

**FOREST MANAGEMENT PLAN
NORTHWOOD
CONSERVATION COMMISSION
4 WOODLOTS
NORTHWOOD, NH
2009**

This plan has been completed by Robert W. Graves III, Forest Technician, for Bean Hill Forest Services, LLC and reviewed by John A. Conde, Forester. It is intended to guide the Northwood Conservation Commission in providing timber management, wildlife habitat, water quality and recreation on Town forest lands by following Best Management Practices and silvicultural prescriptions.

Introduction

This forest management plan has been prepared for the Town of Northwood Conservation Commission. These forestlands consisting of four parcels: Parsonage, School, Giles and Deslaurier collectively compile a total acreage of 363+/- acres. The Town Forestlands became designated Town Forest in 1989 and the responsibility of management for these woodlands are overseen by Northwood Conservation Commission

This plan is a compilation of four separate woodlots owned by the Town of Northwood, N.H. Conservation Commission. The objectives of the Conservation Commission for all four lots are the same while each forestland must be managed uniquely in order to achieve these goals. We have individualized each property separately by: acreage, location, boundaries, access, recreation and wildlife habitat. Stand by stand analysis for each property is broken down by: species composition, acreage, age, site index, basal area, trees per acre, average diameter, softwood sawtimber volumes, hardwood sawtimber and hardwood pulp, stand description, stand prescription and soil type. Sawtimber volumes are measured per 1000 board feet. Pulp volumes are measured per standard cord.

This plan is intended to update the current plan the Northwood Conservation Commission has on file. The previous plan was written by Forester Charlie Moreno of Strafford, N.H. in March of 1990. Although the Moreno plan is very detailed, it needs updating.

A management plan's purpose is to guide the Northwood Conservation Commission as to how to properly manage their woodlands through silvicultural priorities in order to achieve the Commission's objectives.

Landowners Objectives

- Update previous management plan; written by Forester Charlie Moreno, 1990.
- Improve timber quality, productivity and increase the economic potential of the Northwood Town Forestlands. These objectives will be achieved by following long-term sustainable forestry by implementing silvicultural practices. By manipulating the natural growth of a woodlot, we can increase the growth rates (vigor) on the more valued species of timber while enhancing the probability of establishing the same desired species as regeneration. Implementing these silvicultural prescriptions will ensure a higher economic return in the long term, possibly to buy more properties.
- Enhance forest health and aesthetics by eradicating: disease, invasive species, insect infestation and salvaging damage due to natural disasters, etc. By identifying and addressing these potential hazards the Northwood Town Forestlands can stay healthy and continue to remain as productive woodlots.
- Improve accessibility to the Town Forestlands for the use of the general public for recreational purposes. The Giles Lot is currently the only property with any means of meeting this objective. Improvements could be made for the Parsonage, School and Deslaurier Lots. Upgrade road accessibility for potential future logging operations. Revenues gained from harvesting timber would be applied to cost of upgrading roads for truck accessibility.
- Enhance or protect wildlife habitats, through time, by identifying potential and/or established deer yards, food sources, song bird sanctuaries, water sources such as seeps, vernal pools, streams, etc.
- Identify, improve and address how to maintain the current low impact recreational opportunities, natural features and areas of interest that the Northwood Town Forests currently provide to the general public.
- To use Best Management Practices (BMP's) when implementing management prescriptions, ie. erosion control, buffer strips, proper water crossings, etc. where applicable.

Inventory of Timber

Within each Northwood Town Forests, stands have been identified. Each stand that is sufficiently similar and homogenous are to be managed as a unit. Each stand has been described by species composition, acreage, age, site index, basal area, stems per acre, timber volumes, stand description, forest management prescription and soil types.

Each stand was systematically cruised. Data collection included species, tree diameter, tree height and other observations. A 10 factor basal area prism was used to measure sample points. Two-Hundred sample points were inventoried.

Collected data was analyzed using the NED-1 program. Growth rate was calculated on a stand by stand basis.

Timber values are given in Board feet, International ¼ inch scale in standard cords or tons. Appropriate deductions were made for visible defects.

Merchantable timber standards are as follows:

- Pulp/firewood includes all trees 5-11 inches at DBH and a portion of larger trees not suitable for saw timber to a merchantable top diameter of 4 inches.
- Sawtimber includes trees 12 inches at DBH and larger that are at least 50% sound. A minimum top diameter of 10 inches for Hardwoods and 8 inches for Softwoods was used.

The standard sampling error for the Northwood Town Forestlands should be no more than 90% confidence level was 25%-26% for the total sawlog volume estimates and 12.2% for softwood pulp and firewood estimates. The level of variability is a result of heavy harvesting activity on certain portions of each woodlot in the past 50+/- years where other sections of the same woodlot have not been harvested in the past 100+/- years.

Volumes given in inventories are liquidation volumes- the total measured volume. These volumes are presented to facilitate the established value basis for income tax preparation. It is recommended that only part of the volume and value be removed through thinning. See stand prescriptions. Thinning implementations should be consistent with respect for the resource and the woodlot objectives over time.

Parsonage Lot

Woodlot Characteristics

Acreage: 186.1 total acres, 181.8 wooded acres

Location: The Parsonage Lot is located on Saddleback Mountain. This lot has significant frontage on the class VI section of Old Mountain Rd. Old Mountain Rd. can be accessed off of route 43, heading south towards the town of Deerfield.

Boundaries: The Parsonage Lot is well demarcated by stone walls that bound the entire property. The properties bounds were blazed and painted in the winter of 1990 by Forester Charlie Moreno. Majority of this evidence is no longer apparent and the bounds need to be re-established by the blaze and paint method.

Access: The Parsonage Lot can be accessed on both ends of the property. Old Mountain Rd. is class VI through this stretch and is in need of serious repair due to wash outs from years of erosion. There is a small parking area at the point where the town stops maintaining this road, but the walk is upwards to a mile from this parking area and where the trail head begins. This lot can also be reached through the town of Deerfield off of Saddleback Mountain Rd. The road is in much better condition but is posted as private. A gate prohibits any wheeled vehicles at about the half way point of reaching the Parsonage Lot location.

Interior access is minimal on the eastern portion of the property with no usable interior roads. Stream crossings and rough terrain make the lay out of skid roads a challenge. The western section, Deerfield end, of the property contains some residual interior roads from previous harvesting operations. Permission would need to be granted in order to access this section of the property.

History: See Appendix

Recreation: The Parsonage Lot is currently utilized as a low-impact activity area. Hiking and snow-shoeing is the most common activity as the Parsonage trail head is well defined and the hiking trail leading atop Saddleback Mountain is well marked. Camping is a possibility but designated camping sites are recommended along with camp fire restrictions. There is beautiful vista with views to the west as you reach the height of the land as you are hiking along the trail. A sign currently identifies this location and maintenance will be required in the future to keep this view accessible. Hunting is surely a use of this property as there is an abundance of diverse wildlife habitats. Hunter safety should be emphasized during hunting season when there are most likely hikers on the trail enjoy the fall weather.

Wildlife Habitat Management: The four essential elements for wildlife to thrive are food, water, cover and open space. This property, in its natural state, currently provides a

bountiful source of all four of these elements. Multiple food sources are available in stands A which makes up about 45% of the properties area. This stand had been heavily harvested 50+/- years ago and has natural succeeded back to mixed hardwood growth, providing ample amounts of browse of both hard and soft mast. Stand E is composed of mixed mature hardwoods that are producing hard mast such as acorns and beech nuts. Stand E and portions of stand A are positioned next to multiple water sources, ponds and brooks, which is an ideal scenario in having two essential elements for wildlife within close proximity of one another. The vast area that is the “ridge top” found within stands A, B and D, although grows low quality timber provides large amount of open space and low lying browse opportunities with low bush blueberries and juniper berries.

Multiple water resources can be found within the property. I addressed some of them in the previous section with the exception of a 3+/- acre beaver pond found the southern end of stand B.

The element of cover provides safety from predators and harsh weather. There are scattered areas throughout the property that provide sufficient amounts of cover form these fatal factors that mother nature presents on a daily basis. Cover can range form low lying hemlock for a deer yard, coarse woody debris (cwd) on the forest floor and cavities in dead or dying trees. A major deer yard of over an acre can be found on the westerly portion of Stand D. The deer are utilizing the thick softwood growth that tends to catch the majority of snow fall and keeping down the wind speeds. On average, a healthy mature mixed wood forest should have 6 snags and 3 cavity trees (coarse woody debris) per acre. These act as dens for many mammals such as weasels, fishers, black bears and nesting birds. Avoiding these trees during future harvesting operations will ensure a healthy population of wildlife diversity. I had seen a large number of dead trees and snags while collecting data for this plan. Majority of the den trees can be found around the water sources before mentioned.

Creating and maintaining an array of uneven aged species composition. Preferably mast producing species such as oak, cherry and beech along with shelter trees like hemlocks. The combination of tree species coinciding with diverse age classes will provide a wildlife haven for both the critters and the people of Northwood to enjoy. This can be achieved by managing for an un-even aged growth by creating 1/10-1/4 acre openings in Stands A,D,C.

Soils: See Soils Sketch Map

140- Chatfield-Hollis-Canton – 67% of total area; Soil complex with fair to good productivity for Red Oak and White Pine; 8-35% slopes.

141 – Hollis-Canton – 25% of total area; Rocky outcrop-ledges; Low productivity; Steep slopes 15-35% slopes.

67-Paxton – 5% of total area; Fine sandy loam, very stony, rich soils, excellent hardwood growth; 3-15% slopes.

43- Canton – 1% of total area; Fine sandy loam, very stony; good soil for Pine production; 3-25% slopes.

495 Ossipee – 1% of total area; mucky peat , wetland area, poor productivity, 0% slopes.

97 – Greenwood – 1% of total area; mucky peat, wetland area, poor productivity, 0% slopes.

Parsonage Lot Timber Types
(refer to timber type sketch)

Stand A

Species Composition: Mixed Hardwood

Acreage: 79.1+/- acres

Age: 50+/-

Site Index: N/A

Basal Area: 105sq.ft/acre

Trees/Acre: 190

Average Diameter: 11.2"

Softwood Sawtimber: 32.3+/-mbf

Hardwood Sawtimber: 8.5+/-

Hardwood Pulp/Firewood: 625+/-cords

Description: Stand A had been heavily harvested over 50+/- years ago and had naturally succeeded back to hardwood as a result. Lower quality, mature oaks were left behind surviving the heavy harvest. Good mast producing trees. The stand is even-aged with pole sized hardwoods. Over 50% of the regenerated hardwood is composed of higher valued red oak and black birch species. The remaining species are red maple, beech and white birch. Accessibility is limited in some sections due to topography and fords are required when harvesting is underway.

Prescription: A crown thinning to release the higher valued species should be conducted within the 3-5 years. When removing fuel wood retain oaks and black birch along with promising white birch. Leave the scattered lower quality oaks for wildlife benefits. Get stocking levels down to 70sq.ft-80sq.ft/acre. Re-visit stand in 15-20 years there after.

Soils: 140D,141D, 67C

Stand B

Species Composition: White Pine, Mixed Hardwood

Acreage: 30.1+/-

Age: 50+/- to 70+/-

Site Index: White Pine 58

Basal Area: 100.2sq.ft/Acre

Trees/Acre: 174

Average Diameter: 12.8"

Softwood Sawtimber: 37.4+/-mbf

Hardwood Sawtimber: 6.2+/-mbf

Hardwood Pulp/Firewood: 135+/-tons

Description: Stand B is similar to stand A, but with the addition of white pine. Pole sized mixed hardwood and white pine. Pine growing on the ridge portion of this lot is very low quality due to soil types. Pine growing on the easterly side of this stand is much better quality. The wetland component of this stand is producing promising pine growth around the riparian areas.

Prescription: Thinning on the higher quality pine growing closer to the Mountain Rd. side of the stand is recommended. Timber Stand Improvement thinning should be applied to the pine growing around the wetlands while releasing the pine from the competing red maples. Follow same prescription for stand A when managing the hardwood component of this stand.

Soils: 495, 140D, 97

Stand C

Species Composition: Hemlock, White Pine, Red Oak and Mixed Hardwood.

Acreage: 18.5+/-

Age: 75+/-

Site Index: White Pine 70

Basal Area: 95.2sq.ft/Acre

Trees/Acre: 105

Average Diameter: 11.1

Softwood Sawtimber: 59.7+/-mbf

Hardwood Sawtimber: 10.3+/-mbf

Hardwood Pulp/Firewood: 250+/-cords

Description: This stand was harvested conservatively relative to thinning in stands A&B. A moderate growing stock of pine and oak was left behind. These crop trees left behind are of medium saw timber size. The understory has regenerated as mixed hardwoods. Accessibility to portions of this stand is a challenge due to steep grades. A poled ford would need to be set in the brook in order to access the entire stand.

Prescription: A crown thinning needs to be conducted on this stand to increase vigor of the pine and oak stems that are competing with the lower valued hemlock. Form, live crown ratios and overall tree health should be taken into consideration when choosing potential crop trees. Hemlock is of good quality and should be marketed as saw logs rather than pulp if market allows during time of thinning.

Soils: 67B, 67C, 140C, 141D

Stand D

Species Composition: White Pine and Red Pine

Acreage: 25.8+/-

Age: 110+/-

Site Index: White Pine 60

Basal Area: 110.3sq.ft/Acre

Trees/Acre: 74

Average Diameter: 12.2"

Softwood Sawtimber: 196.3+/-mbf

Hardwood Sawtimber: 4.1+/-mbf

Hardwood Pulp/Firewood: 64+/-cords

Description: This is pure even-aged stand of softwoods, mostly composed of white pine with red pine scattered throughout. The productive section, western, of this stand is growing nice quality pine with a high stocking level. Desirable regeneration is non-existent at this time. The eastern portion of this stand is growing pine of poorer quality with a lower stand stocking after the harvest of 50+/- years ago. I assume that the productive portion of Stand D was spared during the harvest due to its accessibility issues.

Prescription: Allowing the lower quality pine stems left to temporarily remain as seed trees is recommended. Adequate regeneration has not yet been established in this area yet and may not, due to elevation and soil type. Once if ever desired regeneration results then I recommend removal of these lower quality stems, changing management treatment from seed tree to shelter wood. The higher quality pine stems needs to be thinned, attempting to release the potential crop trees. Basal area in this section should not fall below 95sq.ft./acre.

Soils: 140D

Stand E

Species Composition: Hemlock and Mixed Hardwoods

Acreage: 18.1 +/-

Age: 120 +/-

Site Index: N/A

Basal Area: 65 sq.ft/Acre

Trees/Acre: 82

Average Diameter: 13.5"

Softwood Sawtimber: 12.2 +/- mbf

Hardwood Sawtimber: 8.6 +/- mbf

Hardwood Pulp/Firewood: 467 +/- cords

Description: Stand E is an older growth even-aged stand of mixed hardwood and hemlock. The stems are of poor-fair quality but the oaks and beech trees do have significant wildlife benefits for providing hard mast. A majority of these older growth hard wood stems could serve as potential cavity trees. The hemlock over-story provides shelter for potential deer yards. The massive rock out-croppings that are found within this stand take on unique formations and would not be surprised if there were some bear hibernation activity during winter, didn't stop to test my theory.

Prescription: Allow to grow and allow Mother Nature to run its course. The wildlife benefits far exceed the need for managing of timber. This stand could be better served as a recreational focal point for the general public due to its unique aesthetic qualities.

Soils: 43C, 141D, 97

Stand F

Species Composition: White Pine, Hemlock and Mixed Hardwood

Acreage: 8.1+/-

Age: 110+/-

Site Index: White Pine 65

Basal Area: 84.2sq.ft/Acre

Trees/Acre: 98

Average Diameter: 13.1"

Softwood Sawtimber: 50.6+/-mbf

Hardwood Sawtimber: 4.2+/-mbf

Hardwood Pulp/Firewood: 138+/-tons

Description: Stand F has contains large pine and hemlock of good quality, indicating soil types capable of producing quality timber. This stand is located on the western side of the property untouched by the previous harvest. Forging of the stream will be necessary in order to reach this stand.

Prescription: Thinning this stand would make it more practical to thin adjacent stands that have minimal needs.

Soils: 141D

Stand G

Species Composition: Hemlock

Acreage: 2.1

Age: 150+/-

Site Index: N/A

Basal Area: 68.7sq.ft/Acre

Trees/Acre: 48

Average Diameter: 17.3"

Softwood Sawtimber: 48.3+/-mbf

Description: This stand pure stand of hemlock with an age class of medium to large was timber and good quality. As you stand in the middle of this stand you get a feeling of standing in a young cedar stand in the pacific northwest. Trees producing 5-6 logs in height, straight and wide allows the imagination to wonder and imagine how forest may have looked before western civilization. The timber production within this stand is as impressive as the aesthetic qualities this small area provides. The stream that flows through this stand cascades over the ledges and creates quite a nice visual effect.

Prescription: Allow hemlock stand to return to old growth status. It is well on its way and in another 150-200 years this stand will be quite impressive. This area is currently identified by any signs or foot paths.

Soils: 141D

Parsonage Lot Management Priorities

The majority of the Parsonage Lot is still showing evidence of recovering from heavy harvesting operations from 50 years ago. Although there are no urgent concerns present on the property, some silvicultural applications should be implemented within the next 1-3 years or when markets allow.

1. Improve accessibility to the location of the property within the class VI stretch of Old Mountain Rd. Portions of the revenue gained from harvesting timber can be put towards costs of road improvement.
2. Thin the pine stand located in the western section of stand D while retaining proper stocking levels.
3. Conduct a TSI on the younger pine growth located in stand B removing fuel wood competing with current pine production.
4. Conduct a crown thinning around the promising future crop trees located in stands C and F.
5. Possible TSI within stand A over the next 5-8 years.
6. Re-blaze and paint boundaries before any management is implemented.
7. Update and maintain trail signs. Trail maintenance is going to be needed after the winter months have passed. Blow downs and snapped branches are likely after the ices storm. A good job for boy scouts.

Parsonage Lot Volumes & Valuations

<u>Species</u>	<u>Volume</u>		<u>Value</u>	<u>Total</u>
White Pine	318+/-mbf	@	\$115/mbf	\$36,570
Hemlock	100.4+/-mbf	@	\$50/mbf	\$5,020
Red Oak	<u>13.8+/-mbf</u>	@	\$275/mbf	<u>\$3,795</u>
Total Volume	432.2+/-mbf			\$45,385
Hardwood Pulp	1679+/-cords	@	\$10/cord	<u>\$16,790</u>
			Total:	\$62,175

Volumes/Acre: Board Feet: 2.3+/-mbf
Hardwood Pulp: 9+/-cords

School Lot

Woodlot Characteristics

Acreage: 117+/- total acres, 110.8+/- wooded acres

Location: This property is located on Lucas Pond Rd. A right away leading to the property can be located off of Upper Camp Rd.

Boundaries: The majority of the property is well defined by stonewalls. Although sporadic blazes were identified the property lot is not clearly blazed. The property lines that separate the School Lot from the subdivided house lots surrounding Lucas Pond are not well demarcated and need to be identified.

Access: Accessibility to the School Lot is much more feasible than the Parsonage Lot. A landing has been previously established off of Lucas Pond Rd. making the eastern section of this property highly accessible. The western section of this property can be accessed by the right away off of Upper Camp Rd, a private rd. Permission would be needed for access and a bond would be likely needed.

Interior access for the easterly portion of this lot is very good. The western section of the property bears the outline of an old skid road from past logging operations. This road is from many years ago with a dense cover of black birch and hemlock saplings making it hard to identify. This road would need to be re-established. Certain portions of the property cannot be easily reached due to rough terrain and this is where the majority of the productive timber can be found. Skidding distances are significant, 3000+/-ft.

Recent History: The recent history of this lot revolves around the eastern section of the School Lot. With recent harvesting activity taking place within stand A. A conservative thinning had been implemented in this stand, probably by the Forester Charlie Moreno, who wrote the previous plan. Blue marking paint is evident throughout stand B and was intended to receive a TSI but doesn't seem that the prescription was ever implemented. This harvesting activity had taking place 3-5 years ago given the evidence found in the field. For information on previous history see Appendix.

Recreation: Current recreational opportunities are minimal at this point in time. There is a foot path marked with white paint that had most likely been established by a local resident of the subdivision. The property is being used by local residents such as hunters, evidence of tree stands, light hiking and snow shoeing. Snowmobile tracks were also noted running through the property. There is also a nice westerly view of Saddleback Mountain from the western side of the property due to the opening of the abutting parcels forest canopy.

Wildlife: The wildlife management for this property can be achieved through silvicultural treatments while managing for timber production. Plenty of soft mast can be

found in stand C. Which is currently being eaten by deer and possibly moose as this stand is recovering from a clear cut and ample amounts of browse is accessible for the next 5 years or until new bud growth is gets too high for the deer to reach. Stand B also provides a nice food source as the red oaks in this stand are surely producing nuts. To enhance this stands potential for providing essential sources of food for browsing animals, creating 1/10-1/4 acre patch cuts every 10+/- years in this area would create softwood regeneration and fresh new buds to be eaten.

There are three different water sources found within the School Lot. The most beneficial is a large marsh with open water located on the western boundary located in stands F and G. This marsh is the head water for Bean River. This habitat provides both a vital water and food source for birds such as the herons that feed on frogs and raptors that will feed on the mammals that reside on the meadow that outlines this marsh. An over grown clear cut along the southern section of the marsh is composed of hardwood poles. A portion of this regeneration could be re-cut creating hardwood seedlings and more browse opportunities. The beaver population seems to be non existent in the area which is surprising. They rely on hardwood regeneration as a food supply and once that supply runs out they will move on to a more suitable habitat. It is only a matter of time before a beaver family re-claims this marsh as home and returns it to a pond.

A small deer yard can be found in stand located in stand D. It is a perfect location for bedding and shelter from the elements due to its dense hemlock canopy. When prescribed thinning is implemented this area should be carefully avoided. Stand D also retains a multiple number of denning trees located around the rocky out crop area. Be sure to leave these trees during the next harvest and identify any other cavity trees. By managing stands B,C and portion of stand F around the wetland area, as an uneven-aged forest ensuring that there will be a adequate supply of food to support a healthy deer population.

Soils: See Soils Sketch Map

140- Chatfield-Hollis-Canton – 50% of total area; Soil complex with fair to good productivity for Red Oak and White Pine; 8-35% slopes.

447 – Scituate-Newfields – 26% of total area; very stony; good productivity for White Pine and Red Oak growth; Moderately drained, seasonal wetness; 3-15% slopes.

657 – Ridgebury – 15% of total area; very fine sandy loam; poorly drained soil with low productivity, wooded wetlands, 3-8% slopes.

495 Ossipee – 7% of total area; mucky peat , wetland area, poor productivity, 0% slopes.

547 – Walpole – 2% of total area; very fine sandy loam, very stony; poorly drained; fair soils for growing White Pine; 3-8% slopes.

School Lot Timber Types
(refer to Timber type sketch)

Stand A

Species Composition: White Pine

Acreage: 5.5+/-

Age: 75+/-

Site Index: White Pine 70

Basal Area: 114.5sp.ft./acre

Stems/Acre: 130

Average Diameter: 12.5"

Softwood Sawtimber: 70.885+/-mbf

Description: Stand A is a pure even aged stand that is producing small-medium saw timber of fair to good quality. Stand A has been managed conservatively, thinned within the last 5-8 years. Evidence of recent logging activity is present, the lack of regeneration and residual blue marking paint is still stuck to the trees. This stand has suffered some marginal ice damage with snapped tops due to the ice storm in December of 08'.

Prescription: Discuss the possibility of a salvage thinning with the conservation commission in regards to ice damage. Salvage should be considered an immediate priority. due to the possibility of blue stain resulting in damaged Pine trees. If it is decided that no action need to be taken stand needs to grow for another 12-15 years. Next thinning should be conducted during dry conditions and on bare ground during a good White Pine seed year, ensuring the highest probability of establishing desired regeneration.

Soils: 447C, 140C

Stand B

Species Composition: Mixed Hardwood

Acreage: 25.5

Age: 75+/-

Site Index: Red Oak 68

Basal Area: 60sq.ft./acre

Stems/Acre: 105.5

Average Diameter: 10"

Softwood Sawtimber: 5.276+/-mbf

Hardwood Sawtimber: 45.595+/-mbf

Hardwood Pulp/Firewood: 317 +/-cords

Description: Stand B is composed of an uneven-aged mixed hardwood overstory, while the drier portion of this stand is growing a mixed understory of white pine and beech saplings. The majority of this stand is wet and the common species of yellow birch, red maple and white ash make up much of the species composition. A moderate stocking of red oaks ranging from small to medium saw log material can be found scattered throughout stand B. Evidence of a prescribed thinning was to be implemented on this stand around the same time stand A was thinned. Timber marking paint on the trees still remains. Judging by the way the stand was marked an improvement cut was intended. The thinning was not performed - maybe it was hard to find a logger who wanted to cut firewood.

Prescription: Implement the previously prescribed thinning on removing the fuel wood from this stand. A thinning around the crowns of the red oaks will encourage vigorous growth while creating adequate openings allowing for increased sunlight releasing the current pine understory. This possibly could be carried out while salvage on lot A is taking place. After this initial TSI is implemented a 15-20 year thinning rotation should be considered.

Soils: 657B

Stand C

Species Composition: Eastern white pine, hemlock, mixed hardwood saplings and poles.

Acreage: 9.1 acres

Age: 40+/-

Site Index: N/A

Basal Area: 72.5sq.ft/acre

Stems/Acre: 190

Average Diameter: 8"

Softwood Sawtimber: 18.257+/-mbf

Hardwood Sawtimber: 3.414+/-mbf

Hardwood Pulp/Firewood: 87+/-cords

Description: This 9.1 acre section of the property has been logged heavily; it presently represents a regenerating clear-cut. Composed mostly of early succession vegetation; red maple, white birch, black birch and beech. Minimal volumes of red oak and white pine are present.

Prescription: Allow to mature. The heavy regeneration of black birch is promising. A thinning could be conducted in another 12-15 years as trees have established height and form. A portion of this stand may act as a landing while harvesting other sections of the woodlot.

Soils: 140C

Stand D

Species Composition: white pine, hemlock, red oak and red maple

Acreage: 21+/-

Age: 120+/-

Site Index: White Pine 68

Basal Area: 101.4sq.ft/acre

Stems/Acre: 147.3

Average Diameter: 10.8"

Softwood Sawtimber: 141.803+/-mbf

Hardwood Sawtimber: 14.347+/-mbf

Hardwood Pulp/Firewood: 82+/-cords

Description: Stand D is composed of mostly softwoods, white pine and hemlock. The age class range from small-large saw timber and the quality is fair to good. The stand stocking and % of crown closure is relatively high. Lower quality pine and hemlock are competing with future crop trees. Topography is not ideal but manageable. Minimal sunlight is able to reach forest floor, no regeneration is present.

Prescription: A thinning of the crowns around the more valuable and higher quality stems is over due. A commercial thinning should be made a priority and be implemented when ground is dry and bare and when a Pine seed source is available. Adequate openings should be made allowing enough sunlight to reach the understory to encourage desired regeneration.

Soils: 140D, 140C, 547B

Stand E

Species Composition: White Pine

Acreage: 12.7+/-

Age: 75+/-

Site Index: White Pine 60

Basal Area: 70sq.ft/acre

Stems/Acre: 116.2

Average Diameter: 10.4"

Softwood Sawtimber: 65.535+/-mbf

Description: This is a pure even aged stand of white pine. The age class of this stand consists of pole to small saw sized timber 8"-12" in dbh. Terrain is rugged but again it is manageable.

Prescription: Needs its first thinning. A classic TSI should be applied. Thinning around future crop trees that are expressing dominance through live crown ratios, height and form. A mechanized operation is recommended for implementing this silvicultural prescription. It would not be economically sensible to have a hand crew apply the proper management to this stand. Another thinning should be applied 15-20 years after the initial TSI, while following the same guidelines stated above. Establishing regeneration should be an objective at this point.

Soils: 140C, 447B

Stand F

Species Composition: Mix hardwoods, white pine and Hemlock.

Acreage: 19.25+/-

Age: 110+/-

Site Index: White Pine 65

Basal Area: 74.4sq.ft./acre

Stems/Acre: 80.2

Average Diameter: 11.2"

Softwood Sawtimber: 55.484+/-mbf

Hardwood Sawtimber: 5.196+/-mbf

Hardwood Pulp/Firewood: 163+/-cords

Description: Portions of stand F are wet and is dominated by the wetland species of yellow birch, hemlock and red maple. White pine and red oak can be found growing on the elevated sections of this stand. This stand had been heavily harvested about 30-40 years ago and is now starting to recover nicely. White Pine is of fair-good quality with a good growing stock of small-medium saw log material.

Prescriptions: A small commercial thinning on the hemlock and fuel wood that may be competing with future pine and oak crop trees should be implemented. Stand should be re-evaluated in 12-15 years for next harvest.

Soil: 140C, 140D, 447B,495

Stand G

Species Composition: White pine and hemlock

Acreage: 4.6+/-

Age: 120+/-

Site Index: White Pine 75

Basal Area: 70 sq.ft/acre

Stems/Acre: 30.4

Average Diameter: 16.5"

Softwood Sawtimber: 31.483+/-mbf

Description: Stand G is an even-aged stand of mixed softwoods. The timber quality is good with a size class of medium-large saw timber. Although the wood is good, accessibility is almost impossible due to wetlands crossing and un-friendly topography.

Prescription: Allow stand G to grow into an old growth forest which some day could be used as an educational tool.

Soils: 495, 140C

School Lot Management Priorities

The School Lot has two issues that need be addressed or at least discussed immediately. Certain portions of the lot are in need of some over due management, but not urgent. These priorities are listed from greatest to least important.

1. Possibility of a salvage cut implemented in Stand A needs to be made top priority.
2. Boundaries need to be re-blazed and painted before any harvesting activity begins. Especially the bound that parallels the houses within the Lucas Pond sub-division.
3. TSI and removal of fuel wood in stand B could be carried out if and when stand A is addressed.
4. Stand D is in need of a commercial thinning to ensure long term, high quality timber production and economic enhancement.
5. Stand E is in need of TSI on the young pine stand.
6. Stand F could also benefit from a conservative thinning and removing fuel wood.
7. Management should only be applied to stands B,D,E,F when markets have rebounded from their current economic lows.
8. Possible layout of a foot path with utilization of skid roads produced by future logging operations.

School Lot Values and Valuations

<u>Species</u>	<u>Volume</u>		<u>Value</u>	
<u>Total</u>				
White Pine	276.7+/-mbf	@	\$125/mbf	\$34,5875
Hemlock	94.3+/-mbf	@	\$50/mbf	\$4,715
Red Oak	<u>30.1+/-mbf</u>	@	\$275/mbf	<u>\$8,307</u>
Total Volume	432.2+/-mbf			\$45,385
Hardwood Pulp	649+/-cords	@	\$10/cord	<u>\$6,490</u>
			Total:	\$51,875

Volumes/Acre: Board Feet: 3.9 mbf/Acre
Hardwood Pulp: 5.6 cords/Acre

Giles Lot

Woodlot Characteristics

Acreage: 30+/- total acreage, 29.5+/- wooded

Location: The location of the Giles Lot is located off of Upper Deerfield Rd., a dead end rd. spurring off of Old Mountain Rd.

Boundaries: The boundaries are relatively definite bordered by stonewall on three sides. The long road frontage, 2500ft, on Upper Deerfield Rd. makes up the southern bound.

Access: Access to the Giles lot is excellent. A landing and an interior road system have already been established by prior harvesting operations.

History: See Appendix

Recreation: Recreational opportunities are currently available within the Giles Lot. Snowshoeing, cross-country skiing and hunting are all activities that are currently taking place in this property. The experience of practicing these low impact recreational activities on this property could easily be made more pleasurable by creating designated signs, and connecting footpath with historic facts.

Wildlife Habitat Management: The wildlife habitat within the Giles Lot, in its natural state, is just about at its full potential. The majority of this property is growing as mixed hardwood un-evenaged forest and is providing maximum amount of browse, both hard and soft. Management should make an effort to always make sure mast producing trees are present by leaving a few mature, lower quality oak stems with large productive crowns per acre. Stand B provides cover for a potential deer yard. A water source is present just outside the easterly bound. A wetland area and stream runs parallel with this section of the property. Maintaining the current quality of wildlife habitat that is currently present on the Giles Lot will coincide with the silvicultural prescriptions that will be applied to managing the timber component of this property.

Soils: See Soils Sketch Map

140- Chatfield-Hollis-Canton – 98% of total area; Soil complex with fair to good productivity for Red Oak and White Pine; 8-35% slopes.

657 – Ridgebury – 2% of total area; very fine sandy loam; poorly drained soil with low productivity, wooded wetlands, 3-8% slopes.

Giles Lot Timber Types
(refer to timber type sketch)

Stand A

Species Composition: White Pine, Hemlock and Mixed Hardwood

Acreage: 15+/- acres

Age: 40+/-

Site Index: White Pine 70

Basal Area: 138.4sq.ft/Acre

Stems/Acre: 256

Average Diameter: 8.2"

Softwood Sawtimber: 11.7+/-mbf

Hardwood Sawtimber: 6.2+/-mbf

Hardwood Pulp: 352+/-cords

Description: This stand had been heavily harvested about 40+/- years prior to me cruising this lot. The size class of stand A is composed of poles and small timber sized saw log material. This stand is still recovering from this harvest and has succeeded naturally back to hardwood regeneration. A high percentage of the regenerated species composition is of higher valued red oak and black birch. White ash, white birch and red maple round out the lesser valued species. Although these species do not have a high economic value, they are providing a wildlife component of soft mast. Clusters of mature pine, hemlock and scattered oaks were spared from this harvest. These stems are of good quality and are mature in age.

Prescription: This stand would benefit for a TSI, thinning around the crowns of the higher quality red oak and black birch stems that are showing dominance. Removing the fuel wood from around these future crop trees would increase vigorous growth and a faster rate of economic return. When thinning this stand management should concentrate on eliminating the potential for sprouting of the crop trees to a minimum along with lowering the basal area to recommended levels for mixed hardwood- 70sq.ft-90sq.ft./acre.

Soils: 140C, 140B

Stand B

Species Composition: White Pine, Hemlock, Red Oak and Mixed Hardwood

Acreage: 14.5+/-

Age: 90+/-

Site Index: White Pine 70

Red Oak 65

Basal Area: 70sq.ft/Acre

Stems/Acre: 156

Average Diameter: 10.8"

Softwood Sawtimber: 26.2+/-mbf

Hardwood Sawtimber: 13.4+/-mbf

Hardwood Pulp: 122+/-cords

Description: This portion of the Giles Lot was somewhat spared from the heavy harvesting of Stand A. This stand is mixed wood, even aged stand with medium sized saw log material while regeneration is small pole growth with red oak, black birch, white pine and red maple. The soils on this site are great for growing high quality pine and oak. The hemlock growth on the eastern portion of the lot is thick in sections closest to the wetland. Cankers are present on black birch and red maple regeneration.

Prescription: This portion of the Giles Lot could be thinned, removing the lower quality, mature oak and pine stems that are competing with the pole sized stems of better form that will provide higher economic return if the future. This can be done in conjunction with the TSI in stand A. Once this initial prescription is implemented the rotation of future thinnings should return to 15-20 year rotations.

Soils: 140C, 140D, 657

Giles Lot Management Priorities

The Giles lot is in no need of immediate managerial action. The Giles lot has the most potential for producing quality timber and could benefit the most from proper management.

1. Stand A could use some TSI treatment in the near future.
2. I recommend thinning stand B when markets allow.
3. Stand A and B should managed in conjunction with one another.

Giles Lot Volumes and Valuations

<u>Species</u>	<u>Volume</u>		<u>Value</u>	
<u>Total</u>				
White Pine	16.6+/-mbf	@	\$125/mbf	\$2,075
Hemlock	21.4+/-mbf	@	\$50/mbf	\$1,070
Red Oak	<u>14.2+/-mbf</u>	@	\$275/mbf	<u>\$3,905</u>
Total Volume	52.2+/-mbf			\$6,341
Hardwood Pulp	474+/-cords	@	\$10/cord	\$4,740
				Total: \$11,081

Volumes/Acre: Board Feet: 1.74+/-
Hardwood Pulp: 15.8+/-cords

Deslaurier Lot

Acreage: 29.8 wooded acres

Location: Southerly side of Saddleback Mountain

Access: The Deslaurier Lot is highly inaccessible with no direct access to the actual lot itself. It is land locked although Saddleback Mountain Rd. comes within 100+/- feet of the property. Saddleback Mountain Rd. is owned by UNH and is the home of N.H Public Television Tower. Interior access is also poor due to un-even terrain and absence of established interior roads.

Boundaries: The majority of boundaries for the Deslaurier Lot are non existent. The two corners closest to the tower were identifiable with the help of town maps and the map provided by Forester Charlie Moreno in his management plan. The northwestern boundary is well demarcated by stonewall and old blazes marked by Forester Charlie Moreno some twenty years prior.

History: See Appendix

Recreation: Recreational opportunities are minimal due to the lack of access. Hunters that do not mind hiking into their stand. Deer hunting is ideal on this lot due to the ample amount of available food sources.

Wildlife: Red oak makes up more than half of the species composition present on the Deslaurier Lot. Acorns might be most important wildlife food source available for mammals found in New Hampshire forests. This property surely provides a surplus of nuts when the seed year for oaks are high, generally every 3-5 years. Currently, managing for wildlife is not economically feasible and may be addressed in the long term when silvicultural prescriptions will be beneficial to the timber productivity of the property.

Soils: See Soils Sketch Map

141 – Hollis-Canton – 88% of total area; rocky outcrop ledges; low productivity; steep slopes 5-35% slopes.

140 – Chatfield-Hollis-Canton – 12% of total area; soil complex with fair to good productivity for Red Oak and White Pine; 8-35% slopes.

Deslaurier Lot Timber Types
(refer to timber type sketch)

Stand A

Species composition: Red Oak, White Pine, Mixed Hardwoods

Acreage: 25+/-

Age: 65+/-

Site Index: Red Oak 60

Basal Area: 68sq.ft./Acre

Stems/Acre: 80

Average Diameter: 10.2"

Softwood Sawtimber: 15.6+/-mbf

Hardwood Sawtimber: 5.8+/-mbf

Hardwood Pulp: 210+/-cords

Description: Stand A is a relatively low in stocking and productivity due to poor soil conditions. This is an un-even aged mixed stand of hard and softwoods, composed of mostly small saw timber (10"-12") and hardwood poles. Large oak stems are present but are short in growth and have little to no timber value. The northeastern section of this stand holds future saw log production in both pine and oak. The wetland area is home for black gum growth and may be an area of interest for conservative measures.

Prescription: No silvicultural needs are present at this time. Return to stand in 8-10 years and assess the productive northeastern section of the property. Hopefully the markets will have turned around by then.

Soils: 141D, 140C

Stand B

Species Composition: Pine and Mixed Hardwood

Acreage: 4.8+/-

Age: 35+/-

Site Index: White Pine 50

Red Oak 55

Basal Area: 78 .4sq.ft./Acre

Stems/Acre: 148

Average Diameter: 9.1"

Softwood Sawtimber: 6.1+/-mbf

Hardwood Sawtimber: 4.2+/-

Hardwood Pulp: 84+/-cords

Description: Stand B is located below the ridge area on this property. This lot was cut over relatively heavy 35+/- years ago. Mixed hardwood composed of red oak, black birch and red maple is present. White pine makes up the softwood component in this stand. The objective of the previous harvest seemed to be that of a high grading operation of the quality pine stems with only poor quality stems remaining. The trees left behind have acted as seed trees producing a nice carpet of white pine regeneration. The red oak growth within this stand is better quality than that in stand A. The age class is composed of small saw timber and nice stocking of mixed hardwood pole size trees. Stocking levels are still recovering from the heavy logging activities of the past.

Prescription: Stand A is not in any need of management within the next 10 years. Allow to grow and mature until stocking levels reach healthy levels.

Soils: 141D, 140C

Deslaurier Lot Management Priorities

The Deslaurier Lot is not in need of any management at this time. By the time this property is in need of any further management, this plan will be out-dated. Hopefully the property will have recovered from the heavy harvesting and growing conditions will have improved.

Deslaurier Lot Volumes and Valuations

<u>Species</u>	<u>Volume</u>		<u>Value</u>	
<u>Total</u>				
White Pine	20.1+/-mbf	@	\$125/mbf	\$2,516
Hemlock	2.1+/-mbf	@	\$50/mbf	\$105
Red Oak	<u>9+/-mbf</u>	@	\$275/mbf	<u>\$2475</u>
Total Volume	31.2+/-mbf			\$5,096
Hardwood Pulp	294+/-cords	@	\$10/cord	\$2,940
			Total:	\$8,036

Volumes/Acre: Board Feet: 1.04+/-mbf
Hardwood Pulp: 9.8+/-cords

Northwood Town Forests Total Volumes and Valuations

<u>Property</u>	<u>Species</u>	<u>Volume</u>		<u>Value</u>	<u>Total</u>
Parsonage	White Pine	318+/-mbf	@	\$115/mbf	\$36,570
	Hemlock	100.4+/-mbf	@	\$50/mbf	\$5,020
	Red Oak	13.8+/-mbf	@	\$275/mbf	\$3,795
	Hardwood Pulp	1679+/-cords	@	\$10/cord	<u>\$16,790</u>
Total					\$62,175
School	White Pine	276.7+/-mbf	@	\$125/mbf	\$34,587
	Hemlock	94.3+/-mbf	@	\$50/mbf	\$4,715
	Red Oak	30.1+/-mbf	@	\$275/mbf	\$8,278
	Hardwood Pulp	649+/-cords	@	\$10/cord	<u>\$6,490</u>
Total					\$54,070
Giles	White Pine	16.6+/-mbf	@	\$125/mbf	\$2,075
	Hemlock	21.4+/-mbf	@	\$50/mbf	\$1,070
	Red Oak	14.2+/-mbf	@	\$275/mbf	\$3,905
	Hardwood Pulp	474+/-cords	@	\$10/cord	<u>\$4,740</u>
Total					\$11,790
Deslaurier	White Pine	20.1+/-mbf	@	\$125/mbf	\$2,513
	Hemlock	2.1+/-mbf	@	\$50/mbf	\$105
	Red Oak	9+/-mbf	@	\$275/mbf	\$2,475
	Hardwood Pulp	294+/-cords	@	\$10/cord	<u>\$2,940</u>
Total					\$8,033

Total Values of Forest Products on Northwood Town Forest Lands: \$136,068

Notes: Stumpage prices shown above are reflective of the quality of the timber growing within the Northwood Town Lots coinciding with current market prices. Unfortunately, the time this plan was written timber prices are at decade lows due to an on going recession that had started in the second quarter of 2008 and have negatively affected the timber markets of all species during the first quarter of 2009.

Depletion

Taxable gain from the sale of timber may be reduced by accounting for the owner's cost of basis in the value of timber by the use of depletion. A representative part of the cost of purchasing land may be allocated to timber on that land at the time of purchase or transfer of ownership, establishing a timber basis when timber is sold. Timber basis may be depleted, offsetting taxable gain by the percentage that is taken from the total tract volume before timber harvesting.

Calculation of Basis for Depletion:

Town of Northwood Forestlands: 947,800+/- board feet = 947.8+/-mbf

Current annual growth rate: 1.9% or 18,000+/- board feet = 18+/-mbf

The estimate of volumes at the time of transfer is calculated by discounting the current volume by the current growth rate. Historic stumpage values are available from the N.H. cooperative Extension Service Forest market Reports which have been published annually since 1947.

The estimated timber value at the time of transfer of ownership may be used in determining the basis for timber and to determine the taxable gains from the sale of timber. The timber value must be a reasonable fraction of the overall basis for land and timber. In order to allow sufficient value for the bare land, not more than 75% of the basis for land and timber should be assigned to the timber.

It is recommended that the services of an accountant be employed to consider estate planning variables. It is important to consider methods of land and timber transferal. An accountant could act as an advisor of the consequences of cutting and selling timber.

APPENDIX

History of the Northwood Town Forest *

Acquisition

A clue to the origin of the Parsonage and School Lots is evidence in their similar configuration. The lots date back to 1736, when the Towns of Northwood, Nottingham and Deerfield were originally staked-out, at that time, as one town. These lots were laid out according to the existing rangelines, for the purpose to which their respective manes ascribe. When the towns separated, these lots came to lie within Northwood's boundaries and have since remained under Town ownership.

According to True Chesley, Town Selectmen, the Giles Lot was acquired by the Town around 1930. Ela Giles, a widow, deeded the property to the Town in return for "caring for her the remainder of her life". The Deslaurier Lot was also acquired in the 1930's as a tax deed, due to unpaid taxes.

Forest History

The primeval forest on the Parsonage and School Lots was cleared long ago, and the properties went through a fairly long period of use as pastureland. The pasture was abandoned on the Parsonage Lot in the early 1900's and the land reverted for forest. In the 1960's, an extensive harvest of pine sawtimber was made on the eastern half of the parcel. A second, heavy harvest followed on the western half of the parcel in the mid-1970's. Much of the forest was harvested in these cuttings, done by portable sawmills, with the exception of a few difficult-to-reach areas, which today contain excellent forest growth. Saplings and residual trees from the past generation now stock the cut-over areas. An interesting note is that proceeds from these harvests were divided amongst the various churches in Northwood.

The School Lot was leased as pastureland until the 1920's, with proceeds sent to the school district. In the mid-1940's, a 50+/- acre section of the land was sub-divided and leased as house lots, including all water frontage along Lucas Pond. Much of the western section of the School Lot was heavily harvested in the mid-1970's. Presently, these areas are in a regeneration age. In 1985, a two acre section of the pine plantation along Lucas Pond Road was thinned by students in the Coe-Brown Academy Forestry Course. The harvest yielded 4 mbf of white pine sawlogs and 7 cords of firewood.

Little is known of the early history of the Giles Lot, though it was undoubtedly farmed as evidence by the surrounding network of stonewalls. The western half of the property was clearcut in the early-1970's.

Due to poor access and low forest productivity, it appears that the upper ridge (western) section of the Deslaurier Lot has not been logged in some time. However, 5+/- acres in the southerly area of the property were logged in 1983, in conjunction with a harvest on the adjoining property. This area is also in the process of recovering forest stocking.

* Forester Charlie Moreno, Management Plan 1990

GLOSSARY OF TERMS

Basal Area: The cross sectional area of a tree or trees at 4.5 feet above the ground. Basal area per acre is a measure of stocking, or the relative occupancy of growing space by trees. If you cut all the trees on one acre 4 1/2 feet above the ground, then measure the surface area of all stumps, you would have the basal area (square feet/acre).

Blaze: An ax mark on a tree, used to indicate boundary lines. Blazes are periodically painted to improve visibility.

Board Foot: A measure of wood volume. One board foot equals 1/12 foot of sawn timber.

Crop tree: A tree which because of species, age, form or dominance is determined to be of high potential economic value for harvesting now or in the future.

Crown classes:

- a. **Dominant** - a tree whose crown receives full sunlight on the top and all sides of the crown.
- b. **Co-Dominant** - a tree whose crown receives full sunlight on the top and indirect sunlight on the sides.
- c. **Suppressed** - a tree that receives little or no sunlight.

Cruise: A survey of forest land to locate timber and estimate its quantity by species, size and quality.

D.B.H.: (Diameter at Breast Height) The diameter of a standing tree at 4.5' above the ground.

Hardwoods: Broad leaf tree species as opposed to conifers or needle-leaved trees.

Improvement cutting: A selective thinning operation designed to improve the quality and/or species composition of a stand by removing low grade and less desirable trees.

Mature: Describes a tree at its peak economic value or biological condition.

Mean Stand Diameter: One that is not happy.

M.B.F.: Thousand Board Feet.

Pole Timber: Trees 4 to 10 inches D.B.H.

Popple: A general term to include all Poplar and Aspen species.

Pulpwood: Trees or portions of trees of poor form or quality which may be used to make pulp for paper, or chipped for fuel to generate electrical power via steam.

Pruning: The removal of the lower limbs from a crop tree to increase the yield of knot-free lumber.

Reproduction: Seedlings representing a new generation of forest trees.

Saplings: Trees 2 to 4 inches D.B.H.

Sawtimber: Trees over 10 inches D.B.H. sufficiently straight and sound to yield lumber or veneer.

Shelterwood: A system of regeneration whereby a maturing stand is harvested in more than one stage, with several years between each stage, providing partial shade to protect new seedlings.

Site: The qualities of an area of land relative to its ability to grow timber. It is a combination of soil, climate, drainage, topography and biological factors.

Site Index: A measure of the ability of an area to grow timber. This is a relationship between tree height and age.

Softwood: Trees with needle or scale-like leaves - conifers.

Stocking: The density of trees in a forest relative to the number desirable for optimum growth.

Thinning: Reducing stocking levels to improve the growth and vigor of forest stands. Thinnings may be either commercial or non-commercial depending upon the nature of the stand.

Timber Stand Improvement, T.S.I.: Practices to improve the quality and growth of young saplings and pole size stands, including weeding, thinning, pruning and cull removal.

Volume: A quantitative measure of wood in a tree stand or woodlot. Common units include board feet, cords, tons and cubic feet.