FOREST MANAGEMENT PLAN Wild Goose Pond Watershed Wallman Lot Pittsfield, NH

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INTRODUCTION

Carl Wallman and George Bachelder are two neighboring landowners located in Pittsfield, New Hampshire who have collaborated to conduct a landscape level natural resource assessment, and construct a forest management plan to encompass and consider all the natural resource features within their local Wild Goose Pond watershed. Each landowner will receive a separate forest management plan for their parcels, however, the plans will have several overlapping features, and management recommendations will consider the natural resource impacts beyond individual property boundaries.

Property Description

Carl Wallman owns approximately 317 acres comprised of seven individual parcels as identified by the town of Pittsfield tax map R-8 Lots 1 and 15 and map R-10 lots 8-4, 8-5, 8-6, 8-7, 8-8, and 8-11. The property is accessible via Clough Road, which is a Class V gravel town road, and lies within the town of Pittsfield, County of Merrimack, in southeastern New Hampshire. The property is primarily forested with water frontage along Wild Goose Pond to the East and Northeast. The properties consist of several buildings. Buildings include the landowner's primary residence, a shed for equipment storage, seasonal rental cabins, additional cabins in need of upgrades, and a second home which also serves as a potential rental. In addition, two interior gravel roads parallel each other providing sufficient access to much of the property. Only one parcel has access limitations. There is an existing woods road entering the lot, however it passes through a neighbors land, and would require collaboration with that individual if access was ever required. The landscape is situated on the East side of Tilton Hill and the north end of Catamount Mountain. The area is primarily forested with a variety of tree species and ages, in combination with some fields, reverted pastures, historical stonewalls, and several small streams.

Management History

A portion of the property is part of Graylag Cabins, available for vacation rentals. In 1946, the property was first established as a seasonal camp, specifically for young boys. The original camp ran operations from 1949-1971. Basketball hall of famer Bob Cousy was part owner of the camp from 1951 until the camp closed in 1971. For additional information on the original camp operations and its history, visit the Graylag website at <u>http://www.graylagcabins.com</u>. After 1971 the camp was closed, the original property was subdivided, and many of the buildings began to diminish.

In 1995 the current landowner, Carl Wallman, purchased the property. Prior to Mr. Wallman's ownership, some timber harvesting took place, most of it during the 1980's. Most of the timber harvesting was a combination of thinning and in places, high grading, only removing the most valuable timber and leaving behind tree species which generate lower value forest products.

Since 1994 the landowner has harvested minimal timber for personal use of firewood, lumber for cabin renovations, improving aesthetic views, and improving wildlife habitats such as low bush blueberry openings for wildlife feed. A more substantial amount of timber was removed during a salvage harvest as a result of a tornado that swept through southeastern New Hampshire in 2008. This storm left behind a swath of uprooted, twisted, tangled, and snapped off trees. Following this event, the landowner had a logging operation in order to salvage the fallen timber and clean up the tangled mess the tornado left behind. Approximately 30 acres of Graylag were affected by this natural event. Fortunately no buildings or guests were impacted. A small portion of the damaged area was left intact in order to retain a riparian buffer along a perennial stream. The area that was salvaged has similar characteristics of a clear cut this is now regenerating a young forest which will one day become the next generation of forest.

Most recently, two additional parcels were acquired by Mr. Wallman within the surrounding landscape. One parcel is 63 acres and was heavily timbered several years prior to being sold. The second parcel purchased is 114 acres located northwest of Mr. Wallman's home along Clough Road. In addition, a 30 acre portion of Graylag was harvested in 2014. A forest thinning was applied to improve the health and growth of the timber, as well as to create recreational trails within the property.

Other notable management activities include a Forest Management Plan written in 2002 for Current Use Assessment purposes and a timber valuation on a 50 acre portion purchased separately in 2007. Both plans were written by Charles A. Moreno, a consulting forester (Moreno C. A., 2002, 2007). More recently in 2008, an Ecological Assessment and Land Stewardship Plan was written by Ellen J. Snyder, a wildlife consultant (Snyder E. J, 2008), and in 2014 Ellen J Snyder wrote a watershed assessment plan titled, Wild Goose Pond and It's Watershed (Snyder E. J, 2014). This current plan will reference each of the previous plans and will expand on the information collected to developed land use goals and recommendations as a guide for the landowner to follow and implement over time.

Cultural Resources

The landscape has a long history dating back prior to the properties current ownership records and land use. Much of this land was active pasture and farmland in the early 1800's through the early 1900's. Cellar holes, wells, old fence line, and stonewalls indicate that like much of New England, the landscape likely supported sheep, cattle, or other farm animals. Also like much of New England, the majority of this farmland was likely abandoned in the 1930's around the great depression. Since this time the area has reverted to forest land with the exception of a few hay fields and pastures that remain in active agricultural use. Historically, this area provided excellent sheep pastures and timber opportunities. Now, 200 years later, the landscape is once again abundant with timber, and still provides opportunities for agricultural uses.



Map 1. Location map with topographic background.

Landscape Setting

These properties are located within the Coastal Transitional watershed group and border the Tidal Coastal watershed group. The properties are situated within the Pittsfield Tributaries watershed, and more specifically within the Wild Goose Pond Watershed. Wild Goose Pond is 118 acres, and is one of Pittsfield's largest waterbodies. The watershed around this pond is 2,064 acres and includes Adams Pond and Shinglemill Brook as primary tributaries into Wild Goose Pond. The outflow of the pond is named Crooked Run, which flows north and eventually reaches the Suncook River in Barnstead.

In addition, the properties are situated within a 1,400 acre, unfragmented, forested block south of Clough Road, and a 2,300 acre block on the north side of Clough Road. The area is heavily forested, rural, and dominated by hemlock-hardwood-pine forest types. Large water bodies are common within the landscape including Wild Goose Pond, Adams Pond, and Shinglemill brook. Terrain within the landscape is typically rugged, undulating, and rocky, although operable for recreation and management purposes.



The Wild Goose Pond watershed, outlined in yellow, lies in the northeast corner of the Town of Pittsfield, New Hampshire. Set against a topographic map, the watershed's hilly landscape and stream inlets and outlet to Wild Goose Pond are evident.

(Map by Ibis Wildlife Consulting; data from ArcGis Online and NH GRANIT, February 2014)

Map 2. Wild Goose Pond Watershed. Map created by Ibis Wildlife Consulting.



Map 3. Local watersheds within the surrounding landscape.

Nearby Lands of Significance

It is of critical importance for maintaining the ecological health and integrity of the landscape to not only manage an individual's property responsibly, but to ensure that responsible land management occurs across property boundaries in continuity with the surrounding landscape and ecosystem. Although individuals have little control over what neighboring lands will do in the future, it is important to create the dialogue between neighbors to share knowledge and raise community awareness of their surroundings, and the impacts their decisions may have on their individual lands as well as surrounding lands within the landscape. With this in mind, the entire landscape and watershed was assessed remotely prior to determining management recommendations for an individual property itself.

Lands within the surrounding landscape are primarily forested with residential homes scattered throughout, typically on larger landholdings. The town of Pittsfield owns one large 140 acre parcel along with a few smaller parcels within the area. Through phone conversations with the managing forester it was learned that all town owned lands have one encompassing management plan outlining generalized conditions and goals for the Pittsfield owned tracts. Many of the tracts were heavily harvested prior to the town's ownership. For this reason limited timber harvesting will occur on many of the properties. Much of the acreage owned by Pittsfield will be left to mature naturally, developing into late successional forests. Forest management efforts will be made where necessary to reclaim forest health in areas where past management activities have degraded the land and forest conditions. The 140 acre Rocky Ridge Town Forest was recently harvested as an effort to restore forest health by harvesting damaged, unhealthy trees resulting from prior ownership's management. This particular timber harvest focused on establishing new young growth and creating adequate spacing for residual trees to expand. In addition to restoring health, goals for this property include an approximately 50 acre section that will be left as an unmanaged reserve to encourage late successional growth. In March of 2016 it was voted and passed that this town forest will be managed and supervised by the Pittsfield Conservation Commission. Goals for this individual tract reflect the Town of Pittsfield's goals on their remaining parcels as well.

One of the largest parcels within the landscape is a 900 acre Boy Scout Camp to the north, owned by the Boy Scouts of America Boson Council. This property is primarily forested, entertains a wide variety of recreational uses, and also receives forest management under the direction of a licensed forester and a Forest Management Plan. Through conversations with the property's forester it was learned that the woodlot is managed via area regulation. This is a sustainable forest management approach where harvestable acreage and volume is calculated along with a desired age to allow the forest to mature to. With this information it is determined how many acres or how much volume of timber can be sustainably harvested at each entry to ensure that the property is consistently growing more timber than is ever being harvested. Common harvest methods on the Boy Scout's property include the removal of individual or small groups of trees. Final determination of harvest methods and timing is ultimately decided by a board of officers located in Boston, Massachusetts. This board oversees all decisions made on Boy

Scout properties taking into account the recommendations made by their forester on a case by case basis. The management impacts in general are complimentary to the surrounding forests and habitats by maintaining a diverse mix of forest age classes.

An additional notable parcel situated between the Bachelder lot and the Wallman lot is a 67 acre lot which connects the lots mentioned, and is owned by a landowner who is also engaged in land steward. This parcel is well managed, and through conversations with the individual landowner it is clear that the property will remain forested, and undeveloped during the period of his ownership.

Non-conserved lands include smaller, residential parcels, many as small as five acres with a few ranging from 20-50 acres. Some of these parcels were heavily impacted by the tornado of 2008. The storm damage erased most evidence of boundary markers and created a natural habitat that extends beyond individual parcels. Although damaging, the tornado created a valuable habitat for wildlife, and regenerated a young forest to replace the since removed mature forest. Prescribed forest management can be used to mimic these natural disturbances in a more controlled manner. Together the smaller surrounding parcels have the potential to sustain forest management practices, and in many cases would provide more significant landscape benefits if done in conjunction with each other, more accurately mimicking a natural disturbance. Landowner collaboration will also increase efficiency and logistics, landscape biodiversity, ecological health, and create more viable wildlife habitats individual properties are unable to sustain. This would be a desired and viable landscape goal and may provide greater incentives for landowners to manage their woodlots, deterring further sub-division and development as a means for income.



Map 4. Conservation Lands within the Landscape.

LANDOWNER OBJECTIVES

Recreation

- 1.) Maintain existing trails for a variety of passive recreational uses as well as management access.
- 2.) Create new trails where appropriate following commercial forestry operations.
- 3.) Create vistas or destination areas such as unique rock formations, ponds, wetlands, or other unique natural features.

Forest Management

- 1.) Maintain forest health. Monitor and identify forests insects and diseases.
- 2.) Sustainably harvest timber for personal use, and/or the sale of stumpage for supplemental income, and to maintain and promote healthy and productive forest conditions.
- 3.) Enhance aesthetics, create vistas, and establish new recreational trails.

Wildlife Habitats

- 1.) Maintain a target of 10% of the entire parcel in small to moderate sized openings of young forest growth to provide young forest habitat conditions for wildlife cover, feeding, and nesting opportunities.
- 2.) Maintain grasslands as permanent wildlife openings to provide a diversity of habitat types within the property and surrounding landscape.
- 3.) Maintain or enhance softwood cover for potential deer wintering areas.
- 4.) Encourage hard and soft mast production to improve wildlife food sources.
- 5.) Monitor and assess the spread of invasive plants throughout the property to determine what kinds, if any, control methods shall be applied.
- 6.) Maintain forested buffers around streams and wetlands to maintain water temperatures, water quality, and the integrity of the existing habitats.

Infrastructure

- 1.) Identify, maintain, and monitor boundary lines to prevent encroachment and unwanted trespassing.
- 2.) Maintain any existing roads for access, forestry, fire protection, and recreational uses.
- 3.) Maintain existing buildings and rental properties for public safety and well-being.

CURRENT CONDITION

Wildlife Action Plan Habitats

In addition to conducting an on-site assessment of the properties, a review of NH Fish & Game's Wildlife Action Plan was reviewed to assess potential wildlife habitats and wildlife species likely to occur within the landscape.

The majority of the landscape is dominated by hemlock-hardwood-pine matrix forest cover types. These forests typically consist of white pine, hemlock, red oak, red maple, and several other combinations of hardwood species. Other matrix forest cover types present within the landscape include Appalachian-oak-pine forests. These cover types include a greater diversity of oak species including white, black, and red oak, and in some cases include hickory. White pine, hemlock, and red maple are also common within this matrix forest type as well.

In addition to matrix forests mapped, finer scale habitats were also identified. Several marshes were mapped, including wetlands adjacent to Wild Goose Pond, vernal pools, and other shrub dominated wetlands with some peatlands and grasslands. This diversity of fine scale habitats within the landscape increases the biodiversity and wildlife capacity the landscape is capable of supporting. It is important to identify surrounding habitats in order to determine if any are lacking or over abundant in order to more accurately direct future management decisions.

Based on the Forest Resource Inventory, the Wildlife Action Plan assessment, and NH Fish & Game's Big Game Plan (New Hampshire Big Game Plan, 2005.) a list of wildlife species with the potential to occur within the landscape was developed.

Potential Wildlife Species within the Landscape								
Blue-spotted salamander	Bald eagle							
Jefferson salamander	Canada warbler							
Mink frog	Bobcat							
Northern leopard frog	Wild turkey							
Bay-breasted warbler	Northern goshawk							
Wood turtle	Cooper's hawk							
American woodcock	Ruffed grouse							
White-tailed deer	Moose							
Black bear	American marten							
Purple finch	Wood thrush							

Figure 1: Wildlife species likely to occur within the landscape.



Map 5. Wildlife Action Plan Predicted Habitat Cover Types.

Forest Resource Inventory

A comprehensive forest inventory was conducted in the spring of 2016 for Mr. Bachelder and Mr. Wallman. A Double Point, also known as Big BAF, sampling method was used. This method uses a 20 factor prism to measure basal area, trees per acre, crown densities, and other tree stocking measurements. A second 80 factor angle gauge is used to determine which trees are measured for timber sizes, heights, volumes, and forest products. Each prism and set of measurements is taken at each sampling point containing timber products.

The forest inventory consisted of 66 sample points on the Bachelder parcels, and 93 sample points on the Wallman parcels. Sample points were spaced 400 feet apart along north/south and east/west gridlines. At each 400 foot interval data was collected. Data includes information describing tree stocking amongst stems and crowns, timber volumes, and information pertaining to understory species, and regeneration. Other information collected includes mapping of streams, wetlands, forest cover types, stonewalls, and any other interior features of significance. The forest inventory provides critical data in determining forest growth, structure, density, composition, health, potential, and management recommendations.



Map 6. Forest Resource Inventory sample points.

Vegetative Condition

Based on the Forest Resource Inventory fifteen individual stands were delineated on the Wallman parcels including upland forest stands, wetlands, and open fields. These stands are divided into five primary categories; hardwood stands, softwood stands, early successional, grassland fields, and wetland habitats.

Hardwood Stands

Hardwood stands are the most dominant on the Wallman parcels composing 45% of the total property. These stands are mapped as "mixed-wood" stands because they do contain a presence of white pine and hemlock, although hardwood species such as red oak, red maple, and sugar maple are the most prevalent species currently on these sites, and soil characteristics favor the growth and successional of hardwood species. Hardwood dominated stands include stand 2, 3, 7, 10, and 14 totaling 143 acres. These stands are suitable and conducive for forest management opportunities, and also contain several hard mast producing trees that provide excellent wildlife benefits.

Stand	Acres	Туре	Age	QuadraticBasalMeanAreaStand/DiameterAcre		Relative Density	Trees / Acre	% Acceptable Growing Stock
	20	Del	05	10.0	125	77	1 4 4	(9
2	30	Red Oak	85	12.6	125	11	144	08
3	62	Pine- Oak- Maple	20/85	-	-	-	-	-
7	38	Pine- Oak- Maple	85	12.1	127	82	157	69
10	10	Pine- Oak- Maple	85	13.2	104	57	109	65
14	3	Pine- Oak- Maple	85	12.8	103	54	104	58

Softwood Stands

Softwood stands on the Wallman parcels are commonly a mix of white pine and hemlock. There are four individual softwood stands delineated totaling 132 acres, and composing 42% of the total property. All the stands are heavily stocked, with dense growing conditions. The quality of the timber is fair to good, and the stands have excellent potential for timber production as well as providing winter cover for wildlife.

Stand	Acres	Туре	Age	Quadratic Mean Stand Diameter	Basal Area / Acre	Relative Density	Trees / Acre	% Acceptable Growing Stock
1	78	White pine	85	14.1	112	60	104	56
6	8	White pine/Hemlock	85	14.4	157	84	138	85
8	45	White pine/Hemlock	85	14.8	153	83	186	79
12	1	White pine/Hemlock	30	-	-	-	-	-

Early Successional

Stands 5 and 13 are both areas impacted by the 2008 tornado. These stands total approximately 20 acres. Most of that acreage has been cleared during a salvage timber harvest resulting in stands with similar characteristics to a clear cut. The stands are in the early stages of regeneration and are mostly dominated by raspberry, blackberry, grass, and forbs. Tree species beginning to regenerate include red maple, paper birch, red oak, white pine, hemlock, and other less abundant species scattered throughout. This particular area provides a habitat component considered lacking within the landscape. If not for the tornado there would be little to no young forest growth within the surrounding landscape. The young regeneration increases biodiversity, improving wildlife habitat and overall forest health.

Stand	Acres	Туре	Age	Quadratic Mean Stand Diameter	Basal Area / Acre	Relative Density	Trees / Acre	% Acceptable Growing Stock
5	16	Seedling	8	-	-	-	-	-
13	4	Seedling	8	-	-	-	-	-

Grassland Fields

There is one individual field totaling 5 acres. Grasslands compose only 2% of the total property. This stand could be maintained via brush hog mowing, however it's been allowed to revert naturally back to a wet, grass-shrub habitat. This stand provides a unique and diverse habitat type within the landscape for the seasonal use of a variety of wildlife species.

Stand	Acres	Туре	Age	Quadratic Mean Stand Diameter	Basal Area / Acre	Relative Density	Trees / Acre	% Acceptable Growing Stock
9	5	Field	-	-	-	-	-	-

Wetland Habitats

There are three stands delineated as wetland habitats, and several interior wetlands without individual stand numbering. All wetlands on the Wallman parcels total 17 acres composing 5% of the property. The wetlands contain a variety of open water pond, vernal pools, some surrounding marsh, grass/shrub wetlands, and forested wetlands. These stands provide excellent habitat for amphibians, turtles, insects, birds, and several mammal wildlife species.

Stand	Acres	Туре	Age	Quadratic Mean Stand Diameter	Basal Area / Acre	Relative Density	Trees / Acre	% Acceptable Growing Stock
All	17	Wetland	-	-	-	-	-	-

A breakdown of the forest structure and habitat distribution within the property is described in the figures below. A more balanced distribution of structure and habitat types within a landscape results in greater biodiversity. Although this property may not support all the necessary habitat components a healthy forest is considered to be composed of, the surrounding landscape is likely to do so. It is important to assess the surrounding landscapes composition in order to create a healthy distribution of forest structure and habitat conditions within an entire landscape in situations where it is not feasible to sustain significant distribution within one land holding.

Cover Type	Acres	Percent of Total Property
Softwood	132	42%
Hardwood	143	45%
Early Successional	20	6%
Grassland	5	2%
Wetland	17	5%

Figure 2: Current habitat distribution.

COMPOSITION	CURRENT CONDITION	DESIRED CONDITION
SIZE CLASS DISTRIBUTION		
Seedling/Sapling	6%	10%
Pole Timber	0%	20%
Sawtimber	75%	51%
Grassland	2%	2%
Wetland	17%	17%

Figure 3: Habitat distribution goals.



Figure 4: Graylag habitat distribution shown by acreage.



Figure 5: Wallman/Bachelder combined landscape habitat distribution shown by acreage.



Map 7. Forest Resource Inventory Stand Map (North) Identified by Stand Number.



Map 8. Forest Resource Inventory Stand Map (South) Identified by Stand Number.

Rare Plants, Species, and Natural Communities

In addition to identifying forest characteristics, rare plants and exemplary natural communities were surveyed and mapped if found. The New Hampshire Natural Heritage Bureau's Data Check Tool was used to determine if any rare plants, animals, or natural communities were present within or around the individual properties and surrounding landscape. The results of the Data Check Tool found no known records of rare plants, species, or natural communities identified within the property or in the immediate landscape. The lack of records could be a result of the absence of surveying or monitoring within this specific area. There were also no rare plants, animals, or natural communities documented during the forest resource inventory.

Forest Protection

At the present time, there is no evidence indicating any major insect infestation. Forest pests recently detected in parts of New Hampshire, and thought to be of imminent arrival, include Emerald ash borer (infecting all species of ash), hemlock wooly adelgid, red pine scale, and in nearby states, Asian longhorn beetle, which impacts a variety of hardwoods including sugar maple. These forest threats all have rapid and severe impacts on their host species and all are potential candidates for occurring within this property and landscape within the next 10 years. Continuous monitoring and early detection will be the best defense for forest pests. The risk of infestation is high for this property due to the high component of hemlock and known hemlock wooly adelgid within the county. Other immediate threats include the Emerald ash borer and red pine scale. If these insects are found, the removal of the host trees via timber harvesting is the most effective and economical control method.

In respect to forest fires, there is no imminent danger. Fire danger throughout New Hampshire is typically low. Average size of a NH forest fire is typically small in size. The natural vegetation and damp characteristics of the forest typically limit fire dangers without the need for man-made fire breaks or barriers. Natural fire breaks such as streams, wetlands, woods roads, and town roads are likely sufficient protection.

During the forest resource inventory no invasive plant species were identified. Species likely or capable of occurring are honeysuckle, European barberry and Oriental bittersweet. These plants can spread rapidly via wildlife, wind, root sprouts, or equipment. Continual monitoring should occur and where identified, entire plants should be removed including root systems, or plants should be chemically treated by a licensed applicator. Invasive plant species can out-compete native tree or shrub species degrading biodiversity, forest health, and wildlife habitats.

Recreational Resources & Aesthetic Values

The properties and landscape offers many recreational opportunities including bird and wildlife viewing, hunting, snowshoeing, hiking, and cross-country skiing. There is a network of existing trails that provide access throughout the parcels for timber removal and recreational uses. There are several opportunities for additional trails by utilizing and improving old or new skid trails. The majority of recreational trails will likely be the result of future forest management that will add to the existing network of trails. All trails are recommended to be designed for low impact uses, minimizing soil compaction and erosion, disturbance of vegetation, and disruption to wildlife. All trails should be stabilized, smoothed, and follow Best Management Practices for stream crossings.

The aesthetic values of the landscape are primarily in the great privacy that comes with a larger acreage parcel with limited neighbors. There area has expansive views from Tilton Hill Road, and provides remote access and opportunities for recreations on several small ponds, including Wild Goose Pond. In addition, maintaining the forest, fields, and trails with periodic mowing, forest management, and brush maintenance will enhance the appearance and enjoyment of the landscape.

Property Soils

Soils play an important role in the health of forests, wildlife habitats, and biodiversity. Soils provide nutrients, water, and stability to trees and plants and soil characteristics have a significant influence on where plant species grow. NRCS generates and updates soils maps for each state. The USDA NRCS Web Soils Survey was utilized to determine the soil types and characteristics for this property (USDA NRCS, 2013). The Wallman parcels are composed of five primary soil types. Scituate, Chatfield-Hollis-Montauk complex, Walpole, Ridgebury, and several mucky peats are all present soil types.

Chatfield-Hollis-Montauk complex is the most dominant soil type within the property composing 49% of the total area. This soil type is found in portions of stand 1-3, 5-8, 10, 13, and 15. This soil is very stony with slopes ranging from 8-15%. The soil is farmland of local importance, is considered well drained, and derived from glacial till. This soil type is part of Important Forest Soil Group IB. Soils within this group are less fertile and productive than IA soils, however are still conducive for timber growth and production. These soils are commonly sandy or loamy over sandy textures. Successional trends are towards shade tolerant hardwoods, primarily American beech. Managed stands typically include a variety of species including red maple, paper birch, sugar maple, and aspen in combinations with hemlock.

Scituate fine sandy loam is the next most dominate soil type within the property. This soil composes 21% of the total property and is found is portions of stand 2, 3, 7, 8, and 14. This soil type has slopes ranging from 3-15% and is farmland of local importance. The soil is very stony, considered moderately well drained, derived from basal melt-out till, and is part of Important Forest Soil Group IA. Soils within this group are deep, loamy textured, and the most fertile and favorable for tree growth. Successional trends are typically towards hardwoods such as American beech and sugar maple. Forest stands commonly compose a variety of hardwood species including sugar maple, red maple, white ash, and red oak in combinations with white pine and hemlock.

Montauk fine sandy loam is also present in stands 5 and 7, composing 8% of the total property. This soil is very stony with slopes ranging from 8-15%, it is well drained, and considered farmland of local importance. Montauk is part of Important Forest Soil Group IA. Characteristics and successional trends are similar to those described previously under Scituate soils.

The next two soils present are Ridgebury and Walpole fine sandy loams. These soils compose a combined 8% of the property, and are found in stands 1-3, and 7. Slopes range from 3-8%, the soil is not prime farmland, and is poorly drained. These soils are part of Important Forest Soil Group IIB. Successional trends are typically towards shade tolerant softwoods, such as hemlock. These soils have a seasonally high water table, and due to poor drainage, forest management and timber production is limited.

The final soil types present are all associated with wetlands or stream drainages. All remaining soils are poorly drained, hydric, mucky peats not suitable for forest management. These soils compose a combined 14% of the property, and include Catden mucky peat, Scarboro mucky fine sandy loam, and Timakwa mucky peat.

Soil	Stand #	MuSym*	IFSG*	Drainage Class	Forest	Percent of Property
Chatfield- Hollis- Montauk complex	1-3, 5-8, 10, 13, 15	250B 250C 250D 250E	IB	Well drained	Hardwood	49%
Scituate	2, 3, 7, 8, 14	449B 449C	IA	Moderately well drained	Hardwood	21%
Montauk	5, 7	45C	IA	Well drained	Hardwood	8%
Walpole	7	547B	IIB	Poorly drained	Softwood	3%
Ridgebury	1-3	657B	IIB	Poorly drained	Softwood	5%
Catden	9	296A	NC	Very poorly Drained	N/A	2%
Scarboro	1, 2	325A	NC	Very poorly Drained	N/A	7%
Timakwa	3, 4	393A	NC	Very poorly drained	N/A	5%

*MuSym – map unit symbol (each soil type is represented by a unique symbol) *IFSG – important forest soil group (a description of forest productivity)

Figure 6: Soil characteristics by stand.



Map 9. Property Soils Map With Stand Lines.

CURRENT MANAGEMENT RECOMMENDATIONS

Recreation

Recommendations for recreational uses are based on direct input from the landowner, in combination with field observations made that may influence the type of recreation suitable, or the location of specific activities.

1.) There are several existing trails within the property, all varying in condition. It is recommended to brush back the trails to maintain their visibility, and to allow for multiple low impact uses such as hiking, snow-shoeing, and cross country skiing. It is also recommended to monitor and assess trail conditions for erosion. Where necessary, water-bars and appropriate water diversion devices should be installed to reduce soil erosion and sediment runoff. It may also be beneficial to sign, or mark the trails in a unique manner to increase visibility and ease of travel.

2.) It is recommended and suitable to create new recreational trails resulting from any timber harvesting that occurs. It is recommended to only establish recreational trails in areas that create a loop network, or access destinations of interest. Not all logging trails should be converted to recreation trails. All new trails are recommended to follow Best Management Practices guidelines for protecting soil and water quality.

3.) Scenic vistas can be created from designated areas via commercial timber harvesting, or by hand cutting or pruning vegetation. Each scenario and destination may require different tactics based on size of timber, terrain, and existing views. Once scenic vistas area created, it is recommended to maintain the views with non-commercial vegetation management in order to reduce the need for heavy equipment in sensitive areas, and to maintain the views prior to being blocked by mature tree growth.

Forest Management

1.) It is recommended to monitor the woodlands every couple years to assess tree health. Declining trees will show signs of defoliation, insect holes, woodpecker activity, or other unusual signs of discoloration or sap running from branches on the softwoods. If declining tree health or actual forests pests are observed, it is recommended to consult with your forester to take appropriate action, or to contact a forest health specialist. Forests pest of emphasis to monitor include hemlock wooly adelgid, emerald ash borer, and red pine scale.

2.) It is recommended to implement periodic commercial forest management to accomplish the majority of forestry and wildlife objectives. Based on the current landscape condition, and the amount and intensity of heavy timber harvesting occurring on surrounding lands, it is recommended to use uneven-aged forest management techniques on all forested stands within this property. Uneven-aged management will complement the surrounding lands by maintaining a diverse and unique range of habitat and forest types within the landscape. Uneven-aged silviculture is a management regime

which promotes a mosaic of multiple age and sizes of trees within a single large stand. A typical uneven-aged stand contains a mature sawtimber canopy, a younger mid-story of intermediate pole-sized timber, and thirdly areas of established regeneration to one day replace the mature stems as the next generation of that forest. Uneven-aged management is well suited for the growth and establishment of moderately shade tolerant species such as red oak, white pine, hemlock, and mixed-wood stands. The current species composition and soil characteristics provide excellent potential for productive and sustainable uneven-aged management applications. Long term cutting guidelines for the stands shall use a combination of thinning, single tree selection, and group selection for long term stand replacement. Group selection, or group cuts, is a regeneration method which removes all the stems in a delineated area, typically between $\frac{1}{2}$ an acre up to 2 acres in size. The group openings will introduce full sunlight to the forest floor, stimulating the growth of new trees by native seed sources, stump sprouts, or root suckering. Thinning and single tree selection are intermediate cutting methods periodically applied to enhance the health and growth of a forest stand that is not yet mature, and not yet appropriate for a regeneration harvest. The combination of thinning, single tree selection, and group cuts, are all uneven-aged techniques designed to maintain healthy and sustainable forest growth, in addition to establishing the desired regeneration and diversity of age classes within the stand for future timber development.

3.) It is of high priority to maintain and enhance aesthetics on the property and throughout the woodlands. It is recommended to use a combination of commercial harvesting and non-commercial maintenance to remove timber along roadways, stonewalls, and field edges for visual enhancement, create vistas from high elevation locations and from specific locations along recreational trails, and to maintain a healthy growing forest to eliminate excessive storm damage and windthrow. A primary focus on aesthetics shall be incorporated into all commercial forest management.

Wildlife Habitats

1.) Woodland Habitats; Wildlife habitats in these stands are primarily a byproduct of past, present, and future forest management activities. Forest management in these stands has and will continue to maintain a diverse mix of wildlife habitats, including young forest, intermediate and pole-sized forest stands, and mature timber growth. In addition it will maintain softwood cover, travel corridors, feeding, nesting, and breeding opportunities. Management should specifically look to enhance hard and soft mast production where available. By following the forest management objectives and recommendations of maintaining 10% of the property in young forest, it will maintain and enhance habitat diversity for myriad of wildlife species.

2.) *Grassland Habitats*; it is recommended to maintain the field areas in a grass/shrub condition. Maintaining a shrub, grass, or clover dominated area will greatly enhance the diversity of habitats within the property. Several wildlife species will use an opening for feeding opportunities, and for many bird species singing or breeding. Mowing and maintaining the fields every 1-3 years is recommended to maintain the desired habitat type.

All mowing should occur after July 15th to avoid conflicts with ground nesting birds and other young wildlife utilizing the habitat.

3.) *Wetland Habitats*; All wetlands and other potentially sensitive areas shall be protected and buffered to maintain their current conditions including water quality, soil characteristics, vegetative cover, and unique habitat features. The wetland and water features within the property provide a valuable and essential component for several wildlife species throughout the entire landscape. Timber harvesting laws shall be adhered, Best Management Practices for Forestry followed, and Good Forestry in the Granite State can be used as a guide for appropriate vegetative buffers along streams, wetlands, and ponds.

4.) *Invasive Plants*; Continue to monitor and identify the presence of any invasive plant species. The most appropriate and effective control method for the broadest range of species is a foliar chemical application during the summer growing season. A foliar application treats the leaves of the targeted plants causing that plant to intake the chemical into its root system resulting in a high rate of successful mortality. All chemical applications are recommended to be performed by a licensed professional. If herbicides are not desired, than mechanical methods such as hand pulling, cutting, or machine stumping is recommended to address the concern of these plants spreading throughout the property and landscape.

Infrastructure

1.) Boundary Lines; Maintain and monitor the boundary lines to prevent encroachment, trespassing, and dumping. The property contains approximately 5.4 miles of boundary lines, although 0.4 miles are road frontage along Clough Road that likely won't require maintenance. Consider having the lots surveyed, blazed, and painted. It is typically recommended to maintain the paint and brushing of the lines every 10 years to clearly identify and acknowledge where the property begins and ends. In addition, it is recommended to walk the perimeter of the property on an annual basis to monitor any disturbances that may be occurring that do not comply with the accepted uses of the property.

2.) Access Roads; Maintain the existing woods roads and culverts that provides the primary access for the properties and facilities. It is also recommended to consider maintaining or improving any skid trails or access roads that will be created from future timber harvests in areas that provide access to portions of the property that don't currently have a trail system, or trails that connect to existing trails and create a loop system to allow for access, management, and recreational enjoyment. Any additional trails created via forest management that are not necessary for access or recreation, shall be left unmaintained and allowed to revert back to forest naturally. By minimizing the amount of trials within the property it will greatly reduce impacts and disturbances to wildlife and the natural resources within the woodlot.

3.) It is recommended to maintain the areas around all buildings and rental cabins for public safety and the well-being of visitors. Remove hazard trees around buildings, parking areas, and access roads. It is recommended to consult with a licensed forester in combination with personal judgment to determine if a tree is unhealthy, and a potential safety hazard. High risk trees include anything within one tree lengths (~75') of any building or parking area. In addition, trees along power lines and driveways pose a potential hazard during wind, snow, and ice storms. Specific tree species such as paper (white) birch and aspen (poplar) are short lived species that when growing around high use areas present a potential hazard. These tree species are recommended to be removed prior to showing visible signs of declining health. Other species shall be monitored for dead or dying limbs, crown die back, signs of mushroom growth anywhere on the tree, holes or cavities in the tree, damage to the roots or base of the tree including soil compaction, exposed roots, and equipment or snow plow damage. When a hazard tree is identified it is recommended to hire a professional to immediately remove the tree.



Map 10. Treatment Map with Stand Lines and Interior Features.

SUMMARY OF ACTIONS:

TIMEFRAME	PRACTICE	PRACTICE	STAND	SIZE	PRIORITY
		CODE			
2017	Commercial timber harvest	N/A	1	78 acres	High
2016-2026	Maintain existing recreational trails	N/A	All	1.5 miles	High
2017	Create new recreational trails	N/A	1, 7	1.0 miles	Med.
2017-2020	Harvest firewood	N/A	2,4,7,10	10 cord/year	Med.
Every 1-3 years	Mow fields	645	9	5 acres	Med.
2017/2018	Maintain boundary lines	N/A	All	5.4 miles	Med.

SUMMARY OF TIMBER VOLUMES AND ESTIMATED VALUES

SPECIES	PRODUCT	UNIT	VOLUME	*AVG.	ESTIMATED
				PRICE	VALUE
White Pine	Sawlog	MBF	1,022.745	\$150	\$153,411.75
Red Pine	Sawlog	MBF	7.436	\$50	\$371.80
Hemlock	Sawlog	MBF	416.505	\$50	\$20,825.25
Red Oak	Sawlog	MBF	255.789	\$300	\$76,736.70
Red Maple	Sawlog	MBF	31.700	\$100	\$3,170.00
Yellow Birch	Sawlog	MBF	4.337	\$200	\$867.40
Black Birch	Sawlog	MBF	11.496	\$200	\$2,299.20
Sawlog Totals		MBF	1,750.008		\$257,682.10
Hardwood	Pulp	TON	762	\$5	\$3,810.00
Softwood	Pulp	TON	1,176	\$1	\$1,176.00
Pulpwood Totals		TON	1,938		\$4,986.00
Woodlot Totals					\$262,668.10

* Price based on common rates at the time this report was written.

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