

FOREST STEWARDSHIP PLAN

prepared for the

Town of Barrington's Goodwill Conservation Area

291+/- Total Acres

Map 233 Lot 38
Map 240 Lots 5,6 & 7
Map 249 Lot 18

Barrington, NH

April 2020

Prepared by:
Timothy R. Nolin
Forester, NH LIC #356



Forest Land Improvement
forestlandimprovement.com

65 Walker Hill Rd., Ossipee, NH 03864
603-651-9711

TABLE OF CONTENTS

1. Background	
• Introduction.....	page 1
• Goals and Objectives	page 3
2. WOODLOT DESCRIPTION	
• Location - Description	page 4
• Boundary Lines.....	page 6
• Land History	page 7
• Topography and Aspect	page 9
• Aerial Photo	page 10
• Soils Map..	page 11
• Soils	page 12
• Access	page 15
3. FOREST RESOURCES	
• Forest Categorization.....	page 19
• Stand Descriptions	page 21
• Forest Type Map.....	page 22
• Stand Technical Data and Recommendations.....	page 23
• Timber Volumes and Values	page 33
4. OTHER RESOURCES	
• Wildlife	page 34
• Wetlands and Water Resources	page 37
• Aesthetics	page 39
• Recreation and Education	page 40
• Cultural Features.....	page 41
• Rare and Endangered Plant & Animal Species.....	page 41
5. OTHER RECOMMENDATIONS	
• Stabilizing and Reseeding.....	page 42
• Safety	page 42
• Best Management Practices	page 42
• Forest Protection – Fire Hazard	page 43
• Insects and Diseases.....	page 43
6. MANAGMENTE SUMMARY	
• Schedule of Priorities	page 44
7. APPENDIX	
•	page 45

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.

The entire property is subject to a Conservation Easement held by the Southeast Land Trust of New Hampshire (SELT). This Easement is recorded at the Strafford County Registry, Book 4735-Page 874. The Easement allows for the landowner to implement forest management activities on the property, subject to the following conditions, as taken from the Easement document;

2.A.ii.: For the purposes hereof, "forestry" shall include the planting, growing and harvesting of forest trees for the production of forest products; those forest practices employed primarily to enhance or protect wildlife habitat; the construction of roads or other access ways for the purposes of removing forest products from the Property and for improving noncommercial recreation opportunities; and the processing and sale of products produced on the Property, such as Christmas trees and maple syrup.

2.A.iii.: Agriculture and forestry on the Property shall be performed, to the extent reasonably practicable, in accordance with the then-current scientifically based practices recommended by the University of New Hampshire Cooperative Extension, USDA Natural Resource Conservation Service, or other government or private, nonprofit natural resource conservation and management agencies then active. No management activity shall be undertaken in a manner that is detrimental to the Purposes of this Easement, as described in Section 1, above, nor materially impair the scenic quality of the property as viewed from public roads.

2.A.iv.: Forestry shall be carried out in accordance with all applicable local, state and federal laws and regulations, and, to the extent reasonably practicable, in accordance with the then current, generally accepted best management practices for the sites, soils and terrain of the Property. (For references, see *New Hampshire Best Management Practices for Erosion Control on Timber Harvesting Operations* (NH Division of Forest and Lands, 2016), *Good Forestry in the Granite State: Recommended Voluntary Forest Management Practices for New Hampshire* (New Hampshire Forest Sustainability and Standards Work Team, 2010) or similar successor publications). Forestry shall be performed, to the extent reasonably practicable, in accordance with the following goals, and in a manner not detrimental to the Purposes of this Easement as described in Section 1, above:

- Maintenance of soil productivity;
- Protection of water quality, wetlands and riparian areas;
- Maintenance or enhancement of wildlife habitat;

CHAPTER 1: BACKGROUND

- Maintenance or enhancement of the overall quality of forest products;
- Maintenance or enhancement of scenic quality;
- Protection of unique or fragile natural areas;
- Protection of unique historic or cultural features; and
- Conservation of native plant and animal species and natural communities.

2.A.v.: Forestry on the Property shall be performed in accordance with a written forest management plan prepared by a forester licensed by the State of New Hampshire. Should such licensed professional not exist, said plan may be prepared by another similarly qualified person, said person approved in advance and in writing by the Grantee. The plan shall include a statement of the landowner's objectives and specifically address the long-term protection of those values for which this Easement is granted, described in Section 1, above. Said plan shall have been prepared not more than ten (10) years prior to the date that any harvesting is expected to commence, or shall have been reviewed and updated as required by said forester at least thirty (30) days prior to said date.

2.A.vi.: At least thirty (30) days prior to the commencement of a commercial harvesting activities, the Grantor shall submit a written certification to the Grantee, signed by a licensed professional forester or other qualified person, said other person to be approved in advance and in writing by the Grantee, that such plan has been prepared in compliance with the terms of this Easement. The Grantee may request the Grantor to submit the plan itself to the Grantee within ten (10) days of such request, but acknowledges that the plan's purpose is to guide forestry activities in compliance with this Easement, and that the actual activities on the Property will determine compliance therewith.

2.A.vii.: Commercial timber harvesting shall be conducted in accordance with said management plan and be prepared and supervised by a licensed professional forester or other qualified person, said other person to be approved in advance and in writing by the Grantee.

Contact Information:

Grantor: Town of Barrington, PO Box 660, Barrington, NH 03825
603-664-9007 barrington.nh.gov

Grantee: Southeast Land Trust of New Hampshire, PO Box 675, Exeter, NH 03833
603-778-6088 info@seltnh.org

Forester: Timothy R. Nolin, NH Lic.#356
Forest Land Improvement, 65 Walker Hill Rd, Ossipee, NH 03864
603-651-9711 forestlandimprovement.com

GOALS AND OBJECTIVES

The Town of Barrington acquired the 5 separate lots that make up this property beginning in December of 2007 and ending in December of 2019. The property is managed by the Town to conserve natural resources and provide the general public with a place to recreate and generally enjoy nature. Specific goals include;

- Providing 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;
- The protection of the scenic beauty of the area; and
- The protection of the cultural and historic features found on the property

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 and the Town Forest Committee.

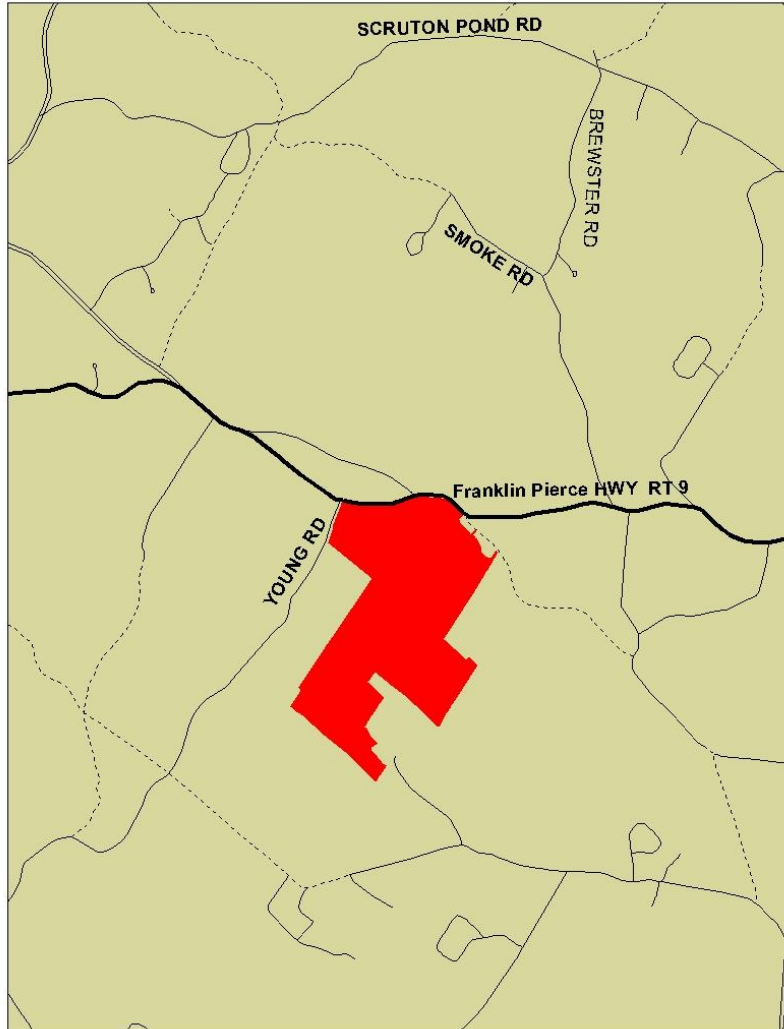
Permitted uses of the property include passive recreation such as walking/hiking, nature study, snowshoeing, cross-country skiing, winter time snowmobile use on some trails, hunting*, fishing, canoeing/kayaking, etc. Non-permitted uses include; OHRV/ATV use, camping, and the kindling of fires.

*For hunting purposes, the temporary installation of tree stands is allowed, with a permit issued by the Town, that must be taken down following the end of the season.

CHAPTER 2: WOODLOT DESCRIPTION

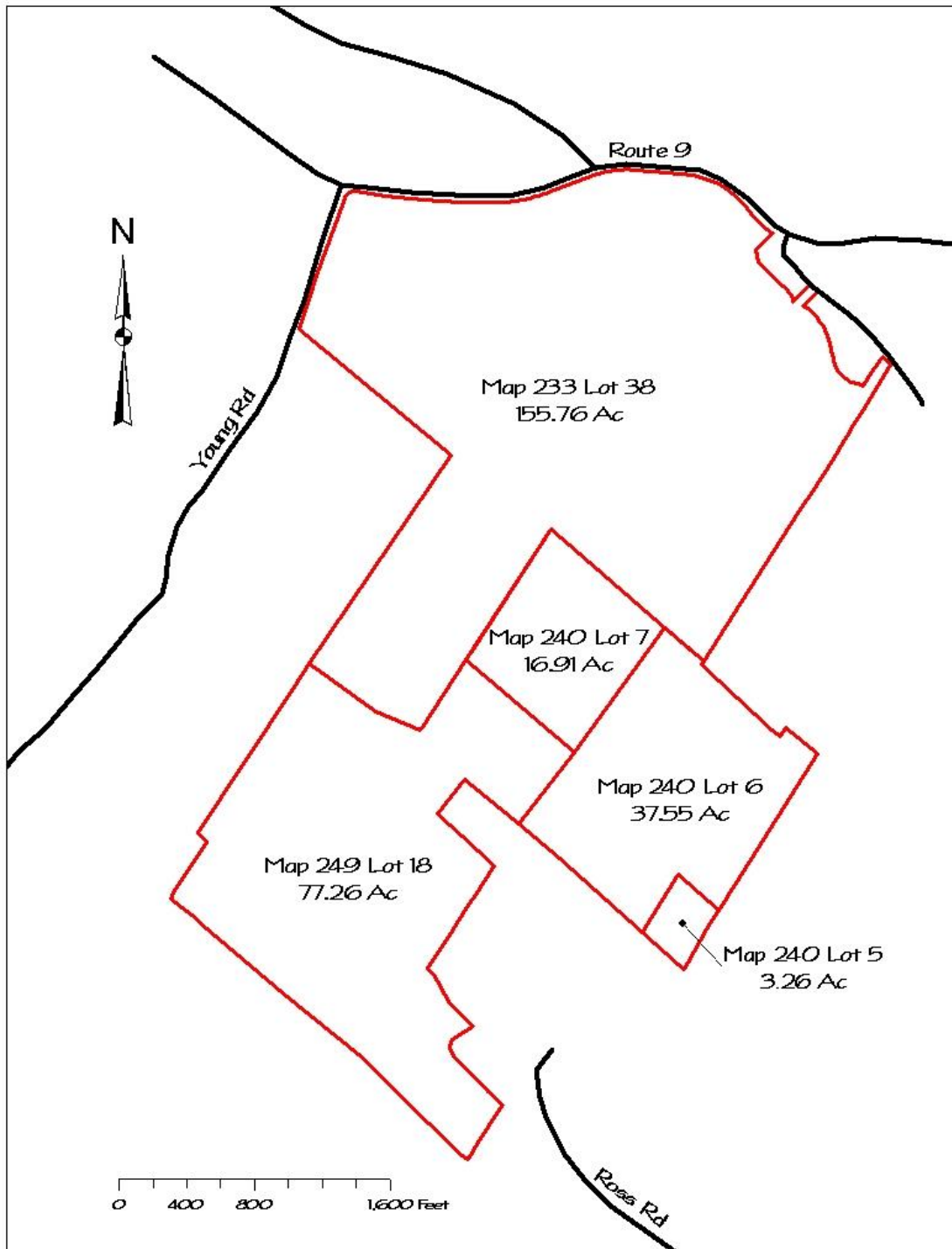
LOCATION - DESCRIPTION

The Goodwill Conservation area is fairly irregular in shape and located on the south side of Route 9 and east side of Young Road in central Barrington. The parking lot for the property is located just off Route 9, approximately 1.5 miles west of the intersection with Route 125.



The property is comprised of 5 lots of record. The following table details the pertinent assessing and deed information for each lot.

Map & Lot	Surveyed Acreage	Date of Acquisition	Deed Reference (S.C.R.D.)
M 233 L 38	155.76	12/2007	B3605-P498
M 240 L 5	3.26	5/2005	B3185-P254
M 240 L 6	37.55	2/2019	B4636-P180
M 240 L 7	16.91	12/2019	B4735-P866
M 249 L 18	77.26	12/2019	B4735-P866



BOUNDARY LINES

The boundaries of the Goodwill Conservation Area range from freshly surveyed, blazed and painted, to fairly obscure. It should be an immediate goal of the Town of Barrington (and something of great import to SELT) to identify and paint/mark all remaining exterior boundary lines of the property.

The two recent surveys of the property are both recorded at the Strafford County Registry. The survey for Map 233 Lot 38, entitled **Boundary Plat, Barrington, Strafford County, New Hampshire, prepared for Carolyn L. Goodwill Living Revocable Trust of 1999**, dated November 16, 2006, prepared by Orvis/Drew, LLC, is recorded as Plan#91-11.

The survey for Map 240 Lots 5,6&7 and Map 249 Lot 18, entitled **Conservation Easement Plan, Tax Map 240 Lots 5,6&7, Tax Map 249 Lots 18 & 19, Ross Road, Barrington, NH**, dated December 18, 2019, prepared by Eric C. Mitchell & Associates, Inc., is recorded as three sheets, Plan #12064, 12065 & 12066.

There is an older plan of Map 249 Lot 18, entitled **Plan of Land “John A. Buzzell Farm” Waldron B. Haley, Barrington, NH**, dated July 1982, prepared by F.E. Drew Associates and recorded as Plan#22A-168.

The boundary lines of Map 233 Lot 38 need to be painted. They are clearly defined on the survey, but evidence in the field consists of old faded blazes, occasional metal markers (from both SELT and the Town) and spotty flagging. These lines should be clearly marked by the application of red paint at frequent intervals. There is no need to paint the boundaries in common with the other lots that make up the property.

The exterior boundary lines of the 4 lots of record to the south of the original Goodwill parcel were just surveyed, blazed and painted red. These lines are in excellent shape and should be repainted every 10 years or so.

Having well defined boundaries is a critical part of any program of responsible property stewardship, and prevent activities on abutting properties from inadvertently straying over the line onto the Town’s land.

LAND HISTORY

The Goodwill Conservation Area, being comprised of 5 separate lots of record, each having a different lineage of ownership and management, has a long, varied history. The majority of the property was at one time cleared for agriculture, as evidenced by stone walls, fallen wire fences, old field timber types, and observed sign. In general, the northern half of the property, principally the original Goodwill property (Map 233 L 38) was likely rough pasture. The soils are thinner, rockier, and with the many large rock outcroppings/cliffs, were not suited to anything more than pasture.

The southern sections of the property are underlain by better soils (less stony, more level, and generally more fertile and easily worked), and the agricultural history appears to be much richer. There are a myriad of old stone walls and three cellar holes were encountered during the field work for this plan. The small size of the stones in some of the walls indicate that portions of this land was tilled for crop production rather than just being pasture.

Following the collapse of the sheep industry in the late 1840's and the expansion of rail service westward to much more fertile agricultural lands after the Civil War, much of the farmland in New England that was cleared in the early 1800's was abandoned and allowed to grow back to woods. These forests matured and began to be harvested for timber products again in the early to mid-1900's. Most woodlands here in Central New England have seen at least one round of harvesting since growing back from pasture and many have seen multiple cuttings.

The abundance of white pine in our landscape is largely due to the agricultural history of the area. In its natural state, pine is adapted to growing on dry, sandy soils that are not all that fertile and lack the available moisture to support most hardwood growth. However, it is also well adapted to colonizing old fields/pastures that are slowly abandoned. Typically, a field or pasture is not abandoned all at once, but rather its use is scaled back over several years prior to outright abandonment. This allows for pine seedlings to begin to colonize the site while there is still enough browsing pressure that the broadleaf species cannot get a foothold. Then, when the area is finally abandoned, the pine, being already established, has a competitive advantage over the faster growing hardwood species. This is one of the main reasons that pine is growing on so many of our old fields/pastures that, given their more fertile soils, would otherwise be growing hardwoods.

Much of the woodland at the southern end of the property, particularly the two lots acquired from the Rizzo Family Trust, show signs of having significant timber harvesting, likely in the 1980's and then again in the early to mid-2000's.

CHAPTER 2: WOODLOT DESCRIPTION

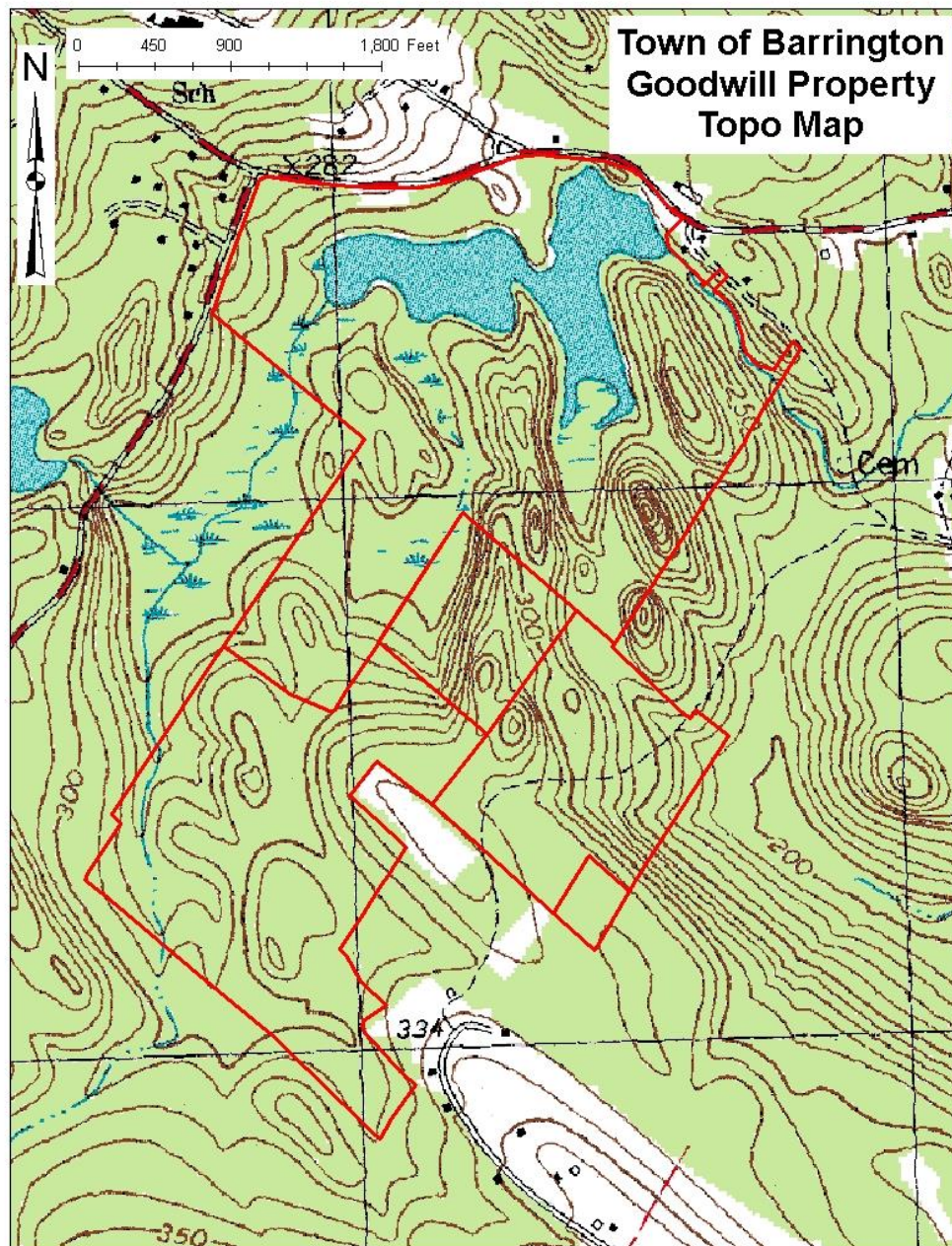
The first parcel (Map 233-Lot 38) was acquired by the Town of Barrington from the Carolyn L. Goodwill Living Revocable Trust in December of 2007. Just prior to the transfer of the fee ownership, a Conservation Easement was placed on the property with the Strafford Rivers Conservancy. This original property has been managed primarily as a recreational area in the 12 years since it was acquired, with an extensive network of trails and a parking area. In 2014, the Strafford Rivers Conservancy merged with the Southeast Land Trust of New Hampshire, making SELT the easement holder.

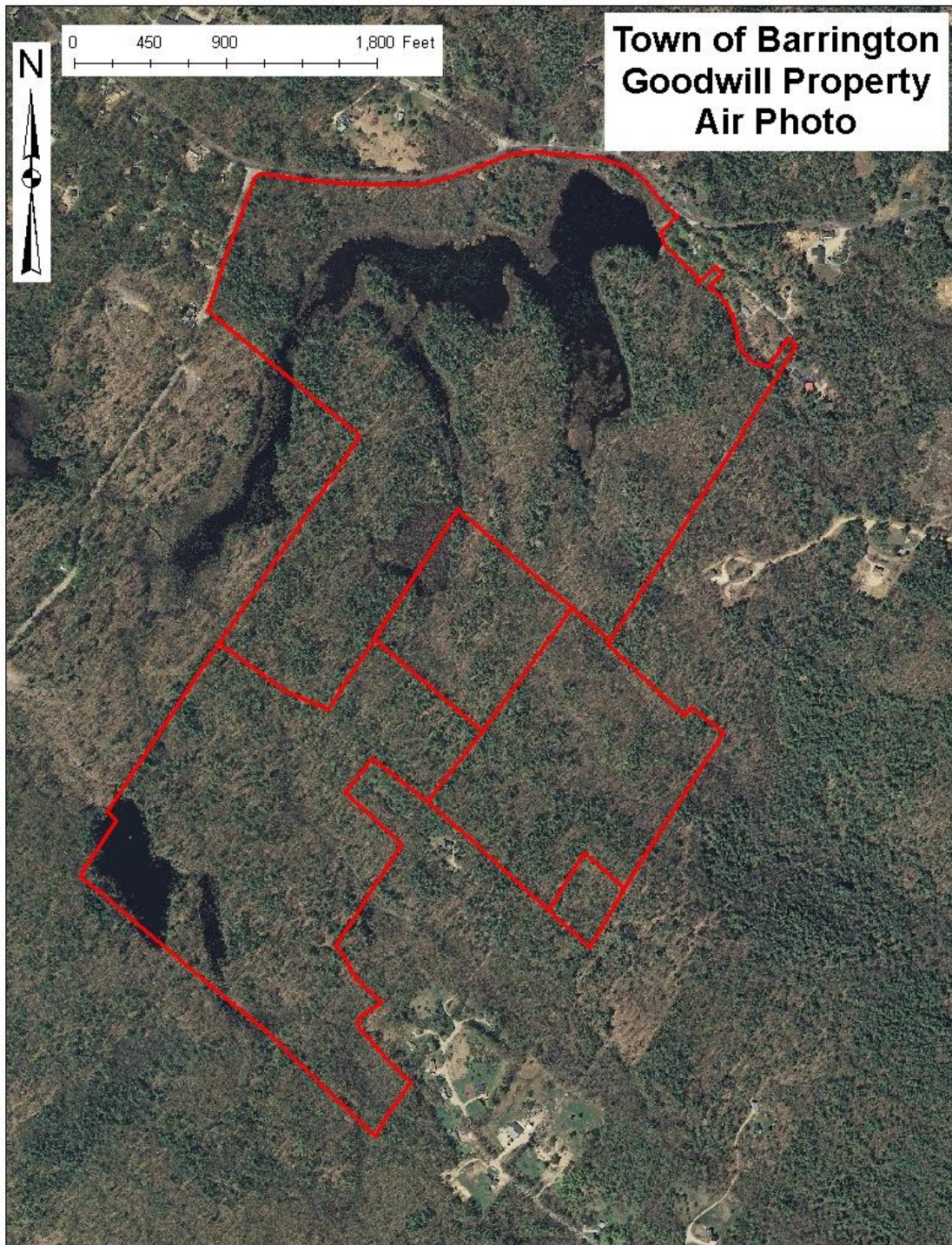
In February of 2019, the Town acquired several lots from the Estate of Stephen G. Rubinstein, including Map 240-Lot 6. In December of 2019, they acquired fee ownership of Map 240-Lot 7 and Map 249-Lot 18 from the Rizzo Family Revocable Trust. These lots, along with Map 240-Lot 5 which was acquired for back taxes in 2005, were surveyed and placed under Conservation Easement with the Southeast Land Trust. The new Conservation Easement deed encompasses the original Goodwill parcel and was recorded in February of 2020, bringing the total conserved acreage of the Goodwill Conservation Area to 290.74 acres.

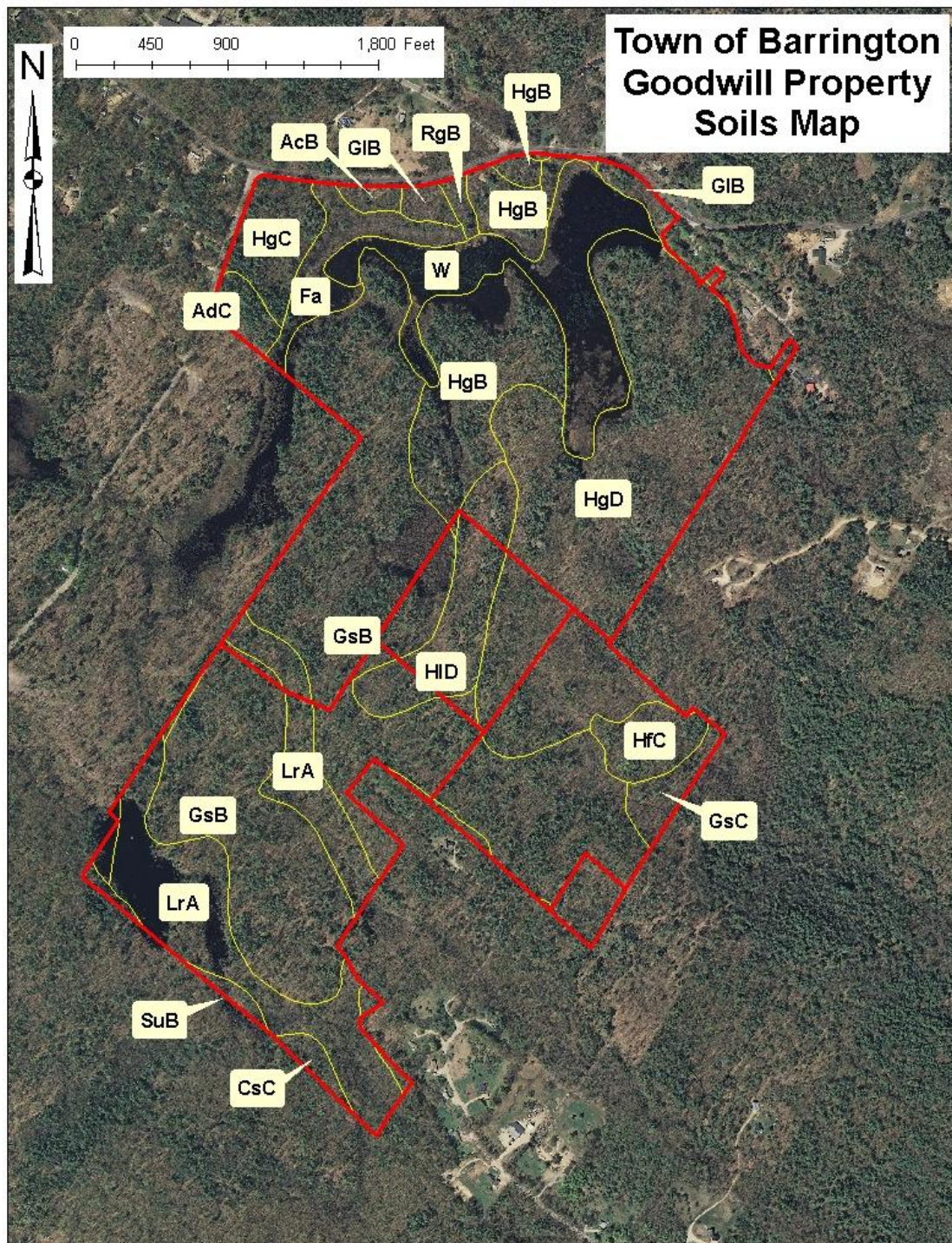
TOPOGRAPHY - ASPECT

The topography on the Goodwill Conservation Area varies greatly over the extent, ranging from nearly level areas in the southeast sections of the property, to very steep ridges and cliffs in the central and northern sections.

Aspect varies greatly with all the ridges on the property, but the majority of the land slopes to the west.







SOILS

Fifteen soil types underlay the Goodwill Conservation Area, 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 IA Soils

Symbol	Description
CsC	Charlton very stony fine sandy loam, 8-15% slopes
SuB	Sutton very stony fine sandy loam, 0-8% slopes

This group consists of the deeper, loamy textured, moderately well, and well-drained soils. Generally, these soils are more fertile and have the most favorable soil moisture relationships.

The successional trends on these soils are toward stands of shade tolerant hardwoods, i.e., beech and sugar maple. Successional stands frequently contain a variety of hardwoods such as beech, sugar maple, red maple, white birch, yellow birch, aspen, white ash, and northern red oak in varying combinations with red and white spruce, balsam fir, hemlock, and occasionally white pine.

Hardwood competition is severe on these soils. Softwood regeneration is usually dependent upon persistent hardwood control efforts.

Group IB Soils

Symbol	Description
AcB	Acton fine sandy loam, 0-8%
AdC	Acton very stony fine sandy loam, 8-15%
GlB	Gloucester fine sandy loam, 3-8% slopes
GsB	Gloucester very stony fine sandy loam, 3-8% slopes
HfC	Hollis-Gloucester very stony fine sandy loam, 8-15% slopes
HgB	Hollis-Gloucester very rocky fine sandy loam, 3-8% slopes
HgC	Hollis-Gloucester very rocky fine sandy loam, 8-15% slopes
HgD	Hollis-Gloucester 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.

CHAPTER 2: WOODLOT DESCRIPTION

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 IIA Soils

Symbol	Description
--------	-------------

HID	Hollis-Gloucester extremely rocky fine sandy loam, 8-25% slopes
-----	---

This diverse group includes many of the same soils as in groups IA and IB. However, these mapping units have been separated because of physical limitations which make forest management more difficult and costly, i.e., steep slopes, bedrock outcrops, erosive textures, surface boulders, and extreme rockiness. Usually productivity of these soils is not greatly affected by their physical limitations. However, management activities such as tree planting, thinning, and harvesting are more difficult and more costly.

Group IIB Soils

Symbol	Description
--------	-------------

LrA	Leicester-Ridgebury very stony fine sandy loam, 0-3% slopes
RgB	Ridgebury fine sandy loam, 3-8% slopes

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
FA	Fresh water marsh
W	Water

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, these soils are associated with the open wetland/pond areas.

ACCESS

As with any property, particularly one of this size with all the topographic and hydric variations, developing and maintaining access is one of the most critical aspects of management. For the sake of organization, I will break the access discussion down, into three distinct areas; north out to Route 9 and Richardson Road, west to Young Road, and south/east out to Ross Road.

Currently, the main access point is at the parking lot off of Route 9, approximately 1.5 miles west of the intersection with Route 125. This parking lot is graveled and can comfortably support 6-8 vehicles and maybe a few more if people use common sense. There is a kiosk here where trail maps are available. There is an old woods road that runs along the southeast side of the parking lot, down to and across the dam to Richardson Pond. The boundary line runs along the southeast side of this road. This woods road is the historic access to this end of the property. There is a wooden bridge over the spillway of the dam and then a culvert further to the south that allows for additional water passage. This main woods road heads southward into the property and is the backbone of the recreational trail system on the property. In terms of using it for forest management access (timber harvest operations), I do not feel it would be practical.

In order for this to be used for truck (tractor-trailer) access, the old roadway behind the parking lot would need to be widened, and the bridge over the spillway replaced with something that would support heavy truck traffic. The risk associated with damaging the old concrete in the spillway with the installation and use of a heavy bridge would be significant.

There are two access points out to Richardson Road in the northern part of the property. Neither of these have any developed access and both of them would require crossing Mallego Brook, which flows out of Richardson Pond. The westerly of these access points is just to the west of the existing snowmobile bridge, and does not have good ground on the banks of the brook. The brook is fairly wide at this point and would require the addition of vast amounts of aggregate, and a very substantial, expensive bridge to support logging truck traffic. Once across the brook, the ground is steep and somewhat wet running up the hill towards the main woods road/Goodwill Trail.

The more easterly of these access points, that in the extreme northeast corner of the property, is un-useable due to steepness and ledge outcroppings. In short, using either of these access possibilities is not practical for either financial or physical reasons.

The long frontage to the west of the parking lot on Route 9 varies in usability, but there are several locations where decent soils exist, and should management access be needed to this small strip of land between Route 9 and the wetlands associated with Richardson Pond, it could easily be created.

CHAPTER 2: WOODLOT DESCRIPTION

The frontage on Young Road also has some areas with good useable soils, primarily across from Penny Lane where a short trail heads down towards the pond. There is a relatively small amount of “useable” upland in this area suitable for timber harvesting, but I feel there may be enough work in this area to justify the construction of a small log-landing. The most suitable location is shown on the Forest Type Map.

This leaves us with the need to develop large-scale access into the southern end of the property off of Ross Road if there is to be any widespread forest management. While the Town of Barrington’s property does not front on the Class V Ross Road, it does benefit from a deeded Right-of-Way extending out to the Town Road. The location of this Right-of-Way is shown on several survey plans, including the recent Conservation Easement Plan by Mitchell & Associates, Inc. (SCRD Plan#12064, 12065 & 12066). It is also shown on a plan for what is now the Panish-Hall Trust property, entitled **Subdivision Plan, Robert Duvall, Barrington, NH** by F.E. Drew Associates which is recorded at the Strafford County Registry, Plan#24-60 and on a plan entitled **A Plan of the Bowen Property, Barrington, NH** by F.E. Drew Associated which is recorded at the Strafford County Registry, Plan#19-13.

This Right-of-Way, originally created and described in the deed of Haley to McCarthy, dated 4/26/1915 and recorded at the Strafford County Registry, Book 374-Page 51, makes reference to an existing Cartway leading from the end of the Town Road, over the property described in the deed (what is now the lands of Panish-Hall and Hashem), to other land of the Haley Brothers that they still owned (what is now Map 249-Lot 18 owned by the Town of Barrington, formerly of Rizzo/Haley family). This Cartway ran (at the time) between the house and barn and is shown to be just on the north side of the well. The house foundation was on the rise in the Panish-Hall field and has been filled in.

This Right-of-Way was used the last two times that logging occurred on the lands now owned by the Town of Barrington. It leads down the driveway and very near the Hashem residence and this should be taken into consideration were it to be opened up and improved for timber harvesting purposes in the future. Immediately after entering the Town’s property, the woods road traverses what is seasonably wet ground for approximately 300’. The ground between the boundary and then end of the Hashem Driveway is also seasonably wet. Using this route for timber harvesting would require some improvements to conduct during the winter months, and much more significant improvements for use during the summer months. Were the Town to decide to use this access route for timber harvesting, it may make sense to “bite the bullet” and make the investment in gravel, fabric, a culvert, and stumping/smoothing to create a good useable road that would be available through the future. The costs and construction efforts associated with these improvements could be incorporated into a planned timber harvest, so as to be borne by the logger and come from the stumpage proceeds that would otherwise be sent to the Town. Specifying what improvements/aggregate would need to be used would allow the logger to estimate the cost and would make sure the construction

CHAPTER 2: WOODLOT DESCRIPTION

was done to the standards/expectations of the Town, as it is ultimately their investment being made in access to their land.

As part of the field work for this plan, I met with Paul Panish (owner of Map 249-Lot 19) to discuss the access situation, as he owns the land directly along the north edge of the Town's Right-of-Way and has been in discussion with the Town about providing a small parking area for recreational access. As part of his discussions with the Town, he wants the "hedge" of invasive species (bittersweet, honey suckle, and multi-flora rose) removed along the north edge of the Right-of-Way, this being where the recreational access would occur. This would be best accomplished by cutting the invasive species, stumping the areas to remove the roots and smoothing it so that it could be mowed.

In discussions with him (and Brian Lenzi of the Town's Forestry Task Force/Committee), I feel we may have reached a solution that will serve to develop good access to the Town's woodlands, provide recreational access, control invasive species, and minimize disturbance to the Hashem driveway. Mr. Panish seemed amenable to allowing the Town to access their woodland by creating a woods road just to the north of their Right-of-Way along the southern edge of his field where the recreational access is slated to take place. Creating this woods road would require the cutting/removal of the invasive species, stumping/rocking the roadway, and the addition of gravel with a fabric underlayment in some areas. This new road would be nearly adjacent to the old existing road, but slightly uphill. The benefits to moving the location of the access road would be;

- The new roadway would line up better on the corner going onto Ross Rd, an important factor for tractor-trailer trucks.
- Keep heavy truck traffic off the Hashem driveway as much as possible.
- Remove the invasive species from the area along the boundary line and create the ability to control them by mowing as they re-sprout.
- Clearly define the recreational and management access onto the Town's land, and this location would be slightly further away from the Hashem residence.

Were this location to be approved by all parties, it should be legally described and documented, likely in concert with the placement of the Conservation Easement on the Panish-Hall property that the Town of Barrington is going to hold.

Near the southwest corner of the Panish field, the new roadway would merge with the existing "Cartpath" R.O.W. and continue onto the Town's land. The expense of this access construction project would be significant, but not much more than the cost of creating a similar quality woods road on the existing R.O.W., and with the added benefits discussed above. The cost could likely be incorporated into a potential timber harvest, minimizing or possibly eliminating any "out of pocket" expenses to the Town. Additionally, this cost is a one-time expense that will gain access to the Town's land for management and recreation well into the future and should be looked at as a long-term investment, as the next time it needs to be used for management, it will be in place and a large monetary investment will not be needed.

The one thing that would need to be addressed if this access development project were to occur, is the control of unwanted motorized access. Creating a good quality woods road like this onto the Town's property is just inviting people to drive down it. A gate would need to be installed at the Town's boundary line to control this unwanted traffic and protect the integrity of the road, while still allowing for the passage of recreational traffic. Either signage and/or a fence should be placed at the start of the roadway in the Panish field to keep people from driving down to the gate.

Once on the property and across the stretch of wet ground, a fairly large landing area should be constructed. This log-landing area would serve as the staging area where the forest products harvested are loaded onto the trucks for transportation to the various mills. Because there will need to be clearing and stumping in order to create this log landing, the opportunity exists to combine the effort with long-term wildlife habitat improvement. By constructing an excessively large landing area (say upwards 1 acre) and then seeding it to grasses and clovers following the operation, a permanent wildlife opening could be formed on the property. Permanent wildlife openings like this, dominated by grasses, forbs and brambles, provide a very interesting and beneficial addition to the wildlife habitat offered by an otherwise wooded landscape. For more information about the wildlife benefits of creating this wildlife opening in conjunction with the landing construction, see the **Wildlife** section. Funding to help offset the cost associated with such a project might be available through the New Hampshire Fish and Game Department's Small Grants Program.

From this log landing, the remainder of the property will have to be accessed by skid trails. The ground is generally good and would support harvesting during either dry or frozen ground conditions.

This leads us to the discussion of what areas on the property should be harvested. With management access for timber harvesting originating at the far southern end of the lot, the practical skidding distance needs to be factored in. Harvesting the extreme northern end of the lot (that area around the Pooh Trail ridge and the slopes down to Mallego Brook) from this far southern access point would be pushing the limits of what is economically practical. In addition, the intense recreational pressure that this northern area receives and the need to maintain the aesthetics, make harvesting here somewhat impractical. I suggest not attempting to conduct timber harvesting north of an imaginary line somewhere around the County Champion Big-tooth aspen. Leaving the area to the north of this in its current condition would preserve the integrity of the recreational and aesthetic values, and not push the limits of what is practical for skidding distance. In addition, retaining this area in its natural state and allowing forest succession to move forward without human interference will diversify the wildlife habitat, serve as a carbon sequestration area, and eventually produce an area of old-growth timber that will be an interesting addition to the various habitats on the property.

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 Goodwill Conservation Area. 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	Black Birch	BB

On the Goodwill Conservation Area, a total of 44 inventory points were recorded using a 20 basal area factor (BAF) prism. Each inventory point was located on a grid spacing of 500' by 500'. 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	H2/3A	127	Fully to over-stocked, pole to sawtimber sized red and white oak with white pine and northern hardwood. Fair quality. 60+ year old.
2	WP/M2/3A	60	Fully-stocked, pole to large sawtimber sized white pine with a mixed and variable component of red/white oak and northern hardwoods. Included in this stand are several small inclusions where hemlock plays a more significant role in the species mix. Fair to good quality. 60+ year old.
3	H1/2A	9	Over-stocked, large sapling to pole sized northern hardwoods with scattered white pine. Fair to good quality. 30+ year old.
4	H/WP2/3A	44	Fully stocked, pole to small sawtimber sized northern hardwoods mixed with red/white oak and white pine. Fair to good quality. 60+ year old.
		51	Open water/wetlands/marsh
		291+/-	Total Acreage

CHAPTER 3: FOREST RESOURCES

Forest type map

STAND TECHNICAL DATA AND RECOMMENDATIONS

STAND 1 H2/3A 127 Acres

TECHNICAL DATA:

Species Composition by Percent (BA)	RO-49%, WP-19%, RM-16%, WO-8%, Other 6%
Mean Stand Diameter	9.4"
Mean Merchantable Stand Diameter	10.7"
# Trees per acre (4" +)	266
Basal Area/Acre	127.8 sq. ft./acre

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

TIME FRAME: 2020-2030

STAND 1 RECOMMENDATIONS:

Stand 1 is the largest of the forest types on the Goodwill Conservation Area, accounting for just over half of the forested acreage. It is fully to over-stocked with predominantly red oak, mixed with a variable component of northern hardwoods, white pine and white oak. There has been no recent logging in the northern sections of the stand, while the southern sections have seen limited harvesting over the last 40 years.

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 fair to good, although there are scattered individuals throughout the

stand that exhibit signs of decay or stress. Management in this stand will focus on oak production, looking to provide a steady supply of hard mast and grow valuable sawtimber.

The recommended harvesting throughout stand 1 would be a combination of improvement thinning and a very conservative group selection harvest. The thinning would be designed to improve the overall timber growth in the stand, giving the better-quality trees room for crown expansion/increased growth by reducing the basal area (the measure of tree density on a forest level) from its current level of around 128 sq.ft./ac down to between 85-90 sq.ft./ac. The thinning should focus on removing the poorer quality oak, as well as the less desirable species such as red maple. While red maple in and of itself is not undesirable, the growth form it exhibits on this property is generally undesirable. It frequently has multiple stems, is not in great health and many of the larger trees are exhibiting signs of rot.

Scattered throughout the stand is a white pine component of various density and quality. Where pockets of better-quality pine exist, it is recommended to attempt to develop pine regeneration within the stand. By removing much of the non-pine growth from the mid-canopy and understory, as well as thinning the overstory to allow for additional light to reach the forest floor, the germination of pine seedlings could be encouraged. White pine is a valuable timber species that tends to do well when mixed with oak. If this regeneration were able to be established, its growth should be monitored, and, as needed, additional light shed on it through subsequent thinnings. If the hardwood sapling growth were vigorous enough to stunt the growth of the young pines, then a round of pre-commercial hardwood control (Timber Stand Improvement) might be necessary. Adding the diversity of young pine growth to this maturing hardwood stand would only serve to benefit the habitat the area provides and help to ensure that the next forest to occupy the site is healthy and productive.

There are scattered pockets throughout the stand that are of generally poor quality or stocked with less desirable species. Within these areas, rather than the thinning harvest recommended in the areas dominated by good quality oak, the group selection method of harvesting would remove groups or small patches of trees, seeking to develop desirable regeneration rather than working with the trees that currently occupy the site. These group openings, or clearcuts, should be fairly small, generally less than ½ acre and in many cases much smaller. We are not looking to develop widespread regeneration with this type of harvesting, rather very small pockets only where the existing growth has little potential.

The one exception to this would be adjacent to and near the active beaver bogs in the southwest corner of the property. In this area, it might prove advisable to create some larger openings to encourage the production of young hardwood growth for beaver food. Beavers rely on ample amounts of young hardwood for the bulk of their food source and the proximity of this growth to the safety of the water is a limiting factor for their populations. When this preferred growth runs out, then they will typically abandon a pond and move onto another area with more food, only to return once the young

hardwood grows back. This natural cycle repeats itself time and time again. The creation of nearby areas of young hardwood growth through timber harvesting can help to prolong the active periods of beaver colony occupation, which in turn benefits all the wetland species that utilize the site.

It would seem counter-intuitive to conduct somewhat heavy cutting near the wetlands, when general harvest guidelines call for the retention of buffers along many wetland and water courses. The publication **Good Forestry in the Granite State** addresses this contradiction, and makes the recommendation that, for certain goals such as the creation of beaver food, the good outweighs the potential harm. However, extreme care should be taken when implementing such a practice, making sure that the soil is not overly disturbed and that erosion issues are not created. By attempting to create these openings on the north and east side of active bogs, the effect of reducing the shade/increased sunlight could be minimized. Prior to implementing any such practice, I would seek input from one of the Fish and Game biologists. Additional information about this practice can be found in the **Wildlife** section of this plan and further recommendations for its implementation in the management recommendations for stand 4.

STAND 2 WP/M2/3A 60 Acres

TECHNICAL DATA:

Species Composition by Percent	WP-54%, RM-17%, Oaks-14%, HM-7%, BB-5%, Other-3%
Mean Stand Diameter	11.2"
Mean Merchantable Stand Diameter	11.9"
# Trees per acre (4"+)	199
Basal Area/Acre	136.7 sq. ft./acre

MANAGEMENT GOAL: The promote the development and regeneration of white pine. Secondary goals include hardwood sawtimber production and the protection of wildlife habitat.

TIME FRAME: 2020-2030

STAND 2 RECOMMENDATIONS:

Stand 2 is widely scattered throughout the property, consisting of many small, irregular patches, rather than widespread areas. In general, the stocking consists of large pole to sawtimber sized white pine with a variable component of red/white oak and mixed northern hardwoods (beech, birch, maple). There are also a couple small inclusions within the stand where hemlock plays a significant role in the stocking. These are the only areas of hemlock on the property and were not significant enough to be treated as a separate stand, so they were lumped into stand 2 because of the similarity of softwood cover. However, these small inclusions are identified on the forest type map and will be addressed separately in the recommendations for this stand.

The majority of stand 2 is well stocked with pine, and management will seek to promote the development of the existing pine sawtimber as well as develop areas of pine regeneration. White pine is by far the most valuable of the softwood species in this region. It is fairly fast growing, but requires significant sunlight to become established and thrive. The existing pine growth in this stand is generally of fair to good quality, but there are many stems that have issues that will warrant their removal. Trees with multiple leaders, old logging scars, signs of red rot, low vigor or generally poor growth form should be targeted for removal. Those trees with good growth form, healthy crowns and the potential to improve in quality over time should be retained.

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 other factor that needs to be addressed when considering management strategies within stand 2 is that it is not a pure pine stand. There is a variable hardwood component throughout, sometimes making up a small percentage of the species mix, sometimes a much more significant portion. The quality of the hardwood ranges greatly, but the size is more consistent, generally being pole to very small sawtimber. The red oak and black birch components are generally of good growth form and has great potential to turn into valuable sawtimber. The red maple that is found in the stand is generally of poor quality and should largely be removed during any harvesting that takes place, capturing what value is there before it deteriorates any further.

Overall management recommendations for stand 2 would be a combination thinning/regeneration cut, designed to promote the development of the good quality white pine, red oak and black birch and to lower canopy density to the point where desirable regeneration can become established on the forest floor. In some areas, red maple makes up patches or small groups within the stand, and these areas should be aggressively targeted for regeneration by creating patch openings. These openings will not be large (generally less than ½ acre) but should be ringed by desirable species (pine, oak and black birch) as a seed source.

If possible, harvesting should occur during bare ground conditions to maximize the disturbance to the forest floor. Pine seed germinates best in exposed mineral soils, not in a thick layer of leaf litter. Logging equipment, and the dragging/moving of trees and brush, tends to disturb the layer of leaf/needles that has built up on the forest floor and prepare the seedbed. This disturbance is not the same as rutting the soils, which is certainly something to be avoided.

Ideally, the harvest should occur in the summer prior to a white pine seed drop. White pines typically produce seed every 3-5 years. It takes 2 years for a pine cone to mature, so, by careful examination of the tops of the trees with binoculars, you can tell when a seed year is going to occur well in advance. This advance notice allows for the planning of harvests designed to promote pine regeneration. Pine seed typically drops in mid to late September.

Included in stand 2 are several small patches of hemlock growth. As discussed, they were not large enough to be addressed as their own stand, and have been lumped into stand 2 because it has the highest prevalence of softwood on the property. Within these inclusions, stocking consists of hemlock, northern hardwoods, oaks and white pine.

Hemlock, while not particularly valuable as a timber species, provides critical winter cover for wildlife. The dense softwood canopy that stands of hemlock create help to block harsh winter winds, keep snow depth down, and trap daytime heat to help offset the effects of radiational cooling at night. Deer in particular seek out stands of hemlock during the winter months, as do many species of songbirds.

These small areas are not significant enough to manage as a stand, but should be retained for the cover they provide. Then harvesting near them, competing hardwoods could be removed, allowing for improved growth and potential regeneration of the hemlock.

STAND 3 H1/2A 9 Acres

TECHNICAL DATA:

Species Composition by Percent	BB-38%, RM-31%, WP-19%, Other-12%
Mean Stand Diameter	5.6"
Mean Merchantable Stand Diameter	8.7"
# Trees per acre (4"+)	461
Basal Area/Acre	80 sq. ft./acre

MANAGEMENT GOAL: To improve the species mix and growth rates.

TIME FRAME: 2020-2030

STAND 3 RECOMMENDATIONS:

Stand 3 consists of a small area near the center of the property in Map240-Lot 7. It appears to be result of a fairly heavy harvest (nearly a clear cut) in the early to mid-1980's. The stand has regenerated to sapling sized northern hardwoods (principally birch and maple) with a scattered component of larger maple and pine that were left during the harvest and are now pole to small sawtimber sized.

The metrics that were produced by the inventory of the stand do not give the most accurate representation, because the majority of the stems are too small (<4") to factor into the inventory and the species composition is calculated by basal area, so the scattered larger pine appear to make up a greater percentage of the stand than they actually do.

The stand is dominated by birch and maple stems ranging from 2-6" in diameter and standing between 25-40' tall. The quality of much of this young growth is quite good, particularly the black birch. The scattered residual stand is comprised of a few red maple and white pines that are pole to very small sawtimber sized and not very good quality.

Management of stand 3 is limited to pre-commercial weeding and thinning, often referred to as Timber Stand Improvement. This practice would consist of going through the stand and selecting a "crop tree" on a 20-30' spacing, and manually releasing it from competition with the neighboring stems. The rule of thumb is to allow 6' of room on two sides of the crown on each "crop tree". This will give these selected individuals ample room to grow and a significant competitive advantage going forward. Conducting this improvement thinning at this early age (roughly 30 years before it would be possible to do commercially) will allow the stand to develop with a much higher percentage of good quality stems and at a much faster pace because of decreased competition/higher growth rates.

This practice is certainly not necessary, particularly in this stand with a high percentage of desirable stems and relatively good overall growth, but is something to

consider. The cost of such a project is generally around \$300/acre so it is not inexpensive. It may be something to consider after a timber harvest on the property has generated substantial income. This potential investment of the Town's money should be weighed against the long-term benefits.

However, I can say from firsthand experience that this type of practice does work. On a particular property in Tamworth that my company has managed for nearly 50 years, substantial areas of Timber Stand Improvement were conducted in the mid to late-1970's in areas of young hardwood that were growing up following the salvage cutting that resulted from the 1938 hurricane. The areas that were treated in the 1970's were ready for commercial thinning 20 years earlier than the areas that were not treated, have a much higher percentage of desirable species and a substantially larger mean stand diameter.

STAND 4 H/WP2/3A 44 Acres

TECHNICAL DATA:

Species Composition by Percent	RM-44%, BB-19%, Oaks-10%, WP-9%, AS-7%, Other-11%
Mean Stand Diameter	10.1"
Mean Merchantable Stand Diameter	10.7"
# Trees per acre (4"+)	244
Basal Area/Acre	135 sq. ft./acre

MANAGEMENT GOAL: To improve the overall timber growth, diversify wildlife habitat, and generate areas of desirable regeneration.

TIME FRAME: 2020-2030

STAND 4 RECOMMENDATIONS:

Stand 4, while having a similar hardwood/softwood breakdown to stand 1, occurs on the soils with more available moisture (in some cases hydric soils), is often associated with the small streams/drainages on the property, and is dominated by northern hardwoods (maple and birch). The overall quality of the timber in stand 4 is much lower, with the maple being of generally poor growth form, and some of the other species such as aspen having low timber value.

Management of stand 4 should seek to improve the timber growth to the extent possible, but will primarily be focused on diversifying the overall age structure on the property with an eye towards wildlife habitat improvement.

Much of the Goodwill Conservation Area is even-aged forest. A healthy forest with a mixture of age classes and species types will typically produce the greatest variety of habitat and support the greatest mix of species.

Harvesting in stand 4 will be primarily of the group selection type and many small patch openings or clearcuts should be placed throughout the stand. These groups should generally be between 1-3 acres in size, and be spaced well apart with areas of uncut forest left in-between. The patch cuts should be located in areas of poor quality or undesirable timber growth (principally red maple and aspen). The resulting regeneration following the harvest should consist of fast-growing stump and root sprouts from the harvested hardwoods, mixed with various grasses, forbs and brambles.

Temporary openings in the forest, like these created by patch harvesting, provide critical habitat to a myriad of species. *“Many wildlife species such as black racer and milk snakes, woodcock, brown thrasher, whip-poor-will, chestnut-sided warbler, common yellowthroat, eastern towhee, indigo bunting, New England cottontail, meadow vole and meadow jumping mouse require grass and shrub dominated early successional habitat for shelter and forage throughout the year. Early successional wildlife habitats (young*

*trees and shrubs) have become very uncommon in much of the northeast, largely due to the maturation of the forests. These habitats are ephemeral and created through some type of human or natural disturbance (e.g., forest management clearcuts, periodic hurricanes, fire, beaver activity and insects). (Taken from **Good Forestry in the Granite State**).*

The creation of the patch openings throughout the stand will serve to create areas of this early successional growth, and greatly diversify the existing habitat. In addition to the species of concern listed above, ruffed grouse and white-tailed deer will benefit from this type of management. Grouse need young forests for nesting and brooding sites, and deer will browse on the young growth during almost any time of the year, particularly the winter months in years without acorns to dig out of the snow. Does will seek out these areas of thick growth to hide their fawns.

As discussed in the management recommendations for stand 1, I recommend locating several of these patch openings adjacent to or near the beaver bogs in the southwest corner of the property. The growth that will result from these cuttings in stand 4 will be even more beneficial, because the species (maple and aspen) are more favored as a food source. By cutting in the small stream valley to the north and east of these bogs, we might be able to encourage the beavers to expand into the area, creating new dams. The loss of this area as forestland would not be significant, as it occurs on hydric B soils and is currently stocked with very low value species.

There are however areas of stand 4 where the management should focus more on the improvement of the existing timber resource. Pine, oak and black birch do make up a significant portion of the stand in some sections. Where present and of good growth form, improvement thinning would seek to promote their growth by removing the less-desirable stems in direct competitions with them. Where white pine is a more significant component, effort should be made to develop pine regeneration, retaining pine in the overstory while removing the undesirable understory and mid-canopy trees.

ESTIMATED TIMBER LIQUIDATION VOLUMES AND VALUES
April 2020

Species	Total Volume	Stumpage Value	Total Value
<i>Sawlogs</i>			
White Pine	822 MBF	\$125/MBF	\$102,750
White Pine Box	92 MBF	20/MBF	1,840
Red Oak	230 MBF	300/MBF	69,000
Black Birch	53 MBF	120/MBF	6,360
Red Maple	10 MBF	75/MBF	750
Mat Logs* ¹	102 MBF	100/MBF	10,200
Mixed HW Pallet	38 MBF	20/MBF	760
Oak Pallet	245 MBF	50/MBF	12,250
Total Sawlogs	1,592 MBF		\$203,910
<i>Pulpwood</i>			
Hardwood	9,139 tons	\$4/ton	\$36,556
Softwood	1,956 tons	1/ton	1,956
Total Pulpwood	11,095 tons		\$38,512
		Total	\$242,422

TOTAL TIMBER VALUE PER FORESTED ACRE (240ac): \$1,010

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.
- *¹ – Mat logs are the sawlogs used to create the cants (squared timbers) that are then bolted together to make the portable bridge panels used for temporary wetlands crossings, particularly during utility line construction/maintenance. The prevalence of their use has increased greatly over the last 10 years, creating a market for logs that would otherwise be used for pallet stock or firewood.

WILDLIFE

From observed sign, there is a tremendous variety of wildlife currently using the woodland and wetland habitat on the Goodwill Conservation Area. Sign of deer, bear, turkey, grouse, bobcat, coyotes, fox, beaver, muskrat, squirrel, raccoon, porcupine, pileated woodpecker, raven, hawk, multiple duck species, blue heron, and a myriad of songbirds was encountered during the field work for this plan. Seasonally, there are probably many more species that use the area, particularly the wetlands in the summer. Other species that I image frequent the property would include otter, mink, moose, osprey, eagles, woodcock, skunk, many species of turtles, snakes, countless songbird species, as well as an abundance of amphibians.

The wetland areas in particular make this one of the most interesting properties (from a wildlife perspective) that I have seen in years. The timing of the field work for this plan coincided with the return of many of the duck species to the area. In the beaver bogs in the southwest corner of the lot, I saw more wood ducks (easily over 40) than I have seen in the last decade combined. In addition to the wood ducks, I saw mallards, mergansers (both hooded and either common or red-breasted), black ducks, and some other ducks that I couldn't identify. There was a red-tailed hawk soaring over one of the bogs, and I believe I saw blue heron nests. It was a beautiful, early spring day and I ate lunch sitting on a little rise overlooking the larger of the beaver bogs. The life that this area was supporting, even this early in the spring, was truly impressive.

Periodic cutting maximizes forest succession to the benefit of many forms of wildlife. A dynamic mix of all age classes is considered advantageous for most species for both food and cover. The forests on the Goodwill Conservation Area are generally even-aged, and the management recommendations for stand 4 address the goal of diversifying the age structure on the property as well as the benefits of early successional growth.

As discussed in the management recommendations for stands 1 and 4, creating some areas of early successional/hardwood sapling growth adjacent to, and near the beaver bogs will hopefully encourage the continued use and expansion of the beaver activity in the area. Also discussed was the need to minimize the negative impacts to working within what would otherwise be a riparian buffer.

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. Stand 1 has a vast amount of oak (both red and white) and the management recommendations for this stand take mast production into account. White oak acorns are favored over red by many species, as they have a lower tannic acid level.

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. By leaving the standing dead trees and those close to dying, you are, over time, adding to the amount of coarse woody debris on the forest floor. The importance of large, standing dead trees near the wetlands is particularly important. Wood ducks use the cavities excavated by pileated woodpeckers as nesting sites and many larger birds like herons and hawks will use these snags for nesting and perching. If desired, the installation of wood duck boxes would make for an interesting project. This could be undertaken by interested volunteers or perhaps as a school project.

The open wetland areas on the property are a major 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. The presence of fish ducks (as witnessed in both the beaver bogs and Richardson Pond) indicated that there are some fish living in the expansive wetland areas.

According to the NH Fish and Game Department's Wildlife Action Plan, there are substantial areas of the property mapped as Highest Ranked Habitat in New Hampshire. There are other areas of Highest Ranked Habitat in Biological Region and still others designated as Supporting Landscape. The entire property is located within what is mapped as a Blanding's turtle Conservation Area Tier 2 and much of the northern sections surrounding Richardson Pond are mapped as a connectivity corridor.

The Barrington Natural Heritage Committee initiated a wildlife habitat assessment of the (then) Carolyn Goodwill property in 2003 which focused on Richardson Pond and Mallego Brook. This report was prepared by Tarr, Eckert & Stapelfeldt and highlighted the many habitat types present in the wetland areas, documented what species were observed using them, and made educated assumptions as to other species that were likely present at various times of the year.

As discussed in the **Access** section of this plan, the opportunity exists, when creating a log-landing area for timber harvesting, to make it much larger than necessary and maintain it as a permanent wildlife opening. By seeding it to a mixture of grasses and clovers following use, the area could be mowed every year or every other year to be maintained as a mixture of grasses, forbs and brambles and keep the woody growth from taking over. Permanent openings like this are used extensively by insects, birds and small mammals/rodents, and in turn, everything that likes to eat them.

Adding several different clovers (red, white, crimson, mammoth, etc.) to the seed mixture is very beneficial to pollinator species and is recommended. Other pollinator species could be added as dictated by availability. Another potential addition to the area, depending on how involved the Town wanted to get, would be the planting of fruiting shrubs around the outer edge of the opening. Native species like viburnums (nannyberry, northern arrowwood, etc.) blueberries, hawthorn, and elderberry can produce copious amounts of soft mast that is enjoyed by many species of birds and small mammals. There is potentially funding available from the New Hampshire Fish and Game Department's Small Grants program for the various aspects of creating this permanent wildlife opening, and could be an excellent community project.

WETLANDS - WATER RESOURCES

The wetland and water resources on the Goodwill Conservation Area are incredibly extensive, with mapped wetlands making up nearly 20% of the total acreage. Richardson Pond is the crown jewel of the property, being extensive and having such high visibility and access from the parking area. Mallego Brook drains out of the pond, beginning at the dam and running east-southeast until entering the Bellamy Reservoir in Madbury. If Richardson Pond is the crown jewel of the property, then the two expansive beaver ponds in the southwest corner are the hidden gems. The abundance of wildlife observed in them was staggering. These large open wetlands are ringed by emergent marsh and scrub-shrub swamp. Other areas of the property contain wetland areas that are solely scrub-shrub swamp, or more forested. There are several vernal pools, and many small seasonal streams/drainages.

The State of New Hampshire regulates work in any of these jurisdictional wetlands and mandates Riparian Management Zones around Mallego Brook (50') and Richardson Pond (150') in which no more than 50% of the basal area may be harvested in any 1-year period. The publication **Good Forestry in the Granite State** recommends doubling these distances, and maintaining a Riparian Management Zone of 75' around all intermittent streams and 100' around the larger wetlands. As discussed in the management recommendations for stands 1 & 4 and the **Wildlife** section, for the purposes of wildlife habitat management near the two bogs in the southwest corner of the property, this recommendation can be waived, providing efforts be made to prevent erosion and protect soil integrity.

Before crossing any watercourse, either seasonal or 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.

I encountered two vernal pools during the field work for this plan (location shown on Forest Type Map) and there are likely more. During the marking/layout for any potential management activity, whether it be forest management or recreational development, the presence of any vernal pools should be noted. If present, the following guidelines should be adhered to;

Within the vernal pool basin;

- Avoid running machinery through the vernal pool basin, even during dry periods, to avoid changing the pool's ability to hold water.
- Avoid adding slash (woody material) to vernal pools.
- Avoid removing trees with crowns immediately overtopping any portion of the pool to maintain water temperature and nutrient inputs.

Within 200 feet of a vernal pool;

- Limit tree removal to individual trees or small groups of trees. Locate groups where advanced regeneration or shrub cover occurs to help maintain shady conditions after the overstory is removed.
- Avoid removing stumps, stones, or other large cover objects.
- Maintain as much of the existing understory vegetation as possible.
- Limit the activity of heavy equipment.
- Locate main skid trails and truck roads outside the buffer.

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.

On the Goodwill Conservation Area, with its frequent and intense use by the public, aesthetics are of particular importance. The Conservation Easement lists protecting the Scenic Quality as one of the chief purposes of the Easement and states that all management activities seek to minimize the impacts to the Aesthetics. As discussed in the **Access** section of the plan, attempting to conduct timber harvest activities to the north of the County Champion Big-toothed Aspen would likely have more significant negative impacts to the extensive trail system that is in place in this area.

Throughout the rest of the property, appropriate buffers should be retained along the trails wherever possible. Where harvesting is very visible from the trails, I generally am in favor of posting some signage to explain what type of harvesting occurred, why it was done this way and what the expected results are. The public often responds much more favorably to visual impacts if they feel informed as to why it has occurred.

RECREATION

There is a wonderful network of trails on the Goodwill Conservation Area, all originating from the parking area off of Route 9. The most frequently used areas are on the first ridge after crossing the dam, where the Pooh and Melvin Trails are located. The Pooh trail in particular sees an abundance of use, with its themed stations and accessibility to smaller children.

The Goodwill Trail winds its way southward through the property, passing cliffs, wetlands, the County Champion Big-toothed Aspen, vernal pools, many habitat types, and eventually leaves the property near the southwest corner. For most of its length, the Goodwill Trail is used by snowmobiles during the winter months.

Plans exist to create a small parking area and recreational access on the Panish-Hall property that will tie into the Goodwill/snowmobile trail near the southeast corner of the property. As discussed in the **Access** section of this plan, controlling unwanted vehicular access will need to be addressed at this access point. There was some sign of ATV access occurring from the snowmobile trail off Richardson Road in the north end of the property. Contacting the local snowmobile club to resolve this issue is likely the best course of action, as I am sure they would be willing to block/cable the trail off following the end of the winter season.

Hunting is allowed on the property and the Town has a permitting system in place to allow for the placement of tree stands, providing they are removed following the end of the season.

Maintaining appropriate buffers along all trails during timber harvest activities is recommended. The one place where this will definitely not be feasible is at the main access point that comes in the “Cartpath” near the Panish-Hall property. This recreational access, as well as a short section of the snowmobile trail will be a truck road and a large landing area will likely be adjacent to (or partially encompass) the snowmobile trail.

Future expansion of the recreational trail system will most likely focus on the newly acquired southern portions of the property. With many interesting features like the cellar holes and exquisite beaver bogs, coupled with generally good ground conditions and many old skid roads/trails, the potential is significant. From a forest management standpoint, I would recommend accomplishing the first round of recommended harvesting before doing much trail construction/expansion. Conducting the harvesting first will allow for future recreational trail layout to not impact the main skid roads that will need to be used during future harvests.

CULTURAL FEATURES

Three old foundations/cellar holes and one well were encountered during the field work for this plan. All three are in the southerly section of the property where the abundance of stonewalls indicate that agriculture was much more prevalent than in the more northerly area. The two cellar holes are in excellent shape with very little damage occurring over the decades since they were abandoned. There is some evidence at the most northerly of the three that someone has been digging (metal detecting ?) looking for artifacts.

During any management activities, all the cellar holes should be given appropriate buffers to prevent disturbance. Whenever possible, existing barways should be used to cross stonewalls, but with the extensive network in portions of the property, this will not always be possible. When new breaks in the walls are created to facilitate access, care should be taken to minimize disturbance.

The Strafford County Champion Big-tooth Aspen tree is located on the property, adjacent to the Goodwill/snowmobile trail.

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 are two records (2010 & 2013) of Blanding's Turtle on the property. Blanding's Turtle is listed as Endangered/Critically imperiled in the State of New Hampshire. The first documented siting occurred in 2010 and consisted of an adult female that was injured crossing Rt. 9 adjacent to Richardson Pond. The turtle was rescued and sent to a rehab facility. The second occurrence was in 2013 when an adult (sex unknown) was observed near the parking entrance to the Goodwill Conservation Area.

As timber management activities are not planned for most of the area immediately surrounding or near Richardson Pond, there should be no negative impact on their population or habitat.

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. The clover species have the additional bonus of being beneficial for pollinator species.

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 to any areas deemed high risk.

One open well was encountered during the field work for this plan, near the barn foundation (the most southerly/westerly of the three). I looked briefly near the two house foundations and did not see the old wells, but I highly recommend conducting a thorough investigation. Open wells are an extreme hazard and should be covered with a cast-concrete cover. Wooden covers rot over time and get covered over with leaves and pine needles, and eventually are almost more dangerous than an uncovered well because someone can inadvertently step on one without knowing it is there and break through.

Whereas hunting is allowed on the property, it may be advisable to post a sign near the parking area during hunting season that recommends wearing blaze orange.

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.

The Conservation Easement that SELT holds on the property will serve to protect it from poor management and land-use change in perpetuity. This Easement will run with the property should the Town ever decide to transfer fee ownership.

The invasive species issues on the property are fairly modest for a parcel this size. In the southeast corner, near the “Cartpath” access and the Panish-Hall field, there are some invasives just over the boundary line, mainly bittersweet, barberry and multi-flora rose. Most of them are on the Panish-Hall property and Paul Panish is making a significant effort to eradicate them. As part of the potential access development, there will be additional measures taken to control these invasives.

The only other area where invasive species were noted is along Route 9 and Young Road. There are several areas where these species are becoming established, particularly in some of the sections with wetter soils. As management activities in these areas are limited, there is no risk of spreading the invasives that way. Their presence should be monitored and efforts made to combat them taken as needed. The proximity of this area to Richardson Pond brings into question the appropriateness of herbicide use, and an expert in this area should be consulted.

INSECTS AND DISEASES

From observed evidence, there is a fairly low occurrence of forest disease problems on the Goodwill Conservation Area. Beech makes up a very small percentage of the woodlot, and, in general, seems to be fairly healthy and unaffected by beech bark disease.

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.

CHAPTER 6: MANAGEMENT SUMMARY

MANAGEMENT SUMMARY – SCHEDULE OF PRIORITIES

2020-2030

Stands	Recommendation	Goal	Page Reference
	Identify and paint/mark exterior boundary lines of Map 233 Lot 38 .	Firmly identify all boundary lines and protect property from future encroachment.	6
	Locate and cover all open wells.	Public safety.	42
	Resolve access plan to southern areas/Ross Road. Act as necessary to document.	Obtaining access for future management	16-18
1,2,4	Improve access off Ross Rd. and conduct timber harvest per stand recommendations.	Improve access, timber resources and wildlife habitat.	16-18,23-32
1,2,4	Improve access of Young Rd. and conduct timber harvest per stand recommendations.	Improve access, timber resources and wildlife habitat.	16-18,23-32
	Install wood duck boxes near wetland areas.	Provide wildlife nesting habitat.	35
	Create permanent wildlife opening in large log-landing off Ross Rd.	Diversify wildlife habitat.	36
	Recreational trail expansion	Provide more public recreational opportunities.	40
3	Consider Timber Stand Improvement, act as necessary.	Improve timber growth.	29-30

APPENDIX

APPENDIX

~Natural Heritage Bureau Printout

~Statutory Permit by Notification - Forestry