TIMBER CRUISE
and
FOREST MANAGEMENT PLAN
of the
BOW TOWN FOREST SYSTEM

BOW N.H.

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April 1997
Revised January 2011

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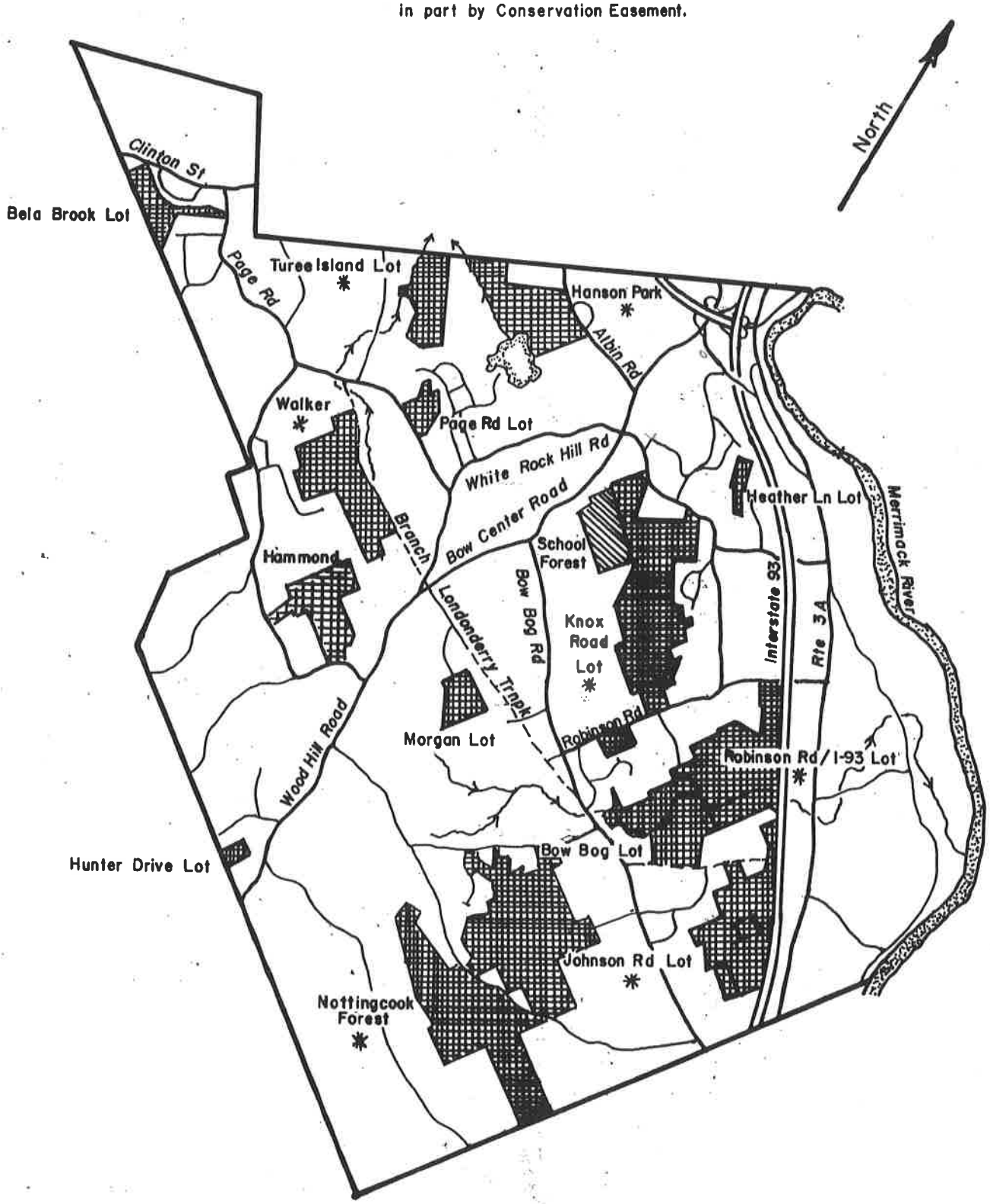
* Denotes lots protected in whole or in part by Conservation Easement.



Location Sketch

BOW TOWN FOREST LOTS

1 inch = 1 mile

1997

LISTING OF THE BOW TOWN FORESTS
January 2011

Tax Map Block/ Lot Number	Common Name	Forested Acreage	Wetland Acreage	Other Acreage	Total Acreage
2-77,78,82,83	Bow Bog Lot	128	25		153
2-88A,et al	Johnson Road Lot	200		43	243
2-97,119	Robinson Road/I-93 Lot	283	24.4	5	312.4
2-122	Robinson Road Lot	20	1.7		21.7
3-2,2Y	Hunter Drive Lot	15	.6		15.6
3-63	Morgan Lot	62	.2		62.2
3-138	Knox Road Lot	288	30.56	13	331.56
4-26,27	Bela Brook Lot	63	13.1		76.1
4-50	Turee Island Lot	52	43.5		95.5
4-56	Page Road Lot	56	.3		56.3
4-77	Hanson Park	44	96	16	156
4-116,et al	Walker Lot	193	14.6		207.6
4-102,103,105	Hammond Lot	95	41	7.52	143.52
5-64	Heather Lane Lot	39			39
2-44,69,et al	Nottingcook Forest	594	84.05	93.07	771.12
	Total Acreage	2,132	374.45	177.59	2,684.6

TIMBER CRUISE AND FOREST MANAGEMENT PLAN
BOW TOWN FORESTS

INTRODUCTION

The Bow Town Forest system contains 15 lots that total approximately 2,684 acres and are found scattered throughout the Town. They range in size from 15 to 771 acres and are currently managed by the Bow Conservation Commission. Of the 2,684 acres, approximately 2,132 acres would be considered commercial forest land. Most of the lots contain wetlands, three are crossed by power lines, and two either contain, or will eventually contain ball fields. Several are protected by Conservation Easements. A majority of the lots were purchased from the Robert Upton Estate in the 1970's. One was purchased from the State of New Hampshire, some have been purchased as part of wetlands mitigation, and the more recent acquisitions, the Nottingcook Forest and the Hammond Lot, were purchased to protect Open Space. The Commission has actively been managing the Town Forests since their purchase. Almost all of the lots have been surveyed and have identifiable boundaries and all have been made accessible to Town-maintained roads. The Commission originally hired Consulting Forester John Morse of Wilmot, New Hampshire soon after acquiring the land to cruise the woodlots and draw up a Forest Management Plan. Following the recommendations found within the plan, most of the lots were harvested using sound, but basic timber management principles. Income from the timber sales was used to set up a Conservation Fund to help manage the forests and purchase other conservation land. In the early 1990's, the management focus of the Commission changed from timber production to a more "Multiple Use" type program. FORECO:Forest Resource Consultants of Contoocook and Rumney, New Hampshire was then hired to help the Commission expand their Forest Management program to include the many and sometimes conflicting uses currently demanded of the Town Forest system. In 1996, the Commission decided to re-write the existing Management Plan to address those uses. That plan was completed in 1997 and later updated in 2011 to reflect changes brought on by timber harvests and land acquisitions.

GOALS AND OBJECTIVES OF THE TOWN FOREST SYSTEM

The goals and objectives for the Town Forest system are many and quite diverse, but all ultimately enhance the environment in which the Town's citizens live. Listed below are the goals of the Bow Conservation Commission that are used as guides in their forest management activities.

- Provide enough undeveloped "Open Space" to help the Town maintain a rural ambiance and character.

- Develop high quality, healthy forest types, whose harvests will produce sufficient income to cover management expenses and allow the purchase of additional conservation lands.

- Provide a variety of productive habitats to maintain a diverse and healthy wildlife population and to protect critical habitat types.

- Provide residents with public land for outdoor recreational activities.

- Protect watersheds and wetland areas.

- Provide areas for Environmental Awareness and Education.

- Protect cultural, historical or other unique features found in the forest.

GENERAL RECOMMENDATIONS TO ATTAIN THE GOALS AND OBJECTIVES

Whereas the Town Forest System contains multiple lots that have similar recommendations regarding non-timber production activities, these general recommendations are listed below to avoid repetition and when applicable, will be referred to within the specific silivicultural recommendations for each forest type.

OPEN SPACE

Open Space is a very important part of any community. It provides aesthetic and recreational opportunities, wildlife habitat and helps to minimize the "urban sprawl" appearance. The Town of Bow has recently experienced a tremendous growth in housing development. Many of those developments carry scenic words in their titles such as "meadows", "woodland", and "birchwood" which reflects the appeal of Open Space. However, such developments frequently destroy the very thing that they are trying to promote. It is extremely important to protect some open space areas allowing the residents a place where they can at least relate to the desirable qualities that originally attracted them to the Town. Several new developments directly abut some of the Town Forest which until now, were quite isolated. Access routes to the Town Forests were wisely provided as part of the subdivision plan. However, such development has an immediate impact of the use of the Town Forest. For example, wildlife populations may have been using the now developed acreage as part of their habitat. If their habitat needs can not be met within the Town Forest, they will move out of the area. Animals will sometimes adapt and become a nuisance in the eyes of homeowners. Deer will browse on shrubbery, skunks will dig up lawns looking for grubs and occasionally have strongly scented liaisons with pets. Raccoons are notorious for getting into trash and eating pet food left outside. On the other hand, having a forest in the back yard gives children an unlimited opportunity to explore and learn about nature on their own. A definite "kiddie zone" can often be found extending 100 to 200 feet into the woods from the back yards in new developments where small forts, camps, and secret paths are frequently located. This zone is technically called the "Urban-Wildland Interface" and as development continues to expand, more and more acreage will fall into this zone.

Recommendations on how to protect designated Open Space adjacent to a proposed development are usually based on an overall environmental evaluation of proposed development. Is the development eliminating habitats and travel corridors not found in adjacent Town Forests? Is there a place for the children to play? What will the impact be on the management plans for the nearby Town Forest? These are only a few of the questions that should be asked when a proposed development abuts a Town forest. Usable open space should be part of most large scale developments. Buffer zones should be established in any adjacent Town Forests to account for the "Kiddie Zone", and conversely, buffer zones should be established in developments around wetlands and other critical habitats and connected to the town forest when possible. Usable public access routes to the adjacent Town Forest should be a continued requirements of future developments. The only major area within the Town now lacking some form of protected land is along the shores of the Merrimack and should be targeted for the acquisition of protected open space land.

Recently, wildfire has become a concern in the urban-wildland interface. Although New Hampshire doesn't experience the wildfire problems more typical of the west coast, house placement and landscaping of the lots near the Town forests should consider wildfire protection in their planning and lay-out.

As the population expands, demand for housing will continue to increase. People also need a "habitat" in which to live. Long term planning with environmental considerations will help keep all types of habitat healthy, productive and relatively compatible.

TIMBER PRODUCTION

Establishing a Town Forest solely for timber and income production is no longer preferable now that forests are recognized for providing many non-income producing benefits. However, income production is still important to cover the costs associated with land management. These costs typically include boundary surveys and maintenance, trail and road construction and maintenance, management plan updates and occasional wildlife habitat improvements. It also provides funds to purchase other conservation lands.

Forest growth is dependent on the interaction of site/soil quality, weather, and past and present management practices. In the past, white pine was considered "king of the forest" and much time, money and effort were wasted throughout the State trying to grow pine on sites not suitable for that species, frequently to the detriment of species that are now more valuable than pine. As a result, emphasis should be placed on growing trees that are suited to the site conditions found within the Town Forest. Site conditions are most easily determined by soil types. In general, the deep, dry sand and gravel outwash soils will favor pine; deep, fairly well-drained glacial till soils will favor a mix of oak, birch, pine and maple; and poorly drained soils will favor red maple and hemlock. Poorly drained soils are often considered wetlands and are not productive timber growing sites. Their value lies in watershed protection and as wildlife habitat. There are only a few areas in the Bow Town Forests that contain the dry, outwash soils. Not surprisingly, those sites are currently dominated by pine. Whereas these natural pine sites are relatively rare in the Town Forest system, efforts should be taken to maintain the pine forest on those sites. The majority of the Town Forests contain the mixed hardwood-white pine type in the mid to late successional stage. Most of the Town Forests were once cleared for pasture or cropland. When the farms were abandoned, the fields grew in with white pine. All of the pine stands have been cut over at least once. Some were clearcut many years ago which allowed the hardwood forests to develop. Others have been selectively cut once or twice which created a more mixed hardwood-softwood forest. The mixed forest type will continue to expand as the regeneration established after the first selective cuts begin to mature. Past gypsy moth defoliation killed off many oak and hemlock trees that had been growing in sites considered marginal for those species and those areas are now slightly dominated by species not included in the moth's diet. As the years progress, the species composition in the mixed forests will probably remain the same, though the proportions of each species will change.

Due to the relatively long time that it takes for a tree to mature, and that forest product markets fluctuate and change over time, stem quality instead of species type should be the stronger consideration when managing a stand of timber. Straight, vigorous stems should be favored for long term growth and development instead of trees that are crooked, forked, growing in clumps, suppressed, diseased or damaged. This does not mean eliminating hollow "den" trees, or trees that are so outrageously deformed that they have aesthetic appeal. Some species are relatively rare for the area, such as spruce, balsam fir, hickory and black gum and should receive some protection.

Cordwood and whole tree chipping (Biomass) thinnings should be conducted when the forest is young to prevent early stagnation. Later timber harvest should be designed to sustain the forest ecosystem, with the high-volume/high-value harvests put out to bid to area mills and loggers to maximize financial returns. Using the services of a Licensed Professional Forester should help insure the successful integration of the silvicultural needs of the Town Forest with the other uses of that particular forest during a harvest operation.

WILDLIFE

Observing wildlife can be the most memorable part of any forest experience. Much wildlife and wildlife sign were noted during the field cruise of the Town Forests in the fall of 1996. Mammal species observed included moose, deer, coyote, raccoon, beaver, muskrat, mink, otter, skunk, porcupine, fox, squirrels, rabbits, bats and mice. Bird species included ducks, geese, herons, hawks, owls, ruffed grouse, crows, woodpeckers, turkey and numerous songbirds. Due to time of year of the cruise, few insects, reptiles and amphibians were observed, though they have been seen at other times of the year. The presence of these species usually indicates the presence of adequate habitat for a breeding population. The size of a species' population is usually dependent on the amount of suitable habitat. Animal populations can often be manipulated by varying the amount of habitat. However, unless a species is rare and endangered, one species should not be favored over another. There are no "good" or "bad" animals in the wild. Providing a variety of habitats will increase the diversity of wildlife. Most wildlife are opportunists and will take advantage of almost any type of habitat according to their needs. As habitats are slowly lost to development, it may become more important to replace lost habitats to avoid losing wildlife populations.

There are several habitat improvement and protection practices that can be incorporated into the timber harvesting activities. First, all harvesting should follow the State's "Best Management Practices" (BMP's) guidelines for logging. Wetlands should be avoided and stream crossings should be kept to a minimum. Any crossings should be designed to prevent mudding of the stream. This includes installing temporary bridges, culverts and/or pole fords. Logging should be avoided during "mud" season or prolonged rain spells. Truck roads should be properly constructed to minimize erosion. These practices are designed to protect water quality, which in turn protects the aquatic habitats of fish, amphibians and certain birds and mammals. Vernal pools should also be protected during harvest activities by creating large enough buffer zones around the edges to keep the pool shaded and to prevent the logging slash from falling into the water zone. Such pools are important breeding grounds for many amphibians. Den trees as well as potential den trees should be left and protected during harvest activities. Leaving five to seven of those types of trees per acre is recommended to provide sufficient habitat. Hollow trees are nesting sites for squirrels, mice, bats, raccoons, owls and other birds along with many insects that are at the bottom of many food chains. Trees with a three-pronged fork are preferred nesting site for hawks. Sufficient "mast" (nuts and acorns) producing trees should also be left to provide a food source for wildlife. Acorns are a primary food source for deer, squirrels, turkey and other birds. Most nesting activities occur during the latter part of mud season and are not often disturbed by the logging, though heavy recreational use during that time of year can also have a negative effect on wildlife.

Dense stands of young white pine and hemlock thickets provide critical winter shelter areas for deer, grouse, rabbit and several other species. Those types should be protected, and attempts should be made to establish or promote those forest types near areas lacking softwood cover. Mature pine and hemlock stands that show signs of winter use by deer should be maintained for winter cover by keeping at least a 70% crown closure, of which 50% should be softwood. Hardwood sprouts, especially red maple are an important food source. Deer, moose and rabbit depend on such browse for their winter and early spring food supply. Most harvesting will temporarily increase the potential browse supply. Quarter to half acre patches of hardwood forests could be clearcut to provide vigorous hardwood sprouting. Sprouts become too tall for the animals five to seven years after the harvest. At that point, the sprouts could be re-cut or allowed to develop into a forest, with new areas cut elsewhere.

Beaver ponds are prime habitats for many wildlife species. Most of the beaver ponds found in the Town Forests were abandoned as the beavers have exhausted their food supply. The pond areas are reverting to marshes which offer habitat to other types of animals. The natural cycle of a beaver ponds should be allowed to continue unhindered as each phase has its own ecosystem.

One particular habitat found lacking in the Town forest system is the "old field" type that primarily contains grasses, weeds and shrubs. The power line right-of-ways were the only areas within the Town Forest system that resembled the "old field" type. Efforts should be taken to preserve the existing open space by periodic mowing to slow down the normal forest succession process. Log yards could be made extra large and seeded and mulched upon completion of the harvest. Re-use of the log yards during future harvest will help keep those sites open. Edges of the woods roads can also provide the grass/shrub habitat if the trees are cut back far enough to allow direct sunlight onto the road. Although this provides some habitat, it also increases the maintenance needs to keep the "brush" from growing into the roadway.

RECREATION

Forest recreation in the Bow Town Forests includes hiking, wildlife observation, cross-country skiing, snowshoeing, mountain biking, snowmobiling, hunting and All Terrain Vehicle (ATV) use. Some of the uses are often thought to be incompatible with logging and are sometimes incompatible with each other. Ironically, most of the above uses occur on logging roads and skidder trails. Occasionally, silvicultural prescriptions or site conditions will dictate the time of year when logging will occur. Advance notice of planned forestry activities helps reduce the shock factor typically found when a harvest is un-expectedly encountered. Buffer zones should be established along heavily used trails that were constructed for a specific use. The zones should be at least one tree length wide on either side of the trail. Topographic restrictions, such as wetlands or steep slopes, may require crossing or running on a trail for a short distance. Care should be taken in such a situation to keep the trail clean and passable at all times. Re-locating established trails out of the timber management zones will help alleviate conflicts. Trails could be located in areas where cutting is not planned such as along brooks and boundaries. It is more difficult to address compatibility when logging roads are used for trails, especially in the winter. Plowing the road during a harvest eliminates recreational winter use of the road, and alternative routes are usually difficult. Safety becomes a major issue for trucking when snowbanks along the roads are high and difficult to climb over. Logging in areas with high recreational use should be avoided during weekends when the use is at its peak. There have been few, if any injuries to curious bystanders during logging, though there have been several close calls. Signs should be posted to warn the public of the dangers of logging, and they should be discouraged from entering the tree felling areas.

Except for ATV's, all of the above listed recreational uses are relatively environmentally friendly. To date, most ATV activity has been limited to the interior logging roads, power line right-of-ways, and Class 6 roads, especially on the Nottingcook Forest. The logging roads have been gated and because they are relatively new and well constructed, they have not yet been damaged. It is important to maintain the gates, as well as to provide parking places near the gates for recreational users. Maintaining the logging roads not only reduces the costs of future harvests, but also provides access routes for fire and rescue vehicles. The Class 6 roads throughout the Town have all been used by four wheel drive trucks during peak mud season as an apparent proof of manhood by a select group of individuals. Because such roads access several ownerships, gating has not been effective. Most landowners serviced by the road are reluctant to properly upgrade the road above what is absolutely necessary do access their lot for a temporary use, especially if the improvements will be to the advantage of an abutter who is unwilling to share in the cost. As a result, whenever a Class 6 road is needed to access a timber sale, expect some high road improvement costs.

Many of the trails within the Town Forests are snowmobile trails that are maintained by the Bow Pioneers, a local snowmobile clubs. Several trails pass through wetlands, making them unusable during the non-winter seasons. With the exception of the trail system on the Nottingcook Forest and the School Forest/Knox Road lot, hiking trail systems on the Town Forests are limited to logging roads and snowmobile trails and an occasional path that leads to an abutting property, though the proposed Heritage Trail is expected to pass through several lots. Typically, trail systems are laid out to access some major attraction or unique feature that will draw people to the site. Mountain and hill summits with views, cliffs and ponds are the most effective draw but are limited to the Nottingcook Forest. Trails on lots without these features could be promoted for "walking" as opposed to the "hiking" trails found on the Nottingcook Forest. Snowmobile trails that cross wetlands should be relocated to drier sites to provide year round use as well as to protect the water quality. If possible, trails should be connected to create loops which are much more preferable than retracing one's steps from a dead end. Any trails that are promoted to the public require **YEARLY MAINTENANCE** and should have directional signs at major trail junctions and intersections. Streams and brooks should be bridged to allow year-round use. The nearby City of Concord requires that bridges be designed to carry 100 pounds per square foot, though there are no formal trail bridge specifications as required by law. Liability appears to be the primary concern used during the City's design review process. Railings should be installed if the drop from the bridge deck is over two feet, but again, there are no formal specifications for the type of railing other than what looks and feels right.

The Nottingcook hiking trail system was constructed in 2002-03 by volunteers. Trail signs were posted at intersections and a bridge was constructed over Cascade brook and two kiosks were erected at the trail heads. Periodic patrols of the trails will help minimize vandalism and discourage ATV use. Two vistas were opened up on the forest which will also need occasional brush cutting to maintain the view.

Recreational use is one way for the public to use and appreciate the Town Forests. Providing the potential for a memorable recreational experience is probably the best way to develop allies in protecting and promoting the open space that the forest provides.

WATER RESOURCE PROTECTION

Life can not be sustained without water, so it is a resource that needs to be respected as well as protected. Siltation from erosion is the most common pollution problem associated with forest management. Another problem source is spilled and leaking fuels and hydraulics. Soil disturbance can seldom be avoided during harvesting, but it can be minimized. Winter harvesting reduces soil scarification, though it is sometimes desired for regeneration purposes. Winter harvesting also reduces mud problems and allows operating in areas while they are frozen that would not normally be logged except during extreme drought conditions. One problem with winter harvesting is that pole crossings will sometimes freeze in and they can not be removed upon completion of the harvest, but the entire area may be too wet to go in and remove the crossing when the site thaws. If skid trails need to cross running streams in the winter, temporary bridges should be used to maintain the stream flow come spring time in case the bridge has to be left. Skid trails should not be run on steep slopes, and even minor slopes should be water-barred when the use of that trail is completed. Skidders should not be driven through marshes, bogs and open water. Logging should be stopped during mud season and periods of prolonged rain spells. Newly installed culverts should be over-sized to accommodate flood conditions. All culverts and water bars should be checked yearly to insure that they are functioning. Following the State's Best Management Practices guidelines for logging will prevent most of the sedimentation problems associated with logging.

Bow does not have a central water supply. The rural developments depend on wells for their water supply. Whereas all of the Town Forests are part of a watershed, groundwater contamination has a higher potential to affect area wells. Minor fuel spills are often unavoidable during a timber harvest and blown hydraulic hoses on log trucks are relatively common. Fuel contamination of the water resources can be minimized by making sure that truck and skidder fueling areas along with the log yards are not located adjacent to wetlands and drainage ways. Leaking equipment and hoses should be repaired before starting the harvest, and heavy maintenance and repair activities should be conducted off site.

EDUCATION

The more people are aware of the environment, the more they tend to appreciate it. Demands for forest products along with the other uses of the forest has increased along with the population. Unfortunately, education regarding the local environment has not kept pace with the uses of that environment. Many people no longer associate that the forest products that they use everyday such as lumber, paper, firewood, pencils, etc. originally comes from trees. The Town Forests offer an excellent opportunity to educate the public regarding the many aspects of the Town's forest management program. Brochures or signs explaining the management goals and objectives could be placed near the site of the timber harvests when they occur in high use areas. Self guiding nature trails could also be established along the existing trails. A mailbox could be set up at the trail head to hold the tour brochures, though it will need periodic checking to insure an adequate supply is available to the public. Nature trails should focus more on concepts and relatively permanent features such as "white pine forest growing on its preferred habitat of dry sandy soil" or "bog ecosystem" or "large boulders left by the glacier and called glacial erratics" as opposed to specific items such as "beaver chewed stump" or "red maple tree" that may die, fall over or rot away rendering the brochure obsolete. The Bow School system could be made aware of the Town Forests and its opportunities, though use of their own school forest has been negligible. Local media could be contacted to promote the trails and other forest management activities. In the past, "Dear neighbor" letters were sent to landowners abutting the timber harvest areas prior to the start of cutting which greatly reduced the inquiring and sometimes opinionated phone calls. This practice should be continued as it appears to be quite successful. Supplements to the annual Town Report could also be used to promote the Town Forests.

Forests are dynamic and ever-changing. Good records kept over time will create a data base that can be used to judge the successes and failures of forest management activities.

HISTORIC PRESERVATION

Many items of historic interest were found during the cruise and mapped whenever possible. The forest itself gives evidence of the past uses of the properties. The age of the white pines will give a pretty good idea as to when the area was last used as farmland. Because many of the Town Forests were woodlots and had been harvested repeatedly over the years, very few areas of "old growth" forests were found. If left alone, all of the forests would eventually develop into "old growth" forests. However, studies have shown that natural disasters (hurricanes, wind shears, fire, etc.) will affect an area at least once every 200 to 300 years. This means that few trees in New England exceed that age. Some areas of each forest type found in the Town Forest system should be left uncut and allowed to develop into "old growth. This will allow some relatively rare ecosystems to develop and will provide

the classic "cathedral" forest type that most people think a forest should look like. Stand 2 in the Knox Road Lot contains some old pine, though it has been thinned twice, once in the 1980's and again in 1994. Stands 3, 6 and 9 in the Robinson Road/I-93 (Lot 97) appear to contain some old hemlock. Stands 3 and 6 were thinned in the 1980's and a very small portion of each were thinned in 2003-04. A stand of relatively old hardwoods can be found in the Nottingcook Forest around the "Indian Cave" that was last thinned in the late 1930's-early 1940's. Small, black gum swamps that contain some relatively rare old black gum trees were found on the Walker lot and the Nottingcook Forest, but they are a fragile wetland ecosystem that should be protected, but not promoted. It is recommended that the Conservation Commission decide if they want to manage for "old growth", and if so, how much and where. Such areas should be designated as "Natural Areas" so future Commission members and foresters will be aware of the situation.

Whereas most of the Town Forests were once farmland, several farmstead sites were found within the lots. Cellar holes and barn foundations were found on the Heather Lane lot, the Robinson Road/I-93 lot, the Walker lot, the Bow Bog lot, the Hammond lot and the Nottingcook Forest. Stone walls and rock dumps were found on almost all of the Town Forests, providing ample evidence of past agricultural use. Boulder quarries were also found on a few lots, with the most prominent located on the Heather Lane lot. Buffer zones should be set up around the old farm sites and skid trails routed away from those zones. Because of terrain restrictions, some of the old farm roads are also the only suitable routes for skidder trails. In this case, extreme care should be taken by the logger to avoid overly disturbing the site. A few handmade watering holes were found on some of the lots. These water holes were used for livestock and occasionally as a later source of water to run the old steam powered saw mills.

The Conservation Commission should look into hiring an archeologist to further study each farmstead site and to evaluate the Town Forests for potential Native American occupation sites.

The Town Forests contain both a future timber supply and evidence of our colonial culture. Both can be easily destroyed by carelessness and mismanagement. It is recommended that the Commission come up with a formal policy statement declaring the importance of both and continue to manage the forests in a way that the benefits of the forest will be sustained and maintained for countless future generations.

INVASIVE SPECIES

In years past, it was thought that planting certain berry producing plant species would improve wildlife habitat. Common species included autumn olive, multi-floral rose, Japanese barberry, Tartarian honey suckle and bittersweet. Although the plants produce berries, the local wildlife did not evolve with those plants, so their digestive systems do not extract the same amount of nutrition from the berries as the wildlife that did. Also, the plant species that were introduced do not have any predators, such as fungus or browsers, that help control their growth. As a result, many of the plant species have over-run various sites throughout the State and crowded out local plant species, thereby destroying native habitats. Unfortunately, wildlife continues to eat the berries and spread them via their droppings in their natural habitats. Occasionally, abutters deposit their landscape clippings into the Town Forests which also spreads unwanted species. It is therefore important to keep invasive species from becoming established within the forest. Keeping "invasives" in check, either by physically pulling the species out of the ground, or by using herbicides, with yearly follow-up checks to remove any seedlings, is the most effective way to protect native habitats. There may be Federal cost-share funds available for such work, but it most important to deal with the invasives while their populations are still small.

TIMBER CRUISING PROCEDURE

The original Bow Town Forest System was cruised by FORECO in 1997. The Nottingcook Forest was cruised in 1999 and the Hammond Lot was cruised in 2007 by using a point sampling technique with a 10 Basal Area Factor. Whereas the various Town Forest lots have different acreages and shapes, the distances between the cruise transect lines; the intervals between sample points on the transect lines; and the total number of points varied from lot to lot. A total of 402 points were taken on the 2119 acres of commercial forest land. Most of the Bow Bog Lot and the Turee Island lot were just given a walk-through cruise as the Bow Bog Lot was cut over quite heavily before its acquisition and the Turee Island Lot was designated as a Natural Area upon its purchase. At each sample point, all trees four inches in diameter at breast height(DBH) and greater were measured and tallied by species, DBH, and merchantable height by product such as grade sawlog, pallet quality sawlog, or pulp. Merchantable heights were measured to a ten inch top diameter for sawlogs and a four inch top diameter for pulp.

Tally sheets containing the sample point data were then sent to **Computer Forest Consultants Inc.** for processing utilizing the **MULTICRUISE** program. MULTICRUISE is an advanced variation of the forest inventory program originally developed at the UNH Forestry Department. The processed results are later summarized in this report.

Due to past harvesting, many of the forest types were found to have a wide variety of species, age classes, stocking levels and composition compared to similar aged forests that have not been cut. Some of the forest types have inclusions of other types that were too small in acreage to call a separate stand. Details such as streams, woods roads, trails, stone walls, cellar holes, wetlands and forest type boundaries were mapped in the field while running the cruise lines. This information was then transferred to a base map of the property, and the forest type acreage was then calculated by using a an instrument called a polar planimeter. Finally, all of the base map details and forest type information were traced with ink on mylar to produce the copies of the Forest Type Maps found in this report. All of the maps were fitted onto an 8½ x 11 inch format to allow for easy use and copying. The maps can also be altered with "White Out" and used for other purposes such as Trail Maps.

A Glossary and other related information are provided at the end of this report.

BOW BOG LOT
Tax map Block 2 Lots 77,78,82,83
1997

GENERAL DESCRIPTION

This 153 acre lot is located off the northeast side of Bow Bog Road behind the Bow Bog Meetinghouse and is connected to the northwest side of the Class 6 Old Johnson Road and a portion of the Robinson Road Lot 97. It is bisected by Bow Bog Brook and contains part of the Bow Bog. Several beaver dams have been built along the brook and most of the lowland is now flooded. Access to the lot is primarily from Old Johnson Road. The northwest side of Bow Bog Brook can be accessed through lot 97 off of Briarwood Drive. A major snowmobile route runs through the lot and crosses Bow Bog Brook over a substantial snowmobile bridge. Lots 77, 78 and 82 were purchased by the Town as part of a wetlands mitigation involving the High School construction. Lots 77 and 78 are primarily wetland lots, and were probably "Meadow Lots". Lot 82 was heavily cut prior to the Town's purchase. Lot 83 was an existing, but small Town Forest lot on the Old Johnson Road and was merged with the other lots to form the Bow Bog Lot.

SITE CONDITIONS

With the exception of the short, but steep slopes along the Bow Bog Brook flood way, the lot is gently to moderately sloped with a generally northeastern exposure and elevations running from 380 to 500 feet. The lot is obviously part of the Bow Bog Brook watershed. Most of the lot contains Gloucester very stony, sandy loam which is considered a good soil for forest growth, slightly favoring red maple, white birch, beech and hemlock, with sufficient soil moisture except in severe drought periods. There is a strip of Hinckley gravelly loamy sand found along the east side of Bow Bog Brook where the previous owner opened up a small gravel pit. Hinckley soils are deep and well drained, but very dry. The droughtiness of the soil has an generally adverse effect on tree growth but will tend to favor white pine over most hardwoods as they are more adapted to drier sites. The Bow Bog Brook floodway contains Ridgebury-Whitman soils which is a wetland soil and is currently submerged from beaver activity. Muck and peat soils are formed under water and found in the larger beaver ponds. Both wetland soils are non-timber producing soils but are very valuable regarding wildlife habitat and watershed protection.

UNIQUE FEATURES

The Bow Bog wetlands complex is quite extensive and very productive wildlife habitat. An old farmstead site containing fieldstone cellar holes is located on Johnson Road about 2/3 of a mile from Bow Bog Road. The Town-owned historic Bow Bog Meetinghouse is located adjacent to the old range road that accesses the southern portion of the marsh complex on Bow Bog Road. A major snowmobile trail bisects the lot and a very large bridge crosses Bow Bog Brook within the lot.

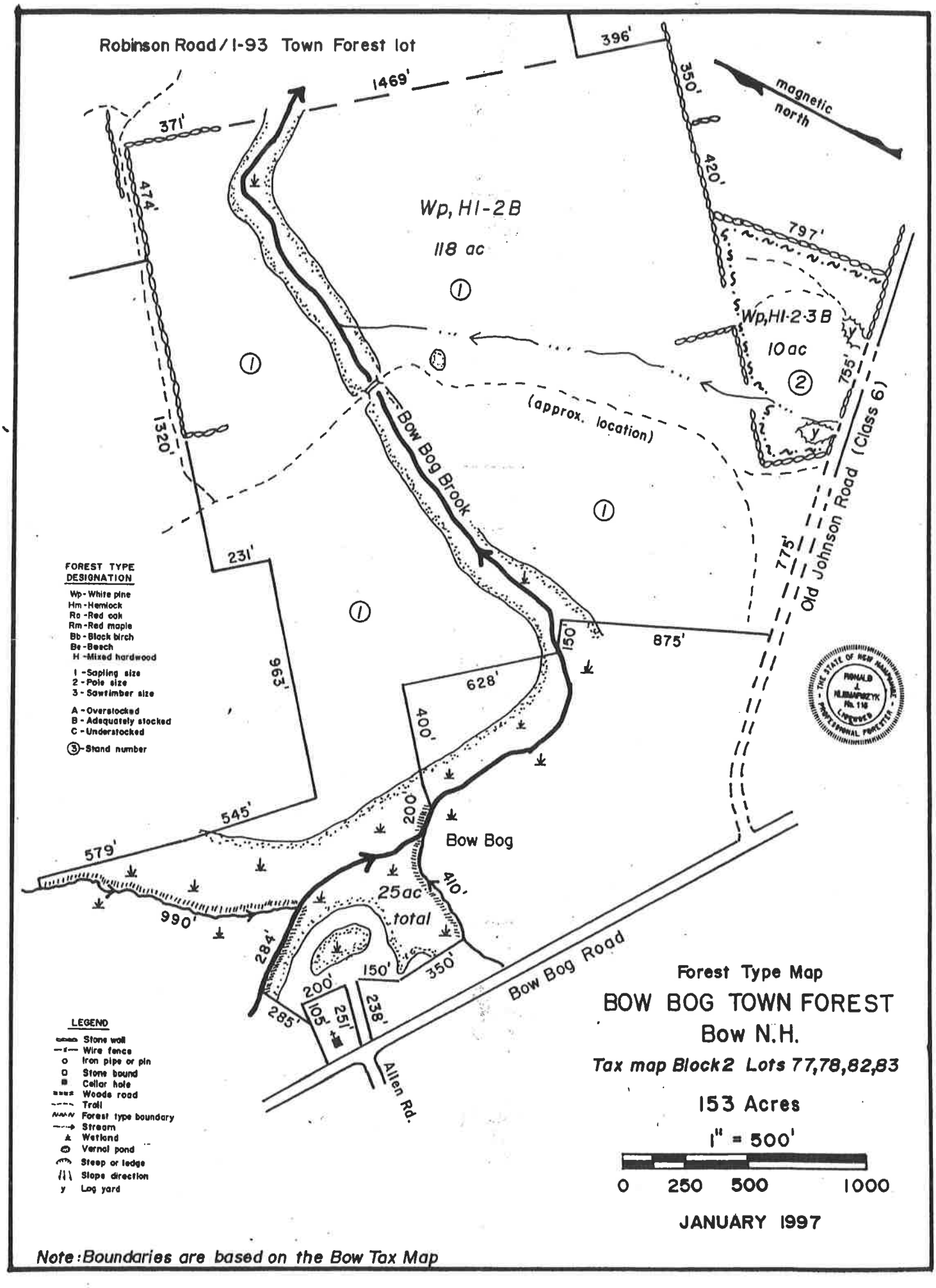
BOUNDARY LINE STATUS

The original 10.7 acre Town Forest lot on Johnson Road was surveyed in 1981 by Walter Morse of Wilmot Flat N.H. Portions of the boundary of Lot 82 abutting the Robinson Road Lot 97 were surveyed when that lot was surveyed in 1978 by Kear-wood Inc. of Wilmot N.H. A small section of boundary on Lot 77 was surveyed as part of the Erin Drive development. The northwestern and southeastern boundaries of Lot 82 are not well defined and need to be established before any management programs are implemented. It is recommended to survey the Bow Bog Lot as one unit, though surveying through the marsh land will require frozen conditions and to establish all missing boundaries, and set any missing corners.

HISTORY

Most of the lot on either side of Bow Bog Brook was cleared for agriculture by the early settlers. Based on the stone walls and farmstead site, the east side of the brook appears to have been used for crops, while land on the west side was probably used more for pasture. Whereas Lot 77 is almost totally marsh land, it can be deduced that the lot was a "meadow" lot and used for the production of marsh grass, though farming such grasses lost their desirability once the larger hayfields were cleared on the dry land. Most of the upland areas were abandoned as farm land in the early 1900's and grew in with white pine. The area behind the cellar hole on Old Johnson road was not abandoned as farmland until the 1950's and also started growing in with white pine. Beavers moved into the Bow Bog Brook area in the 1960's and 70's and have been rebuilding dams ever since. The original 10.7 acre Town Forest lot was logged in 1982 by Lorden Lumber which produced 100,200 Bd.Ft. of pine and $ 6,022.03 in income and harvested again in 1995 by Francis Moody of Boscawen N.H. where 26,625 Bd.Ft. were harvested, mainly pine, and netting the Town $ 2,658.48. The larger Lot 82 was heavily cutover in the late 1980's and early 1990's by its owner prior to the Town's acquisition when he had conceptual plans for developing the site. Lot 78 which lies behind the Bow Bog Meetinghouse was probably used for both upland pasture and marsh grass production in the wetter sites. The upland areas were located on a gravel deposit which was excavated in the 1950's. The pit has since filled in with water and is now a productive wetland habitat. On old range way once ran along the east side of the meetinghouse, across the marsh and then along the northwestern boundary of Lot 82 but has not been maintained for many years.

The Bow Bog Meetinghouse was built in 1835 as a Methodist Church and used as such until the early 1900's. An 1858 map of Merrimack County shows several residences in the immediate area as well as two water powered mills on the southwest side of Bow Bog Road. The Johnson family is shown living in the farmstead site found on the now Lot 82 on Old Johnson Road. Bow Bog Brook was then called "Moores Brook" and the tributary that crosses Bow Bog Road near the Old Johnson Road intersection was called "Parson's Meadow Brook". It is possible that the marsh grass in Bow Bog was once part of the Minister's compensation for tending his Biblical "flock" along with his more mundane livestock.



Forest Type Map

BOW BOG TOWN FOREST

Bow N.H.

Tax map Block2 Lots 77,78,82,83

153 Acres

1" = 500'

0 250 500 1000

JANUARY 1997

Note: Boundaries are based on the Bow Tax Map

FOREST TYPES

STAND 1 Wp,H1-2B

Description: This 118 acre stand occupies all of the upland area of Tax map Lot 82. All merchantable trees were harvested in the 1980's and 1990's. As a result, the site contains a fairly young, but adequately stocked forest that contains white pine and a mix of hardwood including red and black oak, white and gray birch, aspen, red maple. Hemlock dominates the drainage ways along Bow Bog Brook. Almost all of the stems are either sapling to small pole in size. Due to the lack of overstory, the stems are growing quite rapidly. Many signs of rabbit, deer and ruffed grouse were noted during the walk through tour of the stand. Those species prefer the young, brushy growth of early successional vegetation, but their populations will tend to decrease as the forest matures and the habitat changes.

Prescription: Due to the young age of the forest, the primary recommendation is to leave the stand alone and allow it to continue its current course of development. It will probably need to be weeded and thinned in 2025 to 2030 where the poor quality stems and the non-timber species of gray birch and aspen should be removed using a whole tree chipping harvest, also called a Biomass Cut. Future thinnings will depend on how well the stand responds to the first thinning. Buffer zones should be created along Bow Bog Brook, especially on the steep slopes and left un-cut in future thinnings. Several one to two acre patches should be periodically clearcut to maintain some of the forest type in the early successional stage for wildlife habitat.

STAND 2 Wp,H2-3B

Description: This 10 acre stand is found within the original Town Forest Lot along Old Johnson Road. The northeastern part of the stand suffered some blowdown in the 1938 hurricane allowing a mixed pine-oak-maple-birch forest to develop. The pines that did not blow down were thinned in 1982 which allowed red maple and red oak regeneration to develop. The 1995 harvest thinned the pine-hardwood area and removed about half of the residual white pine overstory to release the regeneration. This created a very mixed forest in size classes and species composition. Almost all of the large sawlog sized trees consist of the older white pine and are fairly high quality. The pole sized stems are also fairly good quality as the poor quality trees were removed in 1995.

Prescription: With a basal area of 68 square feet and 118 trees per acre, the stand can be considered at the low end of adequate stocking as was the intention of the last harvest. The stand will need to be thinned again in 2015 to 2020 at which time the remaining large overstory white pine can be harvested. Poor quality stems left as "spacer' in the recent harvest as well as stems that did not respond to the thinning could also be harvested.

BOW TOWN FOREST
BOW BOG LOT

TOTAL OPERABLE VOLUME

Species/Product	Stand 2
White pine	40,000 Bd.Ft.
White pine #4	1,000 "
Red pine	2,000 "
Red oak	1,000 "
White birch	1,000 "
Pallet	1,000 "
Total sawlog	46,000 Bd.Ft.
Softwood pulp	30 cords
Hardwood pulp	45 cords

NOTE: Stand 1 was heavily cut-over prior to purchase by the Town, and the regeneration was too small to tally as pulp or sawlog.

JOHNSON ROAD LOT
Tax map Block 2 Lots 88A,126,128,135A,137A,141A,142,
2007

GENERAL DESCRIPTION

This 243 acre lot is located along the west side of Interstate 93, at the end of the Class 6 Old Johnson Road. Its sole access is Old Johnson Road, either from Bow Bog Road or Morgan Drive and though Old Johnson Road is Class 6, it is relatively passable to the point where it fronts the 6 acre lot recently acquired from the Walnut Tree Farm Development. Most of the lot was harvested in the winters of 2004 -05 and 2006-07 by Chuck Rose who was working for Cersosimo Lumber Company. A log yard was constructed in the 6 acre lot acquired from Walnut Tree Farm Development, but the warm winter of 2004-05 caused the harvest to be shut down early. The winter of 2005-06 was also warm and no attempts were made to finish the lot. The winter of 2006-07 started out warm but eventually the site froze up enough to allow the harvest to be completed. The Old Johnson Road east of the 6 acre lot was roughly graded and allowed to freeze to access a new log yard constructed at the end of the road near Interstate 93. The new site allowed a larger log yard and eliminated several wetland crossings on the main skid trails that accessed the woodlot from the 2004-05 log yard. Truck access to the power lines in the center of the lot can be obtained by way of a woods road from Old Johnson Road that crosses private property. However, that road has trenched out and also has severe drainage problems during wet periods. The lot contains two power line Right-of-Ways that occupy about 43 acres of the tract. This fairly large lot is unusual in that it contains only two forest types. The largest stand consists of the original Town Forest purchased in 1979 from the State of New Hampshire. Tree species vary with site conditions, but overall, the stand is relatively uniform. The area recently obtained from the Walnut Tree Development was heavily cut-over prior to its acquisition, and is now a much younger forest compared to the rest of the lot. The Town acquired two lots at the southwest end of the forest in1997 that totaled about 22 acres which were cut fairly hard by the previous owner. Whereas almost all of the Town Forest was harvested, those two lots now blend in with the overall forest type. There was a privately owned "out-lot" in the middle of the Town Forest that was acquired by the Town in 2003 that contained a farmstead, but its forest type was similar to that of the original Town Forest and was merged with that forest type.

SITE CONDITIONS

Because of the large acreage, site conditions are quite variable. Slopes run from gentle to steep and several ledge outcrops and ledges are found scattered throughout the lot. Elevations run from 340 to 540 feet with a generally eastern exposure. The lot contains several small drainages that run easterly and eventually into the Merrimack River. It is dominated by the Shapliegh-Gloucester very rocky, sandy loam soil complex. Hilltops in such a soil type have shallow to bedrock soil conditions. The shallow soil creates drought-like conditions and is a poor growing site. Trees are often stunted and subject to windthrow. Such stressful conditions also make the trees quite susceptible to mortality from gypsy moth defoliations. Slopes and valley bottoms between the hill summits have generally deeper well drained soils and are a much better growing sites for trees. The soil will tend to favor beech, red maple, white birch and hemlock. Oak and pine can be found dominating the forest in the areas containing Gloucester very stony sandy loams, especially on the well drained, sandy knolls. These sites are located along the western boundary and along Interstate 93 in the central part of the lot. Without opening up the forest canopy, the sites will eventually become dominated by beech and red maple. There is a small forested wetland area in the center of the lot that contains the Ridgebury-Whitman soil. It is a poor growing site for timber due to the high water table and should be avoided during harvest activity.

UNIQUE FEATURES

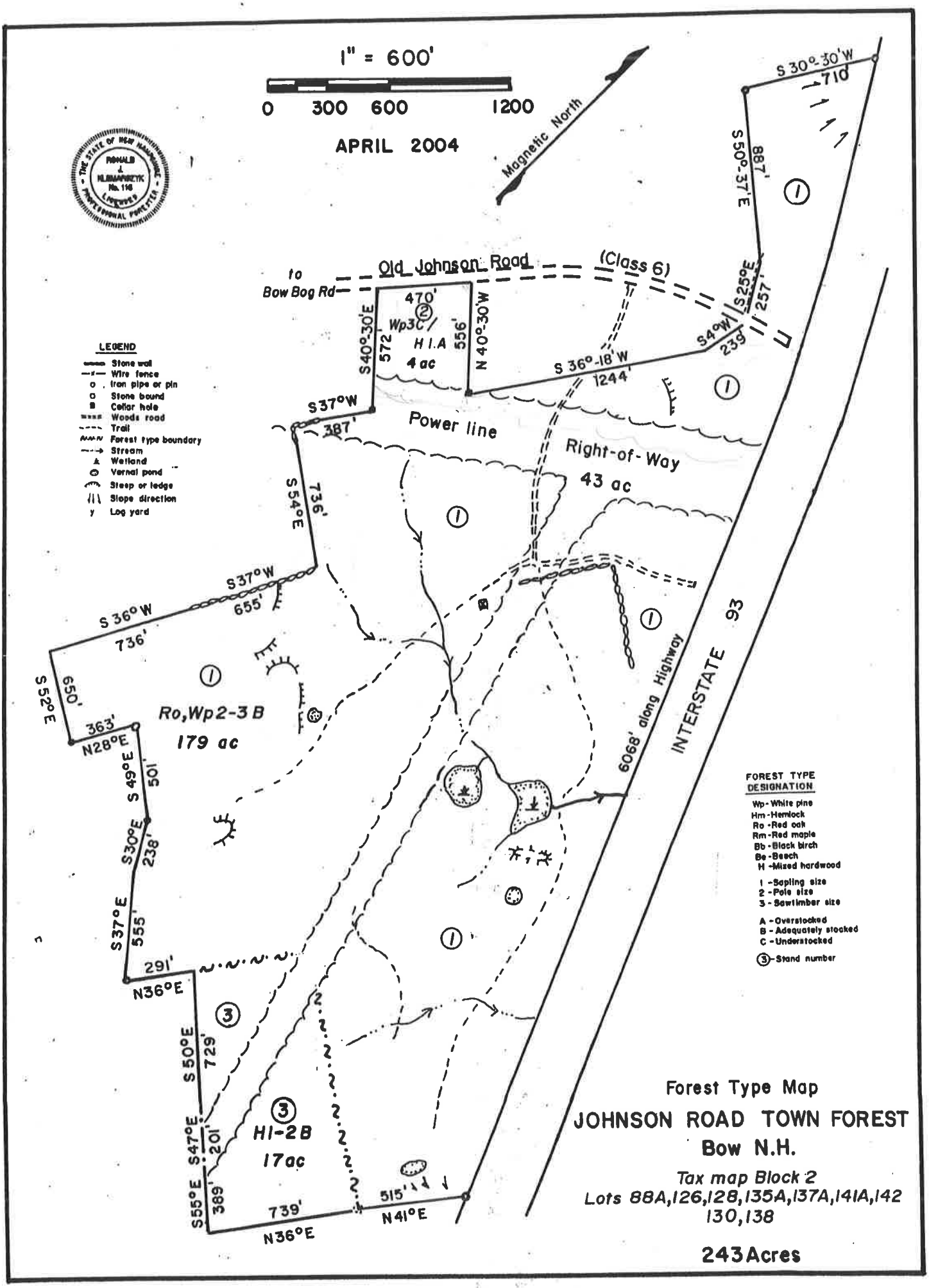
There is an old farmstead site located in the center of the lot that contains fieldstone foundations. Another foundation is located within the nearby PSNH right-of-way. There is a very large stack of fieldstones located within the woods on the east side of the power lines across from the above mentioned farmstead site. There are also some large, but not overly impressive ledge outcrops in the western portion of the property, with some forming a bit of a "gorge". A good view looking east to the Fort Mountain Range in Epsom can be found at the junction of the two power line Right-of-Ways. There are several vernal pools on the lot that were protected with buffer zones during the 2004-07 harvests. A depressed individual hung himself in the center of the lot just off of Interstate 93 in the mid 1980's when the lot was first harvested and was found by some local children, which caused quite an uproar in the neighborhood at the time.

BOUNDARY LINE STATUS

The original 180 acre lot obtained from the State of New Hampshire Highway Department was surveyed in 1974 by highway engineer E.F. Chase. The original map mylar could not be located at the Department of Transportation office in Concord, or the Division office in Hooksett and may have been given to Kear-wood Inc. The lot's entire boundary plus the exterior boundaries of the new acquisitions were painted yellow prior to the 2005 harvest. Old internal boundaries were not re-painted and several old blazed trees on the internal lines were harvested to help eliminate the confusion that the interior lines were causing. The boundaries will need to be re-painted around 2015. There is some confusion as to the ownership of the 6 acre lot and the strips of land intended to widen the Old Johnson Road. The tracts were to be deeded to the Town as part of the Morgan subdivision and subsequent development, but no deed was ever recorded.

HISTORY

With the exception of land immediately around the old farmstead found in the center of the lot that was used to grow crops, almost all of the property was probably used for pasture land after Bow was settled. Much of the land was connected to farms found along the west side of Route 3A. but was "cut off" by the construction of the Everett Turnpike, now Interstate 93. Several old woods roads and cart paths run downhill towards the highway but are no longer usable as they now dead-end at the edge of the highway right-of-way. Due to poor site conditions, most of the lot, including the farmstead, was abandoned as farmland in the mid to late 1800's. The pines that grew into the pastures were clearcut in the early 1900's which allowed the mixed pine-hardwood forest to develop. The newly acquired lot along Old Johnson road followed the same cycle, but around fifty years later. Portions of the lot were thinned in the mid 1980's though records of that sale were unavailable. The gypsy moth defoliations in 1980 and 1990 killed off several oaks and hemlocks found growing in the shallow soil conditions on the hilltops. As mentioned in the introduction, almost the entire lot was harvested during the winters of 2004-05 and 2006-07 with a focus on removing the mature white pine and red oak. A total of 405,810 board feet of sawtimber, 1,860 tons of chips, and 96 cords of firewood were cut. The Town grossed $105,974.18 from the timber sale. Two permanent log yards and a new skidder trail system were created as a result of the harvest.



Forest Type Map

JOHNSON ROAD TOWN FOREST

Bow N.H.

Tax map Block 2

Lots 88A,126,128,135A,137A,141A,142 130,138

243 Acres

FOREST TYPES

STAND 1 Ro,Wp 2-3 B

Description: This large 196 acre stand occupies the entire forest, except for the recently acquired 6 acre lot along Old Johnson Road. The Stand was harvested in the winters of 2004-05 and 2006-07 where most of the mature and larger poor quality stems were cut. Red oak still dominates the stand, followed by white pine, with a scattering of white oak, red maple, hemlock, black birch, white birch and white ash, all in the pole and sawlog size class. Regeneration is slightly dominated by white pine, with a scattering of red oak, red maple and hemlock. Due to variable site conditions, the stand is actually a conglomerate of many small forest types. In general, the dry hill summits are dominated by red, white and black oak, while the valleys with deeper soils contain a mix of red oak, white pine and red maple. Small hills with deep soil have a high proportion of white pine. None of these small forest types could be managed independently, so they were combined to form one forest type. Because many of the poorer quality stems were cut in the most recent harvest, the overall quality of the forest would now be rated as fair to good.

Prescription: The large nature of the forest type has created a somewhat diverse forest that was harvested following the prescription in the 1997 Forest Management Plan. Areas dominated by white pine were selectively thinned and hardwood areas were either patch cut or harvested using group selection method. Areas of pole-sized stands of hardwood were avoided unless they had to be crossed to access areas with mature timber. Wetland areas were either avoided or protected during the harvest considered adequately stocked. It is hoped that a good catch of regeneration will develop in the harvested areas, especially in the patch cut areas. Oak and maple regeneration will probably dominate those sites, while pine and hemlock will probably develop in the areas dominated by those species. Another thinning will be needed in 2025 to 2030 to again remove the mature stems along with the poor quality trees left as spacers and any stems that did not respond well to the previous harvest. The overstory in areas with heavy regeneration that developed after the 2004-07 harvest should be removed to release that regeneration. Assuming that much of the regeneration that existed prior to the 2004-07 harvest survived, the next forest will have a higher percent of pine and red maple mixed in with the red oak. Subsequent harvests will be determined by how well the regeneration develops and how it responds to overstory removals. Areas with shallow soils conditions should be managed with a shorter harvest rotation as stems on those sites tend to become stagnated at an earlier age.

STAND 2 Wp3C/H1A

Description: This small 4 acre stand is part of the 6 acre lot that was acquired by the Town as part of the Walnut Tree Farm subdivision. It is located between the Power Line Right-of-Way and the Johnson Road. Most of the lot was heavily cut-over in the 1980's, leaving a few scattered poor quality pines. A hardwood understory quickly developed consisting of white birch, black birch, red maple and red oak. Parts of the stand contain some small drainages that are slightly dominated by red maple. A log yard was constructed in the middle of the Stand for the 2004-05 harvest, but it was too wet to use in the 2006-07 harvest. However, it can be used in future harvests during dry or frozen conditions.

Prescription: The construction of the log yard and access driveway took a large portion of the productive site within the Stand out of production as will leaving buffer zones along the road and wetland areas. The remaining Stand will need to be thinned in about five years to remove the poor quality stems and any short lived species such as gray birch, aspen and pin cherry. Because the stems are relatively small, they will not be suitable for a commercial firewood harvest. This means that the undesirable stems will have to be hand "girdled". Any poor quality pine that are found to be suppressing high quality hardwood stems should also be removed at this time by girdling to avoid damaging the small but high quality hardwoods. Unfortunately, the reduced acreage of the Stand may make the Timber Stand Improvement operation uneconomical, especially with one of the main stand component now consisting of red maple. The other option is to just wait and thin the Stand by removing the poor quality trees when the rest of the forest is harvested in 2025 to 2030. This thinning will produce mainly pulpwood. After that thinning, the Stand could then be merged with Stand 1.

Other Considerations

Although the lot could be accessed by driving on the entire length of Old Johnson Road, the Bow Conservation Commission wanted the loggers to use Morgan Drive to eliminate the need to upgrade the Old Johnson Road. It was hoped that keeping the road in rough condition would discourage potential development along that road. However, some residents on Morgan Drive objected to log trucks using the road during the morning commuter and school bus "rush hour". Trucking was then restricted to the hours between 8:30 AM to 4:00 PM. But those hours greatly interfered with the loggers normal trucking schedule. Due to a severe cold spell which caused the wet areas on Old Johnson Road to freeze, the loggers were able to truck out along the entire length of the road in the winter of 2006-07 without doing any improvements and allowed them to avoid the trucking restrictions on Morgan Drive.

There was also some concern regarding the land transfer from the Morgan Estates-Acorn Tree Farm developer. There is no record of the Town receiving a deed to the land along Old Johnson Road, though it was part of the subdivision requirements. Additional investigation is needed to clear up that matter.

BOW TOWN FOREST
JOHNSON ROAD LOT

TOTAL OPERABLE VOLUMES

Species/Product	Stand 1 Ro,Wp2-3B 196 ac
White pine	130,000 Bd.Ft.
White pine #4	2,000 "
Hemlock	8,000 "
Red maple	4,000 "
White ash	4,000 "
Red oak	95,000 "
White oak	20,000 "
Pallet	15,000 "
Total Sawlog	260,000 Bd.Ft.
Softwood pulp	170 cords
Hardwood pulp	835 cords

NOTE: Stand 2 had no measurable commercial timber or cordwood volumes at the time of the cruise.

ROBINSON ROAD/I-93 LOT
Tax map Block 2 Lot 97, 119
2009

GENERAL DESCRIPTION

This 312.4 acre lot is frequently called "Lot 97" and is located on the south side of Robinson Road along the west side of Interstate 93. It abuts the northern boundary of the Bow Bog Town Forest and is bisected by Bow Bog Brook and two of its tributaries. The primary access route is by way of a woods road constructed into the center of the lot from Robinson Road near the Interstate 93 underpass. The original bridge was replaced in 2003, though the floods in 2006 undermined a part of one of the abutments which was repaired in 2008. Another access route opened up with the construction of Briarwood Drive whose turn-around abuts the Town Forest along the southwestern boundary. Due to the woods road and old gravel pit found within the lot, recreational use is quite heavy, with hiking, snowmobiling, cross-country skiing being the most common activities. A small parking lot was constructed outside of the gate on Robinson Road and is currently maintained by the Public Works Department. The lot contains ten forest types along with several beaver pond complexes, and a portion of Bow Bog Brook.

SITE CONDITIONS

With the exception of the steep slopes found along the three main brooks, the lot is gently to moderately sloped. Elevations run from a low of 310 feet along Interstate 93 to a high of 420 feet in the southeastern part of the property. The lot has a generally eastern exposure and is part of the Bow Bog Brook Watershed. Wetlands are mainly limited to the floodplain areas along the brooks and contain Ridgebury-Whitman soils. Beavers have dammed the brooks in numerous places, resulting in several beaver ponds in various stages of pond succession. The beaver ponds and generally steep stream banks will restrict crossing them for harvesting purposes, though all of the lot is accessible through round about ways. The central portion of the lot on either side of Bow Bog Brook contains Hinckley Loamy sand and gravelly loamy sand. These soils are deep, extremely well drained and considered droughty. Due to the dryness, the soils are not considered good growing sites for timber, though pine grows better on these soils than hardwoods. Part of the site was tapped for gravel in the past. The extreme northeast and southeast corners of lot contain Shapleigh-Gloucester very rocky, sandy loam soils which are well drained soils, but somewhat shallow in places with ledge outcrops. Although the deeper soils between the ledge outcrops tend to favor red maple, beech and birch, the ledge outcrop areas will tend to have stunted oaks. The area along the access road off of Robinson Road contains Gloucester very stony sandy loam and is a good growing site for timber that will tend to also favor beech, red maple, birch and hemlock.

UNIQUE FEATURES

The valley along Bow Bog Brook is quite scenic, especially in the areas with large trees. Stand 6 contains some very old hemlocks, though they are not overly large. An old farmstead site containing a fieldstone cellar hole and barn foundation is located southeast of the turn-around on Briarwood drive. The access road from Robinson Road turns into a hiking trail deep within the lot that ties into Briarwood Drive and is a well used walking route. A boulder quarry is located northeast of the log yard in stand 5.

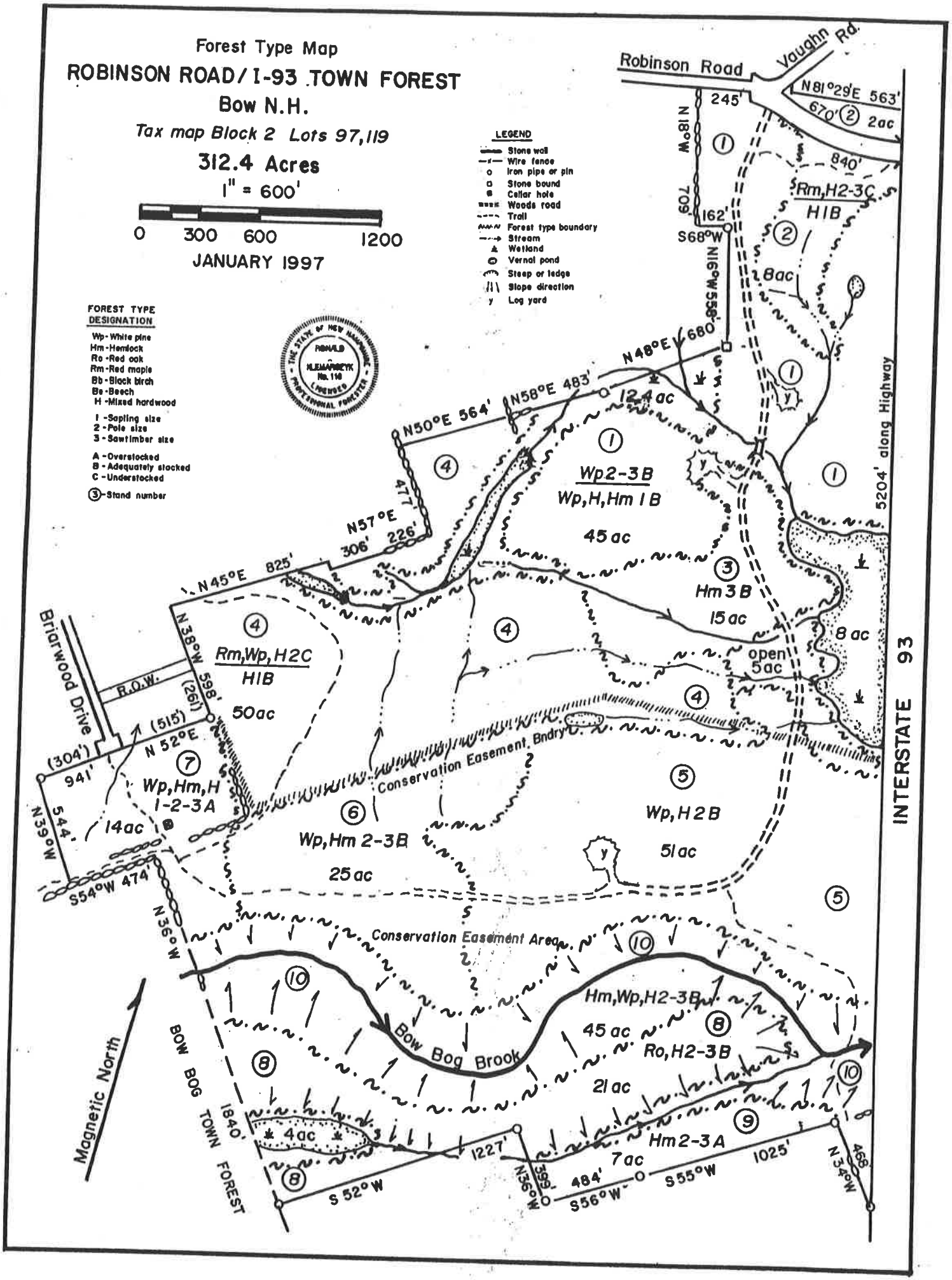
BOUNDARY LINE STATUS

Lot 97 was surveyed in 1978 by Kear-wood Inc. and all boundaries were blazed and painted yellow. Lot 119 was acquired in 1984 by the Town. Most of the exterior boundary on Lot 119 was surveyed in 2003 by an abutter as part of a subdivision on their property and numerous bounds were set along the boundary. However, the external boundaries of Lot 119 along with a four acre piece that was deeded to the Town as part of the abutting subdivision should be identified, blazed and painted along with repainting the applicable boundaries of the original Lot 97.

HISTORY

The lot was cleared for agriculture in the colonial days for cropland, pasture and hayfields. Most of the area used for cropland is located around the old farmstead site. The farm was occupied by J.J. Bunten in 1858, but does not show up on the 1892 map of Bow. Access to that farm was originally by an old woods road that followed the northwest side of Bow Bog Brook from what is now Route 3A, but was later cut off by Interstate 93. Use of the land moved towards pasture and by the early 1900's, appears to have ceased within all of the lot except for the area of Stand 5. Although that site is somewhat dry, it is rock-free on the surface and was probably used for a pasture-hayfield until the Everett Turnpike was built. The rest of the lot grew in with white pine after it was abandoned in the early 1900's and was selectively harvested in 1979-80 by Durgin and Crowell Lumber of New London. The harvest produced 1,030,065 board feet of lumber and netted the Town $ 115,519.28. Stand 1 and a portion of Stand 6 was harvested in the early winter of 2003-04 by "Rocky" Bunnell who was working for Hancock Lumber of Casco, Maine. They harvested 168,405 board feet of sawtimber, mostly white pine, and 480 tons of softwood pulp which netted the Town $15,978.65. Many of the large hemlocks from Stand 6 had rotted interiors. The pine in Stand 5 was much younger than the rest of the forest and was thinned in the mid 1980's using whole tree chipping, also called a "Biomass Harvest". It was again harvested in the winter of 2007-2008 by Hopkinton Forestry and Land Clearing of Henniker, which produced 190,350 board feet of sawtimber, mainly white pine, 740 tons of woodchips and 25 cord of firewood, netting the Town $ 36,949.32. During the harvest, there was concern that some of what was tallied as sawlogs during the marking was chipped due to the poor market conditions for lowgrade pine at the time. However, the loggers did some extra road improvement work on the access road to make up for some of the difference.

The beaver swamp complex found along the tributary to Bow Bog Brook may have once been part of a mill pond. An old ditch that has become a regular brook drains part of the beaver swamp in high water and cuts through part of the Town forest before re-entering the tributary.


Forest Type Map
ROBINSON ROAD/I-93 TOWN FOREST
Bow N.H.
Tax map Block 2 Lots 97,119
312.4 Acres
1" = 600'
0 300 600 1200
JANUARY 1997
LEGEND
Stone wall
Wire fence
Iron pipe or pin
Stone bound
Cellar hole
Woods road
Trail
Forest type boundary
Stream
Wetland
Vernal pond
Steep or ledge
Slope direction
Log yard
FOREST TYPE DESIGNATION
Wp - White pine
Hm - Hemlock
Ro - Red oak
Rm - Red maple
Bb - Black birch
Be - Beech
H - Mixed hardwood
1 - Sapling size
2 - Pole size
3 - Sawtimber size
A - Overstocked
B - Adequately stocked
C - Understocked
(3) - Stand number
THE STATE OF NEW HAMPSHIRE
RONALD KLEMARCZYK No. 116 LICENSED PROFESSIONAL FORESTER
Robinson Road
Vaughn Rd.
N81°29'E 563'
670'
(2) 2ac
245'
N18°W 709'
840'
Rm,H2-3C
H1B
162'
S68°W
N19°W 558'
2 8ac
680'
N48°E
N58°E 483'
12.4 ac
N50°E 564'
Wp2-3B
Wp,H,Hm 1B
45 ac
477'
N57°E
306'
226'
N45°E 825'
Hm 3B
15 ac
8 ac
open
5ac
5204' along Highway
INTERSTATE 93
Briarwood Drive
R.O.W.
N38°W 598'
(261')
(515')
N 52°E
(304')
941'
Rm,Wp,H2C
H1B
50ac
Wp,Hm,H
1-2-3A
14ac
544'
N39°W
S54°W 474'
Conservation Easement, Bndry
Wp,H2B
51ac
Wp,Hm 2-3B
25ac
Conservation Easement Area
N36°W
Hm,Wp,H2-3B
45 ac
Ro,H2-3B
21ac
Bow Bog Brook
BOW BOG TOWN FOREST
Magnetic North
4ac
1840'
1227'
S 52°W
Hm2-3A
7ac
N36°W
399'
484'
S56°W
S55°W
1025'
N34°W
468'

FOREST TYPES

STAND 1 Wp2-3B/Wp,H,Hm1B

Description: This 45 acre stand is located on either side of the main access road off of Robinson Road. It is bisected by a brook and a separate drainage way. The entire stand was logged during the 1979-80 harvest which removed the poor quality stems and allowed the somewhat mixed forest to develop. Most of the Stand was harvested in the winter of 2003-04 to remove the mature stems along with the larger poorer quality stems. As a result of the two harvests, good quality sawlog-sized white pine dominates the stand, followed by a scattering of hemlock, red maple, red oak and white oak. The understory consists of sapling sized white pine, red oak, hemlock, red maple and beech. Because the stand is along the access road, it is highly visible. Due to the heavy recreational use of the road, aesthetics will play an important role in managing the stand.

Prescription: As mentioned above, the stand was logged in the winter of 2003-04. Efforts were made to release the regeneration that developed after the 1979-80 harvest. Whereas the mature stems were harvested, another harvest will not needed until 2020-2025 to again harvest the mature trees and release any regeneration that developed after the 2003-04 harvest. About 30 to 40% of the overstory could be cut to insure adequate sunlight for regeneration. Large, healthy trees along the woods road should be left for aesthetic reasons. Buffer zone should be maintained along the brook and drainage way found within the stand. The next harvest will release the understory which will continue to develop into a mixed forest of pine, hemlock red oak and red maple. A final overstory removal could be expected about 15 years after the next harvest and will completely release the by-then pole sized understory. The next harvests will also tend to thin out the existing understory, so little work will be needed within the understory until the stems start to reach sawlog size.

STAND 2 Rm,H2-3C/H1B

Description: This 10 acre stand is located on either side of Robinson Road. Two acres of the stand are found in the triangle between Vaughn Road, Robinson Road and Interstate 93. The remaining 8 acres are found on the south side of Robinson Road. That area is bisected by a drainage way and also contains a snowmobile trail that runs roughly parallel to Robinson Road. Ledge outcrops run along the eastern edge of the stand. Due to the wet soils found along the drainage way, the stand is dominated by red maple with 50% of the basal area, followed by red oak at 21%, and white pine and white oak with 14% each. The wet site conditions south of Robinson Road probably produced a high proportion of poor quality timber and most were cut in the 1979-80 harvest. That heavy cut caused epicormic branching to develop on several of the residual stems, and crown die-back on others. It did however, allow a heavy understory of red maple and white pine to develop. The upland areas on the west side of the Stand were logged during the 2003-04 harvest. The north side of the road was not included with the 1979-80 harvest and was made part of Stand 2 as a matter of convenience. It does provide an opportunity to observe in part what the stand might have looked like prior to the harvest.

Prescription:

Many of the mature and poor quality hardwood stems located in the upland areas of the western portion of the stand were harvested in 2003-4 in conjunction with Stand 1. This released much of the regeneration that developed after the 1979-80 harvest in that area. A buffer zone was established along the drainage way, along the snowmobile trail and in the area between the trail and Robinson Road, which eliminated much of the Stand from harvesting. The understory from the 1979-80 harvest will continue to develop in the buffer zones and will replace the overstory within 15 years. The area that was harvested in 2003-04 will need another harvest in 2020-2025 to remove the remaining overstory stems, fully releasing the understory and will again have to be logged in conjunction with Stand 1. Due to the high visibility and excessive road frontage of the small two acre parcel north of Robinson Road, it is not a suitable site for timber production.

STAND 3 Hm 3 B

Description: This 15 acre Stand is located on either side of the access road between the bridge and the old gravel pit. It is bisected by a small brook that drains the beaver pond in times of high water. Large, mature hemlocks dominate the basal area at 84%, with a light scattering of somewhat smaller red maple, red oak, white oak and white birch found throughout. Regeneration consists of scattered hemlock and a few mixed hardwoods that developed after the harvest. The stand was lightly logged in the 1979-80 harvest, where most of the poorest quality stems were removed. Only a few trees along the border with Stand 1were cut in the 2003-04 harvest. Although hemlock stands are preferred winter habitat for deer, the lack of understory and the heavy use of the access road limits the use of the stand by wildlife.

Prescription: With a basal area of 130 square feet and 203 trees per acre, the stand is nearing the overstocked level. It should be selectively thinned in 2015-2020 to remove the overmature stems and to encourage further development of the hemlock regeneration. About 30% of the stems could be harvested, though buffer zones should be left along the access road, brooks and other wetland areas. Because hemlock is not a high value species, any logging would have to be in conjunction with logging in the adjacent stands. Additional hemlock regeneration should develop in the areas where the trees were removed and the existing regeneration will be released for further growth. The two levels of regeneration under the overstory will create an un-evenaged stand of softwood that is preferred by wildlife. Once the existing hemlock regeneration reaches a point where it is starting to crowd itself, another harvest should be undertaken to remove most of the overstory. This will probably be needed in 20 years or so after the next harvest.

STAND 4 Rm,Wp,H2C/H1A

Description: This 50 acre Stand is located northwest portion of the lot, south of the beaver pond complex. It occupies all of the upland portion of Tax map Lot 119 and a small portion of Lot 97. It contains several seasonal drainages and small forested wetlands. A "private" snowmobile trail that connects the access road to a backyard on Briarwood drive is located in the southwest part of the stand. The entire lot was heavily logged in 1984, just prior to the Town's acquisition. Almost all of the trees that had reached sawlog size were harvested at that time. Pole sized red maple now dominates the basal area with 49%, followed by white pine at 29%, hemlock ant 14%, with a scattering of white birch and red oak. The heavy cut allowed high amounts of hemlock, red maple, beech, birch, and white pine regeneration to develop. Many of the hardwood trees that were left standing in the last harvest were "shocked" by the sudden release and suffered crown dieback and epicormic branching and would now be considered poor quality, with little hope for improvement.

Prescription: With a basal area of 81 square feet and 203 tree per acre, the stand is considered slightly understocked for a stand of that age which is due to the past harvest. That heavy cut will continue to allow the existing regeneration to grow and develop at a relatively fast rate. To prevent stagnation of the regeneration, the poor quality overstory trees should be removed when they have reached merchantable size and volume, which should occur in 2020 to 2025. Areas of higher quality overstory stems with little regeneration could also be selectively thinned at that time. The overstory removal will tend to randomly thin the regeneration, though care should be taken during the harvest to protect the younger stems as much as possible. Future thinnings will depend on how well the regeneration responds, but another thinning will probably be needed 20 years after the overstory removal.

STAND 5 Wp,H 2 B

Description: This 51 acre stand is located in the center of the lot and borders Interstate 93. It was the last area in the lot to be abandoned as farm land. The entire stand was selectively thinned in the late 1980's through a "Biomass" harvest, where the poor quality stems were chipped and sold for fuel to wood-fired energy plants which allowed an understory of white pine and hemlock to become established. The log yard used during that harvest is centrally located within the stand and was expanded in the winter of 2003-04 to service the harvest in Stand 6. All of Stand 5 was harvested in the winter of 2007-2008 to remove the large scattered stems that had matured since the 1980's harvest. The winter harvested disrupted the snowmobile trail system until by-pass trails were opened up along the logging road. The Stand is now dominated by an overstory of fairly good quality pole to small sawlog sized white pine, followed distantly by red oak, with a scattering of red maple and white oak above a fairly dense understory of white pine and hemlock. The stand sits on a gravel soil that is somewhat dry. Although this soil favors pine over hardwoods, growth is somewhat slow, especially during prolonged drought conditions.

Prescription: Whereas the Stand was thinned in 2007-08, it will not need another treatment until 2025 to 2030. At that time, most of the remaining mature overstory white pine stems could be harvested, though some should be left for age diversity and to act as a potential seed source. The dense pine/hemlock understory was somewhat "mechanically" thinned during the last harvest when the overstory pines were felled and skidded out to the log yard. Red maple will develop in some of the wetter sites, though it will provide some browse for wildlife for about 5 to 7 years. If the hemlock and hardwood regeneration starts to crowd out the pine regeneration, the next harvest should be done just after a seed year to encourage a new crop of white pine regeneration. The timber sale should be set up as soon as the small cones are noticed on the larger pines around the 15 year time frame. The harvest should occur on bare ground conditions to encourage soil scarification which provides a better seed bed for pine. The next harvest will again thin the understory, so little treatment will be needed within the released understory until it starts to become overstocked, probably in 15 to 25 years after the next harvest. Conflicts with the snowmobilers will be avoided if the lot is logged in the summer or fall.

STAND 6 Wp,Hm2-3A

Description: This 25 acre stand is located at the southwest end of the forest access road. Some forested wetlands and drainage ways can be found along the northwest edge of the stand where a few trees have blown over. A snowmobile trail continues through the stand and eventually forks to tie in with Briarwood Drive and the snowmobile trail that runs through the Bow Bog Lot. The Stand is dominated by hemlock, followed by white pine, with a scattering of red maple, red and white oak. Most of the Stand north of the woods road/snowmobile trail was harvested in the winter of 2003-04 where most of the mature stems of pine and hemlock were cut. The area along and on the south side of the trail show little evidence of past harvesting and the forest exhibits all of the characteristics of what people usually think a "classic" forest should look like. The trees are big, tall, well spaced, no stumps or breaks in the forest canopy, and very little understory.

Prescription:

Whereas the mature stems north of the trail were harvested in 2003-04, another harvest will not be needed in that area until 2020 to 2025. Assuming that pine and hemlock regeneration will develop as a result of the 2003-04 thinning, the next harvest should be an overstory removal to fully release the regeneration to allow it to develop into a new forest. The area along and south of the trail should be allowed to develop into "old growth". Essentially, the stand should be preserved in its natural state with no cutting allowed other than trail maintenance. Due to its high visibility and relatively easy access from Briarwood Drive, it is an ideal location to be designated as a Natural Preserve. The preserve can be expanded to include the old farmstead cellar hole area and trail junction in Stand 7, and the Bow Bog Brook corridor in Stand 10.

STAND 7 Wp,Hm,H 1-2-3 B

Description: This 14 acre stand is located in the western most part of the Lot, and is adjacent to the Briarwood Drive turn-around. It contains an old farmstead site that includes a cellar and barn foundation and stone walls. The Stand also contains a main snowmobile trail that runs out to the Bow Bog Lot and a footpath that runs from that trail to Briarwood Drive. A small drainage way runs diagonally through the western portion of the Stand. Parts of the stand were harvested in 1979-80 and as a result, the forest is quite mixed and contains trees in several size and age classes. Species composition also varies within the type. Hemlock runs along the drainage, while almost pure patches of white pine can be found in the northeast end of the Stand. White pine dominates the basal area with 47%, followed by hemlock at 25%, red maple at 11%, with a scattering of red oak, white oak and red pine. Regeneration includes hemlock, beech, red maple, red oak and scattered white pine.

Prescription: With a basal area of 110 square feet and 208 trees per acre, the stand can be considered adequately stocked. It will need a light thinning in 2015 to 2020 to removes the scattered mature stems of red oak and hemlock as well as the poor quality stems of white pine and red maple. About 20% of the basal area could be harvested, though the denser patches of white pine could be thinned a little heavier. The un-evenaged character of the stand can be maintained through the periodic light thinnings, though economics dictate that the stand be harvested in conjunction with Stand 5. The focus of the thinnings would be to remove the trees as they mature and remove the poor quality trees as they become merchantable. Another thinning could be expected around 15 years after the next harvest. The other option is to dedicate the Stand as part of a Natural Area with Stand 10 and a portion of Stand 6. A trailhead parking lot should be set up at the end of Briarwood Drive to prevent parking in the turn-around.

STAND 8 Ro,H2-3B

Description: This 21 acre stand is located on a long, but narrow knoll between Bow Bog Brook and another stream along the lot's southern boundary. Some of the slopes on the southern edge of the stand are steep, but short and can be operated from above. Red oak dominates the basal area with 74%, with red maple, white oak and white pine making up 8% each. The 1990 Gypsy Moth defoliation killed off many of the oaks, which reduced the basal area considerably. The knoll is a gravel soil and is somewhat dry during prolonged droughts, though the adjacent streams have lessened the effect. Most of the higher quality oaks are near the base of the slopes where moisture is more prevalent. The quality of the sawlog sized pine and oak on the summit areas can be considered fair to good. The pole sized stems are somewhat stagnated and generally fair to poor in quality.

Prescription: With a basal area of 66 square feet and 117 trees per acre, the stand can be considered just barely adequately stocked for that forest type. The stand was "thinned" by the gypsy moth, without regard to tree quality. As a result, there are many poor quality trees competing with the better stems. However, thinning the forest now will overcut the stand and will mean foregoing salvaging the dead oaks for firewood. Growth is slower due to the dry site, but the stand will probably need to be thinned in 2011 to 2015. Harvesting the site on bare ground during a white pine seed year will encourage white pine regeneration. The poorer quality white pine sawtimber and the smaller poor quality stems of oak that can be cut for firewood should be harvested. Whereas this stand is on the south side of Bow Bog Brook, the trees will have to be skidded through the Bow Bog Lot onto the Old Johnson Road to avoid making a major skid trail down to and constructing a bridge over the Brook. It could be harvested in conjunction with a sale on the Johnson Road Lot or the Bow Bog Lot. Another thinning will be needed in about 20 years after the initial harvest to remove the mature red oaks and white pine but will depend heavily on the development of adequate regeneration after the first cut.

STAND 9 Hm 2-3 A

Description: This 7 acre stand is located along the southeastern boundary of the lot and on the south side of a tributary of Bow Bog Brook. It is located on the north face of a slope that runs down into the tributary. A few small ledge outcrops are found in the lower portion of the stand, and are not an obstacle to harvesting, but access to the stand is difficult. The tributary and the slopes in Stand 8 make pulling trees across the stream and up the hill somewhat difficult. Pole and sawlog size hemlock dominate the stand with 91% of the basal area followed distantly by red oak at 5% and white pine at 4%. Regeneration consists of scattered hemlocks. An old skid trail runs through the stand indicating the stand was logged at some time in the past, but the stumps have long since decomposed. Because the stand has not been logged for quite a while, quality runs from good to poor. Some of the hemlocks are nearing "old growth" status, and the stand is another good example of a "classic" forest, though it is difficult to access.

Prescription: With a basal area of 230 square feet and 269 trees per acre, the stand can be considered overstocked. Like Stand 6, there are two options for managing this Stand. The first option is to manage it for timber production. Because of access difficulties, it would not be economical to harvest pulp from the Stand unless permission is granted by the southern abutter to skid across their land to a yard on the Old Johnson Road. If such permission is not granted, sawlogs would have to be skidded up across Stand 8 and across the Bow Bog Lot. About 35% of the basal area could be harvested by removing the mature stems of hemlock and white pine. This harvest will encourage additional hemlock regeneration which will in turn attract wildlife. Because the largest stems would have been removed, another harvest would not be expected for 20 to 25 years. Unless the access is somehow improved, only the mature sawtimber would be cut. The second option is to dedicate the Stand as a natural preserve and let it develop into an "Old Growth" forest, though its availability for viewing by the general public is minimal.

STAND 10 Hm,Wp,H2-3B

Description: This 45 acre stand is located on the Prime Wetland floodway and steep slopes along Bow Bog Brook. Portions of the stand are periodically flooded by beavers through dam construction, but the spring floods almost always wash away the dams. Many large trees along the Brook were cut in the 1979-80 harvest, leaving a somewhat mixed forest type. The wet site and past cutting practices caused hemlock to dominate the stand with 60% of the basal area, followed by white pine at 18%, red maple at 10%, red oak at 8% and a scattering of black birch. The steep slopes and floodway soil conditions on either side of the brook have made this stand a difficult one to harvest which is why only the best trees were removed in the last harvest. The generally poor site conditions have also limited stem quality.

Prescription: With a basal area of 100 square feet and 135 trees per acre, the stand can be considered adequately stocked. However, the only fair quality of many of the stems, plus poor site and logging conditions, combined with the high value now placed on protecting water quality, it is recommended that this stand be set aside as a Natural Preserve and become a permanent buffer zone along Bow Bog Brook which complies with the Town's Prime Wetland ordinance. Harvesting and skidding activity would be restricted from the stand. Constructing a road and bridge across the Brook is not recommended unless access that can not be obtained through abutting properties is desperately needed for the portion of the property south of the Brook.

Other considerations

As mentioned in some of the Stands, a trailhead parking lot needs to be constructed off of Briarwood Drive. The trail connecting Briarwood Drive to the main snowmobile trail needs to be upgraded and a small footbridge needs to be built over a drainage way. The logging road by-pass trails that were opened up during the 2007-08 harvest should be permanently upgraded for both hiking and snowmobile trails to create a loop system that ties into the trail parking lot on Robinson Road and the potential trailhead on Briarwood drive. The old gravel pit area need to be periodically brush-hogged to maintain the old field conditions currently found there.

Town of Bow
ROBINSON ROAD / I-93 LOT
Mar-09

TOTAL OPERABLE VOLUMES

Species/product	Stand 1 Wp 2-3B/ Wp,H,Hm1B 45 ac.	Stand 2 Rm,H2-3C/ H1B 10 ac.	Stand 3 Hm 3 B 15 ac.	Stand 4 RmWpH2C/ H1B 50 ac.	Stand 5 Wp,Ro2B 51 ac.	Stand 6 Wp,Hm 2-3B 25 ac.	Stand 7 WpHmH 1-2-3B 14 ac.	Stand 8 RoH2-3B 21 ac.	Stand 9 Hm2-3A 7 ac.	Stand 10 Hm,Wp,H 2-3B 45 ac.	TOTAL
White pine	100,000	0	0	30,000	155,000	105,000	83,000	15,000	12,000	140,000	640,000
White pine #4	5,000	0	0	2,000	2,000	1,000	1,000	0	0	3,000	14,000
Red pine	0	0	0	0	0	0	5,000	0	0	0	5,000
Hemlock	14,000	0	115,000	4,000	0	150,000	12,000	0	115,000	140,000	550,000
Red oak	0	5,000	0	0	2,000	0	5,000	35,000	0	12,000	59,000
Red maple	0	1,000	3,000	14,000	0	0	0	0	0	0	18,000
White oak	0	5,000	2,000	0	0	1,000	2,000	0	0	0	10,000
Hardwood pallet	0	0	1,000	7,000	0	1,000	2,000	8,000	0	5,000	24,000
TOTAL-Bd.Ft.	119,000	11,000	121,000	57,000	159,000	258,000	110,000	58,000	127,000	300,000	1,320,000
Sftwd pulp-cds.	85	10	125	290	200	150	115	5	100	360	1,560
Hdwd pulp-cds.	180	55	30	400	100	30	55	190	10	165	1,220

ROBINSON ROAD LOT
Tax map Block 2 Lot 122
1997

GENERAL DESCRIPTION

This 21.7 acre lot is located on the southeast side of Robinson Road, about ½ mile northeast of Bow Bog Road intersection. It contains 1.7 acres of wetland and is bisected by a tributary to Bow Bog Brook. The lot has just over 1,100 feet of frontage on Robinson Road. The driveway providing access to the lot is located at the northern corner of the lot. There is a log yard about 100 feet down the driveway that services the entire lot. A right-of-way to Erin Road was established as part of the adjacent development and is located in the southwest corner of the forest. The lot contains one general forest type, and because of the relatively small acreage, the entire lot was considered as one management unit.

SITE CONDITIONS

The lot is relatively flat and ranges from 420 to 440 feet in elevation. It has a southeast exposure and is part of the Bow Bog Brook watershed. The somewhat marshy wetland areas contain Ridgebury-Whitman soils and due to the high water table, are not timber producing areas. They are also too small in size to be prime habitats for wildlife other that amphibians and the smaller birds. Some winter use by deer and rabbit were noticed in the areas of dense pine along the northeastern boundary. The upland areas contain Gloucester soils. Gloucester soils are well-drained, generally sandy to loamy sandy and are considered a good site for growing trees, except during prolonged droughts. They tend to favor hardwood species such as beech, red maple, white birch and yellow birch.

UNIQUE FEATURES

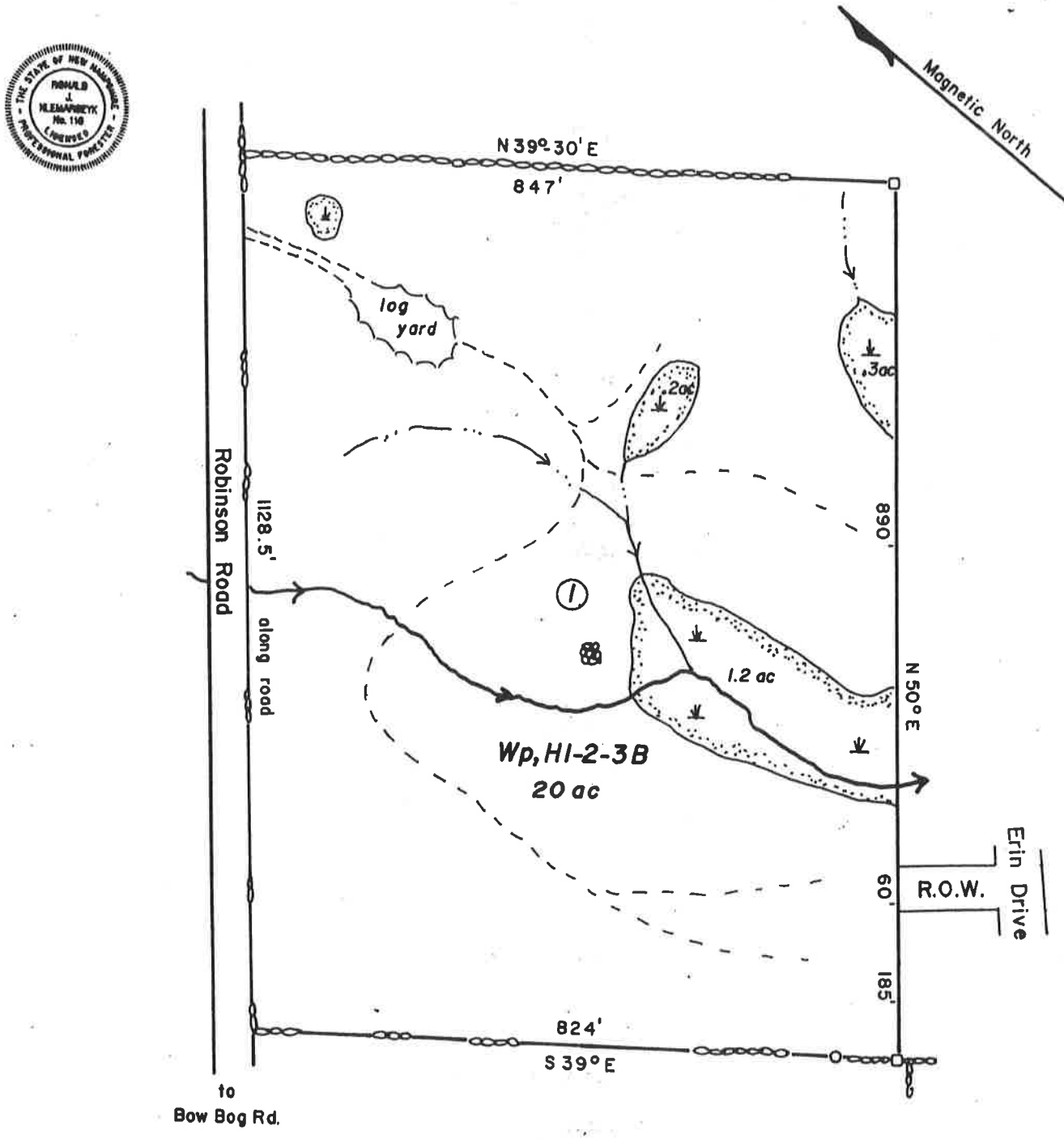
Features of note on the property include a vernal pool near Robinson Road just north of the driveway; some split rocks that are the remnants of a boulder quarry found at the east end of the log yard; several very large white pine trees found along the brook; and a large pile of field stones created when the site was cleared for agriculture and is located in the center of the lot.

BOUNDARY LINE STATUS

The lot was surveyed in 1977 by Raymond Cushman and portions of the property were later surveyed as part of adjacent subdivisions. The boundaries were blazed and painted in 1983. All boundaries need to be repainted.

HISTORY

The lot was entirely cleared for agricultural purposes in the colonial days. The better sites were used to grow crops, while the rockier and wetter sites were used for hay and pasture. Farm use of the land was abandoned in the early 1900's and the property grew in with white pine. It was purchased by lumberman Robert Upton but was never harvested by him. The Town of Bow acquired the lot in 1976 and it was logged in 1979 by Dalphond Lumber of Andover with 150,660 Board Feet of white pine harvested. Another harvest occurred 1995 where a total of 80,130 board feet of timber was cut by logger Francis Moody of Salisbury. Net income from the sales totaled approximately $18,700.



LEGEND

- Stone wall
- Wire fence
- o Iron pipe or pin
- Stone bound
- Cellar hole
- Woods road
- Trail
- Forest type boundary
- Stream
- Wetland
- Vernal pond
- Steep or ledge
- Slope direction
- y Log yard

FOREST TYPE DESIGNATION

- Wp - White pine
- Hm - Hemlock
- Ro - Red oak
- Rm - Red maple
- Bb - Black birch
- Be - Beech
- H - Mixed hardwood

- 1 - Sapling size
- 2 - Pole size
- 3 - Sawtimber size

- A - Overstocked
- B - Adequately stocked
- C - Understocked

(3) - Stand number

Forest Type Map
ROBINSON ROAD TOWN FOREST
Bow N.H.

Tax map Block 2 Lot 122

21.7 Acres

1" = 200'

0 200 400

JANUARY 1997

FOREST TYPES

STAND 1 Wp,H2-3B

Description: This 20 acre stand makes up the entire non-wetland portion of the property. It is dominated by mature, though scattered white pine with 69 percent of the stocking, followed by red maple at 13%, red oak at 10% and hemlock at 6%. There is an understory of mixed sapling sized beech, birch, red maple and hemlock that became established after the 1979 harvest and was released in certain areas by the 1993 cut. The area southwest of the brook is somewhat wetter than the other upland areas and a few seepage sites were noted. As a result of this additional moisture, that part of the forest has a higher percent of hemlock and red maple.

Prescription: With a basal area of 88 square feet and 115 trees per acre the lot can be considered adequately stocked. Whereas the lot was recently harvested, another thinning will not be needed until 2011 to 2015. At that time, the regeneration established after the 1979 harvest and released in 1993 should have reached pole size and would be considered the dominant forest type. The next harvest should focus on removing the remaining scattered mature pine before they deteriorate, though leaving buffer zones along the wetland areas, the vernal pool and the brook. This third harvest will completely release the pole sized understory. The logging operations will have thinned out some of the understory during felling and skidding activities, so although the pole sized understory will itself need to thinned a some point, it probably will not be for another 20 years after the next harvest.

Other Considerations

A hiking trail could be developed to run from the right-of-way on Erin Road along the brook and past the large stone pile out to the log yard on Robinson Road. A skidder trail already runs that route and could be kept open for recreation with the understanding that due to the location of wetlands, it will have to be used as a skidder trail in future harvests. Use of such a trail would probably be limited to the immediate abutters.

BOW TOWN FOREST
ROBINSON ROAD LOT

TOTAL OPERABLE VOLUME

Species/Product	Stand 1 Wp,H2-3B 20 ac.
White pine	140,000 Bd.Ft.
White pine #4	10,000 "
Hemlock	5,000 "
Red maple	1,000 "
Red oak	5,000 "
Pallet	2,000 "
TOTAL SAWLOG	163,000 Bd.Ft.
Softwood pulp	80 Cords
Hardwood pulp	75 Cords

HUNTER DRIVE LOT
Tax map Block 3 Lots 2,2Y
1997

GENERAL DESCRIPTION

This 15.6 acre lot is located along the northeast side of Line Hill Road, on the Bow-Dunbarton Town Line between Wood Hill Road and Hunter Drive. Although there is 632 feet of frontage on Line Hill Road, the road is a Class 6 highway and not maintained by either Bow or Dunbarton. It is currently used as a main snowmobile trail. There is a 30 ft wide by 700 ft long right-of-way to the lot from Hunter Drive, but an intermittent stream appears to run down the center for much of the distance making it relatively unusable for anything other than foot traffic. Line Hill Road has drainage problems on either side of the lot. The section between the lot and Wood Hill Road has washed out in several places and would need at least two culverts, fill and ditching to make it passable. There is evidence that the drainage has been intentionally diverted down the roadway by the landowner whose house lies on Wood Hill Road, northeast of Line Hill Road, and whose back yard would be the recipient of any water if the drainage is redirected to its original and natural course. Hunter Drive could be temporarily connected to Line Hill Road to access the lot, but the area on Line Hill Road between Hunter Drive and the lot is quite flat and poorly drained. Several large ruts have developed over the years that would need to be filled before the road could be used. Of the three possible routes, the last mentioned would be the least expensive for road improvements.

Of the lot itself, it is relatively small and would be treated as one management unit. There is an intermittent stream that runs along the northeastern boundary and creates a small wetland in the northeast corner. A short slope runs diagonally through southwestern portion of the lot. Parts of the lot blew down in 1938, creating some patches of younger trees mixed in with the older growth. There does not seem to have been any past harvesting activity

SITE CONDITIONS

The northeastern and southwestern portions of the lot are relatively flat, with a short, though sometimes steep slope found in between. Elevations run from 700 feet in the northeast corner to 820 in the southwest corner. The lot has an eastern exposure and is part of the Black Brook watershed that runs into the Merrimack River in Manchester, just north of the Amoskeag Bridge. The area found southwest of the intermittent stream contains Paxton very stony loam soils that are considered an excellent growing site for trees. Paxton soils will favor red oak, beech, white ash, red maple white birch, yellow birch and occasionally white pine. The small area along and northeast of the stream contains the wetter version of Shapliegh-Gloucester very rocky sandy loam soils. Trees will grow on these sites until they reach a size where the roots are restricted by the high water table. They then tend to stagnate or blow over. Trees that have adapted to higher water tables such as red maple, yellow birch and hemlock are often found on these sites.

UNIQUE FEATURES

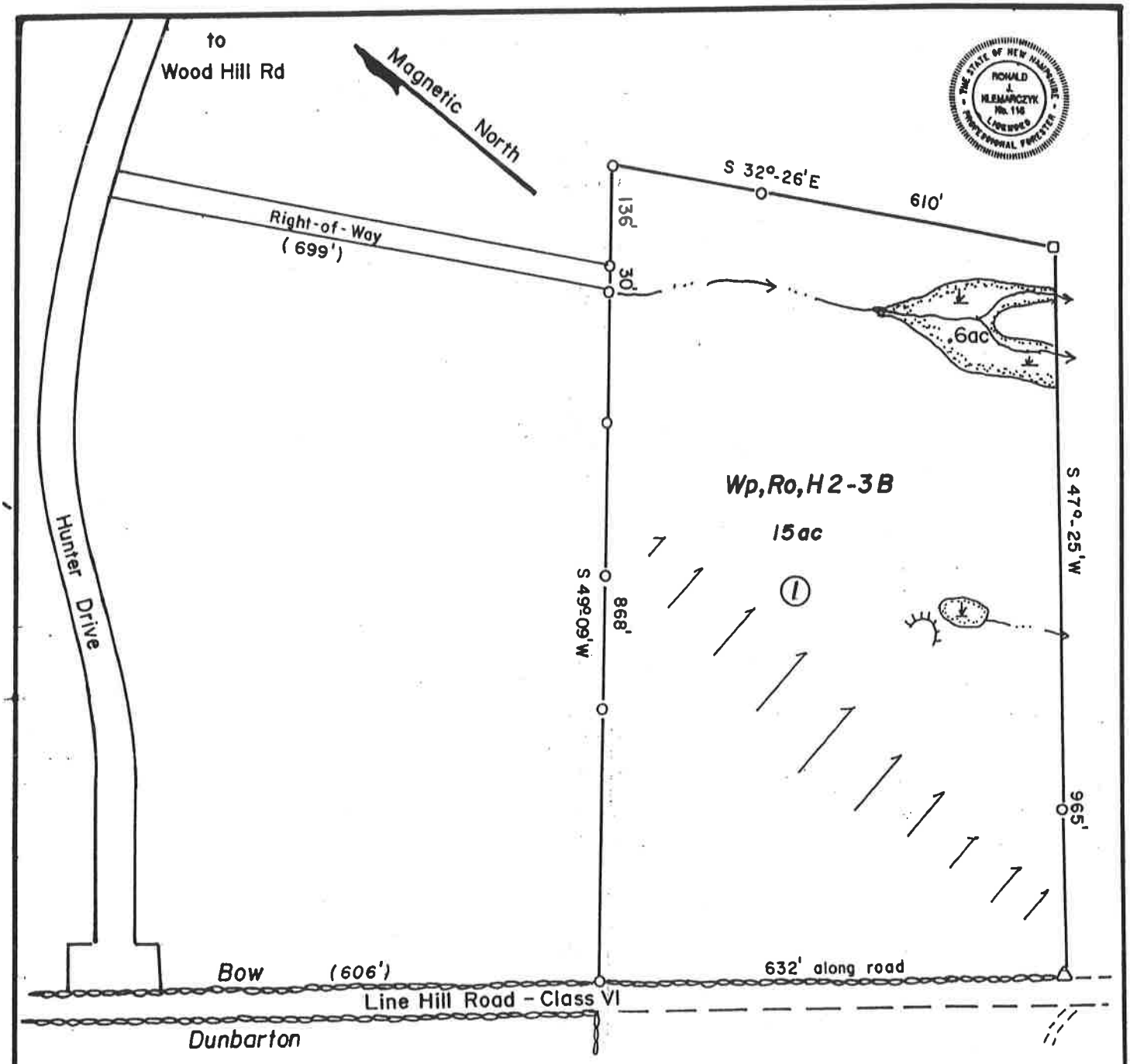
There is a possibility of opening up a vista in the southwest corner of the lot and would require clear-cutting about ½ acre of the slope. The Line Hill Road was built specifically to follow the Bow-Dunbarton Town Line. Due to terrain limitations in much of the state, such roads are relatively rare. Care should be taken to protect the stone walls along the road.

BOUNDARY LINE STATUS

The lot has not been independently surveyed, but has been included in the two adjacent subdivisions allowing the creation of a good map composite. The boundaries were found to have been partly flagged, but none were blazed and/or painted. The lines need to be established before any forest management activity can begin.

HISTORY

Whereas the lot was once dominated by white pine, it is a good indication that it was abandoned pasture land that was "let go" in the early 1900's. Some areas blew down in the 1938 hurricane and grew in with mixed hardwood. A small area in the center of the lot appears to have been kept open longer than the rest of the property. It was either used as a small pasture or a possible log yard area for the hurricane salvage work. No other items of note were found on the lot.



FOREST TYPE DESIGNATION

Wp - White pine
Hm - Hemlock
Ro - Red oak
Rm - Red maple
Bb - Black birch
Be - Beech
H - Mixed hardwood

1 - Sapling size
2 - Pole size
3 - Sawtimber size

A - Overstocked
B - Adequately stocked
C - Understocked

(3) - Stand number

LEGEND

- Stone wall
- Wire fence
- o Iron pipe or pin
- D Stone bound
- Cellar hole
- Woods road
- Trail
- Forest type boundary
- Stream
- Wetland
- Vernal pond
- Steep or ledge
- Slope direction
- y Log yard

Forest Type Map

HUNTER DRIVE TOWN FOREST

Bow N.H.

Tax map Block 3 Lots 2,2Y

15.6 Acres

1" = 200'

0 100 200 400

JANUARY 1997

FOREST TYPES

STAND 1 Wp,Ro,H2-3B

Description: This 15 acre stand includes all of the operable land on the woodlot. Red maple dominates the basal area of the lot with 43%, followed by white pine at 30%. The remaining basal area includes an even scattering of red oak, white oak, hemlock, white birch, black birch and yellow birch. The stems range in size from pole to large sawtimber and quality also runs in a wide range from very poor to very good. Some of the pine and oak are mature and are starting to deteriorate. Many of the pine were damaged by the white pine weevil and though large, are only pulpwood quality. Regeneration includes beech, red oak, red maple, and scattered white pine, white oak and sugar maple in the area southwest of the intermittent stream. Hemlock dominates the regeneration along and northeast of the stream.

Prescription: With a basal area of 125 square feet and 212 trees per acre, the stand can be considered slightly overstocked and in need of a thinning. About 1/3 of the basal area should be harvested by removing the poor quality and overmature stems. The lot would be selectively thinned, though a few areas could support group selections to remove several adjacent, poor quality stems. Access improvement would be included as part of the timber sale. However, the selectmen in both Dunbarton and Bow should be contacted regarding any potential complications from improving sections of Line Hill Road before the timber is marked. Another harvest can be expected in 15 to 20 years after the first harvest to remove the stems that have since matured and to release the regeneration that will develop after the first cut. The hemlock regeneration has the potential to offer winter cover for wildlife. Areas along and northeast of the stream should be left uncut to allow the hemlock to develop and to protect the wetlands.

Whereas Line Hill Road is used for recreation, a vista clearing should be included with the harvest. Though the view would not be very majestic, it is the only one accessible to the trail in that area. The vista should be laid out while the trees are leafless to avoid possibly over-cutting the site.

BOW TOWN FOREST
HUNTER DRIVE LOT

TOTAL OPERABLE VOLUMES

	Stand 1 Wp,Ro,H2-3B 15 ac.
Species/Product	
White pine	45,000 Bd.Ft.
White pine #4	12,000 "
Hemlock	3,000 "
Red maple	9,000 "
White birch	2,000 "
Red oak	4,000 "
White oak	2,000 "
Pallet	5,000 "
TOTAL SAWLOG	82,000 Bd.Ft
Softwood pulp	35 cords
Hardwood pulp	200 cords

HUNTER DRIVE TOWN FOREST

Immediate potential harvest Volumes and Values
1997

Species/Product	Estimated Volume	Estimated Value	Total Value
White pine	20,000 Bd.Ft.	$ 100.00/mbf	$ 2,000.00
White pine #4	8,000	25.00	200.00
White birch	2,000	50.00	100.00
Red oak	3,000	250.00	750.00
Pallet	3,000	25.00	75.00
Firewood	30 cords	$ 8.00/cd	240.00
Total Value			$ 3,365.00

Estimated road improvement costs	- $1,000.00
Estimated management fees	- 750.00
Estimated net value	$ 1,615.00

MORGAN LOT
Tax map Block 3 Lot 63
1997

GENERAL DESCRIPTION

This 62.2 acre lot is located off of the southwest side of the Class 6 portion of the Branch Londonderry Turnpike and near the east end of Arrowhead Lane. The lot was harvested in 1994 and was accessed through the abutting Morgan Heirs property. Since the harvest, the an abutting development was completed and the Arrowhead Lane right-of-way was extended to the western corner of the lot, though the roadbed itself is still about 370 feet from the actual property line. Unless the Morgan heirs property is purchased, future harvest should be accessed the more direct Arrowhead Lane route. Most of the skidder trails used in the last harvest could be re-directed to a log yard in the western corner of the lot. The forest contains three forest types, some wetland areas and an intermittent stream with two minor drainages. Because the majority of the lot is one forest type, the property should be considered as one management unit.

SITE CONDITIONS

The lot is gently sloped with elevations ranging from 600 to 680 feet. It has a southeastern exposure and is part of the Bow Bog Brook watershed. An intermittent stream enters the property at the northern corner and runs southeasterly into a forested wetland along the southeast boundary. This wetland area and the two smaller wetlands that run into it contain Ridgebury-Whitman soils and due to the high water table are not productive sites for timber. The other wetland found in the western corner of the lot consists of a relatively large vernal pool. The upland areas contain the Gloucester very stony sandy loam which is considered a good soil for timber production, favoring red maple, beech, white and yellow birch and hemlock.

UNIQUE FEATURES

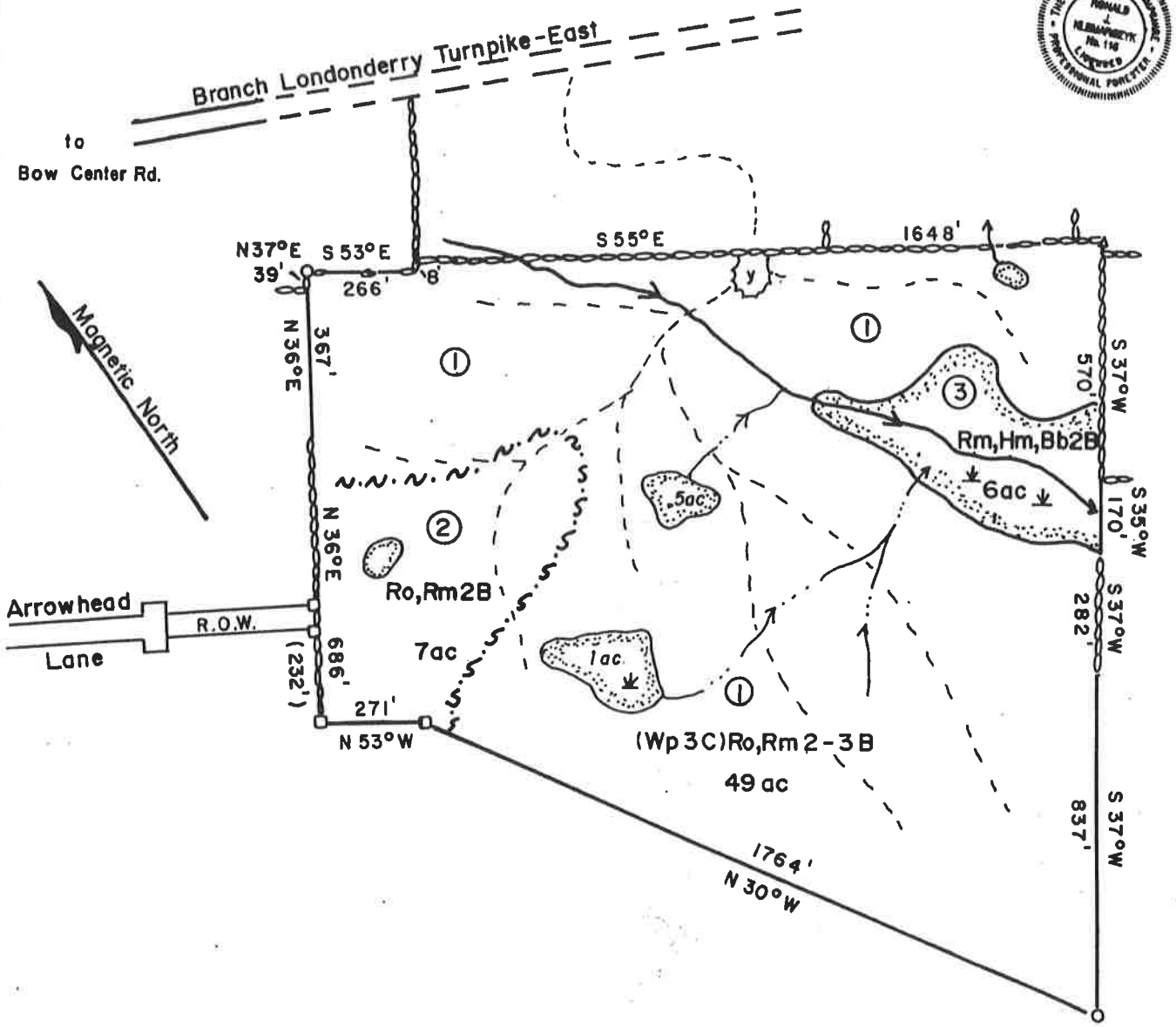
The large vernal pool in the western corner was the only one found on the lot and due to adjacent development, has become an important habitat for the area. Stone piles were found scattered throughout the lot providing evidence of past agricultural use.

BOUNDARY LINE STATUS

The lot was surveyed in 1982 by Kear-wood Inc and all boundary lines have been blazed and painted yellow. The lines need to be re-painted.

HISTORY

Stone piles and barbed wire along the boundaries indicate that the lot was once used for agriculture. When the lot was abandoned in the early 1900's, it appears to have grown in with both white pine and chestnut. The chestnut trees were killed off by the blight in the 1920's which allowed the other hardwoods, mainly oak and maple to develop amidst the pine. Gypsy moth defoliations in 1980 and 1990 killed off numerous oaks and most of the hemlocks found growing on the drier sites. The lot was selectively thinned in 1994 by TIMCO Inc. of Barnstead N.H. with 205,685 board feet of sawtimber, mostly white pine, 169 cords of firewood and 74 tons of softwood pulp harvested, netting the Town $21,589.95.



FOREST TYPE DESIGNATION

Wp - White pine
Hm - Hemlock
Ro - Red oak
Rm - Red maple
Bb - Black birch
Be - Beech
H - Mixed hardwood

1 - Sapling size
2 - Pole size
3 - Sawtimber size

A - Overstocked
B - Adequately stocked
C - Understocked

③ - Stand number

LEGEND

- Stone wall
- Wire fence
- Iron pipe or pin
- Stone bound
- Cellar hole
- Woods road
- Trail
- Forest type boundary
- Stream
- Wetland
- Vernal pond
- Steep or ledge
- Slope direction
- y Log yard

Forest Type Map
MORGAN LOT TOWN FOREST
Bow N.H.

Tax map Block 3 Lot 63

62.2 Acres

1" = 400'

0 200 400 800

JANUARY 1997

FOREST TYPES

STAND 1 (Wp3C)Ro,Rm2-3B

Description: This 49 acre stand occupies the majority of the woodlot, but contains two small wetland areas that are associated with the forest type found in Stand 3. It is dominated by red oak with 42% of the basal area and red maple at 23% in the pole to sawtimber size categories. White pine makes up 24% of the Basal area, but in the form of large, somewhat mature, but scattered stems. Hemlock and white oak make up a minor component of the stand. The 1994 harvest removed most of the overmature and poor quality trees, so the general stem quality would be considered quite good. Regeneration consists of white pine, hemlock, beech and chestnut sprouts.

Prescription: With a basal area of 90 square feet and 152 trees per acre, the stand is considered adequately stocked. Due to the recent harvest, the stand will not need to be thinned until 2011 to 2015. At that time, most, but not all, of the residual pines could be removed, along with the poorer quality stems of hardwood. The second cut will release the existing regeneration creating a two aged forest that has fewer pine in the overstory, but should have a good stocking of pine in the understory. The hardwood overstory will probably need to be removed in 20 to 30 years after the second harvest to completely release the understory. The timing may depend on future gypsy moth infestations which tend to slow the growth and development of the oaks.

STAND 2 Ro,Rm2B

Description: This 7 acre stand is located along the northwestern boundary and contains the vernal pool. It is dominated by pole sized red oak, with a scattering of red maple and a few white pine. Many of the oaks died off in the 1990 gypsy moth defoliation and were salvaged for firewood in the 1994 harvest. The remaining trees are of mixed quality. Many had epicormic branches on their trunks that developed as a result of repeated defoliations. Regeneration consists of red oak, white pine and some hemlock found near the vernal pool.

Prescription: The mortality from the gypsy moth defoliation left the stand understocked with a basal area of 50 square feet and 97 trees per acre. Unless the stand is again defoliated causing even slower growth, it will not need to be thinned until 2011 to 2015. At that time, the poor quality and any mature stems should be harvested. Care should be taken to not over-thin the stand as it will encourage additional epicormic branching. Basal area should be kept around 70 to 80 square feet per acre. The existing regeneration will continue to develop until it is shaded by the overstory. The next thinning will allow it enough light maintain its growth. Future thinnings will depend on the stand's response to the second thinning.

STAND 3 Rm,Hm,Bb 2 B

Description: This 6 acre stand is located in a wetland area along the southeastern boundary. The intermittent stream meanders through the stand, and portions are quite wet. Red maple with 43% of the basal area and hemlock with 39% dominate the stand. White and black birch make up the other 18%. Most of the stems are pole sized. The red maple is fairly good quality, while the birch and hemlock would be considered fair to poor quality, due to the wet site conditions. Regeneration was minimal and limited mainly to scattered hemlock. Wildlife that would normally use the hemlock cover was also limited by the wet conditions.

Prescription: With a basal area of 115 square feet and 325 trees per acre, the stand can be considered overstocked. However, the generally poor quality and difficult operating conditions limit the timber management potential of the stand. Scattered poor quality hardwood stems that can be reached from the edge of the upland around the stand could be harvested in conjunction with Stand 1 to release the hemlock for wildlife habitat. Skidding within the stand should be avoided. Due to the poor timber potential, the majority of the stand should be left in its natural state for watershed protection.

Other considerations

A driveway will have to be constructed from Arrowhead Lane to the lot and could be part of the next sale. In the meantime, a hiking path could be built to the lot from Arrowhead Lane and a loop trail could be constructed within the lot. As there are no unique features that would draw the public, use would probably be limited to a few residents of the Arrowhead Lane development. Whereas the right-of-way is the only guaranteed access to the lot, any trail users should understand that a driveway will eventually be built on the site. The vernal pool should be well protected from any driveway or log yard construction.

BOW TOWN FOREST
MORGAN LOT

TOTAL OPERABLE VOLUME

Species/Product	Stand 1 (Wp3C)Ro,Rm2-3B 49 ac	Stand 2 Ro,Rm2B 7 ac	Stand 3 Rm,Hm,Bb2B 6 ac	Total Volume
White pine	90,000			90,000 Bd.Ft.
White pine #4	20,000			20,000 "
Hemlock	15,000		12,000	27,000 "
Red maple	8,000			8,000 "
Red oak	100,000	4,000		104,000 "
White oak	2,000			2,000 "
Pallet	20,000	5,000		25,000 "
TOTAL SAWLOG	255,000	9,000	12,000	276,000 Bd.Ft.
Softwood pulp	90	5	25	120 Cords
Hardwood pulp	400	40	80	520 Cords

KNOX ROAD LOT

Tax map Block 3 Lot 138

2011

GENERAL DESCRIPTION

This 331.56 acre lot is located on the south side of Knox Road, about 1/4 mile east of Bow Center Road, and runs southerly all the way to Robinson Road. It fronts Knox Road in two areas. The western most frontage totals 220 feet and contains the entrance to the logging access road as well as a small parking lot that was constructed as part of the 2008 timber harvest. The eastern frontage totals 325 feet and contains a driveway to a log yard. Frontage on Robinson Road totals 894 feet and also contains a driveway to a log yard which is used as a trailhead parking lot. The logging access road mentioned above meanders southerly through the lot and ends at an old log yard roughly halfway to Robinson Road. With three separate road frontage areas, and a well-built interior access road, the lot can be considered quite accessible for forest management purposes. There is a wetland drainage along the eastern boundary which may explain the odd shape of that line. The lot was once crossed by an above ground phone cable, but the line was discontinued, though evidence of the old right-of-way still exists. A power line right-of-way crosses the lot at the Robinson Road end. The access road, power line right-of-way, and the old phone line right-of-way are part of a major snowmobile route. The 90 acre Bow School Forest abuts the northwest corner of the lot and shares several snowmobile and hiking trails and a 31.12 acre tract of conservation easement land that is the Open Space land around the Whittier Drive subdivision abuts the lot in the northeast corner. Stand 2 contains some white pine that could probably be considered "old growth" which is a forest type that is becoming rare in the Bow area.

SITE CONDITIONS

Although the lot looks relatively flat from the roads, it would be described as hilly, though the slopes are short and run from gentle to moderate in steepness. Elevations run from 400 feet at both the northwest and southeast ends of the lot, to around 600 feet on a hill top in the west-central part of the property. The lot has a generally easterly exposure, but is somewhat unique in that it is part of three watersheds. The southern part of the lot drains into Bow Bog Brook. The northeast part of the Lot drains into the Merrimack River near the Turkey River inlet, and the northwest part of the lot eventually drains into Turee Pond. In addition to the wetlands found along the eastern boundary and the several drainage ways that run into them, numerous vernal pools were found to be scattered throughout the lot.

Despite the large size of the lot, the forest contains only four soil types. The wetland areas along the eastern boundary contain the Ridgebury-Whitman soil. It is poorly drained and not a productive soil for growing timber, but does have value for watershed protection and wildlife habitat. The southern half of the lot, plus the northern tip of the lot along the western frontage on Knox Road contains the Gloucester very stony sandy loam soils. It is considered a good forest soil, with a slight favor towards beech, red maple and hemlock. There are a few small areas of ledge outcrop in the center of the lot which is typical of Shapliegh-Gloucester soils, though it was not mapped as such. The ledge outcrops have shallow to bedrock soil conditions and are not suitable for growing timber. There is an area of Hinckley soil that starts near the beginning of the access road and runs just past the old phone line right-of-way. The Hinckley soil is a gravel type soil and quite dry during prolonged drought conditions. A small glacial deposit, either a morraine or esker, was tapped for gravel during the access road construction. An older gravel pit can be found on the southwest edge

of Stand 3. Because of its dryness, it will highly favor white pine over the hardwoods, though the pine can easily become stagnated by the lack of moisture if not thinned in a timely manner. Appropriately, the stand of old growth pine is found on that soil. The area south of the eastern frontage on Knox road and east of the wetland contains Acton very stony fine sandy loam. This is a good forest soil that will also favor red maple, hemlock and beech, but is known to contain occasional seepage areas. This seeps will provide adequate moisture to the trees during prolonged droughts, but have the potential to create severe mud conditions if logged during wet periods.

UNIQUE FEATURES

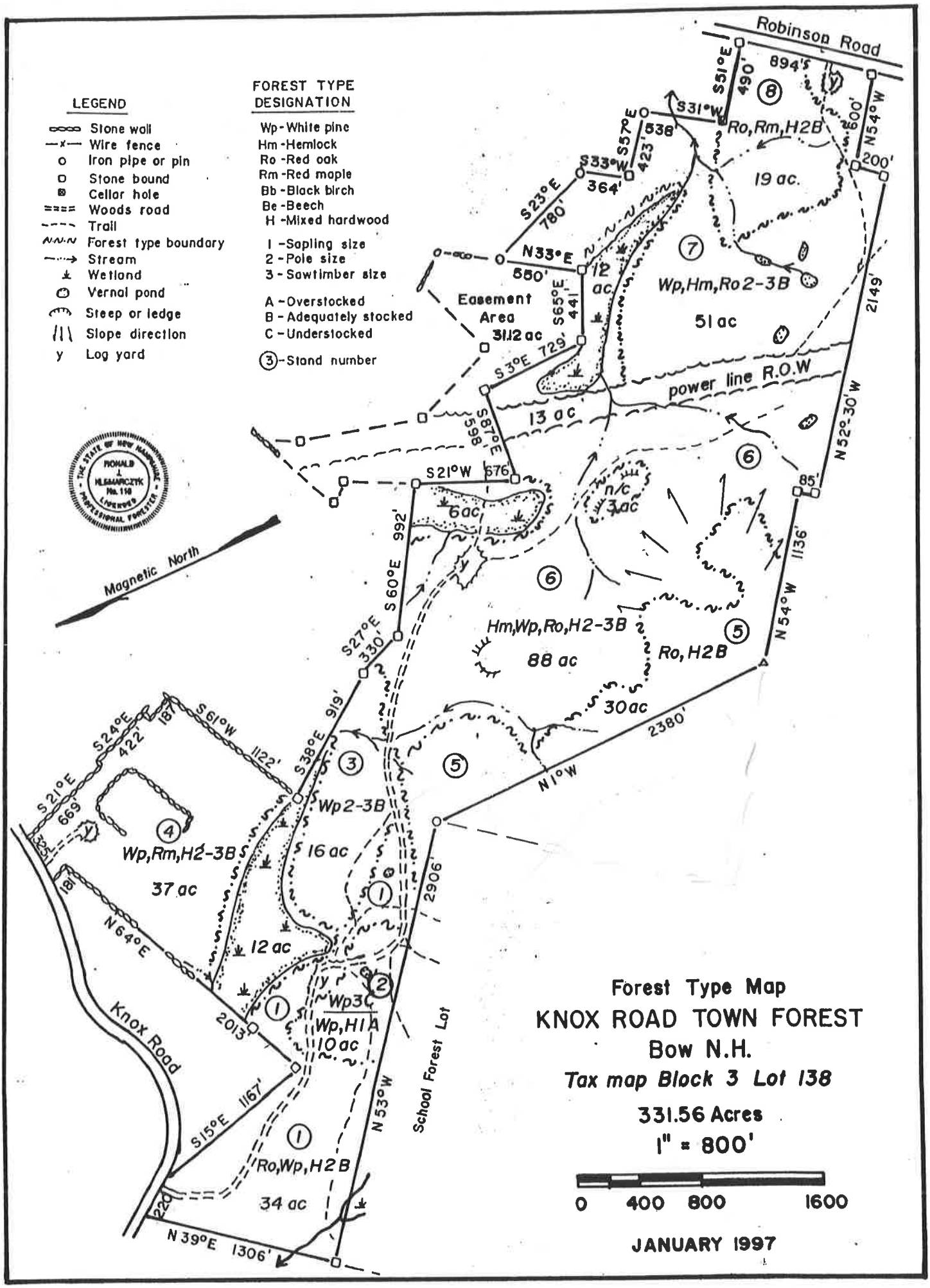
The numerous stone walls in Stand 4 indicate that the area was heavily used for agriculture. The ledge outcrop areas in Stand 6 are interesting in that water seeping over the ledges has allowed sphagnum moss to grow on the bare rock. Several vernal pools are found scattered throughout the lot. A glacial soil deposit, mainly outwash gravel, is located next to the log yard in Stand 2, where the old growth white pine is located.

BOUNDARY LINE STATUS

The entire lot was surveyed in 1979 by Kear-wood Inc. All of the boundaries were blazed and painted at that time and later repainted yellow in the fall of 2008. Portions of the boundary were re-surveyed as part of the Salt Marsh Circle and Whittier Drive subdivisions. The boundaries on the added acreage in the northeast corner of the lot and the Conservation Easement Open Space land near Whittier Drive were blazed and painted yellow in 2011.

HISTORY

The lot has a fairly typical history for the area. It was used for farmland, though site conditions limited intensive agricultural use to the areas along Robinson Road and along the eastern frontage on Knox Road. It appears that most of the lot was abandoned as farmland in the mid to late 1800's. Most of pine forest that grew into the abandoned fields were clearcut in the early to mid 1900's, excepting Stand 2. The Stand 3 area is located on a gravel deposit with few surface stones. That area was not abandoned as hayfield/pasture land until the early to mid 1900's. Stands 2, 4, 6 and 8 were harvested in the early to mid 1980's after the access road was constructed. Stand 3 was thinned in 1996 by logger Arthur Cutter of Salisbury N.H. using whole tree chipping. A total of 33,225 board feet of white pine, 21 cords of firewood, and 475 tons of woodchips were harvested by Mr. Cutter, netting the Town $ 2,740.99. Stand 7 was selectively logged in the winter of 1997-98 by Brett Smith who was contracted by TIMCO of Barnstead, NH. The harvest produced a total of 131,270 board feet of sawtimber, mostly white pine, hemlock and red oak; 97 tons of hardwood and softwood pulp; and 35 cords of firewood, netting the Town $20,103.06. Stand 3 along with portions of Stand 1 were thinned by Robert Lee of C & C Chipping in 2008 which produced 32,405 board feet of white pine; 16 cords of firewood; and 274 tons of woodchips, netting the Town $4,261.92. A parking lot was constructed along Knox Road at the entrance of the logging access road as part of that harvest. Mr. Lee started harvesting Stand 4 in December, 2008, but had to stop due to wet ground conditions. A severe wind storm hit the area on February 25-26, 2010 and numerous trees were blown down on the lot, including the area harvested in 2008, but not enough to salvage. The timber sale was eventually completed in the dry summer of 2010 where 76,570 bd.ft. of white pine; 195 bd.ft. of red oak; 1,200 bd.ft. of hardwood pallet; 577.83 tons of woodchips; and 18 cords of firewood were harvested, which netted the Town another $11,939.09 for a total of $18,219.29.


LEGEND
Stone wall
Wire fence
Iron pipe or pin
Stone bound
Cellar hole
Woods road
Trail
Forest type boundary
Stream
Wetland
Vernal pond
Steep or ledge
Slope direction
y Log yard
FOREST TYPE DESIGNATION
Wp - White pine
Hm - Hemlock
Ro - Red oak
Rm - Red maple
Bb - Black birch
Be - Beech
H - Mixed hardwood
1 - Sapling size
2 - Pole size
3 - Sawtimber size
A - Overstocked
B - Adequately stocked
C - Understocked
(3) - Stand number
Robinson Road
S51°E 490'
894'S
S31°W 538'
S57°E 423'
S33°W 364'
S23°E 780'
N33°E 880'
N54°W 600'
200'
Ro,Rm,H2B
19 ac.
(8)
(7)
12 ac
Wp,Hm,Ro 2-3B
51 ac
Easement Area 31.2 ac
S65°E 441'
S3°E 729'
power line R.O.W
2149'
N52°30'W
13 ac
S87°E 598'
S21°W 676'
6 ac
n/c 3 ac
85'
(6)
S60°E 992'
1136'
N54°W
Hm,Wp,Ro,H2-3B
88 ac
Ro,H2B
(5)
S27°E 330'
30 ac
2380'
N1°W
S38°E 919'
(3)
Wp2-3B
16 ac
S61°W 1122'
187'
S24°E 422'
S21°E 669'
325'
(4)
Wp,Rm,H2-3B
37 ac
181'
N64°E
12 ac
2906'
(2)
Wp3C
Wp,H1A
10 ac
2013'
Knox Road
School Forest Lot
N53°W
S15°E 1167'
(1)
Ro,Wp,H2B
34 ac
220'
N39°E 1306'
Magnetic North
RONALD J. KLEMARCZYK No. 110 LICENSED PROFESSIONAL FORESTER THE STATE OF NEW HAMPSHIRE
Forest Type Map
KNOX ROAD TOWN FOREST
Bow N.H.
Tax map Block 3 Lot 138
331.56 Acres
1" = 800'
0 400 800 1600
JANUARY 1997

FOREST TYPES

STAND 1 Ro,Wp,H2B

Description: This 34 acre stand is located along either side of the access road starting on Knox Road and encompasses Stand 2. There are several heavily used hiking trails that bisect the Stand. The site was clearcut of white pine in the 1940's and then grew in with oak. There is evidence that the area burned many years ago, perhaps by a fire that started at the town dump which was located near the present day Fire Station. Part of the stand is located on gravel soils which proved too dry for the oak and the pines have slowly been returning to the site. The 1990 gypsy moth defoliation killed off many of the oaks, giving the pine a better chance to develop. Because the oak is growing on an "off site", the quality is generally poor, while the pine is generally good. A large portion of the Stand between Knox Road and Stand 2 was thinned in 2008 to remove the poor quality oaks and some of the stagnated pines. Whereas the focus was to remove the poor quality oaks, white pine now dominates the basal area, followed by red oak and black oak, with a scattering of white oak, red maple and white birch. Most of the stems are pole to small sawlog in size. Regeneration is scattered but is dominated by white pine. Because it is the first part of the forest viewed by users of the access road, aesthetics concerns are somewhat higher for this stand than the rest of the lot and a small buffer zone was set up along the road during the harvest.

Prescription: Whereas the Stand was thinned in 2008 on bare ground, it is hoped that additional white pine regeneration will develop. Another treatment will probably be needed in 2025 to 2030 to again remove the poor quality red and black oak for firewood, and to thin some of the denser patches of white pine. Reducing the oak stocking will further encourage the development of the pine, both in existing growing stock and the release of any regeneration that might have developed after the 2008 thinning. Another thinning will probably needed in 15 to 20 years after the second thinning to harvest most of the remaining oaks and to thin the pine. Upon completion of the third harvest, the stand should have evolved into a white pine forest type that will need to be thinned regularly to perpetuate the white pine regeneration. A narrow no-cut buffer strip should be established along the access road and the hiking trails to keep the roadside brush to a minimum as well as for aesthetic reasons.

STAND 2 Wp3C/H1A

Description: This 10 acre stand is located on either side of the access road adjacent to the first log yard. Most of the forest type sits on a glacial deposit that was tapped for gravel during the access road construction. The type consists of a scattered overstory of large mature to overmature white pine, above a mixed understory of beech, red oak, red maple and white pine that developed after the stand was thinned using a shelterwood harvest in the mid to late 1980's. A shelterwood thinning is a heavier than normal harvest specifically designed to establish regeneration, which would then be released by the removal of the overstory in the next harvest. White pine dominates the overstory with 74% of the basal area, with red oak making up the remaining 26%. Because the poor quality stems were removed in the last harvest, most of the pine stems are very high quality, but can also be considered "old growth". A few stems have died off since the last cut. Several trails from the School Forest intersect the access road within the stand just beyond the log yard.

Prescription: With a Basal area of 50 square feet and 33 trees per acre, the stand would normally be considered understocked. However, the last harvest left a low basal area to encourage regeneration which developed as planned. There are two options for managing the stand. Because the overstory pine trees are mature to overmature, and that there is a well stocked understory, they could all be harvested in 2011 to 2015 to release the understory and encourage it to develop into a new forest. The removal of the overstory trees will thin out the regeneration, so another thinning of that regeneration would not be expected for 15 to 20 years. Future thinnings should promote white pine as the soil type favors that species over the hardwoods. The other option recognizes that old growth trees are somewhat rare to the Town Forest system and that they should be left to complete their life cycle in their own time. Though a few stems have died off, the site favors white pine and it will be many years before all of the large pines die out. Many will probably die out from competition from the more vigorous understory as it grows its way into the overstory.

STAND 3 Wp2-3B

Description: This 16 acre stand is located on the northeast side of the access road where the road intersects with the old phone line right-of-way. It is almost a pure stand of small sawlog sized white pine that was thinned in 1995 and again in the late fall of 2008 using whole tree chipping. A few hemlocks can be found along the wetland on the stand's northern edge. The mature stems of pine as well as the poor quality and suppressed trees that were left as "spacers" in the 1995 harvest were removed leaving the stand with good to excellent quality pine trees. The "biomass" harvests established an extensive skid trail system that can be used in future harvests.

Prescription: Because of the recent thinning, it will not need another thinning until 2025 to 2030 at which time about 30 to 40% of the basal area should be removed. In the mean time, the more vigorous, high quality pine trees in the 8" to 11" diameter class could be pruned and be designated as the final crop trees for this generation of pines. Because the site favors pine, future thinnings should be done on bare ground during seed years to encourage pine regeneration unless a good crop of pine regeneration develops from the first thinning. Another thinning could be expected in another 15 years after the next harvest, but if there is a heavy pine understory, the next thinning could also be an overstory removal to allow the pine regeneration to continue to develop into a new forest.

STAND 4 Wp,Rm,H2-3B

Description: This 37 acre stand is located on the southeast side of Knox Road along the eastern road frontage section. It is somewhat isolated from the rest of the Town forest lot by a 12 acre wetland and does not receive the recreational use that the rest of the lot does. It was logged in the mid to late 1980's and again in 2010. The Stand has its own log yard but proved difficult to log due to the wet character of the soils. The stand has several stone walls indicating that the site was heavily used for agriculture in the 1800's. It also contains several seepage areas, with most concentrated down towards the wetland. White pine dominates the basal area, followed by red maple which is indicative of the wetness, then red oak with a scattering of hemlock. The stems are pole to sawtimber in size and because the poor quality and mature pines along with some of the large poor quality red maples were harvested in the 2010, the residual stems are generally good in quality. Some white pine, red maple, red oak, beech and hemlock regeneration developed after the 1980's harvest, though much of it was damaged in the areas that were harvested in 2010. Buffer zones were left along the wetland, Knox Road and most houselots. All of the blowdown from the February windstorm was salvaged.

Prescription: Whereas almost all of the Stand was thinned in 2010, another thinning will be needed around 2025 to 2030 to again remove the mature pines and any large poor quality red maples. If regeneration develops in the openings created during the 2010 harvest, it should be well protected in the next harvest. Due to the wet soils found throughout the Stand, red maples will eventually dominate the forest type, though oak and pine may still grow on the drier sites. The lack of recreational use of the site will allow the forest to be managed to produce high quality timber, whether red oak or red maple, on the better growing sites.

STAND 5 Ro,H2B

Description: This 30 acre stand is located in the central part of the lot along the western boundary and occupies most of the higher ground found on the lot. It probably had the same history as Stand 1, but because of different soil conditions, remained dominated by hardwoods, especially red oak. Although some of the oaks were killed off by the gypsy moth defoliations, it still dominates the basal area at 39%, followed by red maple at 19%, white pine at 14%, with a scattering of white oak, beech, black birch, hemlock and white birch. Most of the stems are in the pole size class and are generally good in quality. The stand was weeded and thinned in the early 1980's by girdling the unwanted stems with a chain saw which helped keep the residual trees vigorous. Regeneration is scattered, but is slightly dominated by beech, with some red oak, hemlock, white pine and red maple. American Chestnut sprouts can be found throughout.

Prescription:

With a basal area of 99 square feet and 308 tree per acre, the stand can be considered adequately stocked. It will need to be thinned in 2011 to 2015 to release the high quality hardwood stems by removing the competing poor quality stems for firewood. High quality stems of all species should be favored, as mixed forests are less susceptible to gypsy moth defoliations. The current regeneration is too scattered to be released by the next harvest, though the beech may tend to increase. Hardwoods tend to develop more slowly than pine, so another thinning will not be needed for another 20 to 25 years. At that time, a harvest to remove about 35% of the basal area with the focus on releasing the highest quality stems. A cut of that nature will encourage additional regeneration to develop.

STAND 6 Hm,Wp,Ro,H2-3B

Description: This 88 acre stand is located in the center of the lot on the west side of the power line right-of-way and contains a wide variety of site conditions including ledge outcrops, hill summits and slopes, and several small drainages. Unfortunately, neither the summits or ledges are large enough to be a recreational attraction. The access road from Knox Road ends at the log yard in the middle of the stand. Most of the Stand was harvested in the 1980's which helped create the mixed forest type. Hemlock dominates the basal area at 41%, followed by white pine at 23%, red Oak at 17%, with a scattering of red pine, red maple, white birch, black birch and beech. They are in the pole to sawtimber size class and whereas most of the large, poor quality stems were cut in the last harvest, the quality can be described as generally good. Many stems within the stand, primarily hemlocks, would be considered mature, but were left to avoid over-cutting the stand. Hemlock dominates the regeneration, though some scattered beech, yellow birch, and red maple were noted.

Prescription: With a basal area of 115 square feet and 267 trees per acre, the stand can be considered adequately stocked. Because many stems are mature, it will need to harvested in 2011 to 2015 to remove the mature trees along with the smaller poor quality hardwoods that were not marketable during the first harvest. About 35% of the basal area could be harvested, with a slight focus on promoting additional hemlock regeneration that could be used for winter cover by wildlife. Unless the stand is heavily cut, hemlock will increase its domination of the forest type. A third harvest could be expected in 15 to 20 years after the second harvest following the same prescription.

STAND 7 Wp,Hm,Ro2-3B

Description: This 51 acre stand is located in the southern portion of the lot along the east side of the power line right-of-way, with a small section fronting on Robinson Road. The stand contains several vernal pools and a large hole that was dug into one of the drainages at some time in the past to either provide a watering hole for livestock, or to provide water for an old steam-powered sawmill. Most of the Stand was selectively logged in the winter of 1997-98 where most of the mature to overmature trees as well as the smaller, poorer quality stems were harvested, leaving a evenly mixed stand of pole and sawlog-sized stems of white pine, hemlock, red oak, and red maple, with a scattering of white birch, black birch, and beech. Most of the sawtimber-sized stems are fairly good in quality, though many would be considered low value species. Some areas of pine and hemlock regeneration developed after the last harvest, but because the lot was logged in the winter, the snowpack and the light nature of that thinning prevented the establishment of widespread regeneration. The last harvest created a skid trail system that can be used in the future, though some of the trails are now being used as hiking trails. Thirteen acres were added to the northeast side of the Stand around 2007. That area has never been logged and contains a higher proportion of poor quality trees. The log yard is currently being used as a trailhead parking lot, but due to terrain restrictions, it will have to be re-used as the log yard site in the future.

Prescription: Whereas the Stand was harvested in 1997-98, another thinning will be needed in 2015 to 2020 to again selectively harvest the mature stems of pine, red oak and hemlock as well as the smaller poor quality trees, especially in the thirteen acres acquired around 2007. Care should be taken to leave a few scattered large stems of white pine within the Stand to act as a seed source for that species. It should be occur during bare ground conditions to encourage soil scarification which will hopefully promote oak and pine regeneration. Another harvest could be expected in 15 to 20 years to again remove the mature stems and to release the regeneration that should develop after the next harvest. If hemlock regeneration becomes dominant, the stand can eventually be managed in conjunction with Stand 6.

STAND 8 RO,Rm,H2B

Description: This 19 acre pole sized stand is located along the north side of Robinson Road and developed when the forest previously growing there blew down during the hurricane of 1938. The stand contains two drainages and a fairly high water table, though it would not be considered a forested wetland. Red oak makes up 28% of the basal area, followed by red maple at 25%, white pine and white birch at 15% each, black birch at 12% and hemlock at 3%. Regeneration is scattered and consists of white pine, beech, hemlock and red maple. Stem quality runs from good to poor.

Prescription: With a basal area of 107 square feet and 377 trees per acre, the stand can be considered slightly overstocked. It should be selectively thinned in conjunction with the next harvest in Stand 7 to remove the poor quality stems found to be competing with the high quality trees. The basal area should only be reduced by 20 to 25% to maintain adequate stocking. The drainage ways should be left uncut during the harvest to avoid mud problems and to minimize future blowdowns. Another thinning will probably be needed in 20 to 25 years after the first thinning just as the trees start to reach sawlog size. Future harvests will depend on how well the stand responds to the first two thinnings.

Other considerations

Whereas the lot abuts the School Forest, and that the log yard on the Town Forest was used for harvesting the School Forest in 1996, and that several trails pass through both lots, there should be a formal Memorandum of Understanding between the School and the Conservation Commission regarding the management program on each lot to avoid conflicting uses. The old growth pine in Stand 2 as well as the glacial deposit that it sits on have some educational value for the Bow students if they ever expand their environmental education program.

The Knox Road lot was once viewed as a potential route for the Heritage Trail. The snowmobile/hiking trail that connects the logging access road from Knox Road to the power line right-of-way crosses several wetland areas before it turns off of the power line right-of-way and onto the old telephone line right-of-way. That route should be relocated further to the south along an old skid trail that is drier and more environmentally sound. It could then be used as part of the Heritage Trail route.

The log yard on Robinson Road is now considered the trailhead for that portion of the lot, though it does not get near as much use as the Knox Road trailhead.

Town of Bow
KNOX ROAD LOT
Mar-11

TOTAL OPERABLE VOLUMES

Species/product	Stand 1 RoWpH2B 34 ac.	Stand 2 Wp3C/H1A 10 ac.	Stand 3 Wp 2-3B 16 ac.	Stand 4 WpRmH2-3B 37 ac.	Stand 5 Ro,H2B 30 ac.	Stand 6 HmWpRoH2-3B 88 ac.	Stand 7 WpHmRo2-3A 38 ac.	Stand 8 Ro 2 B 31 ac.	TOTAL
White pine	60,000	54,000	142,000	211,000	24,000	150,000	12,000	0	653,000
White pine #4	2,000	4,000	1,000	15,000	0	2,000	0	0	24,000
Red pine	0	0	0	0	0	8,000	0	0	8,000
Hemlock	0	0	0	7,000	6,000	239,000	50,000	0	302,000
Red oak	23,000	10,000	0	9,000	30,000	50,000	6,000	8,000	136,000
Red maple	0	0	0	12,000	0	0	4,000	0	16,000
White birch	0	0	0	0	2,000	0	0	0	2,000
Black birch	0	0	0	0	0	7,000	0	0	7,000
Beech	0	0	0	0	0	2,000	1,000	0	3,000
Hardwood pallet	6,000	1,000	0	6,000	6,000	5,000	0	2,000	26,000
TOTAL-Board Feet	91,000	69,000	143,000	260,000	68,000	463,000	73,000	10,000	1,177,000
Softwood pulp-cords	350	5	215	190	70	690	270	95	1885
Hardwood pulp-cords	220	10	0	230	430	570	265	320	2045

BELA BROOK LOT
Tax map Block 4 Lots 26,27
2009

GENERAL DESCRIPTION

This 76 acre lot is located on the side of Clinton Street (Route 13) along the Bow-Dunbarton Town Line. The eastern boundary runs southerly along One Stack Brook for a short distance near Clinton Street, and then southeasterly along Bela Brook for a total of 4,420 feet. Beaver activity has created a marsh complex along the brooks and has raised the water table in parts of the forest land. The lot contains three forest types, though one is part of a buffer zone found in the narrow strip of land between Bela Brook and the One Stack Drive development. The lot also contains a right-of-way to an abutting property located in Dunbarton. This Right-of-way was upgraded for log truck traffic by the abutter in the late 1980's, though part of the Town Forest at the driveway entrance was used for a log yard during the construction process. The four foot diameter culvert that was installed is undersized for the brook and is easily plugged by beaver dams. This has caused the road to wash over in the spring and during prolonged rainstorms. Crushed rock and small washed stone were dumped on the culvert crossing to prevent the road from washing out. However, the person who put in the road used trees as fill along the culvert which were deteriorating at the time of the 1997 cruise. The road was used to access the Town Forest for a timber sale in the winter of 1997-98. The trees were removed from along the pipe and were replaced with crushed stone. However, the brook continued to wash over the causeway in periods of high water. The concrete pipe should be replaced with a six foot diameter "squat" culvert and a two foot diameter pipe should be installed in the sometimes dry floodway found on either side of the larger pipe. This will allow room for the additional flood waters and provide a protected "critter crossing" for smaller mammals and amphibians. In 2008, the abutter in Dunbarton planned to upgrade the road and install a bridge to access his proposed houselot, though no work had been done on the road by the end of 2010.

Although the road has 50 feet of frontage on Page Road, it is not a suitable access route to the main part of the lot. A right-of-way was laid out from One Stack Drive to the lot as part of that development and could be used for access. The route was rough graded to within 100 feet of the boundary but will require crossing a wide drainage to reach a site suitable for a log yard. It will also require a generally uphill or cross-slope skid from most of the lot.

SITE CONDITIONS

The lot is gently sloped with elevations running from 340 feet along Bela Brook to 460 feet in the southwest corner and has a generally northeast exposure. There is a small ledge outcrop near the town line, but it is not large enough to interfere with management activities. Bela Brook crosses the lot near Clinton Street and several small drainages and intermittent streams within the lot run northeasterly into the wetland areas along that brook. The marsh area along Bela Brook contains muck and peat soils that are not suitable for forest land. The relatively flat area immediate adjacent to the marsh in Stand 1 contains Ridgebury-Whitman soils which are soils with high water tables. The beaver activity raised the water tables even further causing slow growth and blow-down occurrences within the Stand. Keeping the water table low will allow a better forest to develop, but will require continuous elimination of the beaver and is not recommended. The rest of the lot contains the Gloucester extremely stony sandy loam and is a good forest soil, favoring hardwoods such as red maple and beech, though the rockiness will make logging difficult in places.

UNIQUE FEATURES

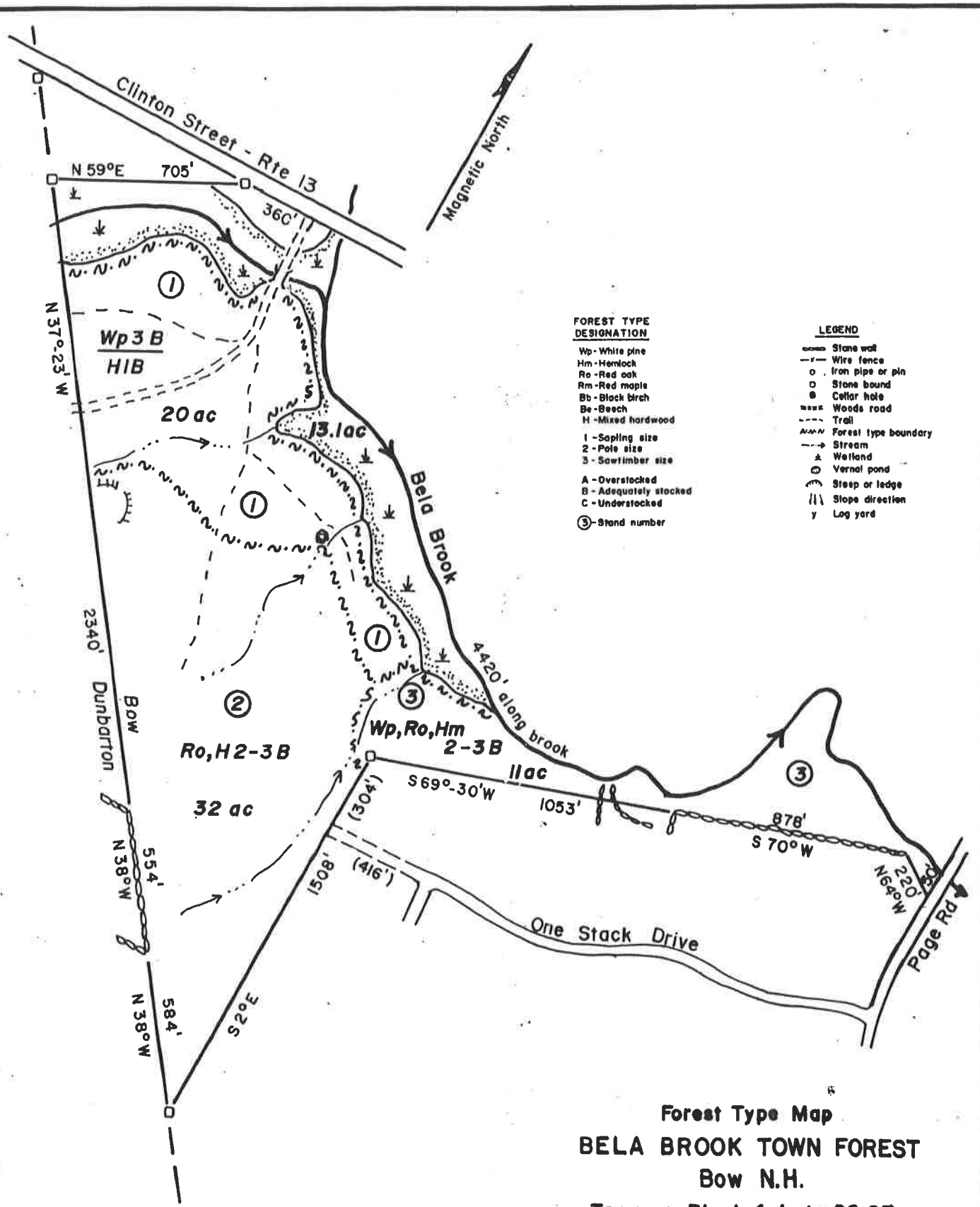
The most predominant feature of the lot is the marsh complex along Bela Brook, though the backyards along Kelso Drive on the opposite shore are visible and detract from the site. A stone lined well was found along a drainage on the edge of Stand 1 in the center of the lot. There does not appear to be a home site near the well, so it was either a very productive spring that was tapped and worth walking to or so old that evidence of a homestead has long vanished.

BOUNDARY LINE STATUS

The lot was surveyed in 1980 by Kear-wood Inc. of Wilmot N.H. and all boundaries except along the sections along the brooks were blazed and painted yellow. They will need to be re-painted within five years. Portions of the boundary that runs easterly to Page Road were re-surveyed as part of the One Stack Drive development.

HISTORY

Due to the rocky site conditions, past agricultural use of the lot was limited to pasture. The Stand 2 area was abandoned as pasture in the mid to late 1800's and the pine that grew in was clearcut in the early 1900's allowing the hardwood forest to develop. It appears that the stand was heavily defoliated during the gypsy moth infestations in 1980 and 1990 which caused some mortality. The Stand 1 area contains better site conditions for pasture and was not abandoned until the early 1900's. It also grew in with pine which was selectively thinned in 1984 by Dalphond Lumber who cut 413,895 bd.ft. producing $50,683.00 in income. The Town set up a timber sale for the winter of 1997-98 which was purchased by Fort Mountain Land and Timber Company, owned by Jeff Eames of Epsom, New Hampshire. They harvested 152,680 board feet of sawtimber, mostly white pine and red oak, 40.5 tons of pine pulp and158 tons of hardwood pulp, netting the Town $ 28,818.02.



Forest Type Map

BELA BROOK TOWN FOREST

Bow N.H.

Tax map Block 4 Lots 26,27

76.1 Acres

1" = 500'

0 250 500 1000

JANUARY 1997

THE STATE OF NEW HAMPSHIRE
RONALD J. KLEMARCZYK
No. 116
LICENSED
PROFESSIONAL FORESTER

FOREST TYPES

STAND 1 Wp3B/H1B

Description: This 20 acre stand is located on the south side of Bela Brook in the northwest part of the lot. It is dominated by very good quality white pine, followed by red maple, red oak and a scattering of hemlock, beech, sugar maple, white ash and white oak. The regeneration that grew in after the first cut is dominated in the drier sites by beech and white pine, while the wetter sites contain red maple and ash. Past beaver activity had raised the water table and killed off several trees near the brook and placed severe stress on many of the other stems. The high water table also created conditions conducive to windthrow and several large pines had already toppled. The Stand was logged in the winter of 1997-98, where many of the mature pines were harvested, especially those in the areas with the higher water tables that were deteriorating. A small patch of "old growth" pine was left undisturbed in the upland area along the south side of Bela Brook west of the access road.

Prescription: The regeneration currently found in the remaining area of Stand 1 will quickly develop after the site is selectively thinned. Due to the age of the trees, a complete overstory removal is recommended for the following harvest. It should occur when the regeneration has reached ten to twelve feet in height, which should occur in 2015 to 2020. The logging activity will thin the regeneration, eliminating the need for management work for another 15 to 20 years, though the logger should still try to avoid damaging the regeneration as much as possible. The forest that develops in the cutover areas with the high water table can then be managed along with the areas with the later overstory removal.

STAND 2 Ro,H2-3B

Description:

This 32 acre stand is located in the southwest corner of the lot. Most of the stand is high and dry, though somewhat rocky. The drainages that cross the stand are broad, though shallow but there are enough narrow crossing places that they will not hinder any harvesting activity. It is dominated by red oak, followed by beech, red maple, hemlock, and a scattering of sugar maple, white ash, white birch, black birch and basswood. The Stand was harvested in the winter of 1997-98 to harvest the mature and poorer quality stems. Most of the residual stems are in the pole to sawlog size category. Beech heavily dominates the regeneration, with some scattered hemlock, black birch and red maple. Some stems showed epicormic branching brought on by the gypsy moth defoliations.

Prescription: Whereas the stand was harvested in 1997-98, another thinning will not be needed until 2015 to 2020. That harvest should focus on removing the remaining poor quality stems and to release the understory that developed after the last harvest. Future harvests will depend on the stands response to the first two thinnings, but should not occur until the high quality hardwood stems have reached at least 18 inches diameter.

STAND 3 Wp,Ro,Hm2-3B

Description: This 11 acre stand is located in the narrow strip of land between the One Stack Drive development and Bela Brook. Western portions of the stand were thinned in the 1984 harvest. Although the stand runs along Bela Brook, it is relatively dry and above the floodway. It is dominated by a mix of white pine, red oak and hemlock in the pole and sawlog size category. Hemlock regeneration developed after the last harvest. Several wildlife trails were noticed during the cruise, though houses are visible from almost all parts of the stand.

Prescription: Due to it's very long and narrow shape, along with its high visibility to the houses on One Stack Drive, and its location adjacent to Bela Brook, it is recommended to designate the Stand as a natural area to act as a buffer zone for Bela Brook. The Stand should be allowed to develop into old growth, free of any harvesting activity thereby protecting the wildlife travel corridors.

Other considerations

A hiking trail could be constructed from the right-of-way on One Stack Drive onto a skid trail that leads out through the proposed old growth area in Stand 1 to Clinton Street. The old log yard near Clinton Street should be upgraded into a parking facility. Two loads of sand spread a foot deep on the east side of the log yard will create ideal turtle nesting habitat, and may draw them away from their current, but precarious nesting sites along Clinton Street.

If the landowner in Dunbarton who has the Right-of-Way ever develops their property, the causeway will need to be upgraded. Ideally, it would include a bridge over the Bela Brook, plus some floodplain culverts and a sidewalk. A driveway to potential log yards would need to be constructed on either side of that road on the south side of the Brook, which could also be used for a hiking trail parking lot. The yard on the south side of the road would have to be near the Town Line to avoid skidding through a substantial wetland.

BOW TOWN FOREST
BELA BROOK LOT

TOTAL OPERABLE VOLUME

Species/Product	Stand 1 Wp3B/H1B 20 ac	Stand 2 Ro,H2-3B 32 ac	Total Volume
White pine	190,000		190,000 Bd. Ft.
White pine #4	7,000		7,000 "
Hemlock		9,000	9,000 "
Red pine	3,000		3,000 "
Sugar maple		3,000	3,000 "
Red maple	2,000		2,000 "
White birch	2,000		2,000 "
Beech		6,000	6,000 "
Red oak	10,000	70,000	80,000 "
Pallet	4,000	10,000	14,000 "
TOTAL SAWLOG	218,000	98,000	316,000 Bd.Ft.
Softwood pulp	45	10	55 cords
Hardwood pulp	120	250	370 cords

TUREE ISLAND LOT
Tax map Block 4 Lot 50
1997

GENERAL DESCRIPTION

This 95.5 acre lot is located on the east side of Birchdale Road, with the access right-of-way located about 3/4 of a mile north of Page Road. It was purchased as part of the wetlands mitigation process involving the High School construction and has been designated a "Natural Area". The lot contains 43.5 acres of prime wetland and 52 acres of upland. Part of the upland consists of a 32 acre island within the Turee Marsh complex, while the remaining upland area is located northwest of the West Gate Drive development. The access route starts on Birchdale Road and runs easterly to the island via an old, but now flooded causeway across White Rock Brook and adjacent wetlands. The route is poorly defined and not marked as such. Because the lot is a Natural Area, it was not cruised using sample points, but only viewed using a walk through tour.

SITE CONDITIONS

The island is a hill that rises out of the marsh. The hillsides are moderately to steeply sloped, though the summit is relatively flat. Most of the upland northwest of West Gate Drive is gently to moderately sloped. Elevations on the island run from 330 at water level up to 387 feet on the summit and 330 feet to around 450 feet on the upland near West Gate Drive. The upland area has a northern exposure and the lot is within the Turkey River watershed. Both upland areas contain Gloucester very stony sandy loam and are considered a good growing site for trees. The muck and peat soils within the wetlands are poor sites for tree growth but provide extremely productive wildlife habitat.

UNIQUE FEATURES

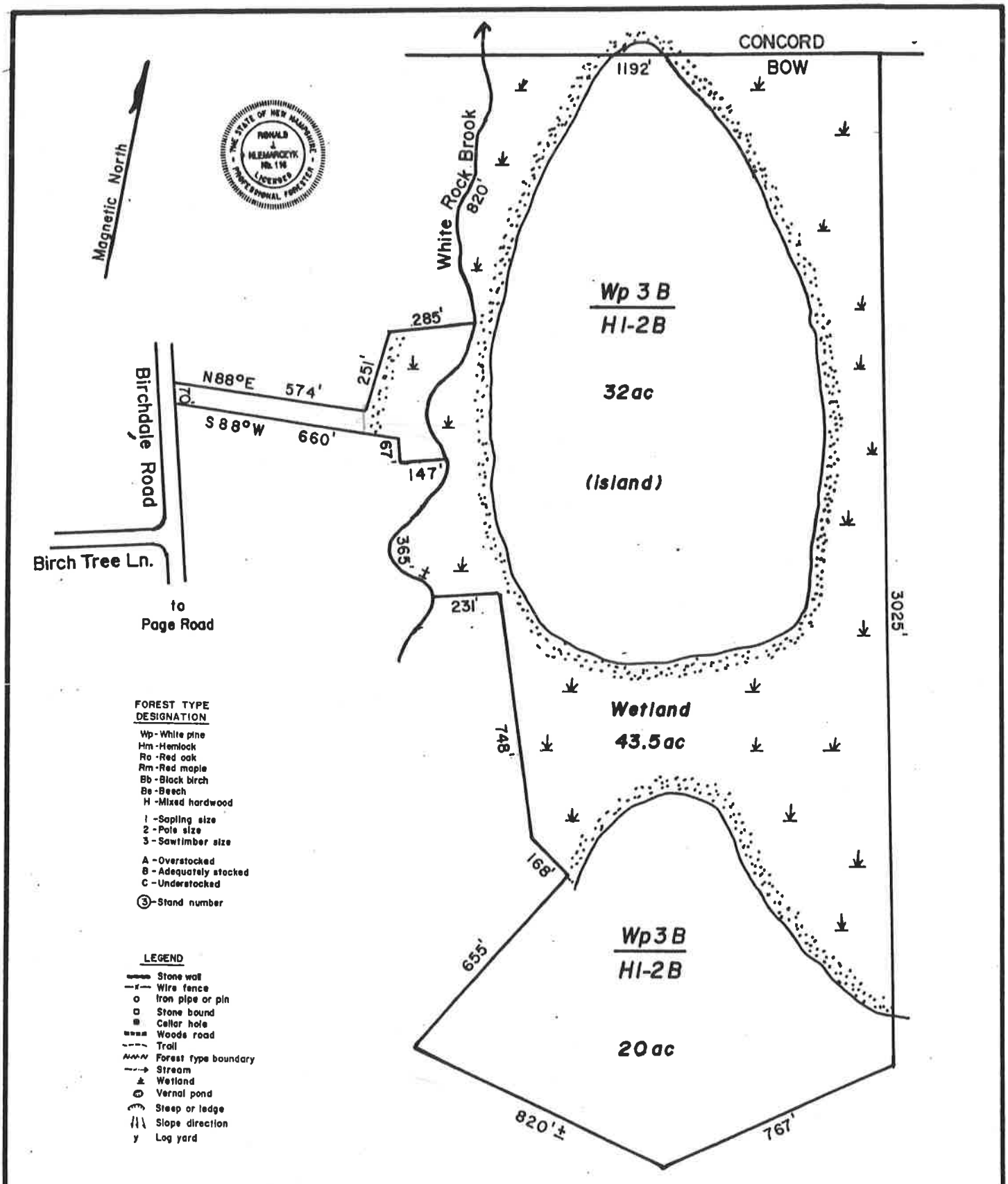
The marsh area is a prime wetland and part of the very large Turee Pond-Turkey Pond marsh complex. The island is also unique as it is the only non-developed island within the marsh. The causeway mentioned earlier was probably built in colonial days and accessed the island for farming purposes. It was severely damaged when the island was harvested in the 1970's and is now the site of a beaver dam.

BOUNDARY LINES

The boundary lines along the West Gate Drive were surveyed as part of that development and are visible. Most of the remaining boundaries are within the marsh and not identifiable. The access route was surveyed as part of an old subdivision but the corners were not set, nor were the boundaries blazed as parts of the boundaries ran through open fields at the time. The right-of-way corners and boundaries should be established, along with the line on the upland area near the West Gate Drive part not part of the development.

HISTORY

The marsh grass in the wetland areas was the primary source of hay when the area was first settled. That source became less important when the surrounding upland was cleared. Both the island and the upland area on the southern boundary were used for hayfield and pasture land. Both areas were abandoned as farmland in the early 1900's. The pine that grew into the fields was harvested in the 1970's, creating the mixed pine hardwood forest found there today. Beaver activity caused the water level to fluctuate in the marsh area and killed off many red maples that had slowly encroached into the marsh over the years.


CONCORD
BOW
1192'
White Rock Brook
820'
Magnetic North
Wp 3 B
HI-2B
32ac
(island)
285'
251'
N88°E 574'
S 88°W 660'
67'
147'
Birchdale Road
Birch Tree Ln.
to
Page Road
365'±
231'
3025'
Wetland
43.5ac
748'
168'
655'
Wp3B
HI-2B
20ac
820'±
767'
FOREST TYPE DESIGNATION
Wp - White pine
Hm - Hemlock
Ro - Red oak
Rm - Red maple
Bb - Black birch
Be - Beech
H - Mixed hardwood
1 - Sapling size
2 - Pole size
3 - Sawtimber size
A - Overstocked
B - Adequately stocked
C - Understocked
③ - Stand number
LEGEND
Stone wall
Wire fence
Iron pipe or pin
Stone bound
Cellar hole
Woods road
Trail
Forest type boundary
Stream
Wetland
Vernal pond
Steep or ledge
Slope direction
y Log yard
1" = 400'
0 200 400 800
JANUARY 1997
Forest Type Map
TURREE ISLAND TOWN FOREST
Bow N.H.
Tax map Block 4 Lot 50
95.5 Acres
Note: Boundaries are based on the Bow Tax Map, Plan File 139,189

FOREST TYPES

STAND 1 Wp3B/ H1-2B

Description: The 52 acres of upland contain a scattered an overstory of generally poor quality, sawlog sized white pine with a few oaks and maples above an understory of sapling to poles sized mixed hardwood, primarily black and white birch, red oak and red maple. Pine stems that were damaged by the white pine weevil were not cut during the last harvest causing the dominance of poor quality trees.

Prescription: Whereas the lot has been designated a Natural Area, it will be left undisturbed in its natural state. The forest will continue to develop and as the mixed hardwoods grow into the overstory, the forest will become a mixed pine-oak-birch-maple forest type. Beech, black birch and hemlock will eventually dominate the sites through natural succession if harvesting is prohibited. Wildlife will use both the wetland and upland sites. Evidence of deer, moose, coyote, beaver, and muskrat were observed. Many ducks were observed in the marsh areas. Animal populations will be affected as the habitat changes, but such changes are part of the natural process.

Access to the island is currently available when the marsh is frozen, or during drought periods. Providing easy access to the island will require building a boardwalk over the marsh above the old causeway. However, heavy use by the public will be extremely disturbing to the wildlife populations, especially during nesting periods. It is recommended to leave the area as a wildlife refuge and not to promote use of the site by the general public.

PAGE ROAD LOT
Tax map Block 4 Lot 56
1997

GENERAL DESCRIPTION

This 56.3 acre lot is located on the northeast side of Page Road, about one half mile west of the White Rock Hill Road intersection. It is accessed by a logging road that enters the lot off of Page Road near its eastern boundary and runs in a generally northerly direction about 800 feet to a log yard that services the entire lot. The road continues northerly as a main skid trail and eventually becomes a walking path that crosses the boundary in the northwest corner of the lot. The abutting West Gate Drive development eliminated the trail beyond the boundary and greatly diminished use of the trail. There are three small streams that originate within the lot and one very small wetland area. The lot contains five forest types, though three of the types are small in acreage.

SITE CONDITIONS

The lot is located on the northwest slope of White Rock Hill. Slope conditions run from gentle to steep. Elevations run from a high of 620 feet on the lot's southeast corner along Page Road, down to around 450 feet near Old Coach Road. Most of the lot drains northeasterly to the Turee Marsh area, though a small portion drains southwesterly to White Rock Brook. The entire lot is part of the Turkey River Watershed. Gloucester very stony sandy loam is the dominant the soil type on the lot. It is well drained and considered to be a good growing site for timber, with a slight favor towards beech and hemlock as well as birch and maple. A strip of Acton very stony fine sandy loam runs along Page Road. This soil is moderately well drained and is noted for its hardpan layer and seeps. Pine and hardwoods, especially red maple grow well on Acton soils, though the wetness may restrict logging during the spring and prolonged rain spells.

UNIQUE FEATURES

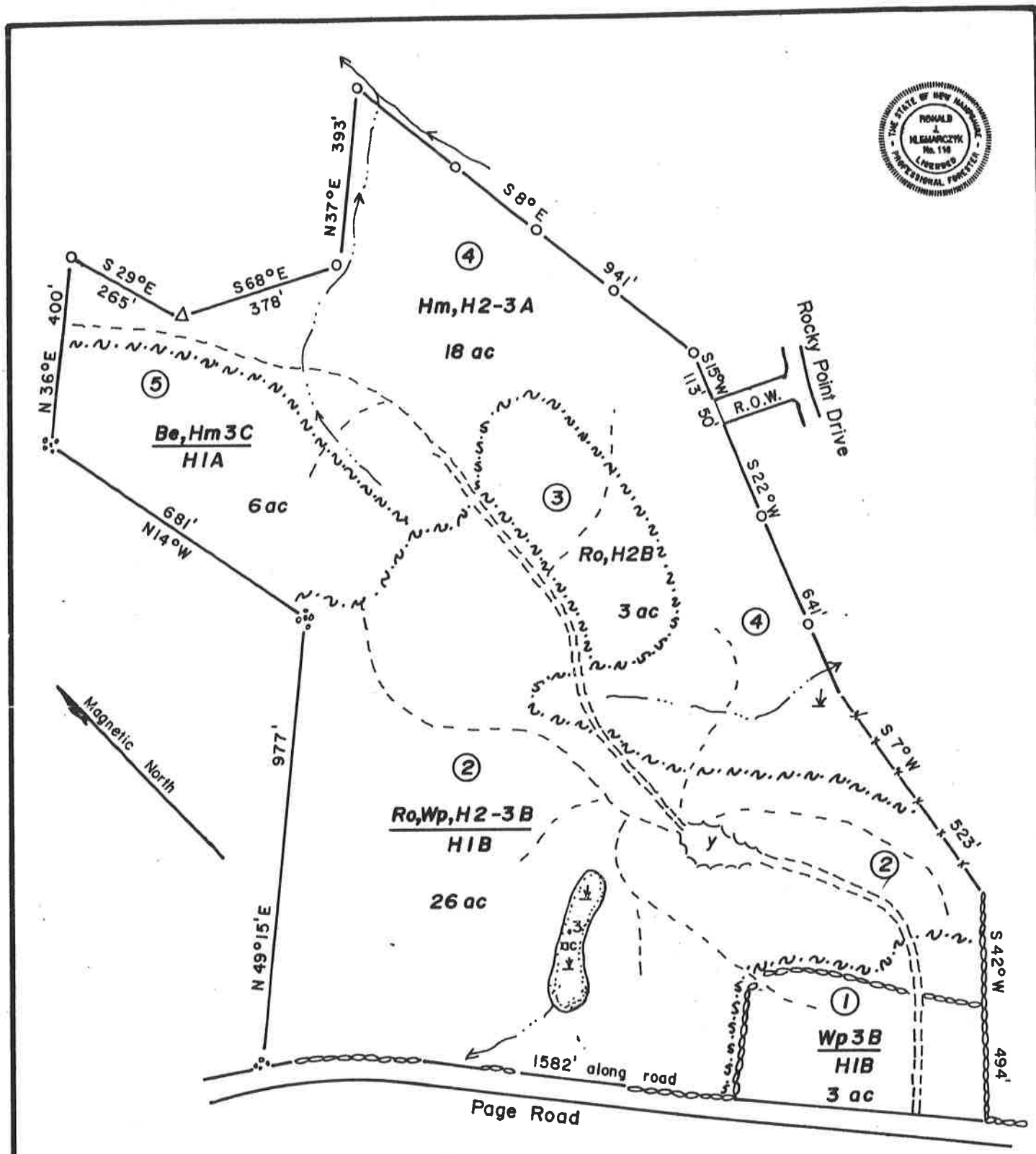
A vista was created in the central part of the lot off of the old woods road as part of the recent timber sale. It looks southwest towards Brown Hill and a few hills in Dunbarton.

BOUNDARY LINE STATUS

The lot was surveyed in 1977 by Ernest Jeffrey of Nashua N.H. Later surveys for the Old Coach Road and West Gate Drive developments showed the northern boundaries to be different from those shown on the Jeffrey survey. The entire boundary had been blazed and painted, including the revised boundaries, but it should be repainted within five years. The forest type map shows the revised boundary.

HISTORY

The entire lot was once cleared for pasture, but that use was abandoned by the mid to late 1800's and it grew in with pine and hemlock. The area shown a Stand 3 blew down in the Hurricane of 1938 but the trees were salvaged and the remaining lot was cut heavily allowing a mixed pine-hardwood forest to develop. The area within the walls in Stand 1 was not abandoned as pasture until the early 1900's, when it too grew in with pine. The entire lot was harvested in 1979 by Dalphond Lumber of Andover N.H. A total of 187,395 bd.ft. of timber was cut, mainly pine, netting the Town $11,964.62. The lot was later harvested in 1994 by Arthur Cutter of Salisbury N.H. A total of 133,445 bd.ft. of sawtimber were cut, including white and red pine, hemlock, black and white birch and red oak, along with firewood, softwood pulp and woodchips, netting the Town $12,605.95.



LEGEND

- Stone wall
- Wire fence
- o Iron pipe or pin
- Stone bound
- Cellar hole
- Woods road
- Trail
- Forest type boundary
- Stream
- Wetland
- Vernal pond
- Steep or ledge
- Slope direction
- y Log yard

FOREST TYPE DESIGNATION

Wp - White pine
Hm - Hemlock
Ro - Red oak
Rm - Red maple
Bb - Black birch
Be - Beech
H - Mixed hardwood

1 - Sapling size
2 - Pole size
3 - Sawtimber size

A - Overstocked
B - Adequately stocked
C - Understocked

(3) - Stand number

Forest Type Map

PAGE ROAD TOWN FOREST

Bow N.H.

Tax map Block 4 Lots 56,57

56.3 Acres

1" = 300'

0 150 300 600

JANUARY 1997

FOREST TYPES

STAND 1 Wp3B/H1B

Description: This 3 acre stand is located along Page Road on either side of the access road. It is dominated by large, sawlog-sized stems of white pine with 90% of the basal area, with red maple making up the other 10%. The 1979 thinning allowed an understory of black birch, red oak, red maple and beech to develop. The 1994 thinning removed the mature trees and the stems that did not respond to the 1979 thinning, leaving the stand occupied with vigorous, high quality trees. Some of the buffer zone trees along the access road had to be cut in the 1994 harvest to allow the passage of tractor-trailer trucks hauling woodchips.

Prescription: With a basal area of 100 square feet and 79 trees per acre, the stand can be considered adequately stocked, despite two previous thinnings. The hardwood understory will continue to develop, and will start to reach up into the overstory around 2015. The pine overstory should be thinned again in 2015 to 2020, where 50 to 60% of the stems should be cut to fully release the hardwoods. A final overstory removal could be expected in 15 years after the next harvest. The next two harvests will tend to thin the hardwood understory, so little work will be needed on those stems other than to protect them during the logging activity. Some of the large pines should be left to grow along the access road for aesthetic reasons. Because of the stand's small size, it will have to managed in conjunction with Stand 2, and will eventually be absorbed by that stand.

STAND 2 Ro,Wp,H2-3B/H1A

Description: This 26 acre stand is the largest forest type on the lot and occupies the southwestern half of the property. It contains the log yard that services the entire lot and also a small wetland near Page Road. The stand is quite mixed with white pine, red oak and red maple each containing 25% of the basal area. A scattering of red pine, hemlock, white birch, black birch and beech make up the rest. Most of the trees are pole to sawlog in size. The sawtimber sized stems are generally good in quality, though about 40 to 50% of the smaller pole sized stems would be considered fair to poor in quality. The 1979 harvest allowed a mixed hardwood understory to develop that is slightly dominated by beech but also includes red oak, black birch, white ash and some scattered white pine.

Prescription: With a basal area of 67 square feet and 124 trees per acre, the stand is at t he low end of adequate stocking, though this is to be expected right after a second thinning in this type of a forest. The understory and pole sized stems will continue to develop and another thinning could be expected in 2015 to 2020 to harvest the mature stems and the poor quality hardwood stems that were too small to cut in the first two thinnings. This harvest will release the understory for rapid development, but will create an even more mixed stand in size class and species composition. Future thinnings will follow the same general pattern, depending on the adequate development of the understory stems.

STAND 3 Ro,H2B

Description: This 3 acre stand is located in the center of the lot and appears to have developed after the trees that had previously occupied the site blew down in the Hurricane of 1938. The trees were salvaged and the area was used as the log yard. Red oak and beech dominate the stand with each having 42% of the basal area. Red maple makes up 14%, with a scattering of white and black birch. The stems are mainly pole sized and are generally good in quality.

Prescription: With a basal area of 70 square feet and 312 trees per acre, the stand would be considered adequately stocked and in no immediate need of a thinning. If the stand continues to develop at it's present rate, it will probably need to be thinned in 2015 to 2020, where the poor quality stems could be removed for firewood. Due to the small size of the stand, it will have to be managed in conjunction with Stand 2, and will eventually be absorbed by that stand.

STAND 4 Hm,H 2-3 A

Description: This 18 acre stand is located along the northeastern boundary adjacent to the housing developments. It contains two streams that feed into a larger one that runs along the boundary line. Portions of the stand were lightly thinned in the 1994 harvest, while areas along the backyards and the streams were designated as buffer zones and were left uncut. Hemlock dominates the type with 50% of the basal area, followed by red maple with 18%, black birch with 15%, and a scattering of white pine, white birch and red oak. Regeneration was minimal, and limited to hemlock found only in areas that were cut.

Prescription: With a basal area of 142 square feet and 291 trees per acre, the stand can be considered overstocked. The overstocked areas are found mostly in the buffer zones which will continue to be left uncut. The forest management areas will need another selective thinning in 2015 to 2020 to remove the mature trees and the poor quality trees that were too small to cut in the 1994 harvest. Although hemlock is a preferred wildlife cover, the close proximity to the houses seems to have discouraged wildlife use. Hemlock will continue to regenerate and it will start to fill in the understory which may encourage future use by wildlife. Future harvest will follow the same pattern of removing mature trees and poor quality young trees, depending on the development of adequate hemlock regeneration. No more than 30% of the basal area should be cut at any one time.

STAND 5 Be,Hm3C/H1A

Description: This 6 acre stand is located in the northwestern tip of the lot. It was dominated by large, mature trees that were heavily cut in 1979 using a shelterwood prescription allowing an understory of beech, hemlock and birch to become established. The few large pines that were left from the 1979 harvest were cut in 1994. The two cuts created a stand with a scattered overstory dominated by beech with 50%, followed by hemlock and black birch with 20% each, and white pine with 10%. Most of the overstory stems are generally good in quality, though nearing maturity.

Prescription: With a basal area of only 50 square feet and 50 trees per acre, the stand can be considered understocked. The heavy cut cuts were intentional to establish regeneration. The overstory trees are mature, and the regeneration is well established, so the overstory should be totally removed in 2015 to 2020 to completely release the regeneration and allow it to develop into a new forest. The overstory removal will thin out some of the regeneration, so a thinning in the regenerated stand will not be needed for at least another 20 years. Due to its small acreage, it will have to be harvested in conjunction with Stand 2 and will eventually be absorbed by that stand.

Other considerations

As the housing developments continue to surround the lot, the forest will become more important as an open space buffer and a place for short walks. Some of the skid trails could be improved for hiking purposes and a small loop could be laid out to include the vista. The vista area will need periodic clearing to maintain the view. The logging access road may also need periodic clearing to prevent it from growing in. The log yard should be maintained in the shrub stage for wildlife habitat purposes.

Town of Bow
PAGE ROAD LOT
Apr-07

TOTAL OPERABLE VOLUMES

Species/Product	Stand 1 Wp3B/H1B 3 ac.	Stand 2 RoWpH2-3B/H1A 26 ac.	Stand 3 Ro,H 2 B 3 ac.	Stand 4 Hm,H2-3A 18 ac.	Stand 5 BeHm3C/H1A 6 ac.	TOTAL
White pine	48,000	42,000	0	3,000	5,000	98,000
White pine #4	0	1,000	0	0	0	1,000
Red pine	0	5,000	0	0	0	5,000
Hemlock	0	1,000	0	72,000	5,000	78,000
Red oak	0	24,000	1,000	8,000	0	33,000
Red maple	0	1,000	0	2,000	0	3,000
White birch	0	0	0	3,000	0	3,000
Black birch	0	3,000	0	8,000	0	11,000
Beech	0	0	0	0	9,000	9,000
Hardwood pallet	0	9,000	0	2,000	7,000	18,000
TOTAL Bd.Ft.	48,000	86,000	1,000	98,000	26,000	259,000
Sftwd Pulp-cds.	5	60	0	150	5	220
Hdwd Pulp-cds.	5	205	45	215	20	490

HANSON PARK
Tax map Block 4 Lot 77
2009

GENERAL DESCRIPTION

This 150 acre lot is located on the southwest side of Albin Road, about 3/4 of a mile west of Logging Hill Road. It is the site of the Town's premier ball-field complex which incorporates 16 acres and is heavily used for recreational purposes. Of the remaining acreage, 96 acres are Prime Wetlands that adjoin Turee Pond and 44 acres are forest land. Based on the original Master Plan for Hanson Park, 30 acres of the forest land are considered a permanent "Buffer Zone" where no cutting was allowed, leaving only 14 acres as manageable forest land. The 14 acre forest management zone is accessed through the two driveway-parking lot areas.

SITE CONDITIONS

The 14 acre forest management zone is located between the wetlands and the upper ball fields and is moderately sloped with elevations running from 340 feet in the wetlands up to 400 feet on the upper ball fields. It has a southwest exposure and is part of the Turkey River watershed. The upper parts of the slope contain Gloucester very stony sandy loam, while the lower sections contain Acton very stony fine sandy loam. Both soils are considered good growing sites for red maple, white birch, yellow birch, and beech. The Acton soil is slightly wetter due to the adjacent wetland and will tend to favor red maple.

UNIQUE FEATURES

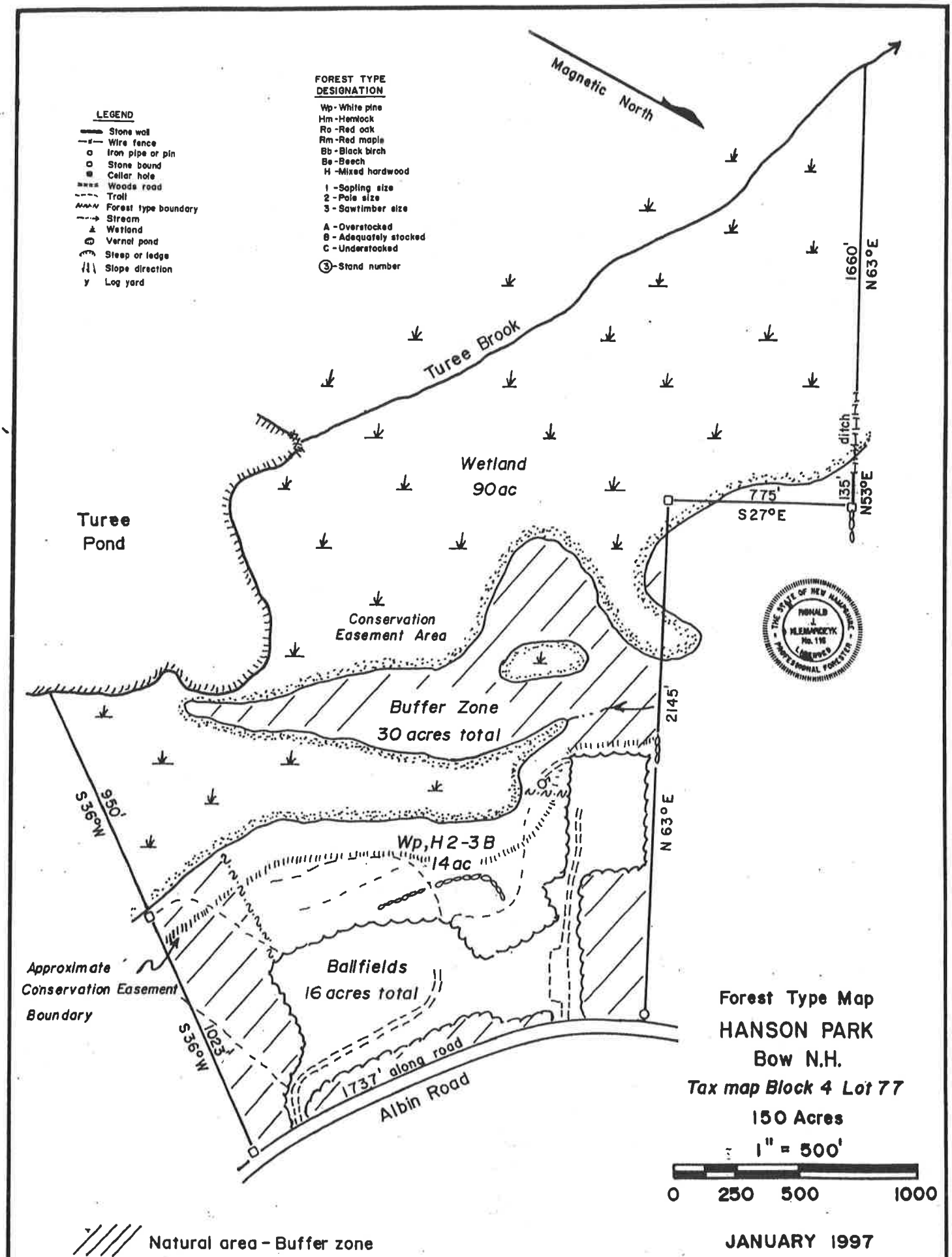
The ball fields are the dominant feature of the lot. There were a few old springs that have been dug out at the base of the slope near the well that was dug in 1996. Other natural features include the extensive wetland areas. Turee Pond can be reached via a narrow strip of land that runs through the wetland area. This strip of land was once a glacial esker but was mined for its gravel many years ago. The southwestern boundary is made up in part of an old drainage ditch. The ditch was probably put in as part of a marsh grass haying operation. A tumbled stone wall at the top of the slope marked the edge of the former cropland area.

BOUNDARY LINE STATUS

The property was surveyed by Bellantone, Foote and Howard Inc. in 1979. All boundaries were blazed and painted yellow, but the paint has faded and needs to be re-painted. The Town also owns Lot 76 which abuts the southeast corner of the lot, but is entirely wetland and is not part of this management plan.

HISTORY

As with the other Town Forests, this parcel was at one time used for agriculture. The natural marsh grass was an important source of hay for the first settlers until forests were converted to hayfields and pasture. The marsh grass was then abandoned for the easier to work dry land. The ball fields occupy the area that was used for cropland. The forest management zone was used for hay and pasture, though the use was abandoned in the early to mid 1900's. Due to the occasional wetness, the area grew in with pine and red maple which was selectively thinned in 1996 by Arthur Cutter of Salisbury N.H. A total of 43,915 bd.ft. of timber, 7 cords of firewood and 249 tons of woodchips were harvested, netting the Town $2,578.07. Some of the buffer zone areas were lightly thinned by C&C Chipping in 2008 to encourage a thicker understory and trees along the ballfields were cut back to improve the lawn care. A total of 42,080 Board feet of pine sawtimber and 1,380 of hardwood pallet w3ere cut along with 322 tons of chips.


LEGEND
Stone wall
Wire fence
Iron pipe or pin
Stone bound
Cellar hole
Woods road
Trail
Forest type boundary
Stream
Wetland
Vernal pond
Steep or ledge
Slope direction
y Log yard
FOREST TYPE DESIGNATION
Wp - White pine
Hm - Hemlock
Ro - Red oak
Rm - Red maple
Bb - Black birch
Be - Beech
H - Mixed hardwood
1 - Sapling size
2 - Pole size
3 - Sawtimber size
A - Overstocked
B - Adequately stocked
C - Understocked
(3) - Stand number
Magnetic North
Turee Brook
Turee Pond
Wetland 90ac
ditch
1660'
N 63°E
135'
N 53°E
775'
S 27°E
Conservation Easement Area
Buffer Zone 30 acres total
2145'
N 63°E
950'
S 36°W
Wp, H 2-3 B 14 ac
Ballfields 16 acres total
Approximate Conservation Easement Boundary
1023'
S 36°W
1737' along road
Albin Road
Natural area - Buffer zone
Forest Type Map
HANSON PARK
Bow N.H.
Tax map Block 4 Lot 77
150 Acres
1" = 500'
0 250 500 1000
JANUARY 1997

FOREST TYPES

STAND 1 Wp,H2-3B

Description: This 14 acre stand is located between the wetland and ball field area in about the center of the lot. It is dominated by white pine with 60% of the basal area, followed by white oak at 17%, red maple at 14% and a scattering of red oak and aspen, all in the pole and sawlog size classes. Regeneration was limited to scattered red maple and red oak. Most of the poor quality stems were removed in the 1996 harvest, so the general quality would be described as good. The only the trees that were cut from this stand were located along the edge of the ballfields.

Prescription: With a basal area of 95 square feet and 127 trees per acre, the stand can be considered adequately stocked and due to the recent harvest, will probably not need to be thinned until 2020. At that time, any poor quality trees left for "spacers" and mature stems should be harvested to avoid possible deterioration. This second cut will also release the regeneration that is developing from the first thinning. If future ball field expansion reduces the acreage of the stand as has been mentioned, it may no longer be commercially feasible to harvest unless some of the designated buffer zones are included. The third harvest will depend on the development of the regeneration and the availability of sufficient volumes.

Other Considerations

Future ball field expansion may eliminate much of the forest management zone, thereby eliminating this tract from the Town Forest system. However, the wetland area is a prime wetland and should be protected during any construction and field maintenance activity. Fertilizer run-off is a major pollutant from manicured lawns. Any septic systems servicing bathroom facilities should be well maintained and pumped regularly.

According to the present Master Plan for Hanson Park, the buffer zone areas were to be left in their natural state. However, the pines in the buffer zones had grown too tall to act as a buffer, so they were thinned to encourage the development of a thick understory which will hopefully re-create the buffering capacity. Whereas hazard trees and trees that were shading the fields were also cut at the same time, there is little work that will be needed in those areas for many years. If the Master plan is ever updated, attention should be given to developing a management plan for the buffer zones as the forests within the zones area always changing as the trees mature.

BOW TOWN FOREST
HANSON PARK

TOTAL OPERABLE VOLUME
2009

Species/Product	Stand 1 Wp,H2-3B 14 ac.
White pine	58,000 Bd.Ft.
White pine #4	2,000 "
Aspen	1,000 "
Red oak	2,000 "
White oak	5,000 "
Pallet	4,000 "
TOTAL SAWLOG	72,000 Bd.Ft.
Softwood pulp	40 cords
Hardwood pulp	75 cords

WALKER LOT
Tax map Block 4 Lots 116,118,119,120,121
2009

GENERAL DESCRIPTION

This 207.6 acre lot is located on the southwest side of the Class 6 section of the Branch Londonderry Turnpike-West, about ½ mile east of Page Road. Although the Town maintained section of the road ends just west of the lot, the road is passable to a point 1,800 feet east of the maintained section where beaver activity occasionally floods the road. The lot can be approached from the east on the Branch Londonderry Turnpike, but several culverts must be installed to make the road usable for log truck traffic. Almost all of the road improvements performed on the Turnpike to service the last harvest have been impacted by either four-wheel drive vehicles, or by the beavers. The skid trail system in the lot can be re-routed to the log yard found just west of the beaver pond and will eliminate the need to upgrade the eastern sections of the Turnpike. There is an old hiking trail found in the western portion of the lot, though the abutting Birchwood Hills Development has interrupted its use. That Development, along with the Van Ger Drive Subdivision provided access routes to the Town Forest. Unfortunately, the terrain of the Town Forest to those points will restrict the routes to pedestrian use only.

The lot contains four forest types, White Rock Brook and several of its tributaries, numerous wetlands and two old farmstead sites and is under a Conservation Easement. The wetlands along the Turnpike are considered Prime Wetlands and need a 150 foot protective buffer.

SITE CONDITIONS

The large size of the lot has allowed for a wide variety of topography. Most of the slopes can be described as gentle to moderate, with a few short steep sections found scattered throughout. A few ledge outcrops are located along the western boundary near Van Ger Drive. The lot has a northeasterly exposure and elevations run from 440 feet near the beaver pond up to 700 feet near the ledge outcrops. Gloucester extremely stony sandy loam dominates the soil type, with some Gloucester very stony sandy loam found in the southeastern corner between the large beaver pond and the Turnpike. The Gloucester soils are considered a good forest soil that favor hardwoods, especially beech and red maple. Upper portions of the slopes, especially near the ledge outcrops, have a shallower soil and trees growing there may be affected by prolonged drought conditions. Hemlock is often found in the moist sites at the base of slopes. Muck and peat soils are found in the beaver ponds with Ridgebury-Whitman soils found along the streams and drainage ways. Both are wetland soils and are not productive timber growing sites, but do provide good wildlife habitat and buffering such areas will provide some watershed protection. Numerous vernal pools are found scattered throughout and the larger ones were mapped when encountered. One pool was found to contain some Black gum trees which typically indicate an old but stable micro-ecosystem. A "lateral" esker was found in the southwest corner of the lot and is also shown on the map. In general, the numerous streams, wetlands and slopes will make this lot somewhat difficult to operate. Permanent skid trails should be carefully laid out to minimize environmental impacts and some areas may need to be avoided altogether.

UNIQUE FEATURES

There are several natural and man-made features of note on this lot. Two cellar holes were found on this lot. Both are small and do not appear to have barn foundations indicating that they may never have developed into large working farms. One of the tributaries to White Rock Brook that runs along the eastern portion of the Turnpike was re-routed to stay on the western side of the road. A water powered mill site is located on the east side of the Turnpike across from the lot, but is on

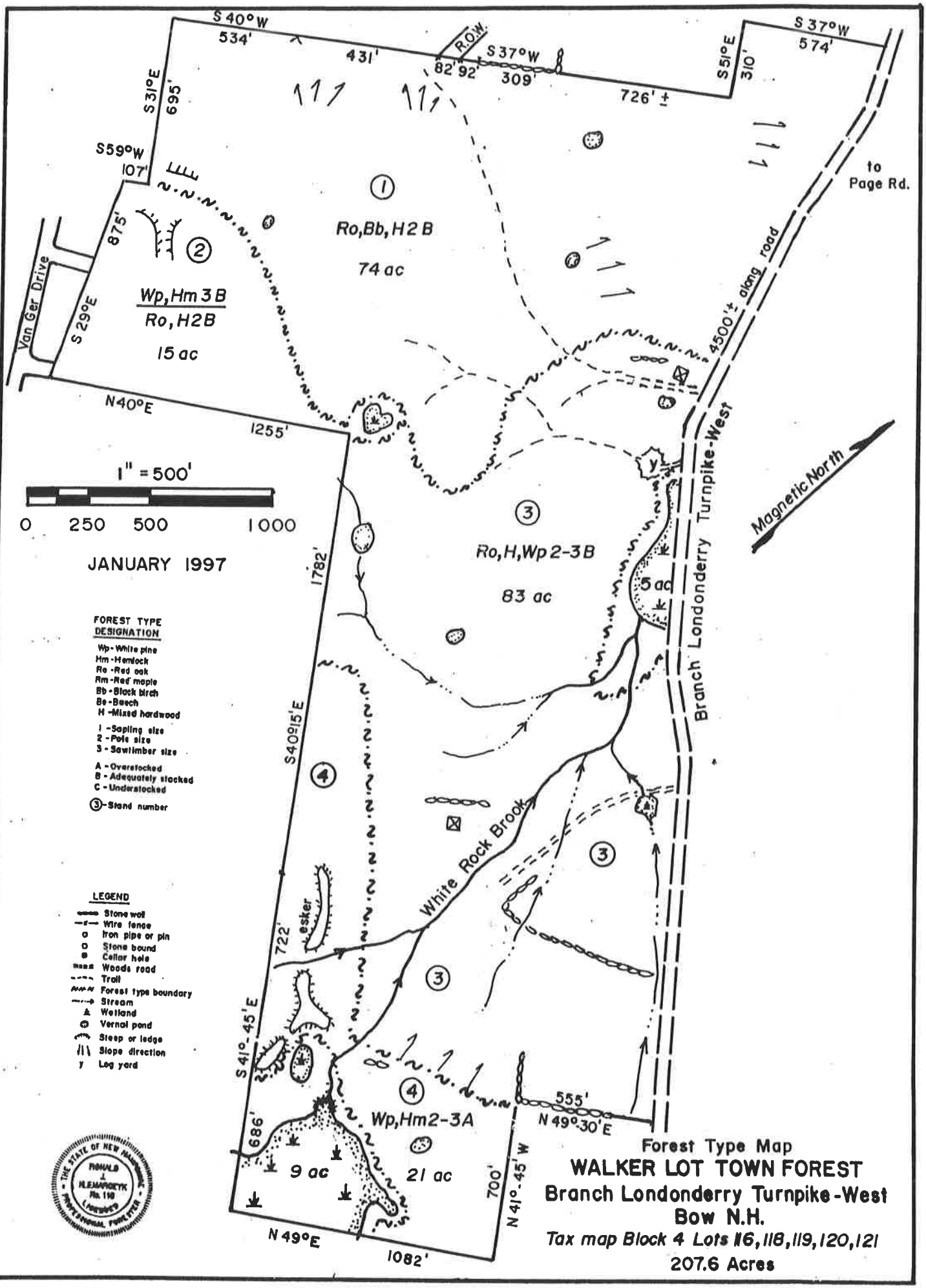
private property. The vernal pools, beaver ponds and the esker are interesting natural features that should be protected. The pools are critical habitats for many amphibian species. The small Black gum swamp is a very unique forest type and indicates that the site has not been disturbed for many years. It should also be protected with adequate buffer zones. There may be some potential vistas near the ledge outcrops, but will require extensive cutting to open up the views.

BOUNDARY LINE STATUS

The lot was supposedly surveyed in 1976 by Jim Niel of Claremont N.H. and Morris Foote of Bow. A map was drawn and recorded at the Merrimack County Registry of Deeds, though bearings and distances are missing on some of the lines. The boundaries were then blazed and painted, but the location of the southeastern property lines were disputed by the abutter, Roy Person. In 1992, the Bow Selectmen hired John Morse of Wilmot to determine the correct line. After extensive research, Mr. Morse re-surveyed the area in question and recorded his map showing what he believed to be the correct boundary. This line was also disputed by Mr. Person who then hired Hank Amsden to survey the property. Mr. Person did not agree with Mr. Amsden and refused to provide the Town with a final version of Hank Amsden's survey. The Town then hired FORECO to do some research to see who was right. The resulting report can be found in the Town Managers office. According to Hank Amsden, the FORECO findings matched his findings, except that FORECO used an old barbed wire fence as the physical evidence of the boundary, while Hank Amsden felt that Mr. Person's lot contains ten acres, as called for in his deed. Mr. Person has since passed away and his heirs should be contacted to resolve the issue. Once a boundary is agreed upon, it should be blazed and painted. The boundaries on the rest of the Walker Lot should also be repainted at that time.

HISTORY

The lot's history is primarily based on site conditions. Most of the lot was cleared for agriculture when the area was settled in the mid 1700's. At least two farmsteads were established, though only a small portion of the lots were suitable for growing crops. Scattered stone piles around the cellar holes show the extent of the cropland. Most of the land was used for pasture, probably by abutters. A water powered mill was constructed on the northeast side of the Turnpike and the 1858 Merrimack County Map shows it listed as "Morgan's Sawmill" with "J.T. Morgan" shown living in the homesite now found on the Town forest. It can be assumed that Mr. Morgan gave up farming and focused on "industry" and that some of the lot was probably not cleared and was used as a permanent woodlot. The mill and homesite were abandoned by the late 1800's as was all pasture use except for the area east of the large beaver pond at the southern end of the lot which was not abandoned until the early 1900's. Pine grew into the abandoned pastures, while hemlocks and hardwoods continued to grow in the areas used for woodlots. The property was bought by Concord Lumber and periodically logged over the years creating the mixed forest currently found there. After the Town bought the lot in the 1970's, the central portion was logged in 1978 by Pittsfield Box Company of Pittsfield N.H. The harvest yielded 398,962 board feet of sawtimber, mainly white pine, and netted the Town $34,370.77. Gypsy moth defoliations in 1980 and 1990 killed many oaks found on the drier slopes in the northwest part of the lot. The lot was agin logged in 2000 by Jeff Eames of J.C. Eames Timber Harvesters of Epsom, N.H. which produced 174,925 board feet of sawtimber, mostly white pine, red oak, hemlock and red pin along with 77 tons of pine pulp and 40 cords of hardwood pulp which netted the Town $28,932.14.



Forest Type Map

WALKER LOT TOWN FOREST

Branch Londonderry Turnpike-West

Bow N.H.

Tax map Block 4 Lots 116, 118, 119, 120, 121

207.6 Acres

FOREST TYPES

STAND 1 Ro,Bb,H2B

Description: This 74 acre stand occupies the northern third of the lot and is located on a series of slopes and small hills. The stand had developed after the area was clear-cut in the 1950's. It was heavily dominated by red and black oak until the Gypsy Moth defoliations killed a high proportion of them. Red oak still dominates the stand with 32% of the basal area, followed by beech with 16%, hemlock at 12%, aspen and white birch with 11% each, black birch at 8%, and red maple and white pine at 4% each. Stem quality runs the range from good to poor. The majority of the hardwood stems are pole sized, while most of the pine and hemlock stems are sawlog sized and are the remnants of the previous stand, but were too small to cut at the time. Due to the past overstory mortality, a fairly thick understory developed in places and is dominated by beech, with some scattered hemlock and pine.

Prescription: With a basal area of 84 square feet and 258 trees per acre, the stand can be considered adequately stocked. The gypsy moth defoliations effectively "thinned" the stand, though they gave no regards to stem quality. As a result, about half the stocking would be considered poor quality, and will start to compete with the better quality stems in about ten years. Therefore, the stand should be thinned in 2011 to 2015 to remove poor quality hardwood stems that are competing with the high quality stems. This will also release the existing regeneration, though the beech/hemlock species composition is not the most desirable mix of future timber. Thinning the lot on bare ground conditions will cause some scarification and will encourage regeneration of pine, oak and birch. Another thinning will probably be needed in 20 to 30 years after the next harvest to remove the mature stems and to fully release the areas with a heavy understory. Future harvests will continue to follow the same pattern and will tend to create a very mixed, un-evenaged forest that is preferred by wildlife.

STAND 2 Wp,Hm3B/Ro,H2B

Description: This 15 acre stand is located on the hill summit in the western part of the lot along the Van Ger Drive development. It had a similar history to that of Stand 3, but was not included with the 1978 harvest. The southeastern half of the Stand was lightly thinned during the 2000 harvest where the poorer quality white pine and the more mature hemlock and red oaks were cut. White pine sawlog-sized timber slightly dominates the basal area of the overstory, followed by hemlock. Red oak has almost 50% of the total basal area but consists mainly of pole sized stems that grew in the openings that were created when the stand was logged in the 1950's. Regeneration includes beech, hemlock and some pine. The stand contains some ledge outcrops and the shallow soil conditions have resulted in the development of some poor quality pine and hemlock stems. Whereas the access routes from Van Ger Drive adjoin the stand, the area has the potential for recreational use if a vista area can be found and opened up as part of a timber sale. The ledge outcrops are not very large, but would offer a place of adventure for younger children.

Prescription: Whereas the more operable portions of the Stand were thinned in 2000, another thinning will be needed around 2015 to 2020 to harvest the trees that have matured as well as to release any regeneration that may have developed after the 2000 harvest, though it may still need to be tied in with the harvest of Stand 3. Poor quality hardwoods stems that were too small to cut in 2000 could also be harvested for firewood at that time. The terrain is somewhat rugged in the area near Van Ger Drive, but is heavily used by the children in that area. Because there are views from other areas along Van Ger Drive, attempts should be made to open up a view near the ledges within the Stand. If a vista is found and opened up with a small clear-cut, the area above the clear-cut should be left uncut, except to remove small trees, shrubs and limbs that may obstruct the view. A third harvest to totally remove the overstory, excepting in any recreational areas, could be expected in 15 to 20 years after the second cut.

STAND 3 Ro,H,Wp2-3B

Description: This 83 acre Stand is located in the center of the lot between the Turnpike and the western boundary. It contains the old cellar holes, the log yard sites and the majority of the streams and drainages. The stand is somewhat flat as compared to Stands 1 and 2 and was logged in 1978 and 2000. The forest is made up of a fairly even mix of Red oak and hemlock, followed by white pine and beech, with a scattering of black birch, white birch, yellow birch and red pine. Regeneration is dominated by beech, with a scattering of hemlock and some white pine. Areas that were cut somewhat heavy in the past have heavier amounts of regeneration. Because the stand has been harvested several times over the last century and contains a wide variety of site conditions, it is quite mixed in size and age classes. The 1978 harvest removed most of the poor quality stems and left the better quality stems to avoid over-cutting the stand, even though the trees were mature. Most of those stems were then cut in2000. As a result, the forest now contains a mix of pole and small-sawlog sized trees that range in quality from fair to good. A few small areas were patch cut to encourage wildlife browse.

Prescription: Whereas the Stand was thinned in 2000, it will probably need to be thinned around the year 2020 to remove the poorer quality trees that were too small to cut in 2000 as well as some matured hemlocks and oaks. If beech is still dominant in the regeneration, the lot should be cut on bare ground to encourage soil scarification. Larger patch cuts could be laid out to encourage Stand diversity as well as to provide additional browse for wildlife. Some of the large pines should also be left for diversity as well as to act as a seed source. The 2020 harvest should start to create a very diverse forest and future thinnings will depend on the growth response of the trees to the thinnings as well as development of the regeneration. Buffer zones will need to be established along the streams, wetlands and cellar holes. The small Black gum swamp is located adjacent to the property corner where Stands 1,2 and 3 converge and will need extra protection.

STAND 4

Description: The area shown as Stand 4 was the area in dispute with Mr. Person. Whereas FORECO deed research indicated that it belonged to Mr. Person, he essentially clear-cut it.

Prescription: Develop a Boundary Line Agreement with the Person heirs.

Other considerations

A hiking trail system should be developed connecting the access routes from Van Ger Drive and Austin Drive to the Branch Londonderry Turnpike that will pass by at least one of the cellar holes. A picnic area could be developed off of Van Ger Drive if a vista can be created. A trail should also be developed within the lot to bypass the Turnpike where the roadbed is continuously flooded by beaver activity. The trail could then be extended to run past the second cellar hole and into the old growth forest and onto the esker in Stand 4 before returning to the Turnpike. Allowing the section of the Turnpike to remain flooded will discourage through traffic between Bow Center and Page Road. The black gum swamp is a unique ecosystem that should be protected. Although such areas are not rare in the State, it is the only one found in the Town Forest system. Due to its wetland nature, it is easily disturbed and should not be promoted to the general public.

Town of Bow
WALKER LOT

TOTAL OPERABLE VOLUMES
April 2007

Species/Product	Stand 1 Ro,Bb,H2B 74 ac.	Stand 2 WpHm3B/RoH2B 15 ac.	Stand 3 Ro,H,Wp2-3B 83 ac.	Stand 4 Wp,Hm2-3A 21 ac.	Total Volume
White pine	16,000	35,000	70,000	90,000	211,000Bd.Ft.
White pine #4	0	0	0	4,000	4,000
Red pine	0	0	2,000	46,000	48,000
Hemlock	23,000	0	75,000	63,000	161,000
Red maple	0	0	8,000	0	8,000
Aspen	57,000	0	0	0	57,000
Black birch	0	0	2,000	2,000	4,000
Beech	0	0	6,000	0	6,000
Red oak	25,000	2,000	90,000	11,000	128,000
White oak	0	0	2,000	0	2,000
Hardwood pallet	9,000	1,000	34,000	0	44,000
TOTAL SAWLOG	130,000	38,000	289,000	216,000	673,000Bd.Ft.
Softwood pulp	115	45	305	170	635 cords
Hardwood pulp	915	190	635	150	1,890 cords

HAMMOND NATURE PRESERVE

Tax map Block 4 Lots 102,103,105

2009

GENERAL DESCRIPTION

This 143.52 acre lot is located about ½ mile southwest of the old Bow Center along the northwest side of the Dunbarton Center Road, with a small piece of road frontage on the northeast side of Brown Hill Road. The majority of the lot is accessed by a woods road that starts as a right-of-way over a now privately-owned driveway that services the former Hammond homestead. After crossing over the driveway, the road then passes through a hayfield before entering the forest. Pipes from a septic system now pass under the driveway, so driving log trucks on that route will not only risk damaging the driveway's pavement, but may also impact the septic system. A log yard was built at the end of the woods road near the center of the property in 2000 and services most of the lot. The lot contains four forest types that total 95 acres. A parking lot was built at the site of the old barn for hikers and some trails were constructed by volunteers in the lat 2000's. There is one major wetland and two minor wetlands that total 41 acres and a 7.52 acre hayfield. With the exception of 7.72 acres along Dunbarton Center Road, the property is covered by a deed restriction which limits the property to preservation, conservation, recreational and educational uses.

SITE CONDITIONS

The lot can generally be described as hilly, with slopes running from gentle to severe. Elevations run from 810 feet on the hill in the center of the lot, down to 630 feet in the wetland in the lot's northeast corner back up to 800 feet on Brown Hill Road. It has a northeastern exposure (except for some of the slopes that run into the large wetland) and is part of the headwater watershed of White Rock Brook that flows into Turree Brook just up from Turkey Pond which eventually drains into the Merrimack River via the Turkey River. The large wetland runs along the lot's southwestern boundary but can be driven around for logging purposes. The steep slope downstream from the outflow of the large wetland has created a waterfall that is impressive in high water.

The soils southeast and west to northwest of the large wetland contains the Chatfield soil complex which is extremely variable. Areas with shallow to bedrock soil conditions are poor growing sites while areas with deeper soils between ledges would be considered productive sites that favor both red oak and white pine. The hill in the center of the lot that includes the log yard and hayfield contains Montauk soil which is considered a very productive forest soil, especially for pine and oak. There is an area of the Scituate-Newfields soil complex located just to the north-northeast of the large wetland at the base of the hill. It tends to have a high water table that reduces productivity, but contains drier knolls which are somewhat better growing sites. The area along the stream as well as the wetland area in the northeast corner of the lot contains the Ridgebury-Whitman soil which is a wetland soil which can support trees such as red maple, but is very difficult to log due to the wetness so should be avoided. The large wetland area contains the submerged Ossipee and Greenwood soils which are too wet to support any type of commercial timber.

UNIQUE FEATURES

Before being sold to the Town, parts of the property had been in the Hammond family for over 200 years. There family cemetery is located behind the old family homestead adjacent to the hayfield. There are two fieldstone cellar holes found on the lot, with the eastern-most cellar hole being much older than the cellar located just north of the log yard in the center of the lot. An old stone-lined well is located just west of the hayfield. There are a series of stone piles found in the northwest corner of the lot. Such stone piles are usually the result of land being cleared for agriculture, though according to Paul Hammond, a local legend claims that the area is haunted.

BOUNDARY LINE STATUS

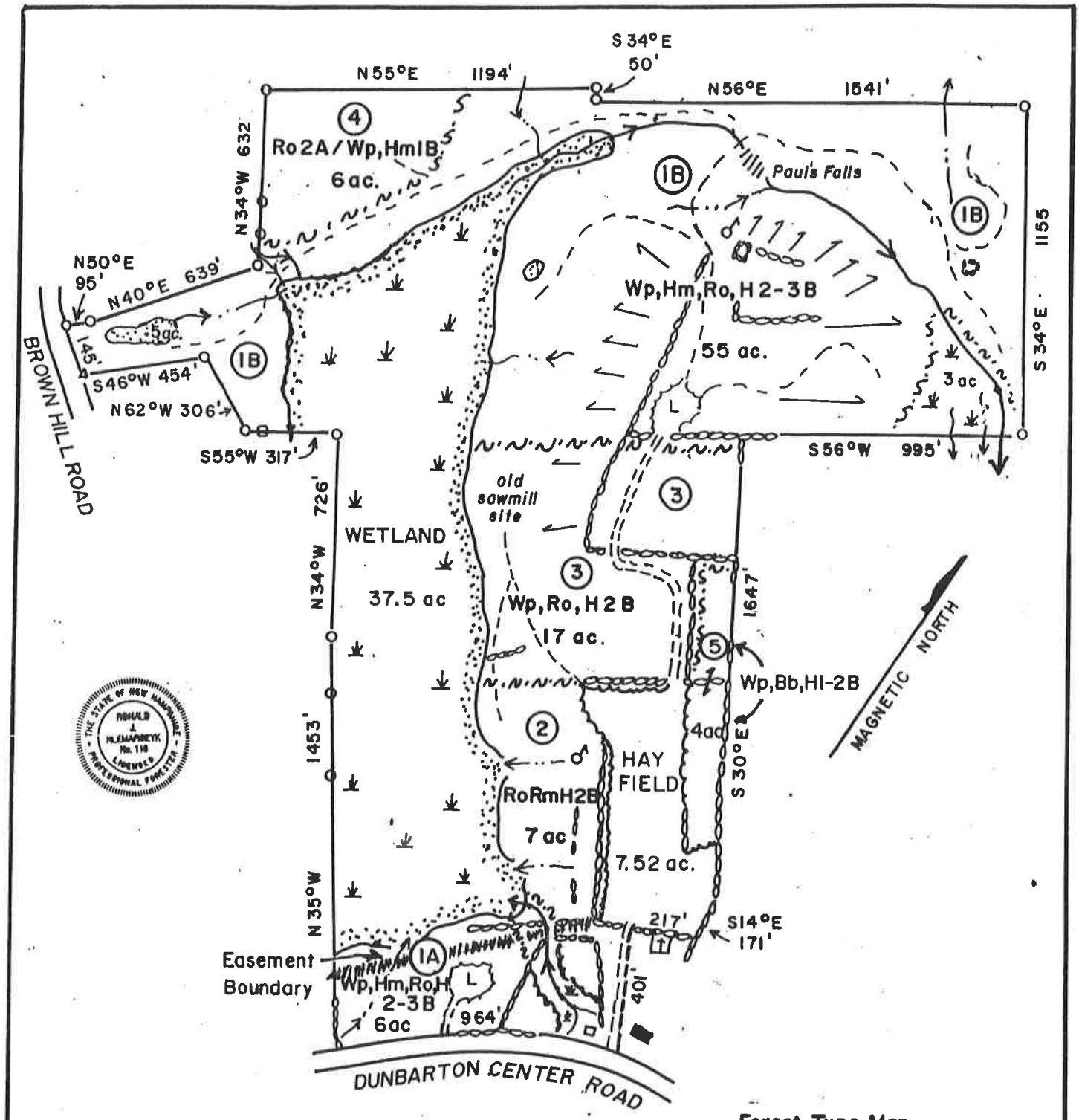
The entire lot was surveyed in 2006 by Eric C. Mitchell & Associates of Bow. Portions of the boundary consists of stone walls and wire fence. Parts of the boundary have been flagged and blazed and/or painted by abutters. It is recommended to blaze and paint the entire boundary in a consistent manner and color before any initiating any forest management activities.

HISTORY

As with most of the land around Bow Center, the lot was totally cleared in colonial times and used for agriculture. Based on the two cellar holes and the still standing former Hammond homestead, the property supported three farmsteads, though it appears that the dwelling located in the northeastern corner of the lot was abandoned in the early 1800's as it does not show on the 1858 Merrimack County Map. The two houses also show up on the 1892 version of the County map. Early agricultural use focused on growing both hay and food. Most flat and gently sloped upland sites were used to grow crops, while the steeper sites were used to grow hay and if rocky, were used for pasture. Marsh grass was cut in the wetland areas to supplement the hay crops. The stone piles in the northeast corner of the lot show a vigorous, but eventually futile attempt to turn some of that site into cropland for the homestead in that area. Thomas Hammond bought three tracts that make up the northern portion of the lot in the late 1840's from Frederick Clough, Moss Colby and the heirs of Moses Hill. Thomas Hammond's son moved to the homestead in the center of the lot, combining the three farm lots in that area, though most of the land was probably used just for pasture.

Based on tree growth, most of the pasture was abandoned in the mid to late 1800's when the mid-western United States was opened to farming and grew in with white pine. Most of those pines were cut in the early 1900's which created a very mixed pine-hemlock-hardwood forest that was selectively logged in 2000 of which 44,000 bd.ft. of white pine; 21,000 bd.ft. of hemlock; 15,000 bd.ft. of red oak; 12,000 bd. Ft. of hardwood pallet; and 525 tons of pine, hemlock and hardwood pulp were cut. The area west and northwest of the present hayfield was abandoned as farmland in the very early 1900's and also grew in with white pine. That area was clear-cut in the 1950's and the lumber was sawn on site with the use of a portable sawmill. Evidence of the mill site is still visible in the form of a decayed sawdust pile, pieces of the sawdust chute, an old fuel can and pieces of a logging scoot. That area has since grown back with a mixed pine-hardwood forest.

Ron Klemarczyk met with Paul Hammond shortly after the Town acquired the lot in 2007 to talk about the history of the property. Paul said that his brother Willy planted the red pines in Stand 3 in the 1930's as part of a 4-H project and that the family grew potatoes, corn and wheat in the present hayfield, adding that they also harvested marsh grass from the wetland found west of the hayfield. The family also raised chickens and sold both hens and eggs. He related that lightning once struck the chicken coop and killed their horse that was standing nearby. He also mentioned that the family had an apple orchard around the hayfield and that trout were regularly caught in the brook found in the northern part of the lot. When asked about the old well found west of the hayfield, he stated that it was used mainly for the cattle, but was occasionally used by the family for their water needs.



FOREST TYPE DESIGNATION

Wp - White pine
Hm - Hemlock
Ro - Red oak
Rm - Red maple
Bb - Black birch
Be - Beech
H - Mixed hardwood

1 - Sapling size
2 - Pole size
3 - Sawtimber size

A - Overstocked
B - Adequately stocked
C - Understocked

(3) - Stand number

LEGEND

- Stone wall
- Wire fence
- Iron pipe or pin
- Stone bound
- Cellar hole
- Woods road
- Trail
- Forest type boundary
- Stream
- Wetland
- Vernal pond
- Steep or ledge
- Slope direction
- y Log yard

Forest Type Map

HAMMOND NATURE PRESERVE

Bow N.H.

Tax map Block 4 Lots 102, 103, 105

143.52 Acres

1" = 500'

0 500 1000

MAY 2007

FOREST TYPES

STAND 1 Wp,Hm,Ro,H 2-3 B

Description: This 61 acre stand contains 2 Units, with Unit 1A containing 6 acres and is located along Dunbarton Center Road, the remaining 55 acres in Unit 1B are located in the northern part of the property. Unit 1A contains a small log yard from when that section was logged in 2000, but is not covered by a Conservation Easement and despite containing some ledge outcrops, can be developed for other uses by the Town. Unit 1B contains several wetlands and vernal pools, two fieldstone cellar hole complexes, a log yard and a stream that is a major tributary to White Rock Brook that contains a nice waterfall in periods of high water. The entire Stand was harvested in 2000 and because a forester was involved, it was a selective harvest, with the focus on cutting the mature and poor quality stems. There is a steep slope on the east side of the log yard that provided a good view of points north and east after the Stand was logged, but has all but grown in. Due to the past harvest and variety of site conditions, the forest is quite mixed in species and size classes. White pine and red oak each make up 28% of the Basal Area, followed by hemlock at 21%, with a scattering of red pine, red maple, white birch, black birch and black oak. Regeneration is dominated by beech and hemlock, with some black birch and a scattering of white pine. Oak and pine tree quality runs from poor to good, with most of the poorer quality stems left during the last harvest to avoid over-cutting the Stand. The small hardwoods have the same quality range, but whereas fewer small diameter stems were cut as part of the harvest, there is a slightly higher proportion of poor quality stems.

Prescription: With a basal area of 89 square feet and 125 trees per acre, the stand can be considered at the low end of adequate stocking. This is due to the recent harvest which thinned the stand. Because of that harvest, another thinning will not be needed until 2020 to 2025 at which time about a third of the stems should be removed, with emphasis on cutting the mature stems before they start to deteriorate as well as the poor quality stems that were left as "spacers". The next cut will also tend to release the regeneration that developed after the first harvest, provided care is taken to protect it during the harvest. Buffer zones restricting timber cutting should be set up around the cellar holes, around the wetlands and vernal pools, along the brook, especially near the water fall and the area with the stone piles. The harvest should also include opening up the vista adjacent to the old log yard. A subsequent harvest will be needed about 15 years after the next harvest to again remove the mature pines and oaks as well as the remaining poor quality trees, though some of the larger trees should be left un-cut to increase Stand diversity and to provide a future seed source. That harvest will also fully release any regeneration that may have developed after the first two operations. Because Unit 1A may be developed by the Town, focus should be more on site protection than regeneration.

STAND 2 Ro,Rm,H 2 B

Description: This 7 acre stand is located on the gentle slope on the west side of the hayfield and abuts the wetland. It contains three intermittent streams and an old well, along with several seeps. The area was clear-cut of pines in the 1950's which allowed the hardwood forest type to develop. Due to the wetness in some parts of the Stand, the site is slightly dominated by red maple with 33% of the basal area, followed by an even mix of white birch, black oak, black birch oak and red oak, with a scattering of sugar maple. Stem quality is fair to good. Regeneration is very scattered and contains beech, black birch, white ash and hemlock. Because the openness of the field and the impassability of the wetland, the Stand is used as a wildlife travel corridor, especially by deer.

Prescription: With a basal area of 140 square feet and 373 trees per acre the stand can be considered just slightly overstocked. However, thinning the Stand in a commercial harvest operation at this time risks damaging the immature, but high quality stems as well as creating a potential for epicormic branches to develop on the residual oaks if they receive too much sunlight on their trunks. As a result, the Stand should not be thinned until 2020 to 2025 to remove the poorer quality trees for firewood. About 25% of the trees could be cut, though a buffer zone should be created along the wetland. Red oak and sugar maple, followed by good quality stems of black birch, white birch and red maple should be favored for further growth and development. Future thinnings will depend on how fast the Stand responds to the initial thinning, but probably should not occur for at least another 20 years.

STAND 3 Wp,Rp,H 2B

Description: This 17 acre Stand is located along the northwest side of the hayfield and is bisected by the truck road that serviced the log yard located just to the north in Stand 1. Portions of the Stand were logged in 2000 in conjunction with the harvest in Stand 1. The Stand is somewhat mixed, more of a result of Will Hammond planting red pine throughout the site, though most of the pines were planted towards the eastern side of the Stand The Stand is slightly dominated by red pine with 37% of the basal area, followed by white pine at 25%, then black oak at 19%, with a scattering of red oak and black birch. Tree quality runs from fair to good, with some of the red pine showing signs of stagnation. Regeneration is dominated by beech and white pine with a scattering of black birch and hemlock and tends to be heavier in the areas that were harvested. Like Stand 2, this Stand is also used as a wildlife corridor. The old sawmill site from the 1950's is located near the northwestern corner of the Stand.

Prescription: With a basal area of 106 square feet and 211 trees per acre, the Stand is considered adequately stocked. Like Stand 1, some poor quality trees were left as spacers, and some of the poor quality hardwoods were too small or too scattered to cut for firewood. As a result, the Stand will need to be thinned around 2020 to 2025 to harvest the mature white pine and poor quality hardwoods along with any stagnated red pines. The stagnated pines will tend to have very small crowns as compared to the height of the tree. If the harvest can occur on bare ground, the resulting soil scarification will encourage pine and oak regeneration. Another thinning will be needed in 15 to 20 after the next harvest to again remove the mature and any poor quality stems which will tend to release any regeneration that has developed.

STAND 4 Ro 2 A / Wp, Hm 1 B

Description: This 6 acre Stand is located in the far northwest corner of the lot. Portions of the Stand were thinned in 2000 and now consists of pole and small sawtimber sized red oak, white pine and hemlock above a thick understory of hemlock and white pine with some scattered beech mixed in. Red oak dominates the overstory with 72% of the basal area, followed by white pine and hemlock with 14% each. The site is quite dry and well drained which is one the reasons for the heavy pine regeneration. Acorns from the overstory oaks combined with the dense softwood cover has created ideal deer habitat and numerous "buck rubs" were observed within the Stand. The softwood cover has also attracted rabbits and ruffed grouse.

Prescription: With a basal area of 70 square feet and 112 trees per acre, the Stand is at the very low end of being adequately stocked. However, attempts should be made to protect and maintain this unique forest type. Whereas forests are dynamic, the forest type will continue to evolve. The softwoods will start to thin out as they mature, causing the loss of the shelter capabilities and the oaks will start to crowd together, causing smaller crowns and fewer acorns. As a result the Stand will need to be thinned in 2020 to 2025 to remove some small groups of the poorer quality red oaks. This will give the crowns on the better quality oaks more room to grow and will somewhat release the white pine and hemlock regeneration, giving them more sunlight to keep their crowns full and closer to the ground. This should be repeated in another 15 years after the next thinning. It should be done on bare ground for scarification purposes to encourage additional pine and oak regeneration, but because of the small size of the Stand, it will have to be done in conjunction with Stand 1.

STAND 5 Wp,Bb,H 1-2 B

Description: This 4 acre Stand is located on the northeast side of the hayfield. It was abandoned as farmland within the last twenty years. It contains some apple trees as well as the remains of juniper shrubs which are often the first plants to invade abandoned fields. It is dominated by white pine and black birch and contains a scattering of beech, red maple, red oak and black oak. Most of the hardwoods are less than 4 inches diameter. Many of the pine are weevilled and shrub-like. Because the forest type is a thicket on the edge of a field, it is good cover habitat for many species of birds and small mammals.

Prescription: With a basal area of 70 square feet and 270 trees per acre, the Stand is at the very low end of being adequately stocked. This is due to the youngness of the forest type. At this stage, the forest can be managed in three separate directions. To improve the forest quality, the shrub-like pines and the few, obviously poor quality hardwood stems should be cut or girdled to allow the better quality stems to continue to develop, though the narrow width off the Stand will make future harvesting difficult. The second option is to allow the Stand to continue to grow and provide habitat as it passes through various stages of development. It could be cut back in 10 to 15 years and allowed to re-sprout and start the process over. The third option is to cut it back and stump it to return it to a hayfield to be managed in conjunction with the existing field. The last option is the most expensive, but based on how the field is being used, could offer the most benefits.

Other Considerations

As mentioned above, there is heavy deer use of the property due to the habitat and travel corridors. Any future management activities should take those uses under consideration in the planning stage. Vehicular access to the hayfield is somewhat restricted by using the paved driveway of the former Hammond homestead. Future harvests should include constructing a new access route up to the field area to avoid using the driveway. Recreational use of the property can be enhanced by opening up the vista in Stand 1. If the hayfield is converted to recreational fields, the vista area, if cleared, should also be stumped and graded at the same time to make it easier to maintain the opening in the future. Buffer zones should be maintained around the two fieldstone cellar hole farmstead sites and waterfall.

The Hammond lot is only a short distance away from the Walker Lot. Efforts should be taken to try to acquire some land to connect the lots.

BOW TOWN FOREST
HAMMOND LOT
May-07

Species/product	Stand 1 Wp,Hm,Ro,H2-3B 61 ac.	Stand 2 Ro,Rm,H2B 7 ac.	Stand 3 Wp,Rp,H 2 B 17 ac.	Stand 4 Ro2A / Wp,Hm 1B 6 ac.	Stand 5 Wp,Bb,H1-2 B 4 ac.	TOTAL
White pine	110,000	0	25,000	5,000	1,000	141,000 Bd.Ft.
White pine #4	10,000	0	0	0	0	10,000 "
Hemlock	40,000	0	0	2,000	0	42,000 "
Red pine	5,000	0	30,000	0	0	35,000 "
Sugar maple	0	2,000	0	0	0	2,000 "
Red maple	5,000	2,000	0	0	0	7,000 "
White birch	4,000	5,000	0	0	0	9,000 "
Black oak	3,000	3,000	0	0	0	6,000 "
Red oak	120,000	7,000	7,000	8,000	0	142,000 "
Black birch	10,000	3,000	0	0	0	13,000 "
Hardwood pallet	20,000	3,000	0	0	0	23,000 "
TOTAL-Board Feet	327,000	25,000	62,000	15,000	1,000	430,000 Bd. Ft.
Softwd Pulp-cords	270	0	130	10	35	445 cords
Hdwd Pulp-cords	210	140	100	40	15	505 cords

HEATHER LANE LOT

Tax map Block 5 Lot 64

1997

GENERAL DESCRIPTION

This 39 acre odd-shaped lot is located just off the west side of Heather Lane, near the cul-de-sac turn-around. The lot is accessed by a dirt driveway within a right-of-way found southwest of the turn-around. A log yard was built at the end of the driveway and services the entire lot. A very old woods road lately used for hiking bisects the lot, though such use appears to have diminished over the years. It contains two forest types and is crossed by several small drainage ways. Because of the relatively small acreage of the lot, it should be managed as one unit.

SITE CONDITIONS

The lot is gently sloped with elevations ranging from 460 feet at the northern boundary up to 520 feet around the log yard. It has a generally northern exposure and is part of a small watershed that flows directly into the Merrimack river via a few small streams. There are no significant wetland areas on the lot. The "pan-handle" area at the south end of the lot is split on a north/south line by two soil types. The west side of the panhandle contains Woodbridge very stony loam with good soil moisture and is considered an excellent growing site for most timber species with a slight favor towards beech, red maple, red oak, white ash and occasionally white pine. The east side of the pan-handle contains Acton very stony fine sandy loam and the northern portion of the lot contains Gloucester very stony sandy loam. Both soils are considered a good growing site for timber, with a slight favor towards beech, red maple, white and yellow birch and usually have adequate soil moisture except during prolonged droughts. The development along the western boundary has apparently changed surface flowage routes onto the western portion of the lot which killed off many trees and created a seasonal drainage.

UNIQUE FEATURES

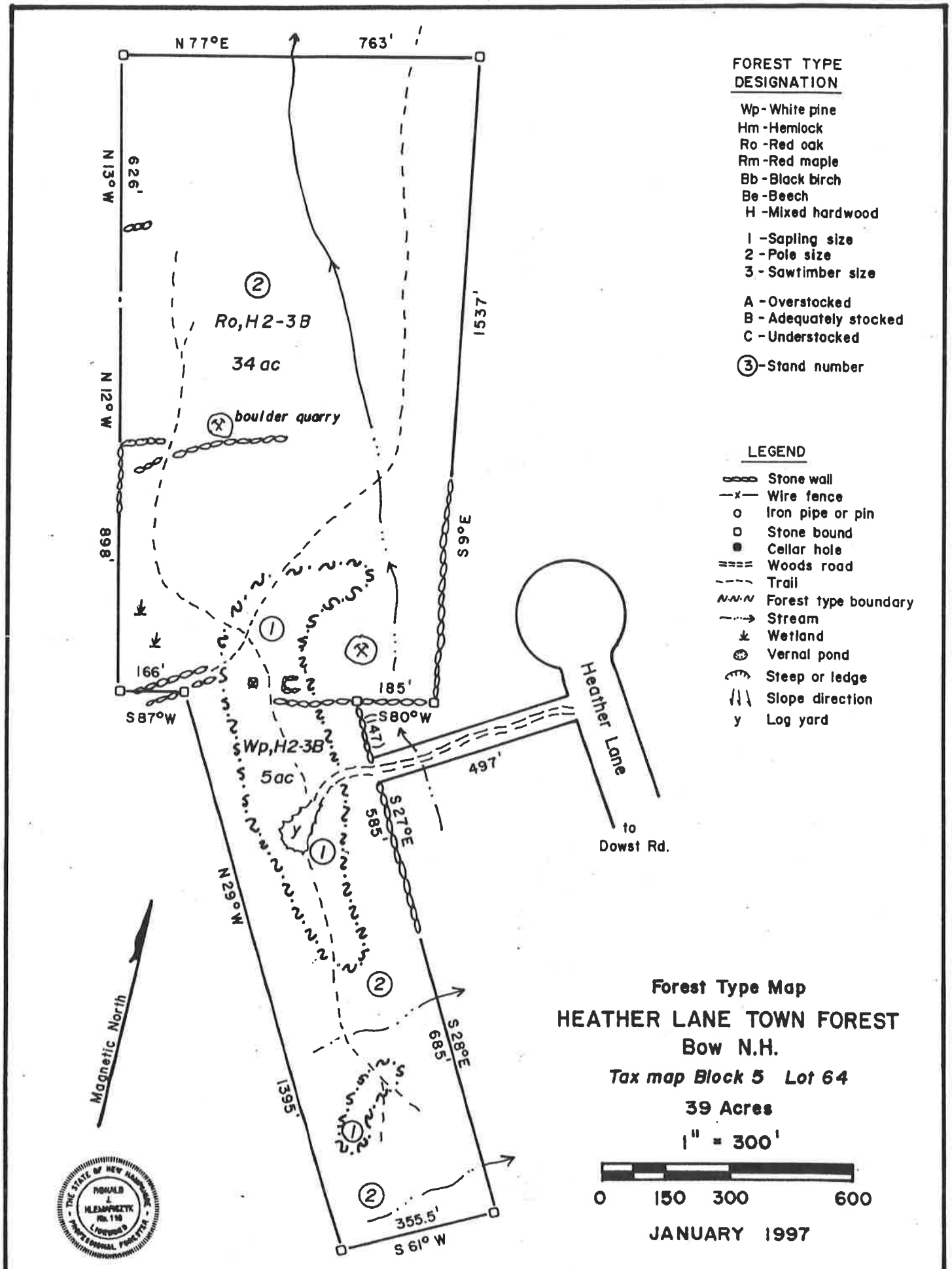
There is an old farmstead site in the center of the lot that contains a short wall-lined lane, house and barn fieldstone foundations, a stone-lined well and two nearby boulder quarries.

BOUNDARY LINE STATUS

The lot was surveyed in 1981 by John Hills and all lines were blazed and painted yellow. The eastern portion of the lot was re-surveyed as part of the Heather lane subdivision. All of the boundaries need to be repainted.

HISTORY

The lot was entirely cleared for agriculture during colonial days and appears to have been all used growing crops. The lot was abandoned as farmland in the late 1800's and grew in with white pine. Most of the pine was clear cut in the 1940's which allowed a red oak forest to develop. The red oaks in the northern portion of the lot were heavily defoliated by the 1980 and 1990 rounds of gypsy moth infestations which caused heavy mortality. A brush fire occurred in the same area in the late 1980's causing additional damage. Most of the property was logged in 1995 by Chuck Rose of Webster N.H. to remove the poor quality and mature white pine and to salvage the dead oak for firewood. A total of 61,000 board feet of sawtimber, 180 cords of firewood and 29 tons of softwood pulp were harvested netting the Town $5,054.30.


N 77°E
763'
N 13°W
626'
N 12°W
898'
1537'
S 9°E
② Ro, H2-3B 34 ac
boulder quarry
① Wp, H2-3B 5ac
166'
S 87°W
185'
S 80°W
147'
497'
Heather Lane
to Dowst Rd.
S 27°E
585'
N 29°W
S 28°E
685'
1395'
355.5'
S 61° W
Magnetic North
y
FOREST TYPE DESIGNATION
Wp - White pine
Hm - Hemlock
Ro - Red oak
Rm - Red maple
Bb - Black birch
Be - Beech
H - Mixed hardwood
1 - Sapling size
2 - Pole size
3 - Sawtimber size
A - Overstocked
B - Adequately stocked
C - Understocked
③ - Stand number
LEGEND
Stone wall
Wire fence
Iron pipe or pin
Stone bound
Cellar hole
Woods road
Trail
Forest type boundary
Stream
Wetland
Vernal pond
Steep or ledge
Slope direction
y Log yard
Forest Type Map
HEATHER LANE TOWN FOREST
Bow N.H.
Tax map Block 5 Lot 64
39 Acres
1" = 300'
0 150 300 600
JANUARY 1997
THE STATE OF NEW HAMPSHIRE
RONALD J. KLEMARCZYK No. 118 LIVERMORE
PROFESSIONAL FORESTER

FOREST TYPES

STAND 1 Wp,H2-3B

Description: This 5 acre stand is located in the center of the lot, with a small isolated section near the southern boundary, and contains the residuals of the white pine that grew in when the farmland was abandoned. Most of the trees are mature, and a few could be considered old growth. White pine dominates the stand with 65% of the basal area, followed by red oak at 25%, with a scattering of red maple and white oak. Regeneration consists of scattered red oak, red maple and white pine. Whereas most of the poor quality trees were recently harvested, the quality of the stand is very good. The farmstead site is located within the stand and an un-cut buffer zone was left around the foundations.

Prescription: With a basal area of 100 square feet and 129 trees per acre, the stand can be considered at the low end of adequate stocking. This is due to the recent harvest which thinned the stand. Because of that harvest, another thinning will not be needed until 2011 to 2015 at which time about half of the stems should be removed, with emphasis on cutting the mature stems before they start to deteriorate. The next cut will release the regeneration established after the first harvest. Because of the nature of the stand, the cut will reduce the stand size by causing the edges of the current stand to more closely resemble the adjacent stand. Most of the remaining pine should be harvested in a third harvest 15 years after the second cut to completely release the mixed hardwood white pine understory that should have developed by then. Any harvesting will have to be done in conjunction with Stand 2.

STAND 2 Ro,H2-3B

Description: This 34 acre stand is mainly located in the northern section of the lot, but is also found along the boundaries of the "pan-handle" and completely encloses Stand 1. It is dominated by pole and small sawlog sized red oak with 69% of the basal area, followed by red maple at 17%, white birch at 6%, and a scattering of white oak, white ash and white pine. Regeneration includes red maple, scattered white pine and chestnut sprouts. The heavy gypsy moth defoliations, the brush fire and the altered drainage patterns severely stressed the stand over the last twenty years. Growth rates on most of the oaks is quite slow. Although most of the dead trees were salvaged during the last harvest, many relatively poor quality trees were left to avoid over-cutting, or in some cases, clearcutting major portions the stand. Because red maple is not a food source for the gypsy moth and is adapted to wetter sites, it will develop into a more dominant component of the stand.

Prescription: With a basal area of 72 square feet and 142 trees per acre the stand can also be considered at the low end of adequate stocking, due mainly to the gypsy moth defoliation mortality rather than the recent thinning. Assuming that the remaining oaks that survived the defoliations may have some resistance to the gypsy moth, the stand will continue to grow though somewhat slowly. As a result, another thinning will probably not be needed for at least 2015 to 2020. That thinning should focus on removing the poor quality stems that were left for spacing during the first thinning and any oak trees that have developed epicormic branches as a result of the defoliations and harvest activity. The thinning should not remove more than 40% of the basal area to avoid "shocking" the oak into creating epicormic branch sprouts. The second thinning will help to totally release the red maple and other regeneration currently found within the stand that should quickly start to develop after the most recent cut. Future harvest will depend on the stands response to the second thinning, though severe gypsy moth defoliations may require changes in this prescription.

Other Considerations

Several deer trails were noted running north-south through the lot. With housing developments found on both the east and west side of the lot, the property is evidently used as a travel corridor. Softwood regeneration should be encouraged and protected to provide some temporary shelter areas for wildlife to use as protection from nearby human activity. Buffer zones should be maintained around the farmstead site and boulder quarries. The driveway into the lot will require periodic maintenance. A small loop trail could be developed on the lot with access from Heather Lane, though use would probably be limited to residents from that development as there is no available access from Poor Richards Drive on the west side of the lot. Depending on the ability to cross abutting private property, the Town Forest was considered a part possible Heritage Trail route. The old trail found within the lot would make an ideal route as it passes near the old farmstead site and boulder quarries.

Several homeowners along Poor Richards Drive were found to be depositing typical lawn debris (grass and shrub clippings, leaves, etc.) onto the Town Forest property. It is important that the western boundary be clearly defined to prevent more serious encroachments.

BOW TOWN FOREST
HEATHER LANE LOT

TOTAL OPERABLE VOLUMES

Species/Product	Stand 1 Wp,H2-3B 5 ac	Stand 2 Ro,H2-3B 34 ac	TOTALS
White Pine	40,000	2,000	42,000 Bd.Ft.
White pine #4	4,000	0	4,000 "
White ash	0	4,000	4,000 "
White birch	0	3,000	3,000 "
Red oak	5,000	75,000	80,000 "
Pallet	1,000	18,000	19,000 "
TOTAL SAWLOG	50,000	102,000	152,000 Bd.Ft.
Softwood pulp	25	15	40 Cords
Hardwood pulp	20	280	300 Cords

NOTTINGCOOK FOREST

Tax Map Block 2 Lots 44,45,46,53E,59,61,63,63A,69,73B
1999-2011

GENERAL DESCRIPTION

This 771 acre lot is located on either side of the Woodhill-Hooksett Road between Bow Bog Road and South Bow Road and between Allen Road and the Bow-Hooksett Town Line. It is the largest Town Forest lot and contains a variety of site and forest types and most of it is protected by a Conservation Easement. Due to the rugged terrain on much of the lot, less than half of the property was actively farmed. The name of Nottingcook comes from a Native American name for that area of what is now Bow which contained difficult terrain. The lot can be accessed from the Class VI portion of Woodhill-Hooksett Road where a system of log yards and skid trails were built by the previous owner. Portions of the lot can also be accessed from the end of Hope Lane and by two dirt driveways off of Allen Road. An internal woods road system was built by the previous owner in the area between Hope Lane and Allen Road. Of the 771 acres, 93 acres contain a sand/gravel pit not covered by the Conservation Easement, of which 10 acres are to be dedicated to future recreational fields. Most of the woods roads are used for recreational purposes, mainly snowmobiling, hiking and mountain biking. An extensive hiking trail system was built in the more rugged half of the property south of the Woodhill-Hooksett Road where two spectacular vistas were cleared on two hilltops. The lot also contains parts of two prime wetlands and several other wetland complexes, four major streams and a power line right-of-way. The forest was inventoried in 1999 and found to contain ten forest types, though the heavy cutting by the previous owner in the accessible areas has created some unique types which will influence their management. All Stand stocking data is from the 1999 cruise.

SITE CONDITIONS

Site conditions and topography on the lot is extremely variable with elevations ranging from 850 near the summit of Great Hill in the northwest part of the lot and 800 feet on a hill in the southwest part of the lot down to 390 feet where Center Brook flows out of the northern tip of the property and 360 feet where Brickyard Brook crosses the Town line into Hooksett. The southern half of the lot has a generally northeastern exposure while the northern half has a general northern to northwestern exposure. The majority of the lot is part of the Bow Bog Brook watershed. Horse Brook and Steer Brook merge in the Parsonage Meadow where Horse Brook then flows northerly to Bow Bog. Center brook starts in the sandpit area and then flows northeasterly to Bow Bog where it combines with Horse, Steer and the Bow Bog Brooks to eventually flow into the Merrimack River. Brickyard Brook drains the Hornbeam swamp and the area along the Hooksett Town Line and flows into the Merrimack River near the I-93 Exit 11 interchange. In addition to the Parsonage Meadow and the Hornbeam Swamp, there are several wetlands found along Horse Brook, some of which contain old Black Gum trees, as well as several small wetlands in the northern corner of the lot near the sand and gravel pit.

There are eight upland soil types and seven wetland soil types. The Hornbeam swamp and the Parsonage meadow contain the submerged Greenwood and Ossipee soils. The wetland areas along Horse Brook west of Hope Lane contains the Chocorua mucky peat soil. The wetland located northeast of the Parsonage Meadow contains the Ossipee soil, while the wetlands located northwest of the meadow contains a Whitman soil. The wetland in the northern tip of the lot off of Allen Road contains the Pipestone soil. The wetland areas along Steer Brook and Horse Brook south of the Woodhill-Hooksett Road that include the Black Gum swamps contain a Scarboro Muck soil. The last wetland soil is a narrow strip of wetland found along most of the streams and brooks called the Walpole soil. With the exception of the Walpole soils, the wetland soils are not suitable for growing commercial forest crops and should be set aside for habitat and watershed protection purposes.

Of the eight upland soils, four are soil complexes which will be combined into two soil groups. The area just northwest of the Parsonage meadow, plus the isthmus between the Parsonage meadow and the hornbeam swamp contains the Hinckley soil which is a dry, gravelly soil that tends to favor white pine over hardwoods. The area around the sand pits and the area east of the pits contains the Windsor and Windsor-Hollis complex. It is also a dry soil that favors white pine over hardwoods, but is sandier than the Hinckley soil. The sloped area southeast of the Hornbeam swamp contains the Gloucester soil which is a glacial till soil. It is well drained and favors both pine and oak. The area just southwest of the Parsonage swamp contains the Canton soil which is similar to the Gloucester soil in that it is well drained and favors both pine and oak. The rest of the property which makes up the majority of the lot contains either the Chatfield-Hollis-Montauk or the Hollis-rock outcrop-Chatfield soil complexes. It is a well to excessively well drained glacial till soil with steep ledges and rock outcrops. Areas with shallow to bedrock soil conditions would be considered poor growing sites, while the areas between ledges with deeper soils would be considered better growing sites that tend to favor hardwoods such as beech, red maple, white ash and red oak as well as white pine.

UNIQUE FEATURES

Because of the large size of the lot, there are many unique natural and man-made features. Natural features include Great Hill which has an elevation of 870 feet located just off of the lot. There are many ledges and a trail system that leads to views near the actual summit on private property looking north and west and another vista located within the lot just below the summit that looks east. Another hill located in the southwest corner of the property also has a great view looking north and some shallow caves found in some of the ledges. Parsonage Meadow is located in the center of the property and is a permanent wetland. It was given to the parson of the Bow Bog meeting house as payment for his services in the form of marsh grass. Nearby is the Hornbeam swamp, another permanent wetland with a very red soil around parts of its shore. There is a glacial "kettle hole" which was created when a piece of buried ice from the glacier created a water filled depression with no inlet or outlet and is located near the sand pit. A large boulder called a "glacial erratic" can be found just off of the south side of the Woodhill-Hooksett Road near Steer Brook. There is a cascade during periods of high water on Horse Brook south of the Woodhill-Hooksett Road. Further upstream are several Black Gum swamps. There is a somewhat strange ledge outcrop south of the reclaimed sand pit which is the site of an ancient geologic fault line.

Man-made features include an old farmstead site with fieldstone foundations for both the house and barn located adjacent to the sand pit. The Woodhill-Hooksett Road was well used during colonial days as it is connected to Bow Bog Road which was at one time a major turnpike for the area. The portion of the Woodhill-Hooksett Road through the Nottingcook Forest is now an un-maintained Class VI road that is primarily used for logging and recreation. An old portable sawmill site is located just south of the Woodhill-Hooksett Road adjacent to Steer Brook. Piles of hemlock slabs can still be seen as can pieces of ductwork from the sawdust chute. The brook could have been used for water to supply a steam engine. An old woods road runs southwesterly from the site where a ledge outcrop on the road contains grooves from the tracks of the bulldozers that were used to haul the logging scoots.

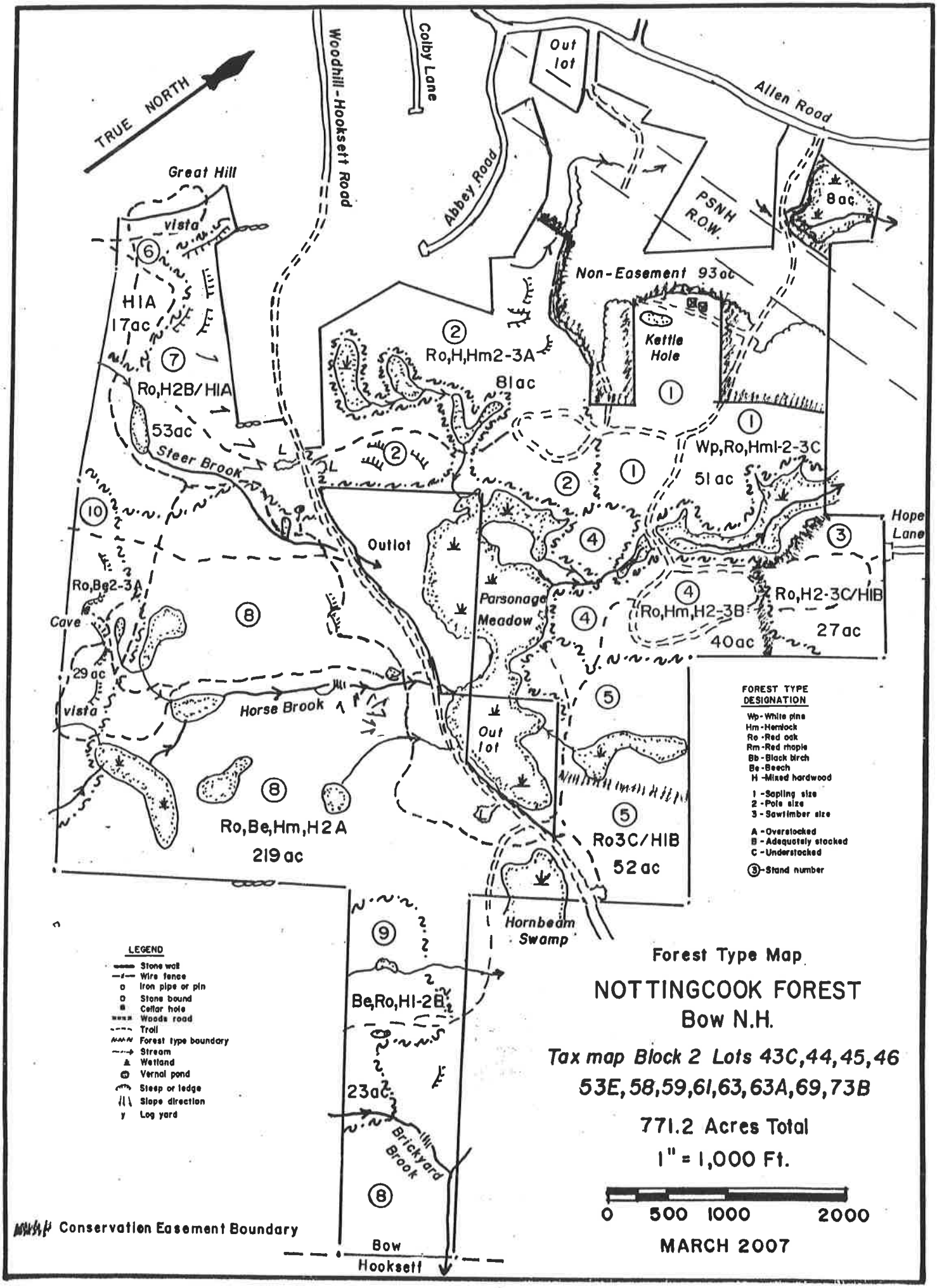
BOUNDARY LINE STATUS

The lot was surveyed in 2001 by FORECO and all exterior boundary lines were blazed and painted yellow. Conservation easement boundaries were blazed and painted red. They will need to be repainted by 2011. During the survey, a discrepancy was found in the area near the Hornbeam swamp along property owned by Betty Hanson. The northwest corner of the Hanson lot was missing but measurements using deed distances from known corners on the range line from the east and the west created a gap between where the northeast corner of the Town's lot should be versus where her corner should be. Ms. Hanson agreed to a Boundary line Agreement so a corner was set and the line was blazed. However, she then changed her mind and would not sign the agreement. It is hoped that an agreement will eventually be reached.

HISTORY

Nottingcook Forest is a compilation of many lots that were acquired by a developer in the 1990's. However, the land use history of the various lots is related to their site conditions. Almost all of the lots south of Woodhill-Hooksett Road and about half of the lots north of the road were too rough for agriculture and were historically used as woodlots for both firewood and lumber. The lots were last logged in the 1990's by the developer which has created a very mixed forest in size of mostly smaller trees. The area south of Hope Lane and the area around the sandpit were once used for agriculture as evidenced by wire fences and the scattered stone piles and short sections of stone walls. Only one farmstead site was located on the property, that being near the sand pit. The soil around the farmstead was relatively rock free but a very dry growing site. It is not surprising that the farmstead was located near the water-filled glacial kettle hole. The area south of Hope Lane appears to have been abandoned as farmland in the late 1800's and the pine was probably clear-cut in the early to mid 1900's creating a mixed forest that was heavily harvested along with the rest of the forest in the 1990's. The sandy soil around the old farmstead was not abandoned as pasture land until the early to mid 1900's, though the actual farmhouse was abandoned much earlier. Much of the pine that grew into the fields was cut in the 1990's to open up the sand and gravel pit by the developer.

Due to public outcry, the land was purchased by the Town to protect the large tract of Open Space from development. The property was inventoried prior to its acquisition and that data was the basis for the Forest Type Map and timber volumes and stocking levels. The forest has grown in the ten years since the cruise, with the most noticeable growth limited to the forest regeneration. Many of the large scattered overstory trees that were left by the developer to create a "park-like" effect have deteriorated or died off. Since it was acquired, a hiking trail system was built mainly in the area south of the Woodhill-Hooksett Road which lead to the previously mentioned vistas. Part of the State's snowmobile highway system also runs though the lot. The Town's Public Works Department uses the sandpit for a source of sand and gravel and as a brush dump.


TRUE NORTH
Great Hill
vista
⑥
H1A
17ac
⑦
Ro,H2B/H1A
53ac
Steer Brook
Woodhill-Hooksett Road
Colby Lane
Abbey Road
Out lot
Allen Road
PSNH R.O.W.
8ac.
Non-Easement 93ac
Kettle Hole
②
Ro,H,Hm2-3A
81ac
①
Wp,Ro,Hml-2-3C
51ac
Hope Lane
③
Ro,H2-3C/H1B
27ac
④
Ro,Hm,H2-3B
40ac
Outlot
Parsonage Meadow
⑩
Ro,Be2-3A
Cave
29ac
vista
⑧
Ro,Be,Hm,H2A
219ac
Horse Brook
Out lot
⑤
Ro3C/H1B
52ac
Hornbeam Swamp
⑨
Be,Ro,H1-2B
23ac
Brickyard Brook
Bow
Hooksett
FOREST TYPE DESIGNATION
Wp - White pine
Hm - Hemlock
Ro - Red oak
Rm - Red maple
Bb - Black birch
Be - Beech
H - Mixed hardwood
1 - Sapling size
2 - Pole size
3 - Sawtimber size
A - Overstocked
B - Adequately stocked
C - Understocked
③ - Stand number
LEGEND
Stone wall
Wire fence
Iron pipe or pin
Stone bound
Cellar hole
Woods road
Trail
Forest type boundary
Stream
Wetland
Vernal pond
Steep or ledge
Slope direction
Log yard
Conservation Easement Boundary
Forest Type Map
NOTTINGCOOK FOREST
Bow N.H.
Tax map Block 2 Lots 43C,44,45,46
53E,58,59,61,63,63A,69,73B
771.2 Acres Total
1" = 1,000 Ft.
0 500 1000 2000
MARCH 2007

FOREST TYPES

STAND 1 Wp,Ro,Hm 1-2-3 C

Description: This 51 acre stand is located just east of the sand pit and contains the old farmstead and the Glacial Kettle Hole. It also contains a woods road system and is adjacent to a major wetland complex on Horse Brook. It was heavily cut in the 1990's where most of the mature trees were harvested which allowed a thick understory to develop. The dry site conditions tend to favor pine over the hardwoods which has caused the pine to dominate the regeneration. Most of the pole and sawlog-sized trees would be considered good quality. The thick pine regeneration is heavily used by deer and rabbit for winter shelter.

Prescription: With a basal area of 38 square feet and 129 trees per acre in 1999, the Stand was still recovering from the last harvest. However, the forest is located on a good growing site and has started to grow in quite rapidly. Another thinning will probably be needed around 2015 to 2020 to harvest some of the mature stems along with the poor quality trees. Focus should be on releasing the pine regeneration that developed after the last harvest before it becomes stagnated. Buffer zones should be created along the heavily used trails/woods roads, the glacial kettle hole and the old farmstead foundations. Future harvests will depend on how well the regeneration develops, but will probably need an overstory removal about 15 years after the next harvest. Some large pines should be left uncut to provide diversity as well as a future seed source.

STAND 2 Ro,H,Hm 2-3 A

Description: This 81 acre Stand is located southwest of the sand pits and fronts on a small section of the east side of the Woodhill-Hooksett Road. It contains a wetland complex, several ledge outcrops and a snowmobile trail. One of the ledge outcrops may mark the north branch of an ancient geologic fault that runs from Epsom southwesterly into Massachusetts. The Stand is one of the few forest types that were not heavily logged by the previous owner. Past logging and the varied site conditions has created a very mixed forest. It is somewhat dominated by hemlock with 30% of the basal area, followed by red maple at 19%, red oak at 15%, and white pine at 13%, with a scattering of white oak, sugar maple, white birch, yellow birch, black birch, beech, white ash and aspen. Because the Stand was not logged, tree quality runs from poor to good. Regeneration is scattered, but is dominated by hemlock and beech., with some red oak, white pine and red maple.

Prescription: With a basal area of 95 square feet and 201 trees per acre, the Stand can be considered adequately stocked nearing slightly overstocked due to ingrowth since the lot was cruised in 1999 and could support a thinning. The snowmobile trail runs between the wetlands and ledges in the southwestern half of the Stand. Whereas buffer zones should be created along the trail and wetlands, and whereas the ledge area towards Woodhill-Hooksett Road is relatively inoperable, it is recommended to set aside that portion of the Stand as a Natural Area. The rest of the Stand could be thinned between 2011 and 2015 to harvest some of the mature hemlock along with the poor quality hardwoods for firewood. A log yard could be set up in the pit in an area played out of gravel. That thinning could harvest about 15 to 20% of the basal area and will create some openings that will encourage the establishment of regeneration, especially if the harvest is conducted on bare ground for scarification purposes. Another thinning could be expected in 15 to 20 years after the next harvest to again harvest the mature hemlocks and any poor quality hardwood, with a focus on releasing any dense patches of regeneration.

STAND 3 Ro,H 2-3 C / H 1 B

Description: This 27 acre Stand is located off of the west end of Hope Lane and was heavily logged by the previous owner which left a Stand of widely spaced hardwoods. It looked somewhat like a park after it was cut, but subsequent windstorms blew down several of the exposed trees, further reducing the stocking. Many of the remaining stems sprouted epicormic branching as a result of being exposed to sudden sunlight. Because of the heavy cut, a thick understory of hardwood regeneration developed. The overstory is dominated by red oak with 41% of the basal area, followed by red maple at 27%, with a scattering of white pine, hemlock, white oak, white birch, black birch and beech. Regeneration includes red maple, beech, red oak and some white pine, though many of the hardwood stems are stump sprouts. There is also a loop trail that runs through the Stand and is used by residents on Hope Lane to access the rest of Nottingcook Forest. The entire Stand is in the area not covered by a Conservation Easement.

Prescription: With an overstory basal area of 41 square feet and 98 trees per acre, the Stand can be considered understocked and many of the overstory trees would now be considered poor quality. However, harvesting the scattered overstory will do enough long term damage to the understory stems to negate any benefits derived from the harvest. As a result, it is recommended to allow the regeneration to continue to develop and weed and thin when the stems reach 4 to 6 inches in diameter by removing any poor quality stems that are competing with preferred species such as red oak, and to thin out some of the clumps of sprouts. The scattered overstory stems should be left to provide some age and size class diversity as well as to provide some perch and eventual "den" trees for large birds. Future thinnings of the Stand will depend on how well the Stands responds to the weeding and thinning, but should not be expected for another 20 to 30 years.

STAND 4 Ro,Hm,H 2-3 B

Description: This 40 acre Stand is located in the center of portion of Nottingcook Forest found northeast of Woodhill-Hooksett Road and abuts the east side of Parsonage Meadow. It contains a loop road that is connected to the road from the sand pit along with a snowmobile trail. It is bisected by Horse Brook. Most of the Stand was lightly logged by the previous owner and is similar to Stand 2, though slightly younger. The Stand is slightly dominated by red oak with 34% of the basal area, followed by hemlock at 28%, white pine at 15%, with a scattering of white oak, red maple, sugar maple, white birch, yellow birch and black birch. Tree quality runs from poor to good. Regeneration is scattered, but is dominated by beech and hemlock, with some white pine and red oak mixed in.

Prescription: With a basal area 102 square feet and 230 trees per acre, the Stand can be considered adequately stocked, nearing overstocked due to ingrowth since the lot was cruised in1999. The Stand could be thinned between 2011 and 2015 to harvest the poor quality hardwoods for firewood and some of the maturing hemlock and white pine. Buffers zones should be created along the trails, Horse Brook, and Parsonage Meadow. About 20 to 25% of the basal area could be cut, with a few small patch cuts in the poor quality hardwood areas to create brows for wildlife. Another thinning could be expected about 20 years after the next harvest to remove the mature pines and hemlocks as well as any remaining poor quality hardwoods.

STAND 5 Ro 3 C / H1B

Description: This 52 acre Stand is located on the east side of the Woodhill-Hooksett Road adjacent to the trailhead parking lot/truck turnaround at the end of the eastern maintained section of the road. It is bisected by a wetland and contains both a hiking trail and a snowmobile trail. The Stand was heavily logged by the previous owner in the 1990's. Like Stand 3, it looked somewhat like a park after it was cut, but did not suffer as many blowdowns as that Stand. Many of the remaining stems sprouted epicormic branching as a result of being exposed to sudden sunlight. Because of the heavy cut, a thick understory of hardwood regeneration developed. The overstory is heavily dominated by red oak with 68% of the basal area, followed by white oak at 27%, with a scattering of white pine, hemlock and red maple. Regeneration includes red oak, red maple, beech, and white oak. The southeastern half of the Stand is not covered by the Conservation Easement.

Prescription: With an overstory basal area of 50 square feet and 69 trees per acre, the Stand can be considered understocked and many of the overstory trees would now be considered poor quality. However, harvesting the scattered overstory will do enough long term damage to the understory stems to negate any benefits derived from the harvest. As a result, it is recommended to allow the regeneration to continue to develop and weed and thin when the stems reach 4 to 6 inches in diameter by removing any poor quality stems that are competing with preferred species such as red oak, and to thin out some of the clumps of sprouts. The scattered overstory stems should be left to provide some age and size class diversity as well as to provide some perch and eventual "den" trees for large birds. Future thinnings of the Stand will depend on how well the Stands responds to the weeding and thinning, but should not be expected for another 20 to 30 years. Buffer zones should be created around the trails and wetlands.

STAND 6 H 1 A

Description: This 17 acre Stand is located on Great Hill in the far northwestern corner of the forest west of the Woodhill-Hooksett Road. The Stand was essentially clearcut by the previous owners in the 1990's with the intent of opening up views to make his proposed development more marketable. The Stand contains mainly sapling-sized stems, though they are about to reach pole-sized due to growth since the lot was cruised. There are a few overstory areas made up of white oak, with a few widely scattered stems of white pine and black birch. The quality of the overstory stems would be considered poor due to the "shock" from being suddenly exposed in the heavy cut. Both a hiking trail and a snowmobile trail cross the Stand. A vista was opened up on a near summit of Great Hill in 2004 by local firefighters as part of their chainsaw training that was sponsored by the New Hampshire Division of Forests and Lands. The vista is now accessed by a loop trail that also runs to the actual summit of Great Hill, though that summit is on private property. Some of the slopes within the Stand are moderate to severe, though they are short and can be driven around.

Prescription: With a basal area of 60 square feet and 146 trees per acre, the Stand would be considered understocked, though it is fast growing into the adequately stocked category since the lot was cruised in 1999. Due to the high amount of trails compared to the size of the Stand, it is recommended to let the forest grow back and set aside the Stand as a Natural Area. The only cutting recommended would be to maintain or expand the vista area. The cut area below the vista could also be periodically burned to encourage lowbush blueberries, though the effort would have to be coordinated with the Bow Fire Department as part of the their training program.

STAND 7 Ro,H 2 B / H 1 A

Description: This 53 acre Stand is located on the lower slopes of Great Hill and is bisected by Steer Brook. It contains a small wetland, some ledges and steep slopes. It was heavily logged by the previous owner with the log yard being located on the west side of the Woodhill -Hooksett Road. It also contains a hiking trail and a snowmobile trail. There is a very large boulder in the far southeastern tip of the Stand, not too far off of the Woodhill-Hooksett Road. It was heavily cut by the previous owner in the 1990's where most of the good quality sawtimber-sized trees were harvested. The Stand is slightly dominated by red oak at 36% of the basal area, followed by beech at 20%, black birch at 15%, sugar maple at 13%, with a scattering of white ash, yellow birch, red maple, hemlock and white pine. About 10 to 15% of the basal area, including most of the beech, would be considered poor quality, with the remaining stems in the fair to good quality. Regeneration is relatively thick and consists of beech, hemlock, white birch, black birch, red maple, yellow birch and some very scattered white pine.

Prescription: With a basal area of 60 square feet and 153 trees per acre, the Stand can be considered understocked, though it is quickly growing into the adequately stocked category since the cruise in 1999. Whereas the understory will start to stagnate without being released, it is recommended to conduct an overstory removal by harvesting groups of poor quality stems in 2011 to 2015 for firewood and low grade sawtimber in about 30 to 40% of the Stand. This will open up the understory which will then continue to develop. The remaining overstory could be removed in another 10 to 15 years afer the next harvest, though buffer zones should be created along the trails, Steer Brook, the wetland and around the large boulder.

STAND 8 Ro,Be,Hm,H 2 A

Description: This large 219 acre Stand is located on the west side of the Woodhill-Hooksett Road and encompasses most of the southwestern portion of the Nottingcook Forest all the way too the Hooksett Town Line. Only a very small portion in the Stand was logged by the previous owner and that involved cutting several wide skidder trails from the log yard located in the southeastern part of the Stand just off of the Woodhill-Hooksett Road. The Stand is crossed by Horse Brook Brickyard Brook and includes several wetlands, some of which contain black gum. There is a network of heavily used hiking trails in the Stand that service a very scenic vista that is located on a ledge in Stand 10. Most of the Stand developed after the area was clear-cut of pine and hemlock in the late 1930's to early 1940's. A portable sawmill was set up along Steer Brook just west of the Woodhill-Hooksett Road where some slab piles are still visible. There are also a few pieces of rusted metal and some small, heavily decayed piles of sawdust that mark the site. There is a large area of rhododendron in the southwest part of the Stand. Due to shallow soils in much of the Stand, the growth rates are somewhat slow. The Stand is dominated by hemlock with 33% of the basal area, followed by red oak at 20%, black birch at 12%, red maple and beech at 10% each, with a scattering of white pine, white oak, sugar maple, white birch, yellow birch, aspen and white ash. Most of the stems are pole-sized, though some have reached small sawlog size, with a few larger stems scattered in areas near ledges and wetlands. Quality runs from poor to good. Regeneration is limited to beech and hemlock, though it is scattered in places. The hemlock cover and acorns from the oaks has created some good deer habitat.

Prescription: With a basal area of 82 square feet and 220 trees per acre, the Stand is considered adequately stocked, though it is now approaching the high end of that category. In order to prevent stagnation, the Stand should be thinned in 2015 to 2020 to remove the low quality hardwoods and some of the mature hemlocks. Red oak should be favored for continued growth and development. The thinning will release the hemlock regeneration which will help maintain the sheltering aspects for wildlife. Around 15 to 20% of the basal area could be cut, though it may not be feasible to harvest just low-grade material from the remote parts of the Stand. Buffer zones should be created along the trails, brooks and the road as well as around the wetlands. The area with the rhododendron should be set aside as a Natural Area and protected from logging. Another thinning will be needed about twenty years after the next harvest to remove the poorer quality and large, sawlog-sized trees.

STAND 9 Be,Ro,H 1-2 B

Description: This 23 acre Stand is located in the "Panhandle" that runs southeasterly to the Hooksett Town line. It contains a small section of Steer Brook and another intermittent stream an two small wetlands, and is bisected by an old woods road. The Stand was logged in the early 1970's, probably for firewood during the 1973-74 energy crisis. Some of the stand contains shallow soils which have stunted the growth on some trees. Access to the Stand via the old woods road requires crossing an abutting property, though a skid trails could be rerouted through Stand 8 to reach the Stand. The Stand contains red maple at 38% of the basal area followed by beech and red oak at 14% each, hemlock at 10% and a scattering of white pine, white birch and black birch. Most of the trees are sapling and pole-sized, though a few are starting to reach the small sawlog sized. Other than a few larger poor quality beech, the quality on most of the stems runs from fair to good. Regeneration is mostly beech and hemlock, with some red oak and white pine.

Prescription: With a basal area of 52 square feet and 209 trees per acre, the Stand would be considered understocked, though many of the sapling-sized stems have now grown into the pole size class since the Stand was cruised in1999. The Stand will probably need a thinning around 2020 to selectively thin the hardwoods by removing the poor quality stems, especially the beech, for firewood with focus on releasing the preferred species such as red oak. Another thinning will be needed in 15 to 20 years after the next harvest to again remove the poorer quality trees. Due to the small size of the Stand, any logging will have to be done in conjunction harvesting in Stand 8.

STAND 10 Ro,Be 2-3 A

Description: This 29 acre Stand is located along the Forest's western boundary and includes several ledges one of which contains a small cave and the other is the site of a spectacular vista that has views of the White Mountains. The Stand also contains several hiking trails and a black gum swamp. It was a fairly remote part of the forest until the abutting private property was clear-cut and subdivided into houselots. Parts of the Stand were harvested in the late 1930's or 40's with Stand 8. Because the site was fairly dry, it contained numerous hardwoods that were not cut during the past harvest. As a result, there a few larger hardwoods scattered around the Stand that are nearing old growth. Beech slightly dominates the Stand with 38% of the basal area, followed by red oak at 25%, red maple at 17%, hemlock at 6%, with a scattering of black birch, white birch and white pine. Tree quality runs from poor to good, with most of the larger beech stems in the poor category. Regeneration is scattered and is limited to beech and hemlock.

Town of Bow
NOTTINGCOOK FOREST
Apr-07

TOTAL OPERABLE VOLUMES

Species/product	Stand 1 Wp,Ro,Hm 1-2-3 C 51 ac.	Stand 2 Ro,H,Hm 2-3 B 80 ac.	Stand 3 RoH2-3C/ H 1 B 25 ac.	Stand 4 Ro,Hm, H 2-3 B 37 ac.	Stand 5 Ro3C/H1B 52 ac.	Stand 6 H 1 A 15 ac.	Stand 7 Ro,H2B/ H1A 54 ac.	Stand 8 Ro,Bo,Hm, H 2 A 219 ac.	Stand 9 Be,Ro,H 1-2 B 24 ac.	Stand 10 Ro,Be 2-3 A 29 ac.	TOTAL
White pine	15,000	45,000	4,000	39,000	10,000	0	0	24,000	0	0	137,000
White pine #4	0	11,000	1,000	7,000	0	0	0	1,000	0	0	20,000
Red pine	23,000	0	0	0	0	0	0	0	0	0	23,000
Pitch pine	1,000	0	0	0	0	0	0	0	0	0	1,000
Hemlock	15,000	96,000	0	62,000	0	0	0	226,000	3,000	9,000	411,000
Red oak	10,000	20,000	15,000	26,000	104,000	0	40,000	90,000	0	25,000	330,000
White oak	0	0	0	0	19,000	15,000	0	0	0	0	34,000
Red maple	0	8,000	0	0	0	0	0	0	0	4,000	12,000
Sugar maple	0	3,000	0	0	0	0	0	4,000	0	0	7,000
White birch	0	9,000	0	4,000	0	0	0	0	0	0	13,000
Yellow birch	0	3,000	0	0	0	0	0	16,000	0	0	19,000
Black birch	0	4,000	1,000	7,000	0	0	8,000	13,000	0	2,000	35,000
Beech	0	0	0	0	0	0	0	8,000	0	26,000	34,000
Aspen	0	0	0	0	0	0	0	1,000	0	0	1,000
White ash	0	10,000	0	0	0	0	0	0	0	0	10,000
Hardwood pallet	2,000	18,000	1,000	17,000	15,000	8,000	16,000	63,000	0	28,000	168,000
TOTAL-Bd.Ft.	66,000	227,000	22,000	162,000	148,000	23,000	64,000	446,000	3,000	94,000	1,255,000
Sftwd pulp-cds.	300	430	20	240	40	60	50	895	25	30	2090
Hdwd pulp-cds.	175	830	190	435	350	75	530	2,200	215	420	5420

Other Considerations

Whereas much of the mature high quality timber was harvested by the previous owner, many of the thinnings and harvests recommended for the various forest types in Nottingcook Forest will depend on the availability of markets for lowgrade products such as wood chips, firewood and pulp. If markets are tight, lowgrade softwood logs are typically chipped and pallet grade hardwood logs end up as firewood. Whereas most of the lowgrade products are of low value, differences in prices for those products are often minimal. If markets are really tight, some of the harvests will have to be delayed until some high quality products can be included in the timber sale.

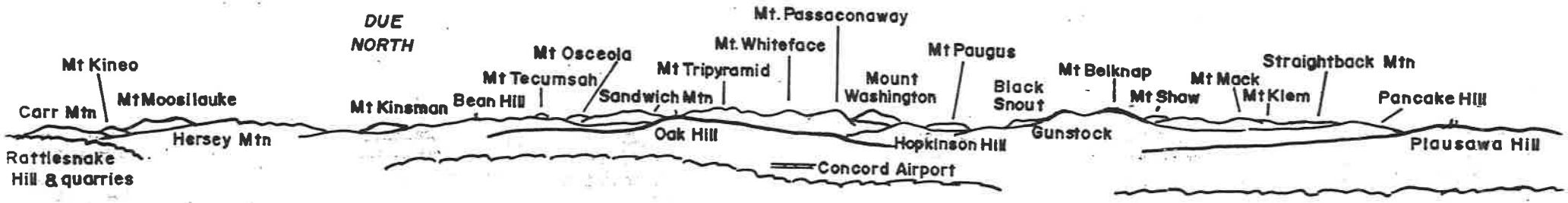
Although Nottingcook Forest is the largest of the Bow Town Forests, it is almost completely surrounded by both new and old developments. There are still a few large tracts of woodland that abut the forest that should be protected by development, either by acquisition by the Town or through Conservation Easements. The Hanson property is located along the southeast part of the forest and includes the hornbeam swamp and the woods road access to parts of Stands 8 and 9. The vista that looks towards the White Mountains in the southwest part of the forest is partly located in Stand 10 and partly on the Woodbury property. The actual summit of Great Hill near the northwest corner of the forest is owned by the Sampo family. With some additional tree cutting, the summit could have a spectacular view of points north and northwest. There are two "outlots" along the Woodhill-Hooksett Road, one is owned by Ken Jordan, the other is owned by Edward McPhee. Acquiring those lots will create a solid block of conservation land and allow better control of Woodhill-Hooksett Road. Although all of those families have been contacted without much success, ownership of those lots should be monitored to make sure an opportunity to acquire them is not missed. Attempts should also be made to make the current trail agreements with the Dawkins, Sampo and Woodbury families permanent.

The section of the Woodhill-Hooksett Road that crosses through the forest is a Class VI road and is not maintained by the Town. A local snowmobile club has done some improvements, though attempts to gate it proved futile. There has been some trash and construction debris dumping along the road and some teenage partying that has led to at least one brush fire. Many of the side trails have been gated or blocked, but those barriers have also been removed. Completely blocking the roads with boulders will reduce misuse, but will also prevent emergency vehicles from accessing the sites. Periodic patrols by the Bow Police Department, especially on Friday and Saturday nights during the summer may help reduce the party problem but not the dumping. The snowmobile club installed a culvert where Horse Brook crosses the road, but it was severely undersized. Based on watershed acreage standards provided by the NRCS, the culvert should be at least 48 inches in diameter.

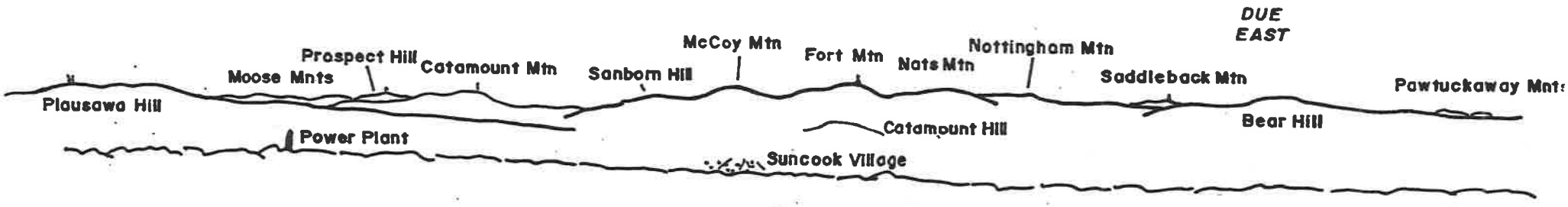
The Conservation Easement boundaries along the sand pit area that are painted red, should be regularly painted so the Public Works Department is aware of their locations. Whereas the edge of the pit must be sloped along property lines, it will be important for the department personnel to know where to stop mining sand and gravel. The Town's Road Agent should be shown the boundaries if he is not familiar with its location. If the non-easement areas at the end of Hope Lane and the eastern portion of the Woodhill-Hooksett Road are ever developed by the Town, access routes to the rest of the forest should be retained. The access should be wide enough to allow a log truck to pass.

The black gum swamp and rhododendron areas should be set aside as Natural Areas and monitored to insure that public use of the sites does not create any negative impacts.

NOTTINGCOOK FOREST VISTAS



NORTHERLY DIRECTION



EASTERLY DIRECTION

LAND ACQUISITION FILE
Bow Town Forest System
April 2007

Tax Map Block/ Lot Number	Common Name	Deed Book & Page #	Registry Map File #	Bow Planning Dept. File #
2-77,78,82,83	Bow Bog Lot	Bk 2040-Pg 974 2016- 682 1274- 819	6925	
2-88A,et al	Johnson Road Lot	Bk 1354-Pg 1092 1443- 318	13257	307
2-97,119	Robinson Rd/I-93 Lot	Bk 1279-Pg 819 1475- 631 2646- 1109	6929 16845	238 395
2-122	Robinson Road Lot	Bk 1279-Pg 819	7682	323
3-2,2Y	Hunter Drive Lot	Bk 1466-Pg 341	9468,5739,14021	311,241
3-63	Morgan Lot	Bk 1279-Pg 826	7471	110
3-138	Knox Road Lot	Bk 1279-Pg 819	6923,6922	
4-26,27	Bela Brook Lot	Bk 1279-Pg 819	6928	242
4-50	Turee Island Lot	Bk 1972-Pg 1810	9156,4508,	189,139
4-56	Page Road Lot	Bk 1279-Pg 819	8167,6927	248,260
4-77	Hanson Park	Bk 1279-Pg 819		
4-116,et al	Walker Forest	Bk 1279-Pg 883 1878- 1440 1178- 364 2002- 197	7683,12525 13401	286,313
5-64	Heather Lane Lot	Bk 819-Pg 834	6926	197
2-44, et al	Nottingcook Forest	Bk 1834-Pg 564 2107- 534-542	16,620	
4-103,et al	Hammond Lot	Bk 2973- Pg 521	18555	

GLOSSARY

ACCESS: The place or ability to enter a woodlot from an existing public road.

BASAL AREA: The cross-sectional area of a tree at 4½ feet above the ground, usually measured in square feet.

BLAZE: An ax mark on a tree denoting a boundary line.

BIOMASS: Commonly refers to the entire mass of living tree material above stumpage height.

BOARD FEET: A measure of wood by volume. One board foot is the volume of wood equal to a piece 12 inches long by 12 inches wide by one inch thick. Many "log rules" are available for converting raw material to board foot units. Log rules are closely linked with the local forest industries and vary with geographical areas. The "International ¼ inch Log Rule" is commonly used in most areas of the Northeast. Board feet per acre (BF/A) is a measure of tree density in a forest stand.

BOLTWOOD: Wood which is used for turning stock and for the eventual manufacture of countless small items, such as buttons, golf tees, dowels and wooden toys. Boltwood mills buy the raw material in four-foot lengths (bolts) and/or log length form.

CAPITAL GAINS: Increase in value over time of an asset. For tax purposes, it is the sale price of an eligible asset less its cost.

CORD: The standard cord of wood is an imaginary rack, or stack of wood, measuring 4 feet by 4 feet by 8 feet and containing 128 cubic feet of wood, bark and voids. Tables are available for estimating the number of cords represented by standing trees. Cords per acres (CDS/A) is a measure of density in a forest stand.

DBH (Diameter at Breast Height): The average diameter of a standing tree, measured outside the bark, at a point 4½ fee above the ground.

DEFECT: Internal rot, knots, or other defects in a live tree. The extent of unseen defect can be estimated from the history of a stand and from evidence of external damage from ice, wind, fire, insects, logging operations, etc.

DEPLETION ALLOWANCE: A tax benefit derived from "depleting" timber harvested as defined by the Internal Revenue Service.

FIREWOOD: Similar to pulpwood in that it is wood, not fit for higher uses such as sawlogs and veneer but it is used for heat production rather paper production.

FLAGGING: The practice of hanging plastic ribbon as temporary markers in the woods for such things as boundary location and skid trail layout.

GROWTH: The amount of fiber added to a tree over a period of time. Usually expressed in cubic feet per acre per year or board feet per acre per year.

HARDWOOD: Hardwood trees are generally of the broad leaved species, also known as "deciduous" trees. Some more economically important hardwood species are maples, birches, ashes, and beech.

INACCESSIBLE: Describes land which cannot be logged at the present time because there is no economical way to get the timber out.

LOGGING COSTS: Include cost of cutting and yarding, trucking, internal road construction, and agent's fees.

MANAGEMENT PLAN: A document which analyzes the forest on a woodlot and makes suggestions for future activities thereon.

MATURE: Describes a tree which is at its peak as far as biological or economic conditions are concerned.

MBF: Thousand board feet (see "board feet").

MEAN STAND DIAMETER: The average diameter of a group of trees measured at diameter breast height (DBH).

MERCHANTABLE HEIGHT: The height of a tree where the merchantable portion of it ends. Usually at about 4" - 6 " in diameter.

MIXED WOOD: Describes a stand condition where both softwood and hardwood are present in significant amounts.

MULTIPLE USE: Concurrent use of the forest resources for more than one goal such as timber production, wildlife habitat, watershed management, etc.

NON-COMMERCIAL: A stand which is not able to be operated economically either due to terrain or size and value of the timber present.

OPEN AREA: Unforested land, typically hayfield, built up areas, or overgrown fields.

OPERABLE: Before a stand of timber can be logged (operated) on a commercial basis, it must have some minimum volume of timber. Just as markets vary from one geographical area to another, so does the minimum volume required to operate a stand profitably.

OVERMATURE: A condition in which a tree or stand is past its peak of either economic value or biological growth.

POINT SAMPLING: Statistical approach determining volumes in a forest. Commonly done with a prism at point randomly selected on a grid network spread out all over the property.

PRISM: In forestry, a prism is a calibrated wedge of glass which deflects light rays at a specific offset angle. In conducting a timber cruise, trees seen through the prism from fixed points are measured and are easily converted to "per acre" figures.

PULPWOOD: Wood or trees used to make pulp, from which paper products are manufactured. Trees of poor form and/or quality (rough and rotten), and of small size, are commonly tallied as pulpwood during at timber cruise.

SAWLOG: The portion of wood cut from a tree which will yield timbers, lumber, railroad ties and other products which can be sawn with conventional sawmill equipment.

SELECTIVE HARVESTING: The process of choosing some trees to cut over others based on such criteria as species, age, quality, location, health, etc., with the owner's long term goals for management in mind.

SILVICULTURE: The practice of growing trees.

SITE INDEX: A measure of the ability of an area to grow timber.

SITE CLASS: Stands fit into size classes based on the size of trees which occupy them.

> **Sawlog** - A live tree which measures over 10 inches in diameter 4½ feet from the ground.
> **Pole** - A live tree which measures between 4 and 10 inches in diameter 4½ feet from the ground.
> **Sapling** - A live tree taller than 4½ feet but less than 4 inches in diameter 4½ feet from the ground.
> **Seedling** - A live tree less than 4½ feet tall.

SOFTWOOD: A class of tree species retaining their needles year round, also known as Conifers such as pine, hemlock, and spruce.

SOIL SUITABILITY: The general quality of the soil to provide a good medium for the growth of timber products.

SOIL TYPE: A general description of depth and water content of soil.

STAND: A group or area of trees or forest having similar characteristics and requiring similar management practices.

STEMS: A term used to describe individual trees usually in the phrase "stems per acres."

STOCKING: The amount, usually in trees and less frequently in basal area or volume per acre of a stand.

> **Overstocked** - A stand condition where there are too many trees present to maximize growth and yield.

Adequately Stocked - A favorable stand condition where growth and yield are in near optimum levels.
Understocked - A stand condition where yield is lessened because all growing space is not adequately utilized.

STUMPAGE VALUE: The value of the standing tree. It consists of the mill price (M) paid for the logs, less the total logging costs (L) for cutting the timber and trucking the wood to the mill. Stumpage value is crucial to the forest owner; it represents his profit on timber sales to the mill, and may be determined by using the formula: S = M - L.

TIE AND PALLET: Logs that are too rough, short, small or crooked to be marketed as high quality sawlogs, but which can be sawn into railroad ties or pallet stock.

TIMBER CRUISE: A "cruise," or initial timber appraisal, is an inspection of a forest tract, conducted in order to determine the species composition, volume and value of timber of the tract. Other considerations during a cruise include site characteristics, reproduction and growth capacities of the species on the tract, operability, and the availability of markets.

TIMBER LIQUIDATION VALUE: The timber liquidation value (TLV) of a forest is the value of all the standing trees in operable stands. The value depends upon many variables, including logging costs and delivered mill prices, and may change from month to month.

TIMBER TYPE LINE: A boundary between two different stands of trees.

TRUCKING: Moving logs or other wood products from the landing area to the mill. One of the costs of logging.

VENEER: Veneer logs are turned on a lathe to produce thin sheets of wood to be used in the production of veneer, plywood and paneling. Veneer logs are usually the highest quality logs produced in a logging operation.

VOLUME: A quantitative measure of the amount of wood in a tree, stand, or woodlot usually expressed in board feet, cords, tons, or cubic feet.

WETLAND: Area of property which has surface water or high water table and is not able to economically grow trees.

WHOLE TREE CHIPS: Wood fiber produced when the remains of a tree are ground up after logs and pulp have been removed.

YARDING: The transport of logs or whole trees from the stump to yard, where wood is sorted. Yarding is usually done with rubber-tired "skidders," with tractors or with horses.