



CRAFTSBURY TOWN FOREST

Forest Management Plan for the Craftsbury Town Forest on Hatch Brook
Road: August, 2021

Forest Management Plan
prepared for the Craftsbury
Municipal Forest Committee

Jared Nunery

Orleans County Forester
VT Licensed Forester
148.0122274

Forest Management Plan Approval

This Forest Management Plan was prepared by Jared Nunery, Orleans County Forester at the Request of the Craftsbury Municipal Forest Committee.



Jared Nunery

Printed Name

A handwritten signature in black ink, appearing to read "Jared Nunery", written over a horizontal line.

Signature

August 11, 2021

Date

We certify that we have read and approve of the 2021 Craftsbury Town Forest Management Plan and agree to implement this plan to the best of our abilities. This Forest Management Plan includes the application of silvicultural practices and the best available applied ecological research, as well as the full implementation of the "Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont" in order to control stream siltation and soil erosion.

James Moffatt (Chair)

Printed Name

Signature

Date

Rob Libby (Vice Chair)

Printed Name

Signature

Date

Barbara Alexander (Secretary)

Printed Name

Signature

Date

Ann Ingerson

Printed Name

Signature

Date

Stuart LaPoint

Printed Name

Signature

Date

Jim Jones

Printed Name

Signature

Date

Logan Jones

Printed Name

Signature

Date

Chris Sanville

Printed Name

Signature

Date

Ben Alexander

Printed Name

Signature

Date

Robert Linck

Printed Name

Signature

Date

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Purpose of Forest Management Plan

The purpose of the following Forest Management Plan is to provide information and guidance to be used by the Craftsbury Municipal Forest Committee (CMFC) for the management of the 187.5-acre forest owned by the Town of Craftsbury. This woodlot is comprised of three separate lots (Blueberry Lot (37.5 ac), Baker Lot (60 ac) and Webster Lot (90 ac)) totaling 187.5 acres. This plan provides management guidance for a ten-year period beginning in 2021. The plan should be updated in 2031, including the completion of a new forest inventory. This report incorporates information from the Craftsbury Town Forest History completed by Ann Ingerson, as well as a recent forest inventory completed in 2021. The information in this plan combines ecological, economic and social information to help the CMFC make informed decisions based on long-term management objectives for this land.

This report combines a comprehensive summary of information from the bottom (bedrock and soils) to the top (trees) and everything in between within the forest. This plan is written to be used as both a guidance document for the CMFC as well as a potential tool for community members interested in better understanding the tremendous asset owned by the people of Craftsbury that are the Municipal Forest lands. Much of the more general information included in this plan is applicable to the forests of the Town of Craftsbury, so will also be applicable to the many private forestland owners in the Town.

Location

The Craftsbury Town Forest is located near the western corner of the Town of Craftsbury, bisected by Hatch Brook Road. From the intersection of Route 14 and Wild Branch Road, travel south along Wild Branch Road for 0.7 miles. Turn right (west) on to Hatch Brook Road and continue west toward the Craftsbury/Hyde Park Town line. Cross over the Wild Branch River, a tributary of the Lamoille River, and continue west for approximately 1.5 miles. The forest is accessed via a small pull off opposite Paquette Road.

The Craftsbury Town Forest is three contiguous lots of four different parcels owned by the Town of Craftsbury (the 4th parcel is located on Colburn Hill Road, see the CFMC website for the Forest Management Plan and map for this parcel). Each of the parcels owned by the Town of Craftsbury offer different services and values to the town.

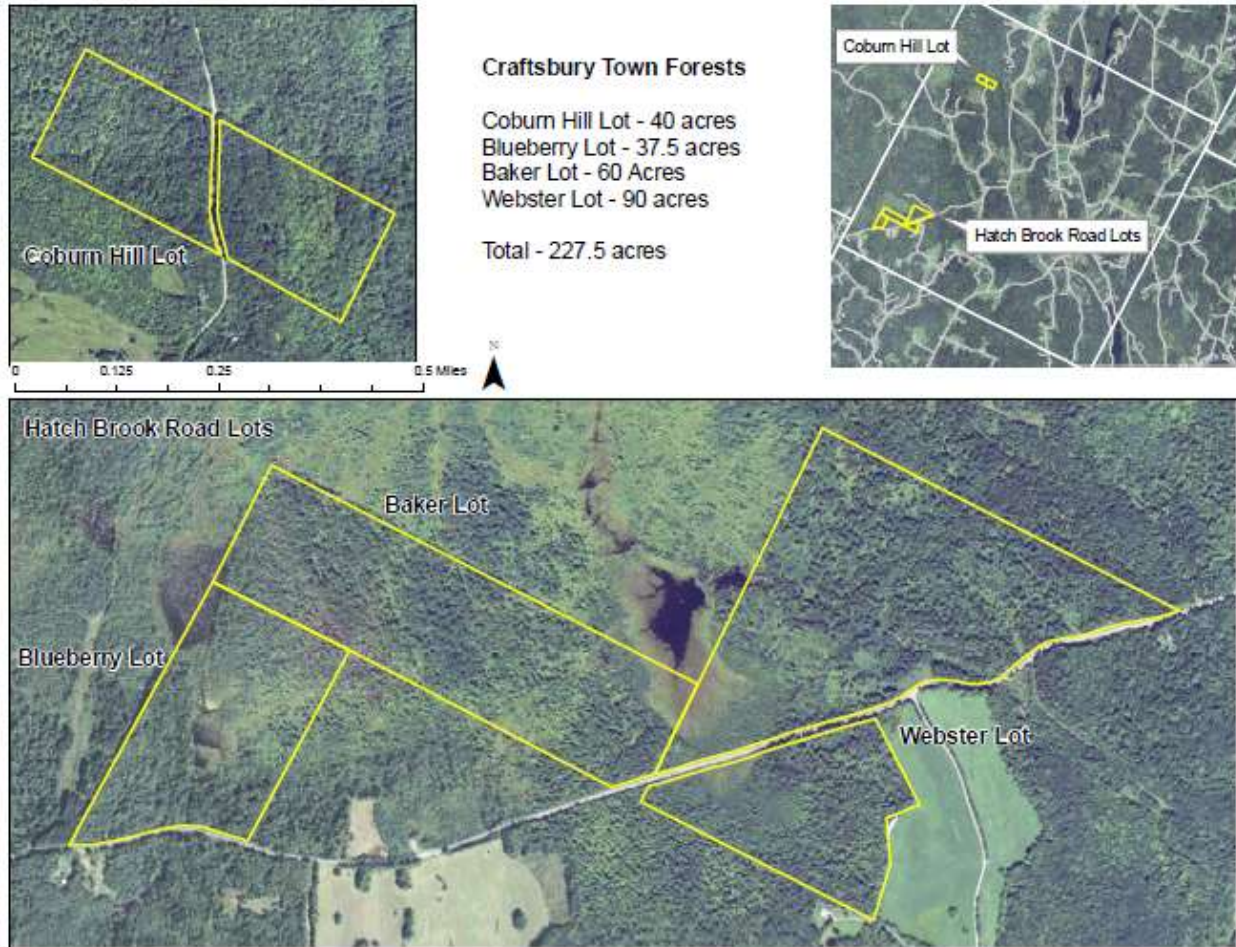


Figure 1: The Hatch Brook Road Town Forest is comprised of three of four different municipal forest parcels in Craftsbury.

Management goals and objectives

Below are the goals identified by the Craftsbury Municipal Forest Committee for the Hatch Brook Road Town Forest at a committee meeting on July 29, 2021.

- Manage the land with an emphasis on wildlife habitat, habitat connectivity, and maintenance of existing important wetland and beaver flowages.
- Provide recreational opportunities (primarily dispersed such as hunting, and wildlife viewing) for use by town residents.
- Provide educational opportunities to help town residents better understand local ecology, important wildlife habitats, and more broadly, better understand our local forest systems.
- Provide periodic income to the Town through the sustainable harvest of forest products.

The report below provides both a comprehensive background of the Craftsbury Town Forest, as well as a complete overview of the current conditions and a pathway forward for the next 10 years to help achieve the goals above. This report is intended to be a useful tool to all residents

of the Town of Craftsbury, as much of the information included in this report is also relevant to adjacent private landowners within the Town.

Historical Background

The CMFC prepared a document titled the “Craftsbury Town Forest History”¹. Excerpts from this document are included below as they relate to the Craftsbury Town Forest. In order to fully appreciate the importance of municipal forests, one must first understand the historical significance of municipally-owned land in Vermont. Vermont passed enabling legislation in 1915 allowing towns to purchase and manage forestland for school endowments and amended legislation in 1917 to allow towns to manage their forests for any public purpose. In 1945, another amendment provided for the state to share up to one-half the cost for towns to purchase forestland inspected and approved by the state forester². Apparently, Craftsbury residents inquired about this possibility, as in 1947 Henry Young received a letter from Perry Merrill, then Vermont State Forester, in response to a query from Donald Drown. Merrill explained that the state would reimburse the town up to half of the \$1,200 purchase cost for new town forest land. Of course, by this time the town already owned the Coburn Hill and Clapper-Baker properties, as well as 160 acres of Craftsbury Academy land on Coburn Hill.

During the 1950’s Vermont appointed two municipal foresters to work with town forests in the northern and southern parts of the state. In 1952 and 1953, Craftsbury received trees from the Soil Conservation Service (SCS), and a letter is on file from Donald Johnson, noting that SCS allotted the town 1,500 additional white pine at that time, apparently received and planted in 1954. In 1954 several classes at Craftsbury Academy, under the direction of the Craftsbury Selectmen, planted approximately 15 acres of land to white pine on the Coburn Hill Academy woodlot. Those involved included Jim Moffatt, Fred Young, Andy Urie, Wayne Stoddard, Wayne Dunbar, Frank Young, and David Lawrence, among others.

In 1971, Craftsbury Town Clerk Earle Wilson received a letter from Robert Hoffman, then Northern Vermont Municipal Forester, responding to an inquiry about having Craftsbury’s town-owned forest lands designated an official municipal forest. The Select Board of the time (Joe Houston, Henry Young, and Edmund Williams) officially applied for municipal forest status in January 1972, but despite the promise that “a better description will follow” the application apparently remained incomplete for two years waiting for a more detailed description of the town lands. In 1974, the state’s new Municipal Forester, J. Mike Green apparently took a personal interest in Craftsbury’s town forest and requested a meeting with the Municipal Forest Committee (Jim Moffatt, Donald Johnson and Joe Houston). Green also mentioned the Academy woodlots, then 210 acres including an original town lot of 160 acres owned since

¹ Craftsbury Town Forest History (2014), Prepared by the Craftsbury Municipal Forest Committee.

² McCullough, Robert, (1995) *The Landscape of Community: A History of Communal Forests in New England*, University Press of New England

1868, as possibly the oldest town-owned forestland in the state. Green saw to it that the application was completed with a map and a management plan.

The Craftsbury Town Forest is comprised of 3 separate lots, each with a unique history that has evolved over the years. Below is a description of each of these separate lots, which in whole, comprise the Craftsbury Town Forest.

Clapper-Baker and Blueberry Lot, Hatch Brook Road

This property is a portion of Lot 2 Range 10 and Lot 2 Range 11 of the original Craftsbury lot system. There has been a great deal of confusion and misunderstanding about this land over the years. A brief history of key transactions follows:

William Baker conveyed 60 acres (exempting lease land) to the town of Craftsbury by tax collectors deed on March 31, 1942. A tax collector's deed was used when a landowner owed several years of back taxes to the town and, finding payment impossible, forfeited the land to the town in lieu of tax payment. The ensuing confusion arises from that phrase "exempting lease land" in that tax collector's deed. William Baker's home and small farm were located on what is popularly known as the Blueberry Lot (see Figures 1 above).

On October 6, 1942 sixty acres of land (same land as above) were transferred from the town of Craftsbury to Clyde Baker by Quit Claim deed for a purchase price of \$450.00. A Quit Claim deed is used when previous ownership records might be somewhat cloudy, and simply indicates that the previous owner renounces any claims to the property upon sale to a new owner (while acknowledging that historic claims may still exist from other unknown parties).

On May 20, 1955 sixty acres of land (same land as above) were transferred from Clyde Baker back to the town of Craftsbury by tax collectors deed. Joe Houston, former Selectman and Municipal Forest Committee member, described an attempt by the Select Board to clarify boundaries when the town assumed ownership for the second time, but the attempt was not successful.

For many years, Craftsbury assumed that they owned the Blueberry lot and additional land to the north to make up 60 acres. In late 1994, a sale of adjoining property convinced the Municipal Forest Committee and the town Select Board to take a closer look at the boundaries and many errors were discovered. For more details on these issues, see the Craftsbury Town Forest History. Following an extensive deed research, the Town resolved identified issues through a land swap with then adjoining landowner in 1994, resulting the formation of one, contiguous piece of land comprised of three separate lots.

Webster Lot, Hatch Brook Road

The Webster Lot consists of about 90 acres in Range 10 Lot 3 of the original Craftsbury lot system. It was conveyed to the town of Craftsbury by warranty deed by Clinton E. Webster on

April 11, 1958. Even though there were back taxes involved, the Selectmen were able to negotiate a warranty deed rather than a tax collector's deed. The open fields and some other acreage were sold off prior to the transfer to the town. The remaining forest land had been very heavily cut so it was not very valuable property at that time. The house and barn had also recently burned.

This land is mostly on the northeast side of Hatch Brook Road near the intersection with Paquette Road. Approximately 27 acres are on the southwest side of Hatch Brook Road. It is mostly coniferous forest with considerable wetlands. There is very good access for public day use.

Since their purchase these lands have provided considerable timber for the town, and Craftsbury Academy students have planted trees on the land. In the late 1970's the town garage and fire department (the former H.P. Hood Creamery buildings) were destroyed by fire. As a town Selectman at the time, Jim Moffatt supervised the cutting of approximately 25 Mbf from the Webster town forest in 1980 to use in reconstruction of those buildings. Everett Demerit sawed the lumber at his nearby sawmill.

Historic Land Use

Much of the Hatch Brook Town Forest shows signs of use as agricultural land at one time. Most of the land was likely used as pasture and agricultural production, which the most recent abandonment likely occurring in the area identified as Stand 3. One cellar hole near Hatch Brook Road on the southern border of Stand 3 can be found on the property. Stone walls on the western border of Stand 3, and barbed wire found along the property boundaries offer clues to the historic agricultural land use of this area. These legacies of historic land use provide excellent opportunities for teaching and can be integrated into a variety of classes from social studies and history, to ecology and other life sciences.

Historical Timber Management

In 1998-99, the Municipal Forest Committee proposed, and the Select Board approved, a plan to work with then Lamoille County Forester Ray Toolan to develop a forest management plan and timber sale on Craftsbury town land. After meeting with the Municipal Forest Committee, Toolan proposed and the Select Board approved a plan to implement a Shelterwood Harvest through the formation of thin harvest strips in the canopy to encourage regeneration while reducing the likelihood of windthrow in the uncut strips, given thin and waterlogged soils. He also recommended surveying and marking boundaries.

Unfortunately, Hurricane Floyd arrived in the fall of 1999 and flattened much of the timber. In 2000-2001, a salvage cut was prescribed for both the Clapper-Baker and Webster lots. From February through November, 2000, Poginy Trucking cut the following volumes on the Webster lot.

Product	Volume	Units	Stumpage per unit	Stumpage paid to town
Balsam fir sawlogs	189.4	Mbf	\$151	\$28,593.36
White pine sawlogs	22.9	Mbf	\$60	\$1,375.26
Balsam fir pulp	155.4	Cords	\$10	\$1,553.80
Balsam fir pulp (rotten)	71.8	Cords	\$6	\$430.56
Hemlock/tamarack pulp	20.6	Cords	\$6	\$123.54
Hardwood pulp	79.8	Cords	\$5	\$2,506.75
Whole-tree chips	237.7	Tons	\$1	\$237.74

From January through July, 2001 Gil Goodridge and Donley Goodridge conducted a salvage operation on the Blueberry and Clapper-Baker lots (including the new 60-acre piece traded with Calvin Maskell in 1994). This operation earned the town \$14,780.97 in stumpage payments.

Product	Volume	Units	Stumpage per unit	Stumpage paid to town
Hardwood sawlogs	23.3	Mbf	\$20 to	\$3,378.47
Softwood sawlogs	133.1	Mbf	\$80	\$10,648.80
Softwood pulp	34.8	Cords	\$15	\$522.45
Hardwood pulp/firewood	46.3	Cords	\$5	\$231.25

In August, 2002, Jim Moffat salvaged some wind-thrown white pine that came down after the previous salvage operation. Stumpage was paid to the town at 35% of the mill price minus trucking cost. Mill prices were between \$110 and \$280/Mbf, varying with log quality, trucking cost was \$38/Mbf, and stumpage paid was \$311.54.

Product	Volume	Units	Stumpage per unit	Stumpage paid to town
White pine sawlogs	5.3	Mbf	\$25-\$85	\$311.54

³ Quality of the hardwood sawlogs varied from red maple pallet wood to white birch veneer, which brought the highest price.

Boundary Line Status

The condition of boundary lines vary across the parcel. On more well drained soils, boundary lines have been maintained by the CMFC and consist of a combination of flagging and yellow blazes. Many of the corner pins closest to Hatch Brook Road can be located, however, some pins located in areas now flooded due to beaver activity were not relocated. This is particularly true along the western boarder of the Blueberry Lot, where a substantial beaver flowage has consumed much of the western boundary line. Boundary markings consist of a combination of yellow painted blazes (Baker Lot), orange painted blazes (Webster Lot), barbed wire, and orange and blue flagging have been used periodically to help identify property lines. The CMFC should continue their periodic maintenance of the property line, with the next monitoring and re-painting of boundaries to occur within the next 5 years. In particular, the northern boundary of the Webster Lot is still easily followed, and could benefit from fresh paint to maintain a clear boundary line.



Figure 2: Example of yellow blaze along property boundary of the Baker Lot.

Ecological Background

The forest inventory of the Craftsbury Town Forest was completed during winter months, so information on herbaceous plant species was not collected. Much of the Craftsbury Town Forest is comprised of hydric soils and wetland conditions, with in-tact forestland surrounding these vital wildlife habitats. For this reason, a significant amount of wildlife tracks were identified during the forest inventory, documenting the critical importance of this area for local wildlife populations.

Geologic Information (bedrock and soils)

The Craftsbury Town Forest is completely underlain by the Moretown Formation, a bedrock with relatively lower available calcium than the nearby Waits River Formation that underlies much of the land east of the Black River in Craftsbury. This old bedrock was formed in the Ordovician to Cambrian period, over 400 million years ago. The resulting lower available calcium within this bedrock in part explains the lack of white cedar found within this forest.

Soils within the Craftsbury Town Forest are largely dominated by hydric soils. Soils underlain Stand 1 and 3 are comprised of better drained Peru and Tundbridge-Lyman soil types (a relatively well-drained soil), whereas the remainder of the forest is comprised mostly of Cabot soil types as well as the wetland areas being Wonsqueak and Pondicherry Mucks (much wetter

soil types which require frozen winter conditions for any management activities). See the stand descriptions below for additional information on soils.

Watershed



Figure 3 Stream flowing through Stand 2 in the Webster Lot. This stream drains one of the large wetland complexes found on the border of the Town Forest.

This parcel lies entirely within the Lamoille River Watershed. The majority of water from this parcel flows into a centrally located wetland complex near the northern corner of the Baker and Webster Lots, and then into an unnamed brook that bisects the eastern portion of Stand 2, eventually joining another stream just east of the property boundary before turning south and crossing Hatch Brook Road and flowing

south east to the Wild Branch River, entering the Wild Branch River just north of the where the river crosses Wild Branch Road near the intersection of Denton Hill Road.

Water from the western portion of the Town Forest (primarily the Blueberry Lot) follows a slightly different path, heading directly south from a large wetland complex near the far western boundary of the Town Forest, crossing Hatch Brook Road and joining another stream on the Demeritt Farm before continuing south into Wolcott and eventually entering the Wild Branch River near the intersection of Brook Road and North Wolcott Road.

The Wild Branch River flows into the Lamoille River, and onward to Lake Champlain. This is an interesting difference from the majority of land in the Town of Craftsbury that lies within the Black River Watershed, ultimately feeding water north to Lake Memphremagog.

Wetlands

The Craftsbury Town Forest includes three separate mapped Class II Wetlands. These areas have expanded over the years, in part due to the influence of beaver populations, particularly on the western portion of the Town Forest, where an expansive beaver pond complex has significantly altered the forest. These three separate wetland complexes bisect the parcel, making management from one central location unrealistic.



Figure 4: Large wetland complex located in the center of the Town Forest.

Any forest management activities planned in the future will need to maintain appropriate buffers along wetland complexes, and consider maintenance of travel corridors for wildlife between the two larger wetland complexes along the stream corridors.

Wildlife

The varied forest conditions found within the three identified stands on this parcel offer a unique suite of niches for a variety of wildlife. During the field inventory, signs of moose, porcupine, snowshoe hare, bobcat, coyote, mink, and ruffed grouse were observed. Although many signs of wildlife can be observed on this land, it is important to recognize that many species are using this land as part of a larger territory. This was most obvious in the western

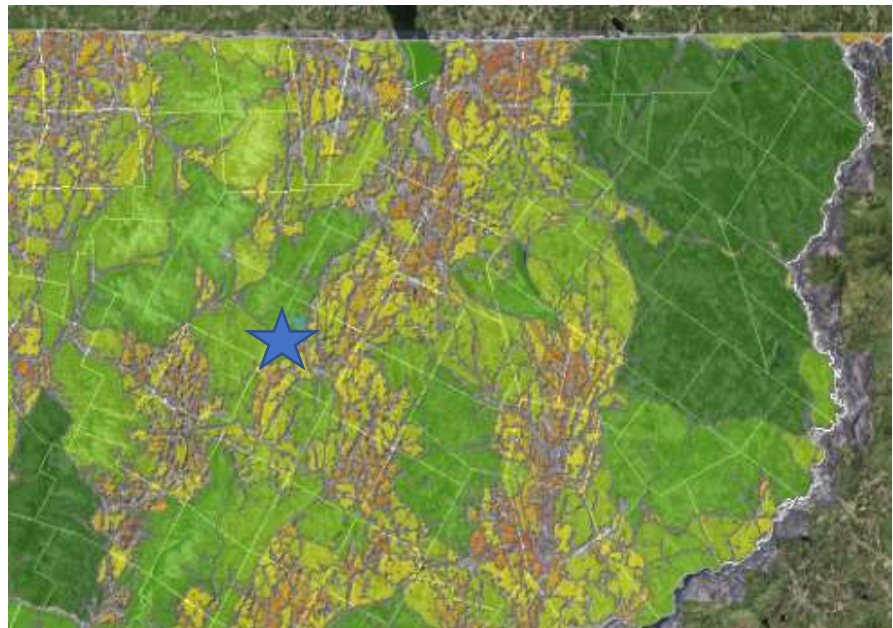


Figure 5: Map of identified habitat blocks in northeastern Vermont. The darker green represents large habitat blocks with less fragmented areas. The blue star shows the location of the Craftsbury Town Forest.

portions of Stand 3 where regularly used territorial markings of numerous coyote were observed, as well as a small stand of mature hemlock at the northern most point of Stand 2, where numerous moose beds were observed, and a recent antler shed was found and brought to the Craftsbury Elementary School to share with students.

The landscape positioning of this parcel is also critical to consider when discussing wildlife habitat. Two of the largest blocks of interior forest habitat in the state of Vermont, exist on either side of this parcel. To the west is the spine of the Green Mountains, running the length of the state of Vermont. To the northeast is the Nulhegan Basin, a large block of forestland historically managed for industrial forestry and now conserved as working forestland through a variety of private and public entities. Connecting these two blocks is a smaller block of largely unfragmented forest spanning from the Green Mountains to the northeast through the Worcester Mountain Range, linking to another larger forest block starting in Hyde Park near Green River Reservoir and running northward through the Lowell Range. This parcel represents a portion of the eastern edge of this critical linkage that offers a connective bridge to the northeast highlands of the Nulhegan Basin and on to forests of Quebec and New Brunswick. When looking at habitat connectivity at the county and/or state level, the critical importance of this parcel becomes very clear. Agricultural fields and roads through eastern Craftsbury, Albany, Irasburg and Barton create challenges for wildlife moving through the forested areas of northeastern Vermont. Management of the Craftsbury Town Forest as a component of a much larger forest block, with the intent to maintain functionality as corridor for animals traveling between the Wild Branch and Black River watersheds, is critical.

Rare Threatened and Endangered Species and Significant Natural Communities

No rare, threatened or endangered (RTE) species were identified during the forest inventory. A review of the Vermont Department of Fish and Wildlife's database also confirmed that there are no known occurrences of RTE species on this parcel.

Biophysical Region

The Craftsbury Town Forest lies on the transition between two northern biophysical regions. To the east is the Northern Piedmont, a region characterized by more gentle topography a more moderate climate relative to regions to the west (Northern Green Mountains) and east (Northeastern Highlands). To the west is the Northern Green Mountain Biophysical region, an area characterized by more acidic metamorphic rocks (especially when compared to those of the Northern Vermont Piedmont), cooler temperatures and increased levels of precipitation. For a full detailed description of each biophysical region see the book *Wetlands, Woodlands and Wildlands*⁴.

⁴ Thompson, E.H., and E.R. Sorenson: *Wetland, Woodland, Wildland: A guide to the Natural Communities of Vermont*, (2005). The Nature Conservancy and the Vermont Department of Fish and Wildlife

Forest Health

In general, no significant forest health issues were observed during the 2021 field inventory. The largest forest health issue noted was the excessive browse on hardwood and balsam fir regeneration. Another issue worth noting was the presence of balsam wooly adelgid (BWA) identified on overstory balsam fir trees in Stand 2 and 3. This insect has been observed throughout Orleans County over the last five years. It largely attacks stressed trees and is limited to only balsam fir trees



Figure 6: Balsam wooly adelgid (small white fluffy patches in the picture above) observed on a balsam fir tree.

as a host. It can result in a decline in health, and in some cases can lead to mortality when combined with other stressors. The majority of mature balsam fir in Stands 2 and 3 have already died as a result of BWA and likely other stresses as well. The salvage operations in 2002 likely removed many trees that would have been impacted by BWA today, and resulted in the release of existing advance regeneration which is now densely growing. As such, no immediate action on account of BWA is required.

Very few non-native invasive species were identified, which is excellent news considering challenges in managing these aggressive plants in other parts of the town of Craftsbury. **Several mature honeysuckle plants were identified near the cellar hole near Hatch Brook Road in Stand 3. It is recommended that these plants are removed as soon as possible, to minimize additional spread of these plants throughout the remainder of the town forest.**

Additionally, it is recommended that annual monitoring for these plants is completed by the CMFC. Of concern would be the presence of plants such as common and glossy buckthorn, and honeysuckle (all of which are well established within just a few miles of the Town Forest). Detailed identification of each of these species can be found at www.vtinvasives.org. If any plants are observed or concerns regarding the presence of an invasive species are raised, the County Forester is available for assistance. Early detection of non-native invasive species is critical in maintaining healthy forests.

Management Considerations

Recreational Use

Currently the primary recreational use of the Craftsbury Town Forest is hunting and dispersed hiking. An older trail exists from the pull-off near Paquette Road, heading north to the large wetland complex, however this trail is largely overgrown and difficult to follow. A second trail can be found near the western boundary of Stand 3, traveling north from Hatch Brook Road to the large, abandoned beaver pond. This road has historically been maintained to allow vehicle access, although it did not appear to be regularly used in recent years.

Forest Inventory and Stand delineation

For the purposes of forest management, areas within the forest of similar age, species and structure are delineated as Forest Stands. Dr. David Smith in his text *“The Practice of Silviculture: Applied Forest Ecology”*⁵ defines a stand as a *“contiguous group of trees sufficiently uniform in species composition, arrangement of age classes, site quality, and condition to be a distinguishable unit”*. In comparison Dr. Ralph Nyland⁶ defers to the Society of American Foresters definition when delineating a stand which states *“communities or groups of trees that grow together at a particular place, and that foresters can effectively manage as a unit”*. Both of these definitions include trees; however, one looks more holistically at the stand, age and structure of the forest. This is a critical difference, as the success of all future management practices is directly correlated to the site conditions as well as historic land use of a given piece of land. For the purposes of this report, stands were based not only on similar species arrangements, but also common abiotic features within the forest (i.e. the soils and hydrology) and how these features interact with the biotic features (i.e. the trees). This type of delineation within a forest is commonly referred to as a *Natural Community*. In the stand information below you will also see Natural Communities for each stand identified. The Natural Community is an interacting assemblage of organisms, their physical environment, and the natural processes that affect them.⁷

Applying silviculture in this forest

Management of the forest is conducted at the stand level through the application of *Silvicultural Treatments*. This extensive body of collective knowledge of how forests grow and function is aggregated and distilled into applied science through the practice of Silviculture. The U.S. Forest Service defines silviculture as *“the art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis.”*⁸ In general this is a

⁵ Smith, D.M., B.C. Larson, M.J. Kelty, and P.M.S. Ashton: *The Practice of Silviculture: Applied Forest Ecology*, (1997) 9th edition. John Wiley & Sons Inc.

⁶ Nyland, R.D.: *Silviculture: Concepts and Application*, (1996). McGraw-Hill Companies Inc.

⁷ Thompson, E.H., and E.R. Sorenson: *Wetland, Woodland, Wildland: A guide to the Natural Communities of Vermont*, (2005). The Nature Conservancy and the Vermont Department of Fish and Wildlife

⁸ Helms, J.A., ed: *The dictionary of forestry*. (1998) Society of American Foresters. P.210.

decent definition, however, it lacks the recognition of the incredible complexity of the multitude of variables that must be considered when practicing silviculture . A more common simplification of this complexity is the fact that silviculture is not rocket science, it is far more complex. It is for this reason that when implementing the silvicultural treatments outlined within this report, the Town is strongly encouraged to employ the services of a Licensed Forester. Additionally, given the goals and objectives defined by the CMFC above, it is also encouraged that any work completed under the guidance of this plan is shared with the broader community, to help demonstrate applied silvicultural practices, as well as educate residents on the benefits of such practices.

Forest Inventory

An inventory of the entire parcel was completed in December of 2020 and January of 2021 by the Orleans County Forester. Variable radius point sampling was completed using a 10 Basal Area Factor prism. Point sampling is a method of selecting trees to be tallied based on their sizes rather than by their frequency of occurrence⁹. Sample points, analogous to plot centers, are located along a random grid generated in ArcMap (a computer mapping program). Once a grid is generated, points are loaded into a handheld GPS unit, which is used to navigate to each point. Within a variable radius plot, the probability of tallying a given tree is based on the cross-sectional area (at 4.5 feet above the forest floor), and the sighting angle (in this case a prism) used. For all inventory work, a 10 Basal Area Factor prism was used, and Vermont State Lands Inventory Protocol was used¹⁰. Data was collected using a handheld tablet and processed and stored using the Vermont State FOREX Inventory Database System.

In all cases within this report, AGS refers to Acceptable Growing Stock. Acceptable Growing Stock Basal Area (AGS BA) consists of that portion of trees tallied as total basal area that are of commercial species and have the potential to produce sawlog-quality or better material now or in the future. Commercial species are those tree species that are commonly acceptable as being commercially valuable. UGS refers to Unacceptable Growing Stock. Unacceptable Growing Stock Basal Area (UGS BA) consists of that portion of trees tallied as total basal area that are NOT of commercial species, or do not have the potential to produce sawlog or better quality material now or in the future. Non-commercial species typically include such species as alder, apple, chokecherry, ironwood, gray birch, hawthorn, striped maple, pin cherry and willow spp. AGS and UGS Basal Area (BA) are presented in the following pages to describe stocking of overstory trees within each stand.

Below is a table showing the general summary statistics as well as the number of sample points included in each stand.

⁹ Avery, T.E., and H.E. Burkhardt: Forest Measurements. (1975) McGraw-Hill Inc.

¹⁰ Vermont Department of Forests, Parks and Recreation: Timber Cruise Manual v1.1. (2014)

Stand	Mapped Acres	Points	Basal Area	Trees Per Acre	Acceptable Growing Stock	QMD (in)
1	28	7	64.3	109.8	12.9	10.4
2	128	27	55.5	146.3	24.1	8.3
3	11	4	80	173.5	27.5	9.2

Figure 7: This table shows the general summary statistics for each stand as well as the number of sample points in each stand. All basal areas are presented in square feet/acre and QMD represents the quadratic mean stand diameter at breast height for each stand.

Management Summary

A management activity summary is provided below. Due to the current stocking conditions, no silvicultural treatment is prescribed for any stand within the Craftsbury Town Forest for the next 10 year planning period. Two management activities are identified below, with the most pressing issue being the removal of the honeysuckle plant found in Stand 3, and continued monitoring for other non-native invasive species throughout all stands.

Year	Activity
2021	Remove honeysuckle plant near foundation in Stand 3
2026	Refresh paint on boundary lines

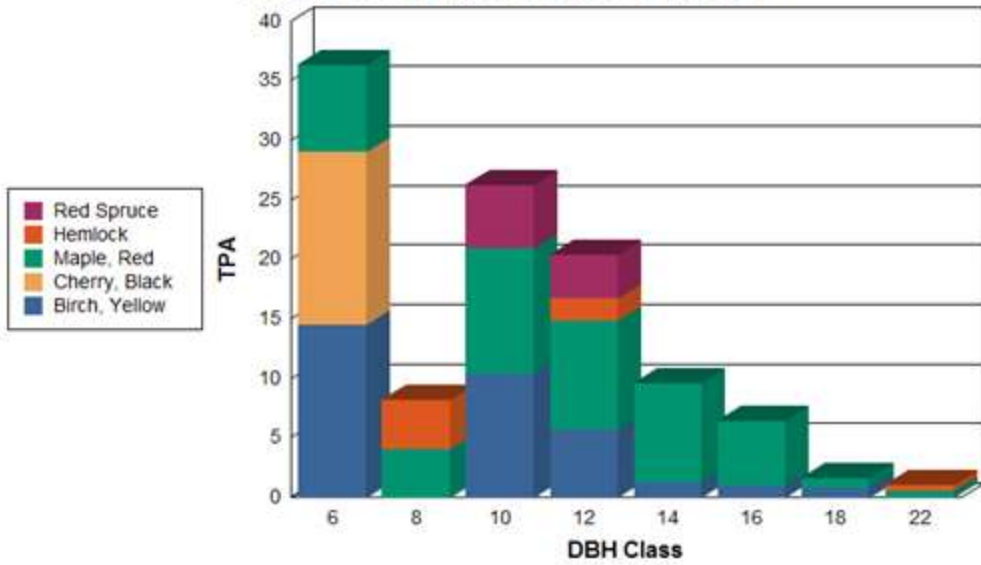
Forest Stand 1

Stand description: This 28-acre northern hardwood stand is dominated by small sawlog and pole sized timber. This stand is comprised of two separate areas found in the northern portions of the Town Forest on moderately well-drained Peru fine sandy loam soils. The forest type follows an abrupt transition from more poorly drained Cabot soils surrounding these areas, to the moderately well-drained Peru fine sandy loam soils underlying this stand. Portions of the stand are comprised of well-developed yellow birch poles, however some areas have continually been browsed by moose and have struggled to develop quality stems. These heavily browsed areas represent the minority of overall stand conditions.

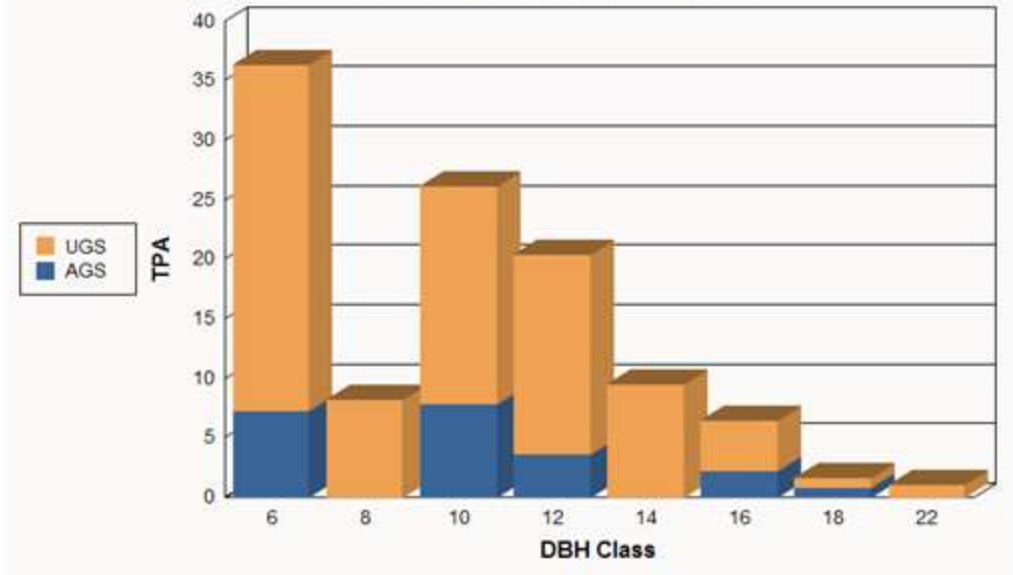
Stocking Data:

	BA	TPA
Mean	64.3	109.7
St. Dev	31.5	37.8
AGS	12.9	21.7
UGS	51.4	88.0
80% Range	(47.2-81.4)	(89.1-130.3)
Snags Per Acre		0.3

Trees Per Acre by DBH Class & Species



Trees Per Acre by DBH Class & Quality



Overstory Species Composition:

Species	BA	%BA	TPA	QMD	RelDen	%AGS	BF Vol	Pulp Vol
Birch, Yellow	17.1	26.8	34.0	9.6	14.3	16.7	24.5	2.6
Cherry, Black	2.9	4.5	14.6	6.0	2.7			
Hemlock	4.3	6.7	6.5	11.0	2.0			0.9
Maple, Red	34.3	53.6	45.9	11.7	27.8	20.8	442.0	5.2
Red Spruce	5.7	8.9	8.9	10.9	2.2	50.0	213.3	0.5
Totals	64.3	100.5	109.8	10.4	49.0	18.7	679.8	9.2

Understory Species: *Not inventoried due to winter conditions*

Natural Community Designation: Northern Hardwood Forest will likely develop to a Red Spruce-Northern Hardwood Forest over time.

Forest Health: Beyond the heavy browse pressure in localized pockets, no significant forest health issues were observed.

Silvicultural Long-term Objectives: Overtime this forest will be managed to develop as a multi-aged forest. Current stand conditions have limited structural diversity as a result of past harvesting creating even-aged conditions.

Silvicultural prescription: Due to the low stocking in Stand 1, this Stand should be allowed to continue to grow for the next 10 years. At the time of the next management plan update, these areas should be evaluated for lasting impacts of moose browse as well as opportunities to enhance growth on quality hardwood stems and scattered red spruce through crop tree release.

Forest Stand 2

Stand Description:

This 128-acre stand comprises the majority of the productive forest soils within the Town Forest. Most of these soils are mapped as cabot silt loam soils, a soil type with varying degrees of productivity relative to the soil moisture. These soils have the capacity to grow quality sawtimber, as evidenced by the past harvest volume tables described in earlier



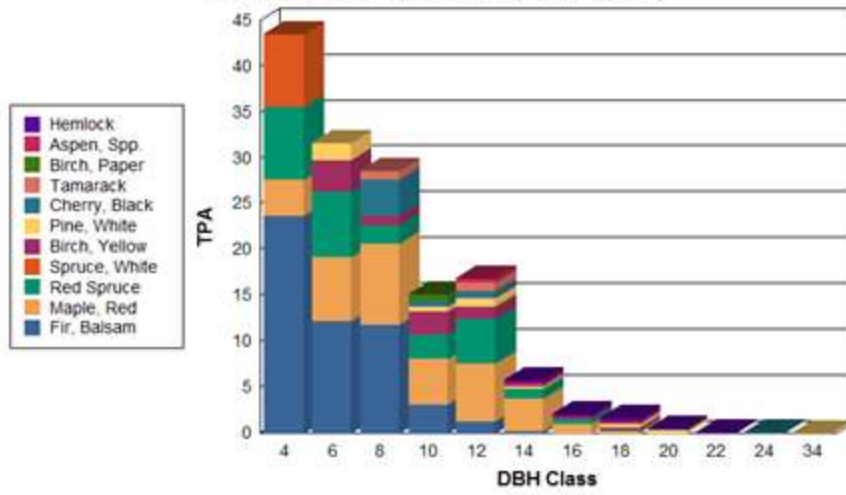
Figure 8: Dense spruce and fir regeneration under scattered spruce overstory in Stand 2.

sections of this report. However, recent harvesting has resulted in an understocked stand, which is still responding from the release of the last salvage and unregulated harvest in this stand. Stocking across the stand is variable, with some areas of dense spruce and fir advance regeneration functioning as high quality snow-shoe hare habitat, and other areas of well-stocked spruce and fir and more well-drained portions, to areas of scattered overstory overtopping hardwood pole-sized trees. A small area planted to white pine can be found near the vicinity of Paquette Road which consists of the remaining trees from a white pine plantation established in the 1950's.

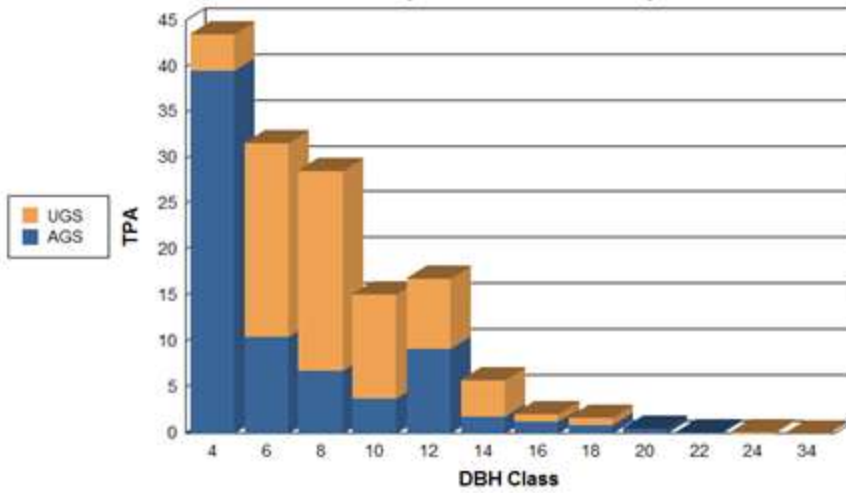
Stocking Data:

	BA	TPA
Mean	55.5	146.2
St. Dev	31.2	150.5
AGS	24.1	74.8
UGS	31.4	71.4
80% Range	(47.9-63.1)	(109.5-182.9)
Snags Per Acre		0.3

Trees Per Acre by DBH Class & Species



Trees Per Acre by DBH Class & Quality



Overstory Composition:

Species	BA	%BA	TPA	QMD	RelDen	%AGS	BF Vol	Pulp Vol
Aspen, Spp.	1.4	2.5	1.2	14.8	0.6	50.0	57.9	0.1
Birch, Paper	0.3	0.6	0.6	10.0	0.3			0.1
Birch, Yellow	4.1	7.5	8.8	9.3	3.5	16.7	26.5	0.3
Cherry, Black	2.8	5.0	5.6	9.5	2.3	25.0	13.2	0.3
Fir, Balsam	11.7	21.3	52.7	6.4	6.5	38.2	79.1	1.1
Hemlock	2.1	3.8	1.3	17.4	1.0	50.0	88.2	0.2
Maple, Red	17.9	32.6	36.0	9.6	15.0	28.9	232.4	2.2
Pine, White	3.5	6.3	4.4	12.0	1.4	50.0	182.2	0.3
Red Spruce	10.0	18.2	26.1	8.4	4.4	79.3	522.1	0.4
Spruce, White	0.7	1.3	7.9	4.0	0.6	100.0		
Tamarack	1.0	1.9	1.9	10.1		100.0	13.2	0.1
Totals	55.5	100.9	146.3	8.3	35.4	43.2	1,214.8	5.1

Understory Species: *Not sampled due to winter conditions*

Natural Community Designation: Lowland Spruce-Fir Forest

Forest Health: Minor levels of balsam woolly adelgid were observed throughout the stand, however in general, young balsam fir is growing vigorously in response to the release of the last heavy harvest.

Silvicultural Long-term

Objectives: Overtime this forest will be managed to develop as a multi-aged forest. Current stand conditions are highly variable as a result of the most recent salvage harvest that removed a majority of the softwood overstory.

Silvicultural prescription: No

prescribed treatment is recommended at this time due to the low stocking. Regeneration response should be monitored for continued impacts of moose browse.



Figure 9: Areas in the eastern portion of Stand 2 in the Webster Lot have experienced excessive browse pressure from moose, which has significantly impacted yellow birch and balsam fir advance regeneration.

Forest Stand 3

Stand Description: This 11 acre stand consists of the highest stocking within the Craftsbury Town Forest, and is largely influenced by past agricultural land use. A cellar hole can be found on the southeastern edge of this stand, as well as one large honeysuckle plant and several apple trees. A stone wall comprises a portion of the western border of this stand.



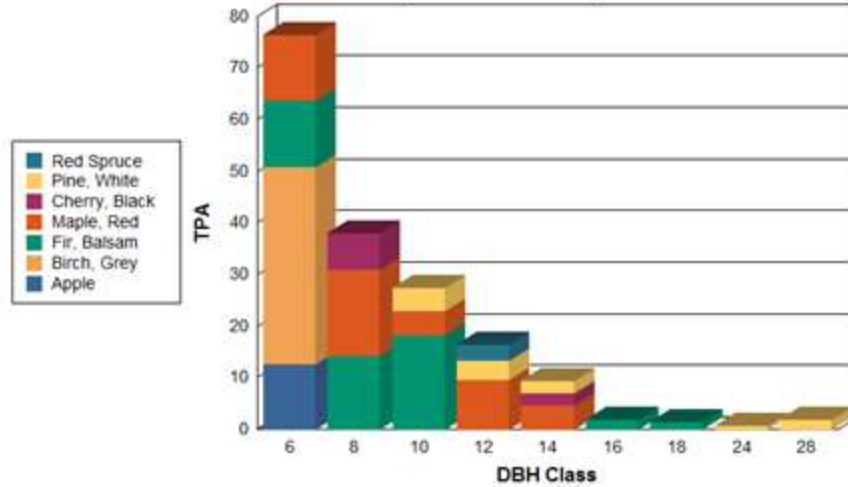
Figure 10: A bully white pine offers clue to the past agricultural history of this stand. For scale the Biltmore stick in this picture shows the tree diameter and also a long-lost container

Tunbridge-lyman soils underlay the majority of the stand. These well-drained soils are excellent sites for northern hardwood species, and current dominance of stocking in softwood species is likely the result of influence of past agricultural abandonment. Stocking is variable throughout the stand, with areas to the south having grown from more recently abandoned agricultural fields, and those area in the northern part of the stand being comprised of more mature forest. An established trail leads from Hatch Brook Road, traveling north to the expansive beaver pond complex on the northern edge of this stand along the western property boundary. Overtime this stand can be managed to increase the proportion of hardwood species which are well-suited for the site.

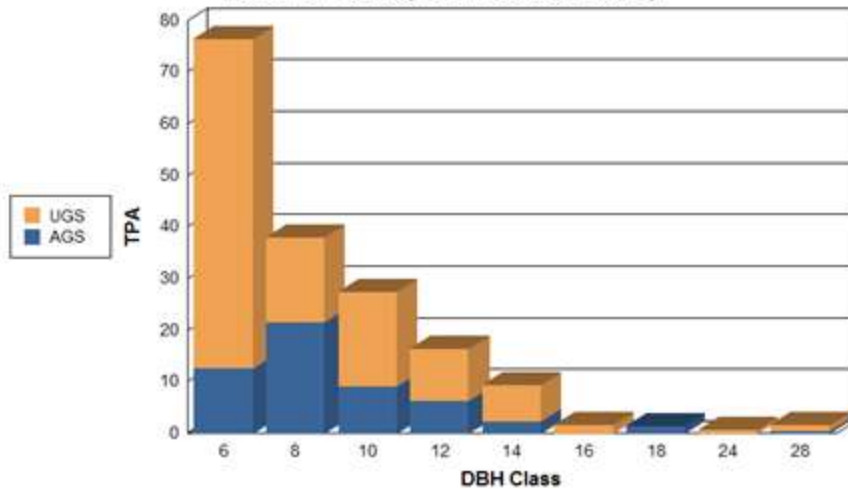
Stocking Data:

	BA	TPA
Mean	80.0	173.4
St. Dev	24.5	106.7
AGS	27.5	54.0
UGS	52.5	119.4
80% Range	(59.9-100.1)	(86.0-260.8)
Snags Per Acre		0.4

Trees Per Acre by DBH Class & Species



Trees Per Acre by DBH Class & Quality



Overstory Composition:

<u>Species</u>	<u>BA</u>	<u>%BA</u>	<u>TPA</u>	<u>QMD</u>	<u>RelDen</u>	<u>%AGS</u>	<u>BF Vol</u>	<u>Pulp Vol</u>
Apple	2.5	3.1	12.7	6.0	2.6			
Birch, Grey	7.5	9.4	38.2	6.0	6.8			
Cherry, Black	5.0	6.3	9.5	9.8	4.2	50.0	49.3	0.2
Fir, Balsam	22.5	28.1	48.6	9.2	9.6	55.6	391.0	2.6
Maple, Red	22.5	28.1	48.1	9.3	18.9	33.3	192.3	3.5
Pine, White	17.5	21.9	13.3	15.6	6.5	14.3	383.6	3.3
Red Spruce	2.5	3.1	3.2	12.0	0.9	100.0	419.3	0.0
Totals	80.0	100.0	173.5	9.2	49.5	33.8	1,435.4	9.6

Understory Species *Unable to sample due to winter locations*

Natural Community Designation: Will likely evolve into a Red Spruce-Northern Hardwood Forest overtime.

Forest Health: One large non-native invasive honeysuckle plant was observed near the cellar hole adjacent to Hatch Brook Road. This plant should be removed as soon as possible.

Silvicultural Long-term Objectives: Overtime this forest will be managed to develop as a multi-aged mixedwood forest. Future management conditions should strive to perpetuate red spruce, yellow birch, and red maple, increasing the proportion of stocking in hardwood species with each entry, aiding in the gradual transition of the stand to a higher proportion of hardwood species over multiple entries.

Silvicultural prescription: No prescribed treatment is recommended at this time due to the low stocking.

Forest Stand 4 – Non-productive forestland

Stand Description: This 20.5 acre area consists of two separate wetland complexes that have been heavily influenced by beavers over the years. Both areas contain abundant standing dead trees, resulting from beaver activity flooding adjoining low-lying softwood forests. Tracks of coyote, moose, fox and fisher were all observed in these areas during the winter inventory.

Edges of wetland

complexes were found

to be densely stocked with young spruce and fir seedlings and filled with abundant snowshoe hare tracks. These areas are important wildlife habitat in all seasons, and during summer and fall months support waterfowl populations as well.



Figure 11: An example of scattered live trees and dead standing trees found within the expansive wetland complexes of Stand 4.

Appendix 1: Town Forest Stand Map

