can be a helpful educational resource that aid in public relations and understanding of land management. The Hillsborough County forester is an excellent resource for public education needs and is usually willing to participate in workshops or provide educational resources. There are many creative ways to educate; opportunities are not limited to those listed here.

Suggested opportunities to utilize the public education potential of Ferrin Pond Forest:

- **Encourage local schools/clubs/etc.** to utilize this valuable resource.
- Prior to, during, or after any forest management activities, **promote and present workshops** inviting the public to come learn about management activities on Ferrin Pond Forest.
- Create and **post educational signage** about Ferrin Pond Forest and management philosophy and activities.
- Create additional **interpretive trails** with signs about management and natural features

## **8 FOREST CONDITIONS**

### **Forest Types**

The following forest type designations are used in the forest type map:

#### **COVER TYPES**

H ≥ 50% dominant & co-dominant trees are hardwood

S ≥ 50% dominant & co-dominant trees are softwood

HS = Mixed species but dominated by hardwood

SH = Mixed species but dominated by softwood

(in some instances a dominant species, such as WP or HE may be included in the cover type)

#### **SIZE CLASS**

1 = Seedlings or regeneration - 90% of stems < 3" DBH

2 = Saplings or small poles 3" - 8" DBH

3 = Large poles and or small sawtimber 9" - 12" DBH

4 = Sawtimber 13" and larger

#### **CROWN CLOSURE/DENSITY**

A = 75-100% crown closure of co-dominant or dominant trees

B = 50-74% crown closure of co-dominant or dominant trees

C = 0-49% crown closure of co-dominant or dominant trees

An inventory was conducted on the main tract in June, 2011 consisting of 48 sample points, providing 1 plot for every 4 acres of forestland. Additional data was collected on the 44 acres that

make up the Jewett Road lots in December, 2001 consisting of 11 sample points. Data was collected as outlined in the Weare master plan. Data was not collected for the small lots on Marsh Ridge Road. Instead a visual review of these lots was performed in December, 2011.

### **Age and Age Class Distribution**

As with most forests in New England, Ferrin Pond Forest is largely even-aged, with the bulk of the trees getting their start after the abandonment of agriculture here early last century. That said, different species and individuals within the same species grow faster and mature at different rates than others. White pine, a fast growing tree, can get to quite a large size, compared to a hemlock of the same age. White birch, another fast growing tree, doesn't get as large as white pine and in addition, matures at an earlier age. Variability exists within an evenage forest, providing opportunity to manage for multiple age classes and diversify the forest structure, providing better wildlife habitat, continuous forest cover, and relatively less intensive silvicultural management. In general, Ferrin Pond Forest is dominated by 90-110 year old white pine, hemlock and red oak in the overstory. Younger trees, often clusters of pole-sized hardwood species, can be found in pockets where past harvesting or natural disturbances, such as blow down, created openings.

### **Growth Rates**

An in-depth study of tree growth is beyond the scope of this plan. While not statistically sound, some growth observations can be made by counting tree rings on old stumps and taking increment cores of some trees. Although volume growth is very difficult to accurately calculate using this method, some rules-of-thumb do apply. A tree's growth is directly related to the substrate on which it is located. Wet, ledgy, and dry areas do not promote rapid growth of trees. Lower elevation and cool moist but well drained areas support better tree growth as the soils are deeper and more fertile. The average managed woodlot in New Hampshire grows at a rate of 2 to 4 percent per year. This corresponds to volume increases of approximately 0.5 cords or 250 board feet per acre per year. Given the site conditions and the current density of the forest, it is likely that tree growth of the Ferrin Pond Forest falls within this range.

### **Tree Quality and Tree Health**

Overall tree quality on the Ferrin Pond Forest is average. Red oak dominates the timber volume on the tract, totaling about 1/3 of the total sawtimber volume and generally is of good quality. An exception to this is the oak growing on the Jewett Road lots. Here the oak is of higher quality, with some veneer potential. It averages over 2.6 mbf of quality sawtimber per acre, almost

100 feet of potential veneer per acre, and an additional 815 feet of low quality oak sawtimber.

The greatest overall volume is hemlock at 24.2%, followed by red oak with 19.1% and red maple with 17.3%. But, of both hemlock and red maple, only about 4% is sawtimber, where 39% of the oak is sawtimber. Red oak appears to do well on these sites and should be favored, especially intermediate and young stems that exhibit strong growth and quality characteristics. Pine and beech each represent about 14% of the total volume. The quality of the pine varies; previous harvests removed a fair amount of the “wolf pine” that are crooked, multi-stemmed, and branchy, but some still remain. Other pine is decent quality, straight stemmed individuals but growing in overcrowded conditions that leads to decline. Given the age and average diameter of the pine, red rot (a common decay fungus in white pine, typically affecting the main stem) is likely widespread. For beech, the quality here in Weare is fairly high compared to elsewhere in the region, but still only about 7% of the volume is sawtimber. Pine is poor to average for the region, with about 20% of its volume as sawtimber. The remainder of the volume is a mix of black birch, ash, and white birch with a scattering of red pine, red spruce, cherry and yellow birch.





Health concerns on the Ferrin Pond Forest include Beech Bark Disease. This fungus eventually kills the tree by girdling the phloem with cavities. This can be seen in the diseased beech bark (top left) versus the healthy beech bark (top right) pictured above. Another threat to forest health includes foliar damage by the forest tent caterpillar (middle left) easily identified the key shaped markings along its back. Though present in Ferrin Pond Forest currently, the population levels are so low they are not considered a problem at this point in time. A larger problem is the presence of Red Rot in much of the maturing pine. Red Rot is a fungus that generally infects pine through a dead branch (middle right) and causes heart rot in the stem. Although not considered a health problem, Weeviled Pine (bottom) is another common problem in the forest. Once straight stemmed pine trees become weeviled when the white pine weevil lays its eggs in the terminal bud of the tree, causing lateral branches to take over creating multi-stemmed pine, and essentially ruining the economic value of affected trees.

Health problems on Ferrin Pond Forest are typical for the region and forest type. Beech bark disease is found throughout the forest, but in much lesser amounts than in surrounding regions. Beech bark disease is caused by a fungus that is disseminated on the wind and enters beech trees through tiny holes in the bark made by the beech scale insect to deposit its eggs. The scale insects overwinter in crevices in the beech bark underneath a waxy coating they excrete for this purpose. The beech bark fungus causes cankers that eventually girdle and kill the tree.

Forest tent caterpillars, a defoliator with few predators, are present in the forest currently, but not at damaging levels.

None of these health problems indicate a need for a salvage operation, but the diseased trees should be targeted for removal should a timber harvest occur.

### **Forest Management Approach**

Management on the Ferrin Pond Forest will utilize a combination of silvicultural techniques that typically are separated into two general categories, even-age and unevenaged management. Evenaged management methods include clearcut, seed tree, shelterwood, overstory removal and patch cut applications and may be used to regenerate a new stand when deemed necessary. Unevenaged management methods generally include single tree and group selection used to regenerate small areas resulting in uneven age classes in a given stand. Often though, applied techniques fall somewhere in between these two text-book defined categories. One may define a

large group opening (unevenage management) as a small clear-cut (evenage management). Improvement thinnings often fall somewhere in between as well, depending on the intended results and the actual results. A thinning may result in improved growth of the overstory trees, an even-aged treatment. A thinning may also provide similar conditions as single tree selection, an unevenaged technique, and result in regeneration of shade-tolerant species. Crop tree release, a practice where designated “crop trees” are released from shade of competing trees on typically 2 to 3 sides, falls somewhere in between as well. Given the variability of site quality and stocking, even within a defined stand, unless evenaged management is specifically called for, management typically will fall in the unevenage category.

Further discussion of unevenage management is required. Traditionally, the intent of unevenage management is to attain forest stocking conditions that mimic a specific diameter/age distribution. But, practicably speaking, unevenage management is often carried out as a simpler form of multiple-age management resulting in the introduction of a new age-class on a portion of a stand each harvest entry. Given the even-aged condition of the majority of land in New England, encouraging multiple age classes is a more attainable, practicable goal and in effect, desirable goal. To clarify discussion of management technique on Weare lands, the term multiple-age management will replace traditional uneven-aged management, but will utilize the same techniques including single tree and group selection.

## **Applied Silviculture**

Below are the generalized silvicultural systems and methods that will be broadly applied to the natural forest communities found on Ferrin Pond Forest and the forest stands within. The methods and their corresponding cutting cycles, rotation ages and target diameters are described and will serve as management guidelines for application in the field.

### Hemlock/Hardwood Silviculture

The hemlock and hardwood community on Ferrin Pond Forest will be largely managed using a multiple-age system. Methods of multiple-age management will involve a combination of singletree and group selection silviculture and will mimic singletree and canopy gap disturbances. These silvicultural methods are used to create and/or maintain a multi-aged stand of largely mid-tolerant and shade tolerant species. Residual stand basal area densities following cuts will range between 60-90 square ft/acre for the hardwood and 110-200 square ft/acre for areas dominated by hemlock. Where mixed types exist, basal area densities will average between the two types. Depending on a number of considerations, the cutting cycles using this multiple-age system will be between 15 and 20 years. Target diameters of the hemlock and hardwood components are listed

below. However because of the variability of sites both diameters and age goals may or may not be reached. Target diameters are as follows:

White Pine	18-24	Beech	14-18
Hemlock	16-20	Aspen	12-14
White Ash	16-22	Sugar Maple	16-22
Black Cherry	14-18	Red Oak	16-24
White Birch	12-16	Red Maple	14-18
Yellow Birch	16-22		

### White Pine Silviculture

White pine is common, but does not dominate in the Ferrin Pond Forest. White pine trees generally produce a seed crop every 7 to 10 years during a period commonly known as a “cone year”. The 100-200 seeds produced by each cone are delicately small and remain viable for a short period after dispersal, approximately a year. Because the pine seed is so small, it does not have the stored energy necessary to grow through the forest duff layer, particularly under shady conditions. This means exposed mineral soil, ideally in deep well-drained sandy loams, and heat are required for successful seed germination. Keeping this in mind, these conditions need to be present during the seeds year of viability. To create these requirements, the silvicultural method most appropriate for pine, or most softwood regeneration for that matter, is evenage. Silvicultural techniques that are best applied where opportunity exists are patch, shelterwood and seed tree cuts. These techniques provide the stand dynamics required for pine regeneration that include space, heat, light, uniform canopy level, tight geotropic structure, hence an evenage structure. Timing of treatments is most effective during the snow-less season, where maximum soil scarification is attained. Previous harvesting in the white pine during the 1980’s and 1990’s was geared towards either a first-stage shelterwood or a typical thinning.

Another variable in obtaining sufficient pine regeneration is the overall ability of the soil to grow hardwood trees. A soil with a high site index for hardwoods is best suited to grow hardwood. In these soils there is a high level of available nutrients that will undoubtedly permit a layer of hardwood regeneration so thick that whatever pine is established will be overgrown readily. This hardwood competition is often seen on the nutrient poor sites as well, but these soils that are better suited for pine. On these sites precommercial weeding of the hardwoods is required for the pine continuance. This hardwood competition is due to the fact that once pine seed germinates it has a slow growth rate for approximately 5 years before more rapid growth begins. Site wise, sandy soils, well-drained and low cation exchange provide excellent pine sites. Timing, silvicultural technique and soil type is critical to promote the continuity of the pine resource.

### Red Oak Silviculture

The art and science of growing red oak is equally as tricky as for pine, due to regeneration challenges. Good seed years for oak are more frequent than that of pine, being 3-5 years. However, two major obstacles affect the germination success of the acorn. As a highly coveted food resource by much wildlife, the acorn is heavily consumed; if the wildlife does not find the acorn, insects like the acorn grub do. According to USDA Forest Service studies, up to 500 acorns are required to produce one seedling, but generally 1% of acorns become available for regenerating northern red oak successfully. Thus, the availability of viable acorns is naturally scarce.

To successfully germinate, the acorn prefers exposed mineral soil, ideally in well-drained, deep loams. Scarifying the duff layer during logging operations in the snowless seasons best does this. Oak's overall survival is most importantly related to light intensity levels. For the seedlings/saplings to photosynthesize optimally it requires 30% light intensity in the open. Under a closed forest canopy light intensities are less than 10%. Therefore, heat and space is critical. Once the seed germinates rapid and vigorous taproot development occurs. This root growth contributes to another challenge of oak management, where it causes very slow initial shoot development and competition for light from other species is very common. Thus, to achieve lasting regeneration success of oak, weeding of interfering species is often a requirement. The success of regenerating oak is highly dependent on the combination of the availability of viable seed, soil scarification, adequate light levels, implementation of weeding applications and seed distribution by wildlife.

Overall, the oak silvicultural system will be multiple-age. Methods of this system to best achieve the requirements of oak will involve mainly singletree and group selection silviculture. These methods will be used for both regeneration and thinning applications. Cutting cycles of oak dominant types will be between 15-25 years with crop tree diameters of 16-22 inches. During thinning and release applications it is important to maintain minimal direct light exposure to oak boles. Maturing and mature oak stems have large reserves of sensitive hidden buds that respond easily to increased light levels, resulting in epicormic branching and severe quality loss. During these cutting entries, releasing crop trees on eastern and northern sides, while maintaining heavier shade conditions on the south and west sides will ensure less opportunity for epicormic branching.

### **Access**

Road access to the main Ferrin Pond Forest tract is generally good, and is provided by an unmaintained section of Mountain Road, which bisects the tract, running parallel to a power line.

Mountain Road is in general good condition, but would require some improvements for truck traffic, largely where Buxton Brook wetland crosses the road and water flows over the road surface. Additional improvements are required to access the southwest section of the tract over Eben Paige Road from Mountain Road where a beaver impoundment has flooded the road. Other more minor upgrades including grading, and drainage improvement will be required.



The road condition into Ferrin Pond Forest is in general in good condition, with the bulk of it running adjacent to power lines (left photo). Some work is required in areas where water flows over the road surface, as in this beaver system that is part of the fen, located near the intersection of Mountain Road and Eben Paige Road.

The Jewett Road lots are accessible by Jewett Road, an unmaintained town road. Minor improvements are required, but in general this road is passable. The Marsh Ridge Road lots are accessible from Eben Paige Road, and so would require work mentioned above to improve access near the beaver impoundment at the intersection of Mountain Road. A small road, not listed as a town road, also provides access to these lots from Bogue Road.

### **Operability**

The terrain and ground conditions on this tract in general do not limit operability, although seasonal restrictions should be observed in some areas. The wetland areas generally are not productive timber growing sites and should be avoided during operations. In some areas near streams or adjacent to wetlands, or low points where the soils tend to be wet need special protection. Winter harvesting on frozen ground with good snow cover will provide the best protection for the soils found here. But, given the unreliability of winter conditions, operations may occur during the summer in dry periods as long as wet areas are avoided or tracked with equipment that minimizes impacts, including a cut-to length system that creates a mat of slash to drive over, therefore protecting wet ground from rutting and mitigating negative impacts.

## Property Boundary

The Ferrin Pond Forest boundary is in variable condition and includes just under 4 miles of maintainable boundary line. A combination of stonewalls, corner monumentation and painted blazes make up the boundary. In places the blazes are becoming difficult to see. The entire boundary should be blazed and painted as soon as possible. It is recommended that the boundary be monumented with Town of Weare signs, especially at corners, roads, and trails.

The boundary lines at Ferrin Pond Forest are in variable condition. A fair amount follows old stone walls, but the blazes are becoming difficult to see (lower photo). In places signs have been placed along the boundary as shown in the right photo.



## Protection of Historic and Cultural Resources

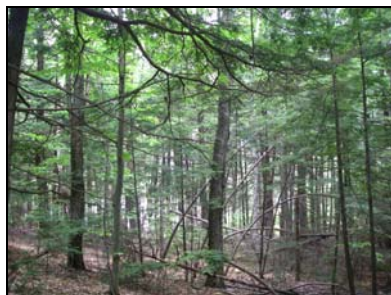
The historic and cultural resources found on the Ferrin Pond forest largely include the miles of stone walls found along much of the property boundary as well as interior to the forest. It is quite possible the stone walls near Ferrin Pond itself were built by its namesake Enos Ferrin in the 1700's. The protection of historic features is important to the Town of Weare and the State of New Hampshire because they help illustrate our cultural heritage and are as such, non-renewable.

The protection of these historic features is important to the Town of Weare and the State of New Hampshire because they help illustrate our cultural heritage and are as such, non-renewable. Active timber sales will involve well thought out protection of these sites and will avoid all unnecessary disturbances. Should disturbance be unavoidable, such as a stone wall crossing, the site will be restored to pre-harvest conditions.

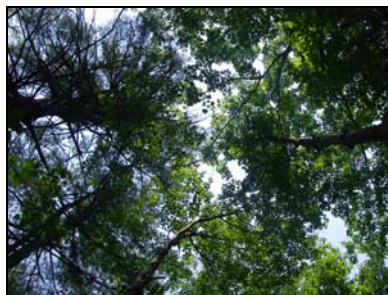


## **FOREST DATA**



**Stand 1     Hemlock-White Pine-Hardwood 4B/HE-H 1-2BC     111.0 acres**

Stand Structure



Stand Structure



Forest Canopy

**GENERAL ATTRIBUTES**

Natural Community Type:	Hemlock-beech-oak-pine forest
Past Management History:	Harvest +/- 25 years ago
Approximate Age of Dominant Trees:	70-90 years old
Stand Health:	Fair to good
Insects/Damage/Disease:	Presence of beech bark disease, red rot in pine, forest tent caterpillar present but no noticeable damage as of June inventory

**SITE CONDITIONS**

Determined by:	Soils map & field observation
Tree vigor:	Moderate
Soils:	Monadnock stony fine sandy loam; Becket fine sandy loam; Skerry stony fine sandy loam; Lyman-Tunbridge rock outcrop complex
Drainage:	Well-drained to somewhat poorly drained
Terrain:	Moderate to gentle slopes
Aspect:	East-southeast

**Snags Per Acre**

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"		4.9		4.9
12-18"	3.9	1.2	0.9	6.0
>18"			0.1	0.1
<b>Grand Total</b>	<b>3.9</b>	<b>6.1</b>	<b>1.0</b>	<b>11.0</b>

Table 1.1: Standing dead trees per acre by size and decay class.

**Down Logs Per Acre**

DBH Class	Moderately punky	Punky throughout	Grand Total
<12"		1.7	1.7
12-18"		1.0	1.0
<b>Grand Total</b>		<b>2.8</b>	<b>2.8</b>

Table 1.2: Down logs per acre by size and decay class.

**WILDLIFE HABITAT**

Forest type:	Mixed hemlock-white pine-red oak-hardwoods
Vertical diversity:	Medium
Vegetative diversity:	Medium
Hard mast:	Acorns, pine seed, beech nuts, birch seed
Soft mast:	Blueberry
Special habitat features:	Fair sized contiguous mixed forest; contiguous to large fen; wildlife travel corridor to fen and powerline
Snag trees:	Good amount small diameter, need more above 18" diameter
Down logs:	Good size distribution but small number
Special wildlife practices:	Create more large snags and down logs, preferably with cavity potential; maintain healthy beech and oak for mast; maintain buffer where adjacent to fen;

**RECREATION**

Recreational features:	Hiking trail system
Recreational infrastructure:	Trail blazes, interpretative trail, map
Aesthetic resources:	"Deep woods" feel with scattered large diameter trees
Public access:	Open, no wheeled vehicles

**SILVICULTURE****Structural and Silvicultural Attributes**

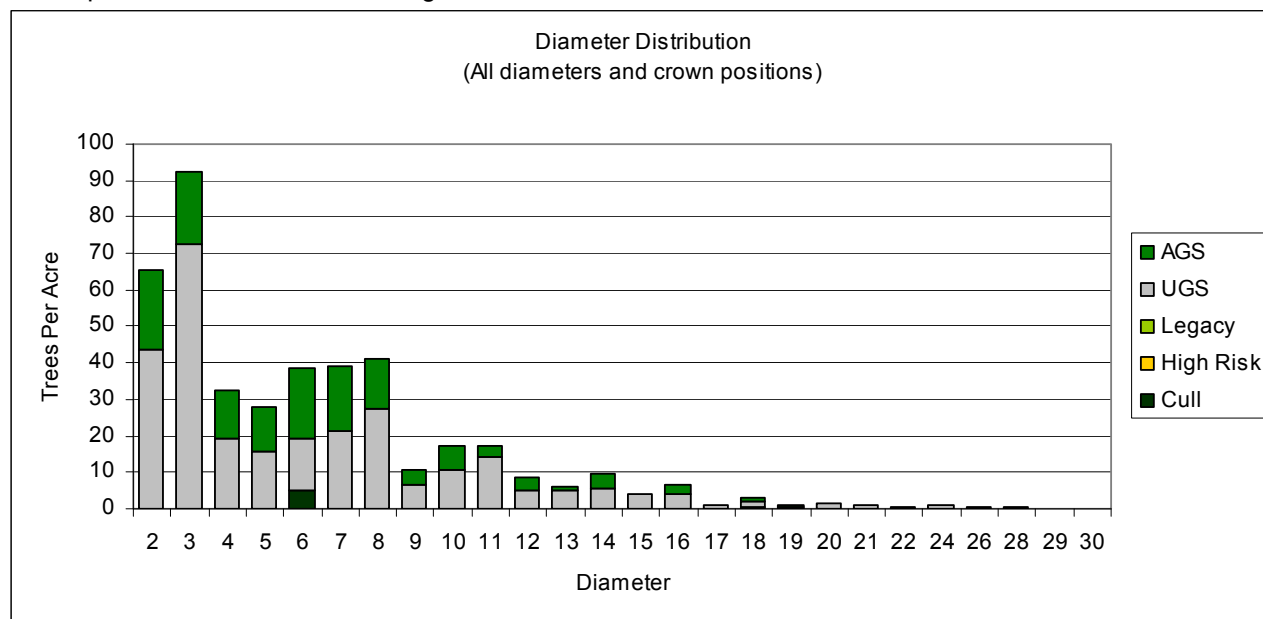
Broad Forest Type:	SH4B/SH12BC
Size Class:	Large sawtimber over sapling and pole-size
Stand Structure:	Becoming multiple-aged
Crown Closure:	85%
Total Basal Area Per Acre:	134
Total Merchantable Basal Area Per Acre:	125
Total Acceptable Basal Area Per Acre:	41
Trees Per Acre:	429
Quadratic Mean Stand Diameter:	7.6
Percent AGS Sawtimber:	56.4
Basal Area of AGS Sawlogs:	18
Timber Quality:	Variable, but generally fair to good with some high quality red oak

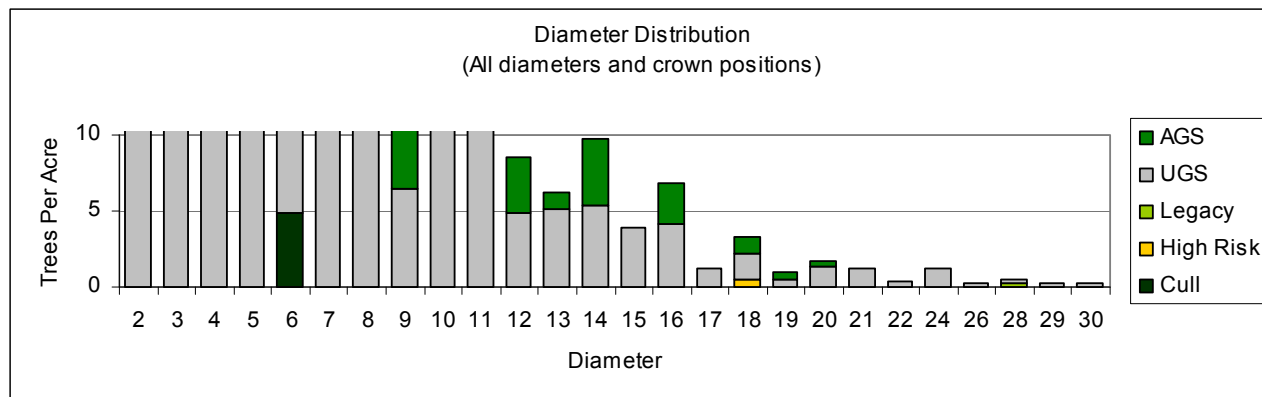
### Forest Composition and volume

Species	% TPA	Veneer (bf)	Sawlog (bf)	Pallet/Tie (bf)	Pulp (cd)	Growing Stock (cd)	Legacy (cd)	Total Volume in Cords	High Risk	AGS Saw	% AGS Saw
American Beech	19.0%	0	135	82	4.6	0.0	0.0	5.3	0	171	79%
Black Birch	13.6%	0	145	220	2.2	0.2	0.0	3.2	0	133	36%
Red Maple	35.3%	0	85	154	7.3	0.0	0.0	8.1	0	119	50%
Red Oak	5.8%	48	613	187	2.0	0.4	0.0	3.9	83	601	71%
Sugar Maple	3.7%	0	0	0	0.6	0.1	0.0	0.7	0	0	0%
White Ash	0.8%	0	68	57	0.3	0.0	0.0	0.6	0	0	0%
White Birch	0.4%	0	0	0	0.2	0.0	0.0	0.2	0	0	0%
Yellow Birch	0.4%	0	44	34	0.1	0.0	0.0	0.2	0	78	100%
<b>Total Hardwood Per Acre:</b>	<b>79.0%</b>	<b>48</b>	<b>1,090</b>	<b>733</b>	<b>17.5</b>	<b>0.7</b>	<b>0.0</b>	<b>22.3</b>	<b>83</b>	<b>1,102</b>	<b>59%</b>
Hemlock	14.4%	0	0	0	3.6	0.2	0.0	3.9	0	0	0%
White Pine	6.6%	0	360	377	2.9	0.1	0.0	5.1	0	369	50%
<b>Total Softwood Per Acre:</b>	<b>21.0%</b>	<b>0</b>	<b>360</b>	<b>377</b>	<b>6.6</b>	<b>0.3</b>	<b>0.0</b>	<b>8.9</b>	<b>0</b>	<b>369</b>	<b>50%</b>
<b>Total Volume Per Acre:</b>	<b>100.0%</b>	<b>48</b>	<b>1,450</b>	<b>1,110</b>	<b>24</b>	<b>1</b>	<b>0</b>	<b>31</b>	<b>83</b>	<b>1,471</b>	<b>56%</b>
<b>Stand Volume:</b>		<b>5,275</b>	<b>160,924</b>	<b>123,155</b>	<b>2,668</b>	<b>111</b>	<b>0</b>	<b>3,467</b>	<b>9,203</b>	<b>163,265</b>	

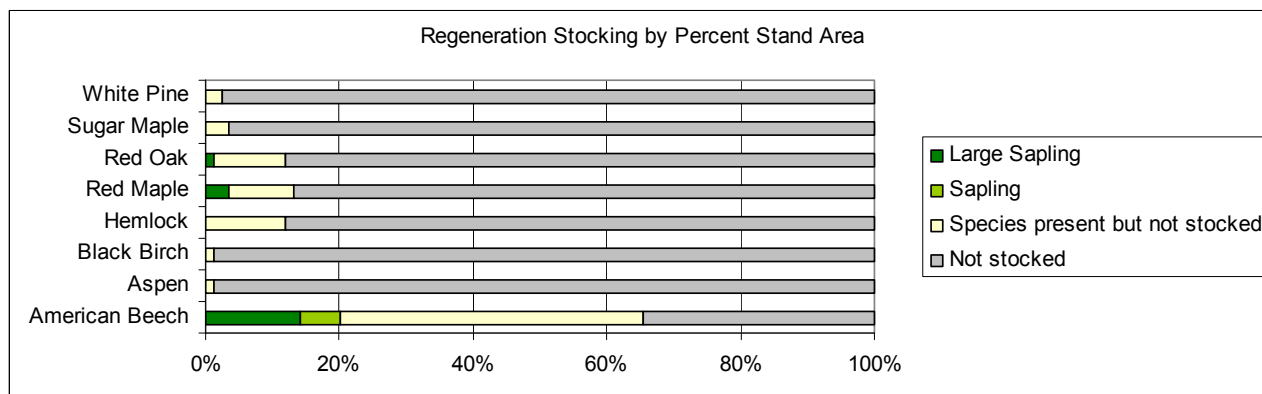
Table 1.3: Stand volume by species and product per acre values.

Graph 1.1a and 1.1b: Diameter distribution showing trees per acre on the Y axis, diameter class on the X axis and tree condition. Includes trees in all canopy positions down to 2 inches in diameter. 1.1b provides a close-up of the breakdown in the larger diameter classes.

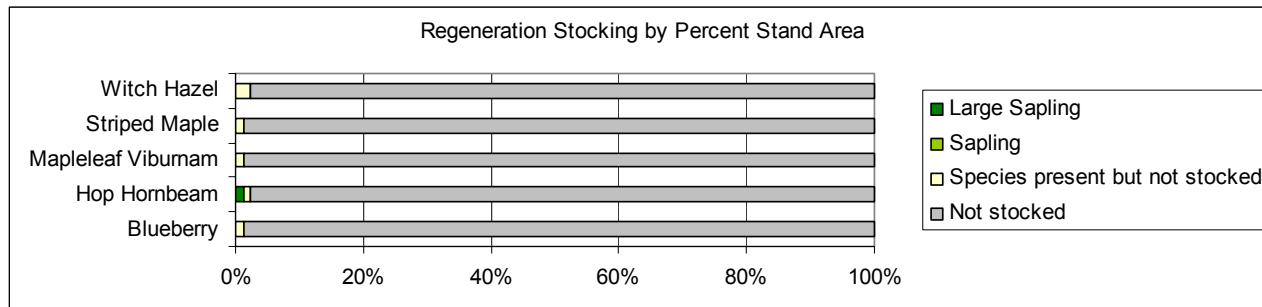




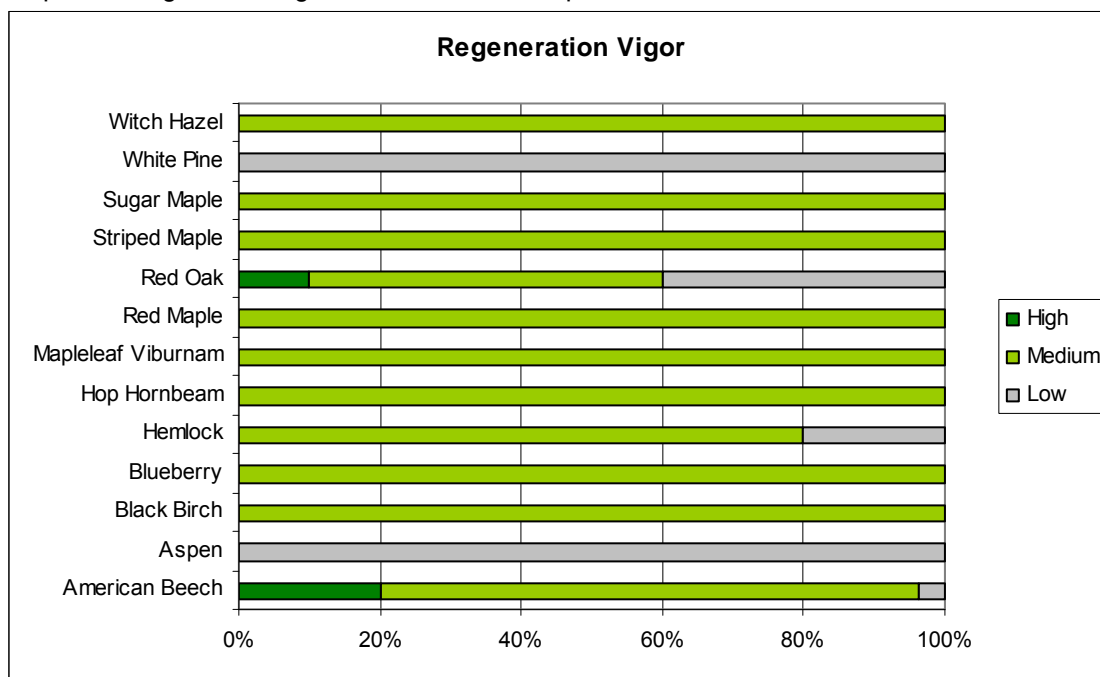
Graph 1.2: Regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter (Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less than 3 feet tall (Seedling). If a species is present but does not meet one of these conditions, it is recorded as present but not stocked.



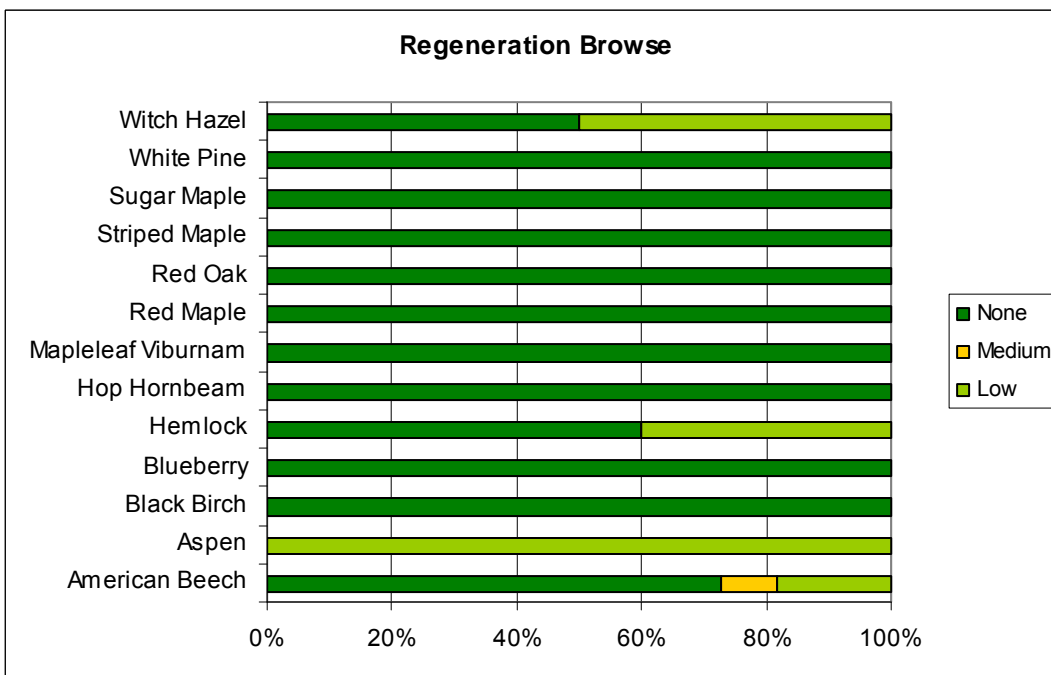
Graph 1.3: Shrub and competing species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter (Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less than 3 feet tall (Seedling). If a species is present but does not meet one of these conditions, it is recorded as present but not stocked.



Graph 1.4: Vigor of all regeneration and shrub species.



Graph 1.5: Browse level of all regeneration and shrub species.



### Silvicultural Objectives

Management system:	Convert to Multiple-aged
Harvest Entry:	15-20 years
Products:	Hemlock, pine and hardwood sawlogs, pulpwood, cordwood
Desired Composition:	Favor Red oak, white pine
Crop tree target diameter:	WP 20"                      HE 18" RO 20"

### Operational Considerations

Operability:	Operable; avoid wetlands
Seasonal limitations:	best summer or winter;
Terrain:	some boulders; some exposed ledge; avoid wet pockets
Access and landing area:	Good access, need to establish landing site
Access distance:	Up to 3/4 mile
General maintenance:	minor upgrading of truck roads; establish landing
Brook-wetland crossings/buffer requirements:	Ferrin Pond Brook crossings likely avoidable north of road, small intermittent brook below powerline crossing needed

## STAND SUMMARY AND 10-YEAR MANAGEMENT SCHEDULE

**Stand 1** is a true mixed-forest type, dominated by a mixture of hemlock, white pine, red oak, red maple, black birch, and American beech. This land was primarily used as pasture until roughly the beginning of last century when they were abandoned and allowed to reforest. The soils tend to be moderately well-drained to well drained and are generally stony, sandy loams of medium nutrient levels, meaning they support best growth of oaks, pines and birch rather than more nutrient demanding hardwood species such as sugar maple and white ash.

The hemlock and red maple are generally located in the lower, moister areas, while the pine, beech, birch and oak on the heights and mid slopes of the better drained portions. The natural community type is hemlock-beech-oak-pine, which is well represented in both the canopy and understory species.

While the oak is only 5.8% of the trees per acre, it represents almost half of the quality sawtimber volume per acre. About 10-15% of the oak sawtimber is in a "high risk" state, either in trees that are nearing or at maturity or are showing signs of heart rot, locally known as "spider heart". The hemlock is generally of poor quality and the pine is variable, with about half of the pine sawtimber found in acceptable growing stock trees. The rest of the volume is mixed hardwood, and is of quality typical for that species with the exception of the beech. The beech is of higher quality than compared to areas outside this region, due to either a general resistance to beech bark disease or due to a low presence of the disease. As a general rule, the quality of all species declines somewhat as you climb in elevation, with typically shallower soils found at the higher, drier sites.

The stocking ranges from overstocked to fully stocked, with a few scattered more open

pockets mainly due to windfall. There is a fair stocking of pole-sized mid-to-low canopy trees, dominated by hemlock and beech but with a few pockets of birch as well.

Regeneration is dominated by beech and in places is very dense. Red maple is fairly common as well. Oak shows up consistently through the stand, and likely would regenerate successfully with a well-timed harvest during an oak seed year. Unlike other forests in the area, browse levels of the regeneration here are tolerable.

The long-term goal of management in this stand is to develop several age classes of quality sawtimber trees of species well suited to the site, particularly white pine and red oak, and to a lesser extent black birch. The age classes will exist primarily as pockets of similarly aged trees mixed throughout the stand. This multiple-age composition will provide a diversity of forest structure beneficial to wildlife and will provide opportunity for a mix of silvicultural operations. The current species composition reflects the natural species mix and likely will not significantly change over time with the exception of a decrease in the white pine component, unless it can be successfully regenerated.

**Silviculture:** The focus of management here will be to harvest mature, diseased, and poor quality overstory trees in groups, patches and singly to release pockets of existing regeneration and understory stock and to create regeneration where none exists. The group and patch openings will range from a few trees to possibly over an acre in size if necessary to release regeneration or where a large pocket of poor quality overstory trees exist.

In addition, crop tree release in between the groups and patches to release desirable crop trees on at least 2 to preferably three sides. If releasing oak for crop trees, attempt to leave bole shade on the south and west side to prevent epicormic sprouting.

**Stand 1a/1b: 2016**

**Stand 1c: 2018**

**Reduce basal area to approximately 90 to 100 square feet through:**

- **Crop tree release** on the best quality and vigor stems. Strive to release 15-20 crop trees on at least 2 sides per acre.
- **Group selection and Patch Cut** release pockets of pole-sized hardwood and existing regeneration. Also use group selection and patch cuts to remove pockets of poor quality stems and encourage regeneration.
- **Scarify soil** in openings to benefit white pine regeneration.
- **Time harvest** with a red oak and/or white pine seed year.

**Wildlife:** Wildlife habitat here will become more diverse as a multiple age structure is developed.

White-tailed deer and moose browse the limited areas with hardwood and hemlock saplings. Any treatments that promote hardwood regeneration will likely benefit deer, moose and rabbits by providing better browse opportunities. Multiple age classes help to ensure there is always a level of browse for wildlife. Specific wildlife habitat improvements will include retaining hard mast producing hardwoods; retaining beech trees with evidence of bear use; creating hardwood browse especially in areas with low-valued or poor vigor trees; creating standing snag trees by girdling some large white pine with no commercial value; creating down woody debris by felling and leaving some large white pine on the forest floor.

- Create additional large snag trees by girdling up to 5 trees >18" in diameter per acre.
- Create additional down logs by felling up to 5 trees > 18" in diameter per acre.
- Maintain existing snags and large down logs.
- Maintain 1/4-acre to 1/2-acre areas with dense hemlock in the overstory for winter cover.



**Stand 2     Beech-Red Oak-Hemlock 234A/Beech 12B****25.2 acres**

Stand Structure



Stand Structure



Forest Canopy

**GENERAL ATTRIBUTES**

Natural Community Type:	Beech forest
Past Management History:	Harvest +/- 25 years ago
Approximate Age of Dominant Trees:	70-90 years old
Stand Health:	Generally good
Insects/Damage/Disease:	Beech bark disease (variable); some heart rot in older red oaks

**SITE CONDITIONS**

Determined by:	Soils map & field observation
Tree vigor:	Average
Soils:	Monadnock stony fine sandy loam; Becket stony fine sandy loam; Skerry stony fine sandy loam
Drainage:	Moderately well drained to well drained
Terrain:	Gradual to moderate slope
Aspect:	East-southeast

**Snags Per Acre**

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"				
12-18"	2.3	2.7		5.1
>18"		1.3	0.7	2.0
<b>Grand Total</b>	<b>2.3</b>	<b>4.0</b>	<b>0.7</b>	<b>7.0</b>

Table 2.1: Standing dead trees per acre by size and decay class.

**Down Logs Per Acre**

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"				
12-18"				
>18"				
<b>Grand Total</b>				<b>0</b>

Table 2.2: Standing down logs per acre by size and decay class.

**WILDLIFE HABITAT**

Forest type:	Hardwood, beech dominated
Vertical diversity:	Medium
Vegetative diversity:	Medium to low
Hard mast:	Beech nuts, acorns, birch seed
Soft mast:	--
Special habitat features:	Beech dominated forest
Snag trees:	Fair amount medium and large diameter
Down logs:	None tallied
Special wildlife practices:	Maintain beech stand for mast production/bear habitat

**RECREATION**

Recreational features:	Hiking trail system
Recreational infrastructure:	Trail blazes, interpretative trail, map
Aesthetic resources:	Scattered groups of large old beech, some cavity trees
Public access:	Open, no wheeled vehicles

**SILVICULTURE****Structural and Silvicultural Attributes**

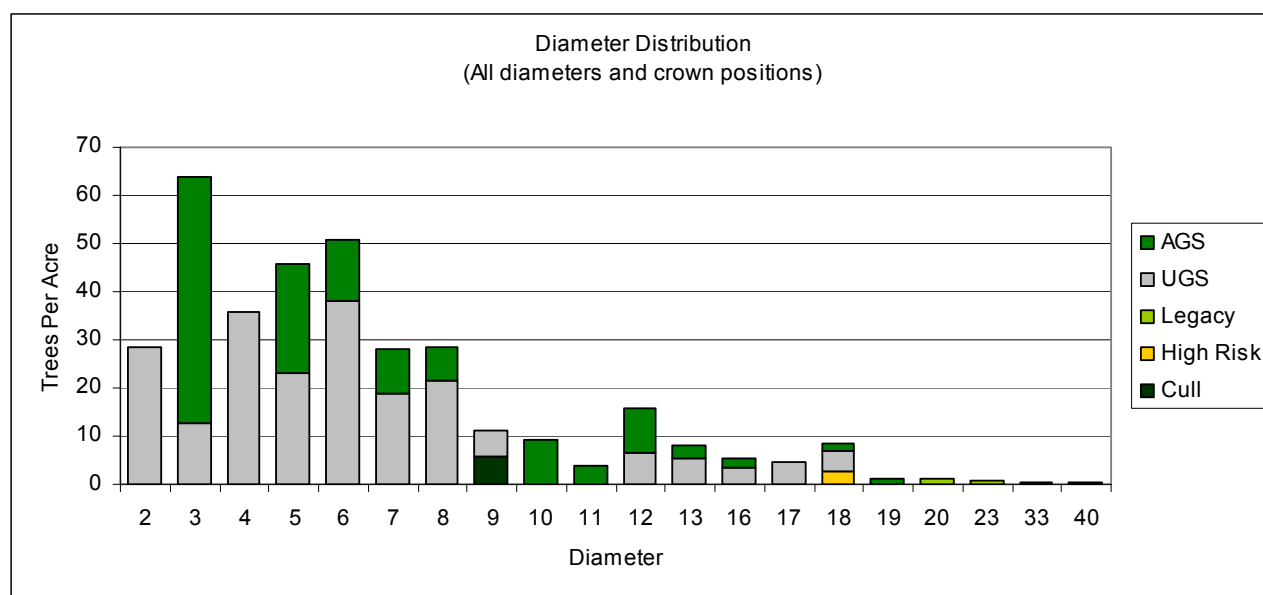
Broad Forest Type:	H34A/H12B
Size Class:	Small to large sawtimber over sapling and pole size
Stand Structure:	Becoming multiple-aged
Crown Closure:	90%
Total Basal Area Per Acre:	116
Total Merchantable Basal Area Per Acre:	109
Total Acceptable Basal Area Per Acre:	38
Trees Per Acre:	353
Quadratic Mean Stand Diameter:	7.8
Percent AGS Sawtimber:	45.8%
Basal Area of AGS Sawlogs:	20
Timber Quality:	Variable- poor to good

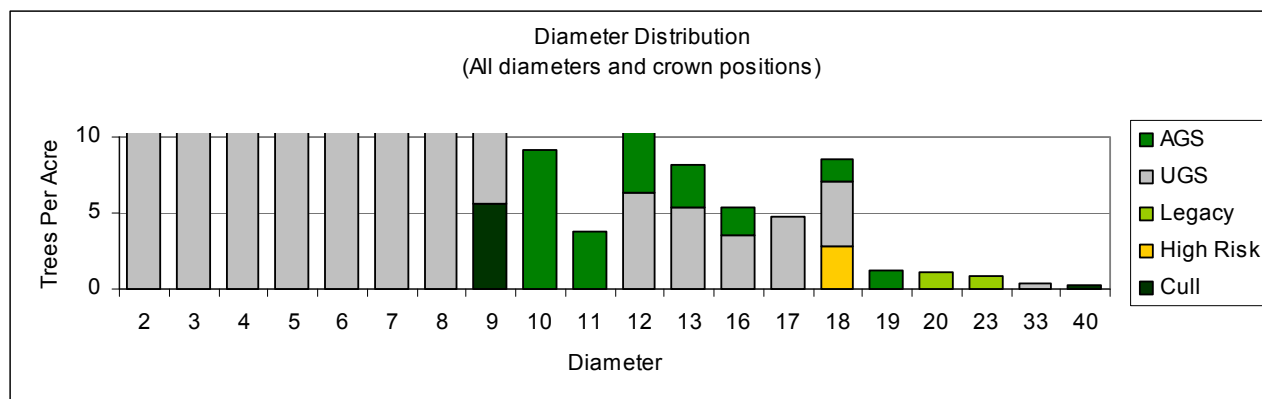
**Forest Composition and volume**

Species	% TPA	Veneer (bf)	Sawlog (bf)	Pallet/Tie (bf)	Pulp (cd)	Growing Stock (cd)	Legacy (cd)	Total Volume in Cords	High Risk	AGS Saw	% AGS Saw
American Beech	33.4%	0	658	251	8.1	0.0	0.0	10.1	0	398	44%
Black Birch	23.7%	0	96	0	2.3	0.3	0.0	2.8	0	96	100%
Red Maple	8.7%	0	0	0	1.2	0.0	0.0	1.2	0	0	0%
Red Oak	12.3%	122	1,289	432	2.7	0.4	0.0	6.3	435	900	49%
Sugar Maple	7.2%	0	0	0	0.3	0.0	0.0	0.3	0	0	0%
White Birch	7.1%	0	109	84	0.8	0.0	0.0	1.2	0	0	0%
<b>Total Hardwood Per Acre:</b>	<b>92.5%</b>	<b>122</b>	<b>2,152</b>	<b>767</b>	<b>15.3</b>	<b>0.7</b>	<b>0.0</b>	<b>21.8</b>	<b>435</b>	<b>1,393</b>	<b>46%</b>
Hemlock	7.3%	0	0	0	0.2	0.0	0.0	0.2	0	0	0%
White Pine	0.2%	0	0	0	0.6	0.0	0.0	0.8	0	0	0%
<b>Total Softwood Per Acre:</b>	<b>7.5%</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.8</b>	<b>0.0</b>	<b>0.0</b>	<b>1.0</b>	<b>0</b>	<b>0</b>	<b>0%</b>
<b>Total Volume Per Acre:</b>	<b>100.0%</b>	<b>122</b>	<b>2,152</b>	<b>767</b>	<b>16.1</b>	<b>0.7</b>	<b>0.0</b>	<b>22.8</b>	<b>435</b>	<b>1,393</b>	<b>46%</b>
<b>Stand Volume:</b>		<b>3,079</b>	<b>54,226</b>	<b>19,331</b>	<b>406</b>	<b>18</b>	<b>0</b>	<b>574</b>	<b>10,969</b>	<b>35,116</b>	

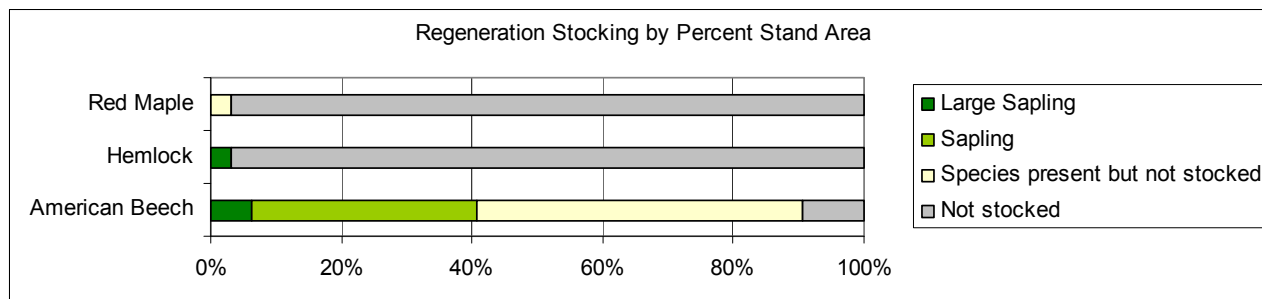
Table 2.3: Stand volume by species and product per acre values.

Graph 2.1a and 2.1b: Diameter distribution showing trees per acre on the Y axis, diameter class on the X axis and tree condition. Includes trees in all canopy positions down to 2 inches in diameter. 2.1b provides a close-up of the breakdown in the larger diameter classes.

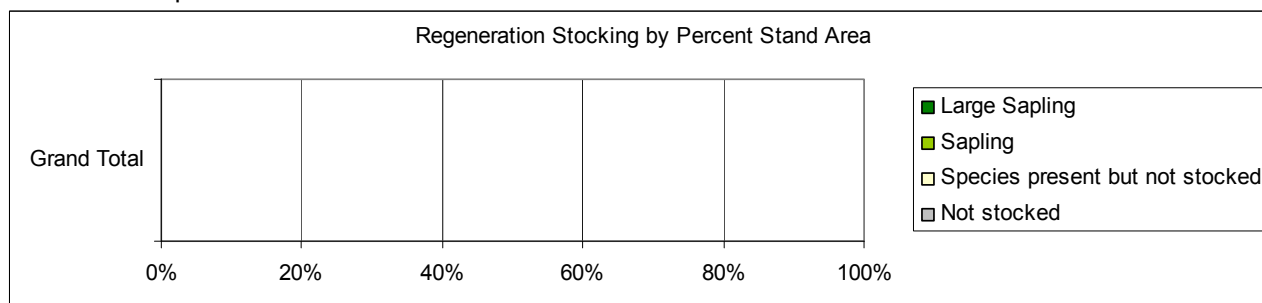




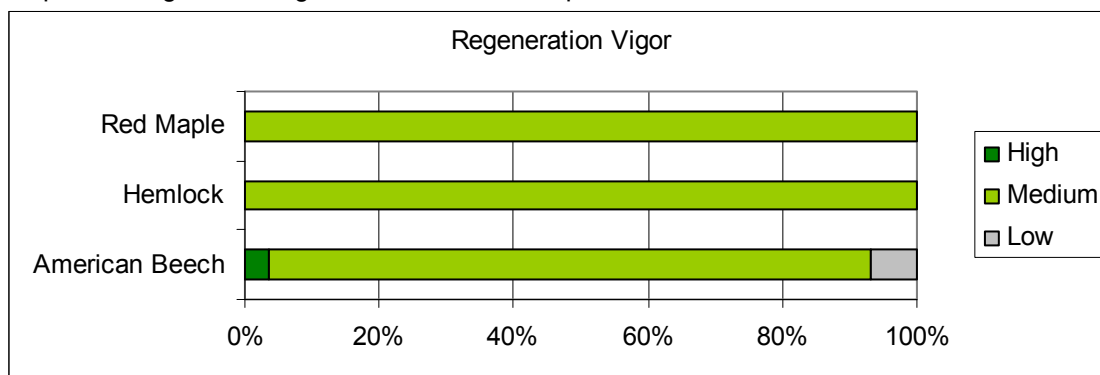
Graph 2.2: Regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter (Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less than 3 feet tall (Seedling). If a species is present but does not meet one of these conditions, it is recorded as present but not stocked.



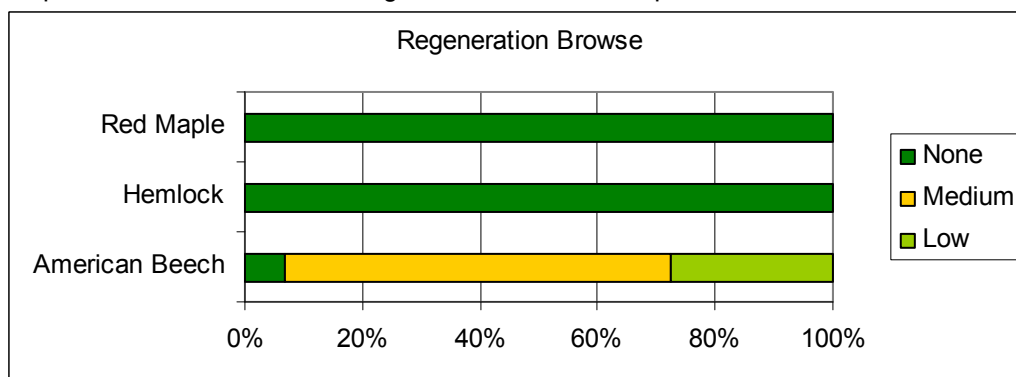
2.3: Shrub and competing species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter (Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less than 3 feet tall (Seedling). If a species is present but does not meet one of these conditions, it is recorded as present but not stocked.



Graph 2.4: Vigor of all regeneration and shrub species.



Graph 2.5: Browse level of all regeneration and shrub species.



### Silvicultural Objectives

Management system:	Convert to multiple age
Harvest Entry:	15 years
Products:	Hardwood sawtimber, chips, and firewood
Desired Composition:	Maintain beech and oak
Crop tree target diameter:	BE 20"                      RO 20"

### Operational Considerations

Operability:	Operable
Seasonal limitations:	Avoid spring and fall mud season
Terrain:	Moderate slope
Access and landing area:	Good access, need to establish landing site
Access distance:	Up to ½ mile
General maintenance:	Minor upgrading of truck roads; establish landing
Brook-wetland crossings/buffer requirements:	Ferrin Pond Brook crossings likely avoidable

## **STAND SUMMARY AND 10-YEAR MANAGEMENT SCHEDULE**

**Stand 2** is a hardwood stand dominated by beech, black birch and red oak. The soils here are somewhat richer than the surrounding site. The beech is fairly impressive on this site, with pockets of pure beech that appear largely resistant to the common beech bark disease, a fortunate characteristic of forests in this region. Because of fairly regular and substantial mast production (beech nuts), this stand provides quality wildlife habitat, especially for black bear who feed heavily on beech nuts during beech mast years.

The oak growing here is of good quality, with scattered veneer quality stems. On average there is about 1,400 feet of quality oak sawtimber per acre.

The stocking ranges from overstocked to fully stocked, with a fair amount of beech regeneration mainly in pockets.

The long-term goal of management in this stand is to develop several age classes of quality sawtimber trees of species well suited to the site, particularly red oak, and to a lesser extent black birch while maintaining a healthy beech population. The age classes will exist primarily as pockets of similarly aged trees mixed throughout the stand. This multiple-age composition will provide a diversity of forest structure beneficial to wildlife and will provide opportunity for a mix of silvicultural operations.

**Silviculture:** The focus of management here will be to harvest mature overstory trees, especially lower quality stems, remove poor quality/damaged/diseased midstory stems, and release existing regeneration. Additionally, where regeneration does not exist, attempt to create conditions conducive to regenerating red oak, while maintaining a healthy beech population. Crop tree release between these groups and patches to release desirable crop trees on at least 2 sides, focusing on quality oak. Attempt to time harvest with a red oak seed year.

### **Stand 2: 2016**

#### **Reduce basal area to approximately 70-90 square feet through:**

- **Crop tree release** on the best quality and vigor stems, focusing on healthy beech and red oak. Strive to release 15-20 crop trees on at least 2 sides per acre.
- **Group selection** to release pockets of pole-sized hardwood and existing regeneration focusing on removing mature/diseased/damaged/low vigor overstory trees. Leave pockets of beech that appear healthy. Also use group selection to remove pockets of poor quality stems and encourage regeneration.
- **Improve beech population** by "half girdling" diseased beech to hasten its decline while reducing its ability to sprout. Encourage mast production and sprouting of healthy trees by releasing crowns on 2 to 3 sides.
- **Time harvest** with a red oak seed year.

**Wildlife:** Wildlife habitat here will become more diverse as a multiple age structure is developed. The significant amount of beech in this stand provides an excellent source of food during mast (seed) years. Any treatments that promote hardwood regeneration will likely benefit deer, moose and rabbits by providing better browse opportunities. Multiple age classes help to ensure there is always a level of browse for wildlife. Specific wildlife habitat improvements will include retaining hard mast producing hardwoods; retaining beech trees with evidence of bear use; creating hardwood browse especially in areas with low-valued or poor vigor trees; creating standing snag

trees by girdling some large white pine with no commercial value; creating down woody debris by felling and leaving some large white pine on the forest floor.

- Create additional down logs by felling up to 5 trees > 18" in diameter per acre.
- Maintain existing snags and large down logs.
- Maintain healthy beech population for mast.

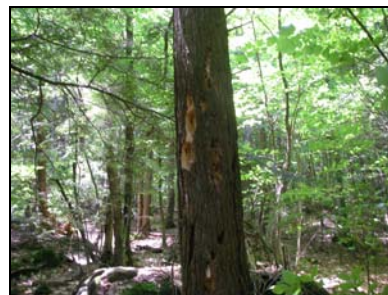


**Stand 3 Hemlock-White Pine-Red Maple4A****9.0 acres**

Stand Structure



Stand Structure



Forest Canopy

**GENERAL ATTRIBUTES**

Natural Community Type:	Hemlock-white pine forest
Past Management History:	No recent management
Approximate Age of Dominant Trees:	70-90 years old
Stand Health:	Good
Insects/Damage/Disease:	No serious problems noted

**SITE CONDITIONS**

Determined by:	Soil map and onsite observation
Tree vigor:	Moderate
Soils:	Becket stony fine sandy loam; Skerry stony fine sandy loam; Monadnock stony fine sandy loam
Drainage:	Moderately well drained
Terrain:	Flat to gentle slope
Aspect:	Variable

**Snags Per Acre**

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"				
12-18"			6.2	6.2
>18"				
<b>Grand Total</b>			<b>6.2</b>	<b>6.2</b>

Table 3.1: Standing dead trees per acre by size and decay class.

**Down Logs Per Acre**

<b>DBH Class</b>	<b>Moderately punky</b>	<b>Punky throughout</b>	<b>Sound</b>	<b>Grand Total</b>
<12"				
12-18"				
>18"				
<b>Grand Total</b>				<b>0</b>

Table 3.2: Standing down logs per acre by size and decay class.

**WILDLIFE HABITAT**

Forest type:	Hemlock-Pine
Vertical diversity:	Medium to low
Vegetative diversity:	Medium to low
Hard mast:	Pine seed; beech nuts
Soft mast:	None
Special habitat features:	Maturing hemlock and pine forest surrounding Ferrin Pond
Snag trees:	Fair amount
Down logs:	None tallied
Special wildlife practices:	Maintain 65-70% canopy cover as buffer to Ferrin Pond

**RECREATION**

Recreational features:	Hiking trail system; access to Ferrin Pond
Recreational infrastructure:	Trail blazes, interpretative trail, map
Aesthetic resources:	Maturing hemlock and pine surrounding Ferrin Pond
Public access:	Open, no wheeled vehicles

**SILVICULTURE****Structural and Silvicultural Attributes**

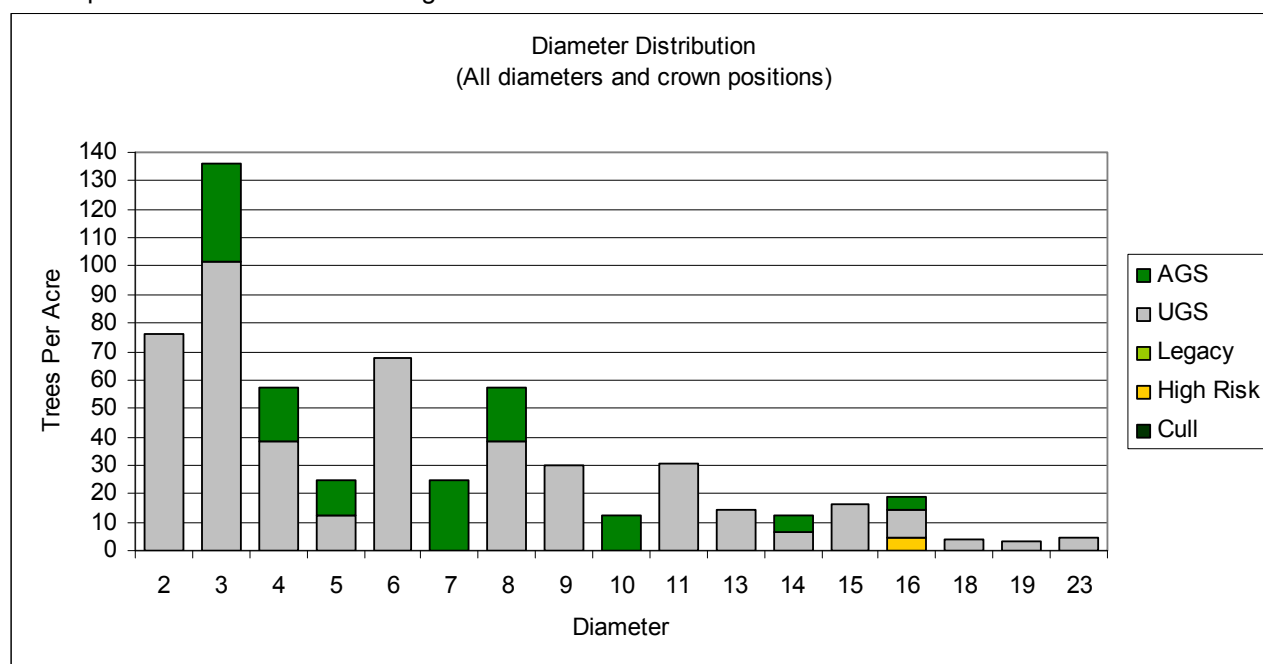
Broad Forest Type:	SH4A
Size Class:	Large sawtimber
Stand Structure:	Evenaged
Crown Closure:	95%
Total Basal Area Per Acre:	197
Total Merchantable Basal Area Per Acre:	183
Total Acceptable Basal Area Per Acre:	38
Trees Per Acre:	591
Quadratic Mean Stand Diameter:	7.8
Percent AGS Sawtimber:	39.8%
Basal Area of AGS Sawlogs:	13
Timber Quality:	Fair

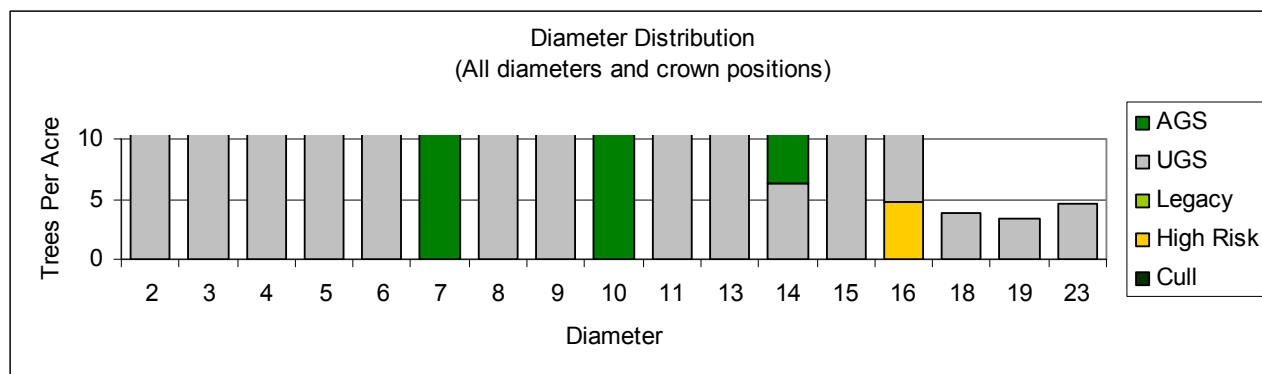
**Forest Composition and volume**

Species	% TPA	Veneer (bf)	Sawlog (bf)	Pallet/Tie (bf)	Pulp (cd)	Growing Stock (cd)	Legacy (cd)	Total Volume in Cords	High Risk	AGS Saw	% AGS Saw
American Beech	14.8%	0	0	0	1.7	0.0	0.0	2.7	0	0	0%
Red Maple	8.9%	0	0	0	3.6	0.0	0.0	3.6	0	0	0%
Red Oak	2.7%	0	317	246	1.7	0.0	0.0	3.7	317	0	0%
White Birch	16.5%	0	0	0	2.9	0.0	0.0	2.9	0	0	0%
<b>Total Hardwood Per Acre:</b>	<b>43.0%</b>	<b>0</b>	<b>317</b>	<b>246</b>	<b>9.9</b>	<b>0.0</b>	<b>0.0</b>	<b>12.9</b>	<b>317</b>	<b>0</b>	<b>0%</b>
Hemlock	27.8%	0	623	0	21.4	0.0	0.0	23.1	0	623	100%
Red Spruce	6.4%	0	245	0	1.6	0.0	0.0	2.2	0	0	0%
White Pine	22.8%	0	1,329	0	10.3	2.8	0.0	15.4	0	476	36%
<b>Total Softwood Per Acre:</b>	<b>57.0%</b>	<b>0</b>	<b>2,197</b>	<b>0</b>	<b>33.3</b>	<b>2.8</b>	<b>0.0</b>	<b>40.6</b>	<b>0</b>	<b>1,100</b>	<b>50%</b>
<b>Total Volume Per Acre:</b>	<b>100.0%</b>	<b>0</b>	<b>2,515</b>	<b>246</b>	<b>43</b>	<b>3</b>	<b>0</b>	<b>54</b>	<b>317</b>	<b>1,100</b>	<b>40%</b>
<b>Stand Volume:</b>		<b>0</b>	<b>22,633</b>	<b>2,216</b>	<b>389</b>	<b>25</b>	<b>0</b>	<b>482</b>	<b>2,855</b>	<b>9,897</b>	

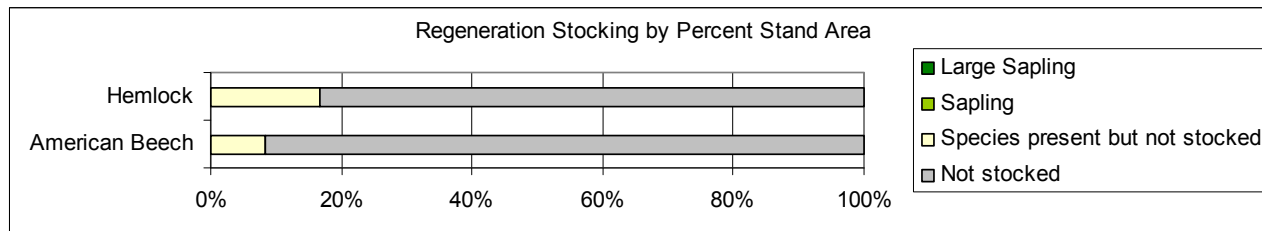
Table 3.3: Stand volume by species and product per acre values.

Graph 3.1a and 3.1b: Diameter distribution showing trees per acre on the Y axis, diameter class on the X axis and tree condition. Includes trees in all canopy positions down to 2 inches in diameter. 3.1b provides a close-up of the breakdown in the larger diameter classes.

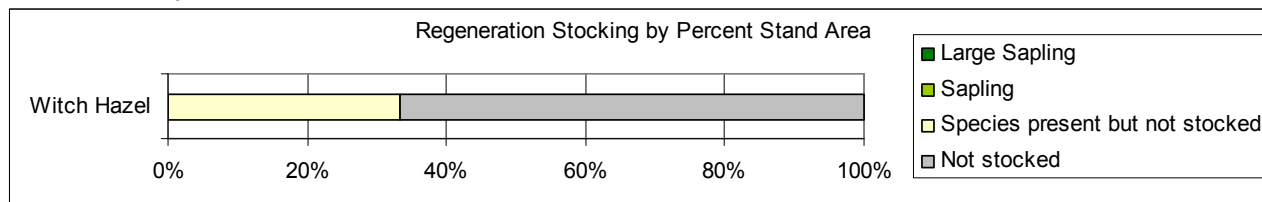




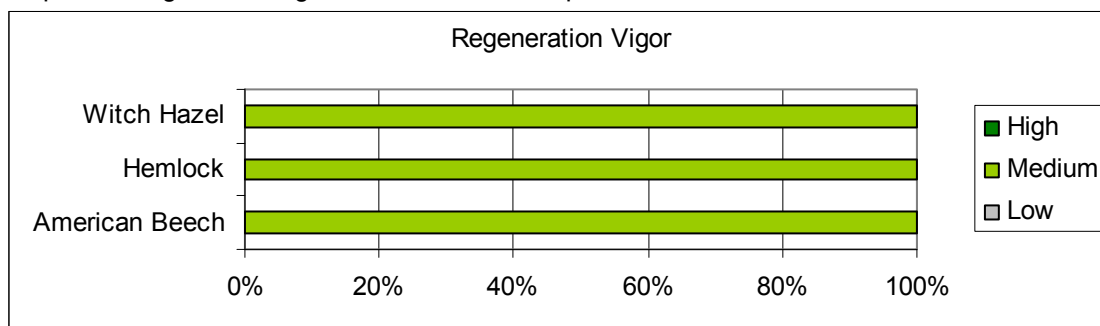
Graph 3.2: Regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter (Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less than 3 feet tall (Seedling). If a species is present but does not meet one of these conditions, it is recorded as present but not stocked.



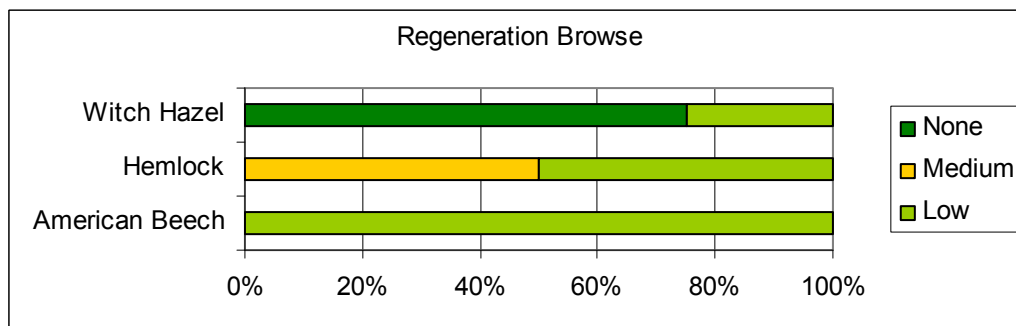
Graph 3.3: Shrub and competing species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter (Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less than 3 feet tall (Seedling). If a species is present but does not meet one of these conditions, it is recorded as present but not stocked.



Graph 3.4: Vigor of all regeneration and shrub species.



Graph 3.5: Browse level of all regeneration and shrub species.



### Silvicultural Objectives

Management system:	Leave as pond buffer; may work edges when working in adjacent stands
Harvest Entry:	15-20 years
Products:	Pine and hemlock sawtimber and pulp/chips
Desired Composition:	Maintain dense pine and hemlock
Crop tree target diameter:	WP - 26"+                      HE - 24"+

### Operational Considerations

Operability:	Operable on outside edges
Seasonal limitations:	Avoid wet spring and fall
Terrain:	Gentle; rocky
Access and landing area:	Use Stand 1
Access distance:	Use Stand 1
General maintenance:	Use Stand 1
Brook-wetland crossings/buffer requirements:	Only lightly thin on outside edges leaving stand primarily to serve as a buffer to Ferrin Pond. Single tree selection removal only.

## **STAND SUMMARY AND 10-YEAR MANAGEMENT SCHEDULE**

**Stand 3** is the dense hemlock and white pine that surrounds Ferrin Pond. This forest type commonly borders ponds and lakes. Though it has a fair amount of pine sawtimber, its value as a buffer to the pond to protect water quality combined with its use as a wildlife corridor surrounding the pond largely overrides its economic potential, but does not eliminate it. Lightly managing this stand from the edges while working in adjacent stands will be compatible to its value at a buffer.

Though this stand is largely dominated by white pine and hemlock, there is a fair amount of hardwoods mixed in, mainly beech and white birch. Regeneration is sparse, including occasional shade tolerant hemlock and beech seedlings or small saplings.

The long-term goal of management in this stand is to maintain dense forest cover, though not necessarily limited to overstory trees, giving preferential treatment to pine, hemlock and scattered beech. Aesthetics have a high level of importance when this stand is viewed from the water and from the trail that circumnavigates the pond. Large, old, hemlock and white pine should be managed for throughout the stand. Release healthy, large, old pine and hemlock if needed to become super-canopy trees.

**Silviculture:** The focus of management here will be to maintain dense forest cover with large, old white pine and hemlock scattered throughout. This will largely be done through single tree selection, with some small groups to regenerate pine if it becomes necessary.

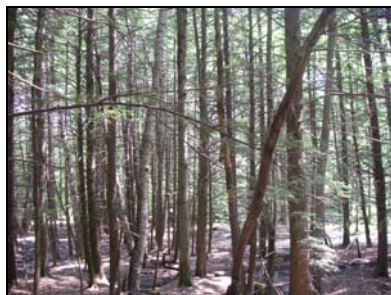
### **Stand 3a/3b: 2016**

When working in adjacent Stand 1, remove single trees to promote vigorous growth and dense forest conditions. Allow pine and hemlock scattered throughout the stand to grow very large and old, for aesthetics and diversity. Maintain 65-70% canopy cover through:

- **Single Tree Selection:** Remove single trees to increase vigor of residual trees and to promote regeneration of shade tolerant species.
- If Pine overstory trees are in decline, **small group openings** and scarified soil should be made to promote regeneration of pine. Time harvest with pine seed year.

**Wildlife:** Wildlife habitat is limited primarily to softwood cover, with few browse opportunities. Retaining large snags will enhance the vertical structure of the stand, and offer perching spots for raptors. Specific wildlife habitat improvements will include retaining hard mast producing hardwoods and maintaining some large pockets of softwood overstory cover.

- Maintain existing snags and large down logs
- Maintain perch sites for predator birds over Ferrin Pond
- Maintain 65-70% canopy cover for wildlife corridor around pond

**Stand 4 Hemlock-Red Maple-White Pine 3B****35.6 acres**

Stand Structure



Stand Structure



Forest Canopy

**GENERAL ATTRIBUTES**

Natural Community Type:	Hemlock-beech-oak-pine forest
Past Management History:	Harvest +/-15-20 years ago
Approximate Age of Dominant Trees:	70-90 years old
Stand Health:	Generally good
Insects/Damage/Disease:	Some red rot and weevil damage to white pine

**SITE CONDITIONS**

Determined by:	Soil map & onsite observation
Tree vigor:	Medium
Soils:	Lyme stony loam; Monadnock stony fine sandy loam; Skerry stony fine sandy loam
Drainage:	Moderately well drained to somewhat poorly drained
Terrain:	Gentle rolling slope
Aspect:	East

**Snags Per Acre**

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"				
12-18"			1.6	1.6
>18"	0.4			0.4
<b>Grand Total</b>	<b>0.4</b>		<b>1.6</b>	<b>2.1</b>

Table 4.1: Standing dead trees per acre by size and decay class.

**Down Logs Per Acre**

<b>DBH Class</b>	<b>Moderately punky</b>	<b>Punky throughout</b>	<b>Grand Total</b>
<12"	7.5	5.7	13.2
12-18"	1.9	1.3	3.1
<b>Grand Total</b>	<b>9.4</b>	<b>7.0</b>	<b>16.4</b>

Table 4.2: Standing down logs per acre by size and decay class.

**WILDLIFE HABITAT**

Forest type:	Mixedwood hemlock red maple forest
Vertical diversity:	Medium
Vegetative diversity:	Medium
Hard mast:	Small amount beech nut, acorn and pine seed
Soft mast:	Blueberry
Special habitat features:	Stand adjacent to large wetland to the east and borders small beaver flow to west Some good large, cavity trees present, but need more per acre
Snag trees:	
Down logs:	Fair amount, good size distribution
Special wildlife practices:	Maintain 100' buffer of 65-70% canopy cover along wetland; create additional snags, create pockets of regeneration for shelter and browse

**RECREATION**

Recreational features:	Access to blueberries along wetland
Recreational infrastructure:	None established
Aesthetic resources:	Views to large wetland
Public access:	Open, no wheeled vehicles

**SILVICULTURE****Structural and Silvicultural Attributes**

Broad Forest Type:	SH3B
Size Class:	Small sawtimber
Stand Structure:	Evenaged
Crown Closure:	85%
Total Basal Area Per Acre:	130
Total Merchantable Basal Area Per Acre:	114
Total Acceptable Basal Area Per Acre:	54
Trees Per Acre:	549
Quadratic Mean Stand Diameter:	6.6
Percent AGS Sawtimber:	88.6%
Basal Area of AGS Sawlogs:	22
Timber Quality:	Variable, some scattered good quality oak, fair quality pine, hemlock

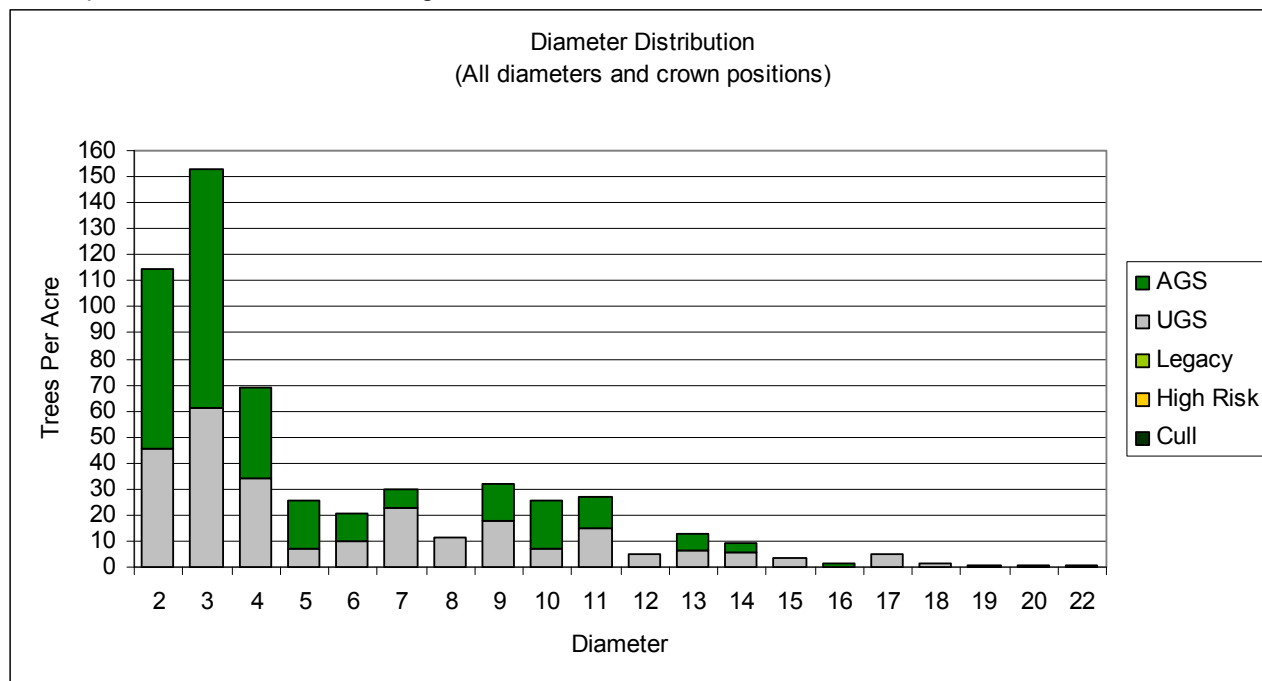


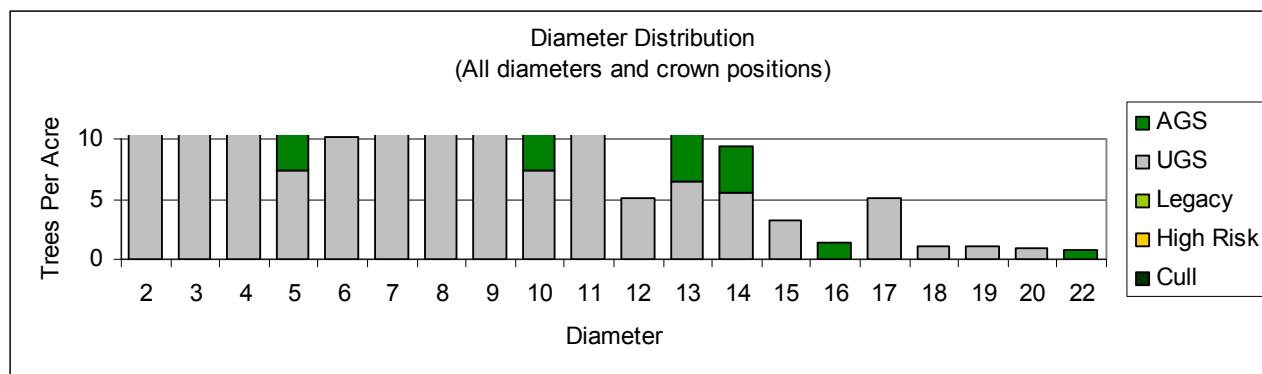
### Forest Composition and volume

Table 4.3: Stand volume by species and product per acre values.

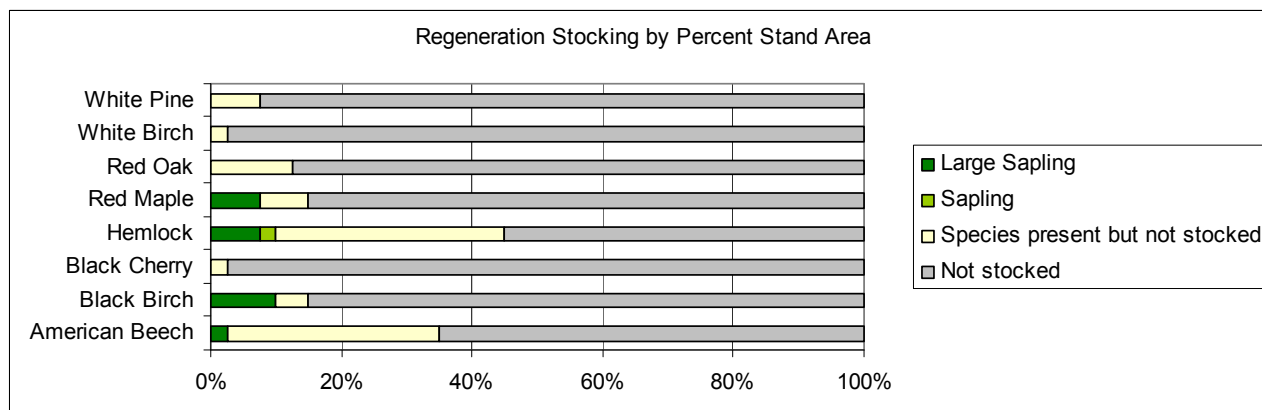
Species	% TPA	Veneer (bf)	Sawlog (bf)	Pallet/Tie (bf)	Pulp (cd)	Growing Stock (cd)	Legacy (cd)	Total Volume in Cords	High Risk	AGS Saw	% AGS Saw
American Beech	2.2%	0	0	92	1.2	0.0	0.0	1.5	0	0	0%
Black Birch	1.6%	0	0	0	0.5	0.0	0.0	0.5	0	0	0%
Red Maple	19.0%	0	0	0	3.6	0.3	0.0	3.9	0	0	0%
Red Oak	2.8%	0	0	0	0.9	0.0	0.0	0.9	0	0	0%
White Ash	2.0%	0	0	0	0.2	0.4	0.0	0.6	0	0	0%
White Birch	5.4%	0	0	0	0.2	0.0	0.0	0.2	0	0	0%
<b>Total Hardwood Per Acre:</b>	<b>33.0%</b>	<b>0</b>	<b>0</b>	<b>92</b>	<b>6.5</b>	<b>0.7</b>	<b>0.0</b>	<b>7.5</b>	<b>0</b>	<b>0</b>	<b>0%</b>
Hemlock	61.7%	0	590	0	12.9	0.0	0.0	14.0	0	517	88%
Red Pine	0.5%	0	0	0	0.6	0.0	0.0	0.6	0	0	0%
White Pine	4.7%	0	316	449	1.5	0.0	0.0	2.8	0	764	100%
<b>Total Softwood Per Acre:</b>	<b>67.0%</b>	<b>0</b>	<b>906</b>	<b>449</b>	<b>15.0</b>	<b>0.0</b>	<b>0.0</b>	<b>17.5</b>	<b>0</b>	<b>1,282</b>	<b>95%</b>
<b>Total Volume Per Acre:</b>	<b>100.0%</b>	<b>0</b>	<b>906</b>	<b>541</b>	<b>22</b>	<b>1</b>	<b>0</b>	<b>25</b>	<b>0</b>	<b>1,282</b>	<b>89%</b>
<b>Stand Volume:</b>		<b>0</b>	<b>32,238</b>	<b>19,242</b>	<b>766</b>	<b>26</b>	<b>0</b>	<b>890</b>	<b>0</b>	<b>45,622</b>	

Graph 4.1a and 4.1b: Diameter distribution showing trees per acre on the Y axis, diameter class on the X axis and tree condition. Includes trees in all canopy positions down to 2 inches in diameter. 4.1b provides a close-up of the breakdown in the larger diameter classes.

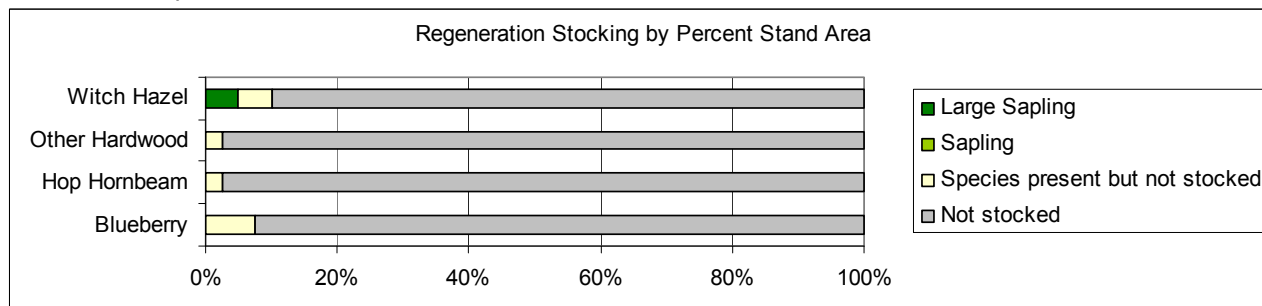




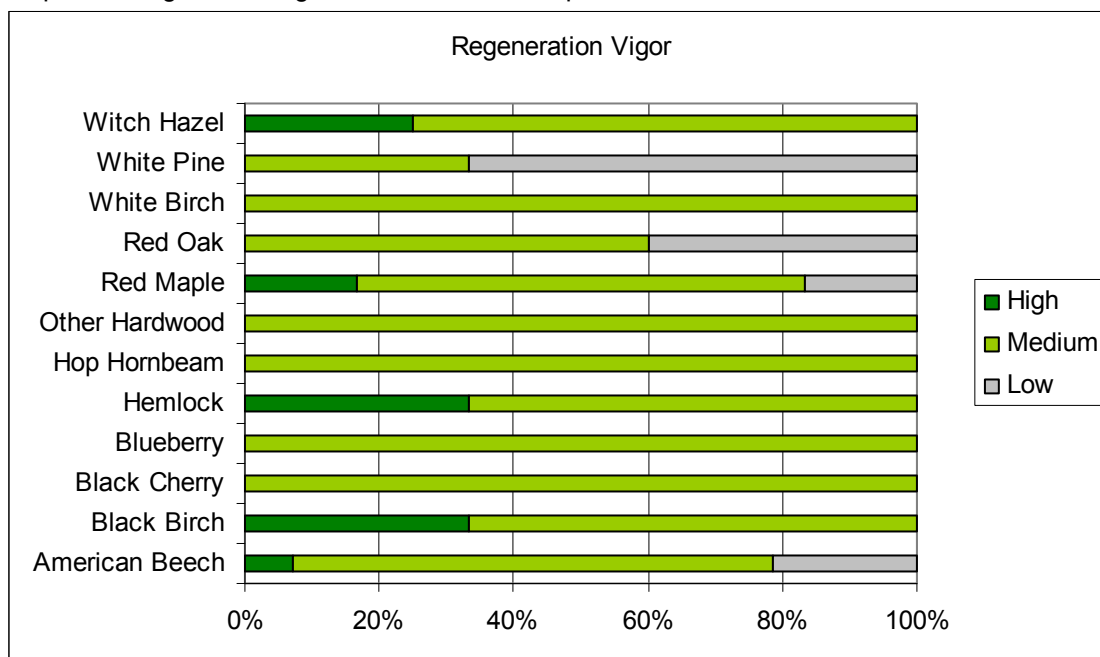
Graph 4.2: Regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter (Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less than 3 feet tall (Seedling). If a species is present but does not meet one of these conditions, it is recorded as present but not stocked.



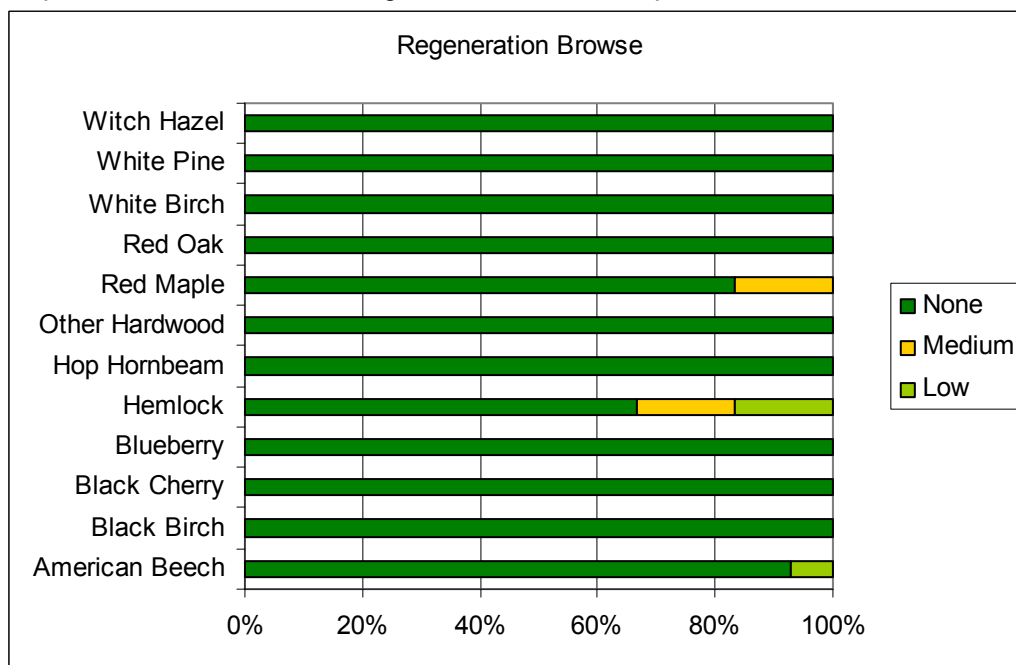
Graph 4.3: Shrub and competing species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter (Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less than 3 feet tall (Seedling). If a species is present but does not meet one of these conditions, it is recorded as present but not stocked.



Graph 4.4: Vigor of all regeneration and shrub species.



Graph 4.5: Browse level of all regeneration and shrub species.



### Silvicultural Objectives

Management system:	Convert to multiple age
Harvest Entry:	10-15 years
Products:	Hemlock and pine sawlogs and pulpwood, low quality hardwood logs and firewood
Desired Composition:	Manage for increased oak, pine and birch
Crop tree target diameter:	HE 18"                      RO 20" WP 20"

### Operational Considerations

Operability:	Operable
Seasonal limitations:	Avoid spring and fall mud season
Terrain:	Gentle slope, scattered low wet areas
Access and landing area:	Access good, need to establish landing
Access distance:	Up to 1/3 mile
General maintenance:	Minor upgrade to truck road, establish landing
Brook-wetland crossings/buffer requirements:	Small stream crossing required below powerline, small section of Stand 4 may need to cross Ferrin Pond Brook

### STAND SUMMARY AND

#### 10-YEAR MANAGEMENT SCHEDULE

**Stand 4** is similar to Stand 1, but with a stronger softwood component, primarily hemlock with some pine near the wetland edge that runs along the border. The soils here are more poorly drained, and the ground is lower in elevation with less slope. The cutting history here is different as well, with a more intensive cut about 20 years ago that appears to have focused on removing mostly pine. The residual stand is generally poor to average quality and is becoming fully stocked, though dominated by immature sawtimber and polesize trees which scattered large trees in the overstory. The timber quality here is poorer than Stand 1. It does not have the red oak component, instead has a high volume of poor quality red maple and a scattering of maturing and overmaturing white birch that is ready for removal. Black birch and scattered red oak should be encouraged through management, while maintaining this hemlock-dominated community.

Regeneration is fairly well stocked, but dominated by beech, red maple, hemlock, and black birch.

Blueberry can be found along the wetland edge that makes up the eastern border of this stand. Large pine is also scattered along this edge. To benefit wildlife, recreational, and aesthetic values the edge of the wetland should be thinned to encourage growth and fruiting of blueberries and increased growth and vigor of select large white pine. A 100 foot wide buffer of at least 65-70% canopy cover is in place to protect the wetland.

The long-term goal of management in this stand is to increase overall quality of the stand while also developing and maintaining distinct age classes of quality trees of species well suited to the site. The age classes will exist primarily as pockets of similarly aged trees mixed throughout the stand. This multiple-age composition will provide a diversity of forest structure beneficial to wildlife and will provide opportunity for a mix of silvicultural operations. The current species composition reflects the natural species mix and likely will not significantly change over time,

though silviculture will manage towards regenerating black birch, white pine and red oak where it exists.

**Silviculture:** The focus of management here will be to improve growth on the better quality trees in the overstory and midstory and create more age classes by removing groups of low value, mature or low vigor overstory and intermediate stems while thinning the residual trees for increased vigor and quality.

**Stand 4a/4b: 2018**

Reduce overall basal area to approximately 90-100 square feet through:

- **Group Selection:** Create openings of 5-10 trees to establish or release intermediate shade tolerant and intolerant regeneration. If harvest is to be done in the summer, scarifying areas with no regeneration or areas of undesirable seedlings/saplings will help promote the regeneration of light seeded individuals such as birch, hemlock, and pine.
- **Crop Tree Release:** In between groups release crop trees of high quality and vigor. Release selected crop trees on at least 2 but preferably 3 sides. This will also promote regeneration of tolerant hardwoods and hemlock.
- **Single Tree Selection:** Focus removal of maturing white birch where it exists.
- **Improvement Thinning:** Where group selection and patch cutting is not desirable, thin overstory and midstory for vigor and health.

**Wildlife:** Wildlife habitat is somewhat diverse, offering areas of dense softwood cover, some hard mast production, browse opportunities in groups, beaver activity, and riparian/wetland habitat. Any treatments that promote hardwood regeneration will likely benefit deer, moose and rabbits by providing better browse opportunities. Specific wildlife habitat improvements will include retaining hard mast producing hardwoods; increase blueberry production along wetland; and maintaining the strong softwood overstory component to provide cover.

- Maintain existing snags and large down logs.
- Release intermediate red oak to encourage acorn production
- Allow more light on blueberry bushes on edge of wetland to encourage fruit production.
- Use group selection to regenerate hemlock and white pine for future cover
- Maintain travel corridor along wetland edge

**Stand 5     Red Maple-White Pine-Beech 2A****17.8 acres**

Stand Structure



Stand Structure



Stand Structure

**GENERAL ATTRIBUTES**

Natural Community Type:	Hemlock-oak-Northern Hardwood Forest
Past Management History:	Partial harvest +/-20 years ago
Approximate Age of Dominant Trees:	Harvest overstory removal +/- 20 years ago
Stand Health:	20 years old
Insects/Damage/Disease:	Good

**SITE CONDITIONS**

Determined by:	Soil map & onsite observation
Tree vigor:	Moderate
Soils:	Peru stony loam; Marlow stony loam
Drainage:	Well drained
Terrain:	Height of land with gentle to moderate slope
Aspect:	Variable

**Snags Per Acre**

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"	0			0
12-18"				
>18"				
<b>Grand Total</b>	<b>0</b>			<b>0</b>

Table 5.1: Standing dead trees per acre by size and decay class.

**Down Logs Per Acre**

<b>DBH Class</b>	<b>Moderately punky</b>	<b>Punky throughout</b>	<b>Sound</b>	<b>Grand Total</b>
<12"	15.7			15.7
12-18"				
>18"				
<b>Grand Total</b>	<b>15.7</b>			<b>15.7</b>

Table 5.2: Standing down logs per acre by size and decay class.

**WILDLIFE HABITAT**

Forest type:	Mix of young hardwood and white pine
Vertical diversity:	Low
Vegetative diversity:	Medium
Hard mast:	Maple and ash seed
Soft mast:	None
Special habitat features:	Young early successional forest adjacent to fen
Snag trees:	None tallied
Down logs:	Few small
Special wildlife practices:	Leave 100' 65-70% canopy cover in buffer around fen

**RECREATION**

Recreational features:	None established
Recreational infrastructure:	None established
Aesthetic resources:	Old agricultural land; impressive stone walls with large, old open grown trees
Public access:	Open, no wheeled vehicles

**SILVICULTURE****Structural and Silvicultural Attributes**

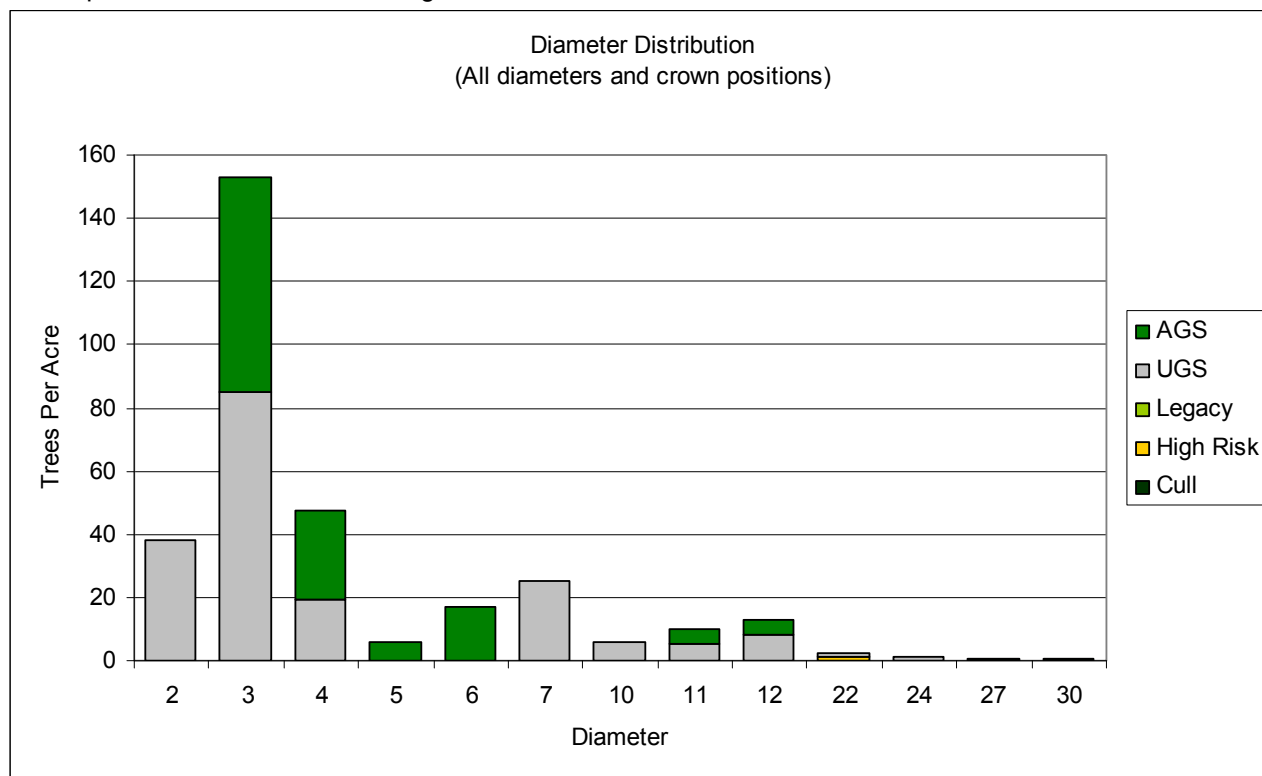
Broad Forest Type:	SH2A
Size Class:	Polesize
Stand Structure:	Evenaged
Crown Closure:	95%
Total Basal Area Per Acre:	60
Total Merchantable Basal Area Per Acre:	54
Total Acceptable Basal Area Per Acre:	17
Trees Per Acre:	321
Quadratic Mean Stand Diameter:	5.9
Percent AGS Sawtimber:	40.4%
Basal Area of AGS Sawlogs:	7
Timber Quality:	Fair to poor

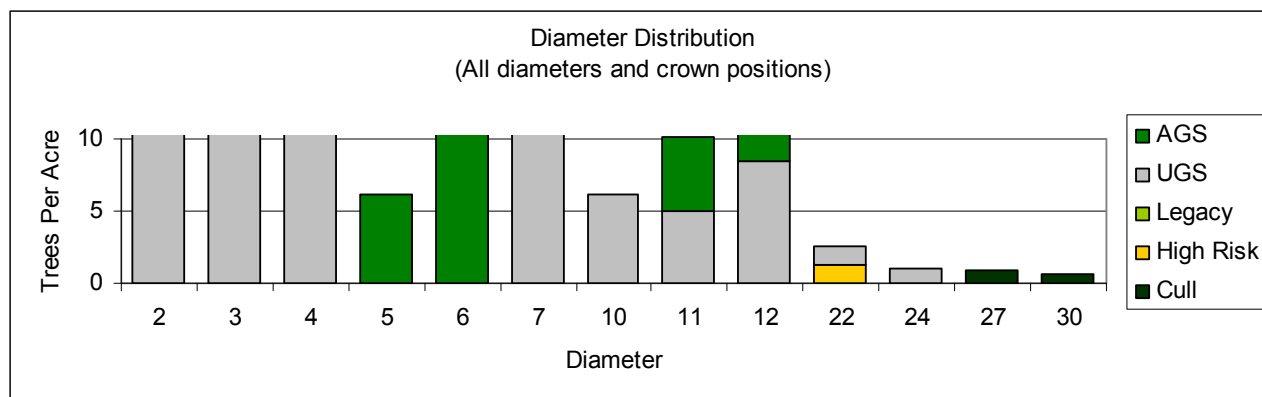
**Forest Composition and volume**

Species	% TPA	Veneer (bf)	Sawlog (bf)	Pallet/Tie (bf)	Pulp (cd)	Growing Stock (cd)	Legacy (cd)	Total Volume in Cords	High Risk	AGS Saw	% AGS Saw
Red Maple	30.0%	0	0	0	1.7	0.0	0.0	1.7	0	0	0%
Red Oak	12.8%	0	132	571	1.0	0.0	0.0	2.2	132	257	36%
White Ash	22.3%	0	0	0	0.3	0.5	0.0	0.8	0	0	0%
<b>Total Hardwood Per Acre:</b>	<b>65.2%</b>	<b>0</b>	<b>132</b>	<b>571</b>	<b>3.0</b>	<b>0.5</b>	<b>0.0</b>	<b>4.8</b>	<b>132</b>	<b>257</b>	<b>36%</b>
Hemlock	16.4%	0	0	0	0.4	0.0	0.0	0.4	0	0	0%
White Pine	18.4%	0	0	282	3.3	0.0	0.0	3.8	0	141	50%
<b>Total Softwood Per Acre:</b>	<b>34.8%</b>	<b>0</b>	<b>0</b>	<b>282</b>	<b>3.7</b>	<b>0.0</b>	<b>0.0</b>	<b>4.3</b>	<b>0</b>	<b>141</b>	<b>50%</b>
<b>Total Volume Per Acre</b>	<b>100.0%</b>	<b>0</b>	<b>132</b>	<b>853</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>132</b>	<b>398</b>	<b>40%</b>
<b>Total Stand Volume:</b>		<b>0</b>	<b>2,346</b>	<b>15,189</b>	<b>120</b>	<b>9</b>	<b>0</b>	<b>161</b>	<b>2,346</b>	<b>7,077</b>	

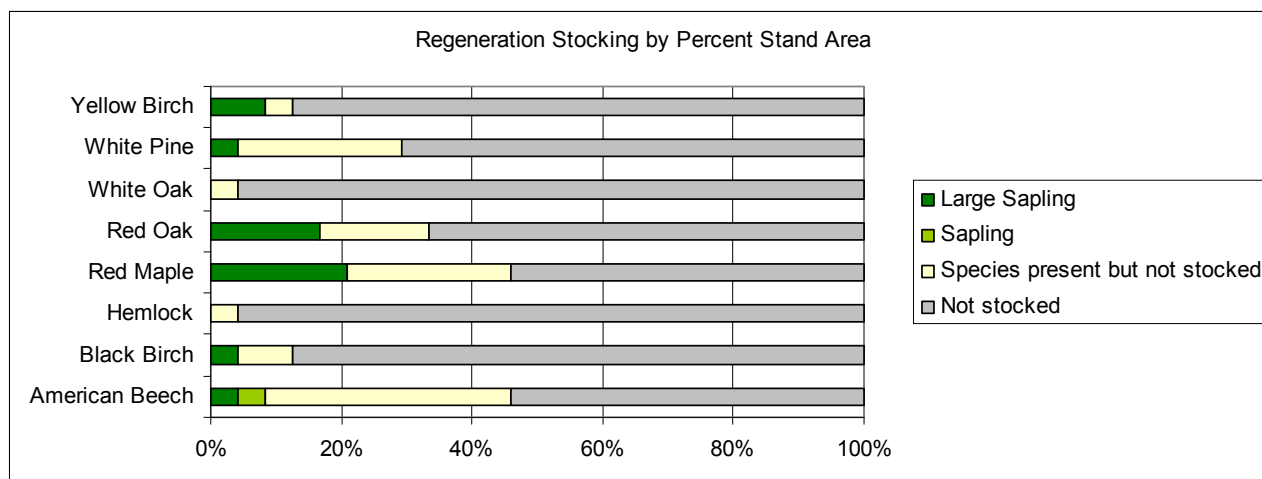
Table 5.3: Stand volume by species and product per acre values.

Graph 5.1a and 5.1b: Diameter distribution showing trees per acre on the Y axis, diameter class on the X axis and tree condition. Includes trees in all canopy positions down to 2 inches in diameter. 5.1b provides a close-up of the breakdown in the larger diameter classes.

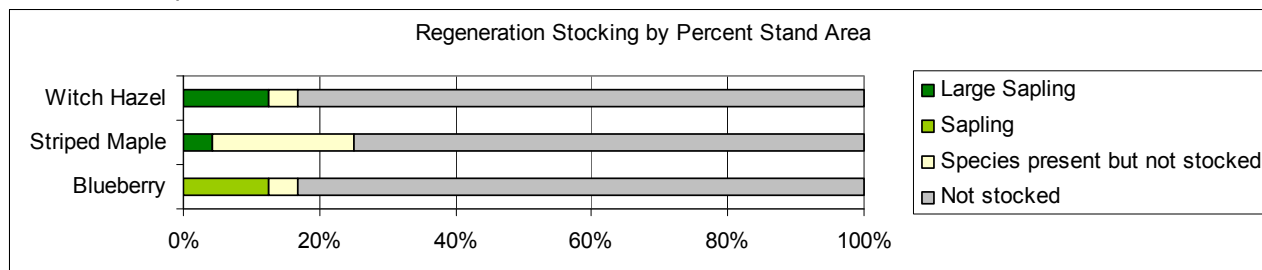




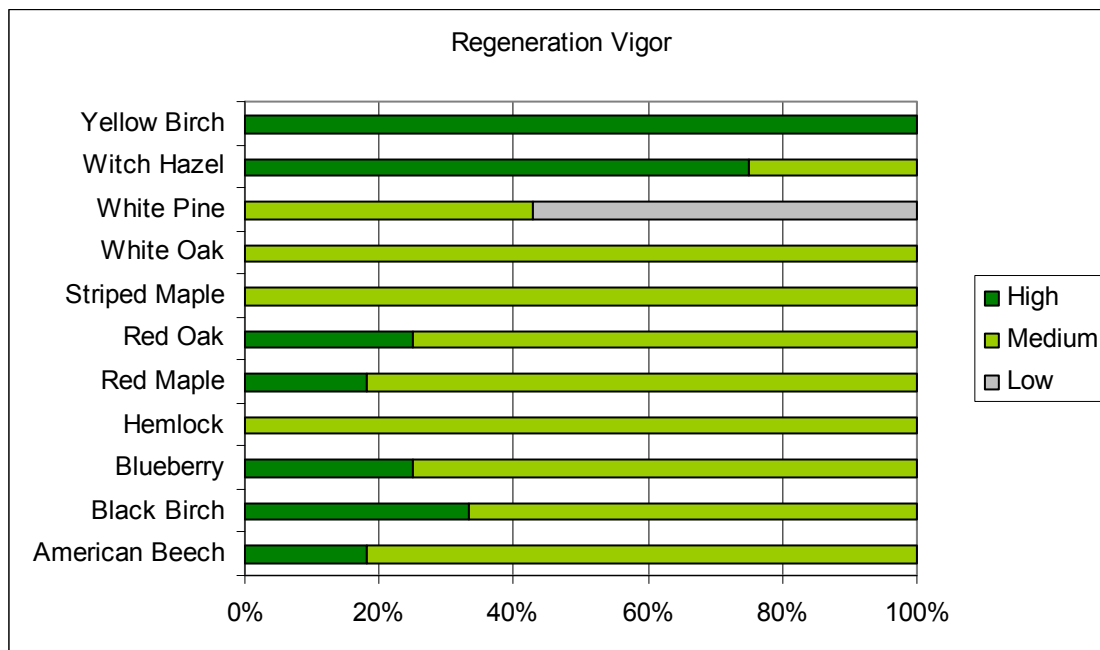
Graph 5.2: Regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter (Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less than 3 feet tall (Seedling). If a species is present but does not meet one of these conditions, it is recorded as present but not stocked.



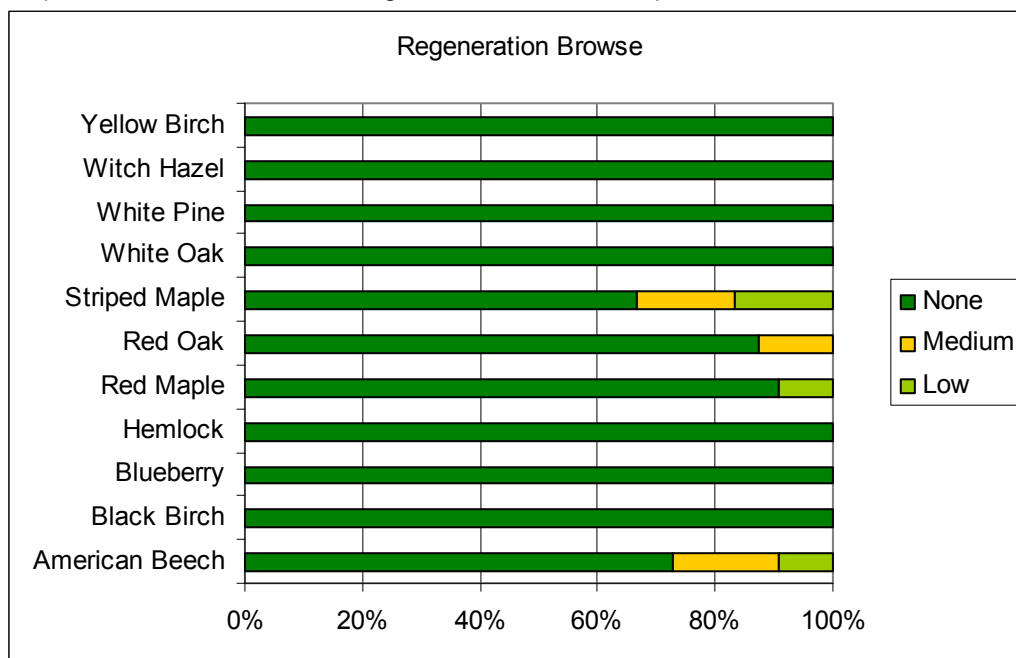
Graph 5.3: Shrub and competing species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter (Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less than 3 feet tall (Seedling). If a species is present but does not meet one of these conditions, it is recorded as present but not stocked.



Graph 5.4: Vigor of all regeneration and shrub species.



Graph 5.5: Browse level of all regeneration and shrub species.



**Silvicultural Objectives**

Management system:	Evenaged
Harvest Entry:	15 years
Products:	Hardwood sawtimber, cordwood, pulpwood
Desired Composition:	2-aged to 3-aged mixed stand
Crop tree target diameter:	WA 20"

**Operational Considerations**

Operability:	Operable
Seasonal limitations:	Avoid spring and fall mud season
Terrain:	Gentle slope on height of land
Access and landing area:	Access adequate, old landing site on Eben Paige Road
Access distance:	Up to 1/10 mile
General maintenance:	Minor upgrade of truck road, open landing
Brook-wetland crossings/buffer requirements:	Seasonal stream bisects stand

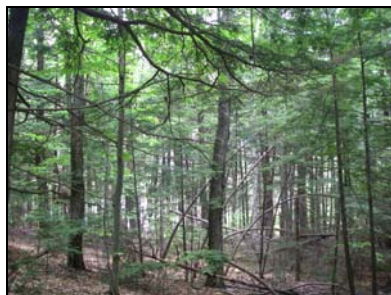
**STAND SUMMARY  
AND  
10-YEAR MANAGEMENT SCHEDULE**

**Stand 6** is the most unique stand on the tract, including about 10 acres of sapling to polesize trees. It was heavily cut about 20 years ago, and is now a dense stand of mixed species including red maple, black cherry, beech, hemlock, white and black birch.

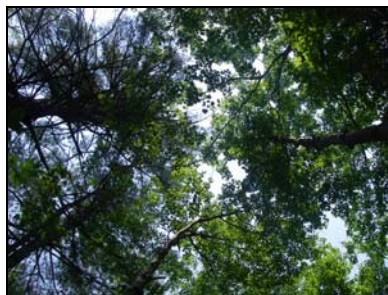
This stand borders the large fen, and provides diversity in forest structure.

A 100 foot buffer bordering the fen should be utilized when this stand is treated. Within this buffer, maintain at least 65-70% canopy cover.

At this point in time, there is no necessary treatment, and the stand should be left to develop on its own for this planning period and re-evaluated with the plan is updated in 10 years.

**Stand 6     Red Oak-Hemlock-Beech-White Pine 3/4AB     44.8 acres**

Stand Structure



Stand Structure



Forest Canopy

**GENERAL ATTRIBUTES**

Natural Community Type:	Hemlock-beech-oak-pine forest
Past Management History:	No recent management
Approximate Age of Dominant Trees:	70-90 years old
Stand Health:	Fair to good
Insects/Damage/Disease:	Presence of beech bark disease, some spider heart in red oak

**SITE CONDITIONS**

Determined by:	Soils map & field observation
Tree vigor:	Moderate
Soils:	Monadnock stony fine sandy loam; Lyme stony loam; Peru stony loam; Tunbridge-Lyman-Monadnock complex, stony
Drainage:	Well-drained to somewhat poorly drained
Terrain:	Moderate to gentle slopes
Aspect:	East-southeast

**Snags Per Acre**

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"	3.3	10.8		14.1
12-18"	2.0			2.0
>18"			0.8	0.8
<b>Grand Total</b>	<b>5.3</b>	<b>10.8</b>	<b>0.8</b>	<b>16.9</b>

Table 6.1: Standing dead trees per acre by size and decay class.

**Down Logs Per Acre**

DBH Class	Moderately punky	Punky throughout	Grand Total
<12"			
12-18"			
<b>Grand Total</b>			<b>0</b>

Table 6.2: Down logs per acre by size and decay class.

**WILDLIFE HABITAT**

Forest type:	Mixed hemlock-white pine-red oak-hardwoods
Vertical diversity:	Medium
Vegetative diversity:	Medium
Hard mast:	Acorns, pine seed, beech nuts, birch seed
Soft mast:	Blueberry
Special habitat features:	Fair sized contiguous, fairly remote mixed forest; contiguous to large open wetland with stream inlet and outlet
Snag trees:	Good amount small diameter, need more above 18" diameter
Down logs:	Need to create down woody material of all sizes
Special wildlife practices:	Create more large snags and down logs, preferably with cavity potential; maintain healthy beech and oak for mast; maintain contiguous forest cover; create regeneration for browse

**RECREATION**

Recreational features:	Access road into wetland on southern lot
Recreational infrastructure:	None at this time
Aesthetic resources:	"Deep woods" feel with scattered large diameter trees; large open wetland system
Public access:	Open

**SILVICULTURE****Structural and Silvicultural Attributes**

Broad Forest Type:	HS34AB
Size Class:	Small to large sawtimber
Stand Structure:	Evenaged
Crown Closure:	90%
Total Basal Area Per Acre:	178
Total Merchantable Basal Area Per Acre:	168
Total Acceptable Basal Area Per Acre:	68
Trees Per Acre:	470
Quadratic Mean Stand Diameter:	8.3
Percent AGS Sawtimber:	76.3%

Basal Area of AGS Sawlogs:  
Timber Quality:

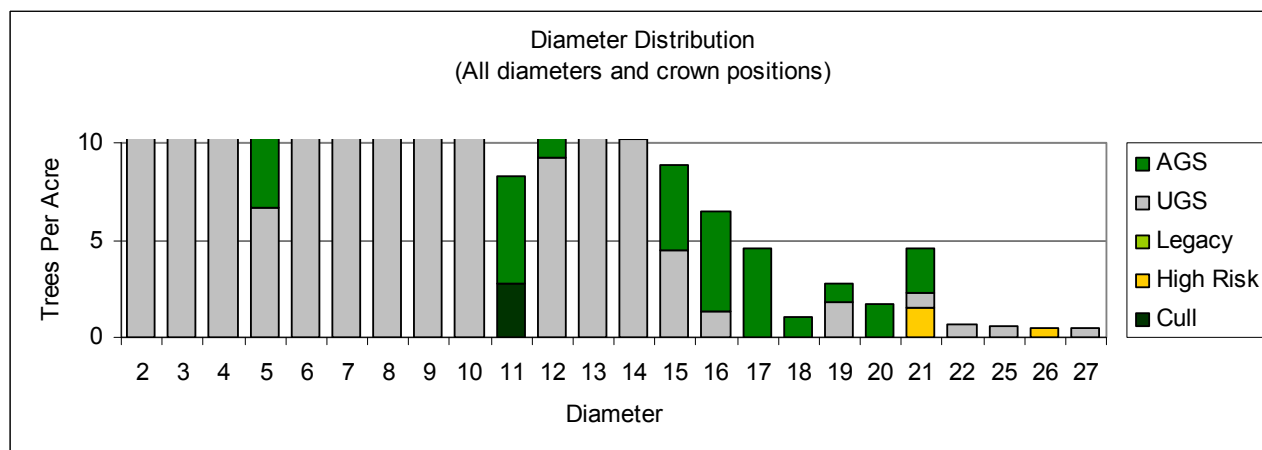
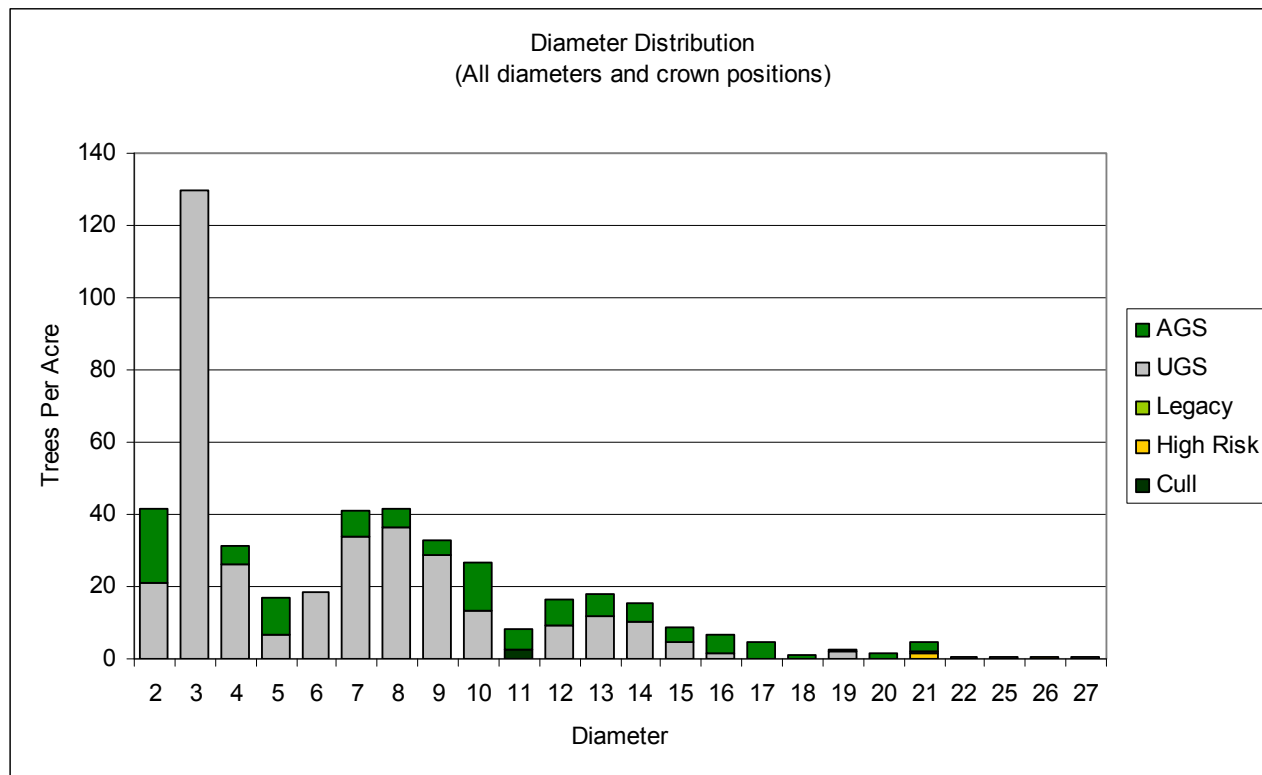
53  
Excellent quality red oak, with minor  
amount spider heart; some excellent  
quality beech; average hemlock and  
white pine

### Forest Composition and volume

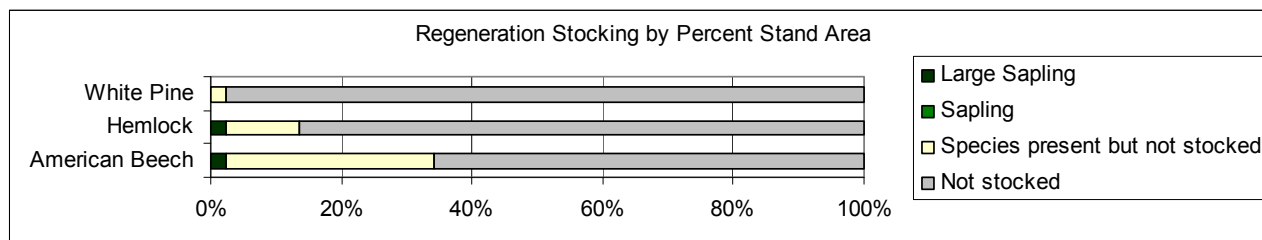
Species	% TPA	Veneer (bf)	Sawlog (bf)	Pallet/Tie (bf)	Pulp (cd)	Growing Stock (cd)	Legacy (cd)	Total Volume in Cords	High Risk	AGS Saw	% AGS Saw
American Beech	14.5%	0	148	145	3	0.0	0.0	3.3	0.0	293	100%
Black Birch	2.3%	0	0	0	1	0.0	0.0	0.8	0.0	0	0%
Red Maple	11.0%	0	0	151	3	0.0	0.0	3.7	0.0	0	0%
Red Oak	23.8%	92	2,647	815	10	0.3	0.0	16.2	265.4	3,044	86%
<b>Total Hardwood Per Acre:</b>	<b>51.6%</b>	<b>92</b>	<b>2,795</b>	<b>1,111</b>	<b>16</b>	<b>0.3</b>	<b>0.0</b>	<b>24.0</b>	<b>265.4</b>	<b>3,337</b>	<b>83%</b>
Hemlock	43.9%	0	426	0	14	0.0	0.0	14.5	0.0	426	100%
Red Spruce	3.3%	0	171	0	0	0.0	0.0	0.8	0.0	0	0%
White Pine	1.2%	0	512	170	2	0.0	0.0	2.7	169.4	264	39%
<b>Total Softwood Per Acre:</b>	<b>48.4%</b>	<b>0</b>	<b>1,109</b>	<b>170</b>	<b>16</b>	<b>0.0</b>	<b>0.0</b>	<b>18.0</b>	<b>169.4</b>	<b>690</b>	<b>54%</b>
											100%
<b>Total Volume Per Acre:</b>	<b>100.0%</b>	<b>92</b>	<b>3,904</b>	<b>1,281</b>	<b>32</b>	<b>0</b>	<b>0</b>	<b>42</b>	<b>435</b>	<b>4,027</b>	<b>76%</b>
<b>Stand Volume:</b>		<b>4,100</b>	<b>174,878</b>	<b>57,383</b>	<b>1,442</b>	<b>12</b>	<b>0</b>	<b>1,881</b>	<b>19,476</b>	<b>180,400</b>	

Table 6.3: Stand volume by species and product per acre values.

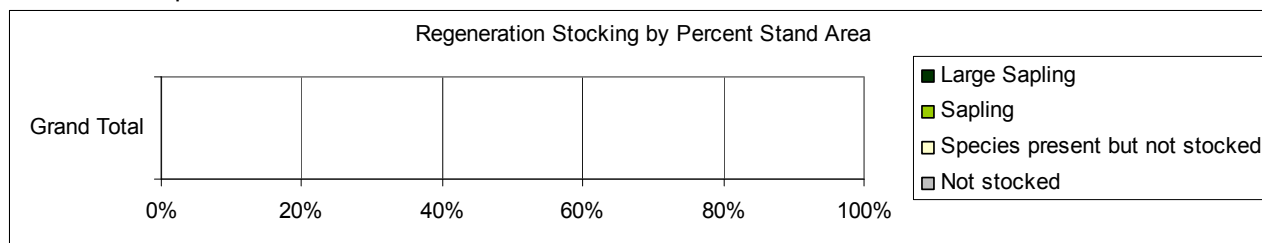
Graph 6.1a and 6.1b: Diameter distribution showing trees per acre on the Y axis, diameter class on the X axis and tree condition. Includes trees in all canopy positions down to 2 inches in diameter. 1.1b provides a close-up of the breakdown in the larger diameter classes.



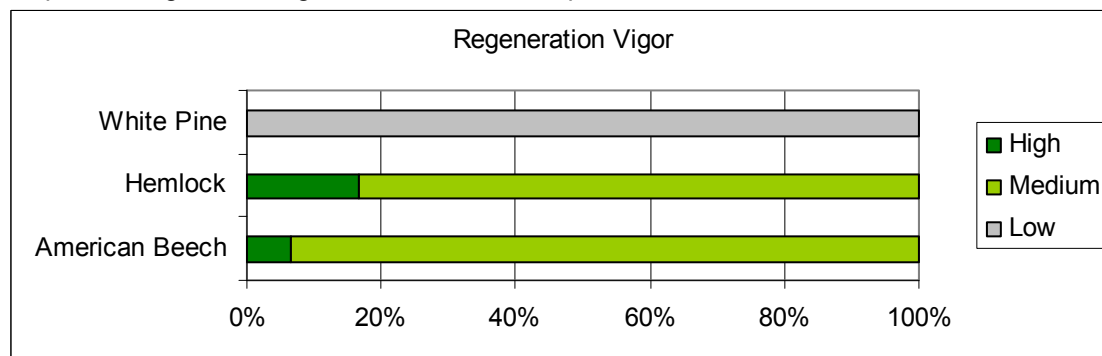
Graph 6.2: Regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter (Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less than 3 feet tall (Seedling). If a species is present but does not meet one of these conditions, it is recorded as present but not stocked.



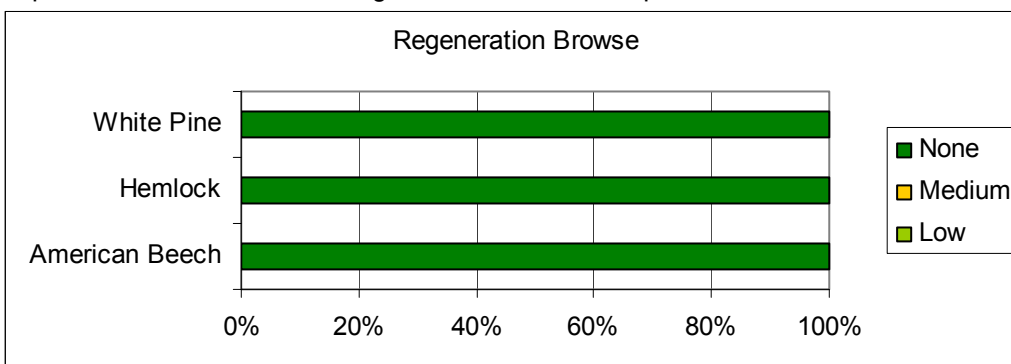
Graph 6.3: Shrub and competing species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter (Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less than 3 feet tall (Seedling). If a species is present but does not meet one of these conditions, it is recorded as present but not stocked.



Graph 6.4: Vigor of all regeneration and shrub species.



Graph 6.5: Browse level of all regeneration and shrub species.



### Silvicultural Objectives

Management system:	Convert to Multiple-aged
Harvest Entry:	15-20 years
Products:	Hemlock, pine and hardwood sawlogs, pulpwood, cordwood
Desired Composition:	Favor Red oak, white pine
Crop tree target diameter:	WP 20"                      HE 18" RO 20"

### Operational Considerations

Operability:	Operable; avoid wetlands
Seasonal limitations:	Best dry summer or frozen winter conditions
Terrain:	Typically gentle to moderate slope with no major obstacles
Access and landing area:	Access from Jewett Rd; no established landing
Access distance:	About 1/3 mile to Jewett Rd
General maintenance:	Minor upgrading of truck roads; establish landing
Brook-wetland crossings/buffer requirements:	Stand bisected by wetland system and feeder/outlet stream- bridge crossing required

## STAND SUMMARY AND 10-YEAR MANAGEMENT SCHEDULE

**Stand 6** is a mixed forest, dominated by beech, red oak, red maple, hemlock and pine with a small amount of red spruce. No recent harvesting has occurred on this stand, as it is fairly remote and only recently acquired by the town. The stand is compiled of 4 lots, 2 contiguous southern lots that share a corner with the main Ferrin Pond tract, and 2 additional contiguous lots to the north, separated by two privately owned lots. Some harvesting has occurred on these privately owned lots, and additional field work is required to identify the property boundaries to protect the Town-owned land from timber trespass.

An abandoned log cabin and multiple outbuildings exist on the southern-most lot across the

outlet stream from the wetland system. An old, collapsed bridge provided access to these structures from a easily traveled woods road. Several well tiles were put in place in wet areas in near streams for spring water, and two fuel tanks sit just in from Jewett Road. A fair amount of junk is lying about the building site and will require a substantial effort to clear out.

The forest here is generally of good quality, with a fair amount of oak sawtimber and some veneer. An old CFI (continuous forest inventory) plot was identified during the December, 2011 inventory process.

This land was primarily used as pasture until roughly the beginning of last century when they were abandoned and allowed to reforest. The soils tend to be moderately well-drained to well drained and are generally stony, sandy loams of medium nutrient levels, meaning they support best growth of oaks, pines and birch rather than more nutrient demanding hardwood species such as sugar maple and white ash.

The natural community type is hemlock-beech-oak-pine, which is well represented in both the canopy and understory species. Red oak represents roughly 25% of the trees per acre but nearly 70% of the sawtimber volume.

The hemlock is generally of poor quality and the pine is variable, with about 2/5 of the pine sawtimber found in acceptable growing stock trees. The stand is overstocked with 168 square feet of merchantable basal area per acre. There is a fair stocking of pole-sized mid-to-low canopy trees, but many of these are suppressed and of low vigor. There is very little regeneration, and what does exist is dominated by shade tolerant beech and hemlock.

The long-term goal of management in this stand is to develop several age classes of quality sawtimber trees of species well suited to the site, particularly white pine and red oak. The age classes will exist primarily as pockets of similarly aged trees mixed throughout the stand. This multiple-age composition will provide a diversity of forest structure beneficial to wildlife and will provide opportunity for a mix of silvicultural operations. The current species composition reflects the natural species mix and likely will not significantly change over time with the exception of a decrease in the white pine component, unless it can be successfully regenerated.

**Silviculture:** The focus of management here will be to harvest mature, diseased, and poor quality overstory trees in groups, patches and singly to establish regeneration. The group and patch openings will range from a few trees to possibly over an acre in size if necessary to release regeneration or where a large pocket of poor quality overstory trees exist.

In addition, crop tree release in between the groups and patches to release desirable crop trees on at least 2 to preferably three sides. If releasing oak for crop trees, attempt to leave bole shade on the south and west side to prevent epicormic sprouting.

#### **Stand 6: 2014**

##### **Reduce basal area to approximately 90 to 100 square feet through:**

- **Crop tree release** on the best quality and vigor stems. Strive to release 15-20 crop trees on at least 2 sides per acre.
- **Group selection and Patch Cut** to remove pockets of poor quality, low vigor, diseased and mature stems to encourage regeneration.
- **Scarify soil** in openings to benefit white pine regeneration.
- **Time harvest** with a red oak and/or white pine seed year.

**Wildlife:** Wildlife habitat here will become more diverse as a multiple age structure is developed.

White-tailed deer and moose browse the limited areas with hardwood and hemlock saplings. Any treatments that promote hardwood regeneration will likely benefit deer, moose and rabbits by providing better browse opportunities. Multiple age classes help to ensure there is always a level

of browse for wildlife. Bear frequently pass through and feed especially on the wetland edges. Maintaining forest cover is important for travel corridors. Specific wildlife habitat improvements will include retaining hard mast producing hardwoods; retaining beech trees with evidence of bear use; creating hardwood browse especially in areas with low-valued or poor vigor trees; creating standing snag trees by girdling some large white pine with no commercial value; creating down woody debris by felling and leaving some large cull trees on the forest floor.

- Create additional large snag trees by girdling up to 5 trees >18" in diameter per acre.
- Create additional down logs by felling up to 5 trees > 18" in diameter per acre.
- Maintain existing snags and large down logs.
- Maintain 1/4-acre to 1/2-acre areas with dense hemlock in the overstory for winter cover.
- Maintain forest cover for travel corridors
- Create hardwood browse

**Marsh Ridge Road Lots Review**

The Marsh Ridge Lots are located south of the Main Ferrin Pond Tract on Marsh Ridge Road, which is an extension of Eben Paige Road. A cursory field review was done of these lots in December, 2011 to generalize forest type and conditions. There are in total 7 separate lots, though some are contiguous. The condition of the boundary lines was not thoroughly reviewed during the brief tour, but in general monumentation was not easily identified. The lots were part of the Husky Development. A survey exists describing the boundary lines.

The northern 4 lots, located on both sides of Marsh Ridge Road resemble Stand 5 in forest type with large scattered white pine in the overstory and a fairly well-developed hardwood and pine understory composed mainly of saplings and polesize trees. Likely these lots were part of the same harvest that created Stand 5 conditions.

The southern 3 lots, located on the cul-de-sac portion of Marsh Ridge Road more closely resemble Stand 1, with a more dense overstory of hemlock, oak, red maple, and pine and a sparse understory, comprised mostly of shade tolerant beech and hemlock saplings. No recent management has occurred on these southern lots.

**Ferrin Pond**  
**TOTAL FOREST TIMBER AND PULP VOLUME**  
**December, 2011**  
**199 Forested Acres**

Species	Veneer (BF)	Sawlog (BF)	Tie (BF)	Total BF	Pulp (CDS)	Growing Stock (CDS)	Cull (CDS)	Total Volume in Cords	% Cords
<i>Hardwood</i>									
American Beech	0	31,520	18,668	<b>50,188</b>	773	0	85	918	16.5%
Black Birch	0	18,539	24,369	<b>42,908</b>	324	30	12	448	8.1%
Red Maple	0	9,476	17,120	<b>26,596</b>	1,022	11	41	1,128	20.2%
Red Oak	8,353	105,680	43,992	<b>158,026</b>	358	57	9	700	12.6%
Sugar Maple	0	0	0	<b>0</b>	77	8	0	84	1.5%
White Ash	0	7,601	6,305	<b>13,906</b>	51	23	0	101	1.8%
White Birch	0	2,754	2,109	<b>4,862</b>	79	0	0	88	1.6%
Yellow Birch	0	4,856	3,747	<b>8,603</b>	12	0	0	28	0.5%
<b>Total Hardwood:</b>	<b>8,353</b>	<b>180,426</b>	<b>116,310</b>	<b>305,0891</b>	<b>2,701</b>	<b>129</b>	<b>147</b>	<b>3,495</b>	
<i>Softwood</i>									
Hemlock	0	26,615	0	<b>26,615</b>	1,069	26	13	1,149	20.7%
Red Pine	0	0	0	<b>0</b>	22	0	0	22	0.4%
Red Spruce	0	2,202	0	<b>2,202</b>	14	0	0	19	0.4%
White Pine	0	63,123	62,822	<b>125,945</b>	544	33	127	879	15.8%
<b>Total Softwood:</b>	<b>0</b>	<b>91,940</b>	<b>62,822</b>	<b>154,762</b>	<b>1,649</b>	<b>59</b>	<b>140</b>	<b>2,077</b>	
<b>Total Volume:</b>	<b>8,353</b>	<b>272,366</b>	<b>179,132</b>	<b>459,851</b>	<b>4,350</b>	<b>188</b>	<b>287</b>	<b>5,572</b>	



## FERRIN POND FOREST

### 10-YEAR TREATMENT SCHEDULE

The dates given in this treatment schedule are meant to help prioritize work on the entire Weare ownership. It is meant to be flexible and may change due to weather and market conditions or to unforeseen opportunities and access issues. The treatment activities may change due to the same reasons if silviculturally justifiable and agree with landowner mission, principles and management objectives.

<b>Stand #</b>	<b>Acres</b>	<b>Treatment</b>	<b>Priority</b>	<b>Year</b>
<b>1a/1b</b>	<b>102</b>	Group selection/Crop tree release	<b>High</b>	<b>2016</b>
<b>1c</b>	<b>9.0</b>	Group selection/Crop tree release	<b>Med.</b>	<b>2018</b>
<b>2</b>	<b>25.2</b>	Group selection/Crop tree release	<b>High</b>	<b>2016</b>
<b>3a/3b</b>	<b>9.0</b>	Single tree selection	<b>Med.</b>	<b>2016</b>
<b>4a/4b</b>	<b>35.6</b>	Single tree/Group selection/Crop tree release/Thin	<b>Med.</b>	<b>2018</b>
<b>5</b>	<b>17.8</b>	Leave to grow	<b>--</b>	<b>--</b>
<b>6</b>	<b>44.8</b>	Group selection/Patch cut/Crop tree release	<b>High</b>	<b>2014</b>
<b>Main Tract</b>		Paint boundary lines	<b>High</b>	<b>ASAP</b>
<b>Jewett Rd Lots</b>		Identify and monument boundary lines	<b>High</b>	<b>ASAP</b>
<b>Marsh Ridge Rd Lots</b>		Identify and monument boundary lines	<b>Low</b>	<b>ASAP</b>
<b>all</b>		Reevaluate and update management plan		<b>2021</b>



## APPENDIX A: SOILS MAP



