

FOREST STEWARDSHIP PLAN

prepared for the

Town of Barrington's Highway Garage Property

84+/- Total Acres
Map 224 Lot 10

Barrington, NH

April 2020

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INTRODUCTION

This Forest Stewardship Plan is being prepared at the request of the Town of Barrington's Select Board, Town Forest Task Force/Committee, and Conservation Commission. It is designed to document the natural resources in their current state and formulate management recommendations to meet the landowners' long-term goals and objectives.

GOALS AND OBJECTIVES

The Town of Barrington acquired this parcel in the early 1970's because of its proximity to the Town Dump and as they had a need for a property on which to build the Highway Garage Facility. Beyond the Highway Garage Facility, the Town manages the property with many goals in mind. Chief among them are:

- Recreational opportunities for the public.
- The protection and improvement of wildlife habitat.
- To conserve and protect the wetland and water resources.
- To protect rare or unique plant and animal species.
- The sustainable production of commercial forest products where this does not have undue adverse impact to the other stated management goals.

This property is not a Municipally designated Town Forest, and management falls to the Barrington Board of Selectmen with consultation/input from the Conservation Commission.

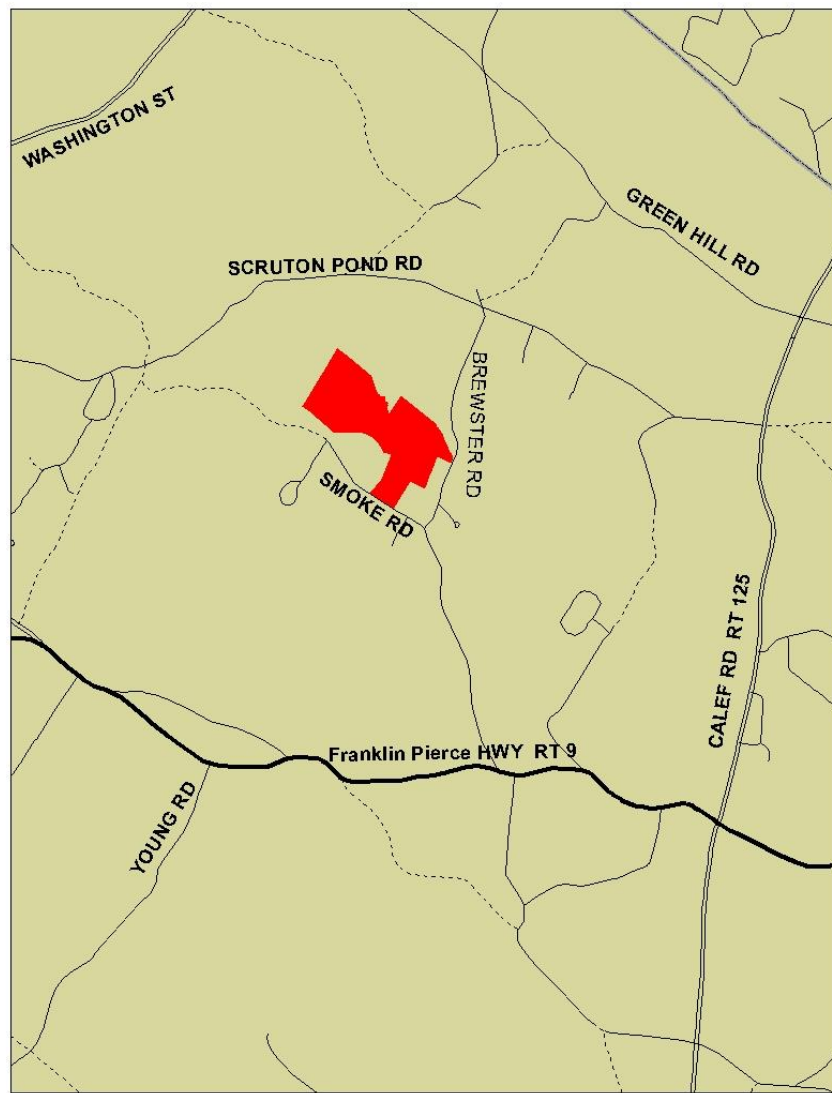
Permitted uses of the property include passive recreation such as walking/hiking, nature study, snowshoeing, cross-country skiing, etc. Non-permitted uses include; OHRV/ATV use, camping, and the kindling of fires.

CHAPTER 2: WOODLOT DESCRIPTION

LOCATION - DESCRIPTION

The Barrington Highway Garage property is irregular in shape and located in the north-central part of Town. It is comprised of a single lot of record, Map 224 Lot 10, and is assessed at 84.6 acres. It is located on the northern side of Smoke Street, to the north and west of the Town Transfer Station. The property briefly fronts on the western side of Brewster Rd, but this frontage is wetland.

The original deed for the property is recorded at the Strafford County Registry of Deeds, Book 897-Page 373. The Town had a survey conducted, which is shown as Plan No.26, Pocket No.6, Folder No.4. The deed transferring the parcel to the Barrington Youth Association is recorded in Book 3062-Page 710 and the survey map for this transfer is recorded in Plan Drawer 76, Plan #64.



BOUNDARY LINES

The boundary lines of the Barrington Highway Garage Property range from freshly surveyed and blazed, to somewhat obscure. During the field work for this plan, I discovered an area where a past (or current) misunderstanding of ownership/boundary line location may have led to the abutting landowner cutting over the actual boundary line onto the property of the Town of Barrington.

This issue occurred in the northwest corner of the property, against property now or formerly of Scruton Pond Farm. The survey that the Town of Barrington had developed in 1972 shows the configuration that I have used on the Forest Type Map and which is also currently shown on the Town's Tax Maps. Additional evidence to support this configuration can be shown on "***Revised Boundary Plan, Scruton Pond Farm, Inc. and John A. Bingham, Barrington, NH***" (recorded at the Strafford County Registry, Plan 38A-63), on "***A Plan of Ye Scruton Pond Farm***" (recorded at the Strafford County Registry, Plan 28-18) and on "***Wetlands Reserve Program Conservation Easement WRP Contract #6614280917, Tax Map 19 Lot 26, Scruton Pond Road, Barrington, NH, Owner: John & Pamela Palmquist Bingham***" (recorded at the Strafford County Registry, Plan 99-59. During my research of the Strafford County Registry's records, I could find no evidence supporting the configuration of the boundary line that cuts off the northwest corner of the Town's land, amounting to roughly 2.5 acres.

However, as shown on the Forest Type Map, this corner of the property is "cut off" by a marked segment of boundary line. Harvesting that originated on the abutting land of Scruton Pond Farm Inc stretched southward to this incorrect boundary line, onto what is by all accounts the Town of Barrington's land. This harvesting was light in nature and not a lot of trees were removed, but it would serve everyone involved to get this discrepancy in the boundary configuration resolved in the immediate future. Once the boundary situation is clarified, all the upland lines of the property should be painted to keep situations like this from occurring in the future.

The boundary between the Town of Barrington's land and that of the Barrington Youth Association, while being shown on the survey map, does not appear to have been marked following establishment. This may or may not be an issue that the Town feels it needs to address, although a fairly generous interpretation of this line may have been used by the BYA during construction of their recreational fields.

LAND HISTORY

The Barrington Highway Garage property was acquired from Melvin and Myrle Clark in December of 1971. The deed for this transfer is recorded in the Strafford County Registry, Book 897-Page 373. Shortly after acquiring the property, the Town contracted with local surveyor F.E. Drew to conduct a complete boundary plan for the property. This plan is titled "*A Plan of Town of Barrington Lot*", was completed in October of 1972, and is recorded in the Strafford County Registry, Plan Number 26-Pocket Number 6-Folder Number 4.

In the nearly 50 years since they acquired the property, the Town has constructed their Highway Garage Facility on the property, as well as expanding an area to the rear of the building for the storage/disposal of materials and debris that are generated through the maintenance of the Town Roads and properties.

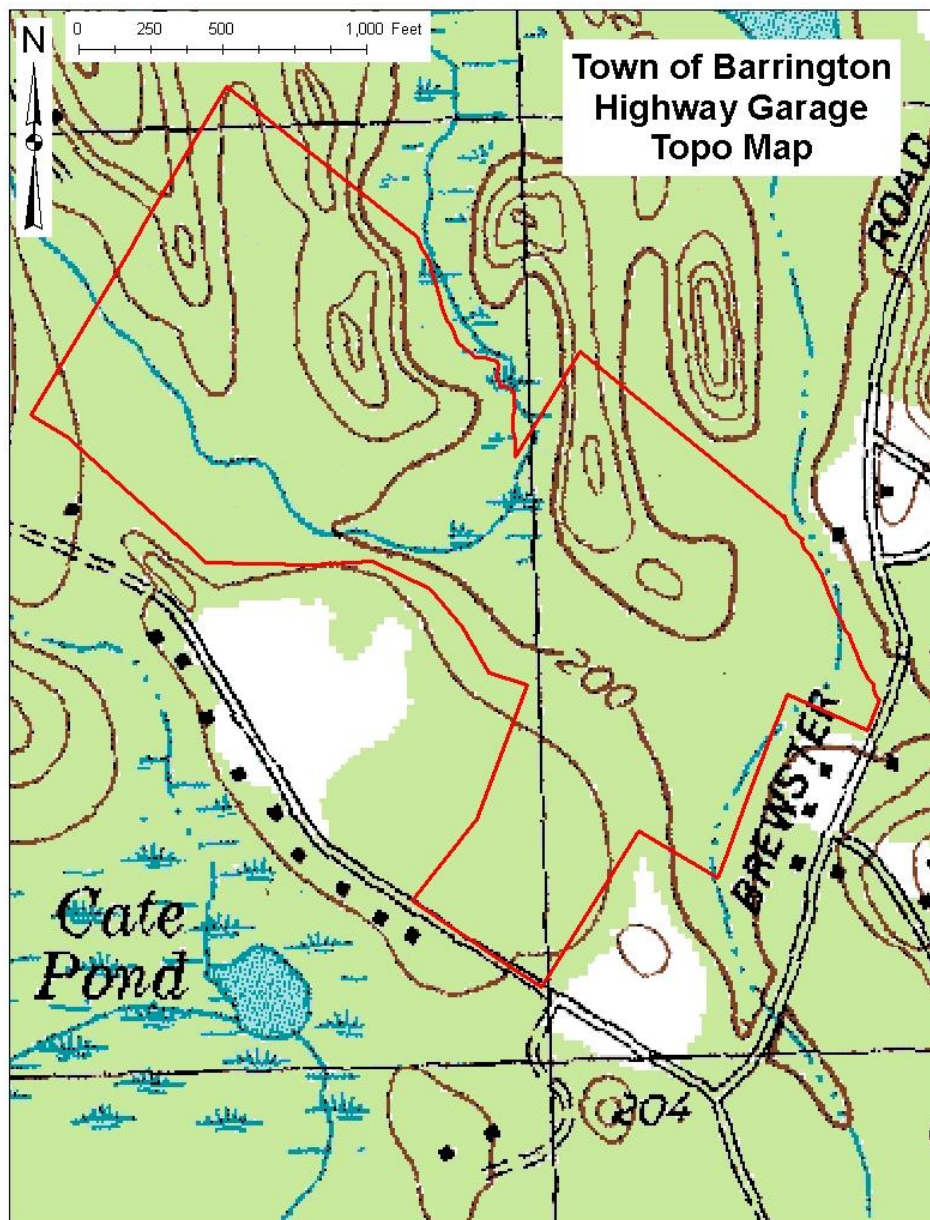
In the mid 2000's they transferred the level, sandy area immediately to the west of the Highway Garage to the Barrington Youth Association for the purpose of constructing recreational fields. The deed for this transfer is recorded in the Strafford County Registry, Book 3062-Page 710. The survey for this transfer is recorded in Plan Drawer 76-Plan #64.

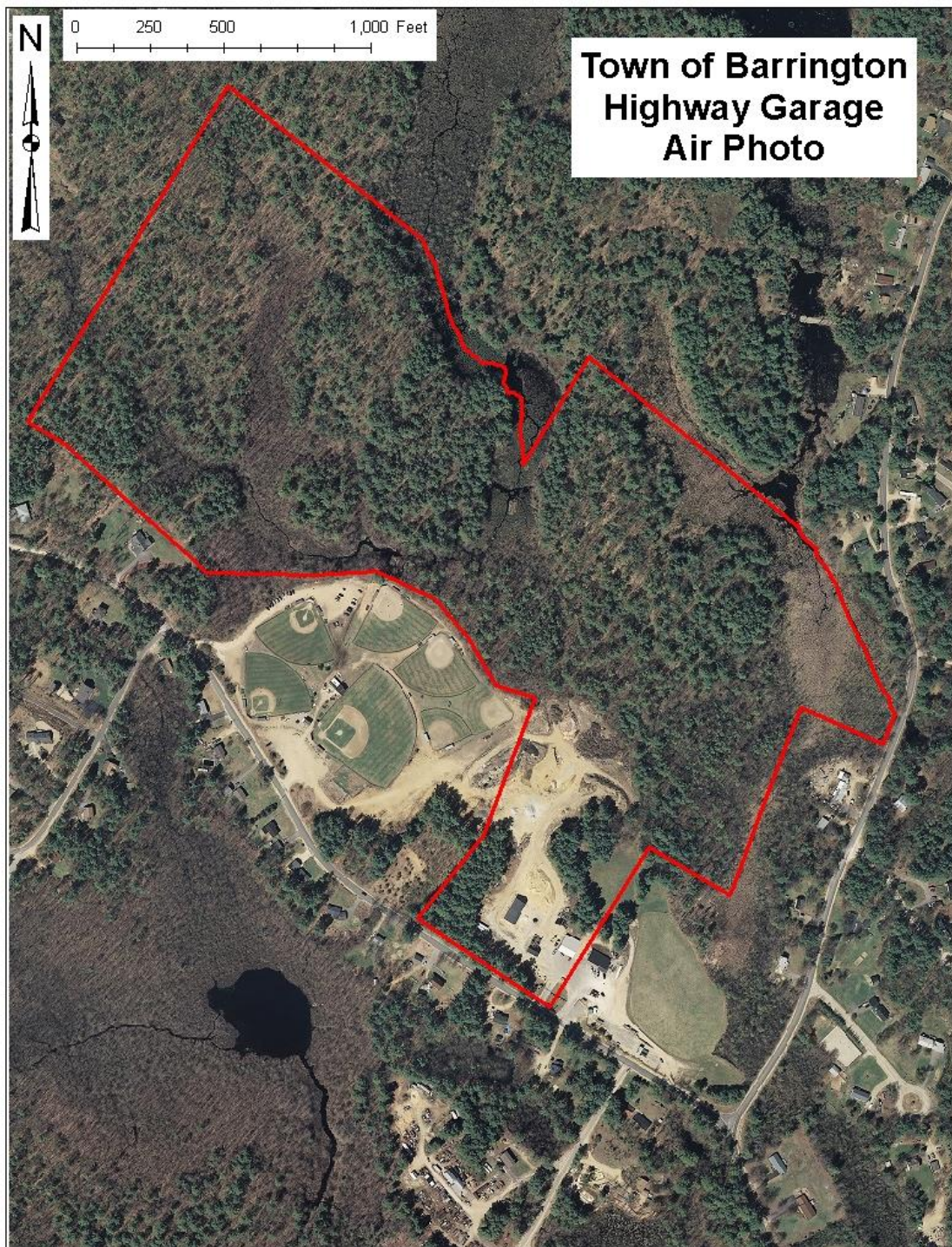
The southern terminus of the Barrington Trail is at the BYA ballfields. The trail was completed in 2001, and from the Town of Barrington's property, travels north and east, eventually crossing Scruton Pond Rd, entering the Barr Easement property, travelling along the Isinglass River, and ending near the northern end of Seavey Bridge Road, just south of its intersection with Green Hill Road. This trail was created by the Barrington Trails Committee, a part of the Town's Recreation Department.

TOPOGRAPHY - ASPECT

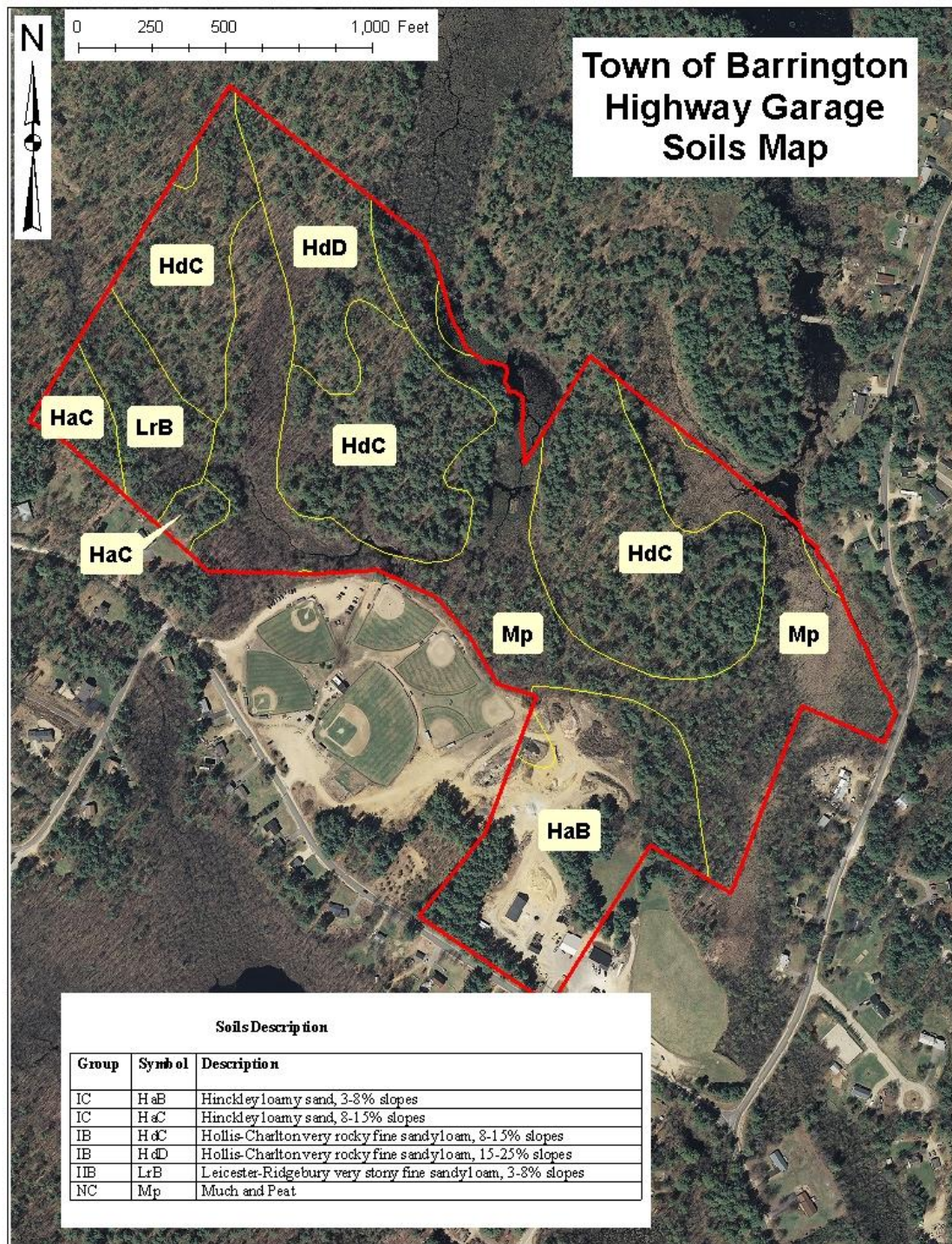
The topography on the Barrington Highway Garage property varies over the extent, ranging from nearly level areas of forested wetland, to gradually sloping upland. There are very few areas where slopes exceed 10%. The steepest areas are generally along the sides of the several ridges and along the edges of the open wetlands to the north.

Aspect varies as well, but the land generally slopes to the south and east.





CHAPTER 2: WOODLOT DESCRIPTION



SOILS

Four soil types underlay the Barrington Town Forest, as determined by the Strafford County Soil Survey Manual. The following is a description of the major forest soil groups (taken from the S.C.S.S.M.) along with a list of which soils fall into each group.

Group IB Soils

Symbol	Description
HdC	Hollis-Charlton very rocky fine sandy loam, 8-15% slopes
HdD	Hollis-Charlton very rocky fine sandy loam, 15-25% slopes

The soils in this group are generally sandy or loamy over sandy textures and slightly less fertile than those in group IA. These soils are moderately well and well drained. Soil moisture is adequate for good tree growth, but may not be quite as abundant as in group IA soils.

Soils in this group have successional trends toward a climax of tolerant hardwoods, predominantly beech. Successional stands, especially those which are heavily cut over, are commonly composed of a variety of hardwood species such as red maple, aspen, paper birch, yellow birch, sugar maple, and beech, in combinations with red spruce, balsam fir, and hemlock.

Hardwood competition is moderate to severe on these soils. Successional softwood regeneration is dependent upon hardwood control.

Group IC Soils

Symbol	Description
HaB	Hinckley loamy sand, 3-8% slopes
HaC	Hinckley loamy sand, 8-15% slopes

The soils in this group are outwash sands and gravels. Soil drainage is somewhat excessively to excessively drained and moderately well drained. Soil moisture is adequate for good softwood growth, but is limited for hardwoods.

Successional trends on these coarse textured, somewhat droughty and less fertile soils are toward stands of shade tolerant softwoods, i.e., red spruce and hemlock. Balsam fir is a persistent component in many stands, but is shorter lived than red spruce and

CHAPTER 2: WOODLOT DESCRIPTION

hemlock. White pine, red maple, aspen, and paper birch are common in early and mid-successional stands.

Hardwood competition is moderate to slight on these soils. Due to less hardwood competition, these soils are ideally suited for softwood production. With modest levels of management, white pine can be maintained and reproduced on these soils.

Because these soils are highly responsive to softwood production, especially white pine, they are ideally suited for forest management.

Group IIB Soils

Symbol	Description
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LrB	Leicester-Ridgebury very stony fine sandy loam, 3-8% slopes
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The soils in this group are poorly drained. The seasonal high-water table is generally within 12 inches of the surface. Productivity of these poorly drained soils is generally less than soils in other groups.

Successional trends are toward climax stands of shade tolerant softwoods, i.e., spruce in the north and hemlock further south. Balsam fir is a persistent component in stands in northern New Hampshire and red maple is common on these soils further south. Due to abundant natural reproduction in northern New Hampshire, these soils are generally desirable for production of spruce and balsam fir, especially pulpwood. Red maple cordwood stands or slow-growing hemlock sawtimber are common in more southerly areas. However, due to poor soil drainage, forest management is somewhat limited. Severe wind throw hazard limits partial cutting, frost action threatens survival of planted seedlings, and harvesting is generally restricted to periods when the ground is frozen.

GROUP NC Soils

Symbol	Description
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Mp	Muck and peat
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Several mapping units in the survey are either so variable or have such a limited potential for commercial production of forest products they have not been considered. Often an on-site visit would be required to evaluate the situation. In this case, the Muck and Peat soil is associated with the forested wetlands and open marsh.

ACCESS

Management access to the woodland areas at the rear of the Highway Garage property is dramatically complicated by the abundant areas of wetland (both forested and open marshland) that occur throughout the property.

The large area immediately behind the Highway Department building that is used as a pit and for material/debris storage would provide an excellent log-landing area that could likely be used during any time of year except for the brief period of mud season in March and April. There are many large open areas near the wood line, and consultation with the Highway Department would be required to see what location would be most convenient and not in the way of the Town's activities.

From a log-landing at the back of the Highway Department's operations area, there are several complications to obtaining access to the upland areas further north on the property. First and foremost is the wide area of forested wetland (stand 2) that must be crossed in order to get to the productive upland areas (stand 1). This forested wetland is a hydric soil, and as such, needs to be protected from rutting if being crossed with logging equipment. Conducting any such operation during the frozen winter months when the ground is snow covered and theoretically frozen will help to protect the integrity of the wetland.

The crossing from the "pit" area behind the Highway Garage to stand 1-1 is the shortest crossing and the most easily accomplished. The best location for a skid road is where the Barrington Trail crosses, which also appears to be where an old woods road crossed. Instead of using this same location and greatly impacting the character of this section of the Barrington Trail, the skid road should be located slightly to the west. This crossing would develop access to the entirety of section 1.

Gaining logging access to sections 2 & 3 is much more complicated. The distance from the "pit" area to the dry upland sections is much longer and will require installing a temporary bridge over Hartford Brook, in between the two areas of open wetland. Taking this route will require around 600' of travel through the forested wetland, which, given the right ground conditions (very cold and snowy) and a conscientious operator, could be conducted without harm being caused to the hydric soils. However, obtaining extended periods of deep snow cover and consistent cold has proven to be anything but a certainty during the past decade. In the past, it appears as though access to these upland areas came from what is now the Barrington Youth Association's property, where the wetland area narrows up considerably and a good crossing was able to be constructed. With the transfer of this land, access to the upland areas in the western part of the property was greatly affected.

The only alternative to the long wetland crossing described above would be to seek temporary access from the property owner to the north and west, Scruton Pond Farm Inc. This is the same landowner with which the boundary line discrepancy exists. However, the friendly resolution of this boundary issue may open the door for discussions about access.

Once on the western sections of upland (stand 1 sections 2&3), there is still a significant finger of forested wetland (stand 2) that runs up through the middle. Crossing this, as with the rest of the wetland crossings discussed on the property, would be best accomplished with ample snow cover and consistent cold.

Any crossing of a stream will require a ***Statutory Permit by Notification – Forestry*** to be filed with the State of New Hampshire’s Wetlands Bureau. All recommendations set forth in the publication ***Best Management Practices for Erosion Control on Timber Harvesting Operations in New Hampshire*** should be followed.

The type of logging equipment to best accomplish any recommended harvesting on the Highway Garage property would be the fully mechanized cut-to-length system. This type of logging consists of a machine (a Processor) that fells the trees, limbs them in place, and processes them into their salable lengths right there in the woods. A hybrid skidder/log truck called a Forwarder then carries the logs and pulpwood out of the woods on its bunks, to stack the wood neatly in the landing for loading onto trucks. There are several benefits to this type of logging system that correspond with the issues that the difficult access on this property presents. First, by limbing the trees in place and running on the brush, additional buffer to the ground/soils is provided, helping to protect the hydric integrity in the forested wetland. These machines, despite being large, are generally (when used correctly and by a conscientious operator) able to have lighter impact on the ground than traditional skidders. By carrying the logs and pulpwood from the woods instead of dragging it, the skid roads do not have to be as straight and there is usually less soil disturbance. The Forwarder is equipped with a cherry picker and is able to haul brush around for placing in wet spots and is able to easily set and remove temporary bridges.

FOREST CATEGORIZATION & INVENTORY

There are many ways a forester can categorize a woodland. The most common way is to break a larger forested area (be it a whole property, compartment, management unit, etc.) down into stands; areas of the forest with similar characteristics (i.e. species composition, size class, and density or stocking). These stands can then, based on their similarity of character, be treated in a uniform manner.

For ease of reference, these stands are given a numerical label (Stand 1,2,3,etc.). These stands can then be broken down into sections (1-1, 1-2, 1-3 etc.). Stands are then given a short coded description on the Forest Type Map to give someone in the field with the map a coarse description of the stand without reading the more involved description contained in the plan. This coded description deals mainly with the overstory by selecting the segment of each of the following categories that best describes the stand.

SPECIES TYPE	SIZE CLASS	STOCKING LEVEL
H: Hardwood	1: Saplings (1-4")	A: Over stocked
M: Mixedwood	2: Poles (5-11")	B: Fully stocked
S: Softwood	3: Sawtimber (12"+)	C: Under stocked
WP: White Pine		

For example, H2A would indicate an overstocked hardwood pole stand, M3C an understocked sawtimber sized mixedwood stand, or WP1B a fully stocked white pine sapling stand. If information regarding the understory were needed to be given in conjunction with overstory information, it would be recorded as ^{WP3C}/_{H1A}, in this case an understocked white pine sawtimber stand with an overstocked understory of hardwood saplings.

CHAPTER 3: FOREST RESOURCES

The following is a list of the abbreviations of the common trees found on the Highway Garage property. These abbreviations can be found throughout the detailed stand descriptions.

Species	Abbreviation	Species	Abbreviation
White Pine	WP	Red Pine	RP
Spruce	SP	Balsam Fir	BF
Hemlock	HM	Other softwood	OS
Red Oak	RO	Red Maple	RM
Sugar Maple	SM	White Birch	WB
Yellow Birch	YB	White Ash	WA
Aspen	AS	Beech	BE
Basswood	Bsw	Other Hardwood	OH

On the Highway Garage property, a total of 16 inventory points were recorded using a 20 basal area factor (BAF) prism. Each inventory point was located on a grid spacing of 400' by 400'. At each inventory point, data was recorded regarding tree species, dbh, merchantable height by various product, and overall tree quality. This information was analyzed by the **Forest Tally** computer program, developed by Lee Goldsmith.

Detailed descriptions of each stand can be found in the **STAND DESCRIPTIONS** and **STAND RECOMMENDATIONS** sections of the Management Plan.

STAND DESCRIPTIONS

STAND	CODE	ACREAGE	DESCRIPTION
1	M2/3A	41	Fully to over-stocked, pole to sawtimber sized white pine and red oak with red maple, white oak, and scattered hemlock. Fair quality. 60+ year old.
2	M2A	19	Fully-stocked, pole to small sawtimber sized red maple and white pine with scattered red oak. Fair quality. 60+ year old. This stand is a forested wetland.
		13	Open wetlands/marsh.
		11	Highway garage operations area.
		84+/-	Total Acreage

CHAPTER 3: FOREST RESOURCES

Forest type map

STAND TECHNICAL DATA AND RECOMMENDATIONS

STAND 1 M2/3A 41 Acres

TECHNICAL DATA:

Species Composition by Percent (BA)	WP-64%, RO-17%, WO-13%, Other 6%
Mean Stand Diameter	10.2"
Mean Merchantable Stand Diameter	11.8"
# Trees per acre (4"+)	238
Basal Area/Acre	134.3 sq. ft./acre

MANAGEMENT GOAL: To improve the timber growth, wildlife habitat and develop desirable regeneration.

TIME FRAME: 2020-2030

STAND 1 RECOMMENDATIONS:

Stand 1 on the Highway Garage property comprises the upland areas and is a mixture of primarily white pine and red oak along with a variable component of white oak, northern hardwoods and scattered hemlock. I have broken it down into three sections based on access. Section 1 occurs in the eastern half of the property, and sections 2 & 3 in the western half.

White pine is found throughout the stand, sometimes making up the vast majority of the species mix, and in other locations, playing a lesser role to the oaks. The soils that underlay the majority of the stand are very favorable for pine growth and management of this area should focus on growing the existing pine to maturity as well as attempting to develop white pine regeneration, so that the next forest to occupy the site will look much the same as the current one.

In white pine management, perhaps the most successful method of naturally regenerating a stand is the shelterwood system of harvesting. The shelterwood system usually consists of 3 stages or steps. The first being the regeneration cut. This first cut will remove 30-40% of the basal area from a fairly mature stand, leaving the better-quality trees in the overstory as a seed source. Obtaining adequate ground scarification (exposing mineral soil) to prepare the seedbed is necessary to obtain good germination of pine seed.

The second stage of the shelterwood system would occur when the pine regeneration is very well established and ready to start rapid growth. This point would

occur some 5-15 years after the regeneration cut, depending on how well the seedling/saplings are doing. This second stage would remove approximately 50% of the remaining stand, giving the established regeneration ample light and room to grow.

The third and final stage of the shelterwood system would occur when the regeneration has reached 25-35 years of age, again depending upon growth. This cut would remove almost all (80%) of the residual stand, leaving only scattered individuals as a seed source for future work, when you begin to thin the regenerating stand at age 45-60. There would likely be two of these thinning harvests as the stand matures, until the point where, somewhere between ages 80-120, the regeneration process is begun again.

It sounds so simple when described in this textbook manner. However, the reality of the situation is that nothing fits the description perfectly, and in most cases, a stand (or property) is at several different stages of the process at any given point, and results will often dictate changes to the timing and methods employed.

The recommended harvesting in stand 1 on the Highway Garage property will be a combination thinning/regeneration cut, due to the variability of the stand. The varying species composition, age structure and presence/type of existing regeneration all factor into the exact recommendation for various portions of the stand. In general, the harvest would seek to create openings in the forest canopy to allow for additional development of regeneration, thin the existing timber to provide room for crown expansion/increased growth rates, and harvest some of the mature timber.

Oaks are the most important mast producing species in this area of the country. Healthy beech can produce crops of nuts periodically, but the beech bark disease has affected the overall health of the trees and there does not seem to be regular nut crops like has historically occurred. White oak acorns are favored over red oak, but white oaks generally make up a much smaller component of our woodlands, although on this property make up a significant portion of the stocking in some areas.

Oaks will begin bearing acorns at 30+ years of age, but peak production does not occur until they reach 18-24" in diameter, often at 100+ years old. In general, the larger and healthier the trees, the greater the acorn production. As with all trees, health is generally in direct correlation to the size of the crown (photosynthetic area) and trees with ample room to spread out their crown instead of competing with neighboring trees for space tend to be healthier.

The oaks in stand 1 are just approaching their peak acorn production years. Overall health is good, although there are scattered individuals throughout the stand that exhibit signs of decay or stress. Although management of this stand will focus on growing and regeneration white pine, retaining the majority of the good quality oak component to an old age is recommended, looking to provide a steady supply of hard mast and grow valuable sawtimber.

The very scattered hemlock component of the stand should be retained wherever possible for the wildlife habitat it provides. Even scattered individuals are important, and by retaining them, we would hope to increase their presence within the stand. Their value as winter cover to many species of mammal and bird cannot be understated.

Stand 1 is currently even-aged. The recommended harvesting is designed to produce widespread areas of young growth. This diversification of the age structure will, over time, serve to create a multi-tiered canopy that provides habitat for a much wider range of species.

The recommended harvesting in stand 1 would likely gross between \$10-12,000 in stumpage proceeds.

STAND 2 M2/3A 19 Acres

TECHNICAL DATA:

Species Composition by Percent	RM-50%, WP-44%, Other-6%
Mean Stand Diameter	9.0"
Mean Merchantable Stand Diameter	11.3"
# Trees per acre (4"+)	310
Basal Area/Acre	136 sq. ft./acre

MANAGEMENT GOAL: To protect the integrity of the hydric soils that underlay the stand and capture some of the value of the white pine growing on the site.

TIME FRAME: 2020-2030

STAND 2 RECOMMENDATIONS:

Stand 2 consists of the forested wetland areas on the Highway Garage property. It is underlain primarily by the Muck and Peat soil type with some small sections of Leicester-Ridgebury. These soils are hydric, and in the case of the Muck and Peat, is not even rated as a timberland soils. As discussed in the **Access** section, even crossing these areas with logging equipment to access the productive upland areas will be problematic. I cannot, in good judgement, make widespread timber management recommendations for this area, knowing how tenuous even crossing them without damage will be. However, there is some work that could be done in conjunction with the recommended work in stand 1.

Despite being underlain by very wet soils, there is a fair amount of white pine sawtimber in some areas of stand 2. This valuable species is blowing down due to shallow root depth and exhibiting signs of rot from the over-abundance of moisture. It seems a shame to lose the entire value of this resource to windthrow and rot, so I recommend cutting the better-quality white pine sawtimber from the stand where it is practical to do so.

Along the skid roads that will cross through the stand, along the edges of stand 1, and on the slight ridges of drier ground within stand 2, it may well be possible to remove some of the white pine sawtimber without causing undue damage to the soil. The removal of this species will not harm the long-term productivity or value to the stand because the pine is on its way out anyway. The red maple that occupies the site is much better suited to the soil conditions and over time would be the predominant species.

The amount of timber removed from this stand will depend greatly on the weather and soil moisture conditions when the harvesting occurs, but I feel that somewhere around \$5,000 in stumpage proceeds could be generated by removing the more accessible pine sawtimber from this stand in conjunction with the recommended harvesting in adjacent stand 1. This value would likely be lost to windthrow and rot if no harvesting were to occur due to the unsuitability of the soils to support long term pine growth.

ESTIMATED TIMBER LIQUIDATION VOLUMES AND VALUES
April 2020

Species	Total Volume	Stumpage Value	Total Value
<i>Sawlogs</i>			
White Pine	408 MBF	\$125/MBF	\$51,000
White Pine Box	50 MBF	20/MBF	1,000
Red Oak	14 MBF	300/MBF	4,200
Oak Pallet	27 MBF	50/MBF	1,350
Total Sawlogs	499 MBF		\$57,550
<i>Pulpwood</i>			
Hardwood	1,448 tons	\$4/ton	\$5,792
Softwood	979 tons	1/ton	979
Total Pulpwood	2,427 tons		\$6,771
		Total	\$64,321

TOTAL TIMBER VALUE PER FORESTED ACRE: \$1,072

Notes:

- **MBF** is the abbreviation for "thousand board feet", the standard measurement for sawlogs.
- **Tons** can be converted to **Cords** using the following conversion rates;
Hardwood 2.55tons/cord
Softwood 2.2tons/cord
- At the time of this report, the timber markets are quite unstable, and these values represent my best estimate of what the Town of Barrington would receive for stumpage rates on the recommended harvesting.

WILDLIFE

From observed sign, a fairly modest variety of wildlife is currently using the Highway Garage property. Sign of deer, turkey, coyotes, fox, beaver, muskrat, squirrel, raccoon, porcupine, pileated woodpecker, raven, hawk, and songbirds was encountered during the field work for this plan. Seasonally, there are probably many more species that use the area, particularly the wetland areas in the summer. I would imagine that several species of ducks, blue herons, a myriad of songbirds, as well as countless amphibian and reptile species can be found within the wetland areas on this and abutting properties.

Periodic cutting maximizes forest succession to the benefit of many forms of wildlife. A dynamic mix of all age classes is considered advantageous for many species for both food and cover. Mast species, especially oak, should be favored and left to grow freely. Larger crowns provide increased nut production and are more valuable for wildlife, especially deer, bear, and squirrels. A standard objective is to retain at least 6 to 12 good mast trees per acre in the large sawtimber size class. Only stand 1 has any appreciable number of oak trees of mast producing size and the management recommendations for this area take this into account.

Trees containing cavities should be left for cavity dwelling birds and animals. Any standing rotten trees should be left as habitat for insects upon which woodpeckers and bear feed. Larger, poor quality, oversized (non-marketable) trees are usually decreasing in vigor which makes them good candidates for future "critter condos". Maintaining a minimum of 6 cavity/snag trees per acre with one exceeding 18" in diameter and 3 exceeding 12" in diameter is recommended. There is not a lot of dead or downed (coarse woody debris) on this property, as it is fairly young in age and has seen some timber harvesting in the past. By leaving the stand dead trees and those that appear to very soon be standing dead, you are, over time, adding to the amount of coarse woody debris on the forest floor. This woody debris is important for amphibians (salamanders), many species of insect, and is critical for nutrient recycling. In stand 2 in particular, there will, over time, be an abundance of large coarse woody debris as the pine component dies or blows down. On a wet soil like what underlays this stand, this woody debris is very important for amphibian/salamander habitat.

The open wetland areas on the property are another significant addition to the wildlife habitat. Riparian and wetland areas are used by more than 90% of the regions wildlife species and are the preferred habitat for more than 40% of them. The openings are used by some birds for hunting insects in much the same manner as fields. There is generally a good shrub edge to wetlands, often comprised of species that produce edible berries/soft mast. Several species of ducks will nest and raise young in the more open areas of wetland, and other bird species will use the more heavily vegetated areas. Numerous amphibians, reptiles and fish species require the year-round water that these beaver-influenced wetlands provide, including many species of snakes, turtles, frogs, salamanders and aquatic furbearers.

According to the NH Wildlife Action Plan, the majority of the Highway Garage property is designated as supporting landscape. The riparian areas that run through the property are contiguous with some to the north that are listed as Highest Ranked Within the Region.

The expansive open “pit” area behind the Highway Garage, with its broad areas of exposed dirt and areas of shrubby growth and grasses provide an excellent addition to the wildlife habitat on the property. Many bird species in particular will use this area for nesting, brooding and hunting insects. Larger birds of prey will hunt small rodents in the shrubby grassy areas. The installation of some bluebird nesting boxes in this area might be something to consider. They require little maintenance and can be placed out of the way of the highway operations.

This area behind the Highway Garage, with its areas of exposed sand and gravel, is also suitable habitat for turtle nesting. As part of the research for this plan, the databases for the New Hampshire Natural Heritage Bureau were searched. There is a record from the summer of 2012 of two female Blandings Turtles nesting and laying eggs in a gravel area near the northwest corner of the “pit” area. These turtles are listed as Endangered in the State of New Hampshire. Because this is an active area that is used by the Barrington Highway Department, there is inherent risk to un-intentionally disturb the nesting sites of these turtles. I propose taking a narrow strip/area along the back edge of the “pit” and creating a turtle nesting site. This could be simply accomplished by adding sandy fill (if there isn’t some there already) and keeping it free from disturbance by blocking it off with rocks/logs or other structure not easily moved. Making all the employees aware that this area is to be left alone should be enough. The impact to the Highway Department would be minimal and it would hopefully provide some secure nesting sites for this Endangered Species.

WETLANDS - WATER RESOURCES

The wetland and water resources on the Highway Garage property are fairly extensive, consisting of the large areas of forested wetland, the several areas of more open wetland (marsh/scrub-shrub swamp) and the Hartford Brook that runs through the property from west to north. Turtle Pond Brook makes up a small section of the northeastern boundary.

The State of New Hampshire regulates work in any of these jurisdictional wetlands. Appropriate buffers (100') should be retained along wetlands/streams in which 50% of the crown cover is maintained and soil disturbance is minimized.

Before crossing any watercourse, either seasonal and perennial, with logging equipment, or constructing a permanent crossing during woodsroad construction, it is necessary to file a ***Statutory Permit by Notification - Forestry*** with the State of New Hampshire's Department of Environmental Services Wetlands Bureau. Crossings must be constructed, in accordance with the standards set forth by the State of New Hampshire's ***Best Management Practices for Erosion Control on Timber Harvesting Operations***. Using the appropriate method to cross a stream will prevent the addition of sediment through soil erosion, which is highly problematic as the levels of particular matter increase.

PIT AREA BEHIND HIGHWAY GARAGE – INVASIVE SPECIES

The large open “pit” area behind the Highway Garage is both a fantastic addition to the wildlife habitat that the property provides, and a severe liability to the overall health of the property based on the prevalence and potential for the spread of invasive species.

This large open area is filled with a mosaic of habitat types, ranging from raw aggregate material (sand and gravel), to grassy piles of loamy material, to shrubby young growth on some of the areas that have not been disturbed in quite some time. This variety of habitat, all being classified as somewhat open, is very beneficial for a multitude of species. Many birds in particular will utilize this, feeding on insects and nesting in the patches of grassy/young growth. Larger, predatory bird species will hunt the opening for small rodents. The installation of bluebird nesting boxes in some of the areas that will not be disturbed is something to think about, as is setting a small area aside for turtle nesting, both discussed in the **Wildlife** section.

The invasive species issues associated with this area is something that should be immediately addressed. Because the Town uses the area to stockpile material from its road maintenance activities, it is inevitable that invasive species will be transported to and from the site. I looked around the site and the most significant problem I saw was the presence of Japanese knotweed in several areas. This is one of the fastest growing and most prolific invasive species that we deal with here in New Hampshire. It is able to be transported/transplanted by the smallest chunk of root material. It is also able to be moved by bird species who eat the fruit.

Control of Japanese knotweed requires either mechanically removing it (along with the entire root, or killing it with herbicides. Merely cutting it back will not kill the plant. From the Town’s perspective, it would be wise to try to get ahead of this problem before it becomes out of control. I feel that contracting with a licensed herbicide applicator may be the most practical route, but consultation from the UNH Cooperative Extension or possibly the State Division of Forests and Lands may be a good first step to take, as I am no expert on invasive species control.

A chief concern beyond having the Town’s property overrun by this species, is the risk of spreading it back out into the community if any of this material is used on projects within the Town.

As material is hauled to the Town’s property, if it is known to have invasive species in it, consider keeping it separate for treatment as the problem presents itself.

AESTHETICS

When planning and implementing any management activity, the affect on the aesthetics of the property should be taken into consideration. Logging in particular can have negative impacts on aesthetics. Matching the kind of logging operation to the needs of the forest as well as aesthetic considerations is important. Having conscientious operators goes a long way towards leaving a site with a reasonable post-harvest appearance. It is the job of the forester who is marking and laying out the harvest to take these concerns in mind and make sure the logging contractor does what is needed to minimize the visual impact.

As discussed in the **Access** section of the plan, if a timber harvest were to occur, it would need to be staged at the back of the “pit” area behind the Highway Garage. This would require crossing the Barrington Trail in several spots. These crossings should be made at right angles and appropriate buffers retained along the edges of the trail.

RECREATION

The Highway Garage property (and abutting BYA property) are essentially the southern terminus of the Barrington Trail. In addition to this trail, there is a small loop that runs over near the edge of the wetland. These trails appear to be well used, probably more so during the warmer months when use of the recreational fields is at its highest. There is little infrastructure to maintain on this trail system, excepting the small footbridge that helps cross the wet area to the north of the “pit” area.

If the Town wanted to expand the recreational opportunities that the property offers, I feel the only reasonable location would not tie in directly with the existing trails, and would instead consist of a separate loop in the western section of the property.

This new trail would leave the BYA property near the eastern edge of the wetland (the approximate location is marked on the Forest Type Map), cross Hartford Brook with a small wooden footbridge, turn to the east and then run out towards the northwest corner of the property (that area with boundary issues that need to be cleared up) by running along the edge of the wetland. From the northwest corner, it would run southwards along the boundary line, eventually turning to the east and skirt the edge of the wetlands associated with Hartford Brook back to the start. There would be one significant finger of forested wetland to cross, and it is likely that a couple short foot bridges would be the best approach. Keeping this new loop trail along the outer edges of this upland area would keep the majority of the area “intact”, minimizing the conflict with timber harvesting.

CULTURAL FEATURES

I did not find any significant cultural features during the field work for this plan, that is not to say that none exist.

The Barrington Trail might be considered a cultural feature over time, as it was created by the community and encompasses several properties/landowners.

RARE AND ENDANGERED PLANT & ANIMAL SPECIES

There were no rare or endangered plant or animal species encountered during the field work for this plan. That is not to say that none occur.

The Natural Heritage Bureau's databases were queried, and there is a record from 2012 of two female Blandings Turtles (endangered) having nested in the pit area behind the highway garage. Based on the record, it would seem the nests were inadvertently disturbed by the Town's activities in the area. As discussed in the **Wildlife** section of the plan, it might prove advisable to create small area of loose gravel/sand somewhere near the back of the pit area that is "off limits" to disturbance to provide a nesting site for turtles. If this was something the Town wanted to pursue, advise could be sought from one of the NH Fish and Game Biologists.

Additionally, within one mile of the property, there is documented presence of two other species of turtle with State listings. The Spotted Turtle (threatened) and Wood Turtle (species of concern) have both been documented.

STABILIZING AND RESEEDING

When any harvest operation or road construction project is completed, all critical skid roads and landings should be stabilized. Steep skid roads and truck roads should be waterbarred, outsloped, ditched and smoothed. Truck roads, major skid roads and landings, as well as any sensitive areas (such as near the potential brook crossing) should be seeded with conservation seed mix and mulched with hay where needed. This will help stabilize the soil, provide feed for wildlife, help control woody plant growth and provide an aesthetically pleasing road or trail. Conservation Mix, combined with white clover is the recommended seed mixture in most applications.

SAFETY

In the forested areas, the safety hazard is currently low. There have been no recent logging operations or damaging storms that have created the hazard of falling limbs. In the event that a timber harvest occurs, it would likely prove advisable to limit public access during the operation. Any potential harvest would likely occur during the winter months when trail usage is likely at its low point.

BEST MANAGEMENT PRACTICES

All woods road construction/use/maintenance and wetland/brook crossings should follow recommendations as made, (and required by law on brook crossings), in the "Best Management Practices for Erosion Control on Timber Harvesting Operations in New Hampshire", a resource manual by J.B.Cullen, DRED, Division of Forests and Lands. A copy of this publication can be requested through the above contact at the Department of Resources and Economic Development, P.O. Box 856, Concord, NH 03301 or call 271-2214.

NOTES: Before crossing a stream/wetland for the purpose of logging or road construction with the eventual intent of logging, a **Statutory Permit by Notification - Forestry** (see **Appendix**) form must be filed with the N.H. Wetlands Board.

FOREST PROTECTION - FIRE HAZARD

Practicing good forestry by maintaining species diversity, avoiding monoculture and promoting varied stages of forest succession should minimize mortality from common pathogens, and environmental stress. Based on what limited evidence is available, maintaining a diverse forest will help to minimize the effects of climate change.

There is no significant fire threat on the property and the kindling of fires is prohibited. The care, maintenance and development of access roads/trails will provide access to the property should the need for fire suppression occur.

To my knowledge, there has been no internal discussion within the Town about placing a permanent Conservation Easement on the property. Obviously, a portion of the property is used by the Highway Department, but the woodland and wetlands areas might be a candidate for permanent protection should that be of interest to the Town. The abutting properties to the north (Bingham and Schulz) are currently, or will shortly be, protected by an Easement, and adding the Town's woodland would increase landscape level conservation.

The invasive species issues have been addressed in the **Pit Area** section of the plan.

INSECTS AND DISEASES

From observed evidence, there is fairly low occurrence of forest disease problems on the Highway Garage property. Beech makes up a very small percentage of the woodlot, so addressing Beech Bark disease management is not necessary.

The impending infestation of emerald ash borer seems inevitable at this point. It has been discovered within Strafford County and is spreading rapidly. There is nothing to be done to treat infected trees on a forest level and the State of NH is recommended preemptively salvaging ash sawtimber during timber harvests. Ash plays such a small part in the woodlands of the Highway Garage property that an infestation by this insect will hardly be felt. During any timber harvest that occurs, living ash should be cut to capture the value before they are lost.

Once killed by these insects, the durability of ash wood will make them an important source of standing dead snags for quite some time.

MANAGEMENT SUMMARY – SCHEDULE OF PRIORITIES

2020-2030

Stands	Recommendation	Goal	Page Reference
	Resolve boundary issues in northwest corner of property and paint all lines.	Firmly identify all boundary lines and protect property from future encroachment.	3
Pit	Begin process of gathering information regarding invasive species control. Act as appropriate.	Forest health on this property and within the Town.	25
1&2	Conduct timber harvest per stand recommendations.	Improve timber resources and wildlife habitat.	16-20
	Possible recreational trail expansion.	Provide public recreation opportunities.	26
Pit	Install bluebird nesting boxes and identify/improve turtle nesting area.	Provide wildlife nesting habitat.	22,23,25

APPENDIX

APPENDIX

~Natural Heritage Bureau Printout

~Statutory Permit by Notification - Forestry