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WEARE – FELCH FARM 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

Felch Farm Forest is a contiguous tract on 728.6 acres (620 forested)¹ and is managed by the Weare Conservation Commission. The majority of the parcel is managed as a working Town Forest (693 acres) while the remaining 33 acres is managed as the Highway Dept and Transfer Station. The terrain is variable, but generally includes moderate to gentle slope. A large open wetland system, the Peaslee Meadow, runs easterly through the north of the property. Numerous trails and old roads cross this parcel, providing relatively easy access to many parts of the interior.

The forestland is varied, but is dominated by white pine established immediately following the abandonment of agricultural land earlier last century. In places white pine is the

¹ Mapped acres, 5/2008

only species; elsewhere it is a scattered but consistent component of the overstory in combination with mixed hardwoods. Hemlock occupies the areas of shallow soil and ledge, and some of the low areas adjacent to the numerous vernal pools and small wetlands dotting the property.

Invasive exotic shrubs are prevalent near the dump/transfer station/gravel pit area accessed via Merrill Road. These shrubs are detrimental to the natural succession of the forest as they out-compete the native trees and shrubs. Additionally, they often produce copious quantities of berries, seeds, or fruits that are consumed and disseminated by songbirds, small mammals and turkeys. Invasive exotic shrubs are becoming an increasingly devastating problem for forests globally and in the Northeast.

The property is located in the north central region of Weare, south of Route 77, west of Peaslee Road and South Road, and north of Merrill Road.

Woodlot History

In addition to the recent multi-decade forestry stewardship, the land has a longer agricultural history; the abundance of stone walls throughout the property suggests a fairly intense use. 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.

The majority of the tract acreage was at one time open agricultural land, a mix of pasture, hayfields, and croplands. The present forest is a mix of hardwoods dominated by red oak, hemlock, and large white pine approximately 90-110 years old. 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 too. The resulting forest has been through a series of timber harvests since its reforestation in the early part of last century, as evidenced by old forest access roads and tree stumps of varying ages.

A stone cellar hole, and other stone framework associated with a farm can be found just north of Merrill Road, near the west boundary line. A small Felch family burial plot can also be found west of the homestead site, and nearly at the western boundary. A unique formation of stonework and a three-grave headstone mark the location of the burial site.



Above: frontal view of the stonework and 3-plot headstone.

Below: view of the wall and backfill for the gravesite. Note the overhanging flat stone above the headstone.

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 so as to maintain and enhance these recreational opportunities.
4. Maintain Tree Farm status

4 GEOLOGIC ATTRIBUTES

Topography and Aspect

The Felch Farm Forest ranges from 400-600 feet.

The property generally has an easterly or southeasterly aspect.

Brooks, Ponds, and Wetlands

The Peaslee Meadow, an extensive wetland system of open water, emergent vegetation, forested wetland, old beaver impoundments and flowing water, occupies significant acreage in and along the northern edge of the Felch Farm Forest. It consists of numerous natural communities, and is surrounded primarily by closed-canopy forestland. Human impacts are obvious, especially along the northern edge of the Meadow, where wheeled vehicles have encroached from bordering properties and some illegal dumping has transpired.



Various views of the Peaslee Meadow open habitat



Views of Peaslee Meadow, forested wetland habitat

There are other smaller forested wetlands within the Felch Farm Forest, and there are many vernal woodland pools. Some of the forested wetlands fostered beaver activity in the past; present activity is either low or nonexistent.



Vernal pool, left, and beaver-caused flooding, right

Recommended Actions to Improve and Manage the Wetland and Water Resource of the Felch Farm Forest²:

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.

² 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

- 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, 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 silt loam soils. The major soil types present include Monadnock stony fine sandy loam, Lyman-Tunbridge-Monadnock rock outcrop complex, Becket fine sandy loam, and Lyme stoney loam. Other minor soils include Tunbridge-Lyman-Monadnock rock outcrop complex, Colton sandy loam, Marlow loam. The majority of the soils are well drained and generally productive, but have limitations due to rockiness and to a lesser degree slope, or are wetlands. For other soils types and other details see soils map in Appendix A.

Recommended Actions to Improve and Manage the Soil Resource of the Felch Farm Forest³:

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.
- When possible, conduct whole-tree harvests of hardwoods during dormant leaf-off season

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

- 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 COMMUNITIES⁴

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 in 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 Felch Farm is hemlock-beech-oak-pine forest. Hemlock-beech-oak-pine is a common, broadly defined community occupying glacial till and terrace soils of low to mid elevations in central and southern New Hampshire. Other natural

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

communities are imbedded within the hemlock-beech-oak-pine forest, usually in relatively small clusters, including: hemlock forest and hemlock-cinnamon fern forest. See Appendix A for a map of the natural communities.

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. Only two records were found and both involve the Eastman Lot. The *Weare Town Lands Inventory* conducted by Bill Nichols made no mention of any natural communities or plant species considered rare/endangered/threatened located on the Felch Farm property; however that does not mean there are not any.

Integrating the varied habitat conditions found on Felch Farm Forest demands *adaptive management*. All attempts will be made on the management level to identify unique areas, learn what makes them unique, how to best manage them and most importantly, refine the management of these areas as the knowledge base grows.

“Ecological Reserve” Areas

As part of the management of the Felch Farm Forest, some areas may be designated as “Ecological Reserve”, meaning there will be no active management allowing the area to progress and change naturally without human influence in terms of active management. “Ecological Reserve” areas offer unique opportunity to learn about the natural succession and disturbance pattern on the forest. These areas can be incorporated into the recreational and educational components of the forest, as well as benefit the diversity of wildlife habitat. These areas can be designated on the forest management map. Acceptable uses of these areas include establishing non-motorized trails to and through them. Unacceptable uses include motorized traffic including logging equipment, infrastructure including benches and or shelters. These areas will not be actively managed, and will not be traveled through when actively managing adjacent forest stands.

6 WILDLIFE HABITAT CONDITIONS

Felch Farm Forest provides a variety of habitats for wildlife, but is dominated by dense conifer forestland. There are places with substantial hardwood browse, especially where

harvesting took place circa 1980 and 1995. Deer and moose evidence is abundant. Bear sign, most notably claw marks on beech trees, was noted. Bear likely frequent the adjacent wetlands areas. Red oak, also fairly abundant on the property with many large individual stems, provides a source of hard mast (acorns) that is eaten by a variety of birds and many mammals including, turkey and deer.

There aren't many upland open areas or recent field abandonments. Most open habitat is limited to differing wetland communities, which provide important habitat for amphibians such as the spotted salamander and red newts. Wetlands also provide an important source of food in early spring as they tend to be one of the first places to "green up". Moose are frequent visitors to these wetlands systems. The beaver meadows and flowage associated with the Peaslee Meadow provides habitat for riverine associated animals, including mink and otters.



An open-water system associated with beaver activity (not Peaslee Meadow). Black gum present.

The forestland does vary and offers some structural diversity. Previous timber harvesting

has 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. Ideally, areas with a large amount of aspen or with isolated large aspen will be cut fairly intensively to encourage sprouting. Aspen sprouts are a preferred browse source for many kinds of wildlife. In addition, keeping historic landing sites open providing a grassy, open habitat through regular maintenance will help maintain a diversity of land types.

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 Felch Farm and on adjacent lands. Hemlock-Hardwood-Pine dominates the site. A small amount of marsh land and some peat wetland can be found on Felch Farm 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 Felch Farm Forest⁵:

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.

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

- 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 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

Felch Farm Forest provides ample recreational and educational opportunities. An extensive trail network exists throughout the forest, used heavily by motorized recreation such as ATV's and snowmobiles. The property is also likely hunted during deer season in the fall. Other recreation opportunities include snowshoeing and cross country skiing during winter months, and hiking in the summer.

The trails on Felch Farm are in need of additional maintenance, especially regarding preventing soil erosion and “trail braiding” around wet spots. *Best Management Practices* provide trail construction and maintenance guidelines that will help prevent soil erosion. Additional signage outlining proper trail use and respect of the land would also benefit 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.

Recommended Actions to Improve and Manage the Recreational Resource of the Felch Farm 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 erosion⁶**
- **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 or interesting natural features of the forest
- **Install benches** for resting along trails and at vistas

Education

Educational opportunities are limitless on Felch Farm. 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

⁶ 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

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 Felch Farm 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 Felch Farm Forest.
- Create and **post educational signage** about Felch Farm Forest and management philosophy and activities.
- Create **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 in June, 2008 consisting of 126 sample points. Data was collected as outlined in the Weare master plan.

Age and Age Class Distribution

As with most forests in New England, Felch Farm 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, Felch Farm 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 Felch Farm Forest falls within this range.

Tree Quality and Tree Health

Overall tree quality on the Felch Farm Forest is average to above average. White pine dominates the timber volume on the forest, but a large percentage of it includes economically maturing and over-mature trees. The quality of the pine varies; previous harvests removed much 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. Hemlock, far below but second to pine in volume on Felch Farm Forest, is of average quality. Red maple, ranking third in total volume, is of low to average quality, with over 75% classified in pulpwood categories. Red oak, fourth in total volume on Felch Farm Forest, is of fair to excellent quality, with a low percentage classified in pulpwood categories. 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. The remaining volume is a mix of species, including decent quality black birch and some maturing, fair quality white birch.

The most pressing health concern involves the mature and over-mature white pine, likely

with red rot and some white pine blister rust. These diseases are widespread and common to pine of this age and initiation, and its presence typically indicates a timber harvest is overdue. Other commonly occurring tree diseases and damage were noted on the forest; including weevil damage in pine, beech bark disease, sugar maple borer, decline in the white ash, and sterile conk of birch. These diseases and insect damage alone do not signal the need for treatment, but should one occur high priority should be given to improving stand quality and health by removing trees with signs of the above mentioned diseases or other forms of damage, including prior logging injury.

Forest Management Approach

Management on the Felch Farm 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.



Unevenaged group selection, left; evenaged shelterwood, right. Both resulted in heavy white pine regeneration. Regeneration is more widespread under shelterwood, and more contained in distinct locations using group selection.

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 Felch Farm 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 Felch Farm 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 dominates the overstory in Felch Farm 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.

The soils on Felch Farm are generally suited for vigorous white pine growth; many areas in the Felch Farm have excellent quantities of white pine seedlings and saplings firmly established in large groups, along skid trails, and below the more open canopy conditions created by a shelterwood. This advanced regeneration will help to perpetuate white pine as a significant component in the natural communities found here.

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 Felch Farm Forest is generally good, and is provided by Merrill Road, a right-of-way off of Route 77, South Road and Peaslee Road. South Road and Peaslee Road are in fair condition, requiring minor improvements for truck road suitability, such as grading, placing a few broad-based drainage dips, installing a culvert, or other measures where needed.

Operability

The terrain and ground conditions on this tract in general do not limit operability, although seasonal restrictions should be observed in some places. The undulating terrain, having dry ridges and somewhat wet sags to be addressed, even though the elevation changes going from one to the other is on the order of 10 to 15 feet, rather than 30 to 50 feet or more. The small wetland areas generally are not productive timber growing sites and should be avoided during operations. 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 Felch Farm Forest boundary is in variable condition and includes approximately 4 miles of maintainable boundary line. A combination of stonewalls, corner monumentation and painted blazes make up the boundary. The entire boundary should be blazed and painted where needed as soon as possible. It is recommended that the boundary be monumented with Town of Weare signs, especially at corners, roads, and trails.

There are a many instances of "trespass" by abutters and others, with cutting of tress, dumping of garbage/debris, ATV encroachments, permanent tree stands/bait stations, and other issues.

FOREST DATA

Stand 1 Hemlock-White Pine-Hardwood 4B/Hardwood 1-2B 74.7 acres



Stand Structure



Stand Structure



Forest Canopy

GENERAL ATTRIBUTES

Natural Community Type: hemlock-beech-oak-pine forest
 Past Management History: moderate harvests ca 1955, 1965, 1980, 1995
 some areas treated with TSI ca 1980
 Approximate Age of Dominant Trees: 90-110
 Stand Health: good
 Insects/Damage/Disease: minor logging damage

SITE CONDITIONS

Determined by: soils map & field observation
 Tree vigor: moderate to high
 Soils: Monadnock stony fine sandy loam
 Colton loamy sand
 Becket fine sandy loam
 Skerry stony fine sandy loam
 Lyme stony loam
 Monadnock bouldery fine sandy loam
 Drainage: well-drained to somewhat poorly drained
 Terrain: rolling; some places moderately steep
 Aspect: varies

Snags Per Acre

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"	7.0		14.8	21.8
12-18"	1.2		1.7	2.9
>18"	0.4			0.4
Grand Total	8.6		16.5	25.1

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

Down Logs Per Acre

DBH Class	Moderately punky	Punky throughout	Sound	Unspecified.	Grand Total
<12"	11.3	28.6			39.8
12-18"	3.1	3.0			6.2
>18"		0.6			0.6
Grand Total	14.4	32.2			46.6

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

WILDLIFE HABITAT

Forest type:	softwood forestland
Vertical diversity:	medium
Vegetative diversity:	moderate
Hard mast:	red oak, beech, hop hornbeam
Soft mast:	high bush blueberry
Special habitat features:	ducks in open water wetland in southern tip of Farm; black gum growing in the wetland
Snag trees:	high number, missing large diameter snags
Down logs:	high number, could use more large diameter sections
Special wildlife practices:	create large snags/down wood by girdling poor white pine and leaving large "cull" sections in the woods, rather than bringing to the landing

RECREATION

Recreational features:	old road in southernmost stand, used by snowmobiles, ATVs, hikers, etc.
Recreational infrastructure:	old road, other skid trails
Aesthetic resources:	minimal
Public access:	good for two stands in south via Peaslee Road; more remote for stand along western boundary, north of Merrill Road

SILVICULTURE**Structural and Silvicultural Attributes**

Broad Forest Type:	SH4B/H1-2B
Size Class:	Sapling to large sawlog
Stand Structure:	Two-aged
Crown Closure:	85%
Total Basal Area Per Acre:	194
Total Merchantable Basal Area Per Acre:	188
Total Acceptable Basal Area Per Acre:	65
Trees Per Acre:	471
Quadratic Mean Stand Diameter:	8.7
Percent AGS Sawtimber:	43.8

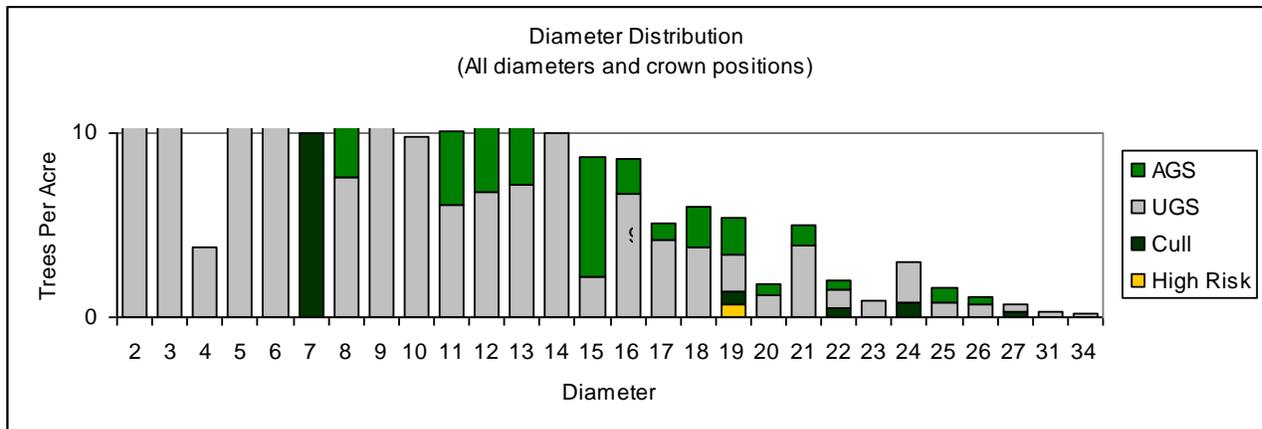
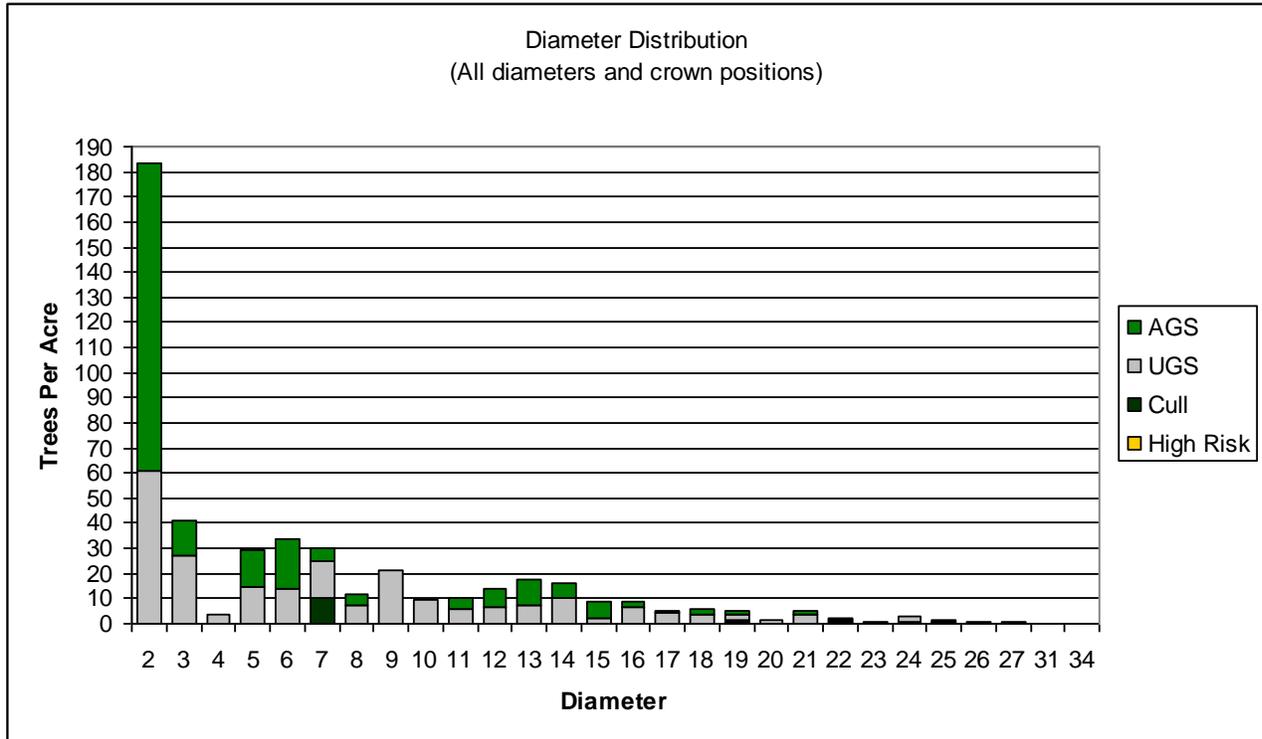
Basal Area of AGS Sawlogs: 53
 Timber Quality: decent

Forest Composition and volume

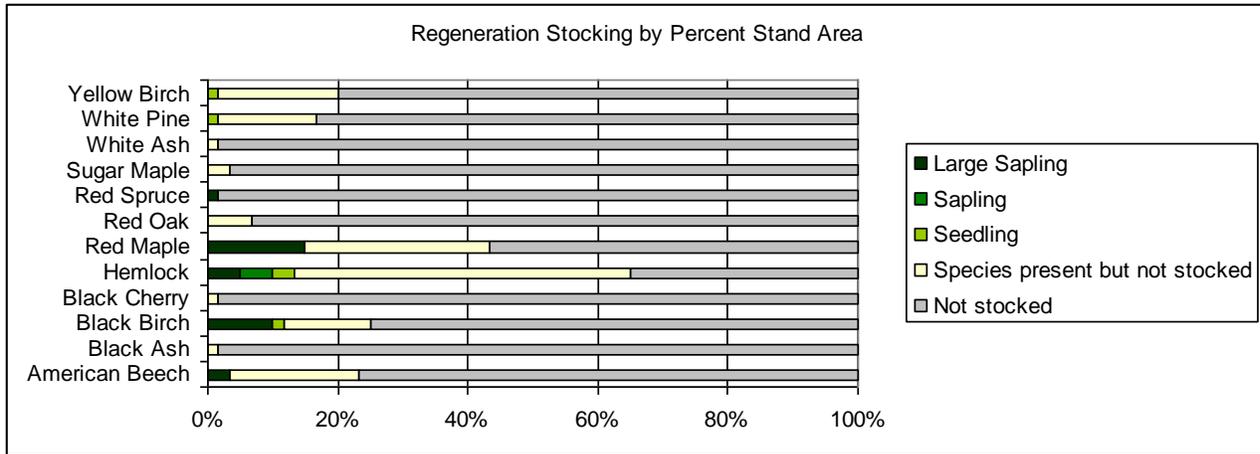
Species	% TPA	Veneer (bf)	Sawlog (bf)	Pallet/Tie (bf)	Pulp (cd)	Growing Stock (cd)	Total Cords	High Risk	AGS Saw	% AGS Saw
American Beech	0.9%	0	0	0	0.5	0.0	0.4	0.0	0	0%
Basswood	0.4%	0	0	0	0.4	0.0	0.4	0.0	0	0%
Black Birch	2.9%	0	98	54	0.6	0.0	0.9	0.0	98	100%
Hop Hornbeam	1.4%	0	0	0	0.2	0.0	0.2	0.0	0	0%
Red Maple	6.9%	0	58	0	2.1	0.0	2.1	0.0	58	100%
Red Oak	3.8%	0	561	192	0.7	0.5	2.5	0.0	553	73%
Sugar Maple	0.4%	0	100	0	0.2	0.0	0.4	0.0	0	0%
White Ash	0.6%	0	0	0	0.5	0.0	0.5	0.0	0	0%
White Birch	3.8%	0	257	0	0.9	0.0	1.4	0.0	103	40%
Yellow Birch	0.9%	0	0	0	0.0	0.2	0.2	0.0	0	0%
Total Hardwood Per Acre:	22.0%	0	1,074	246	6.1	0.7	9.0	0.0	813	62%
Hemlock	48.2%	0	1,434	0	6.0	0.0	8.6	0.0	663	46%
Red Pine	0.3%	0	239	0	0.0	0.0	0.5	0.0	239	100%
Red Spruce	0.7%	0	185	0	0.0	0.0	0.4	0.0	185	100%
White Pine	28.7%	0	11,763	3,069	7.6	0.0	34.4	318.2	5,986	40%
Total Softwood Per Acre:	78.0%	0	13,621	3,069	13.6	0.0	43.9	318.2	7,072	42%
Total Volume Per Acre:	100.0%	0	14,695	3,315	19.7	0.7	52.9	318.2	7,885	44%
Stand Volume:		0	1,097,856	247,677	1,472	55	3,951	23,770	589,097	

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

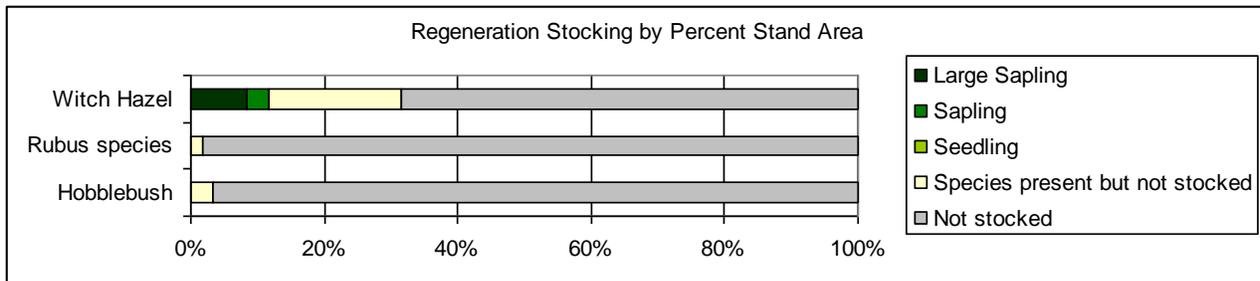
Graph 1.1a and 1.1b: Diameter distribution showing trees per acre on the Y axis, diameter class on the X axis and tree condition. Includes trees in all canopy positions down to 2 inches in diameter. 1.1b provides a close-up of the breakdown in the larger diameter classes.



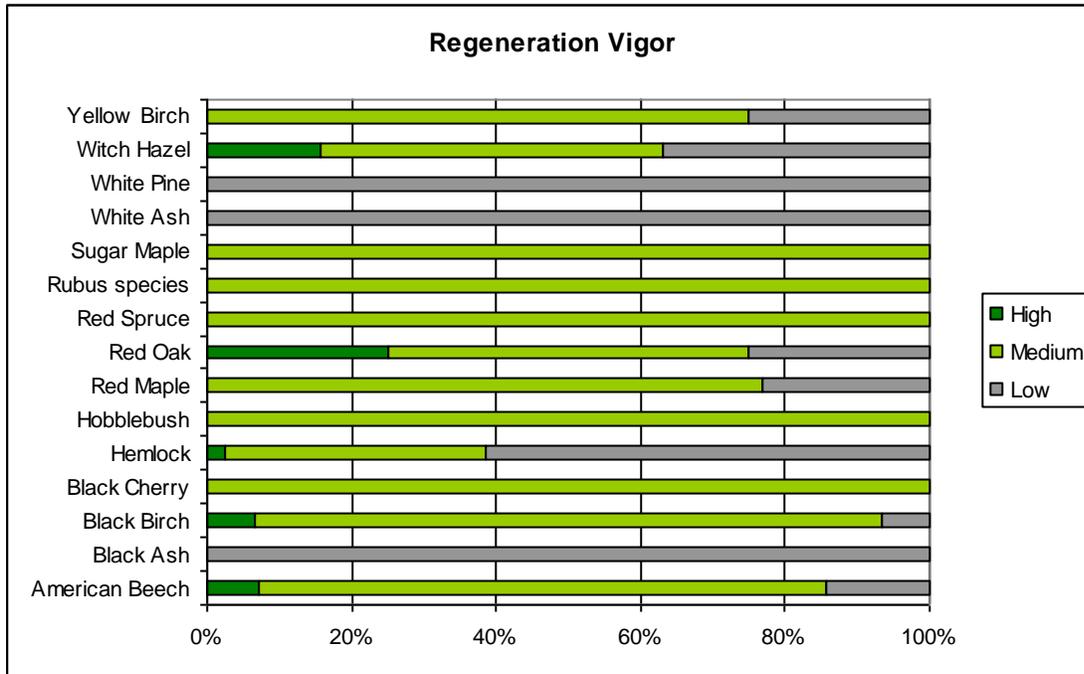
Graph 1.2: Regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less 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.



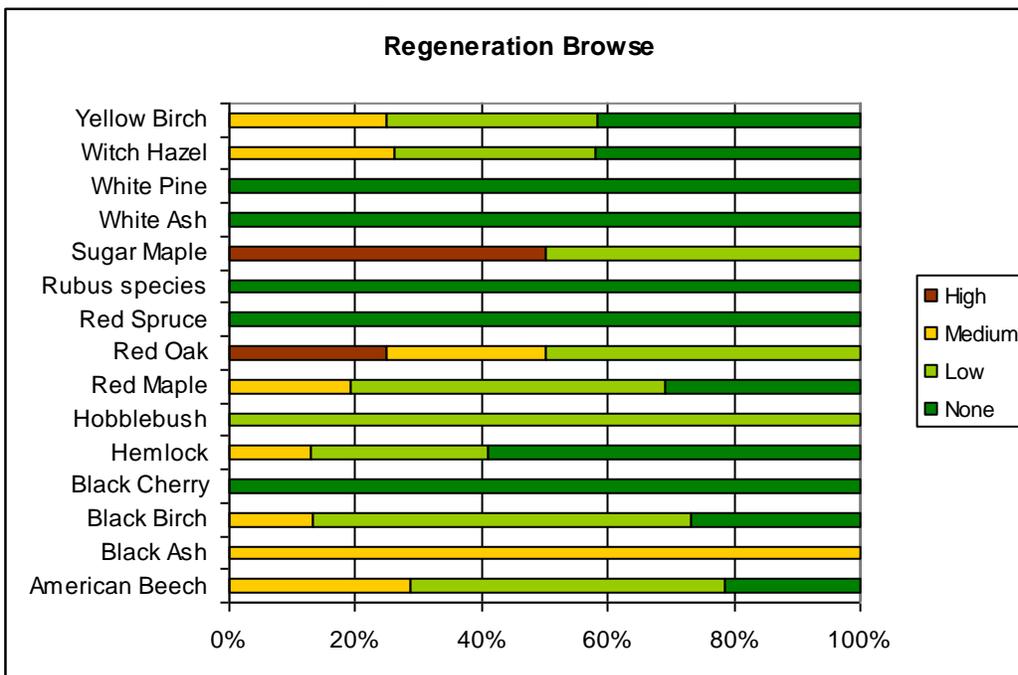
Graph 1.3: Shrub and competing species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), 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: shelterwood; group selection
 Harvest Entry: 5-10 years

Products:	sawlogs, pulpwood, cordwood	
Desired Composition:	favor BB/RO/WP	
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:	Adequate
Access distance:	less than 1/4 mile
General maintenance:	minor upgrading of truck roads/landings
Brook-wetland crossings/buffer requirements:	could have minimized harvest adjacent to open water system in south of property; likely 2-4 intermittent crossings

STAND SUMMARY AND 10-YEAR MANAGEMENT SCHEDULE

Type 1 includes 3 non-contiguous stands of white pine and hemlock, with a minor component of mixed hardwood. White pine dominates the product volumes, while hemlock accounts for nearly 50% of the total stem count. The canopy is relatively closed in most parts of the type, averaging 85% closure. Total type basal area is high, at nearly 190 square feet per acre. The type approximates a two-aged stand, with a patchy understory surrounded by significantly older trees.

Regeneration is modest, and tends to be found in distinct groups. Stem counts are dominated by hemlock and red maple which appear in 60% and 40% of the type area, respectively. Many of these are large saplings that are ready to be released from competition. There is also significant black birch and beech regeneration, with many large sapling black birch established, also in need of release.

There are many intermediate stems (poletimber and small sawtimber) scattered in the type, having decent quality and growth characteristics. These size stems are the immediate replacements for larger sawtimber trees that will be removed at some point, although many sawtimber stems will not be harvested. Red oak, black birch, hemlock and white pine should be favored during group selection treatments.

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 hemlock, 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 white pine and hemlock, especially lower quality stems, and attempt to create conditions conducive to regenerating white pine. These goals will be accomplished by removing about 1/2 of the overstory in groups, focusing on removing those individuals of poor quality and retaining the individuals that are of high quality and vigor.

2009-2014: Harvest significant white pine and hemlock volume, removing the poorest quality wood as a priority, but also include high-quality mature stems. Release groups and individual intermediate and regeneration stems, especially black birch, red oak and white pine. Reduce basal area to approximately 100-130 square feet through:

- **Group Selection:** Create openings of 5-10 trees to establish 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.
- **Shelterwood:** In areas with limited existing regeneration, remove most of the understory and 40 to 60% of the overstory, leaving a somewhat well distributed overstory of average to above average quality white pine to serve as a seed source and protective cover for new seedlings. The remaining overstory within the shelterwood should be removed following successful establishment of new seedlings and saplings, approximately 10-15 years following the first stage harvest. This can be modified by removing only half of the remaining overstory at the 10-15 year mark, and removing most of the remaining original overstory 25 year after the first stage harvest.

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 White Pine-Hemlock4B/Hardwood1B

211.5 acres



Stand Structure



Stand Structure



Forest Canopy

GENERAL ATTRIBUTES

Natural Community Type:

hemlock-beech-oak-pine forest
sugar maple-beech-yellow birch forest
red maple-sphagnum basin swamp
vernal woodland pools

Past Management History:

TSI ca 1980 in some places
overstory removals/groups ca 1960, 1990

Approximate Age of Dominant Trees:

90

Stand Health:

average to above average

Insects/Damage/Disease:

minor beaver; pine weevil; blister rust

SITE CONDITIONS

Determined by:

soils map & field observation

Tree vigor:

Average

Soils:

Lyman-Tunbridge-rock outcrop complex
Becket fine sandy loam
Monadnock stony fine sandy loam
Colton loamy sand

Drainage:

moderately well drained to well drained; poorly drained

Terrain:

flat to rolling; minor steep sections

Aspect:

Varies

Snags Per Acre

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"	1.4	4.9		6.3
12-18"	2.0	1.3	1.1	4.4
>18"	1.1	0.1	0.9	2.0
Grand Total	4.4	6.3	2.0	12.7

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"	18.0	19.8		37.8
12-18"	1.8	5.1		6.9
>18"	0.3	0.3		0.6
Grand Total	20.1	25.2		45.3

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

WILDLIFE HABITAT

Forest type: softwood forestland
 Vertical diversity: Moderate
 Vegetative diversity: Moderate
 Hard mast: red oak, beech
 Soft mast: Blueberry
 Special habitat features: vernal pools
 Snag trees: Acceptable
 Down logs: acceptable; some larger sections would be better
 Special wildlife practices: leave some down large bole sections following harvest

RECREATION

Recreational features: snowmobile trail passes through some portions; skid trails; wildlife/bird watching
 Recreational infrastructure: skid trails, main haul skid trails
 Aesthetic resources: cellar hole and associated stonework along west boundary, north of Merrill Road
 Public access: decent from Merrill Road and Peaslee road

SILVICULTURE

Structural and Silvicultural Attributes

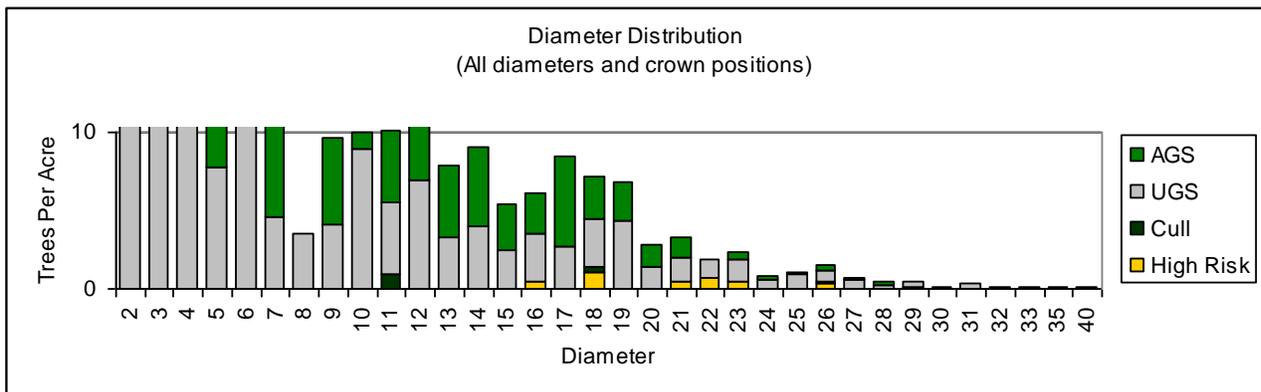
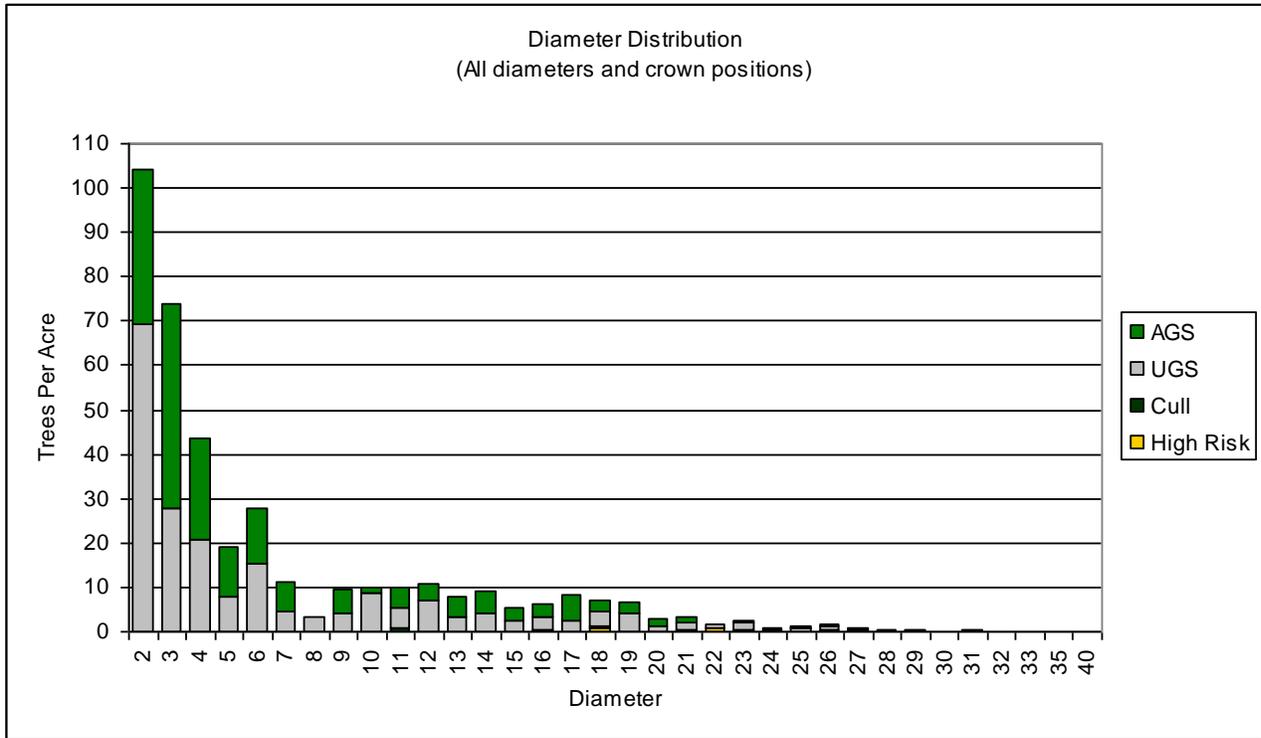
Broad Forest Type: S4B/H1B
 Size Class: Small Sawlog
 Stand Structure: Evenaged
 Crown Closure: 85%
 Total Basal Area Per Acre: 167
 Total Merchantable Basal Area Per Acre: 158
 Total Acceptable Basal Area Per Acre: 67
 Trees Per Acre: 391
 Quadratic Mean Stand Diameter: 8.9
 Percent AGS Sawtimber: 35.8
 Basal Area of AGS Sawlogs: 53
 Timber Quality: average; high quality-high risk WP

Forest Composition and volume

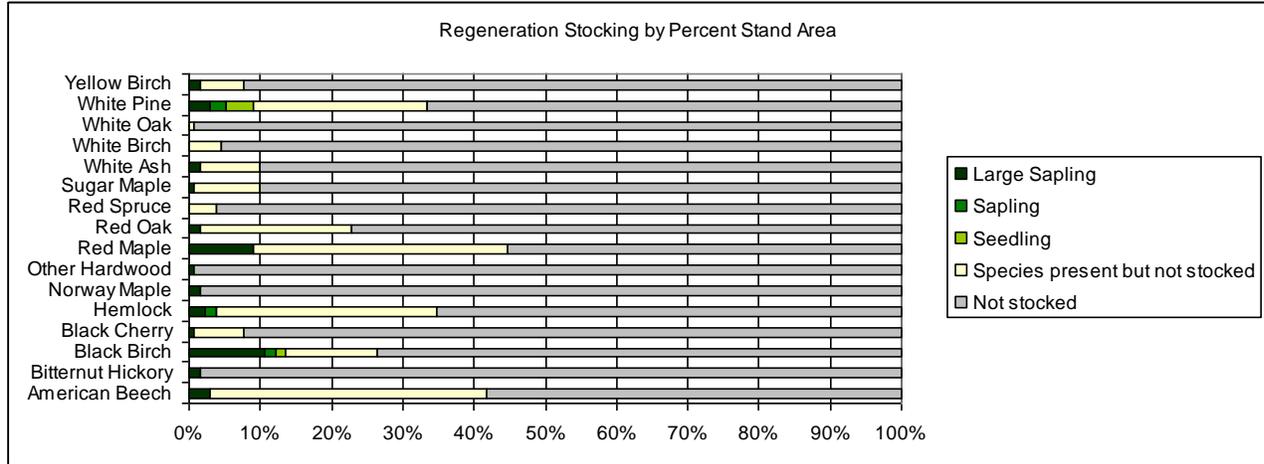
Species	% TPA	Veneer (bf)	Sawlog (bf)	Pallet/Tie (bf)	Pulp (cd)	Growing Stock (cd)	Total Cords	High Risk	AGS Saw	% AGS Saw
American Beech	1.7%	0	0	0	0.3	0.0	0.3	0	0	0%
Black Birch	7.5%	0	90	35	0.3	0.3	0.9	0	103	83%
Red Maple	9.1%	0	107	51	1.9	0.0	2.2	0	48	31%
Red Oak	0.8%	0	55	42	0.1	0.0	0.3	0	97	100%
Sugar Maple	0.3%	0	0	45	0.1	0.0	0.2	0	0	0%
White Birch	2.5%	0	29	22	0.3	0.0	0.4	29	0	0%
Yellow Birch	0.3%	0	50	0	0.1	0.0	0.2	0	50	100%
Total Hardwood Per Acre:	22.3%	0	330	195	3.1	0.3	4.5	29	299	57%
Hemlock	17.2%	0	95	0	1.7	0.0	2.1	0	95	100%
Red Pine	0.5%	0	190	0	0.0	0.0	0.4	0	190	100%
Red Spruce	2.1%	0	14	0	0.0	0.0	0.1	0	14	100%
White Pine	57.9%	0	13,655	3,978	11.6	1.4	44.8	1,662	8,151	46%
Total Softwood Per Acre:	77.7%	0	13,954	3,978	13.4	1.4	47.4	1,662	8,451	47%
Total Volume Per Acre:	100.0%	0	14,284	4,173	17	2	52	1,691	8,750	47%
Stand Volume:		0	3,021,385	882,591	3,493	359	10,978	357,671	1,850,715	

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

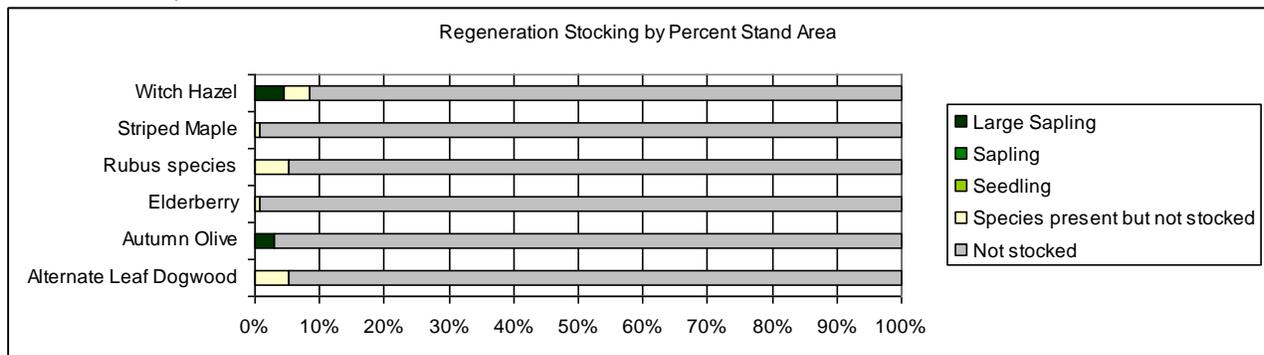
Graph 2.1a and 2.1b: Diameter distribution showing trees per acre on the Y axis, diameter class on the X axis and tree condition. Includes trees in all canopy positions down to 2 inches in diameter. 2.1b provides a close-up of the breakdown in the larger diameter classes.



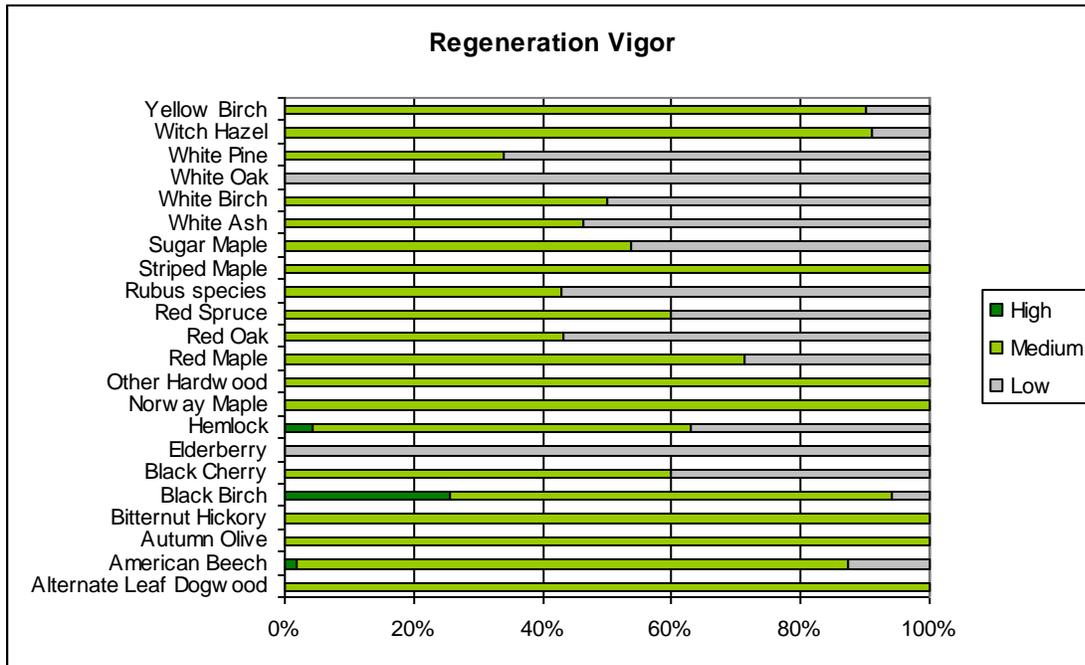
Graph 2.2: Regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less 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.



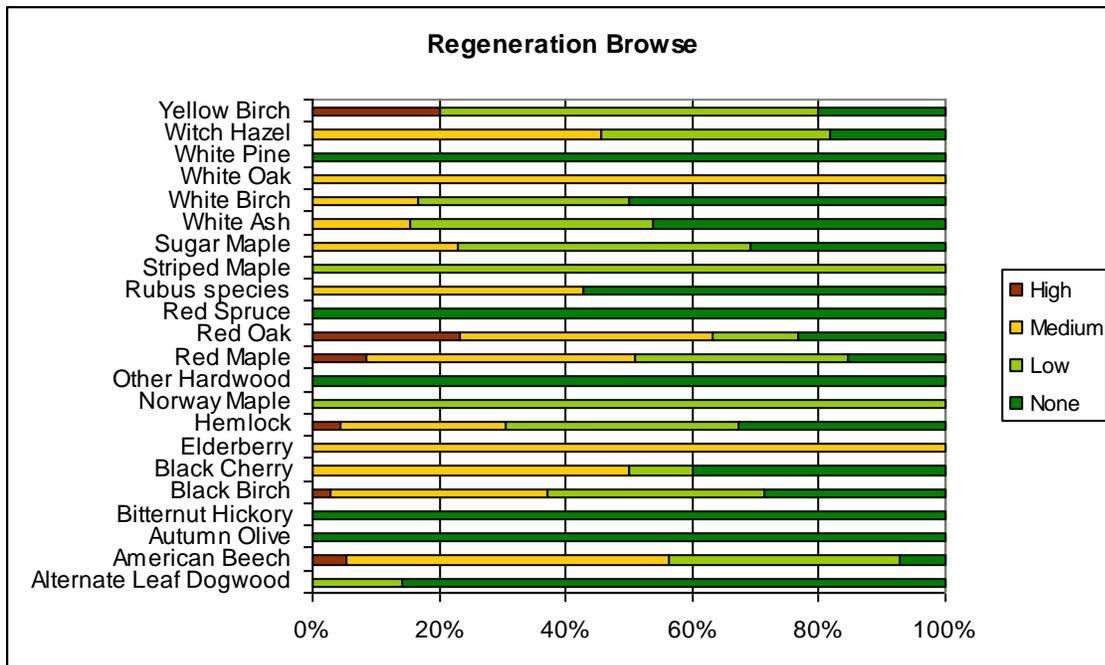
2.3: Shrub and competing species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), 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:	transition to multi-aged stand	
Harvest Entry:	within 5 years	
Products:	high and low quality sawtimber, pulpwood	
Desired Composition:	retain strong WP component	
Crop tree target diameter:	WP-22	HE - 20

Operational Considerations

Operability:	highly operable
Seasonal limitations:	minor, avoid low areas in spring
Terrain:	some surface stone/boulders, minor steep areas
Access and landing area:	ok for most stands in the type
Access distance:	mostly 1/4-mile, some areas approaching 1/2-mile
General maintenance:	upgrade of Peaslee Road; update landings
Brook-wetland crossings/buffer requirements:	utilize minimum harvesting adjacent to open wetlands; leave cover intact around vernal pools/minimize disturbance; several internal crossings required

STAND SUMMARY AND 10-YEAR MANAGEMENT SCHEDULE

Type 2 includes 4 non-contiguous stands dominated by white pine, which accounts for almost 60% of the total stem count and over 90% of the total product volume in the stand. Hemlock and hardwoods are present as a minor component of the stand. The canopy is generally closed in most parts of the Type, averaging 85% closure, while basal area is medium for the type, around 170 square feet per acre. Current stand structure and characteristics indicate the Type is evenaged, but there is existing strong white pine, hemlock and black birch regeneration that formed, primarily in groups created following timber harvesting ca 1990.

Regeneration is excellent within the groups and within many of the skid trails; it is less established in between the groups, where the overstory was more intact. White pine, hemlock, beech and red maple can be found in over 30% of the area within type, and black birch and red oak can be found on over 20% of the area within the type. The presence of the abundant white pine regeneration is promising for trying to maintain pine in the overstory.

Intermediate stems (poletimber and small sawtimber) are somewhat lacking, although there are many quality examples scattered within the type. These intermediates should be released during overstory removals and at the edges of more group selections. Intermediates to favor are white pine, red oak and black birch, which appear to have the best quality and highest potential in this type.

Sawtimber opportunities are very good in this type, with an estimated 13,000 board feet per acre of white pine alone. Many pine are high risk, in that they are presently high valued, but could be compromised in the next 10 to 15 years, either by decay, weather, or other events. The long-term goal of management in this stand is to perpetuate the pine resource, primarily via evenage strategies. The resulting pattern of harvesting will create a multi-aged stand that 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, although beech may be more present in the overstory. The most easterly stand area of type 2 had a timber harvest trespass sometime in 2007. This occurred where cruise plot #17 is located; loggers cut many trees beyond the stone wall that serves as the boundary.

Silviculture: The focus of management in this stand will be to harvest white pine and hemlock sawtimber, especially high-risk individuals and low quality stems. Release existing groups of regeneration, especially white pine, but also work with quality black birch and red oak examples. Create conditions to regenerate white pine seedlings where absent.

2009-2014: Harvest significant white pine and hemlock volume, removing the poorest quality wood as a priority, but also include high-risk mature stems. Release groups and individual intermediate and regeneration stems, especially black birch, red oak and white pine. Reduce basal area to approximately 90 to 110 square feet through:

- **Group Selection:** Create openings of 5-10 trees to establish 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.
- **Shelterwood:** In areas with limited existing regeneration, remove most of the understory and 40 to 60% of the overstory, leaving a somewhat well distributed overstory of average to above average quality white pine to serve as a seed source and protective cover for new seedlings. The remaining overstory within the shelterwood should be removed following successful establishment of new seedlings and saplings, approximately 10-15 years following the first stage harvest. This can be modified by removing only half of the remaining overstory at the 10-15 year mark, and removing most of the remaining original overstory 25 year after the first stage harvest.

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 down logs by felling up to 5 trees > 18" in diameter per acre.
- Maintain existing snags and large down logs.
- Maintain areas with dense hemlock overstory for winter cover.

Stand 3 White Pine-Hemlock4B/SH1-2B

63.9 acres



Stand Structure



Stand Structure



Forest Canopy

GENERAL ATTRIBUTES

Natural Community Type: hemlock-beech-oak-pine forest
 vernal woodland pools
 Past Management History: overstory thinning ca. 1975
 Approximate Age of Dominant Trees: 90
 Stand Health: acceptable
 Insects/Damage/Disease: minimal

SITE CONDITIONS

Determined by: soil map and onsite observation
 Tree vigor: moderate
 Soils: Monadnock stony fine sandy loam
 Drainage: well drained
 Terrain: flat
 Aspect: southerly

Snags Per Acre

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"	5.7	3.7	10.2	19.6
12-18"		1.3	2.5	3.8
>18"	0.2			0.2
Grand Total	6.0	4.9	12.7	23.6

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

Down Logs Per Acre

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"	51.5	11.2		62.6
12-18"	3.5	1.9		5.4
>18"				
Grand Total	55.0	13.0		68.0

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

WILDLIFE HABITAT

Forest type: softwood forestland
 Vertical diversity: limited; few recent large openings
 Vegetative diversity: limited, primarily pine, hemlock
 Hard mast: beech
 Soft mast: blueberry
 Special habitat features: hemlock winter cover, Peaslee Meadow along south edge
 Snag trees: ok, limited number large diameter
 Down logs: many, but small diameter
 Special wildlife practices: create more large snags/debris; maintain hemlock cover

RECREATION

Recreational features: wildlife/bird watching
 Recreational infrastructure: limited, no well-used skid trails
 Aesthetic resources: views of Peaslee Meadow
 Public access: limited, no good place to park, no internal open trails

SILVICULTURE

Structural and Silvicultural Attributes

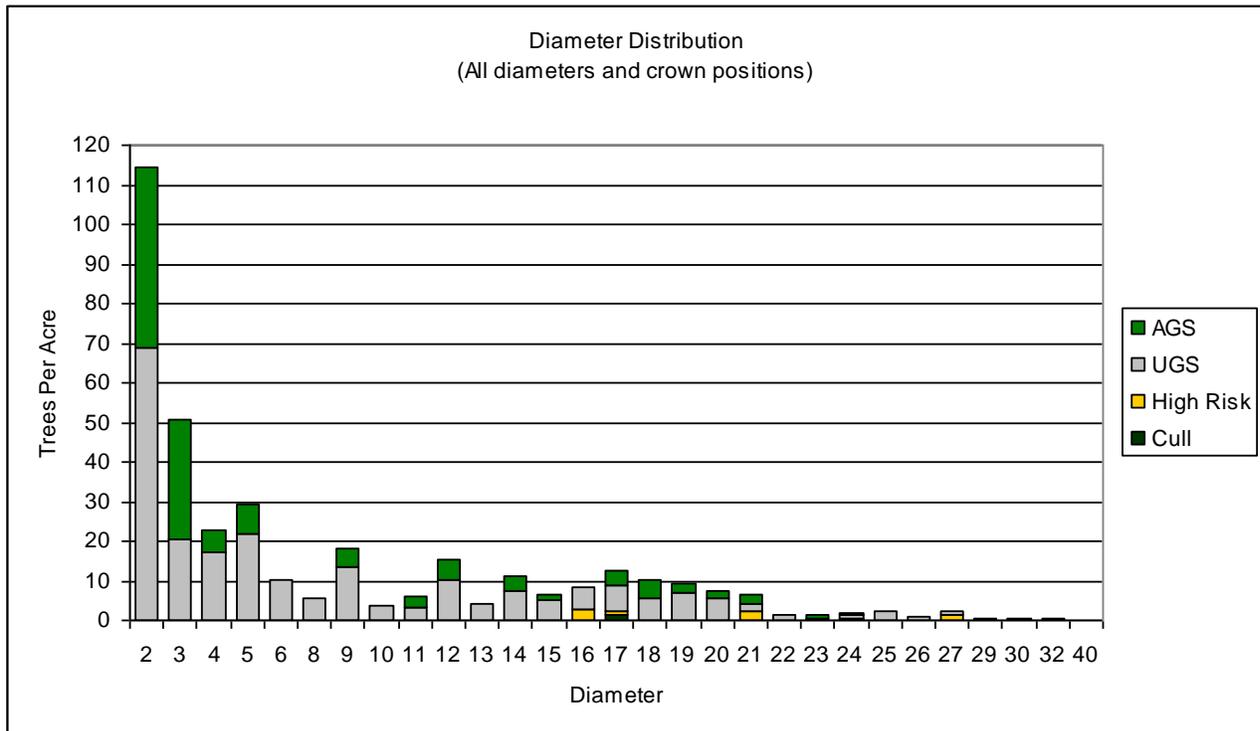
Broad Forest Type: S4A/SH1-2B
 Size Class: Sapling to Large Sawlog
 Stand Structure: Two aged
 Crown Closure: 85%
 Total Basal Area Per Acre: 209
 Total Merchantable Basal Area Per Acre: 202
 Total Acceptable Basal Area Per Acre: 50
 Trees Per Acre: 366
 Quadratic Mean Stand Diameter: 10.2
 Percent AGS Sawtimber: 46.7
 Basal Area of AGS Sawlogs: 44
 Timber Quality: low to average

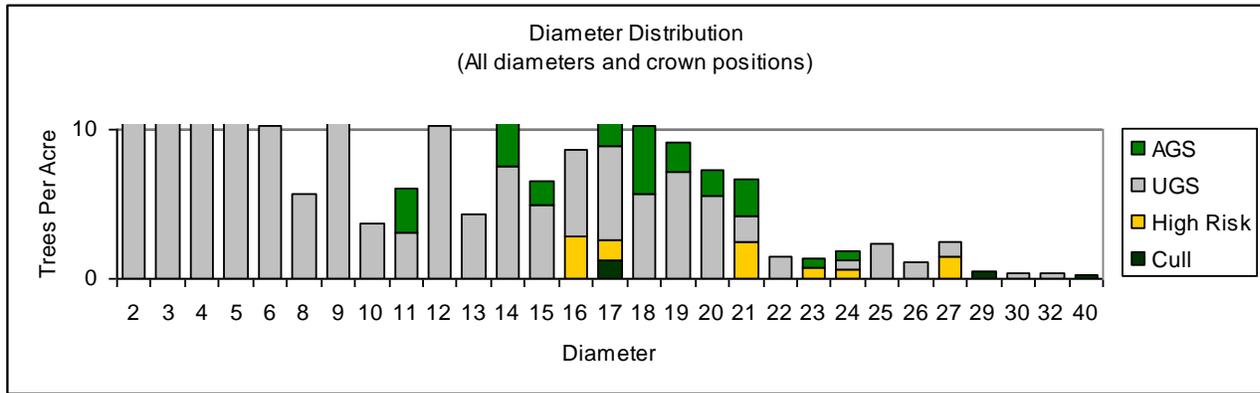
Forest Composition and volume

Species	% TPA	Veneer (bf)	Sawlog (bf)	Pallet/Tie (bf)	Pulp (cd)	Growing Stock (cd)	Total Cords	High Risk	AGS Saw	% AGS Saw
American Beech	0.3%	0	0	0	0.2	0.0	0.0	0	0	0%
Black Birch	3.1%	0	0	0	0.5	0.0	0.5	0	0	0%
Red Maple	1.0%	0	0	0	0.4	0.0	0.4	0	0	0%
Red Oak	1.3%	0	178	228	0.3	0.0	1.0	0	270	67%
Sugar Maple	2.2%	0	83	262	0.3	0.0	0.9	0	0	0%
Total Hardwood Per Acre:	7.9%	0	261	490	1.7	0.0	2.9	0	270	67%
Hemlock	39.6%	0	2,342	0	7.9	0.0	12.2	0	1,132	48%
White Pine	52.5%	0	20,913	2,986	6.9	0.0	48.7	4,776	6,760	26%
Total Softwood Per Acre:	92.1%	0	23,255	2,986	14.8	0.0	60.9	4,776	7,892	30%
Total Volume Per Acre:	100.0%	0	23,516	3,476	17	0	64	4,776	8,162	30%
Stand Volume:		0	1,501,941	222,025	1,057	0	4,076	305,042	521,309	

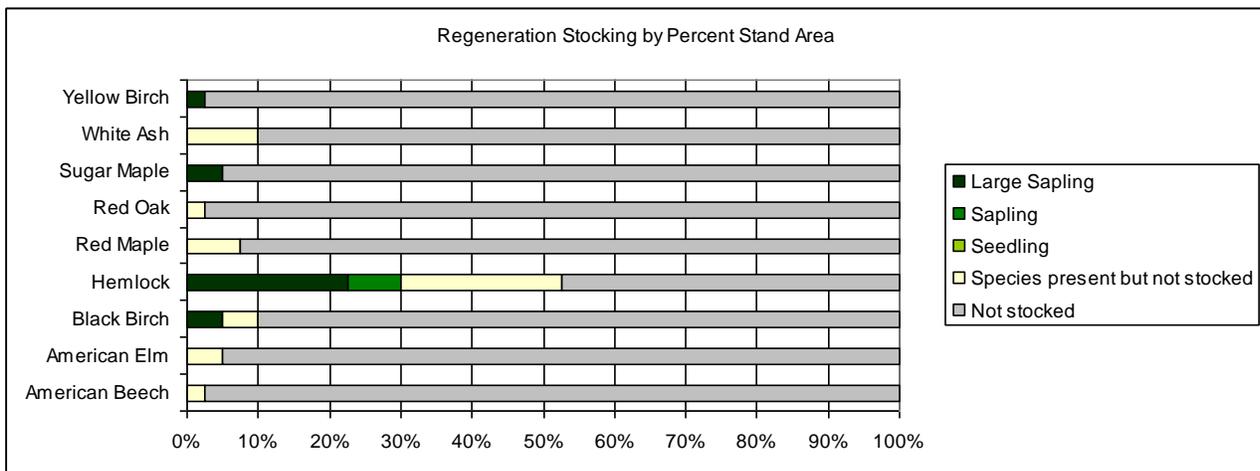
Table 3.3: Stand volume by species and product per acre values.

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.

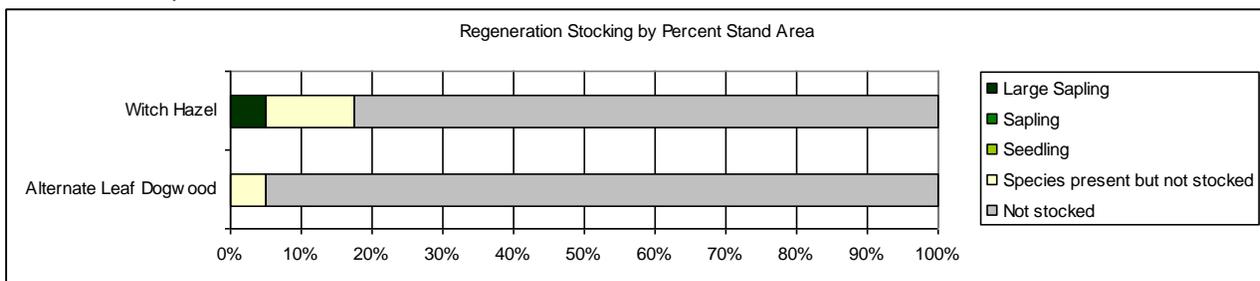




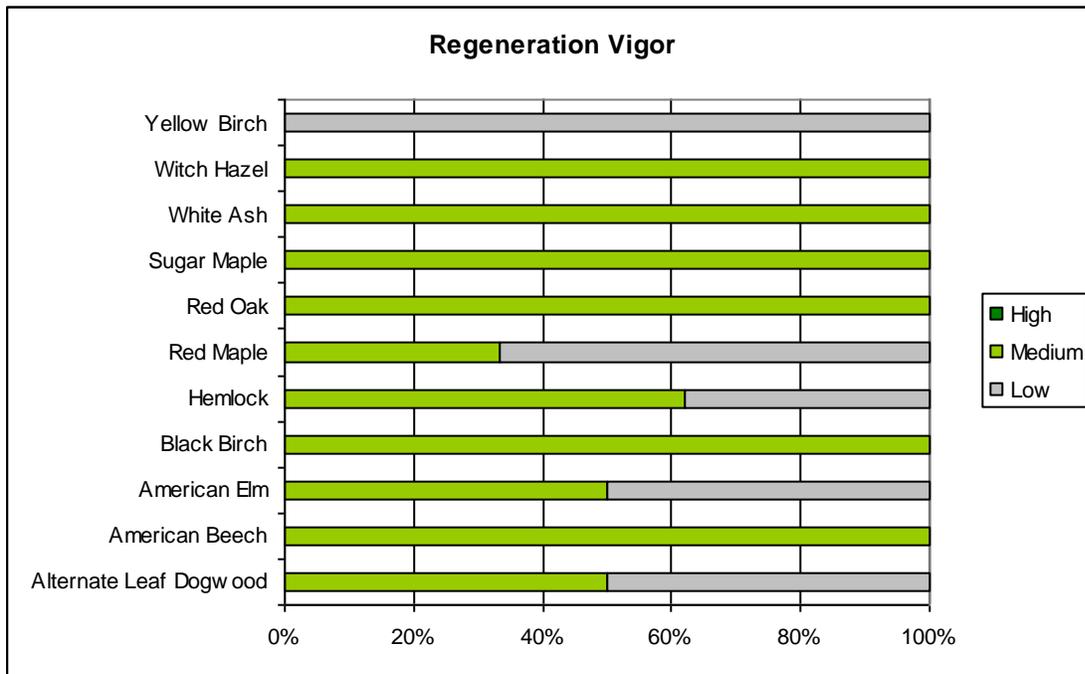
Graph 3.2: Regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less 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.



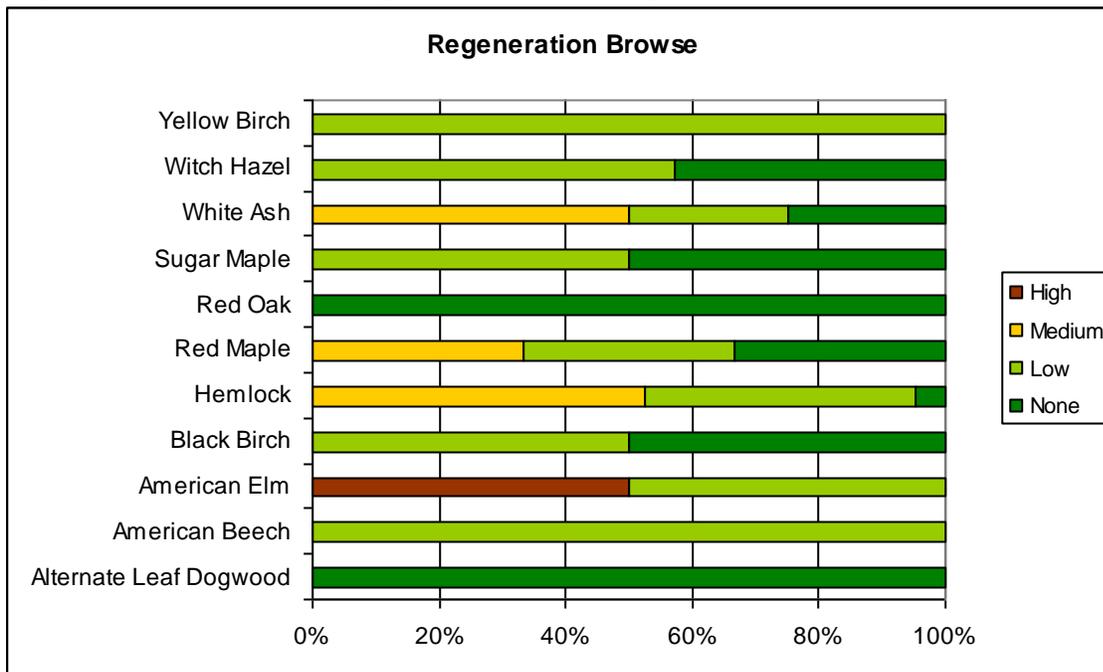
Graph 3.3: Shrub and competing species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), 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:	evenage	
Harvest Entry:	within 5 years	
Products:	sawtimber, pulpwood maintain hemlock, increase hardwood	
Desired Composition:	component	
Crop tree target diameter:	WP – 22	HE - 18

Operational Considerations

Operability:	highly operable
Seasonal limitations:	minimal
Terrain:	some ledge, but not limiting
Access and landing area:	no developed landing or access (R-O-W exists)
Access distance:	once created, short internal distances
General maintenance:	need to install access road/landing
Brook-wetland crossings/buffer requirements:	minimize harvest adjacent to wetlands, retain canopy adjacent to vernal pools

STAND SUMMARY

AND

10-YEAR MANAGEMENT SCHEDULE

Type 3 is a single stand dominated by white pine, with associated hemlock and limited mixed hardwoods. The stand occupies most of the forestland north of Peaslee Meadow within the Felch Farm Forest. The Town of Weare has a Right-of-Way to access this area, but the access at present hasn't been developed sufficiently to allow for timber harvesting. This is the only type not to experience significant harvesting during either the 1980's or 1990's, although blue marking paint was noted on some stems, indicating a sale was contemplated during that time. There are also abutter trespass issues with this stand, including removal of trees from the Felch Farm Forest, encroaching fencing for livestock/pets, a semi-permanent hunting stand and bait station, and an encroaching dirt-bike/ATV track in the northeast corner.

This stand possess the highest per acre volume of sawtimber on the Felch Farm Forest, with estimated volume exceeding 20,000 board feet for white pine, or 1.5 million board feet for the entire 64 acres.

Advanced regeneration (large saplings and small poletimber) is present, and includes black birch, hemlock, sugar maple and white pine. Quality examples could be released during overstory treatments. Seedlings and small saplings tend to be absent, although hemlock examples can be found in 50% of the stand area.

Intermediate stems (poletimber and small sawtimber) are notably absent from this stand, with only a few (mostly hemlock) scattered examples.

Sawtimber opportunities are better in this type than in the other types. The mature white pine overstory is overdue for harvesting. With a stand basal area of nearly 210, and an acceptable stem basal area of only 50, heavy removals are indicated. A two-part shelterwood would accomplish the removals, and would create conditions for establishing new white pine, hemlock and black birch seedlings. Most red oak stems, especially ones capable of acorn production, should be retained. Given the proper conditions, oak might grow well in this stand.

Silviculture: The focus of management here will be to harvest a significant portion of the white

pine overstory, create good seedbed conditions for pine, hemlock, black birch and red oak, and to retain intermediate and older red oaks.

2011-2012: Treat most areas of the stand using evenage methods. Reduce overall basal area to approximately 100-115 square feet through:

- **Group Selection:** Create openings of 5-10 trees to establish 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.
- **Shelterwood:** Remove most of the understory and 40 to 60% of the overstory, leaving a somewhat well distributed overstory of average to above average quality white pine to serve as a seed source and protective cover for new seedlings. Exceptions are to retain existing quality hardwood advance regeneration and intermediate stems in the understory. The remaining overstory within the shelterwood should be removed following successful establishment of new seedlings and saplings, approximately 10-15 years following the first stage harvest. This can be modified by removing only half of the remaining overstory at the 10-15 year mark, and removing most of the remaining original overstory 25 year after the first stage harvest.

Wildlife: Wildlife habitat is limited primarily to softwood cover, with few browse opportunities. Evenage treatments should create more browse. 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
- Release intermediate red oak to encourage acorn production
- Use shelterwood and group selection to regenerate hemlock and white pine for future cover

Stand 4 Hemlock/Hardwood4B/Hemlock-Hardwood1C 54.6 acres



Stand Structure



Stand Structure



Forest Canopy

GENERAL ATTRIBUTES

Natural Community Type: hemlock-beech-oak-pine forest
 red maple-sphagnum basin swamp
 vernal woodland pool

Past Management History: thinned ca. 1945 and 1985

Approximate Age of Dominant Trees: 70-75

Stand Health: average

Insects/Damage/Disease: minor

SITE CONDITIONS

Determined by: soil map & onsite observation

Tree vigor: medium

Soils: Lyme stony loam
 Monadnock stony fine sandy loam

Drainage: somewhat poorly drained; well drained

Terrain: rolling; some flat areas

Aspect: northerly

Snags Per Acre

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"	21.3	3.3	14.8	39.4
12-18"				
>18"	0.9			0.9
Grand Total	22.2	3.3	14.8	40.3

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

Down Logs Per Acre

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"	9.3	19.4		28.7
12-18"	8.4	4.8	2.5	15.7
>18"				
Grand Total	17.8	24.2	2.5	44.4

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

WILDLIFE HABITAT

Forest type: softwood forestland
 Vertical diversity: moderate, some openings
 Vegetative diversity: moderate, small aspen component absent in other stands
 Hard mast: red oak, especially in single stand in north central location
 Soft mast: not noted
 Special habitat features: wetlands; hemlock cover; browse
 Snag trees: ok, missing large snags
 Down logs: ok, missing large debris
 Special wildlife practices: create more large snags/debris

RECREATION

Recreational features: wildlife viewing, bird watching
 Recreational infrastructure: none
 Aesthetic resources: limited
 Public access: decent, directly from Peaslee/South Road

SILVICULTURE

Structural and Silvicultural Attributes

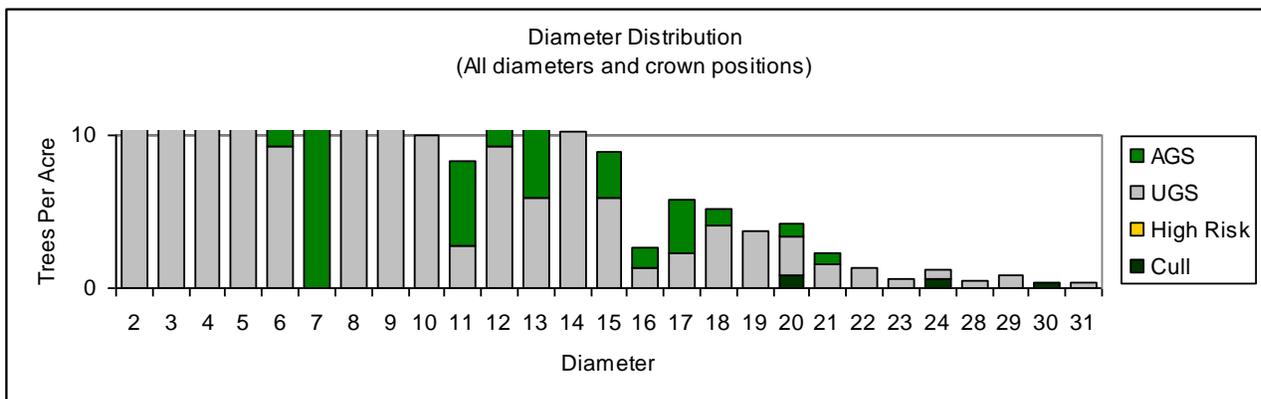
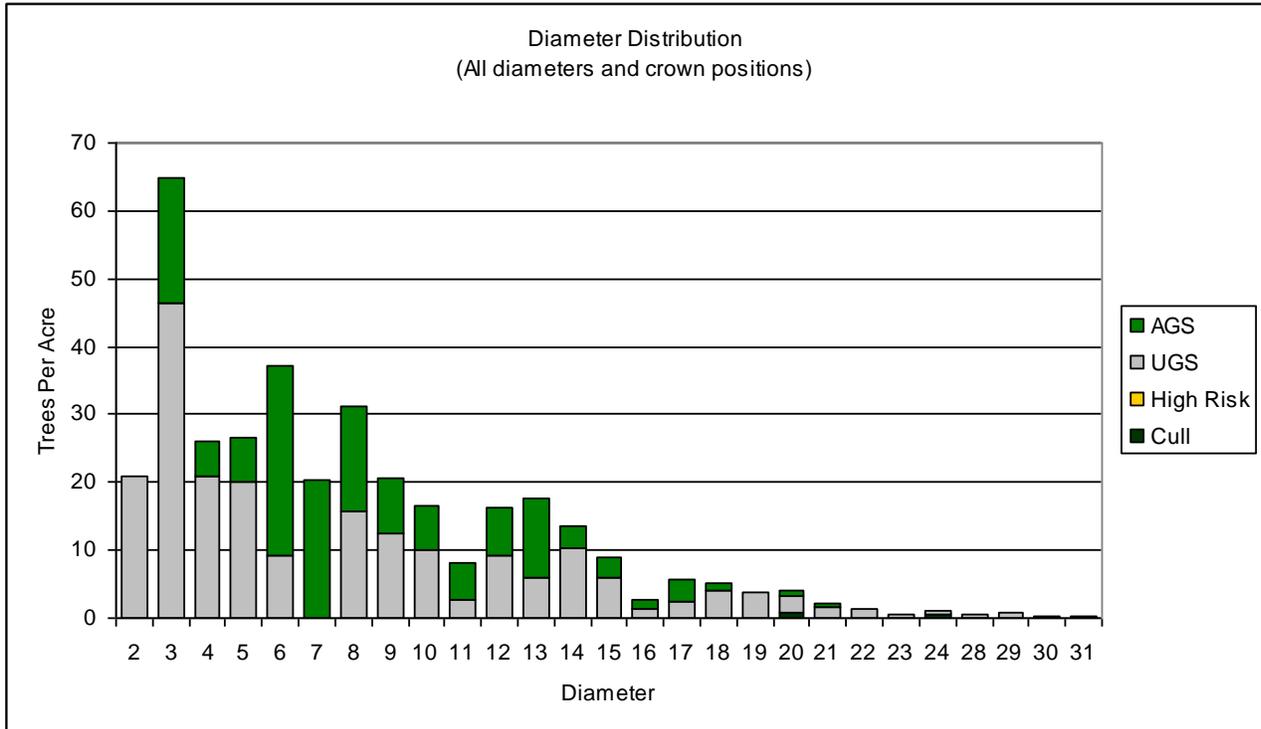
Broad Forest Type: SH4B/SH1C
 Size Class: Large Sawlog/Saplings
 Stand Structure: Two-age
 Crown Closure: 85%
 Total Basal Area Per Acre: 173
 Total Merchantable Basal Area Per Acre: 167
 Total Acceptable Basal Area Per Acre: 66
 Trees Per Acre: 358
 Quadratic Mean Stand Diameter: 9.4
 Percent AGS Sawtimber: 54.4
 Basal Area of AGS Sawlogs: 40
 Timber Quality:

Forest Composition and volume

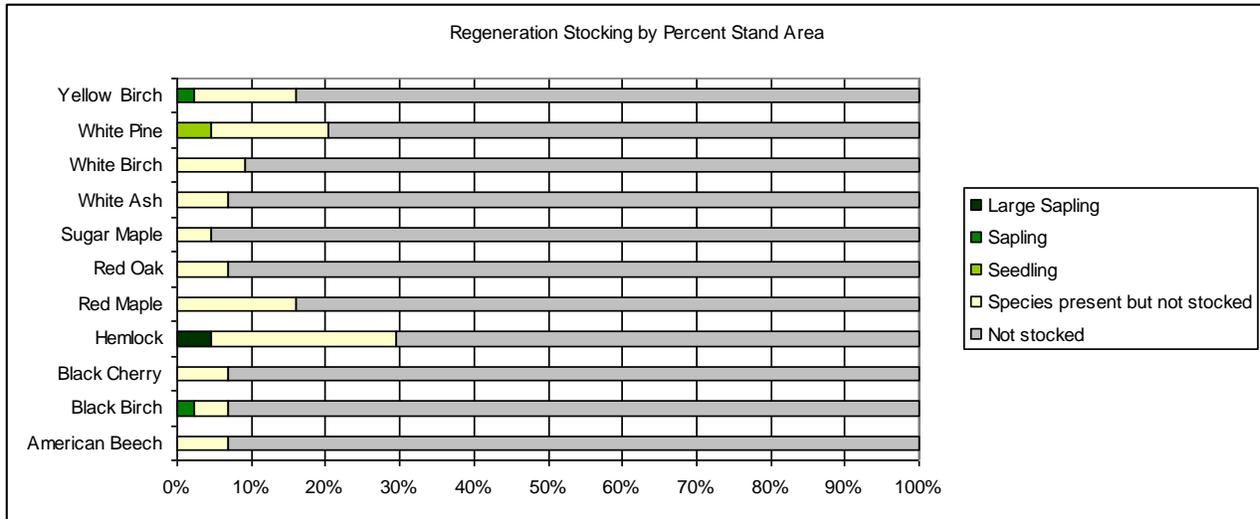
Species	% TPA	Veneer (bf)	Sawlog (bf)	Pallet/Tie (bf)	Pulp (cd)	Growing Stock (cd)	Total Cords	High Risk	AGS Saw	% AGS Saw
Aspen	2.8%	0	318	0	1.1	0.0	1.6	0	156	49%
Red Maple	11.8%	0	82	144	3.6	0.0	4.0	0	226	100%
Red Oak	4.8%	0	1,423	865	1.5	0.0	5.5	0	734	32%
Sugar Maple	1.5%	0	0	0	0.2	0.0	0.3	0	0	0%
White Ash	2.0%	0	161	124	0.4	0.0	1.0	0	285	100%
White Birch	2.3%	0	148	0	1.0	0.0	1.3	0	0	0%
Yellow Birch	1.1%	0	0	0	0.2	0.0	0.2	0	0	0%
Total Hardwood Per Acre:	26.3%	0	2,132	1,133	8.1	0.0	14.0	0	1,401	43%
Hemlock	68.2%	0	2,255	0	12.1	2.0	18.6	0	1,718	76%
Red Pine	0.6%	0	0	0	1.1	0.0	1.1	0	0	0%
Red Spruce	1.5%	0	119	0	0.2	0.0	0.5	0	0	0%
White Pine	3.4%	0	806	183	3.3	0.0	5.2	0	896	91%
Total Softwood Per Acre:	73.7%	0	3,179	183	16.6	2.0	25.4	0	2,614	78%
Total Volume Per Acre:	100.0%	0	5,311	1,316	25	2	39	0	4,015	61%
Stand Volume:		0	289,990	71,829	1,351	108	2,151	0	219,242	

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

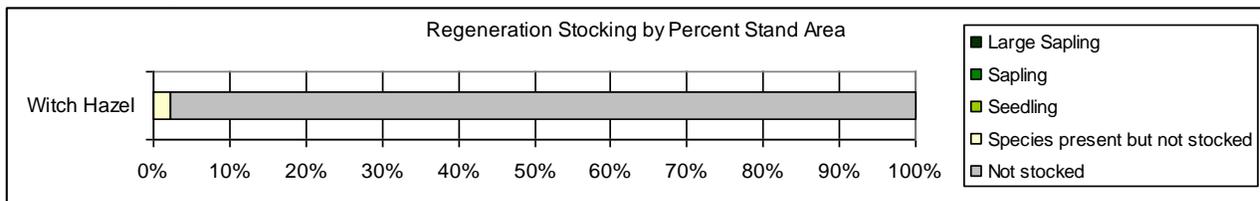
Graph 4.1a and 4.1b: Diameter distribution showing trees per acre on the Y axis, diameter class on the X axis and tree condition. Includes trees in all canopy positions down to 2 inches in diameter. 4.1b provides a close-up of the breakdown in the larger diameter classes.



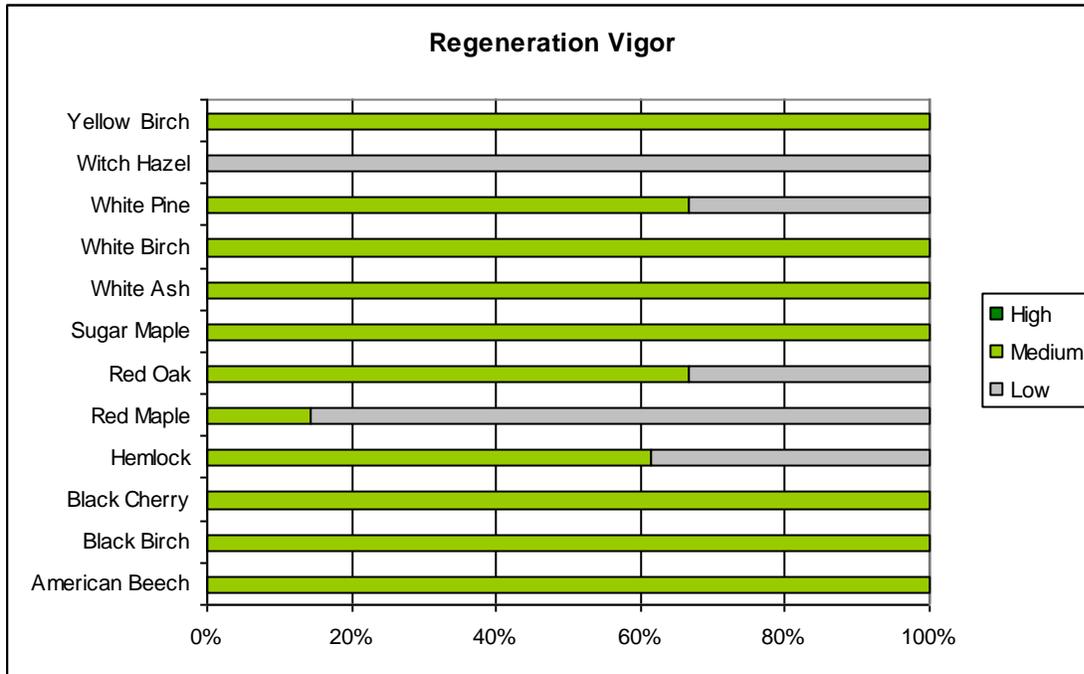
Graph 4.2: Regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter (Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less 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.



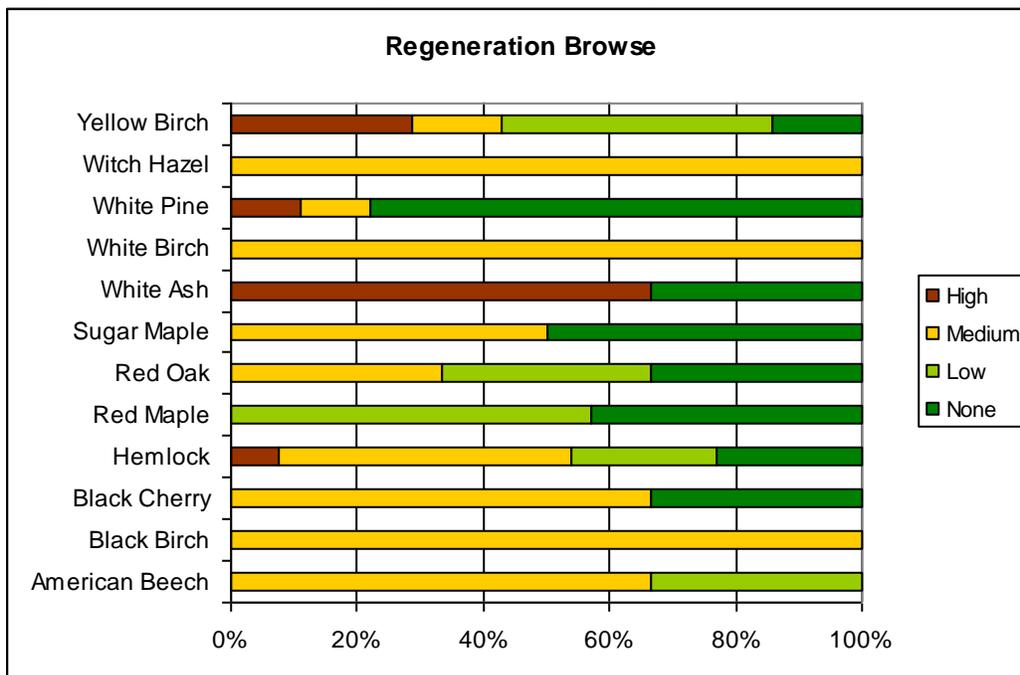
Graph 4.3: Shrub and competing species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), 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:	uneven aged or multi-aged
Harvest Entry:	10-15 years
Products:	sawlogs, pulpwood
Desired Composition:	increase hardwood overstory component
Crop tree target diameter:	HE – 20 RO - 22

Operational Considerations

Operability:	mostly operable
Seasonal limitations:	avoid during spring
Terrain:	some slopes, not rocky
Access and landing area:	adequate for two eastern stands, less so for northern
Access distance:	short
General maintenance:	upgrade Peaslee Road and landing
Brook-wetland crossings/buffer requirements:	some interior crossings needed; avoid basin swamp; limit cutting adjacent to wetlands

**STAND SUMMARY
AND**

10-YEAR MANAGEMENT SCHEDULE

Type 4 includes 3 non-contiguous stands of hemlock and mixed hardwoods and is the only upland forest type on the property without significant white pine in the overstory. Hardwoods comprise about one-quarter of the trees, with hemlock making up most of the remaining stems. The canopy is somewhat closed in most parts of the type, averaging 85% closure, and basal area is high for a mixed stand, approaching 175 square feet. Current stand structure and characteristics indicate the type is somewhat evenaged, but that it could be transitioned into a three-aged or multi-aged type.

Regeneration is limited primarily to groups, and is only found on 20% of the stand area. However, white pine was successfully regenerated in some of the openings, while the hardwoods and hemlock are being moderately browsed.

Intermediate stems (poletimber and small sawtimber) are also lacking in this type, mostly hemlock red oak and red maple. There are some older aspen stems in this type that are being shaded out, although they aren't large.

Sawtimber opportunities are limited in this type. The red oak in this type is older and perhaps is less vigorous; the hemlock is of average quality and vigor. The long-term goal of management in this stand is to develop and maintain at least three 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 with the exception of an increase in the tolerant hardwood (sugar maple, beech) component.

Silviculture: The focus of management here will be to create more age classes by removing groups of low value or low vigor overstory and intermediate stems.

2013-2018: Reduce overall basal area to approximately 100-115 square feet through:

- **Group Selection:** Create openings of 5-10 trees to establish 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.

Wildlife: Wildlife habitat is somewhat diverse, offering areas of dense softwood cover, some hard mast production, browse opportunities in groups, riparian/wetland habitat in vernal pools and the basin swamp, and a fairly high total number of down woody debris (44 logs/acre). There is moose and deer sign and browse evidence, porcupine activity, and beaver activity. 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; creating larger openings around living aspen trees; 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
- Try to create aspen sprout regeneration
- Use group selection to regenerate hemlock and white pine for future cover

Stand 5 White Pine-Hardwood 4B/Hardwood1B

42.4 acres



Stand Structure



Stand Structure



Forest Canopy

GENERAL ATTRIBUTES

Natural Community Type: hemlock-beech-oak-pine forest
 vernal woodland pool
 semi-rich mesic sugar maple forest, red oak variant

Past Management History: cut ca. 1955 and 1990

Approximate Age of Dominant Trees: 75-80

Stand Health: good

Insects/Damage/Disease: blister rust, beech bark disease

SITE CONDITIONS

Determined by: soil map & onsite observation

Tree vigor: moderate

Soils: Tunbridge-Lyman-Monadnock complex stony
 Monadnock stony fine sandy loam
 Becket fine sandy loam
 Skerry fine sandy loam

Drainage: moderately well drained to well drained
 somewhat steep in places, rolling in the two north stands

Terrain:

Aspect: varies

Snags Per Acre

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"	15.1			15.1
12-18"	3.7			3.7
>18"		2.7		2.7
Grand Total	18.9	2.7		21.6

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

Down Logs Per Acre

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"		28.4		28.4
12-18"	3.3	8.1	3.7	15.1
>18"				
Grand Total	3.3	36.4	3.7	43.4

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

WILDLIFE HABITAT

Forest type:	hardwood forestland
Vertical diversity:	medium
Vegetative diversity:	moderate
Hard mast:	red oak; beech; white oak
Soft mast:	cherry
Special habitat features:	higher component of hardwood than in other stands
Snag trees:	acceptable
Down logs:	acceptable, could have more large debris

RECREATION

Recreational features:	limited
Recreational infrastructure:	limited; skid trails
Aesthetic resources:	minor
Public access:	decent; not far from maintained roads

SILVICULTURE**Structural and Silvicultural Attributes**

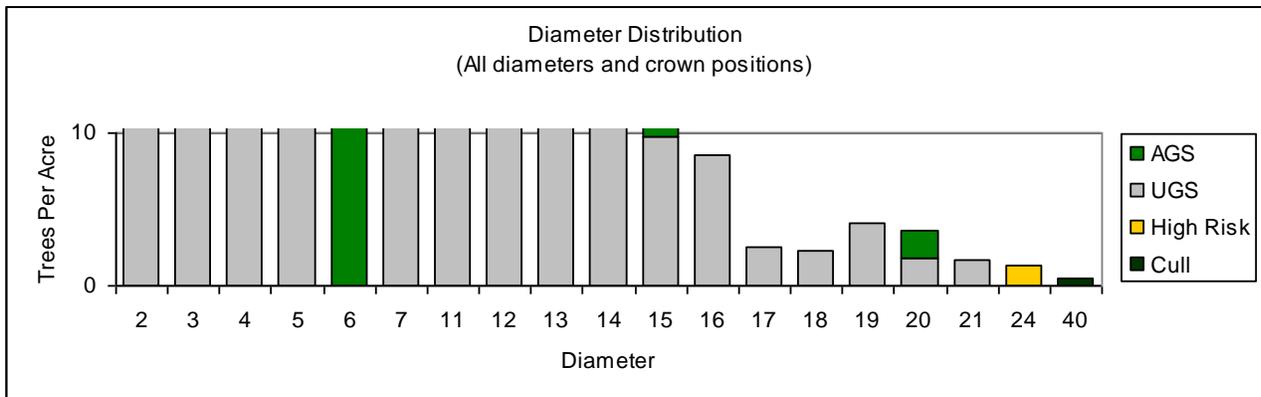
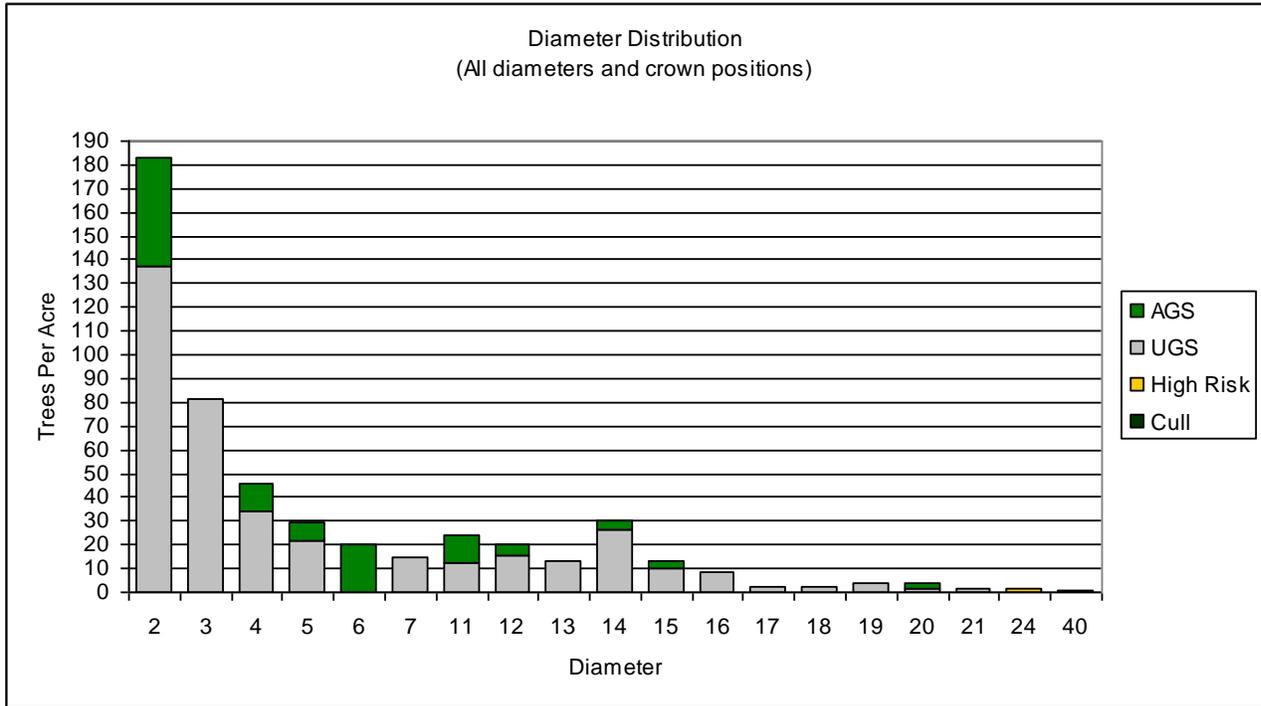
Broad Forest Type:	SH4B/H1B
Size Class:	Large Sawtimber/Sapling
Stand Structure:	Two-age
Crown Closure:	80%
Total Basal Area Per Acre:	164
Total Merchantable Basal Area Per Acre:	152
Total Acceptable Basal Area Per Acre:	31
Trees Per Acre:	500
Quadratic Mean Stand Diameter:	7.8
Percent AGS Sawtimber:	38.0
Basal Area of AGS Sawlogs:	24
Timber Quality:	average; some poor white pine

Forest Composition and volume

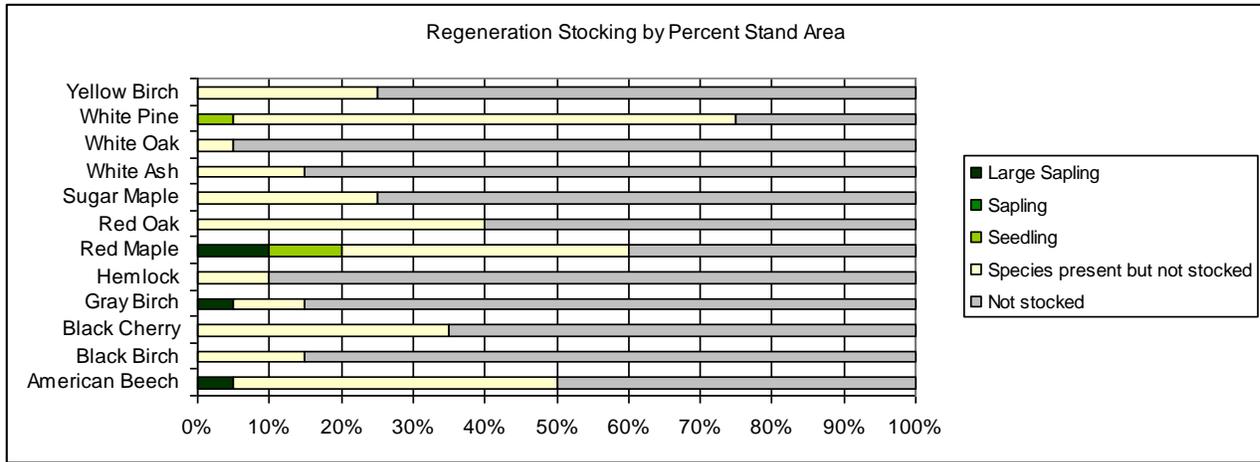
Species	% TPA	Veneer (bf)	Sawlog (bf)	Pallet/Tie (bf)	Pulp (cd)	Growing Stock (cd)	Total Cords	High Risk	AGS Saw	% AGS Saw
Black Birch	14.8%	0	316	125	2.1	0.0	2.9	0	0	0%
Black Cherry	3.2%	0	0	309	0.5	0.0	1.1	0	0	0%
Red Maple	16.4%	0	0	184	5.1	0.0	5.5	0	0	0%
Red Oak	22.3%	0	1,165	363	1.7	0.8	5.3	0	1,085	71%
Sugar Maple	0.3%	0	0	0	0.0	0.0	0.0	0	0	0%
White Ash	1.3%	0	128	291	0.2	0.0	1.2	0	0	0%
White Birch	6.5%	0	169	447	1.1	0.0	2.3	0	298	48%
White Oak	2.3%	0	0	0	1.0	0.0	1.0	0	0	0%
Total Hardwood Per Acre:	67.0%	0	1,778	1,719	11.7	0.8	19.4	0	1,383	40%
Hemlock	4.7%	0	0	0	1.2	0.0	1.2	0	0	0%
Pitch Pine	6.1%	0	0	0	0.0	0.0	0.0	0	0	0%
White Pine	22.2%	0	5,098	2,453	4.2	0.0	18.1	868	964	13%
Total Softwood Per Acre:	33.0%	0	5,098	2,453	5.4	0.0	19.3	868	964	13%
Total Volume Per Acre:	100.0%	0	6,877	4,172	17	1	39	868	2,347	21%
Stand Volume:		0	291,572	176,893	724	34	1,639	36,785	99,518	

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

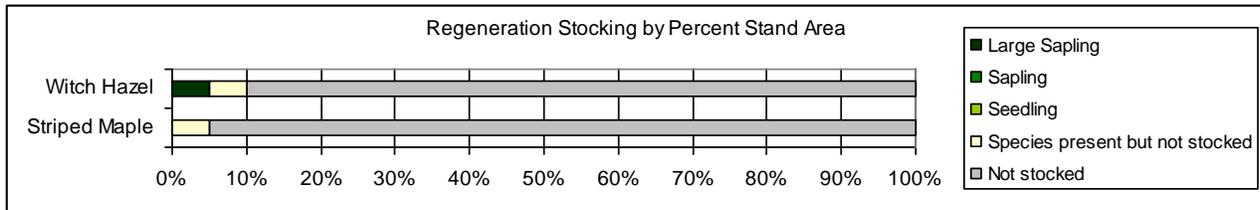
Graph 5.1a and 5.1b: Diameter distribution showing trees per acre on the Y axis, diameter class on the X axis and tree condition. Includes trees in all canopy positions down to 2 inches in diameter. 5.1b provides a close-up of the breakdown in the larger diameter classes.



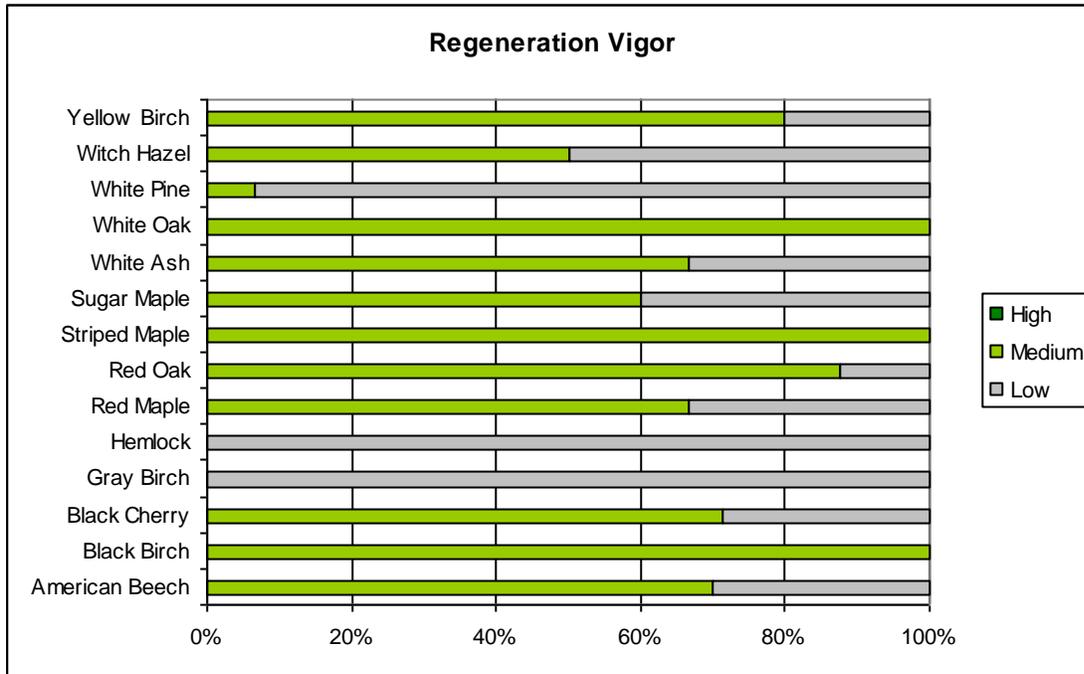
Graph 5.2: Regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less 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.



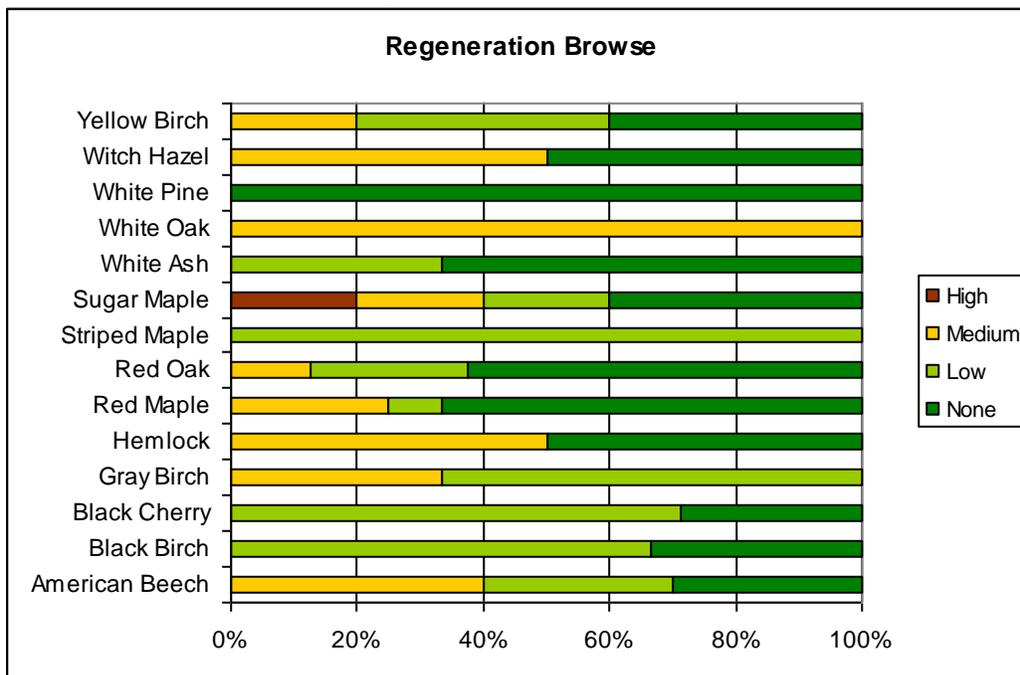
Graph 5.3: Shrub and competing species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), 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 to 2-aged	
Harvest Entry:	within 15 years	
Products:	sawtimber, cordwood, pulpwood	
Desired Composition:	2-aged to 3-aged mixed stand	
Crop tree target diameter:	WP – 20	RO - 20

Operational Considerations

Operability:	mostly operable
Seasonal limitations:	best in summer
Terrain:	steep in some areas
Access and landing area:	adequate
Access distance:	short
General maintenance:	minor update to landings
Brook-wetland crossings/buffer requirements:	limit removals adjacent to wetlands and vernal pools

STAND SUMMARY AND 10-YEAR MANAGEMENT SCHEDULE

Type 5 includes 5 non-contiguous stands mixed hardwoods and white pine, and is one of the smaller upland forest types in the Felch Farm Forest. Hardwoods comprise about two-thirds of the trees, yet white pine represents nearly 90% of the total sawtimber volume in this type. The canopy is somewhat open in parts of the type, averaging 80% closure. Current stand structure and characteristics indicate the type is somewhat evenaged, but that it could be transitioned into a multi-aged type. There are some areas in this type that could be classified as northern hardwoods, but they are limited in area, and were included with the surrounding broad type. Treatment in the northern hardwood-like areas lends itself to single tree release, which has the effect of favoring shade-tolerant regeneration – sugar maple, beech, hemlock.

Regeneration is sporadic, but white pine, red maple and beech appear in over 50% of the area, while red oak, yellow birch, sugar maple and black cherry occur in over 25%, with higher densities and more species in the more recently harvested areas.

Intermediate stems (poletimber and small sawtimber) are limited, although there are some high quality individuals in this type. Favored species include red oak, black birch, white pine, yellow birch and red maple.

Sawtimber opportunities are modest in this type. Although limited in acreage, hardwood sawtimber should be the primary objective. The red oak in this type is vigorous and appears to be above average quality, and the white pine is somewhat poor quality. The long-term goal of management in this stand is to develop and maintain at least three 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 with the exception of an increase in the tolerant hardwood (sugar maple, beech) component.

Silviculture: The focus of management in this stand will be to harvest white pine sawtimber, especially high-risk individuals and low quality stems. Release existing groups of regeneration, especially white pine, but also work with quality black birch and red oak examples. Create conditions to regenerate white pine seedlings where absent.

2009-2014: Harvest significant white pine volume, removing the poorest quality wood as a priority, but also include high-risk mature stems. Release groups and individual intermediate and regeneration stems, especially black birch, red oak and white pine. Reduce basal area to approximately 70 to 100 square feet through:

- **Group Selection:** Create openings of 5-10 trees to establish 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.

Stand 6 Hemlock-White Pine-Hardwood4B/Hemlock-Hardwood1C 115.1 acres



Stand Structure



Stand Structure



Forest Canopy

GENERAL ATTRIBUTES

Natural Community Type: hemlock-beech-oak-pine forest
 vernal woodland pool
 Past Management History: overstory removals ca. 1955 and 1985
 Approximate Age of Dominant Trees: 85
 Stand Health: medium
 Insects/Damage/Disease: white pine weevil

SITE CONDITIONS

Determined by: Field observation
 Tree vigor: moderate
 Soils: Tunbridge-Lyman-Monadnock complex stony
 Monadnock stony fine sandy loam
 Becket fine sandy loam
 Skerry fine sandy loam
 Drainage: moderately well drained to well drained
 somewhat steep in places, rolling in the two north
 stands
 Terrain:
 Aspect: varies

Snags Per Acre

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"	6.6		15.5	22.1
12-18"		2.8	4.7	7.5
>18"	0.5	0.2	0.4	1.1
Grand Total	7.1	3.0	20.6	30.7

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

Down Logs Per Acre

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"	13.3	11.4		24.8
12-18"	6.8	0.6		7.5
>18"		0.5		0.5
Grand Total	20.2	12.5		32.7

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

WILDLIFE HABITAT

Forest type: softwood forestland
 Vertical diversity: limited; few recent large openings
 Vegetative diversity: limited, primarily pine, hemlock
 Hard mast: beech
 Soft mast: blueberry
 Special habitat features: Many vernal pools
 Snag trees: ok, limited number large diameter
 Down logs: many, but small diameter
 Special wildlife practices: create more large snags/debris; maintain hemlock cover

RECREATION

Recreational features: limited
 Recreational infrastructure: limited; skid trails
 Aesthetic resources: minor
 Public access: decent; not far from maintained roads

SILVICULTURE

Structural and Silvicultural Attributes

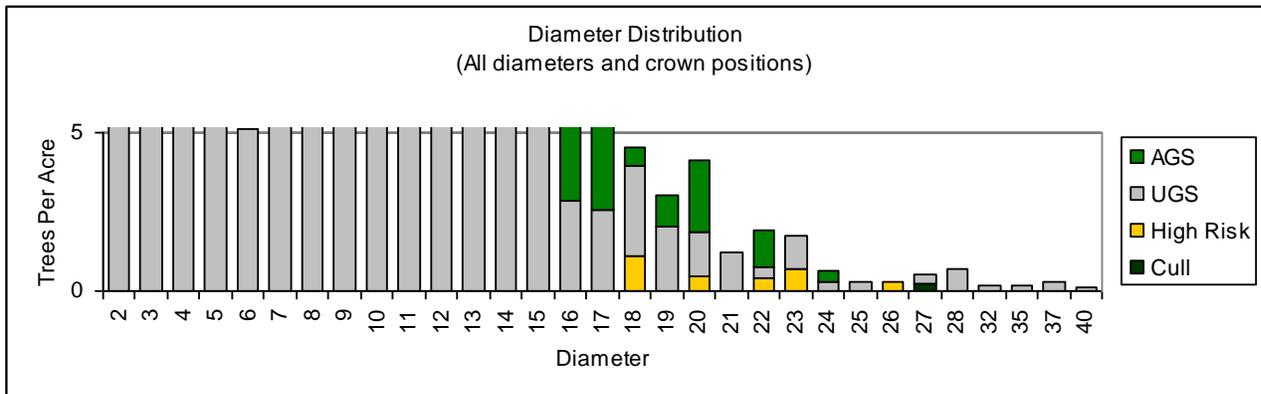
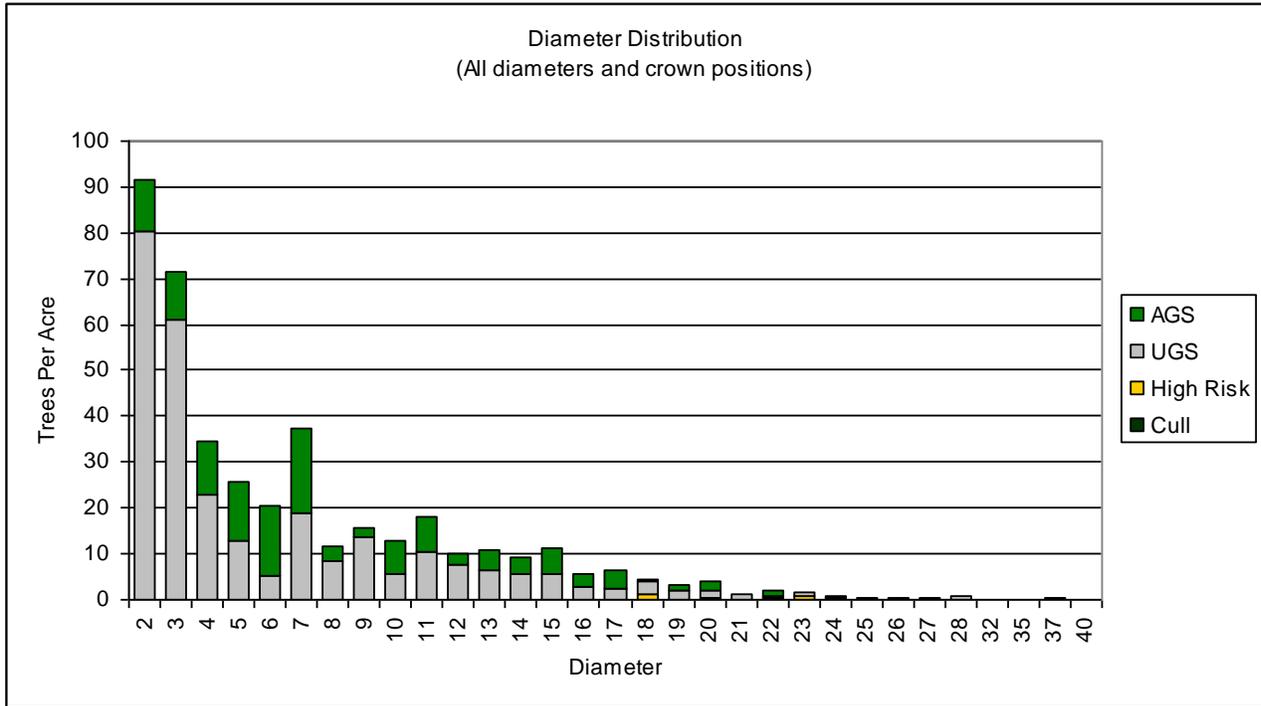
Broad Forest Type: SH4B/SH1C
 Size Class: Large Sawlog/Saplings
 Stand Structure: Two-age
 Crown Closure: 85%
 Total Basal Area Per Acre: 166
 Total Merchantable Basal Area Per Acre: 158
 Total Acceptable Basal Area Per Acre: 62
 Trees Per Acre: 413
 Quadratic Mean Stand Diameter: 8.6
 Percent AGS Sawtimber: 54.4
 Basal Area of AGS Sawlogs: 44
 Timber Quality: Fair to good

Forest Composition and volume

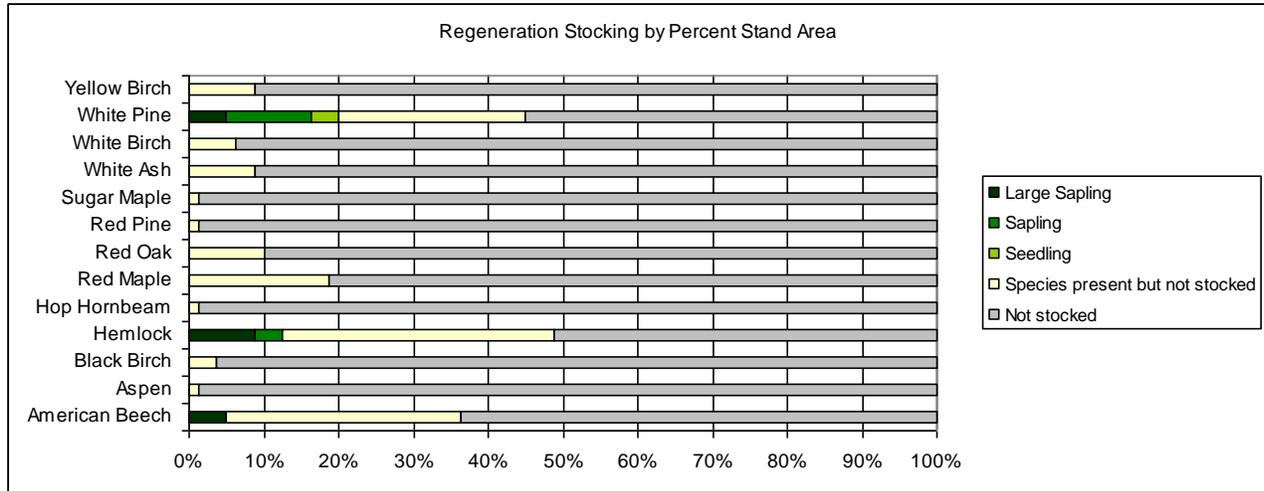
Species	% TPA	Veneer (bf)	Sawlog (bf)	Pallet/Tie (bf)	Pulp (cd)	Growing Stock (cd)	Total Cords	High Risk	AGS Saw	% AGS Saw
American Beech	3.9%	0	0	0	0.3	0.0	0.3	0	0	0%
Aspen	1.5%	0	85	0	0.8	0.0	1.0	0	85	100%
Black Birch	2.0%	0	0	0	0.1	0.0	0.1	0	0	0%
Red Maple	15.5%	0	388	142	3.6	0.0	4.6	89	0	0%
Red Oak	7.3%	0	296	296	0.9	0.0	2.0	120	426	72%
Yellow Birch	0.2%	0	0	39	0.2	0.0	0.3	0	0	0%
Total Hardwood Per Acre:	30.5%	0	769	477	5.9	0.0	8.2	209	510	41%
Hemlock	37.6%	0	760	0	6.3	0.2	8.1	0	619	82%
Red Pine	0.1%	0	181	0	0.0	0.0	0.3	0	0	0%
White Pine	31.8%	0	9,354	1,209	7.3	0.8	27.7	1,167	5,559	53%
Total Softwood Per Acre:	69.5%	0	10,295	1,209	13.7	1.0	36.2	1,167	6,178	54%
Total Volume Per Acre:	100.0%	0	11,064	1,686	20	1	44	1,376	6,688	52%
Stand Volume:		0	1,273,091	194,003	2,255	114	5,109	158,387	769,637	

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

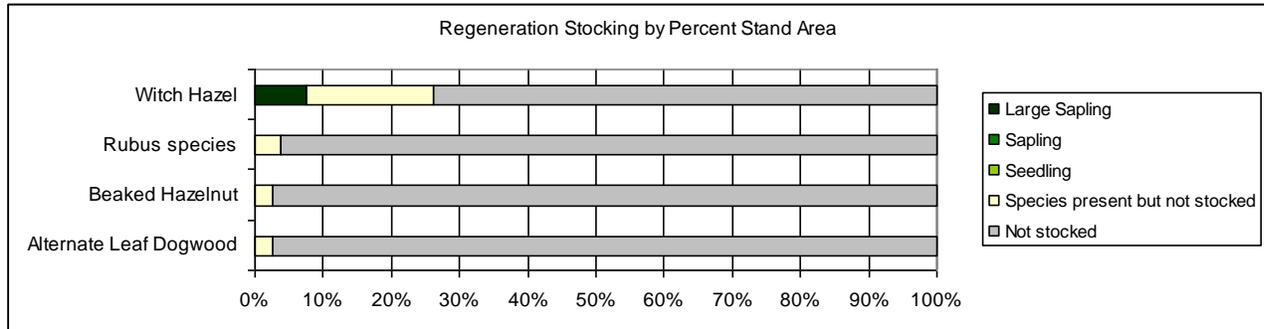
Graph 6.1a and 6.1b: Diameter distribution showing trees per acre on the Y axis, diameter class on the X axis and tree condition. Includes trees in all canopy positions down to 2 inches in diameter. 4.1b provides a close-up of the breakdown in the larger diameter classes.



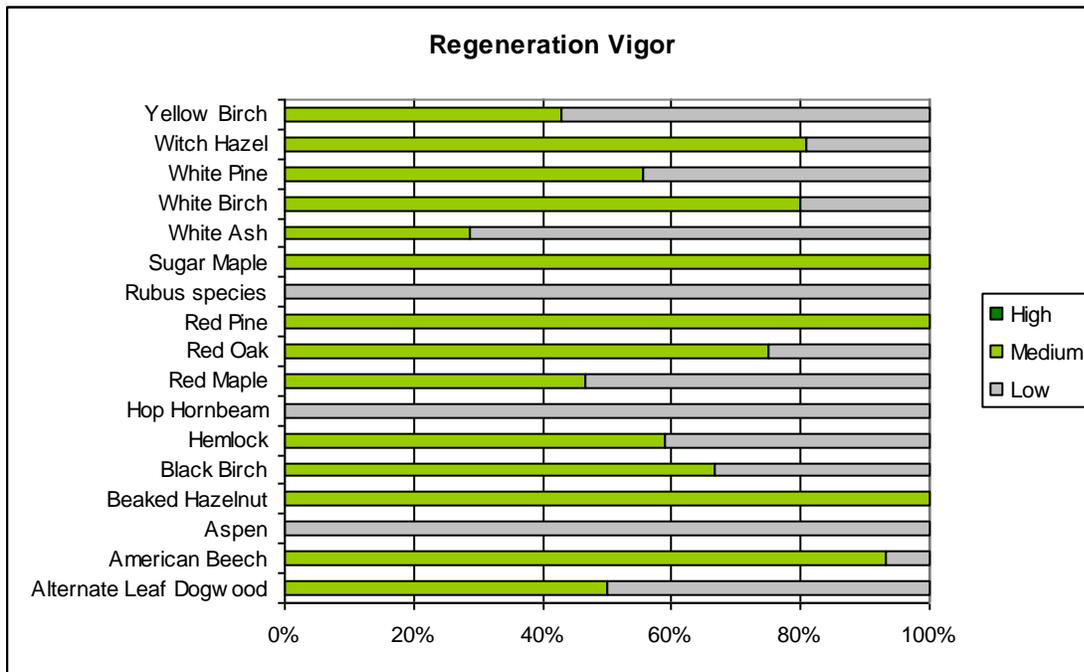
Graph 4.2: Regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter (Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less 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.



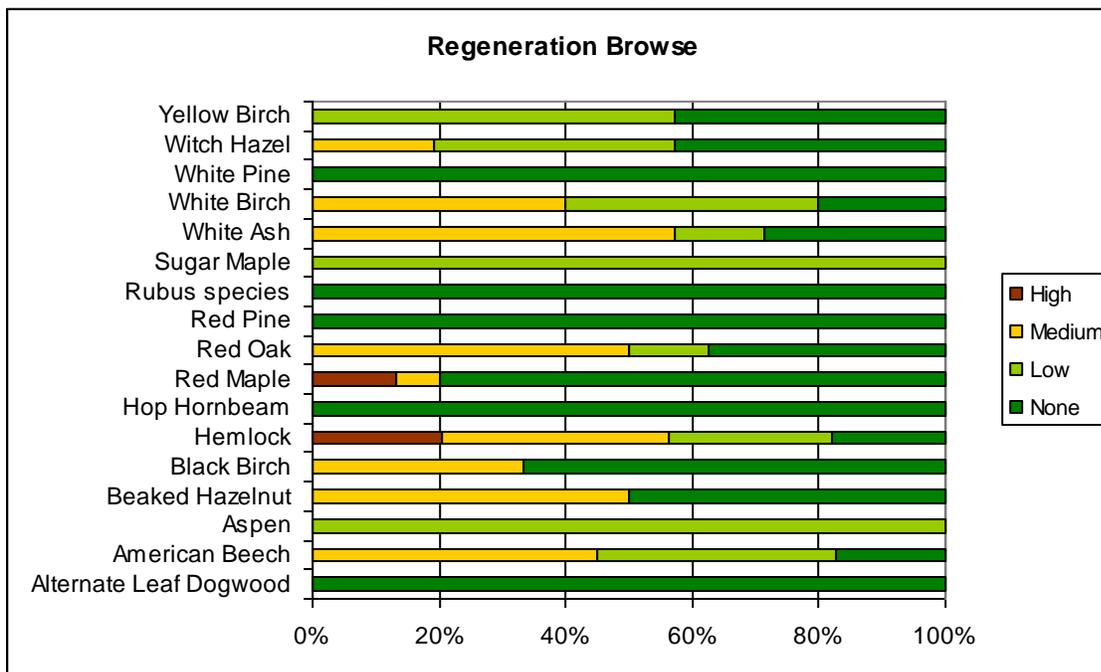
Graph 4.3: Shrub and competing species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), 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 6.4: Vigor of all regeneration and shrub species.



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



Silvicultural Objectives

Management system:	evenaged to 2-aged
Harvest Entry:	within 15 years
Products:	sawtimber, cordwood, pulpwood
Desired Composition:	2-aged to 3-aged mixed stand
Crop tree target diameter:	WP – 20

Operational Considerations

Operability:	mostly operable
Seasonal limitations:	best in summer
Terrain:	Rolling
Access and landing area:	Adequate
Access distance:	Short to remote
General maintenance:	minor update to landings
Brook-wetland crossings/buffer requirements:	limit removals adjacent to wetlands and vernal pools

**STAND SUMMARY
AND**

10-YEAR MANAGEMENT SCHEDULE

Type 6 includes 2 non-contiguous stands dominated by white pine and hemlock, which accounts for nearly 70% of the total stem count and over 90% of the total product volume in the stand. Hardwoods are present as a minor component of the stand. The canopy is largely fragmented in most parts of the Type, averaging 65% closure, while basal area is medium for the type, around 160 square feet per acre. Current stand structure and characteristics indicate the Type is evenaged, but there is existing strong white pine, hemlock and black birch regeneration that formed, primarily in large group harvests areas created in the timber harvesting ca 1980's.

Regeneration is excellent within the groups and within many of the skid trails; it is less established in between the groups, where the overstory was more intact. White pine, hemlock, and beech can be found in over 30% of the area within type. The presence of the abundant white pine regeneration is promising for trying to maintain pine in the overstory.

Intermediate stems (poletimber and small sawtimber) are somewhat lacking, although there are many quality examples scattered within the type. These intermediates should be released during overstory removals and at the edges of more group selections. Intermediates to favor are white pine, red oak and black birch, which appear to have the best quality and highest potential in this type.

Sawtimber opportunities are very good in this type, with an estimated 9,000 board feet per acre of white pine alone. Many pine are high risk, in that they are presently high valued, but could be compromised in the next 10 to 15 years, either by decay, weather, or other events. The long-term goal of management in this stand is to perpetuate the pine resource, primarily via evenage strategies. The resulting pattern of harvesting will create a multi-aged stand that 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, although beech may be more present in the overstory.

Silviculture: The focus of management in this stand will be to harvest white pine and hemlock sawtimber, especially high-risk individuals and low quality stems. Release existing groups of regeneration, especially white pine, but also work with quality black birch and red oak examples. Create conditions to regenerate white pine seedlings where absent.

2015-2018: Harvest roughly half white pine and hemlock overstory, removing the poorest quality wood as a priority, but also include high-risk mature stems. Release groups and individual intermediate and regeneration stems, especially black birch, red oak and white pine. Reduce basal area to approximately 70 to 90 square feet through:

- **Group Selection:** Create openings of 5-10 trees to establish 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.
- **Shelterwood:** In areas with existing acceptable regeneration, remove 40 to 60% of the overstory, leaving a somewhat well distributed overstory of average to above average quality white pine to serve as a seed source and protective cover for new seedlings. The remaining overstory within the shelterwood should be removed following successful establishment of new seedlings and saplings, approximately 10-15 years following the first stage harvest. This can be modified by removing only half of the remaining overstory at the 10-15 year mark, and removing most of the remaining original overstory 25 year after the first stage harvest.

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 down logs by felling up to 5 trees > 18" in diameter per acre.
- Maintain existing snags and large down logs.

Stand 7 Red Maple Swamp

33.2 acres



Stand Structure



Stand Structure



Stand Structure

GENERAL ATTRIBUTES

Natural Community Type: Red maple swamp-Non Commercial
 Past Management History: N/A
 Approximate Age of Dominant Trees: 80
 Stand Health: N/A
 Insects/Damage/Disease: No serious problems noted

SITE CONDITIONS

Determined by: Field observations
 Tree vigor: Low
 Soils: Greenwood Muck and Peat
 Drainage: Poor
 Terrain: Hummocks to Flat
 Aspect: N/A

Snags Per Acre

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"			6.5	6.5
12-18"				
>18"				
Grand Total			6.5	6.5

Table 7.1: Standing dead trees per acre by size and decay class.

Down Logs Per Acre

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"	6.5			6.5
12-18"	6.0	7.3		13.2
>18"				
Grand Total	12.4	7.3		19.7

Table 7.2: Standing down logs per acre by size and decay class.

WILDLIFE HABITAT

Forest type: Forested Wetland
 Vertical diversity: Low
 Vegetative diversity: High
 Hard mast: Beaked Hazelnut
 Soft mast: Blueberry
 Special habitat features: Forested Wetland
 Snag trees: Few
 Down logs: Moderate
 Special wildlife practices: N/A

RECREATION

Recreational features: Trail near periphery
 Recreational infrastructure: N/A
 Aesthetic resources: N/A
 Public access: Open

SILVICULTURE

Structural and Silvicultural Attributes

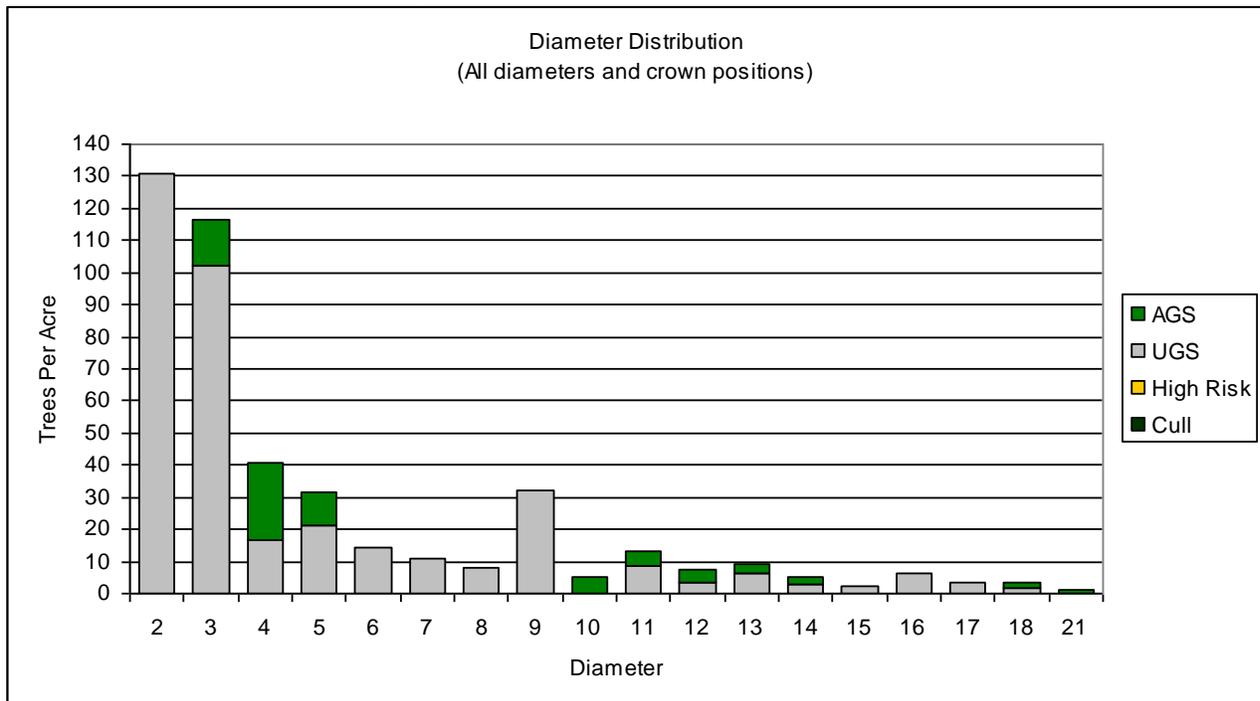
Broad Forest Type: Wetland
 Size Class: Shrub to Sawtimber
 Stand Structure: Evenage
 Crown Closure: 10%
 Total Basal Area Per Acre: 96
 Total Merchantable Basal Area Per Acre: 84
 Total Acceptable Basal Area Per Acre: 24
 Trees Per Acre: 500
 Quadratic Mean Stand Diameter: 7.8
 Percent AGS Sawtimber: 38.0
 Basal Area of AGS Sawlogs: 17
 Timber Quality:

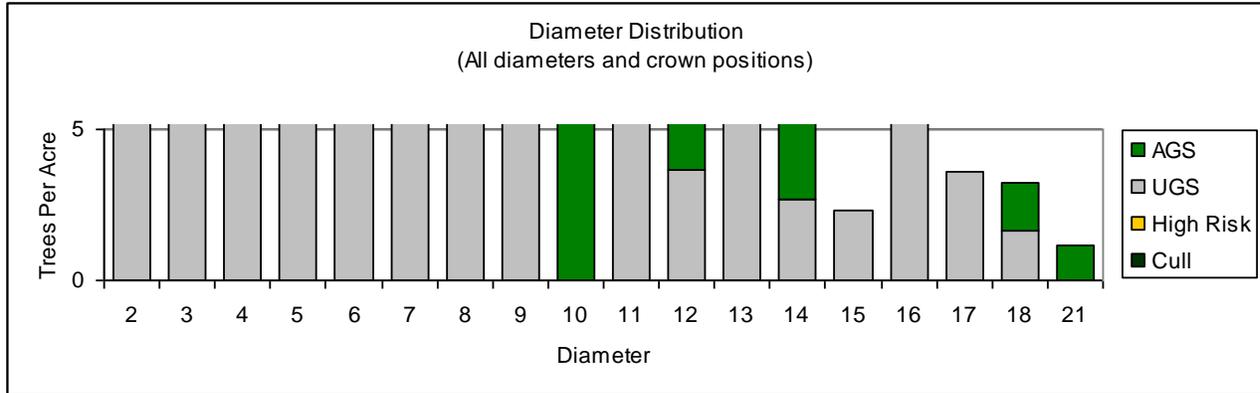
Forest Composition and volume

Species	% TPA	Veneer (bf)	Sawlog (bf)	Pallet/Tie (bf)	Pulp (cd)	Growing Stock (cd)	Legacy (cd)	Total Cords	High Risk	AGS Saw	% AGS Saw
Black Gum	1.3%	0	0	0	0.0	0.0	0.0	0.0	0	0	0%
Red Maple	65.6%	0	407	0	9.2	0.0	0.0	9.9	0	131	32%
Yellow Birch	3.0%	0	0	0	0.4	0.0	0.0	0.4	0	0	0%
Total Hardwood Per Acre:	69.9%	0	407	0	9.5	0.0	0.0	10.2	0	131	32%
Hemlock	5.3%	0	0	0	0.2	0.0	0.0	0.2	0	0	0%
White Pine	24.8%	0	1,361	0	2.1	0.0	0.0	4.8	0	752	55%
Total Softwood Per Acre:	30.1%	0	1,361	0	2.3	0.0	0.0	5.0	0	752	55%
Total Volume Per Acre:	100.0%	0	1,768	0	12	0	0	15	0	884	50%
Stand Volume:		0	58,743	0	395	0	0	507	0	29,361	

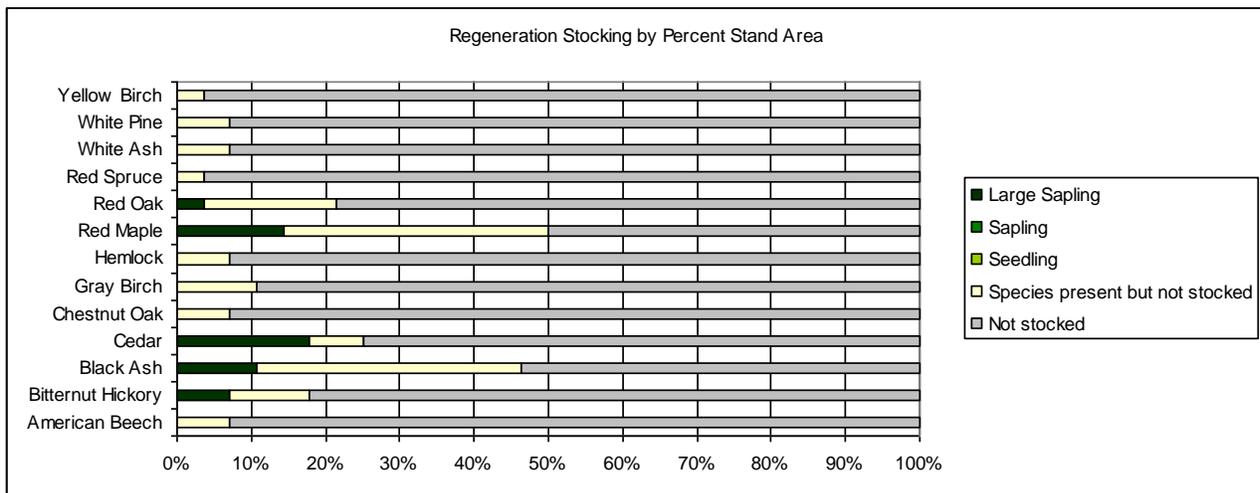
Table 7.3: Stand volume by species and product per acre values.

Graph 7.1a and 7.1b: 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.





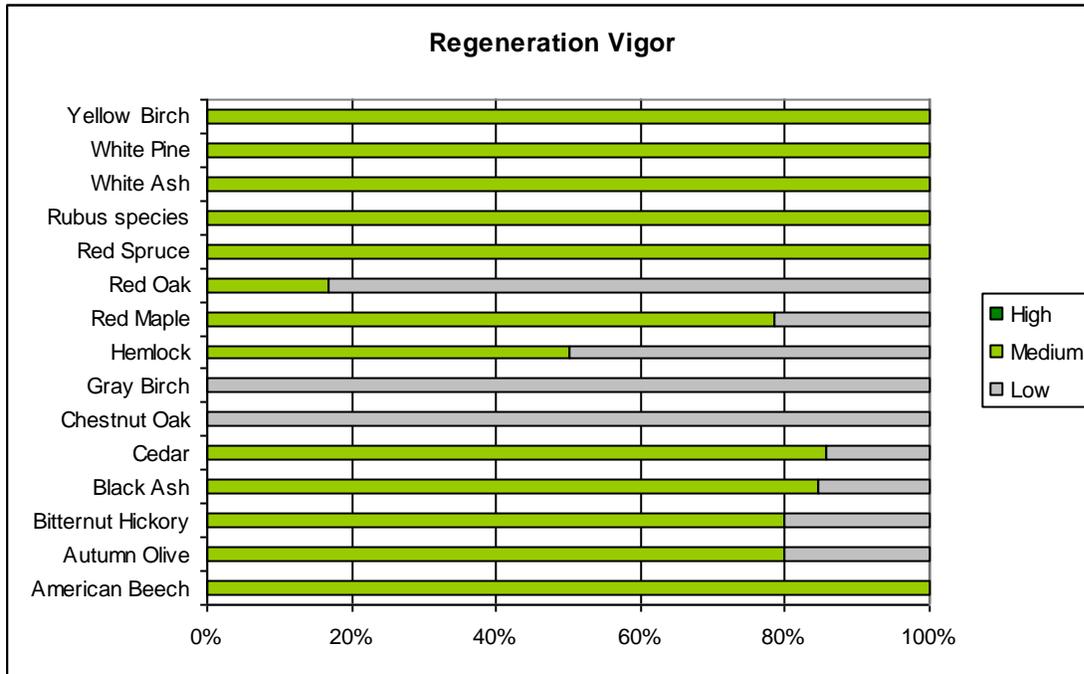
Graph 7.2: Regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less 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.



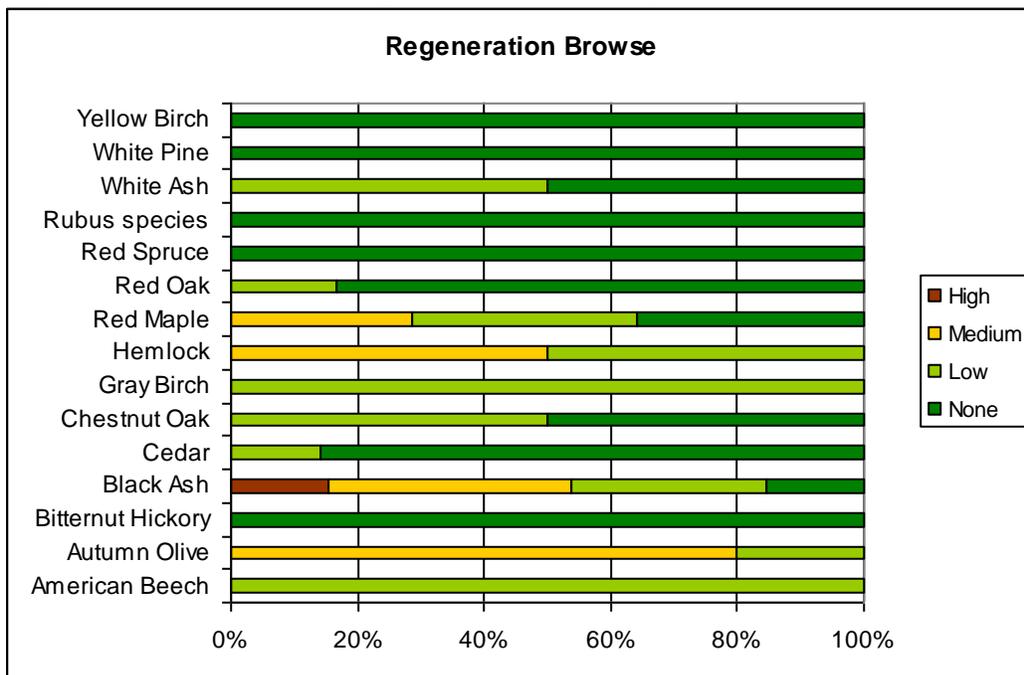
Graph 7.3: Shrub and competing species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), 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 7.4: Vigor of all regeneration and shrub species.



Graph 7.5: Browse level of all regeneration and shrub species.



Silvicultural Objectives

Management system:	N/A
Harvest Entry:	N/A
Products:	N/A
Desired Composition:	N/A
Crop tree target diameter:	N/A

Operational Considerations

Operability:	N/A
Seasonal limitations:	N/A
Terrain:	N/A
Access and landing area:	N/A
Access distance:	N/A
General maintenance:	N/A
Brook-wetland crossings/buffer requirements:	N/A

Stand 8 Hemlock-Maple Forested Swamp

24.4 acres



Stand Structure



Stand Structure



Stand Structure

GENERAL ATTRIBUTES

Natural Community Type: Hemlock-Red Maple Swamp
 Past Management History: N/A
 Approximate Age of Dominant Trees: 80
 Stand Health: Good
 Insects/Damage/Disease: None documented

SITE CONDITIONS

Determined by: Field observation
 Tree vigor: Low
 Soils: Greenwood Muck and Peat
 Drainage: Poor
 Terrain: Hummocks to Flat
 Aspect: N/A

Snags Per Acre

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"				
12-18"				
>18"			2.3	2.3
Grand Total			2.3	2.3

Table 8.1: Standing dead trees per acre by size and decay class.

Down Logs Per Acre

DBH Class	Moderately punky	Punky throughout	Sound	Grand Total
<12"	44.2			44.2
12-18"	5.4	4.1		9.5
>18"		1.9		1.9
Grand Total	49.7	6.0		55.6

Table 8.2: Standing down logs per acre by size and decay class.

WILDLIFE HABITAT

Forest type:	Forested Wetland
Vertical diversity:	Low
Vegetative diversity:	High
Hard mast:	Beaked Hazelnut
Soft mast:	Blueberry
Special habitat features:	Forested Wetland
Snag trees:	Few
Down logs:	Moderate
Special wildlife practices:	N/A

RECREATION

Recreational features:	Trail near periphery
Recreational infrastructure:	N/A
Aesthetic resources:	N/A
Public access:	Open

SILVICULTURE**Structural and Silvicultural Attributes**

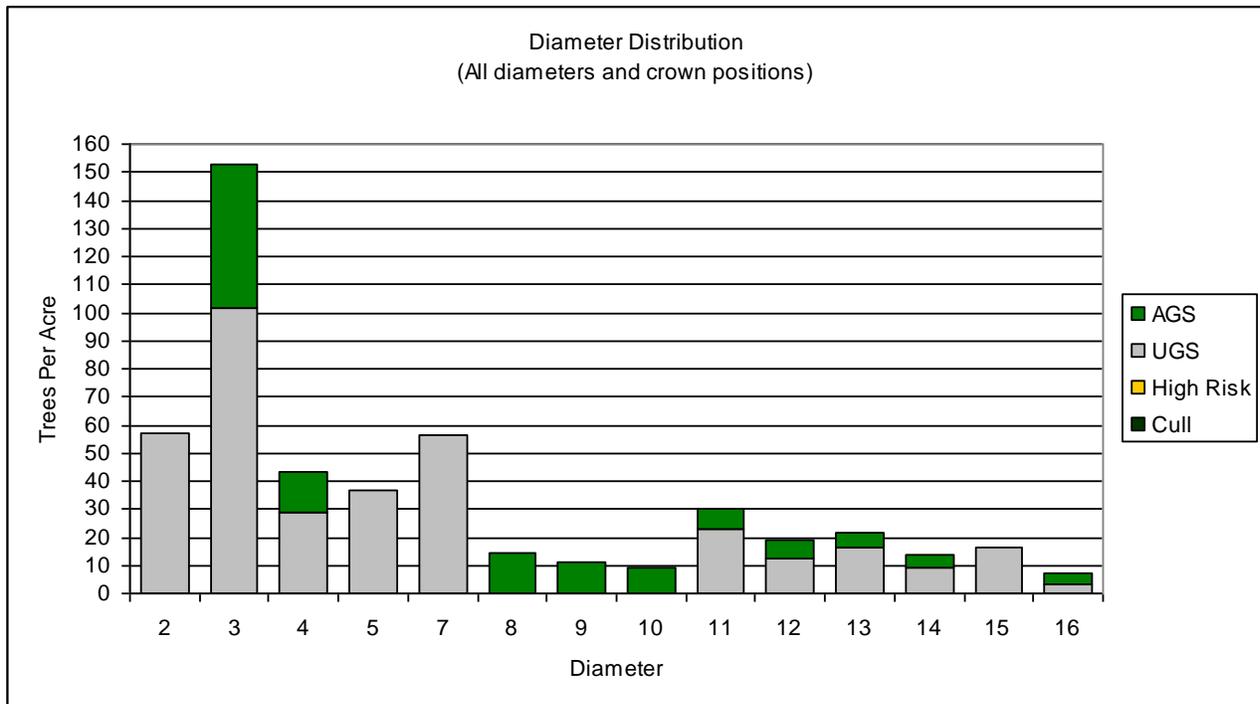
Broad Forest Type:	Forested Swamp
Size Class:	Shrub to Sawtimber
Stand Structure:	--
Crown Closure:	Variable
Total Basal Area Per Acre:	148
Total Merchantable Basal Area Per Acre:	135
Total Acceptable Basal Area Per Acre:	44
Trees Per Acre:	489
Quadratic Mean Stand Diameter:	7.4
Percent AGS Sawtimber:	38.0
Basal Area of AGS Sawlogs:	25
Timber Quality:	N/A

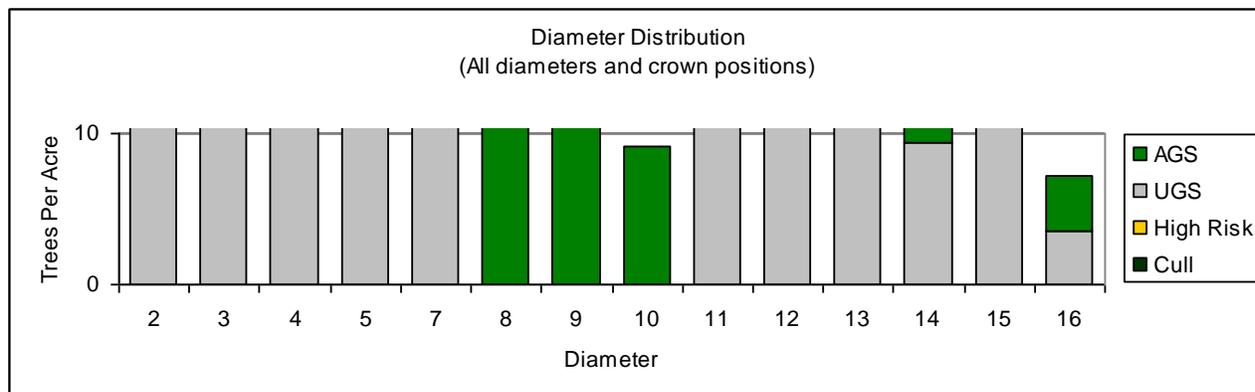
Forest Composition and volume

Species	% TPA	Veneer (bf)	Sawlog (bf)	Pallet/Tie (bf)	Pulp (cd)	Growing Stock (cd)	Total Cords	High Risk	AGS Saw	% AGS Saw
Black Gum	3.8%	0	0	0	0.0	0.0	0.0	0	0	0%
Red Maple	46.0%	0	234	0	11.3	0.0	11.7	0	0	0%
Yellow Birch	8.9%	0	219	0	1.2	0.0	1.6	0	219	100%
Total Hardwood Per Acre:	58.6%	0	453	0	12.5	0.0	13.3	0	219	100%
Hemlock	17.7%	0	1,479	0	4.8	0.0	7.7	0	1,479	100%
White Pine	23.7%	0	608	0	3.6	0.0	4.8	0	396	65%
Total Softwood Per Acre:	41.4%	0	2,086	0	8.5	0.0	12.5	0	1,875	90%
Total Volume Per Acre:	100.0%	0	2,539	0	21	0	26	0	2,094	82%
Stand Volume:		0	61,928	0	511	0	628	0	51,062	

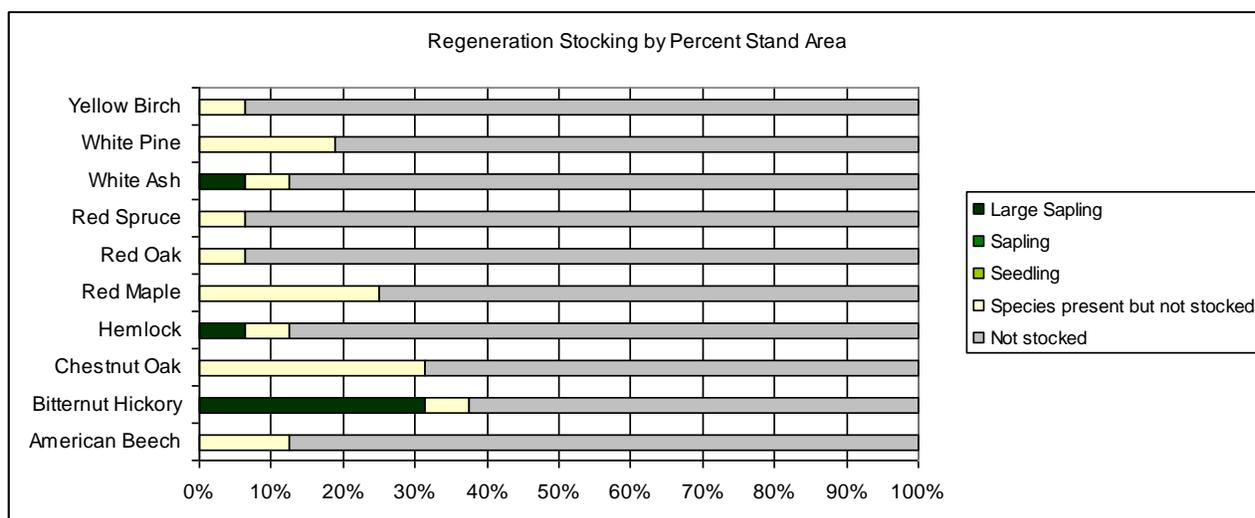
Table 8.3: Stand volume by species and product per acre values.

Graph 8.1a and 8.1b: 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. 8.1b provides a close-up of the breakdown in the larger diameter classes.

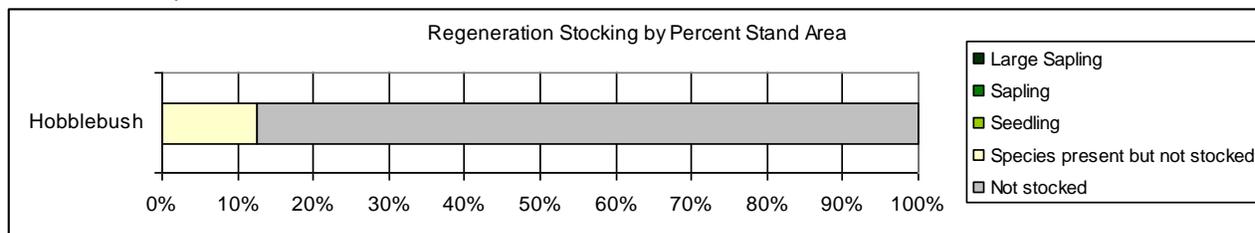




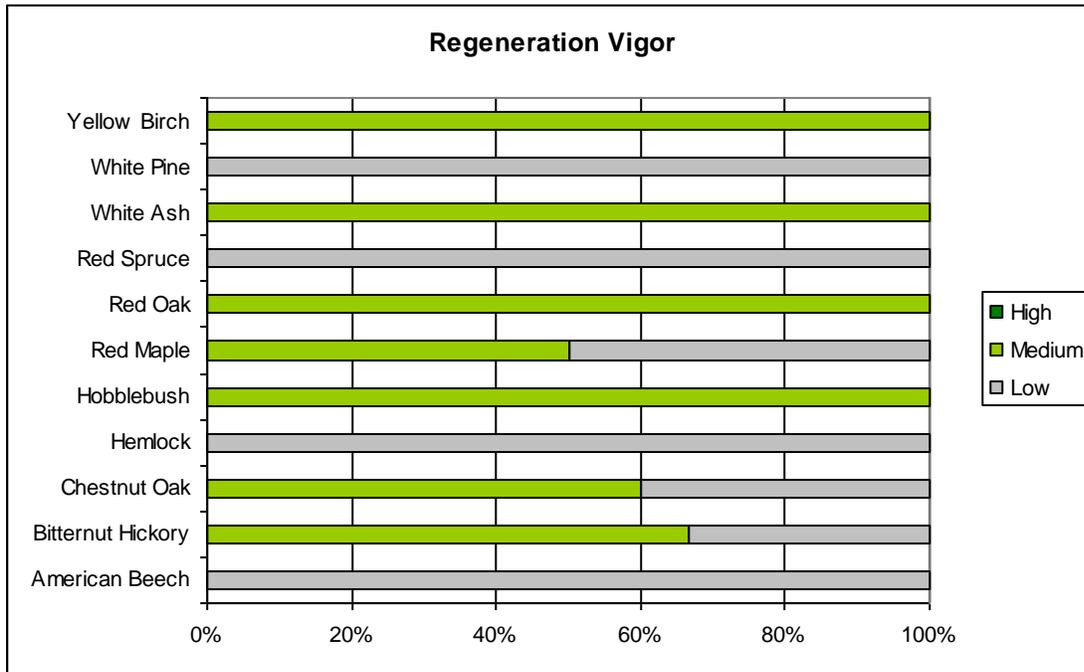
Graph 8.2: Regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less 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.



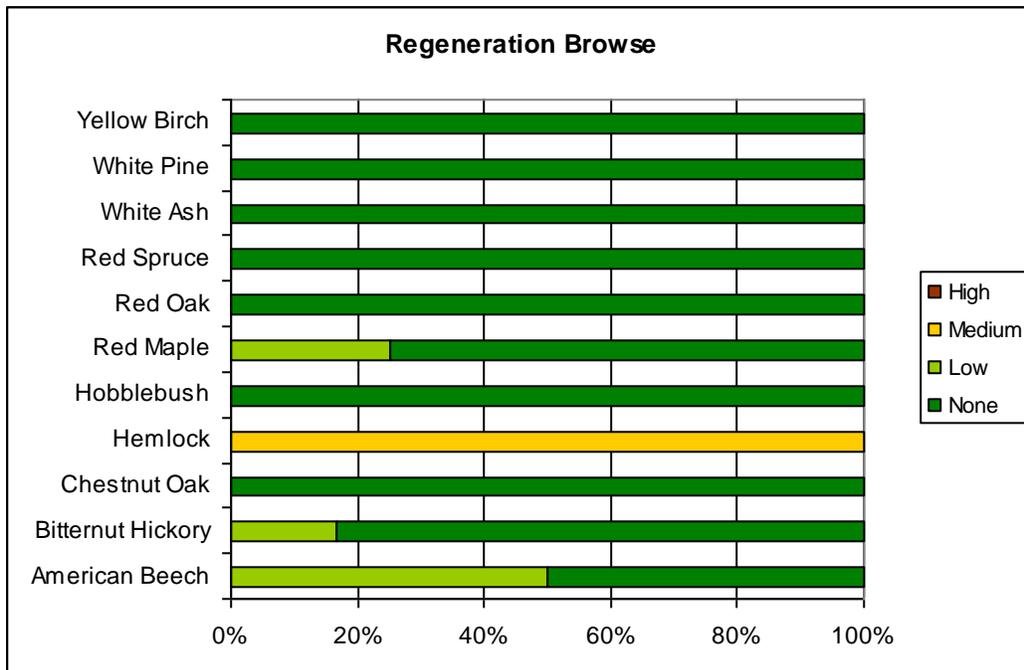
Graph 8.3: Shrub and competing species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), 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 8.4: Vigor of all regeneration and shrub species.



Graph 8.5: Browse level of all regeneration and shrub species.



Silvicultural Objectives

Management system:	N/A
Harvest Entry:	N/A
Products:	N/A
Desired Composition:	N/A
Crop tree target diameter:	N/A

Operational Considerations

Operability:	N/A
Seasonal limitations:	N/A
Terrain:	N/A
Access and landing area:	N/A
Access distance:	N/A
General maintenance:	N/A
Brook-wetland crossings/buffer requirements:	N/A

Felch Farm
TOTAL FOREST TIMBER AND PULP VOLUME
August, 2008
619.8 Forested Acres (includes 57.6 acres forested wetlands)

Species	Sawlog (bf)	Tielog (bf)	Total BF	Pulp (cfs)	Growing Stock (cfs)	Cull (cfs)	Total Volume in Cords	Percent Cords
<i>Hardwood</i>								
American Beech	0	0	0	135	0	67	128	0.4%
Aspen	27,126	0	27,126	155	0	0	202	0.7%
Basswood	0	0	0	30	0	0	30	0.1%
Black Birch	39,658	16,662	56,320	385	72	0	561	1.9%
Black Cherry	0	13,089	13,089	20	0	0	45	0.1%
Black Gum	0	0	0	0	0	0		
Hop Hornbeam	0	0	0	12	0	0	12	0.0%
Red Maple	95,245	42,774	138,020	1,998	0	124	2,252	7.5%
Red Oak	226,025	134,529	360,554	359	74	38	1,083	3.6%
Sugar Maple	12,745	26,168	38,913	62	0	73	139	0.5%
White Ash	14,225	19,100	33,326	68	0	12	140	0.5%
White Birch	40,536	23,700	64,235	235	0	0	354	1.2%
White Oak	0	0	0	44	0	0	44	0.1%
Yellow Birch	15,991	4,486	20,476	98	15	0	150	0.5%
Total Hardwood								
Per Acre:	471,551	280,508	752,059	3,601	161	314	4,174	
<i>Softwood</i>								
Hemlock	631,444	0	631,444	2,950	132	209	4,314	14.3%
Pitch Pine	0	0	0	0	0	0		
Red Pine	78,839	0	78,839	67	0	0	213	0.7%
Red Spruce	23,304	0	23,304	18	0	0	76	0.3%
White Pine	6,871,484	1,514,510	8,385,994	4,909	376	472	20,481	67.8%
Total Softwood								
Per Acre:	7,605,071	1,514,510	9,119,581	7,944	508	681	20,770	
Total Volume:	8,076,622	1,795,018	9,871,640	11,545	669	995	24,944	

FELCH FARM 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.

Stand #	Acres	Treatment	Priority	Year
1a/2a/5a	87.7	Group selection/Shelterwood/Single Tree	High	2009
3	64.9	Group selection/Shelterwood	High	2011
1b/1c/2b/4b/ 5b/5c	175.6	Group selection/Shelterwood/Single Tree	High	2013
2c/2d/4a/6a	126.8	Group selection/Shelterwood/Single Tree	Med.	2015
2e/4c/6b	97.9	Group selection/Shelterwood/Single Tree	Med.	2017
		Paint boundary lines	Med.	2010
all		Reevaluate and update management plan		2018

APPENDIX A: SOILS MAP

