

WILDLIFE HABITAT IMPROVEMENT & FOREST STEWARDSHIP PLAN

prepared for the
Brookfield Town Preserve

250+/- Total Acres

Brookfield, NH

December 2018

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INTRODUCTION

This Wildlife Habitat Improvement and Forest Stewardship Plan is being prepared at the request of the Town of Brookfield's Selectmen 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. Financial assistance for the development of this plan is being provided by the State of NH's Fish and Game Department, through their Small Grants Program. A site visit with Karen Bordeau (NH F&G Wildlife Biologist) was conducted and her recommendations have been incorporated into this plan.

GOALS AND OBJECTIVES

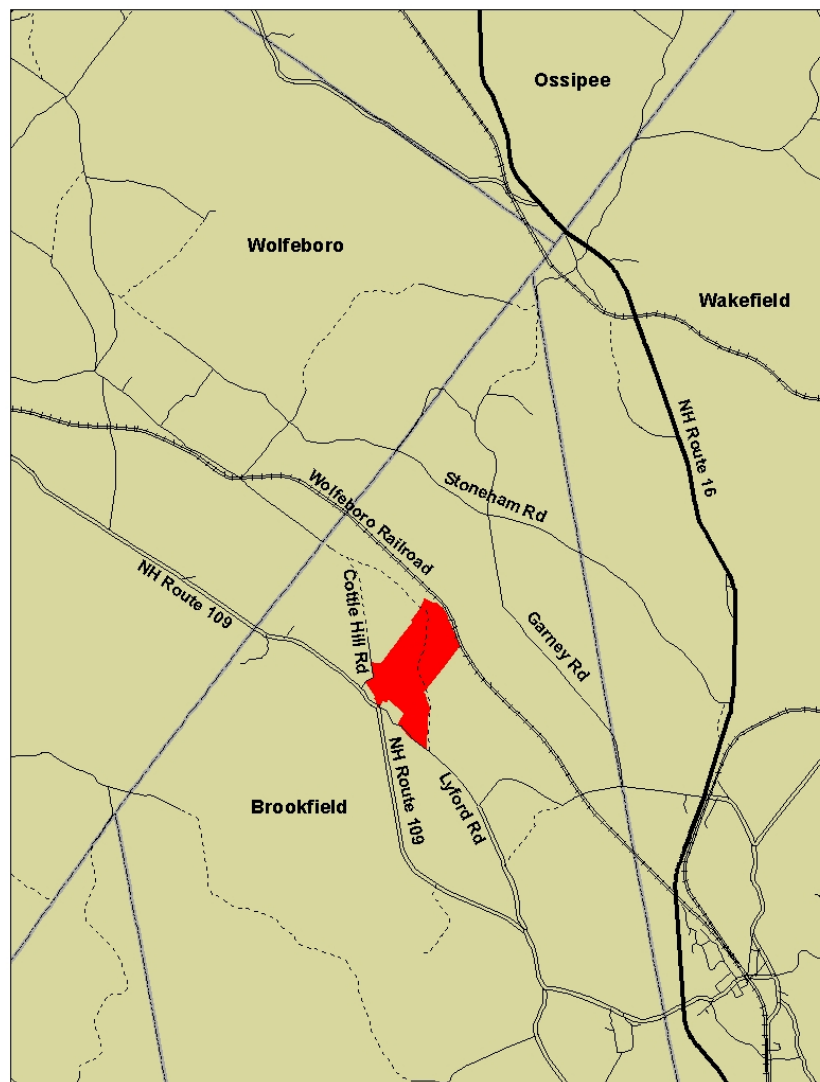
The Town of Brookfield acquired this large parcel in 2015 & 2016 with several goals in mind.

- The maintenance and enhancement of the wildlife habitat offered by the property.
- The development of a small cemetery along Lyford Road and the potential expansion/development of Town infrastructure.
- The improvement of the timber resources.
- The protection of the extensive wetland areas.
- The maintenance of the large field area for both its agricultural and wildlife values.
- Providing public open space for passive recreational activities.
- To generally manage the Town Preserve to be of lasting benefit to the residents of the Town of Brookfield.

CHAPTER 2: WOODLOT DESCRIPTION

LOCATION - DESCRIPTION

The Brookfield Town Preserve is irregular in shape and located in the north-central section of Town. It is comprised of two separate lots of record, Map 19 Lot 10, consisting of 244.5 acres (this lot was created when Map 19-10 and Map 20-3 were merged in November of 2016) and Map 19 Lot 10B, consisting of 5 acres. Both of these lots were acquired from Marsha B. Hunter. Lot 10B was acquired first, in October of 2015, and the deed is recorded at the Carroll County Registry, Book 3228 Page 704. Lot 10 was acquired a year later in September of 2016 and the deed is recorded at Book 3281 Page 399. There are two recorded surveys that show the boundaries of the property, both developed for Marsha Hunter by White Mountain Survey Company of Ossipee. These plans can be found at the Carroll County Registry, Plan Book 235 Page 37 and Plan Book 237 Pages 9-11.



BOUNDARY LINES

The boundary lines of the Brookfield Town Preserve range from well evident to somewhat obscure. There are many sections that are evidenced by stonewalls. Other sections are blazed lines, or the course of old wire fences. Many of the corners are marked by iron pipes.

A very detailed survey of the entire property exists, showing the on-the-ground evidence, as well as the bearing and distance of all the lines.

Of primary importance in the Town's management of this property is the marking and maintaining of the boundary lines. Even the sections of boundary that are evidenced by stonewalls should be painted, to ensure that there is no mistaking the location of the lines. A brush-on type of paint is more durable than aerosol paint, and requires repainting much less frequently. The Nelson Paint Company makes a paint specific to this purpose that works quite well. It is available for purchase at Windy Ridge Corp. in Tamworth, NH. The other product that I have used that works well is Rust-Oleum Professional High Performance Protective Enamel. This is the paint that the US Forest Service specifies for their boundary marking. Regardless of the brand, I recommend using bright red for the color. This seems to remain highly visible for a longer period than the other colors commonly used for boundaries (orange, yellow or blue). If trails are eventually marked on the property, make sure to use different colors than the boundary lines.

LAND HISTORY

The Brookfield Town Preserve has a rich history, predating the Revolutionary War. The Old Governor's Road that runs through the property was the main thoroughfare to get to John Wentworth's (NH's second Royal Governor) estate in Wolfeboro. The cellar hole on the property was the site of the home/inn of Colonel Hackett, who won renown during the Revolutionary War, and is buried in the small cemetery at the northeast corner of the field.

The majority (if not all) of the woodlands were cleared for agriculture beginning in the late 1700's and lasting until the collapse of the sheep industry in the 1840's. Following the Civil War, and the expansion of railroad access into the fertile agricultural lands of the mid-west, the population of rural New England dwindled and much of the pasture land and less fertile fields were abandoned and allowed to regrow into forest.

This property has remained woodland ever since, and was long owned by the Belknap family. Marsha Hunter acquired full ownership of the property in 2008 from Debra (Belknap) MacMahon. Under her ownership, much of the road frontage on Lyford Road was subdivided off and a series of somewhat heavy handed timber harvests removed much of the commercially valuable timber. Based on Timber Tax records at the Brookfield Town Office, a total of 612.819 MBF of sawtimber and 698 cords of pulpwood were harvested from the property between 2002 and 2012. Included in this volume is more white pine than is currently growing on the property. A summary of these timber harvests is found in the **Appendix** of this plan.

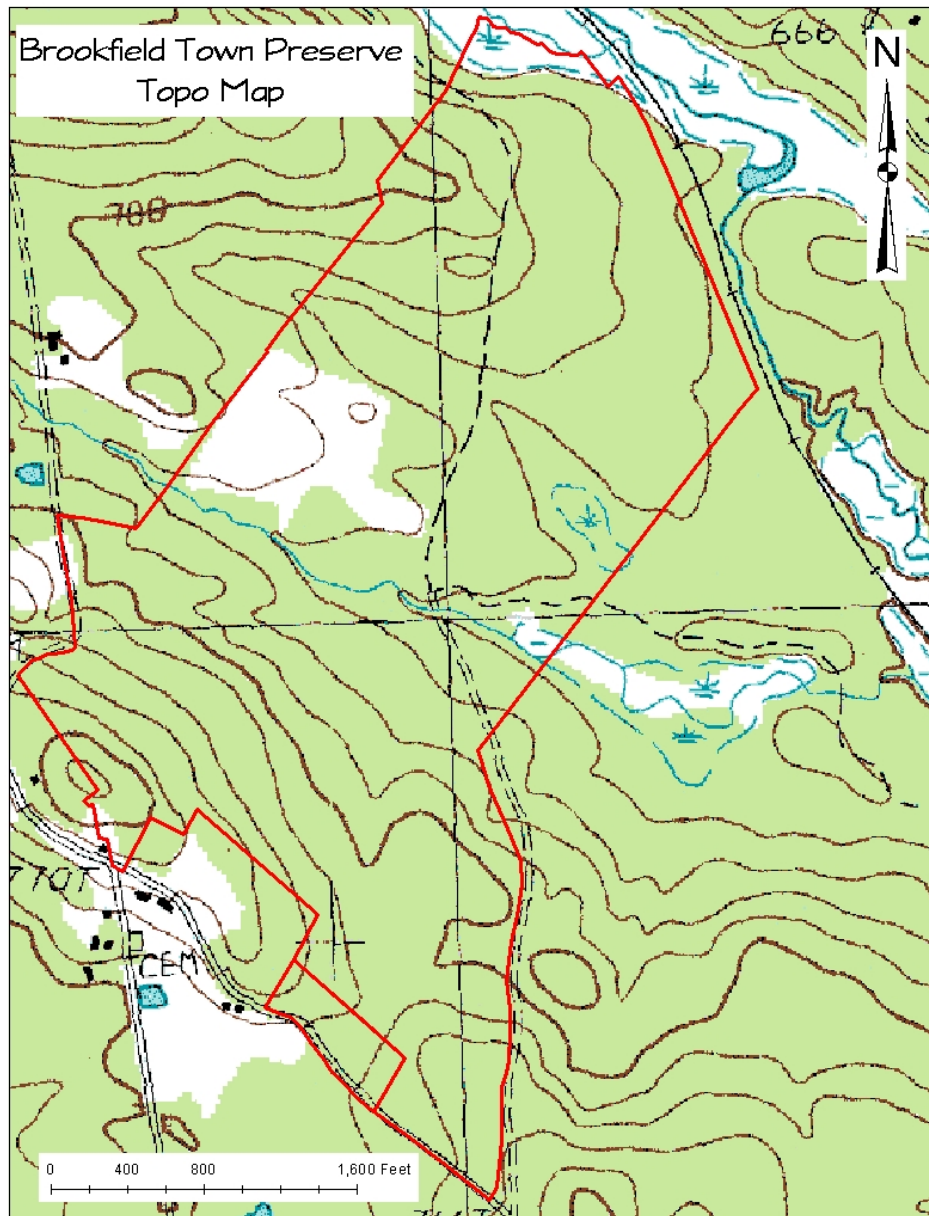
The Town of Brookfield acquired the land from Marsha Hunter in 2015 and 2016.

Since their ownership began, they have reached an agreement with local farmer Alan Fredrickson to mow and maintain the hayfield, placed several bluebird/tree swallow boxes along the edge of the field, and begun construction of a kiosk at the southern end of the Old Governor's Road.

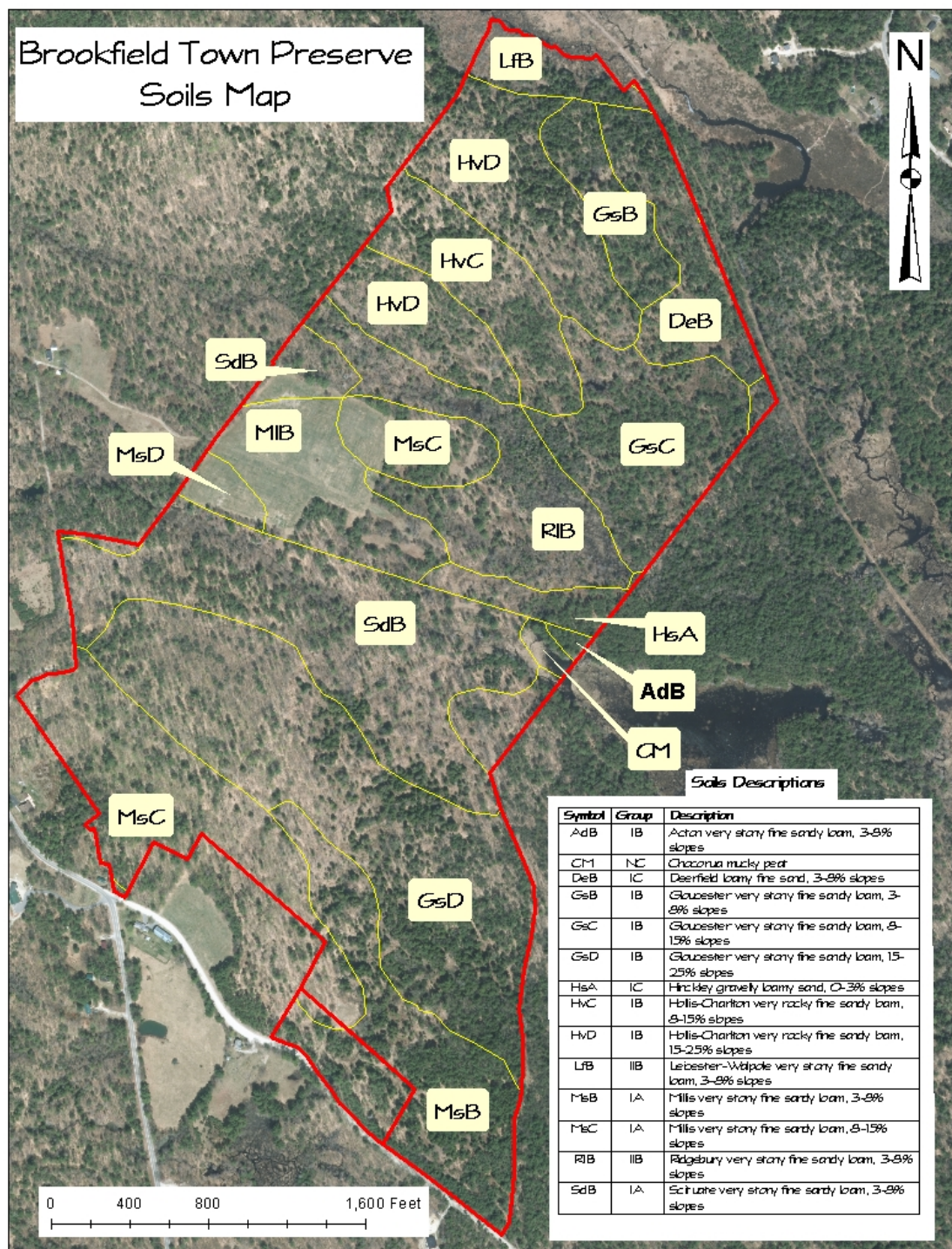
TOPOGRAPHY - ASPECT

The topography on the Brookfield Town Preserve varies over the extent, as to be expected on a property of this size. The steepest areas can be found in the southeast corner of the property, just to the west of the Old Governor's Road. Much of the rest of the property is gently sloping and rolling, with some areas of nearly level ground.

Aspect varies as well, but the land generally slopes to the north.







SOILS

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

Group IA Soils

Symbol	Description
MsB	Millis very stony fine sandy loam, 3-8% slopes
MsC	Millis very stony fine sandy loam, 8-15% slopes
SdB	Scituate very stony fine sandy loam, 3-8% 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
AdB	Acton very stony fine sandy loam, 3-8 % slopes
GsB	Gloucester very stony fine sandy loam, 3-8% slopes
GsC	Gloucester very stony fine sandy loam, 8-15% slopes
GsD	Gloucester very stony fine sandy loam, 15-25% slopes
HvC	Hollis-Charlton very rocky fine sandy loam, 8-15% slopes
HvD	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
DeB	Deerfield loamy fine sand, 3-8% slopes
HsA	Hinckley gravelly loamy sand, 3-8% 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 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
LfB	Leicester-Walpole very stony fine sandy loam, 3-8% slopes
RIB	Ridgebury very stony 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
CM	Chocorua mucky peat

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 Chocorua soil is associated with open marsh wetlands.

ACCESS

Management access to and onto the Brookfield Town Preserve is moderately good, but will generally require improvement for any management activity that requires access with heavy equipment. With frontage on a Class VI road, a Class V seasonal road, and a Class V road, I will begin my discussion with Cottle Hill Rd on the western side and move eastward to the Old Governor's Road.

Cottle Hill Road leaves Rt. 109 and travels northward. The road is in fairly good shape as far as the summer house on the property of Chanticleer Farm LLC. The Brookfield Town Preserve has approximately 1,000' of frontage on this road, and a small log landing exists (albeit grown up) just north of the boundary line, where the small trail intersects Cottle Hill Rd. There is another spot for a log landing a little further north on the road. Both of these locations would serve to access stand 1 and adjacent areas in the western sections of the property. This section of Cottle Hill Road is designated class V Seasonal. The road reverts to Class VI just past the summer house.

The main access to the hayfield on the Town Preserve is a woodsroad that leaves Cottle Hill Rd, passes through the dooryard of the summer house, then eastward through a rough field, and onto the Town's property through a narrow barway in the stonewall. This access route is not deeded and is used by the permission of the landowner. This is an important access, because the only other existing route to the hayfield comes from the Old Governor's Road, which is in rough shape and generally not suitable for haying access to the field. In the past, unwanted access has created ruts in the field, with use by vehicles during inappropriate times of year. Alan Fredrickson, the farmer who hays the field, has smoothed and fixed these ruts.

The hayfield access is not suited to use by large trucks due to the sharp corner off Cottle Hill Rd at the summer house.

The Brookfield Town Preserve has substantial (1750' +/-) frontage along Lyford Road (class V). A log landing exists, between the land of Marsha Hunter and the Cemetery. This landing is serviced by a short section of woodsroad that tends to be wet during all but the driest times of year. The landing was used for harvesting during the Hunter ownership and could be used to service much of the southern half of the property.

This log landing area is currently being used as a dumping place for woody debris. I do not know if this is being done by the Town's Road crew or by the public. In any case, the landing area is mostly filled, and will need to be pushed off soon. The hazard in using it as a debris dump is the potential introduction of invasive species to the property. Road side ditch debris in particular tends to be full of invasive species. There is already an infestation of bittersweet along the back side of the debris dump. This vine

CHAPTER 2: WOODLOT DESCRIPTION

(a native of Asia) will infest areas, killing and choking out native flora. Attempts should be made to control its growth whenever possible.

The Old Governor's Road provides the most direct route to much of the lot, and is the only realistic way to obtain management access to the northern half of the Preserve. However, because of its Class VI status, the Town of Brookfield cannot spend money on the improvement of the road. Any improvement will need to be made by the contractor as part of whatever project they are conducting.

This being said, Old Governor's Road is in tough shape and getting worse. The field work for this plan was conducted in late fall (during a wet year), so I got to see it during very adverse conditions. There are many areas that are severely rutted with standing water. Many other areas have substantial amounts of water running down the length of the road, causing further erosion. The public access that must be maintained with a Class VI road allows use by trucks, which further harm the integrity of the road when used during periods when the road is soft.

In order to be used by large truck for logging, substantial brushing back and grading of the road will be required, as well as the replacement of at least one culvert and the addition of gravel/fill in many areas. As previously stated, this work will have to be done in conjunction with some sort of management activity as part of the scope of work. There is potentially some aggregate (gravel or good sandy fill) that could be found on site and used by a contractor in his efforts to upgrade the road to a useable state. If present it would likely occur in the southeast and northeast corners of the lot, but exploratory test pits would need to be made to determine the approximate volume and quantity of the material and if it would be suitable/practical to use.

There are several log landing areas along both sides of the Old Governor's Road that were used during the series of timber harvests that occurred during Marsha Hunter's ownership. Most all of these could be reused for any management activity that required a staging area.

In addition to the poor condition of several sections of the Old Governor's Road, the issues of existing Rights-of-Way needs to be addressed. There are two abutting properties that have a Right-of-Way over the Brookfield Town Preserve, out to the Class VI Old Governor's Road. The first occurs on the east side of the road, just south of the cellar hole at the Hackett homesite. The old woodsroad travels east and eventually exits the property onto the land of the Alden Young Trust. A deeded Right-of-Way exists, given by Belknap to Young in 1953 and recorded at the Carroll County Registry, Book 294 Page 324.

The second Right-of-Way occurs in the extreme northern section of the property, where, historically, a woodsroad ran between the Old Governor's Road and a crossing of the railroad tracts and onto the abutting land to the north. The deed that grants this

CHAPTER 2: WOODLOT DESCRIPTION

Right-of-Way dates back to 1877 (CCRD Book 70 Page 369) and benefits the property currently owned by Gargas (Map 21 Lot 3). It is highly doubtful that this Right-of-Way could ever be used, as it crosses an area on either side of the railroad tracks that is now open wetland.

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 Brookfield Preserve. 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 Brookfield Preserve, a total of 38 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/B	26	Fully to over-stocked, pole to sawlog sized red oak and northern hardwood with scattered white pine. Fair to good quality. 70+ year old.
2	WP/M2/3B	35	Adequately to under stocked, pole to small sawlog sized white pine with a mixed component of red oak, northern hardwoods and hemlock. Fair quality. 60+ year old. Areas of this stand have a dense hardwood sapling understory.
3	H/M2C	69	Under stocked, pole to small sawtimber sized northern hardwoods and red oak with a variable component of hemlock and white pine, overtopping mixed regeneration of northern hardwoods and white pine. Poor to fair quality. 50+ year old.
4	M2/3B	92	Adequately stocked, pole to small sawtimber sized hemlock, white pine, northern hardwoods and red oak. Portions of this stand have small sapling sized regeneration resulting from the most recent harvests. 60+ year old.
		15	Hayfield.
		8	Wetlands.
		3	Brushy areas, historic house site
		2	Town Cemetery
		250	Total Acreage

Forest type map

STAND TECHNICAL DATA AND RECOMMENDATIONS

STAND 1 H2/3A/B 26 Acres

TECHNICAL DATA:

Species Composition by Percent	RM-31%, RO-27%, BE-17%, WP-12%, Other 13%
Mean Stand Diameter	9.0"
Mean Merchantable Stand Diameter	11.1"
# Trees per acre (4"+)	309
Basal Area/Acre	137.1 sq. ft./acre

MANAGEMENT GOAL: To promote the growth of good quality red oak sawtimber for both its wildlife and timber values.

TIME FRAME: 2019-2029

STAND 1 RECOMMENDATIONS:

Stand 1 is the largest area on the Brookfield Town Preserve that did not see significant harvesting under the Hunter ownership. It is well stocked with a mixture of red oak and northern hardwoods (beech, birch and maple) with a mixed component of white pine. The red oak is of good quality and is the main focal point for management of this stand.

Red oak is 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 make up a much smaller component of our woodlands. The importance of red oak cannot be understated, as it is plentiful throughout much of New England and consistently produces large crops of protein rich acorns.

Red oak 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 generally 70+ years of age and 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.

Management of this stand would focus on retaining the majority of the good quality red oak component to an old age, looking to provide a steady supply of hard mast for the myriad of wildlife species that feed on them. Throughout the stand, and the property as a whole, bear clawed beech trees should be retained. These trees show evidence of producing beech nuts, another valuable source of hard mast.

Red oak is also a valuable timber species. Timber management of this stand would not differ much from the prescription set forth above for wildlife values. The oak in this stand is just reaching the size when it can be considered “veneer” quality. This grade of sawlogs is based on the diameter and quality of the tree, and is generally found in butt logs that are free from defect and greater than 14” diameter. As the trees increase in girth, the value of them increases exponentially, with typically a 40-50% increase in value for the same tree as it increases from 14” to 18”+.

Careful thinning of stand 1 would seek to remove some of the trees that are competing with the better quality red oak stems, reducing the overall basal area from its current level at 137sq.ft./ac down to around 85sq.ft./acre. Giving the good quality oak room to expand their crowns will allow for increased vigor and growth rates, producing better quality trees and increasing nut production. The thinning would focus mainly on non-oak species (maple and beech) as well as the poorer quality oaks or those necessary to obtain the right spacing in the residual stand. By removing a portion of the stand in a careful thinning operation, not only will the overstory have ample room for crown expansion, but the regeneration process will begin. The areas opened up in the understory will immediately begin to grow back to a mixture of northern hardwoods and hopefully red oak. Obtaining red oak regeneration is hit or miss, but the odds for success can be increased by conducting a harvest in conjunction with a heavy acorn year. The disturbance to the forest floor helps to prepare the seedbed for the germination of the acorns. As the regeneration develops, it should be monitored and every 10-20 years (as needed) additional thinning of the overstory occur to shed additional light on the developing understory. In each thinning, the healthiest oaks should be retained and allowed to increase in size and productivity, eventually harvesting some of them at 22”+ when acorn production and value are maximized.

Additional considerations for management/harvesting in stand 1 would include the potential to develop white pine regeneration. There are scattered white pine throughout the stand. By opening small holes in the canopy adjacent to some of these pines, and scarifying the seedbed during the logging process, white pine seed will hopefully germinate and become established along with the various hardwood species that will inevitably occupy the site. This valuable timber species would be an excellent addition to the future stand that will occupy the site.

White ash, while a minor component of the stand, should be harvested before it is killed by the emerald ash borer, a non-native insect that has recently been found in Carroll County. It is estimated that 80%+ of the standing ash will be killed as this insect gains a foothold in the area. There is nothing that can be done to treat woodlands and the State of NH is recommending a pre-emptive salvage on all standing ash.

This conservative thinning designed to promote good quality sawtimber oak development and the production of hard mast would likely gross around \$7,000 in stumpage proceeds. The timing of this harvest could occur anytime within the next ten year period, preferably in conjunction with an abundant acorn drop.

STAND 2 WP/M2/3B 35 Acres

TECHNICAL DATA:

Species Composition by Percent	WP-69%, RM-11%, RO-9%, Other-11%
Mean Stand Diameter	9.8"
Mean Merchantable Stand Diameter	12.2"
# Trees per acre (4"+)	186
Basal Area/Acre	98.2 sq. ft./acre

MANAGEMENT GOAL: To maintain as much white pine as possible in the future species mix, and develop white pine sawtimber.

TIME FRAME: 2019-2029

STAND 2 RECOMMENDATIONS:

Stand 2 is the area of the Brookfield Preserve where white pine still occupies a major part of the overstory. Based on the stumps that can still be identified, white pine played a much more significant role in the forests on this property prior to the series of heavy handing timber harvests that occurred just prior to the Town's purchase of the land.

The soils on the property generally favor the growth of hardwood species, but white pine has the competitive ability to occupy old field sites following abandonment and out compete the hardwood species. This is particularly true in the abandonment of pasture land, where pine will often become established in the years prior to being abandoned, when the grazing by the livestock often becomes less frequent. Having a several year advantage over the hardwood species (which are often eaten by livestock) is usually all that is required for pine to take over a site. The one drawback to these thick stands of pasture pine is the inherent poor quality. The ample sunlight in an old pasture is the perfect habitat for the pine weevil, an insect that lays its egg in the terminal shoot of a pine, and the larvae kills it upon hatching. With the terminal shoot dead, one or many of the side shoots will grow up and take over as the main leader of the tree, creating the multi-stemmed, crooked, limby trees that give rise to the term "pasture pine". There is little potential in some of these stems ever producing quality sawtimber and they should be removed during thinning operations in order to favor the better quality trees, eventually producing sawlogs.

Throughout the woodlot, there has been periodic harvesting that has removed most of the better quality white pine sawtimber, converting many areas from pine stand to mixedwood or hardwood stands, and decreasing the average quality. Many areas still have an overstory with a strong pine component but an understory with hardwood

saplings established to the point that attempting to regenerate pine on the site would be a waste of time and energy. In these areas already dominated by young hardwood growth, some the pine overstory should be carefully removed when working in adjoining areas, allowing the vigorous hardwoods to take over the site. The quality of these hardwood saplings is average to above average in many areas, with a surprising amount of red oak found in the species mix. As this hardwood understory is released and develops, it should be monitored and perhaps a pre-commercial weeding project would eventually be deemed appropriate in some areas to help improve the species mix and focus growth on the better quality oak and maple.

The areas along the eastern boundary (shown as stand 2-2 on the Forest Type Map) have more potential for future pine management. The soils that underlay these areas of the stand are droughty and more suited to softwood production than most of the rest of the woodlot. The overall size of the trees here is slightly smaller and the quality not quite as good, but there is good potential to manage for pine sawlog development and regeneration.

A commercial thinning of these two areas would seek to remove the more poorly developed stems, allowing for increased growth in the trees with potential for sawlog development. Mostly low grade products would be removed, necessitating the use of mechanized logging equipment. I feel that cut-to-length equipment would be best suited to the recommended harvest. This type of logging operation fells, limbs, and processes the trees in the woods, rather than dragging them to the landing area. A forwarder (a piece of logging equipment with bunks and a cherry picker) then picks up the logs and pulpwood and carries them out to the landing. Not only does this type of mechanized operation allow for the harvesting of great volumes of pulpwood and low value sawlogs, but it is very light on the ground, minimizing disturbance and erosion potential.

Stumpage proceeds from this recommended harvesting would likely be in the neighborhood of \$5,500.

From a wildlife standpoint, a pine stand is not a particularly beneficial forest type, although it does have some features that make it valuable from a habitat standpoint. There are many species of birds that utilize pine for nesting sites, and pine seed is favored by many bird and small mammal species. As winter habitat, it is not nearly as good as hemlock or spruce/fir forest types, but any softwood is better than none. Young pine thickets can act as habitat for nesting/brooding birds as well as cover for mammal species such as snowshoe hare and red squirrel.

STAND 3 H/M2C 69 Acres

TECHNICAL DATA:

Species Composition by Percent	RM-37%, BE-18%, RO-17%, WP-13%, Other-15%
Mean Stand Diameter	6.6"
Mean Merchantable Stand Diameter	12.0"
# Trees per acre (4''+)	372
Basal Area/Acre	88.9 sq. ft./acre

MANAGEMENT GOAL: To, over time, improve the species composition, favoring red oak for mast production, hemlock for winter cover, and white pine for timber production.

TIME FRAME: 2019-2029

STAND 3 RECOMMENDATIONS:

Stand 3 consists of the area of the Brookfield Preserve that saw the brunt of the heavy handed timber harvesting in the decade prior to the Town's purchase. These harvests were focused on removing the higher value sawtimber trees, primarily white pine and red oak. The residual stand is comprised of an irregular, patchy overstory of northern hardwoods, red oak and white pine. The understory is also quite varied, as the harvesting occurred periodically over many years. In some areas, the young growth is 10-20' tall and 10+ years old, and in the areas most recently harvested, the saplings are knee to waist high. In some areas white pine has become established (likely due to the timing of the harvest coinciding with a white pine seed drop) and in other areas, northern hardwoods dominate the species mix.

Throughout the stand there are large sapling to small pole size red oak that were present during the last round of harvesting and were not cut. These stems, with the added sunlight, have quickly responded with crown expansion and increased growth. They are already above much of the rapidly developing understory and should continue to thrive. They are 10-20 years away from acorn development and 50 years away from heavy production, but their presence in the stand is a welcome addition.

The sapling understory should be monitored as it develops. In 5 years (around 2023) a thorough assessment of this stand should be made to see what the species mix looks like and the need for a pre-commercial weeding/thinning operation determined. If there are ample oak, hemlock and pine seedlings that need a little help to outcompete the

fast growing beech and maple stems, the logistics/funding for this type of project should be investigated. Much of the good quality regeneration is too small at this time to commit the time and money towards this type of project. However, once the desirable regeneration averages 8-12' in height, a single release from competition is likely all that would be required to permanently impact the species mix in the mature forest 50 years down the line.

Commercial harvesting within the stand would be limited to the removal of some of the poor quality overstory that was left during the last series of harvests. Primarily beech and poor quality maple would be targeted and only in the areas adjacent to other planned work. Bear clawed beech trees should be retained as they are the best producers of nuts, and during years of production bears will visit those particular trees. This is not something that would support a stand alone project, it would only occur in conjunction with other, more significant projects.

Included in this stand is a small patch clearcut in the far northeast corner of the property. This area appears to have been harvested 10-15 years ago and is older than much of the young growth in other areas of the stand. The white pine regeneration in this area is doing particularly well.

When conducting work in adjacent stands, it is recommended to create several small patch clearcuts within this stand, up to approximately 2 acres in size. The vast majority of the early successional growth on the property is found in stand 3, and as it matures, it will become less suitable to the wildlife species that use it. By creating these clearcuts, and the young growth that will immediately occupy the site, there will be areas of early successional habitat coming along to replace what currently exists as it ages. This is not an economically viable stand alone project, but could be done in conjunction with work in adjacent stands.

Another project that could be accomplished within stand 3 while doing more financially practical work in adjacent areas is the creation of woodcock habitat. By clearcutting small areas of the stand that will regenerate to aspen/birch/alder, you can create patches of singing/feeding growth. In general, these areas should be located on wetter sites, near wetlands, and where aspen/birch are present to maximize the potential for them occupying the site post harvest. I have shown on the map the approximate location of several of these areas.

STAND 4 M2/3B 92 Acres

TECHNICAL DATA:

Species Composition by Percent	HM-39%, RM-18%, RO-14%, BE-11%, WP-9%, Other-9%
Mean Stand Diameter	8.2"
Mean Merchantable Stand Diameter	10.6"
# Trees per acre (4"+)	318
Basal Area/Acre	116.7 sq. ft./acre

MANAGEMENT GOAL: To promote softwood development and a multi-tiered softwood canopy throughout the stand, the development of hardwood browse, and the development of red oak for mast production.

TIME FRAME: 2019-2029

STAND 4 RECOMMENDATIONS:

Stand 4 is the largest forest stand on the Brookfield Preserve and is quite variable across its extent. The common component is hemlock, which is not found in any abundance in the other forested areas of the property. Although having seen harvesting in many areas of the stand, the cutting was not nearly as aggressive as in other sections of the property, particularly stand 3.

Hemlock is an incredibly important species for wildlife because of the winter cover it provides. A myriad of species rely on thick stands of hemlock to block harsh winter winds, keep snow depth down, and trap small amounts of heat near the ground to help offset nightly radiational cooling. Deer in particular rely heavily on stands of hemlock in the winter months, yarding in these areas when the snow gets deep.

Because hemlock is not a particularly valuable species, it was not regularly targeted during the series of harvests prior to the Towns ownership. Throughout much of the stand, the loggers just ran skidroads through the woods (avoiding as much hemlock as possible) while focusing on removing the singular and small groups of pine and oak. The result is a forest that still has a largely intact canopy, with small openings. Within these openings, the regeneration that has become established is a mixture of hardwoods, hemlock and white pine. As this regeneration develops, it will constitute another age class within the stand and begin to form a multi-tiered canopy.

Management of the stand will seek to promote the existing pockets of regeneration (particularly the softwood), and develop more small pockets of young growth, using a very conservative version of the group selection harvesting system. Very small clearcuts (often no more than 50-75' in diameter) should be spaced throughout the

CHAPTER 3: FOREST RESOURCES

stand. These openings should be located to shed additional light on desirable regeneration, be located adjacent to good quality seed sources (mature hemlock, pine and oak), and focus on the poor quality hardwood (beech, birch, maple) within the stand that will sprout back and produce browse for deer during the winter months. Over time (conducting a group selection harvest every 15-25 years) this type of cutting will produce a uneven aged forest with several canopy layers/age classes. It is particularly beneficial to shade tolerant species such as hemlock, which is able to grow in the partial to full shade of a forest canopy.

The red oak component of the stand is not a major part in many areas. Where present and healthy, it should be avoided during any harvest operations and retained for its mast production.

It is estimated that approximately \$6,600 in stumpage proceeds might be removed from this stand in the recommended harvesting.

ESTIMATED TIMBER LIQUIDATION VOLUMES AND VALUES
December 2018

Species	Total Volume	Stumpage Value	Total Value
<i>Sawlogs</i>			
White Pine	438.653 MBF	\$150/MBF	\$67,798
White Pine Box	85.356 MBF	20/MBF	1,707
Hemlock	111.674 MBF	40/MBF	4,467
Red Pine	25.343 MBF	40/MBF	1,014
Red Oak	113.404 MBF	350/MBF	40,041
Red Maple	21.904 MBF	65/MBF	1,424
Sugar Maple	16.952 MBF	150/MBF	2,543
Ash	3.609 MBF	100/MBF	361
Oak Pallet	116.049 MBF	70/MBF	8,123
Hardwood Pallet	23.913 MBF	25/MBF	597
Total Sawlogs	956.857 MBF		\$128,075
<i>Pulpwood</i>			
Hardwood	5,087 tons	\$6.50/ton	\$33,065
Softwood	2,325 tons	2.00/ton	4,650
Total Pulpwood	7,412 tons		\$37,715
<i>Biomass</i>			
Fuel Chips	6,660 tons	\$1.00/ton	\$6,660
		Total	\$172,450

TOTAL TIMBER VALUE PER ACRE: \$690

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 Brookfield would receive for stumpage rates on the recommended harvesting. These rates also reflect the necessary access improvements that will be necessary for the logger to conduct.

WILDLIFE

From observed sign, a wide variety of wildlife are using the Brookfield Town Preserve. Sign of deer, moose, bear, ruffed grouse, bobcat, coyotes, fox, beaver, squirrel, raccoon, skunk, porcupine, pileated woodpecker, raven, hawk, owl, 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 wetlands 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 main objective would be to retain at least 6 to 12 good mast trees per acre in the large sawtimber size class. Only stand 1 has a high 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. At the time of the field work for this plan, there was an abundance of woodpecker activity on the property, primarily occurring in the trees that are beginning to rot from the damage received during the 1998 and 2008 ice storms. There was ample evidence of pileated woodpeckers in particular, excavating large holes in standing dead timber.

The brushy area around the cellar hole is a very interesting addition to the wildlife habitat on the property. This area consists of several small fields that have grown up to bushes, brambles, goldenrod and other woody growth, interspersed with stonewalls and larger trees. There are many fruiting shrubs in the area, including several species of viburnum (northern arrowwood and nannyberry), blueberry, and elderberry, along with several old apple trees, and some large black cherry. Unfortunately, there is also an abundance of invasive species, principally bittersweet, autumn olive and honeysuckle. These invasive species are great for wildlife in that they produce excellent food and habitat, but are incredibly detrimental to the property in the long term, having the ability to choke out native species and overrun a site.

Management of this area would seek to accomplish two main goals. First is maintaining as much of this area as possible in low grasses, forbs and brambles through yearly mowing, and possibly expanding the edges to make the area larger to create a habitat that is different from the hayfield/grassland. Keeping a buffer of vegetation between the old field and the hayfield and releasing old apple trees and fruiting shrubs would be beneficial to wildlife. A good deal of the area could be mowed with a tractor and brush hog or sickle bar. During the initial mowing, it may prove advisable to have someone on the ground looking for rocks or other obstructions that would damage the mower. Hand work with a brush saw may be the best way to clear some of the unwanted growth back to the walls. My suggestion would be to talk to Alan Fredrickson (who hays the adjacent field) and see if he would be willing to conduct this mowing. It is my guess that it would take 2-3 hours to mow everything within this area.

The second objective would be to begin the process of controlling the unwanted growth, primarily the invasive species. There are two ways to accomplish this, either mechanically through frequent cutting or chemically by the application of herbicide. Much of the bittersweet has grown up into the crowns of the surrounding trees and is probably beyond the point of being pulled down. Cutting it back at ground level and maintaining/killing it there is likely all that can be done.

In a perfect world, in which money were no object, the area would be mowed, the unwanted growth along the stonewalls and edges cut back, piled and burned, and then the roots/stumps of the unwanted growth dug out to further facilitate yearly mowing/maintenance. This would however be quite costly. Any steps towards this ideal goal that the Town can accomplish through volunteer work or paid labor would certainly be beneficial.

Open, brushy areas such as this are referred to as permanent wildlife openings. They provide necessary habitat for about 22% of New England's wildlife species and seasonally important habitat for nearly 70%. Bird species in particular use these areas for nesting, both on the ground and in the surrounding shrubs. The abundance of food from the insects that gather in these sites and the fruiting shrubs such as elderberry, viburnums, and blueberry draw birds and mammals in from the surrounding areas to feed, and also the predator species such as hawks, owls, fox, bobcat and coyote that prey on the smaller animals. It is recommended to wait until after August 1st to conduct the mowing of this site to allow ground nesting birds to finish fledging their young.

In doing any of the above recommended management activities around the old cellar hole, it is important to consider the integrity of the historic site. By clearing brush, debris and trees away from the site, it will be more easily seen and hopefully remain in good shape. Care will need to be taken to not do anything that will adversely impact the site. Also, be on the lookout for open wells. One was found and covered shortly after the Town took over ownership, but more may exist.

The large hayfield adjacent to this brushy area is a fantastic addition to the wildlife habitat that occurs on the Brookfield Town Preserve. At 15 acres in size, it is a significant feature on the landscape. When the Town took ownership of the land, the field had not been mowed for several years. Local farmer Alan Fredrickson has taken over the haying and maintenance of the field and in my opinion, is doing an outstanding job. He has smoothed some ruts that unwanted vehicular access had created, spent 4 days with an excavator pulling large rocks that hindered mowing, and pushed the encroaching brush back to the edge. He fertilizes the field every spring based on a soil test, and then spreads a combination of manure and wood ash mid summer to build up the organic layer in the soil. He brushes back the edge of the field every year to keep brush from encroaching on the mowable area. The frequent mowing and management of the soil ph has made a dramatic improvement in the amount of good grasses and clover that can be found in the field and cut down markedly the amount of weed species. I want to express to the Town that they are very fortunate to have found someone willing to go to these lengths in the management of a field that they do not own. I manage many properties that have fields being hayed by someone other than the landowner, and can state unequivocally that I have never seen a field better cared for by someone who does not own it. Every effort should be made on the Town's part to continue this relationship, because I do not feel you could find a better one.

From a wildlife standpoint, the field offers tremendous value. Many bird species seek out the insects that thrive here. Predator species hunt the small bird species and rodents that frequent the area. Deer will utilize the field as a food source, preferring the same high protein grasses that are promoted for livestock feed. At the time of the field work for this plan, in a year with no significant acorns or beech nuts, the amount of browsing in the field by deer was amazing, based on the freshly cropped grasses and scat. A flock of over 30 turkeys were encountered in the field, chasing late season insects in the warm sun.

From a ground nesting bird's perspective, it would be better to only cut the field once per year, after the 1st of August. However, this does not work from the standpoint of hayfield management, as the grasses will have lost much of their nutrients by this time and the infrequent mowing allows for the weed species to thrive. The Town has placed several bluebird/tree swallow nesting boxes near the edge of the field. Many more could be located around the outside edge of the field, but make sure they are far enough back that they don't interfere with the haying operation.

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.

CHAPTER 4: OTHER RESOURCES

Numerous amphibians, reptiles and fish species require the year round water that these old beaver influenced wetlands provide, including many species of snakes, turtles, frogs, salamanders and aquatic furbearers.

Near and adjacent to these open wetland areas, the potential exists to promote woodcock habitat. As discussed in the management recommendations for stand 3, creating several patch clearcuts near these wetlands to promote aspen/birch regeneration.

There are several vernal pools on the property. I have mapped the most significant ones. Vernal pools are small depressions that fill with water during the wet times of year, but will periodically dry up, making them unsuitable habitat for fish. This is important, because fish can be a major predator to amphibian tadpoles and larvae. These species include spotted salamanders, Jefferson salamanders, wood frogs, and the State-endangered marbled salamander. Other non-amphibian species use the vernal pools. Fairy shrimp, small crustaceans, require vernal pools for all life stages. State-endangered Blandings turtles and State-threatened spotted turtles feed on amphibian eggs in vernal pools and also use them for basking, mating and overwintering. These turtles also use vernal pools as stopover habitat when migrating, because pools provide moist refuge and abundant food.

For appropriate management buffers along wetlands and vernal pools, see the **Wetland and Water Resources** section of this plan.

According to the NH Wildlife Action Plan, the majority of the Brookfield Town Preserve is designated as supporting landscape. The riparian areas that run through the center of the property and along the railroad tracks are listed as Highest Ranked Within The Biological Area. The importance of these areas has been addressed within the **Wildlife** and **Wetlands** sections of the plan.

WETLANDS - WATER RESOURCES

The wetland and water resources on the Brookfield Town Preserve are extensive, consisting of the large wetland areas associated with the small brooks as well as numerous small streams/drainages and vernal pools.

The State of New Hampshire regulates work in any of these jurisdictional wetlands. Appropriate buffers (75') should be retained along wetlands/streams in which 50% of the crown cover is maintained and soil disturbance is minimized. Along the larger open wetland areas, this buffer should extend out 100'

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 ***Notification of Forest Management Activities Having Minimum Wetlands Impact*** with the State of New Hampshire's Department of Environmental Services. 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.

There are many small wetlands that I believe are vernal pools on the property. I have mapped the most significant ones that I came across. The following management recommendations regarding vernal pools are taken from the publication **Good Forestry in the Granite State**.

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.
- Avoid applying herbicides or insecticides.

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.

RECREATION

The Brookfield Town Preserve currently sees the most public recreation during the fall hunting season, which coincided with the field work for this plan. There was ample evidence of hunters using the property. Some mountain bikers were encountered on the Old Governor's Road. A kiosk is in the process of being constructed at the southern end of the Old Governor's Road where a small parking area exists, suitable for two to three vehicles.

In talking with Conservation Commission members, the potential location of two recreational trails was discussed. The first was a trail from the cemetery area that would eventually reach the hayfield. In my mind, it makes the most sense to have a trail leave the cemetery and travel northeast down to the Old Governor's Road. Once at the Class VI road, hikers could then travel along the road to the Hackett homesite and eventually to the field. I feel this is more practical that remaining in the woods all the way to the field for several reasons. First, the Old Governor's Road will be used as a main thoroughfare for recreational traffic anyway, with parking at the Lyford Road end. Second, in order to stay in the woods, and basically run parallel with the Class VI road, several wet areas will need to be crossed, necessitating small foot bridges, whereas a trail down to the Old Governor's Road could likely avoid wet ground. However, a recreational trail through stand 4 would likely impact deer wintering activity if the pedestrian trail were used in the winter. Forest recreation should avoid deer wintering areas as much as possible. A thorough field review to document winter deer use on the Brookfield Town Preserve and surrounding property would be recommended.

The second potential trail would connect the Class VI road to the recreational trails that use the old Wolfeboro Railroad tracks. There are two potential locations for this that should be investigated. The first is the Right-of-Way to Gargas. This woodsroad leaves the Class VI road and travels northward to the railroad tracks, but enters an open wetland area unsuitable for travel. Veering eastward off this way and gaining access to the tracks may be doable using existing skidtrails and paths.

CHAPTER 4: OTHER RESOURCES

The other alternative to gain access to the railroad tracks comes from a woodsroad that leaves the Class VI road and runs eastward in a straight line toward the northeast corner of the property. It dead ends about 400' from the railroad tracks, and from this point the most suitable way would need to be sought.

Something to consider when planning and implementing these trails is the type of use they will receive. The railroad tracks are heavily used by snowmobiles during the winter months. If trails on the Town's land are opened up onto the snowmobile corridor, it is likely they will see use by snowmobiles. This may be acceptable or desired by the Town, but it should be considered when planning for these trails. Snowmobile trails should avoid deer wintering areas.

As discussed in the **Boundary** section of this plan, marking recreational trails with a different color paint than is used to delineate the boundary lines is important.

CULTURAL FEATURES

There are two known sites on the property with historic significance. The first is the Hackett homesite just to the east of the hayfield. Colonel Hackett was a Revolutionary War veteran who ran an inn at his home along the Governor's Road, which at the time was the main highway from the seacoast to Governor John Wentworth's summer estate in nearby Wolfeboro.

There is a small cemetery just off the northeast corner of the hayfield where Colonel Hackett is buried, along with other members of his family and the immediate area.

During the planning and implementation of any management activities near these historic sites, care will need to be taken to protect their integrity.

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 no known occurrences of any rare or endangered plant or animal species on or near the property.

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 should be limed, fertilized, reseeded 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. Carroll County 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.

BEST MANAGEMENT PRACTICES

All woods road construction, use, maintenance, wetland and 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 **Notification of Forest Management or Timber Harvest Activities having Minimum Wetland Impact** (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.

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

INSECTS AND DISEASES

From observed evidence, there is fairly low occurrence of forest disease problems on the Brookfield Town Preserve. The only widespread disease that was noted during the cruise is the presence of Beech Bark Disease. Nothing can be done to treat trees infected with this widespread malady. Some trees have clean, smooth trunks, being resistant to the beech scale insect, which creates the wounds that enable the Nectria fungus to gain a foothold. These resistant trees should be left in stands and their regeneration encouraged.

The impending infestation of emerald ash borer seems inevitable at this point. It has been discovered within Carroll County and is spreading rapidly. There is nothing to be done to treat infected trees and the State of NH is recommended preemptively salvaging ash sawtimber during timber harvests. Ash plays such a small part in the forests on the Brookfield Town Preserve 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

2019-2029

Stands	Recommendation	Goal	Page Reference
	Repaint boundary lines	Firmly identify all boundary lines.	5
	Mowing/invasive species control around the Hackett homesite.	Maintain/improve early successional wildlife habitat and control invasive species.	30,31
	Possible construction of hiking trails from the cemetery to the Old Governor's Road and out to the railroad tracks. Assess deer wintering activity and take results into account when planning trail location.	Develop recreational opportunities without negatively impacting deer wintering activity.	35,36
	Push off debris in the landing area to the west of the cemetery along Lyford Road. Stop adding debris. Control invasive species if possible.	Re-establish access and control the spread/establishment of invasive species.	13,14
1 & small portions of 2&4	Upgrade landing area along Cottle Hill Rd and conduct timber harvesting per recommendations.	Promote red oak growth for mast production and timber, develop desirable regeneration. Access improvement a part of the project.	13,20-24
2,4 and small portions of 3	Necessary improvements to Old Governor's Road to support a timber harvest. Timber harvesting per recommendations.	Improve winter deer habitat, promote hemlock growth, generate browse, provide additional sunlight on developing regeneration, promote pine sawlog development, develop desirable regeneration.	14,23-28
3	Monitor regeneration with an eye towards the need for pre-commercial weeding and thinning to release the desirable saplings from competitions.	Manipulate stocking to promote growth in desirable species.	23,25,26
	Place additional bird houses near hayfield	Provide nesting habitat for bluebirds and swallows.	32

APPENDIX

APPENDIX

~Timber Harvest Summary 2002-2012

~Natural Heritage Bureau Printout

APPENDIX

Brookfield Town Preserve
 Timber Harvest Summary Under Previous Ownership
 2002-2012

	Timber Tax Year (April 1 – March 31)						
Product	'02-'03	'03-'04	'04-'05	'05-'06	'06-'07	'10-'11	'11-'12
<i>Sawlogs</i>							
White Pine	29.760MBF	48.575MBF	28.315MBF	10.830MBF	4.204MBF	179.625MBF	241.420MBF
Hemlock						20.420MBF	15.520MBF
Red Oak					9.745MBF	9.130MBF	15.275MBF
<i>Pulpwood</i>							
Softwood	9.47 cds	37.13 cds	7.54 cds	7.31 cords		156.76 cords	382.79 cords
Hardwood						7 cords	90.16 cords

Total Timber Harvested 2002-2012

Sawlogs

White Pine 542.729 MBF
 Hemlock 35.940 MBF
 Red Oak 34.150 MBF
Total 612.819 MBF

Pulpwood

Softwood 601 cords
 Hardwood 97.16 cords
Total 698.16 cords