Forest Management Plan

for the

Moretown Town Forest

Moretown, Washington County, Vermont

Grand List: 173.5 Town Listed Acres
SPAN #: 408-127-10531

January, 2024

Sugaring arch remnants.

FOREST MANAGEMENT PLAN

for the

Moretown Town Forest

Moretown, Washington County, Vermont

Grand List: 173.5 Town Listed Acres
SPAN #: 408-127-10531

January, 2024

Town of Moretown
79 School St.
Moretown, VT, 05660

Date

Michael Brown VT License # 2876 Exp. 09/30/24
Birdseye Forestry Consulting LLC

Date

Vermont Land Trust

Date

Vermont Agency of Natural Resources

Date

Contents

Forest Stand Map

Owned By: Town of Moretown

173.5 Town Listed Acres

Moretown, VT

SPAN #:408-127-10531

Orthophoto #: 128182, 132192
Series 5000, 2006

Drawn by M. Brown VT License 2876
Exp. 09/30/22
5/18/2023
This map is not a survey

500 250 0 500 Feet

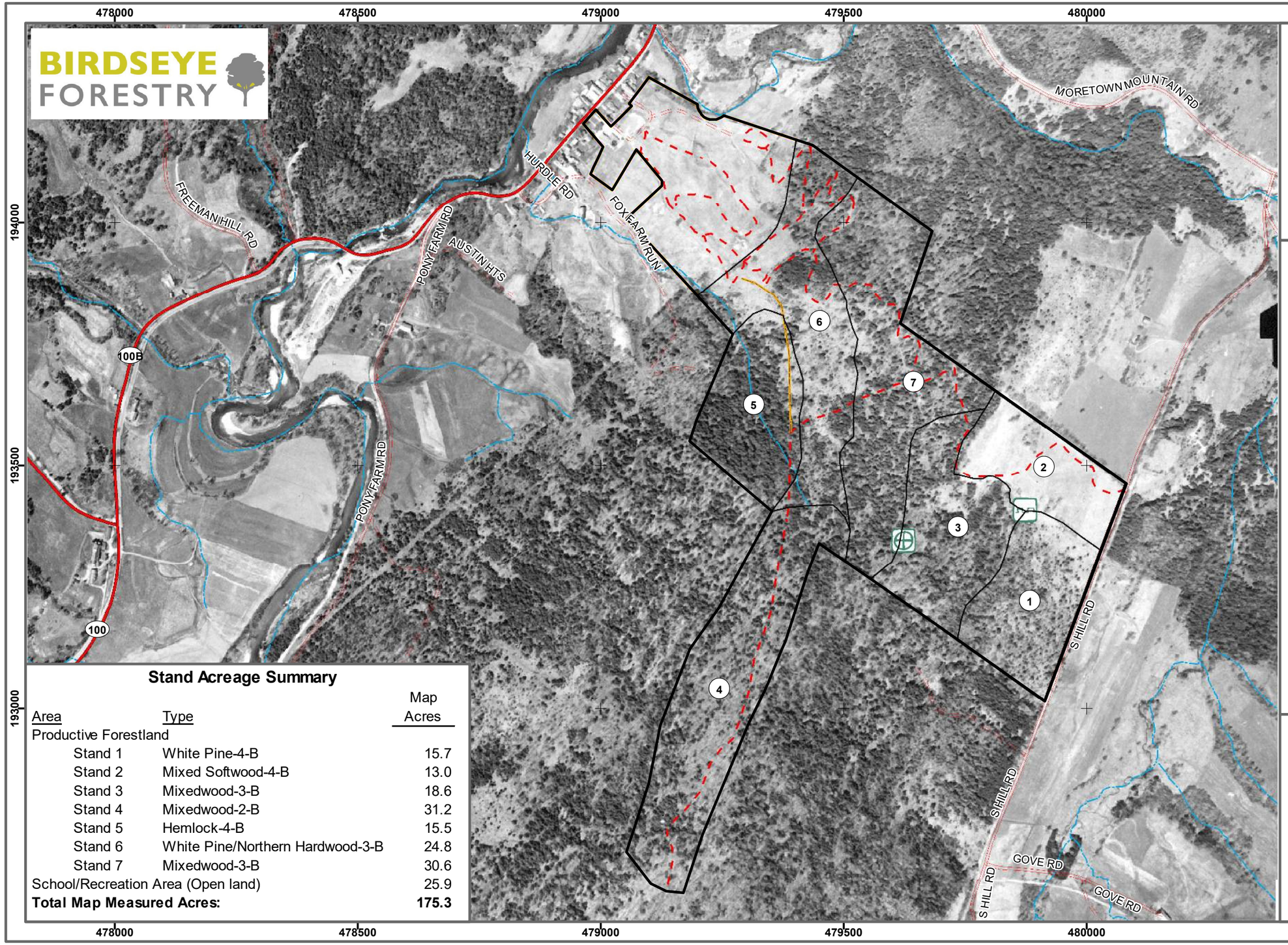
Legend

- Boundary
- Stand Boundary
- Open Land
- Cellar Hole
- Sugaring Arch
- Trail
- Emergency Access
- Interstate
- US Highway
- State Highway
- Maintained Town RD
- Other
- Stream

Stand Acreage Summary

Area	Type	Map Acres
Productive Forestland		
Stand 1	White Pine-4-B	15.7
Stand 2	Mixed Softwood-4-B	13.0
Stand 3	Mixedwood-3-B	18.6
Stand 4	Mixedwood-2-B	31.2
Stand 5	Hemlock-4-B	15.5
Stand 6	White Pine/Northern Hardwood-3-B	24.8
Stand 7	Mixedwood-3-B	30.6
School/Recreation Area (Open land)		25.9
Total Map Measured Acres:		**175.3**

State of Vermont
Michael Brown
No. 148.0122876
Licensed Forester



BIRDSEYE FORESTRY

1962 Ortho Photo

Owned By: Town of Moretown

173.5 Town Listed Acres

Moretown, VT

SPAN #:408-127-10531

Orthophoto #: 128182, 132192
Series 5000, 2006

Drawn by M. Brown VT License 2876
Exp. 09/30/22
5/18/2023
This map is not a survey

500 250 0 500 Feet

Legend

- Boundary
- Stand Boundary
- Open Land
- Cellar Hole
- Sugaring Arch
- Trail
- Emergency Access
- Interstate
- US Highway
- State Highway
- Maintained Town RD
- Other
- Stream

Stand Acreage Summary

Area	Type	Map Acres
Productive Forestland		
Stand 1	White Pine-4-B	15.7
Stand 2	Mixed Softwood-4-B	13.0
Stand 3	Mixedwood-3-B	18.6
Stand 4	Mixedwood-2-B	31.2
Stand 5	Hemlock-4-B	15.5
Stand 6	White Pine/Northern Hardwood-3-B	24.8
Stand 7	Mixedwood-3-B	30.6
School/Recreation Area (Open land)		25.9
Total Map Measured Acres:		**175.3**

State of Vermont
Michael Brown
No. 148.0122876
Licensed Forester

Stand Acreage Summary

Area	Type	Map Acres
Productive Forestland		
Stand 1	White Pine-4-B	15.7
Stand 2	Mixed Softwood-4-B	13.0
Stand 3	Mixedwood-3-B	18.6
Stand 4	Mixedwood-2-B	31.2
Stand 5	Hemlock-4-B	15.5
Stand 6	White Pine/Northern Hardwood-3-B	24.8
Stand 7	Mixedwood-3-B	30.6
School/Recreation Area (Open land)		25.9
Total Map Measured Acres:		**175.3**

Harvest Map

Owned By: Town of Moretown

173.5 Town Listed Acres

Moretown, VT

SPAN #:408-127-10531

Orthophoto #: 128182, 132192
Series 5000, 2006

Drawn by M. Brown VT License 2876
Exp. 09/30/22
04/18/2023

This map is not a survey

500 250 0 500 Feet

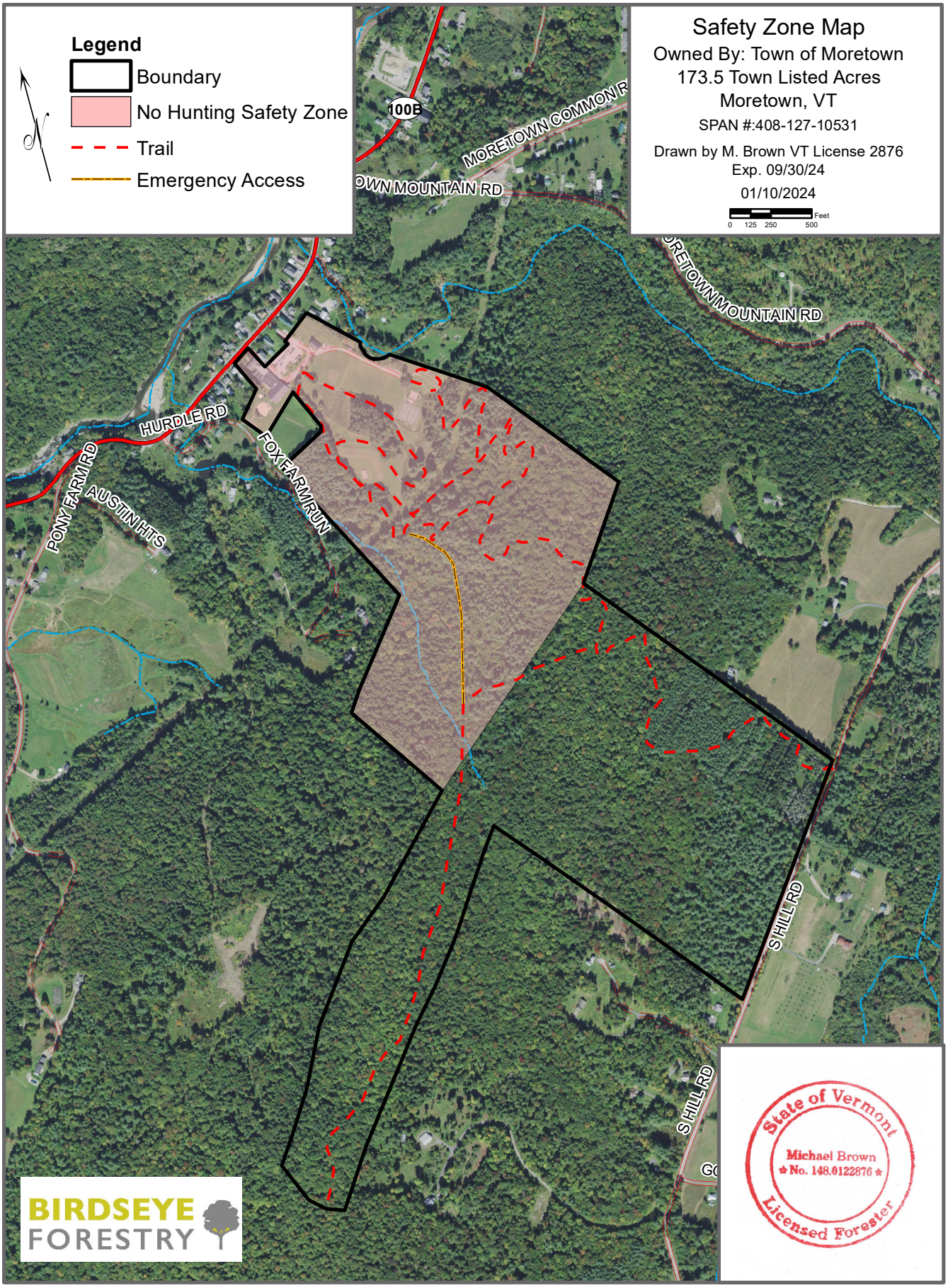
Legend

- Boundary
- Stand Boundary
- Open Land
- Group Selection & Crop Tree Release
- Patch Cut & Thinning
- Trail
- Emergency Access
- Interstate
- US Highway
- State Highway
- Maintained Town RD
- Other
- Stream

State of Vermont
Michael Brown
No. 148.0122876
Licensed Forester

BIRDSEYE FORESTRY

BIRDSEYE FORESTRY CONSULTING, LLC, 3958 MORETOWN MOUNTAIN RD., MORETOWN, VT 05660 802.777.5240 BIRDSEYECONSULTING@GMAIL.COM BIRDSEYEFORESTRY.COM


Legend
Boundary
No Hunting Safety Zone
Trail
Emergency Access
Safety Zone Map
Owned By: Town of Moretown
173.5 Town Listed Acres
Moretown, VT
SPAN #:408-127-10531
Drawn by M. Brown VT License 2876
Exp. 09/30/24
01/10/2024
0 125 250 500 Feet
100B
MORETOWN COMMON R
OWN MOUNTAIN RD
MORETOWN MOUNTAIN RD
HURDLE RD
FOX FARM RUN
PONY FARM RD
AUSTIN HTS
S HILL RD
S HILL RD
BIRDSEYE FORESTRY
State of Vermont
Michael Brown
No. 148.0122876
Licensed Forester

Vermont Land Trust

Moretown School Board Property
Town of Moretown
Washington Co., VT

December 2010

VLT Project #130610

The Moretown School Board Property Conservation Plan is based on the following State of Vermont Base Map 1:5000 orthophoto(s):
Moretown, #128192, 2006;
Moretown Gap, #132192, 2006

1:5,000 1 inch = 416.7 feet

Feet: 250 125 0 250 500 750

Meters: 50 25 0 50 100 150 200

Note:

Portions of the boundaries of the Protected Property are based on a survey entitled:
Survey and Subdivision of the Lands of Steven L. Robbins, South Hill Road, Moretown, Vermont by McCain Consulting Inc., dated 6/21/04

Protected Property
Excluded Land
ROW

479000 480000 194000 193000

Vermont Route 100B

ROW

Excluded Land
±27 acres

±81 acres
Conserved 2008

ROW

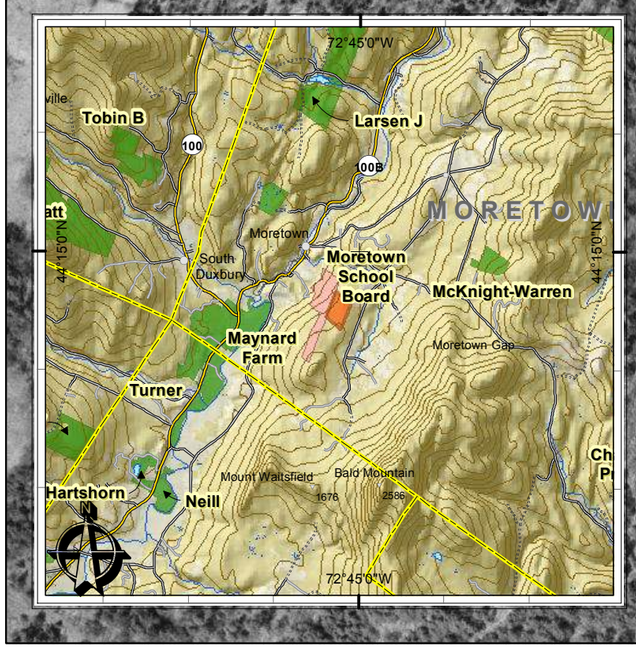
S. Hill Rd (TH #41)

Excluded Land
±30 acres

GRID NORTH

This map is not a survey or subdivision plat, and should not be used or construed for such purposes. It was prepared without the benefit of field measurements or extensive title research. It is intended solely to assist the owner(s) of the conserved land and the holder(s) of the conservation easement in the administration and interpretation of the conservation easement by clearly depicting the presumed boundaries of the protected property, calculating the approximate acreages, and showing the approximate locations of any excluded lands, farmstead or homestead complex, farm labor housing complex, or special treatment areas.

THIS MAP IS NOT A SURVEY



ACREAGE INFORMATION*

Woods	116 acres
Total Protected Property	**± 116 acres**
Excluded Land	± 57 acres

**All acreage is approximate, and exclusive of public road rights of way.*

Reviewed and Accepted by:

Duly Authorized Agent of the Moretown School District — Date

Duly Authorized Agent of the Town of Moretown — Date

Duly Authorized Agent of Vermont Land Trust, Inc. — Date

PLAN INTRODUCTION AND PURPOSE

A forest management plan can be thought of as a “User’s Guide” for a tract of land, typically including a description of the forest, wetland and open land resources as well as management recommendations. Forest management is the practical application of silvicultural principals to the growth, harvest, regeneration and conservation of forests in order to maintain healthy forests and to meet the specific objectives of the landowner. The forest management plan should include information about the ownership and surrounding landscape regarding historical uses, soil and water resources, and wildlife habitat. The plan is intended to:

- Update the 2010 management plan;
- Comply with the conservation easement on 116 acres held by the Vermont Land Trust;
- Present a picture of the current state of the forest;
- Serve as a tool to implement informed management of the land.

This forest management plan has been prepared for The Town of Moretown, for their 173.5 acre property in Moretown, VT. It is meant to actively cover a 10-year period, though it will remain useful for a far longer period of time with regular 10-year updates.

PUBLIC INPUT, GOVERNANCE & MANAGEMENT RESPONSIBILITIES

PUBLIC INPUT

A Town Forest committee was created for the development and implementation of the management plan. The committee has met intermittently beginning in the summer of 2022. Committee roles were open to the public and included the Moretown Elementary School Principal, Town Selectboard members, Moretown Volunteer Fire Department Chief, and members of the town. Meetings are open to the public.

A survey conducted by the Recreation Committee in 2022 outlined respondents' uses and desired future uses of the town forest. More information can be found in the appendix.

GOVERNANCE & MANAGEMENT RESPONSIBILITIES

Once the management plan is accepted, management of the property will fall to the Recreation Committee. The Recreation Committee will be in charge of day-to-day operations, and will seek Selectboard approval for any changes or additions to uses of the property. Members of the Town Forest Committee may be consulted as deemed necessary by the two governing bodies.

ALLOWED USES

- Non-motorized recreation(hiking, biking, skiing, snowshoeing, wildlife viewing, etc.)
- Hunting in designated areas (see safety zone map for specific areas)
- Outdoor education & workshops

PROHIBITED USES

- Motorized recreation
- Trapping
- Hunting within designated safety zones (see safety zone map for specific areas)
- Camping
- Camp Fires (outside ECO management programs)

Well maintained hiking and biking trails access much of the property.

PROPERTY LOCATION

The 173.5 acre property is located in Moretown Village, in Moretown, Washington County, VT. The property is located between Route 100B and South Hill Road. The Moretown Elementary School and Moretown Town office are in the western part of the property. Recreation fields, tennis courts, and a playground for public use are also located in this area. The ownership is comprised of 149.4 acres of productive forestland, and 25.9 acres of open land.

MANAGEMENT OBJECTIVES & POLICIES

The following management objectives have been defined for this 10-year management plan:

1. To maintain and enhance deer wintering habitat in a manner which is consistent with the objectives of a

Vermont Land Trust (VLT) deeryard easement held on 116 acres within Moretown's Town Land. A copy of the deeryard easement can be found in the Appendix, and a copy of the purchase and sale agreement adding the additional 35 acres can be found in Appendix.

- The primary purpose of the deeryard easement is to conserve, protect, maintain or enhance critical wildlife habitat on the Protected Property as identified by the State of Vermont. These habitats consist of 116 acres, which provide deer winter shelter.
- The secondary purposes, which must be compatible with the primary purpose of conserving the winter deeryard habitat within the deeryard easement, are to conserve the forestry values, wildlife habitats, biological diversity, natural communities, soil productivity, water quality and native flora and fauna on the Protected Property, and the ecological processes that sustain these natural resource values as these values exist on the date of this instrument and as they may evolve in the future, and non-motorized, non-commercial recreational opportunities compatible with the primary purpose of this grant, open space values, scenic resources associated with the Protected Property for present and future generations.

2. To improve wildlife habitat for a variety of species;
3. To locate and maintain all boundary lines;
4. To develop opportunities for outdoor classroom experiences;
5. To support recreational opportunities; and
6. To manage and maintain a trail system that is compatible with the management objectives of the deeryard easement within the Town land.

The following management policies have been identified for this 10-year management plan:

Land Management Plan - Moretown Town Land

1. Sustaining Forest Health and Productivity: Silvicultural management practices must assure that future generations are not more limited in resource use options than present conditions allow. Any herbicide or pesticide use will be reviewed by the Recreation Committee subject to select board review. The goal is to minimize and/or eliminate use of these products. A public process will be conducted to ensure community input. Green Mountain Power (GMP) has been notified by the select board and agreed not to spray kill under the power lines, they are to use manual cutting best practices ongoing.
2. Water Quality Protection: Land use activities shall not degrade long-term water quality.
3. Potable Water Supplies: Identify and protect potable water supplies prior to any management activities.
4. Harvest Operations: Harvest in a manner consistent with the management objectives defined above with oversight by a Vermont licensed forester hired by the selectboard.
5.Public workshops should be conducted prior to, during, and post-harvest to engage and educate the people of Moretown during active management. Interpretive signage may also be installed post-harvest in harvest areas, or

on other interesting ecological or archaeological features.
6. Wildlife (including VLT deeryard easement): Maintain and improve deer wintering habitat and foster habitat diversity.
7. Recreation:
a. Keep the network of trails open for non-motorized travel and recreational uses that are compatible with the primary wildlife and habitat purposes of the deeryard easement.
b. Maintain the current low-impact recreational/educational uses, such as hiking, biking, snowshoeing, cross-country skiing, wildlife viewing, etc. that are compatible with the primary wildlife and habitat purposes of the deeryard easement.
c. Permit changes to the trail network compatible with the primary wildlife and habitat purposes of the deeryard easement.
8. Educational Opportunities: Encourage Moretown's Elementary School (and
others) to use the property for educational purposes. In particular the Educating Children Outdoors (ECO) non-profit organization manages the K-6 outdoor learning spaces.
9. Hunting: Foster recreational hunting in a manner that is consistent with the management objectives defined above as well as State Fish and Wildlife safety guidelines. For hunting safety reasons the school property will have a "No Hunting Safety Zone." See the hunting map for more detail.
10. Financial Management: All revenues shall be accounted for in the General Budget and shall be used to further the objectives defined in this plan
11. Management Responsibilities: The Moretown Recreation Committee, or other committee authorized by Moretown's Selectboard, will monitor the property for illegal activities such as dumping, prohibited uses of the property, damage to gates and signs, etc. and work with the Moretown selectboard to manage the property.

LANDOWNER OBJECTIVES

Landowner objectives or goals are one of the most important factors in the development of a management plan for a piece of land. A landowner's objectives should express their vision of their land and use of its resources. These objectives must also be compatible with the ecological capacities and natural communities present on a said piece of land.
All objectives may not be able to be implemented on every acre of land, but many objectives can compliment another. For example, a timber harvest may meet the objective of managing for quality sawtimber while also creating a network of trails and improving specific wildlife habitats.
Landowner's may have multiple objectives for a piece of land. These objectives should be clearly identified and prioritized. The management plan is an important tool to provide an in-depth view of the current state of the land. Management goals can then be tailored based on the ecological capabilities of the land and landowner preference.

Moretown Town Forest Ownership Objectives:

- Be a good land steward;
- Maintain a healthy, productive and aesthetically pleasing forest;
- Protect and improve water quality;
- Protect soils;
- Provide quality wildlife habitat for a diversity a species;
- Protect and enhance aesthetics and scenic beauty;
- Provide opportunity for non-motorized recreational use of the land;
- Provide opportunities for education;
- Utilize adaptive management strategies that keep climate change in mind;
- Manage for the conservation of open-green-space;

GREATER LANDSCAPE PERSPECTIVE

The most significant landscape feature is the Mad River. The Mad River lies just to the west of the town forest. The Mad River is a tributary of the Winooski River, which drains into Lake Champlain just north of Burlington, VT. The headwaters of the Mad River are in Granville Gulf. From there the river flows through Warren, Waitsfield and Moretown, where it joins the Winooski River. The watershed is 144^2 miles in size and the river is approximately 25 miles in length. The River and its tributaries are a high quality natural fishery in the State of Vermont.
The majority of the Moretown Town Forest is conserved with a conservation easement held by the Vermont Land Trust.

Other significant conservation features in the greater landscape surrounding the Moretown Town Forest include the Harwood Union High School Forest. The Hardwood Forest is approximately 110 acres in size, and lies ½ mile to the west. Several privately conserved parcels are found southwest of the Town Forest along Route 100B and Pony Farm Road.

FORESTLAND HISTORY

According to Wetland, Woodland, and Wildland: A Guide to the Natural Communities of Vermont (Thompson, Sorenson, 2019), “Forests covered 95% of the state prior to European Settlement, and they cover more than three-quarters of it today.” The 1800’s saw large scale clearing of forests for agricultural uses, and at its peak, approximately 75% of the state was open. By the late 1800’s unsustainable agricultural uses had begun to exhaust the productivity of these lands, and they began to be abandoned. Slowly forests reclaimed these sites and began to stabilize the soils and ecosystems. Some sites, on sandy soils were planted with softwoods to stabilize the site and keep more land from eroding.

The 1800's saw intensive agricultural use throughout New England, with extensive clearing for hay, crops, and pasture. The gentle terrain along portions of the Mad River are highly productive, and hosted intensive agricultural use right through the mid to late 1900's. Today, much of this land remains open, though it is not uncommon to find pine growing in what was once open field

GEOLOGICAL ATTRIBUTES

Physiographic Regions

Vermont has nine distinct biophysical regions. A biophysical region helps to organize the landscape into smaller units that share features of climate, geology, topography, soils, natural communities, and human history. Each region is distinct, but have variety within them. More information can be found in Wetland, Woodland, and Wildland: A Guide to the Natural Communities of Vermont (Thompson, Sorenson, 2019).

Moretown Town Forest Physiographic Regions:

The Moretown Town Forest is located in the Northern Green Mountains, one of eight distinct regions found in the state. According to the book Wetland, Woodland, and Wildland: A Guide to the Natural Communities of Vermont (Thompson, 2000.) this section covers the northern half of the Green Mountains from Chittenden Reservoir to the Canadian Border. The highest elevation is the chin of Mount Mansfield, 4,393' located in Underhill, VT. Lowest elevations in this area are found in the Winooski, Lamoille & Missisquoi River valleys with elevations under 500'. The Northern Green Mountains are characterized by high elevations, cool summer temperatures and acidic metamorphic rocks.

Geology in the area consists mainly of metamorphic rock consisting of schists, phyllites, gneisses and quartzites. These generally acidic rocks are only locally calcareous. Over the millions of years since their formation, the Green Mountains have eroded to only a fraction of their original height. The Northern Green Mountains have the best examples of many high elevation and boreal communities found in Vermont. Northern Hardwood Forest is the most common natural community in the region.

Topography and Aspect

The present land formations of New England were shaped by the latest glaciation during the Pleistocene Era, which began approximately two million years ago. At that time New England was covered by ice approximately 1 mile thick. The glaciers receded 10,000 to 12,000 years ago leaving behind the mountains, hills, gullies and valleys we are familiar with today. Following primary succession where pioneer species including lichen, algae and fungi in combination with abiotic factors like wind and water slowly built up soils, the forest began to re-grow. Over long periods of the forest evolved to the mix of species found here today largely determined by soils type,

topography, and aspect but also shaped by more recent land use history.

Moretown Town Forest Topography and Aspect:

The topography of the Moretown Town Forest consists primarily of gentle to moderately steep slopes. Isolated steep slopes and exposed ledge are found in the central and southwestern portions of the property. Elevation ranges from 600' along Route 100B to 1,260' in the southeastern corner. Aspect on the property is generally northwest. These slopes support a diverse mixedwood forest comprised of hemlock, white pine, sugar maple, red maple, and yellow birch.

Soils

Soils are the substrate upon which all plants and trees grow. Soil productivity is directly influenced by the rock from which the soil is derived. Different soil types drive the ecological potential of a site. Certain tree species have evolved to compete better on certain soil types. Sound forest management strives to grow the tree species best suited to a particular site. Growing species that are suited to the site will result in well formed, healthy stems.

Moretown Town Forest Forest Soils:

There are several different soil types identified on the Moretown Town Forest. The soils are mapped by the United States Department of Agriculture, NRCS (formally the Soil Conservation Service). The dominant soil in the wooded portion is Colonel fine sandy loam, site class I. Peru fine sandy loam, site class I; and Tunbrudge-Lyman complex, site class I comprise the remaining forest area. The open land and school complex are comprised by several different soil types, that are silt loams, and are all site class I or II soil types. The Forest Soil Groups help determine long-term management strategies for the forest, driving primary silvicultural objectives.

Soil site class is determined by several different factors including but not limited to drainage, soil depth, aspect, bedrock, and soil substrate. Many soils have species that compete best on them, and herbaceous species that are indicators of the site quality. E.g., blue cohosh and maidenhair fern are indicators that rich soils are present. Soils are classified by their productivity and ability to support forested ecosystems. Different soil types are found in different areas, and naturally support different tree species based on the soil's capabilities. Five factors affect the distribution of soils on the landscape: parent material, climate, vegetation, topography and time Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont (Thompson, 2000.). Forest soil site classes range from I-IV. A site class I represents the highest quality soil type, capable of growing high quality and productive stems. The other extreme, site class IV is considered a non-productive soil, generally incapable of supporting well formed or quality trees or growing 20 cubic feet per/year. Soil productivity can also be affected by soil depth and water availability.

Wetland and Water Resource in Forested Ecosystems

Water features are an integral part of the forest ecosystem. Brooks, streams, ponds, and wetlands all provide

essential riparian habitat and functions. According to the publication Good Forestry in the Granite State (Bennett, 2010), riparian areas provide flood control, regulate streamflow and protect water quality by filtering and retaining sediment, nutrients, and other pollutants from upslope areas. Riparian areas also regulate temperature of aquatic habitat by shading streams, provide large, woody material to create pools, riffles, debris-jams, and related aquatic habitat, and provide leaves, twigs, fruit and insects which contribute energy to drive aquatic food webs.
Riparian areas also provide habitat for nesting, feeding, cover, and travel for many amphibians, birds, furbearers, and reptiles. Topography, elevation, bedrock, and soils dictate the water features found on a particular tract of land. The protection of water quality is an integral part of sound, sustainable forest management.

Moretown Town Forest Wetland and Water Resource:

The Mad River and its tributaries are clearly the primary water concern on the ownership. All of the water from the Town Forest flows into the Mad River. Doctors Brook, a perennial stream flows along the northern boundary. Intermittent and ephemeral streams flow to the west and drain into the Mad River. Small seeps and forested wetlands are found scattered throughout the forested land.
Should a stream crossing be necessary during harvesting, crossings should be kept to a minimum and at right angles to the stream bank. Poles may be used in the winter, a culvert or bridge panels in the summer is preferred. A 25' No-Harvest buffer is recommended along any perennial or large intermittent streams, as well as the required 50' B-line stocking. This will easily be met and exceeded. Riparian areas, streams, and wetlands will be protected by implementation of Vermont's Acceptable Management Practices.

Rare Species and Unique Natural Communities

The Non-game and Natural Heritage Program of the Vermont Department of Fish & Wildlife makes available information regarding Rare, threatened or endangered species within the state of Vermont. An in-depth flora and fauna survey was not within the scope of this plan. There were no known endangered plants or animals encountered while collecting the data for this plan. That does not mean there are not any, however.
It is possible other rare species and unique natural communities exist. Close adherence to conservation practices discussed in Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont (FPR., 2019.), will help to protect any unknown occurrences.

NATURAL PROCESSES

One of the objectives of sustainable management is to mimic natural processes occurring on both forest and open land. Certain natural processes can be sped up, slowed down, or enhanced through management. Some processes in which nature sets the precedent cannot be "managed" at all. To consider the role these processes play in management activities, it is important to identify and explore the major ones.

Succession

Succession is a process which takes place naturally on any piece of land, be it forest, wetland, open land, or even developed land. The temporal scale on which this is viewed is important. On a geologic time scale processes such as glaciation, global temperature, and plate tectonics all play a role. In the life of an individual, land-use patterns play the biggest role, but natural disturbances, insect and disease infestations, fire, and natural aging processes all contribute to succession. The process of succession heavily influences silvicultural prescriptions and management objectives.

Different tree species are predisposed to grow in certain conditions and in terms of forest succession this is dictated by the amount of sunlight available to the seedling - expressed as a plant's shade tolerance. In general, if allowed to develop naturally, a forest will develop from fast growing, short lived early successional species that generally require full sunlight to develop, such as white birch, aspen and white pine, to slow growing and long lived late successional trees like hemlock, red spruce, sugar maple, beech, and yellow birch that can regenerate in their own shade.

As early successional species develop, shade increases on the forest floor as their crowns spread in the canopy, changing the growing conditions on the ground to favor late successional, more shade tolerant species. Once a forest hits a late successional stage it will remain in that state until there is a disturbance, such as a wind storm, that changes the amount of sunlight hitting the forest floor and thereby bringing it back to an earlier stage of succession. Wildlife habitat and the species that use a particular habitat change as succession progresses. Silvicultural management in part can dictate successional stages by re-allocating sunlight to the forest floor when overstory trees are harvested.

Wetland areas undergo change over time as well. Areas of open water become filled in over long periods of time, a process known as eutrophication. Bogs generally exhibit patterns of zonation: on the fringes they are wooded, there is then a zone of partially decomposed peat, and towards the middle there may be open water. Streams change course over time, forming oxbows and new channels. They also erode deep ravines and change the topography over time.

While every management decision cannot possibly be analyzed on every level, it is important to consider what the possible outcomes might be. Through prudent consideration, management can be designed to achieve a set of desired results, including accelerating or retarding successional trends.

Water & Nutrient Cycling

Water and nutrient cycling is crucial in maintaining the long-term stability of a forested ecosystem. All types of

vegetation, including trees, are involved in nutrient and water cycling. The removal of all trees and other vegetation from a site will lead to less water uptake and thus more runoff and erosion. Increased runoff often leads to the leaching of nutrients in the soil which changes down-stream water chemistry. Many nutrients are sequestered in trees and vegetation. The inevitable result of the removal of vegetation from a site is a loss of some nutrients. Therefore, how water and nutrients are “managed” have important implications for forest productivity.

Most of a tree’s nutrients are concentrated in the leaves, limbs and branches. The bole of the tree has relatively few reserve nutrients. There is some concern that whole-tree harvesting can deplete nutrients from a site because the entire tree is removed. In a thinning situation on productive soils where only a portion of the trees are removed, this is probably not a concern. In clear-cuts, or when whole-tree methods are employed on the same area repeatedly, the potential for nutrient loss can be and must be considered. Soils and sites influence nutrient status and leaching as much as the vegetation. Dry sandy soils or thin soils on high elevations and ridgelines are inherently low in fertility and are prone to rapid leaching.

Adaptation

A plant’s ability to adapt over time helps it to survive in a changing world. Furthermore, the passing of genes from one generation to the next allows the best adapted to thrive. Trees that are expressing themselves well are usually well-adapted to their environment. An example is red spruce’s ability to withstand the harsh growing conditions of the area in which it lives - high elevation and with thin, dry soils. Red spruce has adapted to its environment over thousands of years. Well adapted trees should be encouraged through management decisions favorable to them. While the genetic makeup (genotype) of individual trees or stands of trees is not practical to determine, forest management should encourage trees of superior appearance (phenotype) and high vigor that are free from obvious defects.

Disturbance & Climate Change

All natural systems are prone to disturbance, and forests are no exception. Ice storms, fire, micro-bursts of high winds, hurricanes, floods, long-term weather patterns, and insect and disease outbreaks all affect forests. Approximately 12,000 years ago, New England was covered by ice perhaps a mile thick. When the glacier first retreated, the landscape resembled the arctic tundra. It has changed dramatically since then and is now a fairly complex forest system. More recent disturbances are often responsible for creating a multiple age structure to a natural forest. For example, a small area of blow-down created by a high wind will often regenerate to shade-intolerant species, thereby setting back succession.

As with the majority of forestland in New England this forest saw widespread destruction from the great hurricane

of 1938. It is still possible to see the “pit and mound” structures created when tree roots are pulled from the ground as the trees were blown down. The root ball eventually decays but leaves a mound of soil next to the pit where the roots once were. These pit and mound structures resulting from the ’38 hurricane can be found throughout New England. Vermont sustained some of the highest winds from that storm and as a result lost a record amount of timber and sugarbushes.

The 1938 hurricane and the more recent 1998 ice storm which affected millions of acres of forestland in New England are examples of natural disturbances that had widespread effects. If allowed to recover without human influence, the forest will, over time, grow back usually with a more complex structure than it had before.

A more diverse forest has many more niches for biological development. This increased complexity leads to a wide variety of species. In areas of significant disturbance, the most severely damaged trees will begin to decay and rot. As the dead and dying trees decompose, the abundance of snags will dramatically increase. An increase in wood boring insects will be followed by an increase in woodpeckers and other insectivores that will excavate cavities for other birds and small mammals. As limbs and broken tops of the trees begin to decompose, nutrients will leave the wood and leach into the soil. Some nutrients will be recycled further as the snags begin to fall and decompose. The cycle of the forest is thus a continuum consisting of many inter-relationships.

No discussion about disturbances would be complete without considering human impacts. Human disturbances in recent history have done more to influence the present state of our forests than any natural events. Human disturbances of the forest include clearing, logging, fire, pollution, and the introduction of exotic species. In the 300 years since European settlement, virtually all of the forests in New England have been cut; some areas have been cut more than five times. Much of the land was stumped and used for agricultural purposes. Soils were depleted by a lack of attention to water and nutrient cycling. Intensive development and subsequent paving of former forest land eliminates natural processes for the foreseeable future. Air pollution and climate change pose real threats to our forests. The introduction of chestnut blight and Dutch elm disease essentially extirpated those species from our forests. The introduction of invasive exotic species pose similar threats. Invasive exotic species are a cause of great concern because of their prolific nature and exotic characteristics enable them to vastly out-compete native plants, having a drastic impact on biodiversity.

Adaptive management is necessary when faced with any large-scale disturbance, natural or human-caused. Adaptive management with climate change in mind can help to increase diversity, age classes, and complexity within the forest. Maintaining managed forest as forests can help with carbon sequestration, and make our forests and landscape more resilient to disturbance events and the spread of non-native organisms as the climate warms.

INVASIVE EXOTIC PLANTS

Invasive species are plants that are introduced to a non-native ecosystem and can also cause harm to the environment, economy, or human health. Invasive species are largely spread by human activities. Many species have been introduced intentionally for reasons such as: agriculture, decoration, and land stabilization. Several invasive exotic species have become well established in New England. These include but are not limited to: Asiatic bittersweet, Japanese honeysuckle, multiflora rose, glossy and common buckthorn, and Japanese knotweed.

The characteristics of these plants that makes them such a nuisance, are the very same reasons that some of them were introduced: they are prolific, hardy, produce a large number of seeds, and can out-compete native vegetation. On top of the changes they cause to plant natural communities, they can also cause harm to wildlife than ingests the fruit. Much of the mast produced by these plants is not as nutrient rich as the mast produced by native species. Animals that consume invasive mast over native mast are receiving less nutrients while expending the same amount of energy.

Control of invasive species can be very difficult and costly to a landowner if they have become established. If the population is eradicated, a seed bank is still present in the soil, requiring years of monitoring to control new sprouts. Control techniques vary based on several factors including plant species, location, size of infestation, and landowner preference.

Moretown Town Forest Invasive Species:

Honeysuckle, barberry, and wall lettuce are found on the property. The invasives are found in the open land, and stands 2, 3, and 6. The barberry, where present in the forest, is found as scattered individuals. The wall lettuce in stand 2, and the eastern part of stand 3 ranges from low to high population levels. Invasives in the open land are generally restricted to edges, and hedgerows.

It is strongly recommended that an invasive control plan be implemented. Individual invasive species will be controlled on a case by case basis. Decisions will be based on the plant, plant location, population levels, and planned activity where the invasive species is present.. For more information on invasive species go to: www.vtinvasives.org.

Wall Lettuce	Barberry

WILDLIFE ECOLOGY

Moretown Town Wildlife Habitat Types:

The wildlife habitat on the Moretown Town Forest is primarily forested, with a small amount of open land. The softwood cover on the property provides good wintering habitat for deer and other animals. The beech component in the hardwood areas provides a hard mast source for wildlife. Little browse is present due to a closed canopy throughout much of the forest. The rural setting allows the property to be used for foraging, hunting, and nesting/breeding. Animals that could utilize the Moretown Town Forest are not limited to: moose, deer, bear, coyote, turkey, small predators, song birds, and amphibians.

The open field provides excellent habitat for birds that require open space or use forest edge, as well as quality grazing habitat for deer and foraging for turkeys. The open areas are primarily mowed as grass, so provides very little benefit to nesting birds or small mammals.

The mix of general habitat types here include mixedwood, softwood, and hardwood forest with large trees, edge habitat, and open grassland. Some representative species that one could expect to find here include:

- **Mixed wood forest:** Black-throated Blue Warbler, American Woodcock, Black-throated Green Warbler, Canada Warbler, Yellow Bellied Sapsucker, White-Throated Sparrow, Blue-headed Vireo, Wood Thrush, and Eastern Wood-Pewee in the forested area;
- **Softwood forest:** White-throated Sparrow, Black-throated Green Warbler, Blue-headed Vireo.
- **Hardwood forest:** American Woodcock, Black-throated Blue Warbler, Chestnut-sided Warbler, Eastern Wood-Pewee, Scarlet Tanager, Veery, Wood Thrush, Yellow Bellied Sapsucker;
- **Open grassland/Edge Habitat:** Eastern bluebird, American Kestrel, and Grasshopper Sparrow;

FOREST STRUCTURE and MANAGEMENT APPROACH

Structure and Age Class Distribution

The size and distribution of vegetation layers make up the structure of the forest including vertical spacing and horizontal layers. Vertical spacing is simply the density of individual plants, shrubs and trees. The horizontal layers are usually described in four levels including ground cover, understory, mid-story, and overstory. The ground cover includes herbaceous plants and small woody plants. The understory includes trees seedlings and small saplings and woody shrubs. The mid-story includes pole size trees and tall saplings, topped by the overstory of the largest trees. Often the different horizontal layers with the exception of ground cover are associated with different age classes of trees, but this is not always the case. A slow growing, shade tolerant tree species, such as Eastern hemlock, can remain in the understory for many years biding time until space above is created. Age structure in a forest system can be simple, with one distinct age class called even-aged. Two-aged forests are just as they sound, two distinct age classes. And forests with more complex age structure are called un-even aged.

Understanding forest structure conditions is important for management. It determines the general type of silviculture to be applied and is closely related to biological diversity and wildlife habitat.

Moretown Town Forest Structure and Age Class Distribution:

The structure on the Moretown Town Forest is even-aged. Much of the forest was cleared for agricultural uses prior to being abandoned and reverting back to forestland. Minimal work has been completed on the property since reforestation, resulting in an even-aged structure. Future treatments will aim to move the forest towards an all-aged structure.

Stocking, Timber Quality, and Volumes

Stocking is a term used by foresters to describe the relative density of the trees in a stand. Stands may be under stocked, over stocked, or fully stocked. Stands which are fully stocked have trees which are wholly utilizing the growing space available to them. Volume refers to the quantity of merchantable timber found on the property.

Timber quality specifically relates to the products found in a tree. A poor-quality timber tree may be an excellent quality wildlife tree, and vice versa.

Forest Health

Forest health can affect a forest at a stand wide or individual tree level. Diseases and pests have evolved with their hosts and natural communities. Diseases and pests include diseases, insects, invasive exotic pests, and pollution. Quality forest management should improve the resiliency of forests, and reduce their risk of severe health issues.

Moretown Town Forest Health:

Typical forest health problems can be found in the Moretown Town Forest. None of the health issues present are abnormal or at concerning levels.
Beech bark disease can be found in the hardwood sections of the forest. Beech bark disease is a combination of an invasive insect, *Cryptoccus fagisuga*, and a native fungus, *Nectria coccinea*, that weakens and eventually can kill the tree. Beech trees that show resistance or retain smooth bark should be retained to retain those resistant genes in their seed source.

Damage from the white pine weevil is also present. The white pine weevil targets the bud on the leaded stem in a sapling to pole size pine for laying its eggs, which kills the bud forcing one of the lateral branches to take over as the new leaded. This results in a crooked or multi-stemmed pine. This doesn't affect the health of the tree, but significantly degrades its timber quality. Properly thinning a stand targeting infected trees for removal is often adequate control measures. When working in the pine, trees showing the presence of any of these diseases should be targeted for removal.

The following forest health issues were not noted, but are common to the forest types present:

Red rot is a native disease that causes the interior wood to turn a red color in the beginning stages of decay. Red rot infects many native softwoods. Over time a white pocket of rot forms with that wood eventually dying. In extreme cases of infection this can cause a stem that is almost completely hollow from the butt up. Fruiting bodies of red rot is a conk on the outside of the tree. Management recommendations include removing stems with signs of infection.

The Emerald Ash Borer is the newest and likely most deadly insect recently found in Vermont. This insect has nearly a 100% mortality rate on ash, and will eventually kill all ash stems greater than 4” in diameter. The insect was initially found in February 2018 in the Groton, Plainfield & Orange area. It has since been confirmed in Montpelier and parts of Addison, Bennington, Caledonia, Chittenden, Grand Isle, Orleans, Rutland, Washington,

Windsor Counties. The state has created management recommendations that can be summed up to being prepared to harvest your ash in the near future, or when the insect is located within 20 miles of your property if salvaging economic value is a goal. The Emerald Ash Borer actually moves quite slow on its own natural rate, but can spread very quickly when transported in firewood or logs. Keeping an eye on the spread of this insect can be done at www.vtinvasives.org. Salvage of some merchantable ash should be considered when planning any active management moving forward. Ash in all size classes should be retained to maintain a seed source and try to allow ash to persist on the landscape.

Growth Rates and Allowable Cut

An in-depth growth study was beyond the scope of this management plan; some rules-of-thumb do apply. A tree's growth is directly related to the substrate (soil) on which it is located. Wet, ledgy, and dry areas do not promote rapid growth of trees. Lower elevation and cool moist but well drained areas support better tree growth as the soils are deeper and more fertile. The average woodlot in New England grows at a rate of .42 cords per acre per year. Additionally, the average managed woodlot in Vermont grows at a rate of 2 to 4 percent per year.
Allowable cut is the volume that can be sustainably harvested from a defined area. Typically, allowable cut is equal to or less than growth, and is calculated by multiplying the growth rate times the area times the years between harvest entries.

Moretown Town Forest Growth Rates and Allowable Cut:

It is likely the growth rates on the Moretown Town Forest fall within the average range of 2 to 4 percent per year. The total operable and accessible acreage is 149.4 acres, resulting in a conservative estimate of 62 cords of growth per year. Silviculture will be geared towards creating multiple age classes to support the resilience of the forest, capturing value on mature or over mature trees, removing diseased, damaged and low-quality trees, and overall improving the quality and health of the forest.

Management History

The recent harvest history of individual tracts of land is ideally garnered through records kept by the landowner, but generally this is not the case. Often the past management history is gleaned through field evidence including age and distribution of stumps, existing or historical access infrastructure, and through forest structure.
Much of the land in New England has a similar history when looking back a hundred years or more. Agricultural use peaked in the mid 1800's and declined through the beginning of last century. Around 1900, about 75% of the land in New England was open for agricultural use and only 25% was forested. By the late 1900's the inverse was true, with only 25% open and 75% forested. This means the average overstory tree is likely to be around 80 years old. And the average forest has been cut at least twice in that time period. Assessing the history of harvesting on a piece of land is an important component of management planning.

Moretown Town Forest Management History & Ownership:

The Town of Moretown took ownership of the 173.5 acre property from Burton S. Ward in February of 1928. A conservation easement with the Vermont Land Trust was placed on a portion of the property in 2008. Additional acreage was added into the easement in 2011. In 2015, and potential ownership that the Moretown School District had in the Town Forest was quitclaimed to the Town of Moretown.

Portions of the property were treated in 1993. There has been no recent forestry activity on the property. More specifics can be found below in the Stand Description sections.

Management Approach

Management of the forest will be aimed at increasing the diversity and complexity of the forest with an overarching goal to sequester increasing volumes of carbon over time. Cavity trees, snags, and coarse woody debris will be retained wherever possible and future snags will be recruited during active management. The publication *Restoring Old Growth Characteristics* found here: Restoring Old-Growth Characteristics will be referenced and implemented prior to, and during active management.

OPERATIONAL CONSIDERATIONS

Boundaries and Property Survey

Knowing the location property boundaries is an important step in owning land. The old idiom is true, good fences make good neighbors. Clearly marked boundary lines prevent a multitude of problems, not the least of which is timber trespass, and also provide benefits such as outreach to neighbors visiting areas of your forest you may not otherwise.

Boundary lines may deteriorate beyond recognition if not maintained. Boundary lines should be monumented with permanent blazes which are cut into trees using an ax and then painted with a long-lasting paint. Proper blazing techniques are specific, with rules about location and size of the blaze depending on its location along the line. To protect the historical integrity of a line, new blazes should not be made over old blazes. The blazes should be painted every 10 to 15 years. If monumentation doesn't exist or has been lost over time, a survey may be required to establish the location of the boundary lines. Regular maintenance of your boundary is a worthwhile endeavor.

Moretown Boundary and Survey:

Boundaries in the Moretown Town Forest is comprised of stone walls, barbed wire, blazed lines, and road frontage. Overall boundaries on the property are in fair condition. A portion of the southern line was hard to locate

due to portions of the evidence being removed by the abutter.

It is strongly recommended that the boundaries on the property be clearly marked with flagging and boundary paint during this management cycle. This will help to prevent confusion and/or the need for survey work to be completed in the future.

A survey of the property is on file in the town clerk's office, though it is not an official survey.

Portions of the Moretown Town Forest boundary.

COMPLEMENTARY MANAGEMENT OBJECTIVES

Recreation & Aesthetics

The landowner's recreational and aesthetic uses of their land may significantly drive management activities. For some owners, these uses contribute significantly to how they feel about their land, or may be the primary reason that they own land. Many management activities, if planned carefully, can enhance and complement recreational and aesthetic uses. Logging trails can be upgraded and maintained for use as recreational trails. Forest management can increase aesthetics by leaving mature trees and legacy trees.

Following active management, trails, landings, and truck roads should be closed out in a way that is in line with the landowner's goals. While all of the approaches to aesthetic management take extra time, hence extra cost, it is well worth it in the long run as they conform to owner objectives and good forest stewardship. Monies should be set aside for putting a logging job "to bed". If the logging contractor is required to do this work it should be spelled out beforehand so that the cost can be determined and it is not left for the logger to do as an additional practice.

Moretown Town Forest Recreation & Aesthetics:

The Moretown Town Forest is used for a variety of different uses. The Moretown Elementary school utilizes the open and forestland land for recreation and outdoor classrooms. A memorandum of understanding is in place between the Town of Moretown and the Harwood Unified Union School District for the shared use and maintenance of the property. The tennis courts and recreational fields as well as the trail system are open to the public for their use. The trail system is utilized for hiking, biking, snowshoeing, skiing, wildlife viewing, and hunting.

Future trail construction/maintenance will be located and conducted in such a manner as to not impact sensitive ecological areas, or the Deer Wintering Area. Trail maintenance and future construction is overseen by the Recreation Committee. The Recreation Committee collaborates with the Vermont Mountain Bike Association (VMBA) to help maintain and secure funding for trail maintenance and construction. Ideas for expanded public use will be overseen by the Recreation Committee and Selectboard. All future trail construction will be consistent with the VLT held easement on the property. The public should be given a chance to provide input, and VT Fish & Wildlife should be consulted in regards to potential impacts to wildlife.
In conjunction with active management conducted off of South Hill Road, a small public parking area may be constructed. This is to allow a permanent public parking area on that side of the Town Forest, as parking is currently available along the road or adjacent to the South Hill Cemetery.

Protection of the legacy trees throughout the forest has a high aesthetic and ecological value. The large stems provide wildlife habitat and water quality protection.

Yellow birch snag.

Archaeological & Cultural Attributes

Archeological features give us a glimpse into the past land use. Stonewalls, cellar holes, and old wells are the most common features found on forestland. Cultural attributes may also include the assemblage of plants which are often associated with homesteading. These may include, but are not limited to apple trees, lilacs and white cedar.

Significant cultural resources should be protected during any active management. A 50-foot no cuts buffer and equipment exclusion zones should be maintained where possible. If a stonewall must be crossed, either create a permanent bar-way or be prepared to replace stones after the job has been completed.

Moretown Town Forest Archaeological & Cultural Attributes:

The Moretown Town Forest has several archaeological features. The most prominent is old stone walls that comprise portions of the boundary and are also found in the forestland. A cellar hole and remnants of a maple sugaring arch are found in the eastern portion of the property. Legacy trees are found scattered throughout. These significant features will be protected during management.

Cellar Hole

Stone Wall

FOREST INVENTORY PROCEDURES

A forest inventory is conducted to evaluate the timber types, wildlife and bird habitats, recreational and cultural resources found on the property. The forest inventory is also used to evaluate the stocking and composition of the forest and the volume of the merchantable timber on the woodlot. Data is collected at points established on a systematic grid.

For the cruise a 20-BAF prism was used to sample trees 4.5 inches and larger at each point. The trees which fell within the sample at each point were recorded by species, diameters tallied to the nearest inch, growing stock status, and crown position. The trees were also tallied as sawlogs, pulpwood, or a combination of the two. Information on snags, cavity trees, and regeneration was also collected. Photographs were taken at each point and at other points of interest.

To determine the volume more accurately and make forest management and wildlife habitat recommendations, the property was broken into separate management areas called forest stands. Stands were differentiated from each other primarily on the basis of natural community type and past land use, but soils, tree size, species composition, density and access are also considered. As with any piece of land, there are many micro-stands on

the property (small areas within a larger stand that are distinct, such as a small pocket of rocky ground or a forested seep) but these variations are too subtle to map and too numerous to describe.

Product Specifications:

Sawlog **Hardwoods:** 12” DBH & greater to a 10” top, with two or more clear faces.
Spruce/Fir: 8” DBH & greater to a 5” top, free of excessive defect. Minimum 12’ length.
Pine & Hemlock: 10” DBH & greater to a 8” top, free of excessive defect. Minimum 12’ length.
Cedar: 8” DBH & greater to a 5” top, free of excessive defect. Minimum 12’ length.

Pallet/Tie log **Sugar Maple/Birches:** 9” DBH & greater to a 8” top.
Hardwoods: 12” DBH & greater to a 10” top.
Pine: 10” DBH & greater to a 8” top.

Pulpwood **Hardwood & Softwood:** Hardwood and softwood down to a 4” top. Sound, no more than 50% rot.

The computer program Forest Metrix was used to process the data collected at the sample points to the entire forest. The detailed computer program output is not included as part of this plan but is available, if needed, from Birdseye Forestry Consulting LLC.

Stand type abbreviations often include primary species, size class, and density. Primary species can be generalized in different ways. Often, we used NH, SM, SW, or MW where NH is northern hardwood, SM is sugar maple, SW is softwood, and MW is mixedwood. Size class ranges from 1-4, and stocking level ranges from A-D as defined below:

Size Class:

1: Seedlings or regeneration - 90% of stems < 3" DBH;
2: Saplings or small poles 3” to 8” DBH;
3: Large poles and/or small sawtimber 9” to 12” DBH;
4: Sawtimber 13” DBH and larger.

Stocking:

A: A-Line: This is considered full stocking (the average density of undisturbed stands)
B: B-Line: This is considered the minimum density for maximizing growth while maintaining quality.
C: C-Line: This is considered the minimum stocking of a manageable stand.
D: Below the C-Line level stocking.

Moretown Town Forest Inventory:

A forest inventory was completed in August, 2022. Forest data was collected at points on a systematic grid providing approximately 1 point for every 3.2 acres of forest land. The forestland is delineated as seven different stands.

STAND DATA & DESCRIPTIONS

ACTIVITY SUMMARY

Stand	Forest Type	Acres	Scheduled Activity	Year
1	White Pine-4-B	15.7	Group Selection & Crop Tree Release	2026
2	Mixed Softwood-4-B	13.0	Patch Cut & Thinning	2026
3	Mixedwood-3-B	18.6	Group Selection & Crop Tree Release	2026
4	Mixedwood-2-B	31.2	-	-
5	Hemlock-4-B	15.5	-	-
6	White Pine/Northern Hardwood-3-B	24.8	Group Selection & Crop Tree Release	2026
7	Mixedwood-3-B	30.6	-	-
all			Blaze & paint boundary lines	ASAP
			Forest Review	2028
			Plan Update	2033

Stand 1 White Pine-4-B 15.7 acres (5 pts)




Stand 1 is a well-stocked white pine/hardwood stand.

General Attributes

Natural Community Type: Northern Hardwood Forest

Quadratic Stand Diameter: 13.2”

Trees Per Acre: 137

Total Basal Area/Acre: 130ft^2

AGS Basal Area/Acre: 98ft^2

Stocking Level: Adequately stocked

Structure & Management

Age Class Distribution: Even aged

Target Age Class Distribution: All aged

Stand Age (Current): 80 years

Cutting Cycle: 20 years

Crop Tree Target Diameter: White pine 24”, red maple 16”, all other hardwoods 20”+

Site Characteristics

Access & Operability: The most likely landing spot would be the existing landing in Stand 2. Access and operability are good throughout the stand. Operability is limited in some areas due to poorly drained soils. Skids will be short in length, generally flat or downhill.

Access Distance: 1,100’

Terrain: Gentle slopes, eastern aspect.

Water Resources: Seeps

Forest Health: White pine blister rust

Invasive Species: Wall lettuce

Recreation Features: Maintain skid trails for use for walking, wildlife viewing and hunting.

Aesthetic Features: Legacy trees and exposed ledge.

Wildlife Habitat: Apple tree release, promote down logs and standing snags. Release areas of desirable regeneration to increase browse and cover.

Easement Status: Uneased

Management Objectives

This stand will be managed for high quality forest products, aesthetics, and wildlife habitat. High quality white pine, red maple, and tolerant hardwoods will be favored for retention. Uneven-age techniques will be used to promote and maintain a balanced distribution of multiple age classes while encouraging the establishment and growth of desirable regeneration.

Stand Description: Stand 1 is comprised of 15.7 acres of white pine and northern hardwood stocking. White pine

comprises 57% of the basal area. The white pine present is generally well-formed and vigorous. The white pine component is generally mature. The red maple component of the stand is generally lower quality. Some stems are multi-stemmed, while others are poorly formed and suppressed. Apple trees are found scattered throughout the stand, remnants of when the stand was agricultural land. Hardwood regeneration is variable, but generally understocked in the stand. The understory is comprised primarily by interrupted and hayscented ferns, along with other herbaceous species. White spruce and hemlock are present as minor associated species. The white spruce is likely remnants of a plantation.

Stand History: The stand was last harvested in 1993. Smooth micro topography and stone walls along the southern boundary line suggest the area was utilized as hay or crop land prior to being abandoned and reverting back to forestland.

Scheduled Treatment: 2026

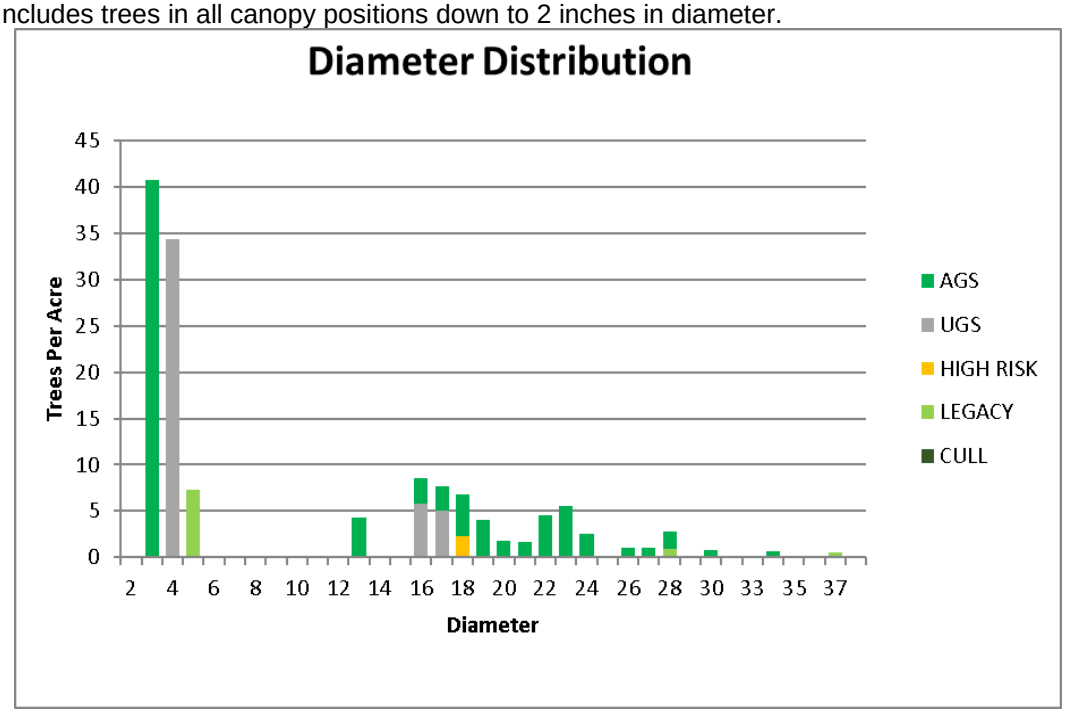
- **Group Selection & Crop Tree Release**: A group selection and crop tree release harvest will begin to move the stand towards an all-aged structure. Groups will range in size up to 1 acre, and be placed in areas with lower quality hardwood overstory, or where acceptable regeneration is absent. Groups will cover 20% of the stand area (3 acres). Between groups, crop tree release will aim to retain the highest quality and most-vigorous white pine and northern hardwood stems. There should be 50-60 crop trees per acre, depending on the overall quality in particular areas. Crop trees should have their crowns released on 2-3 sides. Residual basal area will be 90-100 square feet per acre.
- **Apple Tree Release**: All apple trees within the stand will be released by harvesting all stems within 30’ of the apple tree. Extreme care will be taken to protect the stem and root system.

STAND 1 TABLES AND GRAPHS

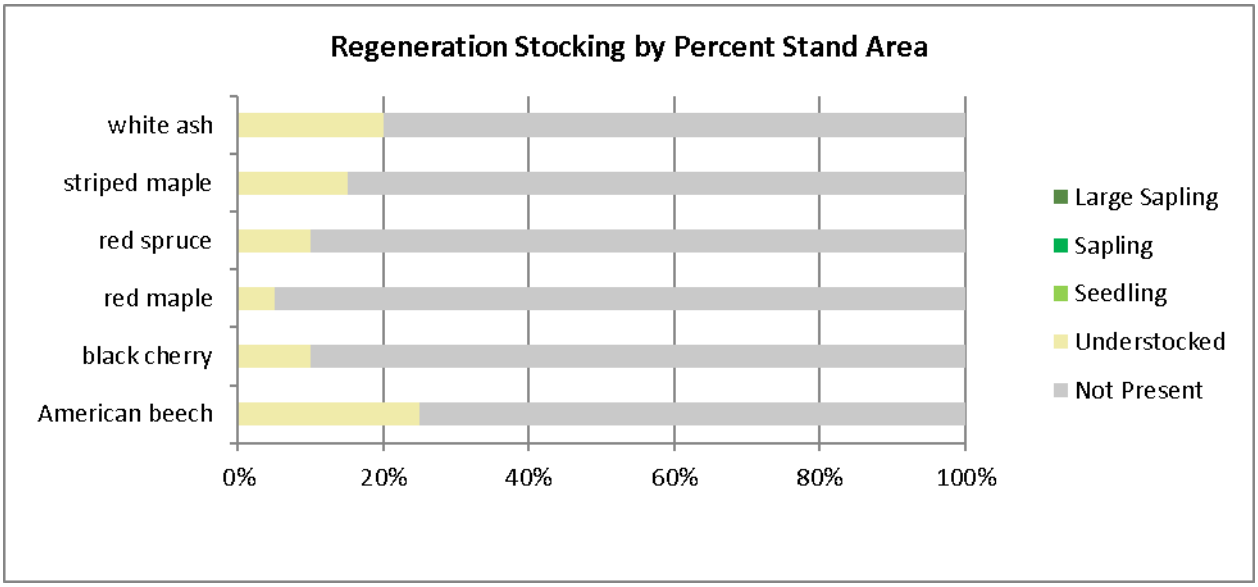
Species	% BA	% TPA	Veneer (BF)	Sawlog (BF)	Tielog (BF)	Pulp (Cords)	Growing Stock (Cords)	Cull (Cords)	Total Volume in Cords	High Risk	% AGS Saw
red maple	28.8%	37.9%	-	2,361	470	5	0	-	11	455	14.9 %
apple	0.8%	11.9%	-	-	-	-	-	0	0		0.0%
Hardwood Total	29.6%	49.8%	-	2,361	470	5	0	0	11	455	14.9 %
Eastern white pine	57.6%	35.8%	-	11,131	1,477	7	-	-	32		78.8 %
white spruce	6.4%	9.3%	-	-	-	2	-	-	2		0.0%
Eastern hemlock	6.4%	5.2%	-	559	-	1	-	-	2		3.5%
Softwood Total	70.4%	50.2%	-	11,690	1,477	9	-	-	36		82.3 %
Volume Per Acre	100.0 %	100.0 %	-	14,051	1,947	15	0	0	47	455	97.2 %
Stand Volume			-	220,598	30,564	229	3	1	736	7,141	

Table 1.1: Forest Composition and Volume.

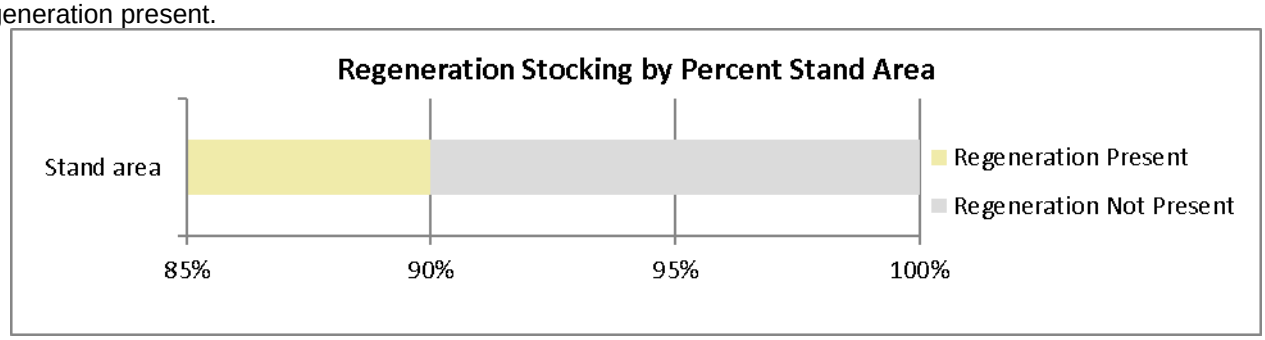
Graph 1.1: Diameter distribution showing trees per acre on the Y axis, diameter class on the X axis and tree condition. Includes trees in all canopy positions down to 2 inches in diameter.



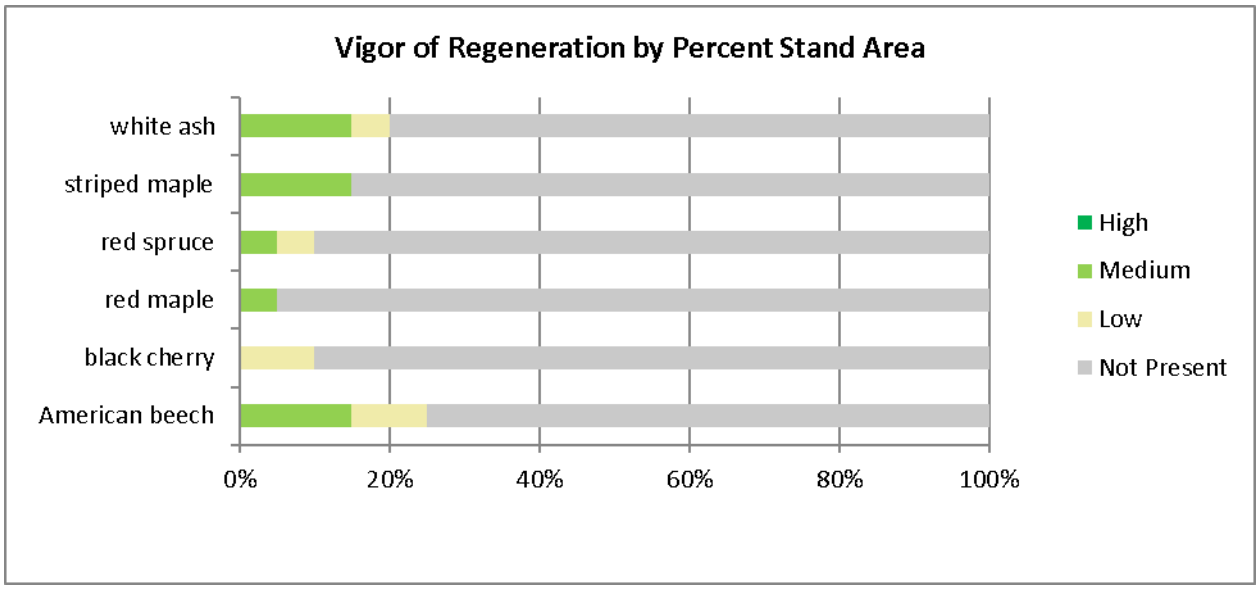
Graph 1.2: Tree and shrub species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less than 3 feet tall (Seedling). If a species is present but does not meet one of these conditions, it is recorded as present but not stocked.



Graph 1.3: Percent of stand area with regeneration present in any category, versus percent of stand area with no regeneration present.



Graph 1.4: Vigor of regeneration and shrub species.



Graph 1.5: Browse level of regeneration and shrub species.

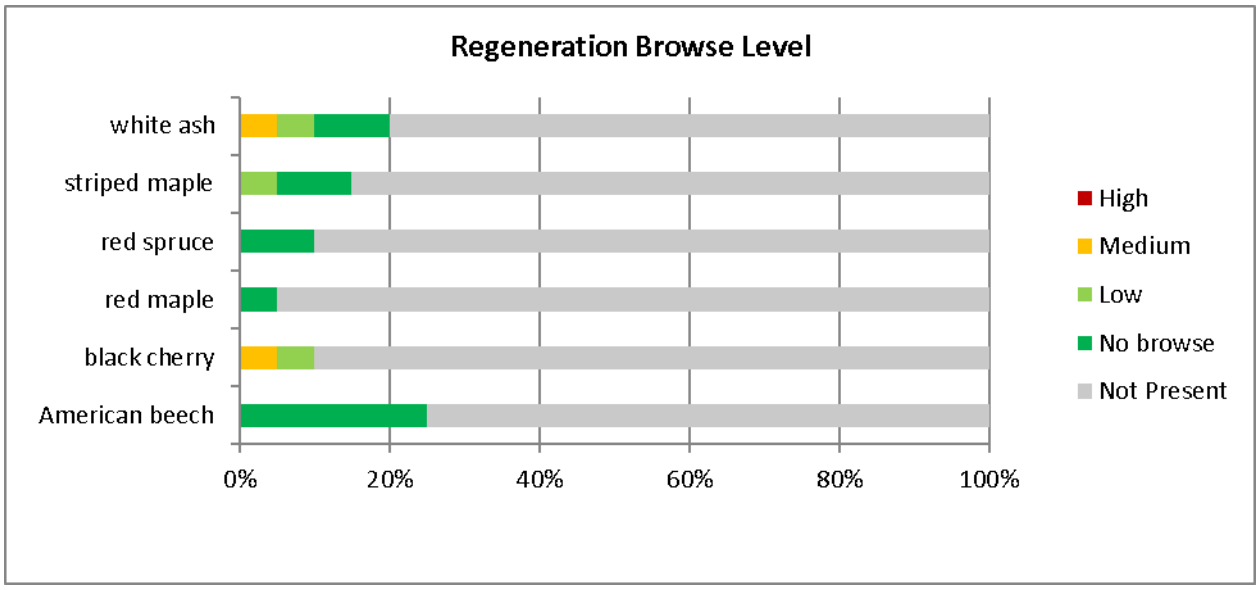


Table 1.2: Snags per acre by size and decay class.

DBH Group	Sound	Moderately Punky	Punky Throughout	Stand Total
<12"	-	-	-	-
12-18"	-	-	-	-
>18"	-	0.6	-	0.6
Stand Total	-	0.6	-	0.6

Table 1.3: Down logs per acre by size and decay class.

DBH Group	Sound	Moderately Punky	Punky Throughout	Stand Total
<12"	-	-	-	-
12-18"	7.2	3.6	12.7	23.5
>18"	3.2	-	-	3.2
Stand Total	10.3	3.6	12.7	26.7

Table 1.4: Cavity Trees per acre by size and decay class.

DBH Group	Large	Medium	Small	Stand Total
<12"	-	-	-	-
12-18"	-	-	5.1	5.1
>18"	-	-	-	-
Stand Total	-	-	5.1	5.1

Stand 2 Mixed Softwood-4-B 13.0 acres (4 pts)

Stand 2 is a fully-stocked softwood stand.

General Attributes

Natural Community Type: Northern Hardwood Forest

Quadratic Stand Diameter: 12.8”

Trees Per Acre: 198

Total Basal Area/Acre: 178ft^2

AGS Basal Area/Acre: 170ft^2

Stocking Level: Adequately stocked.

Structure & Management

Age Class Distribution: Even aged

Target Age Class Distribution: Even aged

Stand Age (Current): 60 years

Cutting Cycle: 20 years

Crop Tree Target Diameter: White pine 24”, spruce/fir 14”, red pine 14”, all hardwoods 20”+

Site Characteristics

Access & Operability: The existing landing in the eastern portion of the stand will be utilized for future harvests. Access and operability are good throughout the stand. Skids will be short in length, generally flat or downhill.

Access Distance: 900’

Terrain: Gentle slopes, eastern aspect.

Water Resources: N/A

Forest Health: Minor white pine weevil damage, white spruce decline.

Invasive Species: Wall lettuce.

Recreation Features: Maintain skid trails for use for walking, wildlife viewing and hunting.

Aesthetic Features: Legacy trees.

Wildlife Habitat: Promote black cherry mast trees, down logs and standing snags. Release areas of desirable regeneration to increase browse and cover.

Easement Status: VLT Easement & partially uneased

Management Objectives

This stand will be managed for high quality forest products, aesthetics, and wildlife habitat. High quality white pine, Norway spruce, and northern hardwoods will be favored for retention. Even-age techniques will be used to grow the current cohort to maturity, and regenerate the stand to desirable species.

Stand Description: Stand 2 is an area comprised of mixed softwood plantations and areas that have naturally regenerated to northern hardwoods. The three species in the plantations are white pine, Norway spruce, and red pine. White spruce was also planted in the eastern portion of the stand, but has mostly senesced. A few living

stems are present, though in severe decline. The other three planted species-white pine, red pine, and Norway spruce have all grown into well-formed stems. Outside of the plantation areas, black cherry, red maple, and other northern hardwoods are present as minor associates, though only black cherry was tabulated during the field inventory. The understory is variably stocked. Areas with a closed softwood canopy have little regeneration present, and are dominated by hayscented fern. Areas with small canopy gaps are comprised by hardwood and softwood sapling, sensitive and hayscented ferns, and herbaceous species. Remnants of a cellar hole are found in the southwestern corner of the stand.

Stand History: The stand was last harvested in 1993. The softwood plantations were planted in the early to mid-1960's. The stand was open land when the 1962 aerial photo was taken. Smooth micro topography in the stand and the presence of a homestead suggest that the area was used as hay or crop land.

Scheduled Treatment: 2026

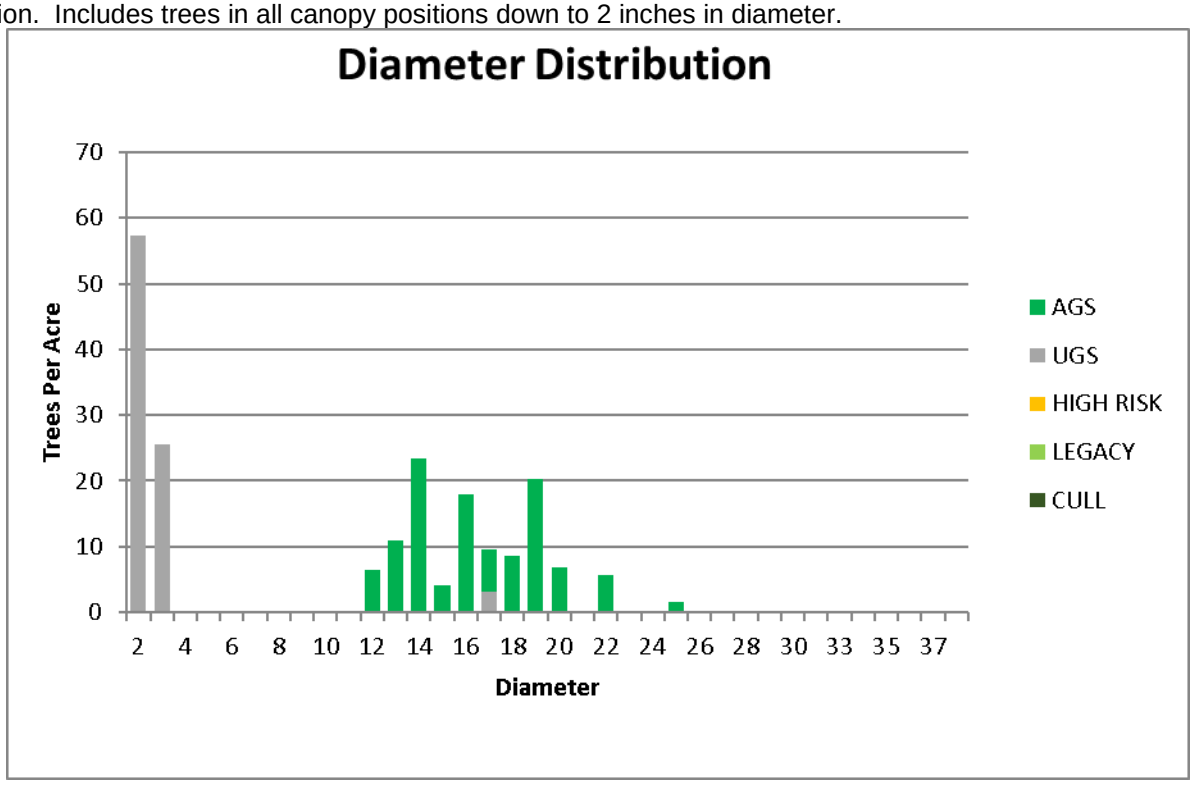
- **Patch Cut:** The Norway spruce component of the stand is mature and should be removed. The species has performed very well on the site, and the area should be regenerated to allow native species to become established. Norway spruce occupies approximately 1.7 acres of the stand area. All Norway spruce stems should be removed. Native hardwoods and softwoods will be retained for structure and a seed source. Extreme care will be taken to protect established desirable regeneration where present. This may include cutting 'bumper stumps' to protect young growth. Outside of operational restrictions, snag and cavity trees will be retained for wildlife. This area could be potentially re-planted as a community project with American Chestnuts or other mast producing species for the benefit of wildlife.
- **Thinning**: The white and red pine portions of the stand should receive an improvement thinning. The thinning will focus on removing unacceptable stems. Target species for removal will be white pine with white pine weevil damage, and unacceptable red pine. Incidental red maple of low-quality will also be removed to release high-quality and vigorous white pine, red pine, and northern hardwoods. Residual basal area in treated areas will be 90-100 square feet per acre.

STAND 2 TABLES AND GRAPHS

Species	% BA	% TPA	Veneer (BF)	Sawlog (BF)	Tielog (BF)	Pulp (Cords)	Growing Stock (Cords)	Cull (Cords)	Total Volume in Cords	High Risk	% AGS Saw
black cherry	2.9%	2.8%	-	710	-	0	-	-	2	-	2.5%
Hardwood Total	2.9%	2.8%	-	710	-	0	-	-	2	-	2.5%
Eastern white pine	41.2%	33.9%	-	9,601	1,095	5	-	-	27	-	35.7%
red pine	29.4%	38.3%	-	8,373	-	-	-	-	17	-	29.9%
Norway spruce	26.5%	24.9%	-	8,236	-	1	-	-	17	-	29.4%
Softwood Total	97.1%	97.2%	-	26,211	1,095	6	-	-	61	-	95.0%
Volume Per Acre	100.0%	100.0%	-	26,921	1,095	7	-	-	63	-	97.5%
Stand Volume			-	349,970	14,232	85	-	-	813	-	

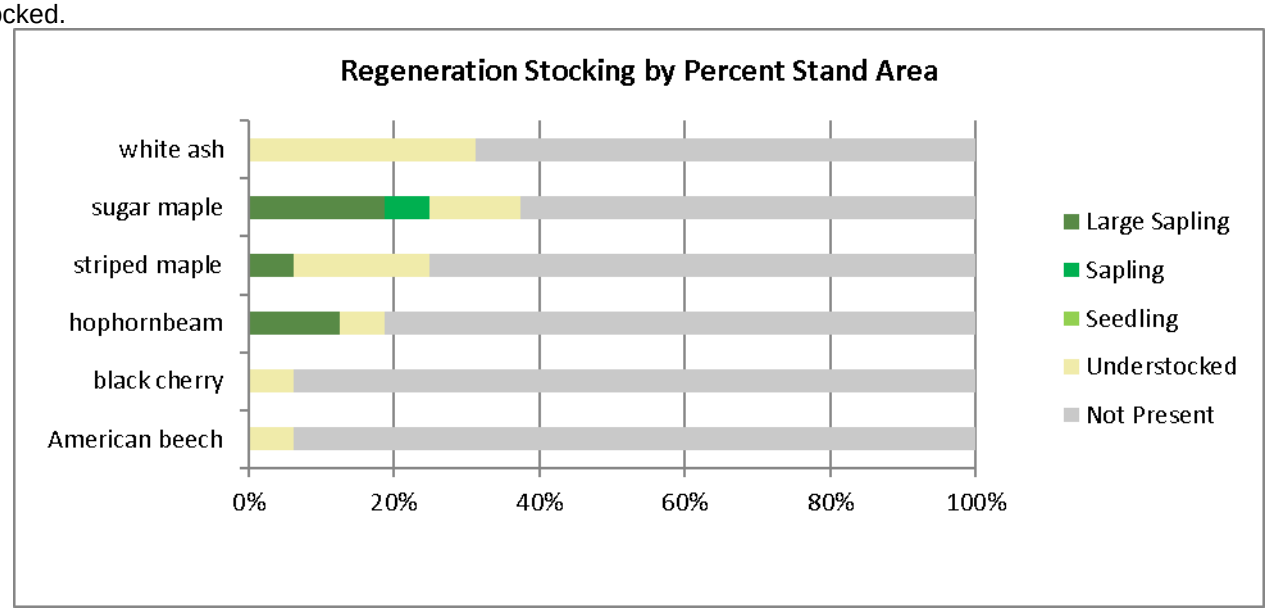
Table 2.1: Forest Composition and Volume.

Graph 2.1: Diameter distribution showing trees per acre on the Y axis, diameter class on the X axis and tree condition. Includes trees in all canopy positions down to 2 inches in diameter.

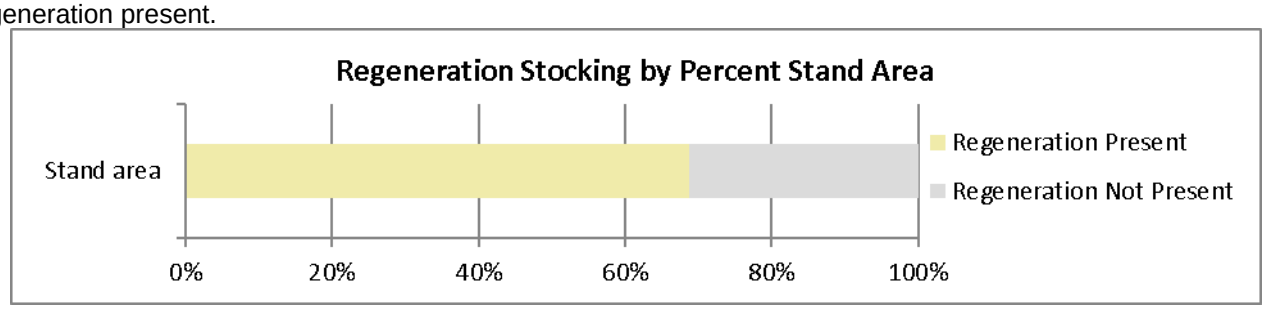


Graph 2.2: Tree and shrub species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and

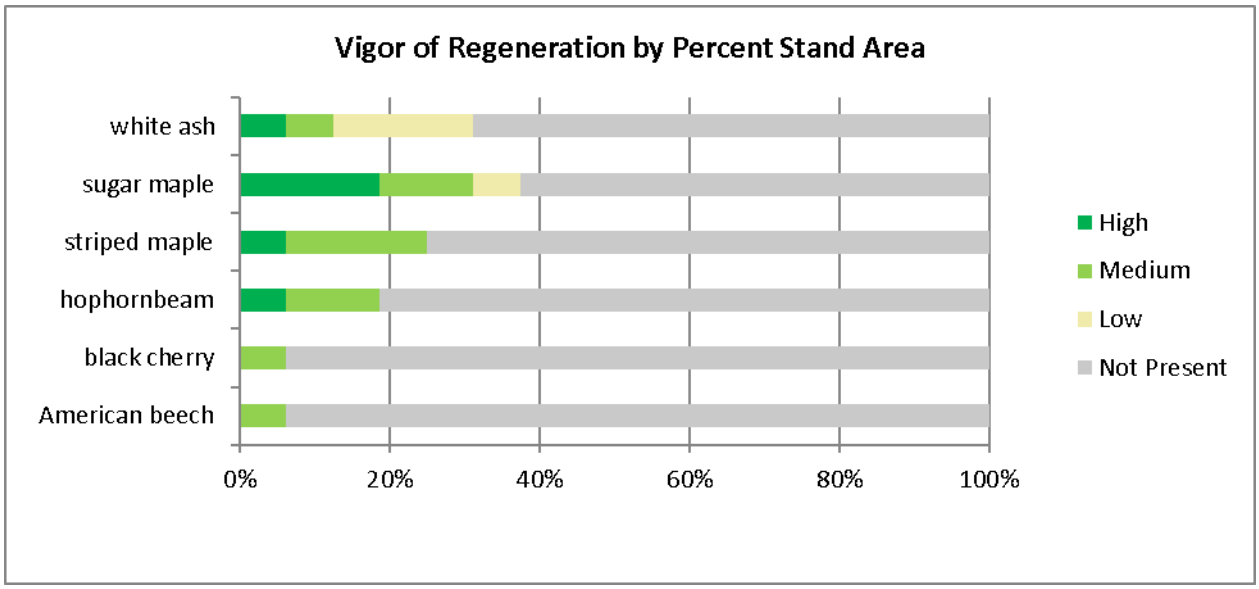
1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less than 3 feet tall (Seedling). If a species is present but does not meet one of these conditions, it is recorded as present but not stocked.



Graph 2.3: Percent of stand area with regeneration present in any category, versus percent of stand area with no regeneration present.



Graph 2.4: Vigor of regeneration and shrub species.



Graph 2.5: Browse level of regeneration and shrub species.

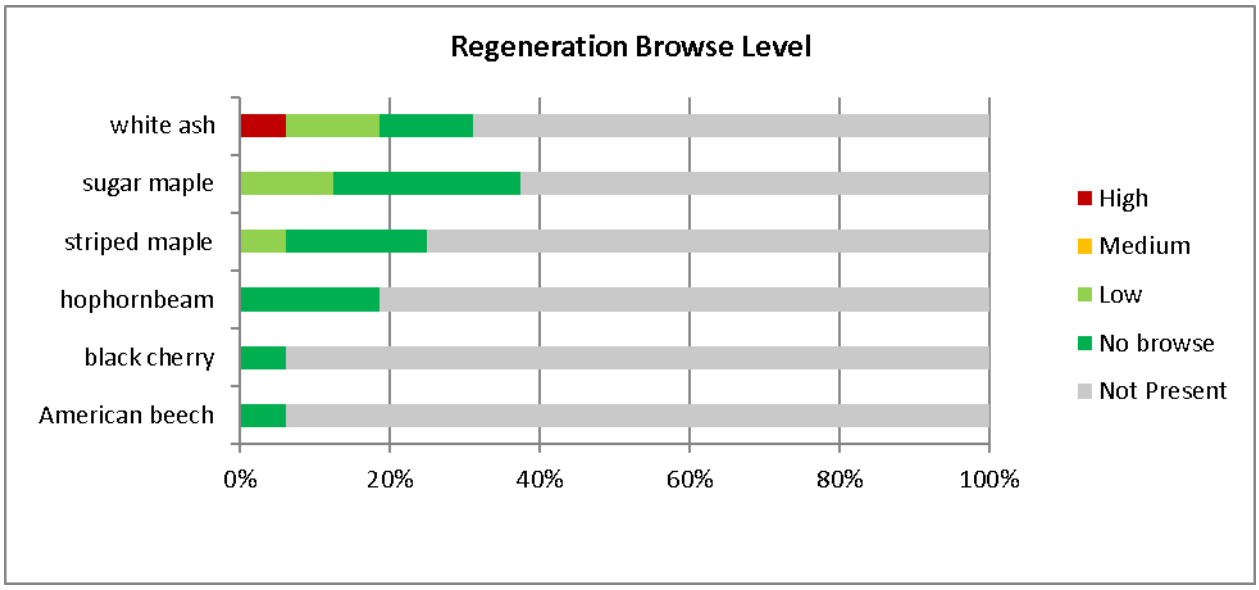


Table 2.2: Snags per acre by size and decay class.

DBH Group	Sound	Moderately Punky	Punky Throughout	Stand Total
<12"	-	7.6	-	7.6
12-18"	-	3.6	-	3.6
>18"	2.5	-	-	2.5
Stand Total	2.5	11.2	-	13.7

Table 2.3: Down logs per acre by size and decay class.

DBH Group	Sound	Moderately Punky	Punky Throughout	Stand Total
<12"	-	-	57.3	57.3
12-18"	-	4.7	-	4.7
>18"	-	-	-	-
Stand Total	-	4.7	57.3	62.0

Stand 3 Mixedwood-3-B 18.6 acres (5 pts)




Stand 3 is a variably stocked mixedwood stand.

General Attributes

Natural Community Type: Northern Hardwood Forest

Quadratic Stand Diameter: 9.6”

Trees Per Acre: 306

Total Basal Area/Acre: 154ft^2

AGS Basal Area/Acre: 125ft^2

Stocking Level: Adequately stocked.

Structure & Management

Age Class Distribution: Even aged

Target Age Class Distribution: All aged

Stand Age (Current): 90 years

Cutting Cycle: 20 years

Crop Tree Target Diameter: Red maple 16”, red spruce 14”, hemlock 20”, all other hardwoods 20”+

Site Characteristics

Access & Operability: The existing landing in Stand 2 will be utilized for future harvests. Access and operability are good and generally not limited in the stand. Skids will be short in length, generally flat or downhill. Gentle uphill pulling will be required from the western portion of the stand.

Access Distance: 1,500’

Terrain: Gentle slopes, flat and eastern aspect.

Water Resources: N/A

Forest Health: N/A

Invasive Species: N/A

Recreation Features: Maintain skid trails for use for walking, wildlife viewing and hunting.

Aesthetic Features: Legacy trees and exposed ledge. Remnants of a sugaring arch.

Wildlife Habitat: Promote hophornbeam and black cherry mast trees, down logs and standing snags. Release areas of desirable regeneration to increase browse and cover.

Easement Status: VLT Easement & partially uneased

Management Objectives

This stand will be managed for high quality forest products, aesthetics, and wildlife habitat. High quality red spruce, red maple, hemlock, and sugar maple will be favored for retention. Uneven-age techniques will be used to promote and maintain a balanced distribution of multiple age classes while encouraging the establishment and growth of desirable regeneration.

Stand Description: Stand 3 is comprised of 18.6 acres of mixedwood forest. Red maple, red spruce, and

hemlock comprise almost 80% of the basal area in the stand. Small ridges of exposed ledge are found in the center of the stand at the height of land. Quality is variable. The red spruce, hemlock, and more tolerant hardwoods are generally well-formed. The red maple in the stand is generally lower quality. Multi-stemmed stems, defects, and over mature stems are common. Small poorly drained areas are found in the western portion of the stand. The understory is variably stocked. Areas with a closed softwood canopy have little present in the understory. Small wet areas are dominated by sensitive fern, other areas are comprised by hardwood regeneration, interrupted and hayscented fern, and herbaceous species. Remnants of a farm dump are found in the northern portion of the stand.

Stand History: The eastern portion of the stand received an intermediate treatment in 1993.

Scheduled Treatment: 2026

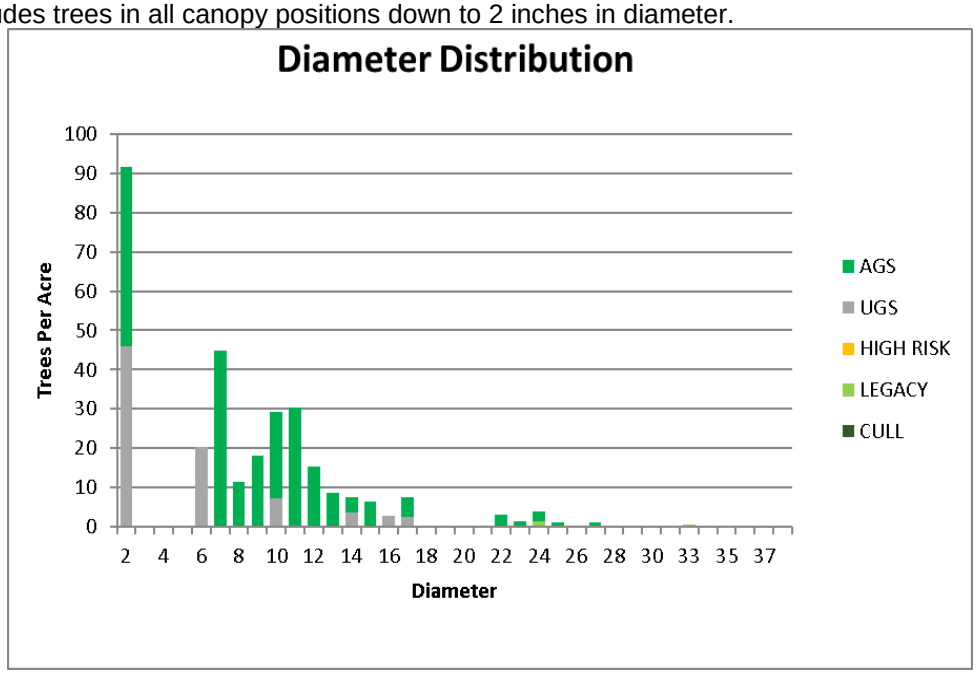
- **Group Selection & Crop Tree Release:** A Group selection harvest will target unacceptable and over mature red maple stems for removal while beginning to move the stand towards an all-aged structure. Groups should be placed in areas where the canopy is comprised primarily by unacceptable stems. Groups will range in size up to 1 acre, and cover 20% of the stand area (3.7 acres). Between groups, crop tree release will release the highest quality and most vigorous stems. High quality red spruce, hemlock, red maple, and other northern hardwoods are the target species for retention. Low-quality and over mature red maple will be targeted for removal. Residual basal area in treated areas will be 90-100 square feet per acre.

STAND 3 TABLES AND GRAPHS

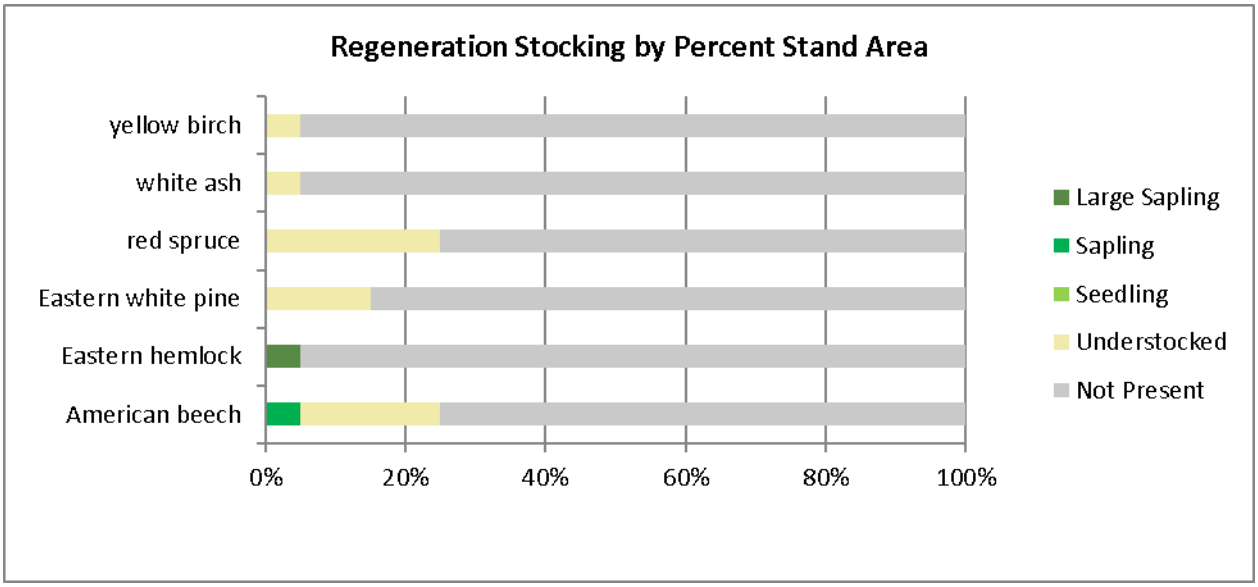
Species	% BA	% TPA	Veneer (BF)	Sawlog (BF)	Tielog (BF)	Pulp (Cords)	Growing Stock (Cords)	Cull (Cords)	Total Volume in Cords	High Risk	% AGS Saw
red maple	36.8%	29.3%	-	2,289	742	6	3	-	15	-	26.7%
sugar maple	7.9%	3.6%	-	-	322	2	-	-	3	-	2.8%
white ash	5.3%	7.6%	-	605	-	0	1	-	2	-	5.3%
hophornbeam	2.6%	9.5%	-	-	-	0	-	-	0	-	0.0%
black cherry	2.6%	2.8%	-	-	-	0	1	-	1	-	0.0%
Hardwood Total	55.3%	52.9%	-	2,894	1,064	9	4	-	21	-	34.8%
red spruce	28.9%	39.8%	-	4,784	-	0	-	-	10	-	42.1%
Eastern hemlock	13.2%	6.8%	-	1,892	-	2	1	-	6	-	13.8%
Eastern white pine	2.6%	0.5%	-	734	-	0	-	-	2	-	6.5%
Softwood Total	44.7%	47.1%	-	7,411	-	2	1	-	18	-	62.3%
Volume Per Acre	100.0%	100.0%	-	10,305	1,064	12	4	-	39	-	97.1%
Stand Volume			-	191,669	19,784	219	78	-	720	-	

Table 3.1: Forest Composition and Volume.

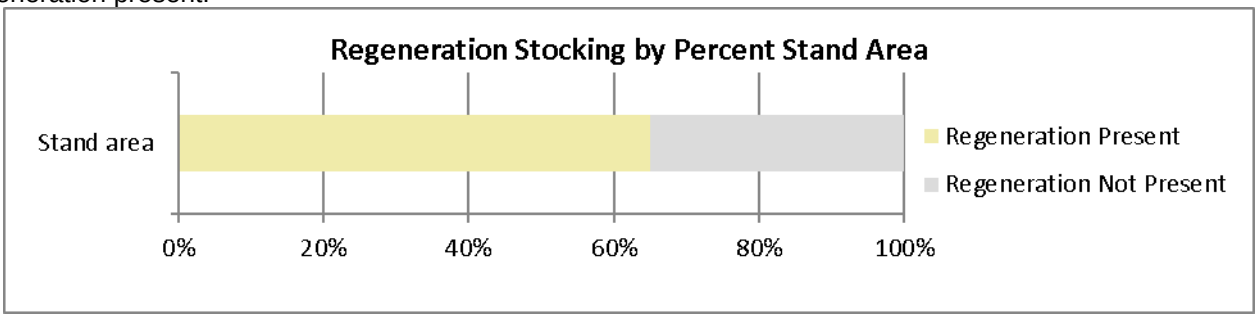
Graph 3.1: Diameter distribution showing trees per acre on the Y axis, diameter class on the X axis and tree condition. Includes trees in all canopy positions down to 2 inches in diameter.



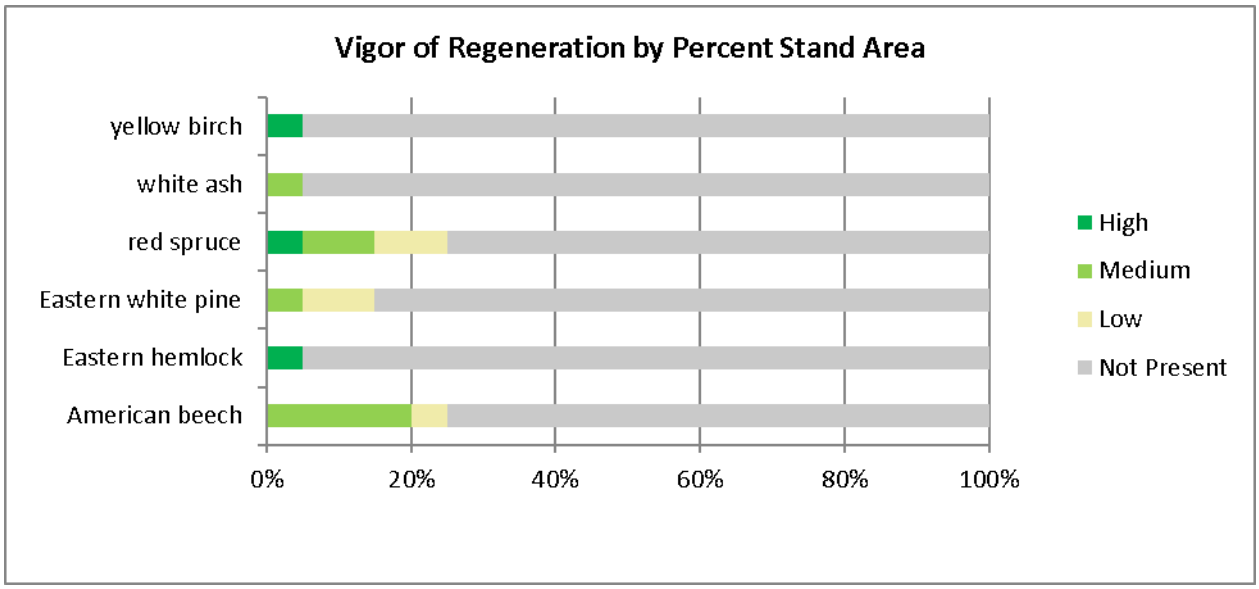
Graph 3.2: Tree and shrub species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less than 3 feet tall (Seedling). If a species is present but does not meet one of these conditions, it is recorded as present but not stocked.



Graph 3.3: Percent of stand area with regeneration present in any category, versus percent of stand area with no regeneration present.



Graph 3.4: Vigor of regeneration and shrub species.



Graph 3.5: Browse level of regeneration and shrub species.

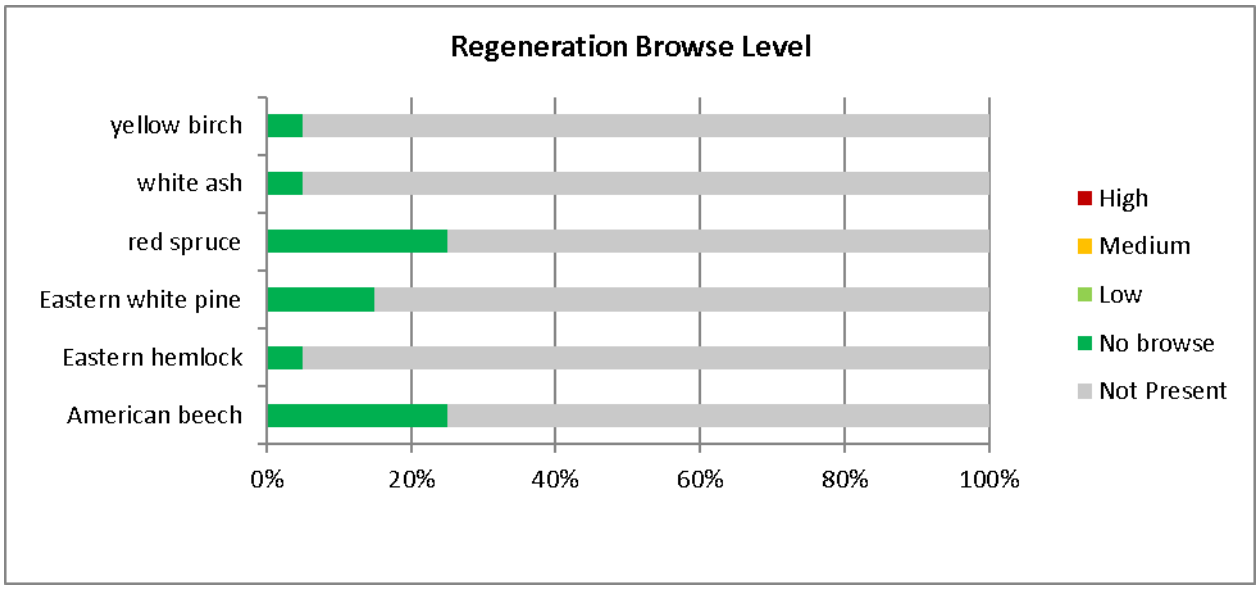


Table 3.2: Snags per acre by size and decay class.

DBH Group	Sound	Moderately Punky	Punky Throughout	Stand Total
<12"	-	-	-	-
12-18"	-	6.1	-	6.1
>18"	-	-	-	-
Stand Total	-	6.1	-	6.1

Table 3.3: Down logs per acre by size and decay class.

DBH Group	Sound	Moderately Punky	Punky Throughout	Stand Total
<12"	-	-	165.6	165.6
12-18"	-	-	-	-
>18"	-	-	2.3	2.3
Stand Total	-	-	167.9	167.9

Table 3.4: Cavity Trees per acre by size and decay class.

DBH Group	Large	Medium	Small	Stand Total
<12"	-	-	-	-
12-18"	-	-	3.3	3.3
>18"	0.7	-	-	0.7
Stand Total	0.7	-	3.3	4.0

Stand 4 Mixedwood-2-B 31.2 acres (9 pts)




Stand 4 is a well-stocked northern hardwood and hemlock stand.

General Attributes

Natural Community Type: Hemlock-Northern Hardwood Forest

Quadratic Stand Diameter: 8.4”

Trees Per Acre: 363

Total Basal Area/Acre: 138ft^2

AGS Basal Area/Acre: 106ft^2

Stocking Level: Adequately stocked

Structure & Management

Age Class Distribution: Even aged

Target Age Class Distribution: All aged

Stand Age (Current): 90-100 years

Cutting Cycle: 20 years

Crop Tree Target Diameter: Hemlock 20”, paper birch 16”, all other hardwoods 20”+

Site Characteristics

Access & Operability: Future treatments could utilize the existing landing in stand 2. Access and are limited in the portions of the stand due to exposed ledge. Skids will be moderate to long in length, with uphill pulling required.

Access Distance: 4,800’

Terrain: Gentle to steep slopes with exposed ledge.

Water Resources: N/A

Forest Health: Beech bark disease

Invasive Species: N/A

Recreation Features: Maintain skid trails for use for walking, wildlife viewing and hunting.

Aesthetic Features: Legacy trees and exposed ledge.

Wildlife Habitat: Promote healthy beech mast trees, down logs and standing snags. Release areas of desirable regeneration to increase browse and cover.

Easement Status: VLT easement

Management Objectives

This stand will be managed for high quality forest products, aesthetics, and wildlife habitat. High quality sugar maple, hemlock, and yellow birch will be favored for retention. Uneven-age techniques will be used to promote and maintain a balanced distribution of multiple age classes while encouraging the establishment and growth of desirable regeneration.

Stand Description: Stand 4 is comprised of 31.2 acres of northern hardwood and hemlock forest. The stand lies

in the southern portion of the property in a long ‘dogleg’ that runs to the south. Gentle slopes throughout the stand are interspersed with small bands of exposed ledge and steep slopes. Portions of the stand have enriched soils. Rich-site indicator species such as blue cohosh and Christmas Fern were noted in these areas. The beech component of the stand is infected with beech bark disease, and is in severe decline. Quality in the sugar maple, hemlock, and yellow birch component of the stand is generally good to very good. The understory is variably stocked and comprised by northern hardwood saplings and poles, hayscented fern, and herbaceous species.

Stand History: The stand has not received any recent activity.

Scheduled Treatment: None

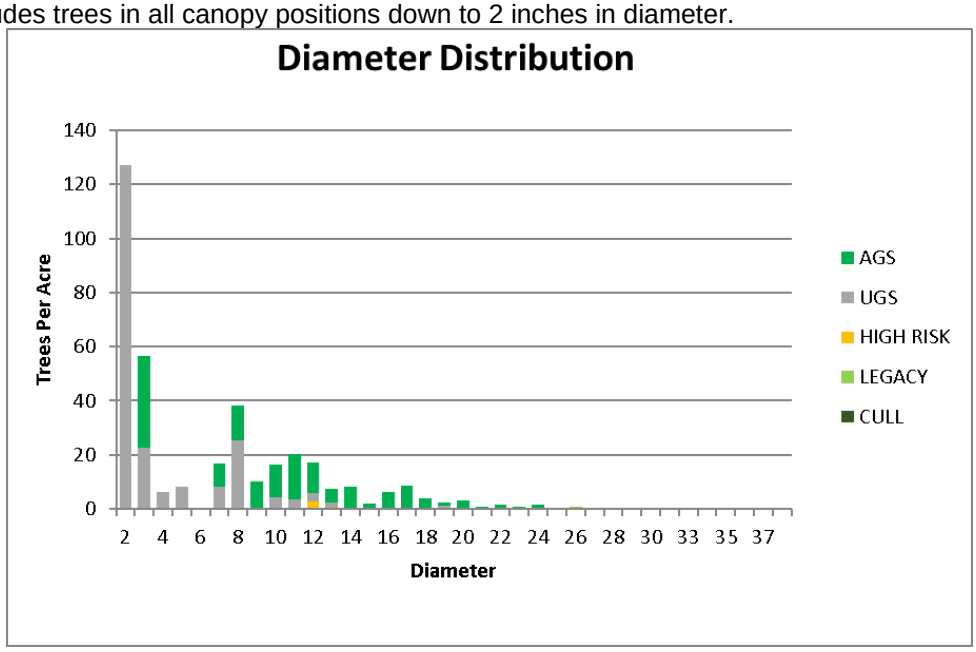
- **Deferment:** This stand should be allowed to develop further prior to any treatment being necessary. Re-evaluated and updated during the next ten year management cycle.

STAND 4 TABLES AND GRAPHS

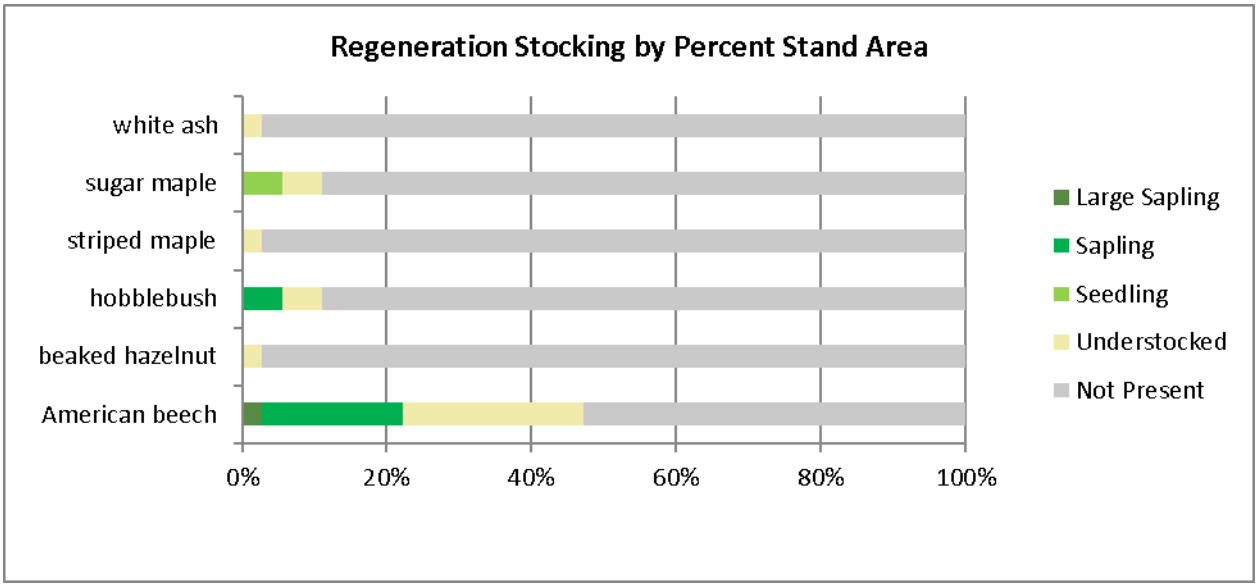
Species	% BA	% TPA	Veneer (BF)	Sawlog (BF)	Tielog (BF)	Pulp (Cords)	Growing Stock (Cords)	Cull (Cords)	Total Volume in Cords	High Risk	% AGS Saw
sugar maple	38.7%	33.6%	-	3,755	326	4	2	-	15		40.0%
yellow birch	10.1%	12.9%	-	453	188	0	1	-	2		6.6%
American beech	5.5%	11.6%	-	-	-	1	-	-	1		0.0%
paper birch	5.0%	4.9%	-	402	61	0	0	-	2		4.8%
hophornbeam	3.8%	10.8%	-	-	-	0	-	-	0		0.0%
white ash	3.4%	2.1%	-	395	-	0	0	-	1		4.1%
red maple	1.7%	0.8%	-	252	-	0	-	-	1		2.6%
Hardwood Total	68.1%	76.8%	-	5,257	575	7	4	-	22		58.1%
Eastern hemlock	31.9%	23.2%	-	3,869	-	3	0	-	11	166	35.4%
Softwood Total	31.9%	23.2%	-	3,869	-	3	0	-	11	166	35.4%
Volume Per Acre	100.0%	100.0%	-	9,126	575	10	4	-	34	166	93.5%
Stand Volume			-	284,735	17,943	312	136	-	1,054	5,171	

Table 4.1: Forest Composition and Volume.

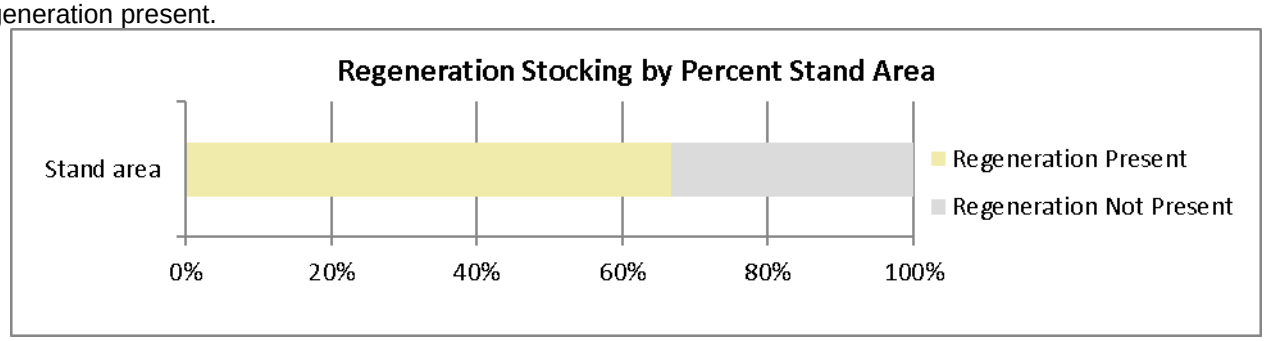
Graph 4.1: Diameter distribution showing trees per acre on the Y axis, diameter class on the X axis and tree condition. Includes trees in all canopy positions down to 2 inches in diameter.



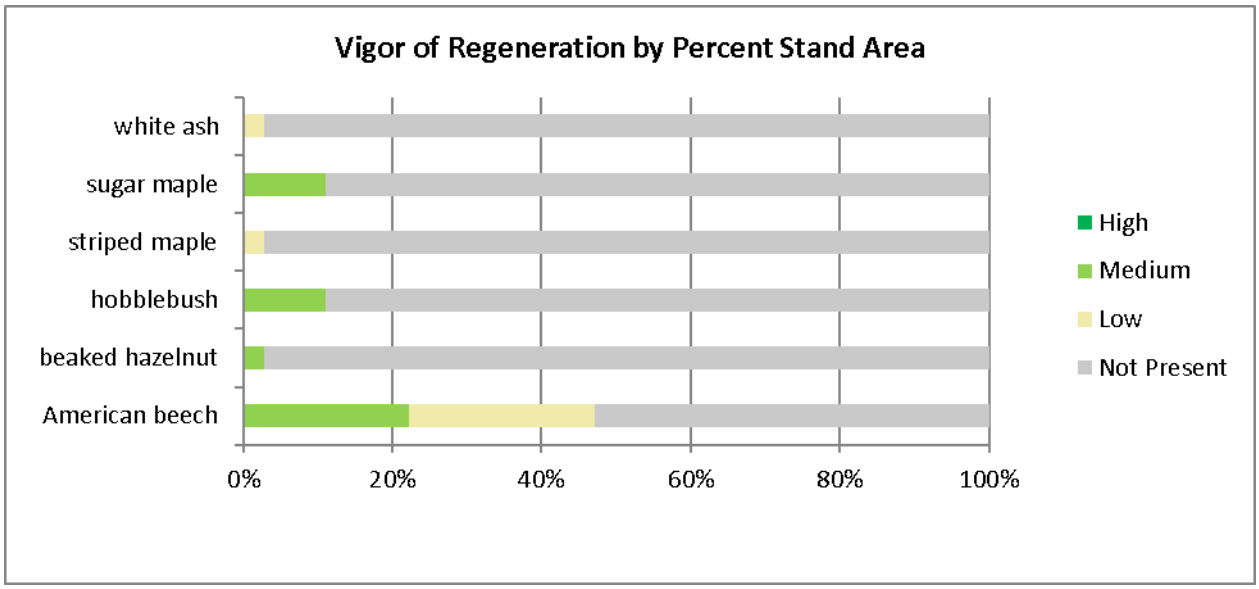
Graph 4.2: Tree and shrub species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less than 3 feet tall (Seedling). If a species is present but does not meet one of these conditions, it is recorded as present but not stocked.



Graph 4.3: Percent of stand area with regeneration present in any category, versus percent of stand area with no regeneration present.



Graph 4.4: Vigor of regeneration and shrub species.



Graph 4.5: Browse level of regeneration and shrub species.

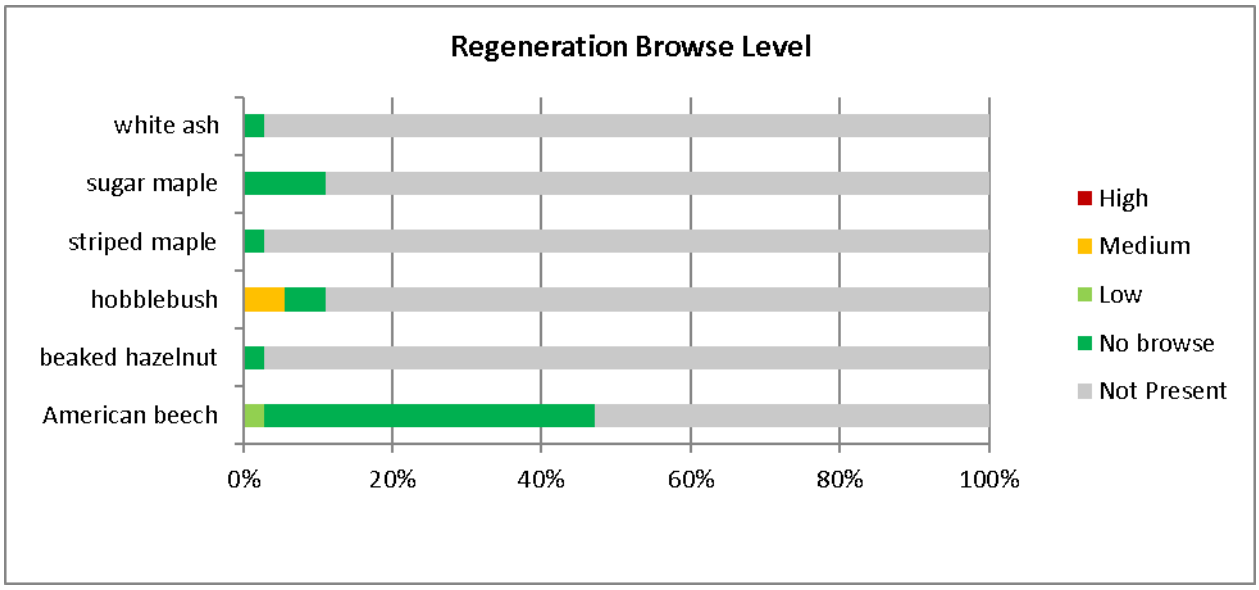


Table 4.2: Snags per acre by size and decay class.

DBH Group	Sound	Moderately Punky	Punky Throughout	Stand Total
<12"	-	3.4	-	3.4
12-18"	-	6.9	2.4	9.3
>18"	-	-	1.1	1.1
Stand Total	-	10.3	3.5	13.8

Table 4.3: Down logs per acre by size and decay class.

DBH Group	Sound	Moderately Punky	Punky Throughout	Stand Total
<12"	-	23.5	18.3	41.8
12-18"	-	3.6	15.4	19.0
>18"	-	-	-	-
Stand Total	-	27.1	33.8	60.8

Stand 5 Hemlock-4-B 15.5 acres (Points pts)




Stand 5 is a fully stocked hemlock stand.

General Attributes

Natural Community Type: Hemlock Forest

Quadratic Stand Diameter: 12.3”

Trees Per Acre: 233

Total Basal Area/Acre: 193ft^2

AGS Basal Area/Acre: 143ft^2

Stocking Level: Adequately stocked

Structure & Management

Age Class Distribution: Even aged

Target Age Class Distribution: All aged

Stand Age (Current): 100-120 years

Cutting Cycle: 20 year

Crop Tree Target Diameter: Hemlock 20”, red maple 16”, all other hardwoods 20”+

Site Characteristics

Access & Operability: The open land in the west of the property would need to be utilized for a landing. Access and operability are limited in portions of the stand due to very steep slopes. Trails would likely need to be constructed using a bulldozer or excavator to access the southern portions of the stand. Skids will be moderate in length, generally flat or downhill.

Access Distance: 2,500’

Terrain: Steep slopes, western aspect.

Water Resources: Intermittent stream.

Forest Health: N/A

Invasive Species: N/A

Recreation Features: Maintain skid trails for use for walking, wildlife viewing and hunting.

Aesthetic Features: Legacy trees hemlocks.

Wildlife Habitat: Promote softwood cover, down logs and standing snags. Release areas of desirable regeneration to increase browse and cover.

Easement Status: VLT easement

Management Objectives

This stand will be managed for high quality forest products, aesthetics, and wildlife habitat. High quality hemlock, red spruce, and tolerant hardwoods will be favored for retention. Uneven-age techniques will be used to promote and maintain a balanced distribution of multiple age classes while encouraging the establishment and growth of desirable regeneration.

Stand Description: Stand 5 is comprised of 15.5 acres of mature hemlock. Hemlock comprises 70% of the basal

area in the stand. The hardwoods in the stand are usually present as understory or suppressed stems, and not part of the canopy. Due to the steep slopes present in the stand, it has likely always been at least partially forested. The hemlock in the stand is generally well-formed and vigorous. The high level of hemlock stocking forms a closed softwood canopy, allowing little light to penetrate to the forest floor. As such, there is little regeneration or vegetation present in the understory. Hayscented fern, starflower, and maidenhair fern were noted in the understory. Maidenhair fern is a rich-site indicator.

Stand History: The stand has not received any recent activity.

Scheduled Treatment: None

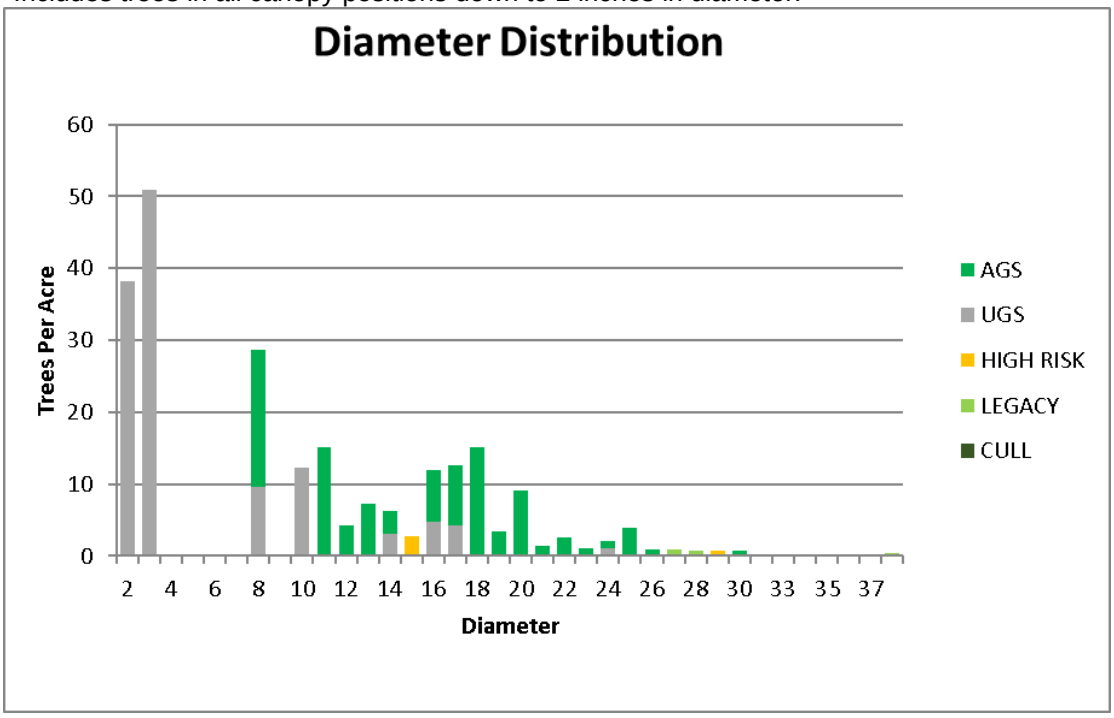
- **Deferment:** This stand has an optimal stocking and canopy closure for deer wintering habitat. The stand should be re-evaluated and updated during the next ten year management cycle.

STAND 5 TABLES AND GRAPHS

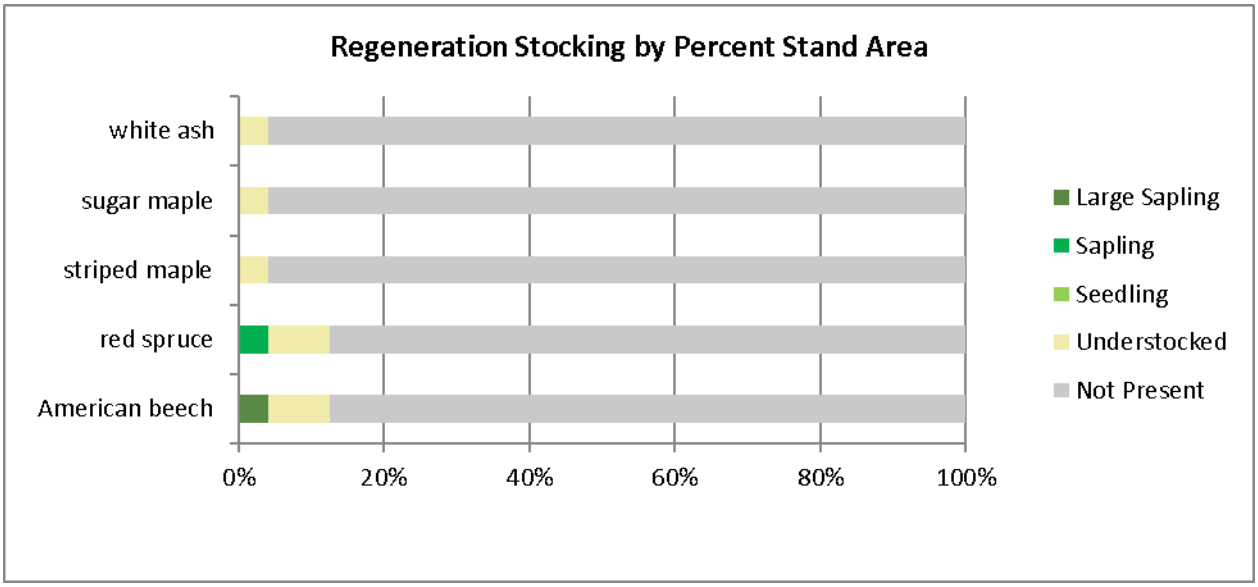
Species	% BA	% TPA	Veneer (BF)	Sawlog (BF)	Tielog (BF)	Pulp (Cords)	Growing Stock (Cords)	Cull (Cords)	Total Volume in Cords	High Risk	% AGS Saw
red maple	10.5%	14.1%	-	659	-	4	-	0	5		3.4%
sugar maple	10.5%	19.6%	-	1,086	-	2	1	-	5		5.5%
yellow birch	3.5%	2.8%	-	382	-	1	-	-	2		2.0%
white ash	1.8%	0.3%	-	316	-	1	-	-	1		0.0%
Hardwood Total	26.3%	36.7%	-	2,442	-	8	1	0	14		10.9%
Eastern hemlock	70.2%	60.3%	-	15,881	-	13	0	-	46	417	79.0%
red spruce	3.5%	2.9%	-	1,260	-	-	-	-	3	565	3.6%
Softwood Total	73.7%	63.3%	-	17,141	-	13	0	-	48	982	82.5%
Volume Per Acre	100.0%	100.0%	-	19,583	-	21	1	0	62	982	93.4%
Stand Volume			-	303,537	-	327	20	7	961	15,220	

Table 5.1: Forest Composition and Volume.

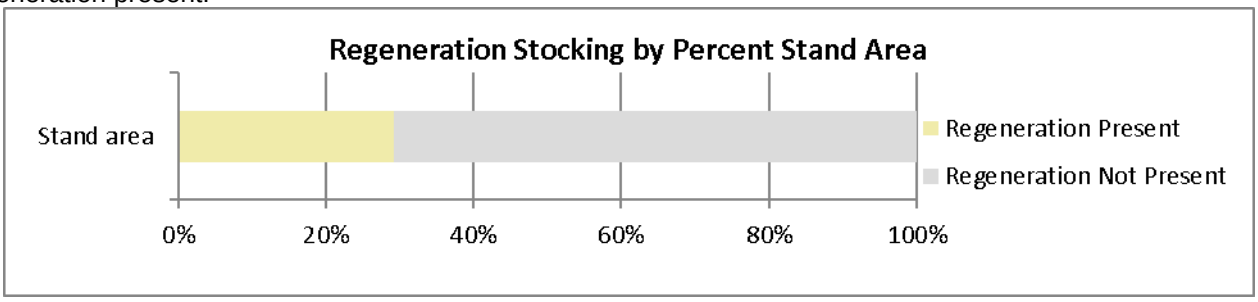
Graph 5.1: Diameter distribution showing trees per acre on the Y axis, diameter class on the X axis and tree condition. Includes trees in all canopy positions down to 2 inches in diameter.



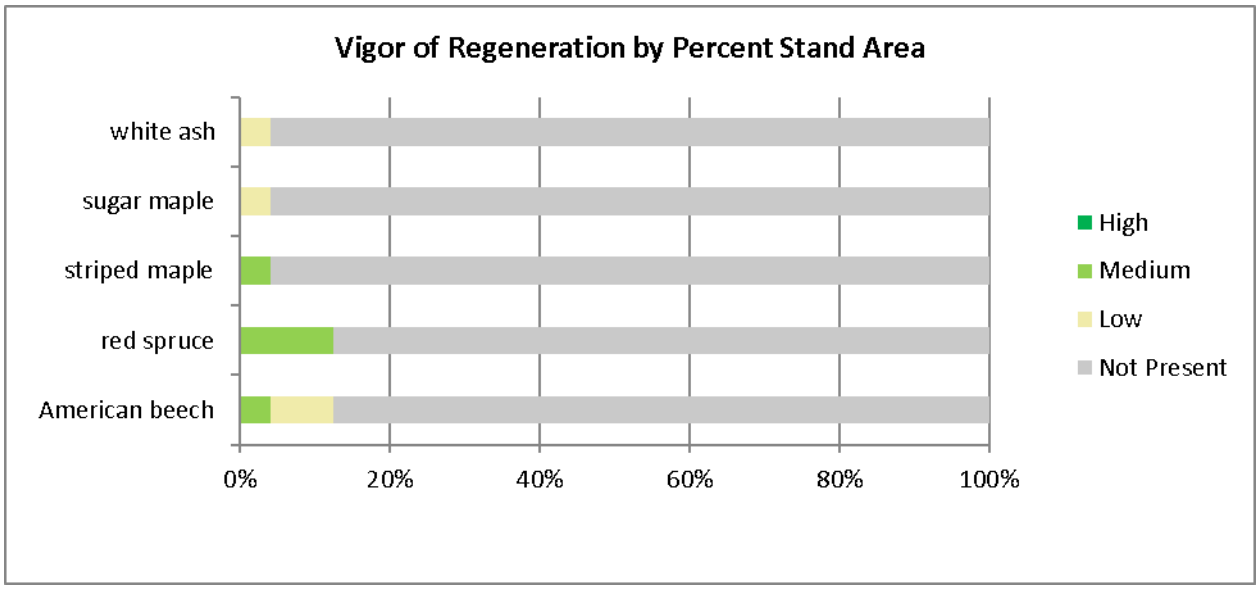
Graph 5.2: Tree and shrub species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less than 3 feet tall (Seedling). If a species is present but does not meet one of these conditions, it is recorded as present but not stocked.



Graph 5.3: Percent of stand area with regeneration present in any category, versus percent of stand area with no regeneration present.



Graph 5.4: Vigor of regeneration and shrub species.



Graph 5.5: Browse level of regeneration and shrub species.

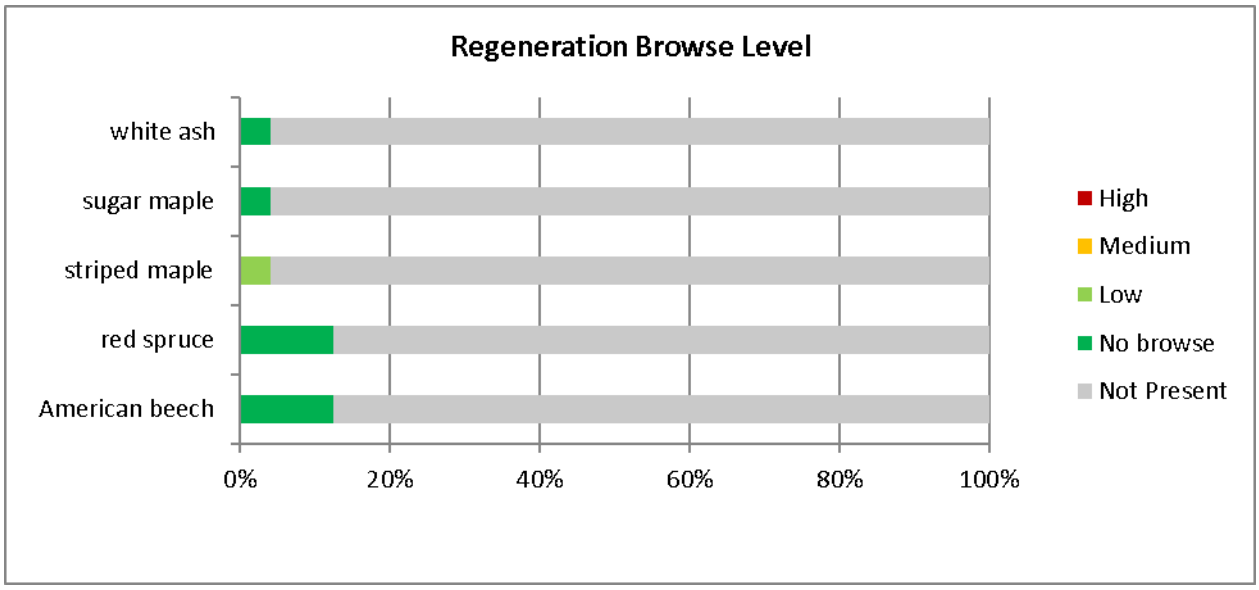


Table 5.2: Snags per acre by size and decay class.

DBH Group	Sound	Moderately Punky	Punky Throughout	Stand Total
<12"	9.5	-	-	9.5
12-18"	2.4	-	-	2.4
>18"	-	-	0.5	0.5
Stand Total	11.9	-	0.5	12.5

Table 5.3: Down logs per acre by size and decay class.

DBH Group	Sound	Moderately Punky	Punky Throughout	Stand Total
<12"	9.2	-	9.2	18.3
12-18"	6.4	-	9.9	16.3
>18"	-	-	-	-
Stand Total	15.5	-	19.1	34.6

Table 5.4: Cavity Trees per acre by size and decay class.

DBH Group	Large	Medium	Small	Stand Total
<12"	-	-	-	-
12-18"	2.1	-	2.4	4.5
>18"	0.5	-	-	0.5
Stand Total	2.6	-	2.4	5.0

Stand 6 White Pine/Northern Hardwood-3-B 24.8 acres (7 pts)

Stand 6 is a variably stocked mixedwood stand with a large white pine component.

General Attributes

Natural Community Type: Hemlock**-**Northern Hardwood Forest

Quadratic Stand Diameter: 11.6”

Trees Per Acre: 185

Total Basal Area/Acre: 136ft^2

AGS Basal Area/Acre: 89ft^2

Stocking Level: Adequately stocked

Structure & Management

Age Class Distribution: Even aged

Target Age Class Distribution: All aged

Stand Age (Current): 80-90 years

Cutting Cycle: 20 years

Crop Tree Target Diameter: White pine 24”, red maple 16”, all other hardwoods 20”+

Site Characteristics

Access & Operability: The open land in the west of the property would need to be utilized for a landing, or wood could be pulled uphill to the landing in Stand 2. Access and operability are generally good. Operability may be limited in the western portion of the stand due to steep slopes. Skids will be short to moderate in length, generally flat or downhill.

Access Distance: 2,500’

Terrain: Gentle to moderately steep slopes. Western aspect.

Water Resources: Intermittent stream

Forest Health: White pine blister rust

Invasive Species: Wall lettuce, barberry

Recreation Features: Maintain skid trails for use for walking, wildlife viewing and hunting.

Aesthetic Features: Legacy white pines.

Wildlife Habitat: Promote softwood cover, down logs and standing snags. Release areas of desirable regeneration to increase browse and cover.

Easement Status: VLT easement

Management Objectives

This stand will be managed for high quality forest products, aesthetics, and wildlife habitat. High quality white pine, red maple, hemlock, and tolerant hardwoods will be favored for retention. Uneven-age techniques will be used to promote and maintain a balanced distribution of multiple age classes while encouraging the establishment and growth of desirable regeneration.

Stand Description: Stand 6 is comprised of 24.8 acres of white pine and northern hardwood forest. High-quality,

mature white pine is found throughout the stand. Hemlock is found as a minor associate scattered throughout the stand. Red maple comprises the majority of the stocking, with 45% of the basal area. The red maple is variable in quality. Regeneration is variable in the stand. Little to none is present in some areas, while pockets of spruce/fir, white pine, and northern hardwood saplings are found in other areas. Small poorly drained areas and seeps are found in the stand. These areas are comprised of sensitive and interrupted fern, and jewelweed.

Stand History: Evidence on the ground suggests that this stand has not been harvested since its establishment in the 1950's. The western portion of the stand is younger, having been abandoned from agricultural use more recently.

The Moretown Elementary School has outdoor classrooms within this stand.

Scheduled Treatment: 2026

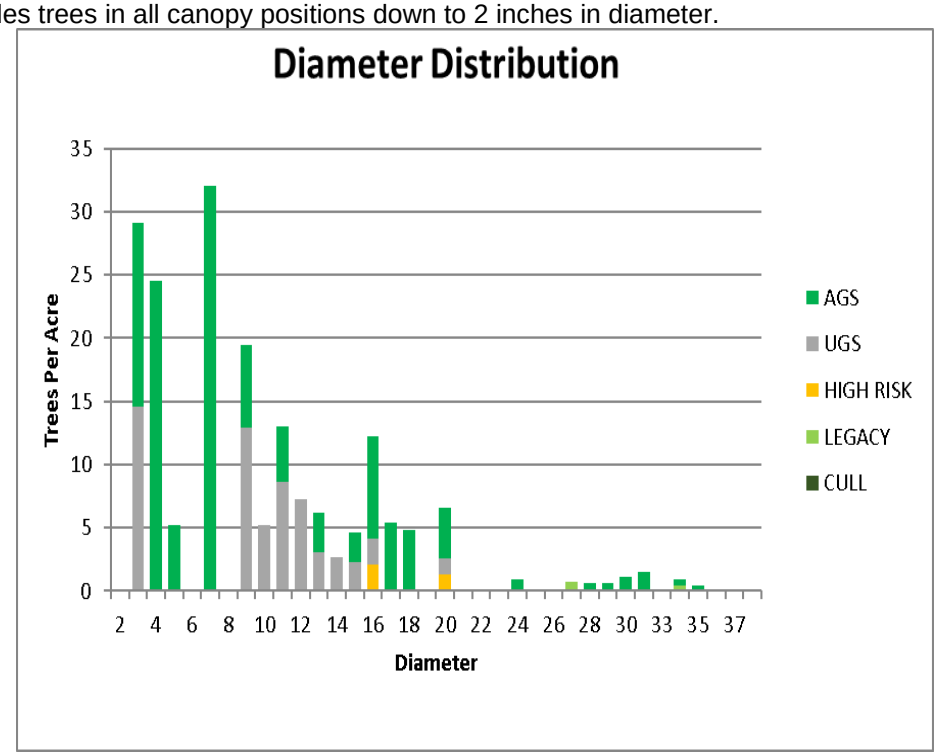
- **Group Selection & Crop Tree Release:** A Group selection harvest will target mature white pine, white ash, and unacceptable red maple. Groups will range in size up to 1 acre, and will cover 20% of the stand area (5.0 acres). Groups will not be wider than 1.5 times the average tree height. Groups will be placed where advanced acceptable regeneration is present. These groups will resemble an overstory removal, with advanced spruce/fir, white pine, and northern hardwood regeneration present. Between groups, crop tree release will release the highest quality and most vigorous stems. High quality white pine, hemlock, and tolerant hardwoods will be favored for retention. Hemlock will not be targeted for removal to help maintain and enhance the quality of the deer wintering habitat in the stand. Bands of mature white pine will be retained that run in an East/West direction between stands 5 and 7. This will help maintain travel corridors for deer between those two areas. Ideally the band of white would be approximately 300' wide. Residual basal area in treated areas will be 90-100 square feet per acre. This work would ideally be completed in the summer to avoid disturbing wildlife during the winter.
- **Hazard Tree Mitigation:** In conjunction with the above silvicultural treatment, hazard trees surrounding the Moretown Elementary School ECO classrooms will be removed for the safety of the students. Trees will be selected at the direction of the classroom teachers and town Tree Warden.

STAND 6 TABLES AND GRAPHS

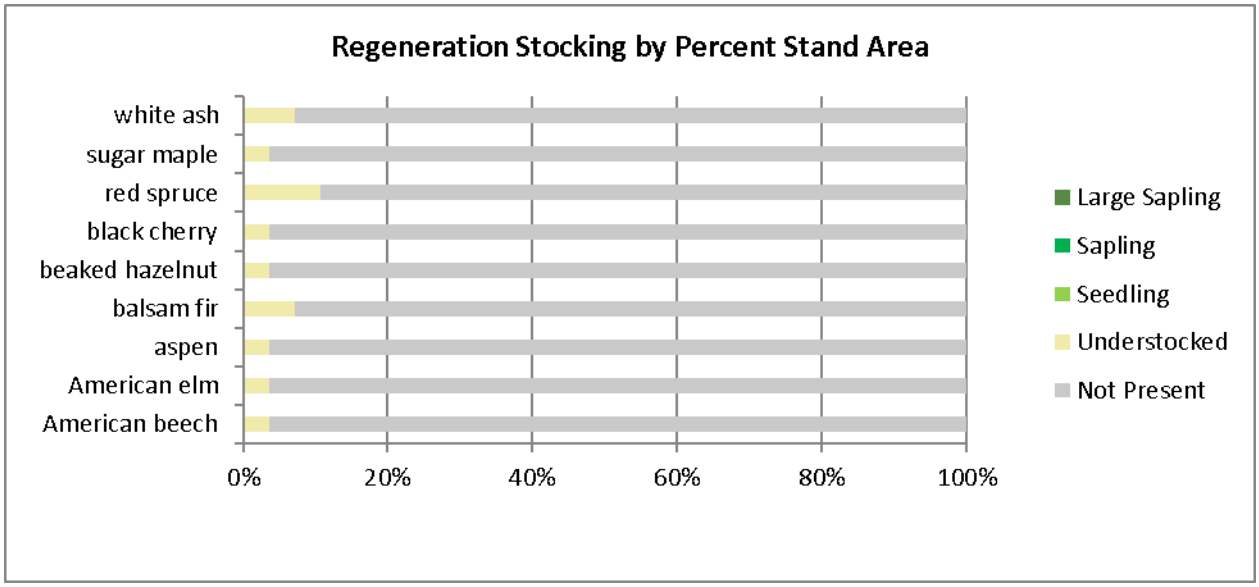
Species	% BA	% TPA	Veneer (BF)	Sawlog (BF)	Tielog (BF)	Pulp (Cords)	Growing Stock (Cords)	Cull (Cords)	Total Volume in Cords	High Risk	% AGS Saw
red maple	45.9%	60.6%	-	2,596	675	6	1	-	14	234	22.2%
white ash	6.5%	2.8%	-	524	77	2	-	-	3	196	3.4%
quaking aspen	4.3%	3.3%	-	-	-	2	-	-	2		0.0%
Hardwood Total	56.8%	66.7%	-	3,120	752	10	1	-	19	430	25.6%
Eastern white pine	34.6%	10.5%	-	6,414	1,634	4	-	-	21		66.7%
Eastern hemlock	6.5%	14.7%	-	-	-	1	0	-	1		0.0%
balsam fir	2.2%	8.1%	-	152	-	-	-	-	0		1.3%
Softwood Total	43.2%	33.3%	-	6,566	1,634	5	0	-	22		67.9%
Volume Per Acre	100.0%	100.0%	-	9,686	2,387	15	1	-	40	430	93.5%
Stand Volume			-	240,216	59,189	369	34	-	1,001	10,670	

Table 6.1: Forest Composition and Volume.

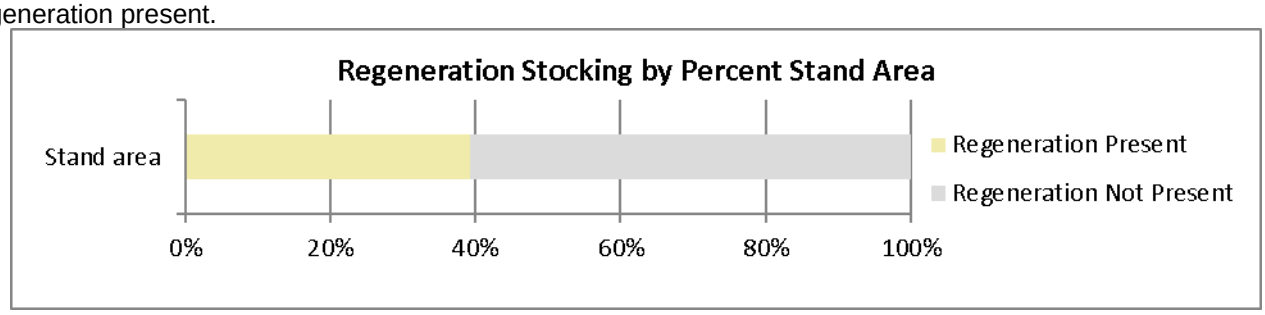
Graph 6.1: Diameter distribution showing trees per acre on the Y axis, diameter class on the X axis and tree condition. Includes trees in all canopy positions down to 2 inches in diameter.



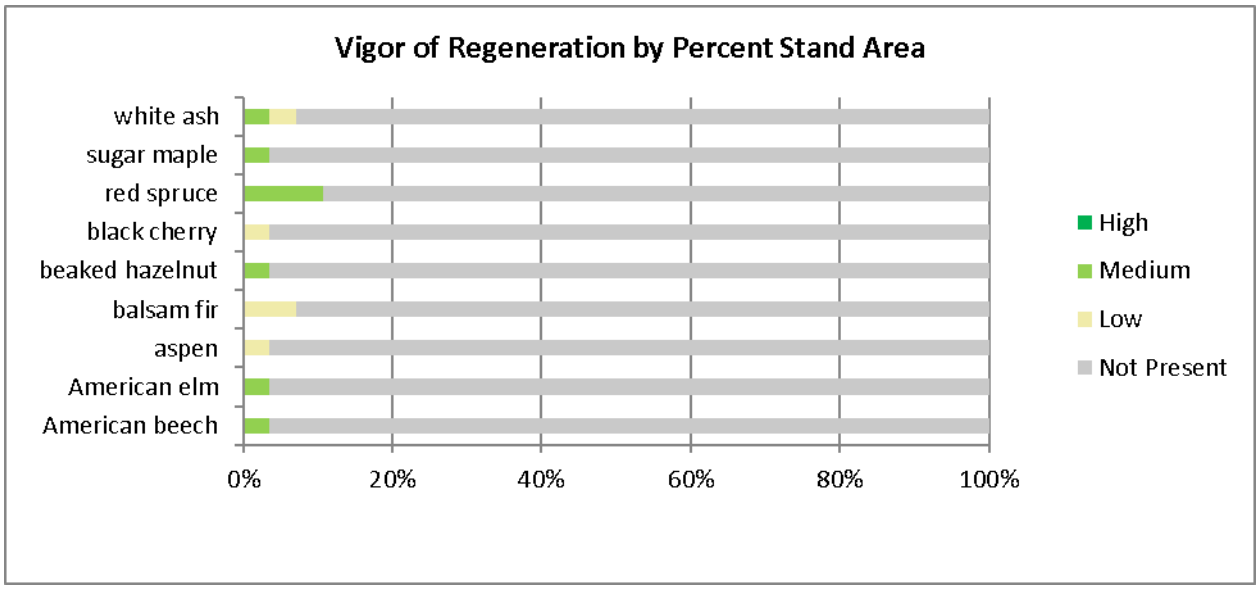
Graph 6.2: Tree and shrub species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less than 3 feet tall (Seedling). If a species is present but does not meet one of these conditions, it is recorded as present but not stocked.



Graph 6.3: Percent of stand area with regeneration present in any category, versus percent of stand area with no regeneration present.



Graph 6.4: Vigor of regeneration and shrub species.



Graph 6.5: Browse level of regeneration and shrub species.

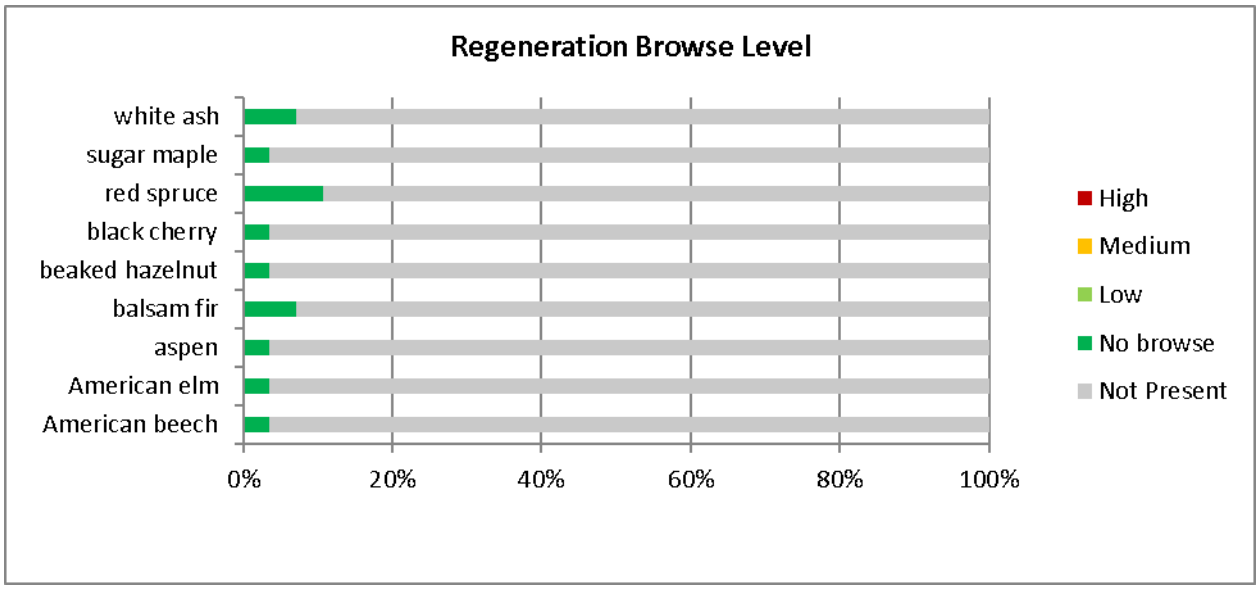


Table 6.2: Snags per acre by size and decay class.

DBH Group	Sound	Moderately Punky	Punky Throughout	Stand Total
<12"	-	21.0	-	21.0
12-18"	-	-	-	-
>18"	1.5	2.3	3.3	7.1
Stand Total	1.5	23.3	3.3	28.1

Table 6.3: Down logs per acre by size and decay class.

DBH Group	Sound	Moderately Punky	Punky Throughout	Stand Total
<12"	-	14.9	138.1	153.0
12-18"	-	1.1	1.1	2.3
>18"	-	-	-	-
Stand Total	-	16.0	139.2	155.2

Table 6.4: Cavity Trees per acre by size and decay class.

DBH Group	Large	Medium	Small	Stand Total
<12"	-	-	-	-
12-18"	-	-	-	-
>18"	0.7	-	0.4	1.1
Stand Total	0.7	-	0.4	1.1

Stand 7 Mixedwood-3-B 30.6 acres (10 pts)




Stand 7 is a well-stocked hemlock and northern hardwood stand.

General Attributes

Natural Community Type: Hemlock-Northern Hardwood Forest

Quadratic Stand Diameter: 10.1”

Trees Per Acre: 238

Total Basal Area/Acre: 133ft^2

AGS Basal Area/Acre: 98ft^2

Stocking Level: Adequately stocked

Structure & Management

Age Class Distribution: Even aged

Target Age Class Distribution: All aged

Stand Age (Current): 90-100 years

Cutting Cycle: 20 years

Crop Tree Target Diameter: Hemlock 20”, red maple 16”, all other hardwoods 20”+

Site Characteristics

Access & Operability: The open land in the west of the property would need to be utilized for a landing, or wood could be pulled uphill to the landing in Stand 2. Access and operability are generally good throughout the stand. Small wet areas will limit operability. Skids will be short to moderate in length, generally flat or downhill.

Access Distance: 3,000’

Terrain: Gentle to moderately steep slopes

Water Resources: Seeps

Forest Health: N/A

Invasive Species: N/A

Recreation Features: Maintain skid trails for use for walking, wildlife viewing and hunting.

Aesthetic Features: Legacy trees.

Wildlife Habitat: Promote softwood cover, down logs and standing snags. Release areas of desirable regeneration to increase browse and cover.

Easement Status: VLT easement

Management Objectives

This stand will be managed for high quality forest products, aesthetics, and wildlife habitat. High-quality hemlock, yellow birch, sugar maple, white ash, and red spruce will be favored for retention. Uneven-age techniques will be used to promote and maintain a balanced distribution of multiple age classes while encouraging the establishment and growth of desirable regeneration.

Stand Description: Stand 7 is comprised by 30.6 acres of hemlock and northern hardwood forest. The stand is variably stocked. Areas of the stand are comprised almost entirely by hemlock, while other areas are a mixture of

hemlock and hardwoods, and other areas are comprised by northern hardwood poles. Quality is generally good, with well-formed and vigorous hemlock, yellow birch, and sugar maple stems. Combined, these three species comprise 70% of the basal area. Red spruce is found as minor associate scattered throughout the stand. Heavy deer browse was noted on the regeneration in much of the stand. Boulders and exposed ledge are found throughout. The understory is comprised of hardwood and softwood saplings and poles, haysecented, interrupted, and sensitive ferns. Maidenhair fern, a rich-site indicator species was noted in the stand.

Stand History: Portions of the stand were harvested in 1993.

Scheduled Treatment: None

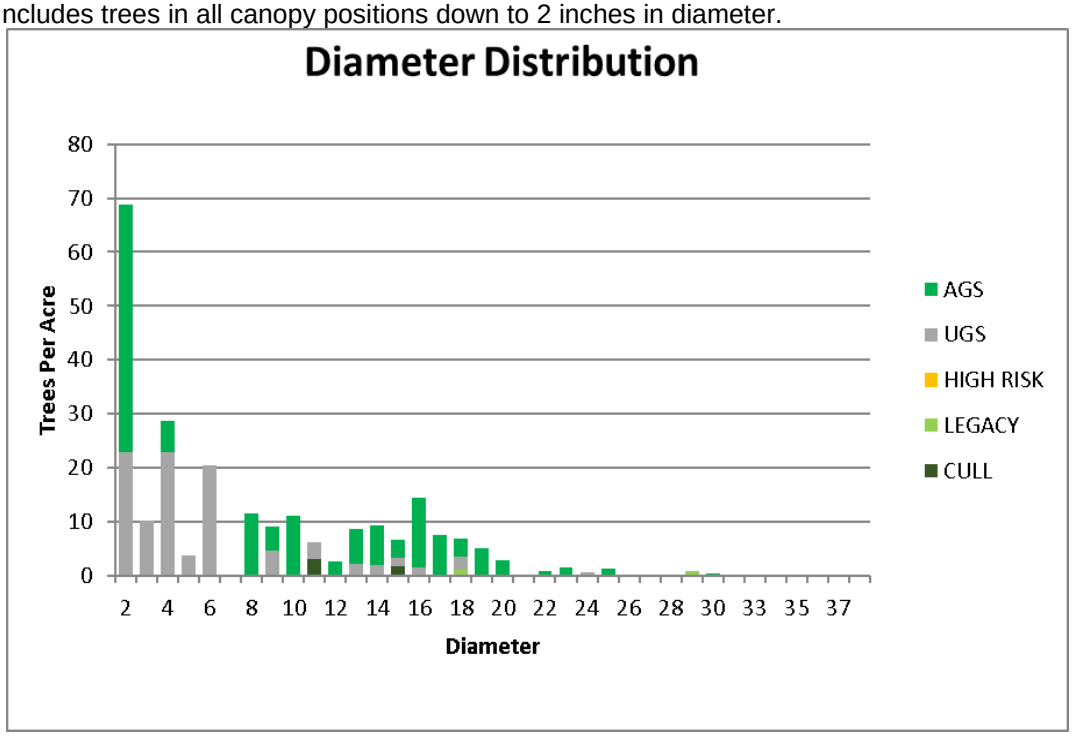
- **Deferment:** This stand should be allowed to develop further prior to any treatment being necessary. Re-evaluated and updated during the next ten year management cycle.

STAND 7 TABLES AND GRAPHS

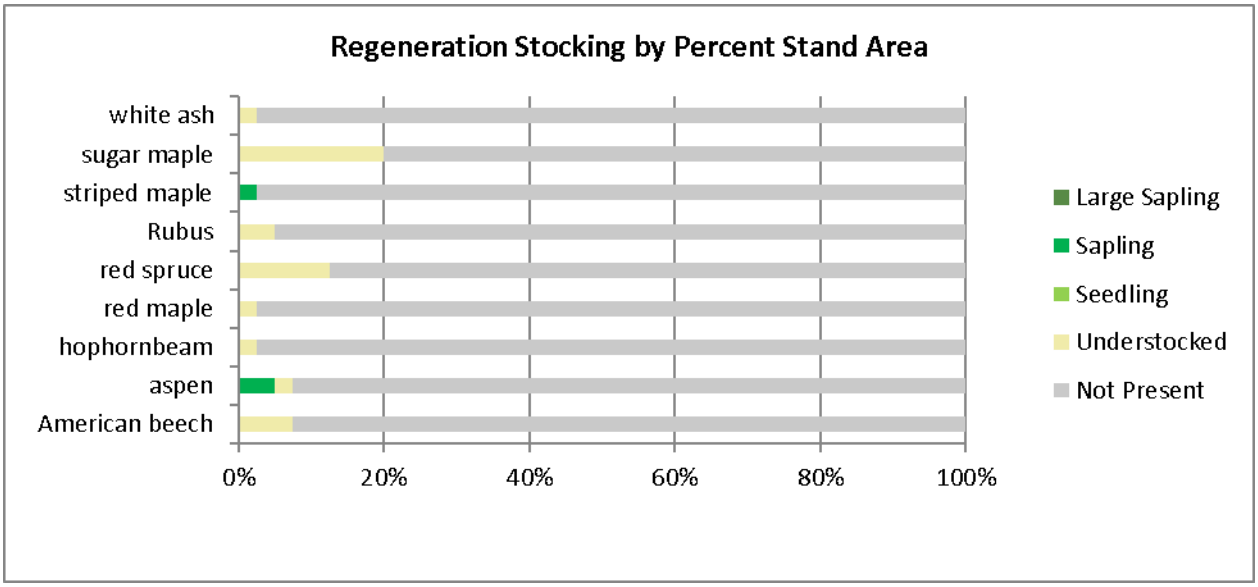
Species	% BA	% TPA	Veneer (BF)	Sawlog (BF)	Tielog (BF)	Pulp (Cords)	Growing Stock (Cords)	Cull (Cords)	Total Volume in Cords	High Risk	% AGS Saw
yellow birch	20.2%	22.3%	-	1,564	119	2	1	-	7	-	15.3%
sugar maple	10.9%	10.5%	-	614	53	2	0	-	4	-	6.6%
white ash	9.3%	4.6%	-	1,277	50	2	-	-	4	-	13.1%
red maple	7.8%	6.5%	-	528	-	1	-	0	2	-	5.2%
hophornbeam	5.1%	19.3%	-	-	-	1	-	-	1	-	0.0%
Hardwood Total	53.3%	63.1%	-	3,983	222	8	1	0	18	-	40.3%
Eastern hemlock	40.5%	29.5%	-	4,683	-	6	-	-	15	-	46.4%
red spruce	6.2%	7.4%	-	1,204	-	0	-	-	3	-	11.9%
Softwood Total	46.7%	36.9%	-	5,887	-	6	-	-	18	-	58.3%
Volume Per Acre	100.0%	100.0%	-	9,870	222	14	1	0	35	-	98.6%
Stand Volume			-	302,030	6,791	416	37	12	1,082	-	

Table 7.1: Forest Composition and Volume.

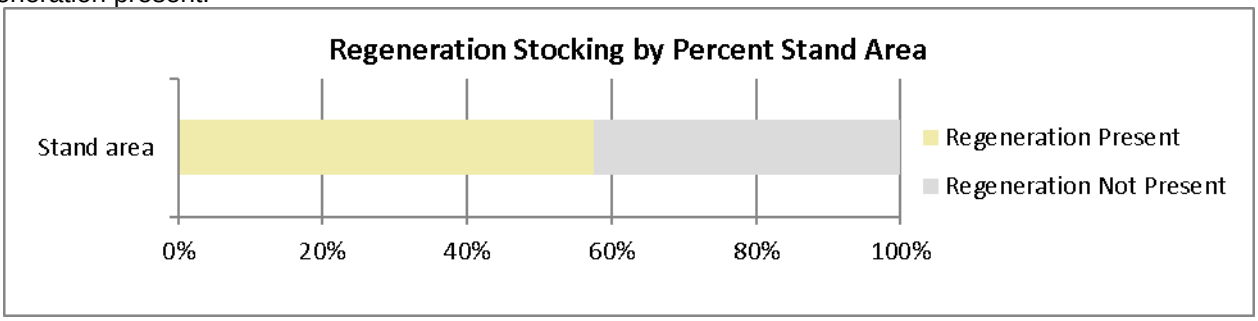
Graph 7.1: Diameter distribution showing trees per acre on the Y axis, diameter class on the X axis and tree condition. Includes trees in all canopy positions down to 2 inches in diameter.



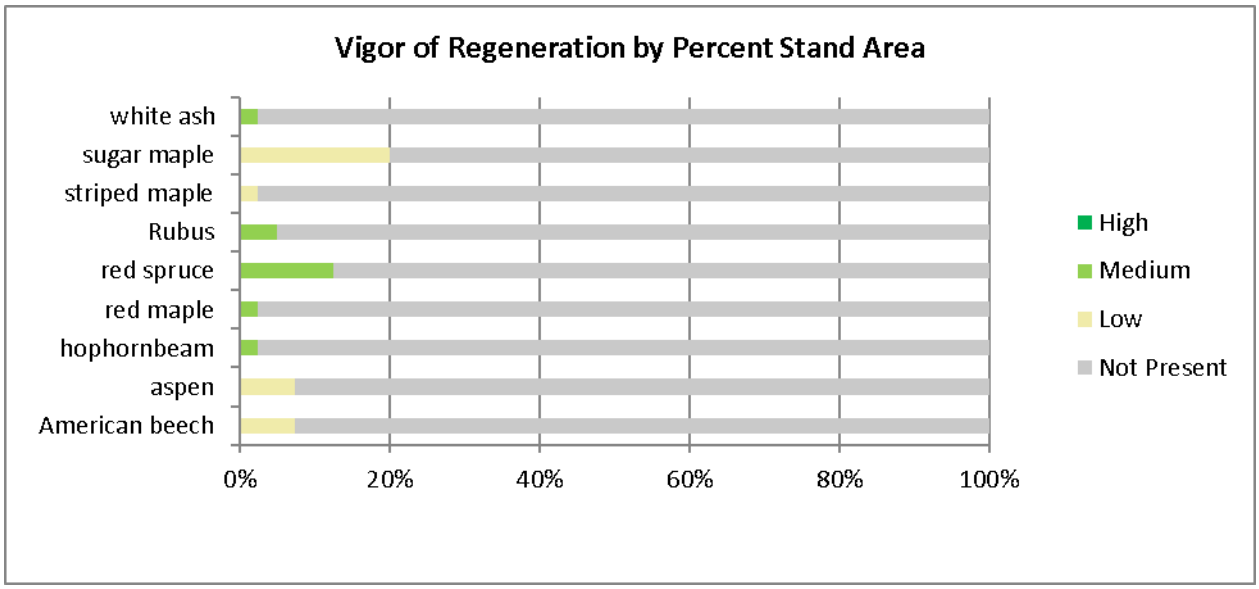
Graph 7.2: Tree and shrub species regeneration stocking by percent of stand, species and stocking class. The species is considered “stocked” if it meets at least one of three stocking levels including 2 stems between 0.5 and 1.5 inches diameter(Large Sapling), 5 stems between 3 and 5 feet tall (Sapling), or 25 seedlings less than 3 feet tall (Seedling). If a species is present but does not meet one of these conditions, it is recorded as present but not stocked.



Graph 7.3: Percent of stand area with regeneration present in any category, versus percent of stand area with no regeneration present.



Graph 7.4: Vigor of regeneration and shrub species.



Graph 7.5: Browse level of regeneration and shrub species.

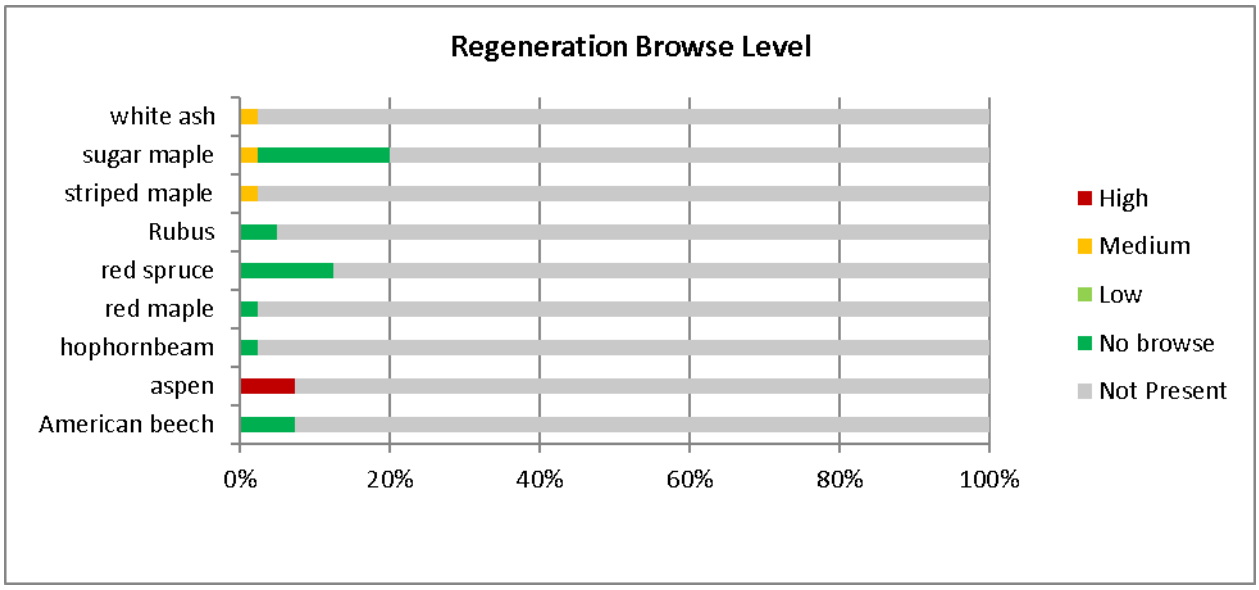


Table 7.2: Snags per acre by size and decay class.

DBH Group	Sound	Moderately Punky	Punky Throughout	Stand Total
<12"	-	4.5	3.7	8.2
12-18"	-	-	-	-
>18"	0.6	-	0.7	1.3
Stand Total	0.6	4.5	4.4	9.5

Table 7.3: Down logs per acre by size and decay class.

DBH Group	Sound	Moderately Punky	Punky Throughout	Stand Total
<12"	-	-	64.6	64.6
12-18"	4.0	-	14.7	18.7
>18"	-	-	-	-
Stand Total	4.0	-	79.3	83.3

Table 7.4: Cavity Trees per acre by size and decay class.

DBH Group	Large	Medium	Small	Stand Total
<12"	-	-	3.0	3.0
12-18"	-	-	1.6	1.6
>18"	-	0.7	0.4	1.1
Stand Total	-	0.7	5.1	5.8

APPENDIX – A

Table and Graph

Data Keys and Explanation

Tables:

Tract Level Total Forest Stocking

This table shows the total of all products tallied on the tract. The header rows include:

- **Veneer:** Board feet of veneer volume by species. Veneer is the highest value product, sold as either sliced or rotary.
- **Sawlog:** Board feet of sawlog volume by species. Sawlog is the second highest value product, and is sawn into dimensional lumber.
- **Pallet/Tielog:** Board feet of Pallet or Tie logs. Pallet/Tie are low grade sawtimber, often sold as pallet material, historically sold as ties for the railroad.
- **Total BF:** Total of all Veneer, sawtimber and pallet products, computed into board feet.
- **Pulp:** Total of pulp volume by species in cords. Cords are piles of round wood measuring 4x8'. This is a low value product, can also include volume that would be used as chips for paper or pellets.
- **Growing Stock:** Measured in cords, growing stock is volume of trees that are too small to be a commercial product but have the quality to become sawtimber in the future. It is helpful to differentiate valuable growing stock from low value pulpwood but measured in cords.
- **Cull:** Measured in cords, cull is non-commercial volume. Its quality is so low it has no commercial value, but often has high wildlife or diversity value as standing trees.
- **Total Volume in Cords:** This is the total volume on the tract converted to cords. It is useful for determining allowable cut and growth rates.
- **% Cords:** This shows the percent of volume by species calculated in cords.

Stand Level Forest Composition and Volume

This table shows the volume and composition at a stand level. The header rows include:

- **Species:** Species found in stand separated into hardwood and softwood groups.
- **%BA:** This is the percentage of basal area the species represents. Useful for understanding stocking levels. See definition of basal area in glossary.
- **% TPA:** This is the percent trees per acre by species. Useful for determining stand composition.
- **Veneer:** Board feet of veneer volume by species. Veneer is the highest value product, sold as either

sliced or rotary.

- **Sawlog:** Board feet of sawlog volume by species. Sawlog is the second highest value product and is sawn into dimensional lumber.
- **Pallet/Tielog:** Board feet of Pallet or Tie logs. Pallet/Tie are low grade sawtimber, often sold as pallet material, historically sold as ties for the railroad.
- **Total BF:** Total of all Veneer, sawtimber and pallet products, computed into board feet.
- **Pulp:** Total of pulp volume by species in cords. Cords are piles of round wood measuring 4x8'. This is a low value product, can also include volume that would be used as chips for paper or pellets.
- **Growing Stock:** Measured in cords, growing stock is volume of trees that are too small to be a commercial product but have the quality to become sawtimber in the future. It is helpful to differentiate valuable growing stock from low value pulpwood but measured in cords.
- **Legacy:** Calculated in cords, legacy trees have some sort of exception biological or other value, often called biological legacies. They might include large old trees that are often non-commercial or they might be an uncommon species. They are trees that typically would not be harvested during a timber sale.
- **Total Volume in Cords:** This is the total volume on the stand converted to cords. It is useful for determining allowable cut and growth rates.
- **High Risk:** Calculated in board feet, this is high value sawtimber volume found in a tree that has been identified as high risk, meaning there is risk of losing this product if left to grow much longer. For example, it might be in a tree that is structurally unsound such as having a split fork or is in significant decline. High levels of high risk volume is a signal that a timber sale should be evaluated soon.
- **% AGS Sawtimber:** This shows the percent of the sawtimber by species that is found in the AGS trees. Low percent means that species in general is of poor quality, health and/or vigor and would likely be targeted for harvest in a timber sale. High percent means that species would not be targeted for harvest.

Snags Per Acre, Down Logs, and Cavity Trees

These tables are fairly self-explanatory. They show numbers of Snags (standing dead trees), Down Logs, and Cavity Trees per acre by class, including Sound, Moderately Punky, and Punky Throughout. Snags and Down Logs are important for many types of wildlife and forest functions. Generally, the more and larger per acre the better.

Graphs:

Diameter Distribution

This grapy shows Trees Per Acre on the Y axis, and diameter on the X axis. The Trees Per Acre are further

categorized into Status Codes, shown it the legend, typically including AGS (Acceptable Growing Stock), UGS (Unacceptable Growing Stock), High Risk, Legacy, and Cull.

Regeneration Stocking by Percent Stand Area

The first graph graphs shows species on the Y axis and percent stand area on the X axis. The species are further broken into status categories shown in the legend. Each category represents the number and size per area required to ultimately generate 1 successful tree. For example, to be considered “Stocked” in the “Large Sapling” category, there must be at least 2 stems between .5 and 1.5 inches in diameter in 1/400th acre. To be stocked in the “Sapling” category, there must be 5 stems between 3 and 5 feet tall, and “Seedling” requires at least 25 seedings present. The value of this type of regeneration data goes beyond just numbers of stems per acre, it sets thresholds that must be met to safely say that species will successfully regenerate. The last category of “Not Stocked” means the species was present but did not meet the threshold to be considered stocked.

The second graph shows the percent of the stand area that has regeneration of any level present.

Vigor and Browse Levels of Regeneration

These graphs are fairly self- explanatory. They show both the vigor and browse level of regeneration. This is important for determining is the species is doing well on the site (vigor) or if it is being browsed. Both of these are important considerations for determining “Success” of existing regeneration.

APPENDIX – B

Forestry terms for the woodland owner

Carol B.Trokey, The School of Natural Resources
Fred Bergman, Missouri Department of Conservation

As a woodland owner, you may hear or see many terms to help describe your forest, habitat types, or logging operations. This guide will define many of the terms commonly used in forestry and woodland management.

Acre - An area of land containing 43,560 square feet.
Advanced Reproduction - Young trees established before a regeneration cutting.
Aspect - The direction that a slope faces (north, south, etc).
Basal Area - The cross-sectional area of a tree, in square feet, at 4.5 feet from the ground (breast height). When the basal area of all trees in a stand are summed, the result is expressed as square feet of basal area per acre, which is a measure of a stand's density.
Biltmore Stick - A graduated stick used to estimate tree diameters by holding it against the tree at breast height.
Board Foot - A unit for measuring wood volumes. It is commonly used to express the amount of wood in a tree, sawlog or individual piece of lumber. A piece of wood one foot long, one foot wide and one inch thick (144 cubic inches).
Bolt - A short log or a squared timber cut from a log, usually less than 8 feet long.
Browse - Twigs and buds of small shrubs and trees eaten by deer and livestock.
Buck - To saw felled trees into shorter lengths.
Buffer Strip - A protective strip of land or timber adjacent to an area requiring attention or protection. For example, a protective strip of unharvested timber along a stream.
Cambium - The growing layer of cells beneath bark of a tree from which new wood and bark develop.
Canopy - The more or less continuous cover of branches and foliage formed collectively by the tops (crowns) of adjacent trees.
Cavity Tree - See Den Tree.
Chain - A unit of linear measurement; 66 feet.
Clearcut - A harvest and regeneration technique that removes all trees from an area. Also called a regeneration cut.
Clinometer - An instrument for measuring vertical angles or slopes.
Co-Dominant Tree - Trees whose crowns form the general level of the forest canopy and receive full sunlight only from above.
Conifer - A cone-bearing tree with needles, such as pines, spruces and firs that produces wood commonly known as softwood.
Cord - A stack of wood containing 128 cubic feet. A standard cord measures 4 feet X 4 feet X 8 feet of wood and air.
Crop Tree - A tree identified to be grown to maturity for the final harvest cut, usually on the basis of its location with respect to other trees and its timber quality.
Crown - The branches and foliage of a tree.
Cruise - A survey of forest land to locate timber and estimate its quantity by species, products, size, quality or other characteristics; the estimate obtained in such a survey.
Cruiser Stick - See Biltmore.
Cull - A tree or log of merchantable size that, because of a defect, is useless for its intended purpose.
DBH - See Diameter Breast Height.
Defect - That portion of a tree or log which makes it unusable for the intended product. Defects include

rot, crookedness, cavities and cracks.
Den Tree - A living tree with a hollow cavity in the top large enough to shelter wildlife. Also called cavity tree.
Dendrology - The study of the identification of trees.
Diameter Breast Height (DBH) - The diameter of a tree at 4.5 feet above the ground.
Diameter Inside Bark (DIB) - The diameter inside the bark; used in log scaling.
Diameter Tape - A specially graduated tape used to directly determine tree diameter when stretched around the circumference of the tree stem.
Dibble Bar - A flat or round metal tool used to make holes for planting seedlings.
Dominant Tree - Tree with its crown above the general level of the canopy that receives full sunlight from above and partial light from the sides.
Edge - In wildlife management, the area where the variety of types of food, cover, water or terrain required by a particular species come together.
Even-Aged Management - Forest management with periodic harvest of all trees on part of the forest at one time, or over a short period to produce stands containing trees all the same or nearly the same age or size.
Face Cord - A stack of wood 4 feet high and 8 feet long, composed of logs of varying length.
Felling - The process of cutting standing trees.
Firebreak - A natural or constructed barrier utilized to stop or check fires.
Firsts and Seconds (FAS) - The highest standard grade for hardwood lumber.
Forest - A plant community dominated by trees and other wood plants.
Forest Inventory - See Cruise.
Forest Type - A group of tree species that, because of their environmental requirements, commonly grow together. Example - the oak-hickory type.
Forester - A person who has been professionally educated in forestry at a college or university.
Girdling - Completely encircling the trunk of a tree with a cut that severs the bark and cambium of the tree, usually resulting in the death of the tree.
Grading - Evaluating and sorting trees, logs or lumber according to quality.
Habitat - The type of place in which the plant or animal lives, such as forest habitat, grassland habitat and marsh habitat.
Hardwood - A term describing broadleaf trees, usually deciduous, such as oaks, maples, ashes, etc.
Harvest - In general use, removing all or portions of the trees on an area. It can mean removing trees on an area to 1) obtain income, 2) develop the environment necessary to regenerate the forest, and on occasions, 3) to achieve special objectives such as development of special wildlife habitat needs, in contrast with intermediate cuttings.
Heel-In - To store young trees before planting by placing in trench and covering roots with soil.
Height, Merchantable - Tree height up to which a particular product may be obtained. For example, if 8-inch minimum diameter sawlogs were being cut from a tree, its merchantable height would be its height up to a diameter of 8 inches.
Height, Total - Tree height from ground level to top.
High-Grading - Cutting only the high value trees from a forest property.
Hypsometer - A graduated stick used to estimate tree height. It is often combined with a Biltmore stick.
Increment Borer - An auger-like instrument with a hollow bit, used to extract cores from trees for growth and age determination.
Intermediate Cut - Removing immature trees from the forest sometime between establishment and stand harvest to improve the quality of the remaining forest stand. Contrast with a harvest cut.
Intermediate Trees - Trees with crowns below the general level of the canopy, receiving some sunlight from above but none from the sides.

Legacy Tree-see 'Wolf Tree'.
Landing - A place where logs are taken to and loaded on trucks for transport to mill.
Log Rule - A table showing estimated amount of lumber that can be sawed from logs of given lengths and diameters. Commonly used in Missouri are:
1. Doyle Rule is a simple formula used in the eastern and southern United States; it underestimates the amount of lumber in small logs and overestimates large logs.
2. International 1/4" Rule is a formula rule allowing 1/2" taper for each 4 feet of length and 1/16" shrinkage for each one-inch board; closely approximates the actual sawmill lumber tally.
Logger - An individual whose occupation is harvesting timber.
Lump Sum Timber Sale - Standing timber is sold for a fixed amount agreed upon in advance; the sale may cover a given acreage, tracts, certain species or diameter classes of trees. Distinguished from a scale or unit sale in which payment is based on the amount harvested (e.g. so much per thousand board feet).
Mast - Nuts of such trees such as oak, walnut and hickory that serve as food for many species of wildlife.
Mature Tree - A tree that has reached the desired size or age for its intended use.
MBF - Abbreviation for One Thousand Board Feet.
Merchantable - The part of a tree or stand of trees that can be manufactured into a salable product.
Multiple Use - Land management for more than one purpose, such as wood production, water, wildlife, recreation, forage and aesthetics.
Overstocked - Forest or stand condition where more trees are present than at normal or full stocking.
Overstory - That portion of the trees in a stand forming the upper crown cover.
Overtopped - See Suppressed Trees.
Pallet - Tray constructed from wood used to store, load and unload various materials.
Planting Bar - A hand tool used to plant seedlings. (See Dibble Bar)
Plot Sample Cruise - A method of estimating standing timber, stocking or volume whereby all trees above a minimum diameter are tallied on plots with fixed boundaries.
Point Sample Cruise - A method for estimating standing timber, stocking or volume without establishing sample plot boundaries. An instrument such as a prism is used to make a 360^{o} sweep from a series of sampling points, counting at each the number of stems that breast-height diameters appear larger than the fixed angle of the instrument. The average stem number multiplied by a factor appropriate to both the fixed angle and the units of measurement chosen gives the basal area per unit area of stand. (Also called variable plot sampling, prism cruising)
Pole Saw - A saw attached to a long pole for pruning tree limbs without using a ladder.
Pole Timber - Trees from 6" to 12" in diameter at breast height.
Prescribed Burning - Use of controlled fire to dispose of unwanted material, following a planned prescription of fuel, weather or other conditions.
Props - In mining, a round, squared or split timber that supports the roof.
Prism, Wedge - An instrument that incorporates a fixed angle and can be used to determine basal area. See Point Sample Cruise.
Pruning - Removing live or dead branches from standing trees to improve wood quality.
Pulpwood - Wood cut primarily for manufacture of paper, fiberboard or other wood fiber products.
Regeneration Cut - See Clearcut.
Release - To free trees from competition by cutting, removing or killing nearby vegetation.
Reproduction - Young trees. The process by which a forest is renewed; either artificially by direct seeding or planting or naturally by self-sown seeds and sprouts.
Riparian Zone - The area adjacent to, or on the bank of, rivers and streams. Identified by vegetation, wildlife, and other characteristics unique to these locations.
Rotation - The number of years required to establish and grow trees to a specified size, product or

condition of maturity. For example, oaks may have an 80-year rotation for sawlogs and Scotch pine a 10-year rotation for Christmas trees.
Salvage Cut - Harvesting damaged or defective trees for their economic value.
Sapling - Trees from 2" to 6" in diameter at breast height.
Sawtimber - Trees 12" diameter breast height and larger, from which a sawn product can be produced.
Scale Stick - A flat stick calibrated so log volumes can be read directly when the stick is placed on the small end of a standard log.
Scaling - Estimating usable wood volume in a log.
Seed Tree Harvest - Removing nearly all trees from the harvest area at one time, but leaving a few scattered trees to provide seed for a new forest. Sometimes used in Missouri to regenerate pine.
Seedlings - New trees growing from seeds or sprouts less than 2" in diameter at breast height. Also, trees grown in a nursery for one or more years.
Selection Harvest - Harvesting of trees in small groups or as individual trees at periodic intervals to maintain an uneven-age stand. May be described as single tree or group selection system.
Shade Tolerance - The capacity of a tree to develop and grow in the shade of and in competition with other trees. An example of high shade tolerance is sugar maple.
Shearing - To trim back and shape tree branches, making foliage dense and giving the tree a conical form. Used to produce Christmas trees.
Shelterwood Harvest - A harvesting method that entails a series of partial cuttings over a period of years in the mature stand. Early cuttings improve the vigor and seed production of the remaining trees. The trees that are retained produce seed and also shelter the young seedlings. Subsequent cuttings harvest shelterwood trees and allow the regeneration to develop as an even-aged stand.
Silviculture - The art and science of producing and tending a forest.
Site - 1) A tract of land with reasonably uniform soil and climatic factors; 2) an area evaluated for its ability to produce a particular forest or other vegetation based on the combination of biological, climatic and soil factors.
Site Index - An expression of forest site quality based on the height of a free-growing dominant tree at age 50. (or age 100 in western United States).
Site Preparation - Preparing an area of land for forest establishment. May include clearing, chemical vegetation control or burning.
Skid Trail - A road or trail over which equipment or horses drag logs from the stump to a landing.
Skidding - Pulling logs from where they are cut to a landing or mill.
Slash - Debris left after logging, pruning, thinning or brush cutting. May include tree tops, branches, bark or debris left after wind or fire damage.
Snag - A standing dead tree from which leaves and most of branches have fallen. Used for wildlife.
Softwoods - See Conifer.
Stand - A grouping of trees with similar characteristics (such as species, age, or condition) that can be distinguished from adjacent groups. A stand is usually treated as single unit in management plan.
Stave Bolts - Material cut from the white oak group and used in the manufacture of wooden barrels.
Stocking - An indication of the number of trees in a stand as compared to the desirable number of trees for best growth and management. See Overstocked, Understocked.
Stumpage - The value of timber as it stands uncut in the woods (on the stump).
Succession - The replacement of one plant community by another until ecological stability is achieved.
Suppressed Trees - Trees with small crowns that are entirely below the level of the canopy, receiving no direct sunlight. Also called overtopped trees.
Thinning - Generally, a cutting or killing of trees in an immature stand to reduce the tree density and concentrate the growth potential on fewer, higher quality trees resulting in larger trees with faster growth.
Timber Stand Improvement (TSI) - All thinnings made during life of a forest stand for the purpose of

improving the composition or productivity of the stand. TSI methods may include removing vines, thinning, cull tree removal and pruning.
Tree Farm - A privately owned forest or woodland in which producing timber crops is a major management goal, certified as a "Tree Farm" by the American Tree Farm System, an organization sponsored by the American Forest Foundation, Washington, D.C. Tree Farm is a registered trademark of the American Forest Foundation.
Undesirable Growing Stock - Trees of low quality or less valuable species that should be removed in a thinning.
Understocked - Insufficiently stocked with trees.
Understory - That portion of the trees and shrubs in a forest forming lower layer of vegetative growth.
Uneven-Aged Management or Stand - A stand of trees containing at least three age classes intermingled on the same area.
Veneer/Veneer Log - A thin sheet of wood sliced or peeled on a veneer machine and often used for plywood or surfacing furniture; veneer logs are the large (usually more than 18 inches in diameter), knot-free, high-quality logs from which veneer is obtained.
Volume - The amount of wood in a tree, stand of trees or log according to some unit of measurement (board foot, cubic foot, etc.)
Volume Table - A table estimating volume of wood in a standing tree based on measurements of tree, most commonly DBH and merchantable height.
Wolf Tree - An overmature tree of very large size.

APPENDIX – C
LANDOWNER FORESTRY RESOURCES

BOOKS & MAGAZINES

Working with your Woodland by Molly Beattie, Charles Thompson, and Lynn Levine.

University of New England Press.

A landowner guide to forest management.

Northern Woodlands: www.northernwoodlands.org

A quarterly magazine devoted to natural resource and forest management issues in New England and New York.

A Landowner's Guide to Wildlife Habitat Forest Management for the New England Region

by Richard DeGraff, Mariko Yamasaki, William Leak, Anna Lester.

University of Vermont Press.

Wetland, Woodland, Wildland by Elizabeth H. Thompson & Eric Sorenson.

STATE SERVICES

State Extension Services

Vermont State extension is based out of the University of Vermont. It offers practical help with all aspects of land management and ownership.

VT www.uvm.edu/extension/environment_and_natural_resources

State Forestry Department

VT Division of Forestry: www.vtfpr.org/htm/forestry.cfm

PRIVATE ORGANIZATIONS

Vermont Woodlands Association: http://www.vermontwoodlands.org/

New Hampshire Timberland Owners Association: www.nhtoa.org

"The New Hampshire Timberland Owners Association is a nonprofit organization of forest owners and users working together to promote better forest management and a healthy wood products industry."

MAPPING

VCGI Map Center: http://vcgi.vermont.gov/maps

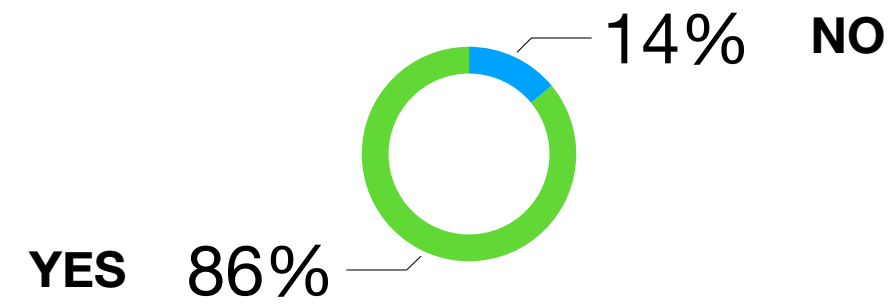
Vermont Center for Geographic Information provides publicly available GIS data, current & historic maps of Vermont.

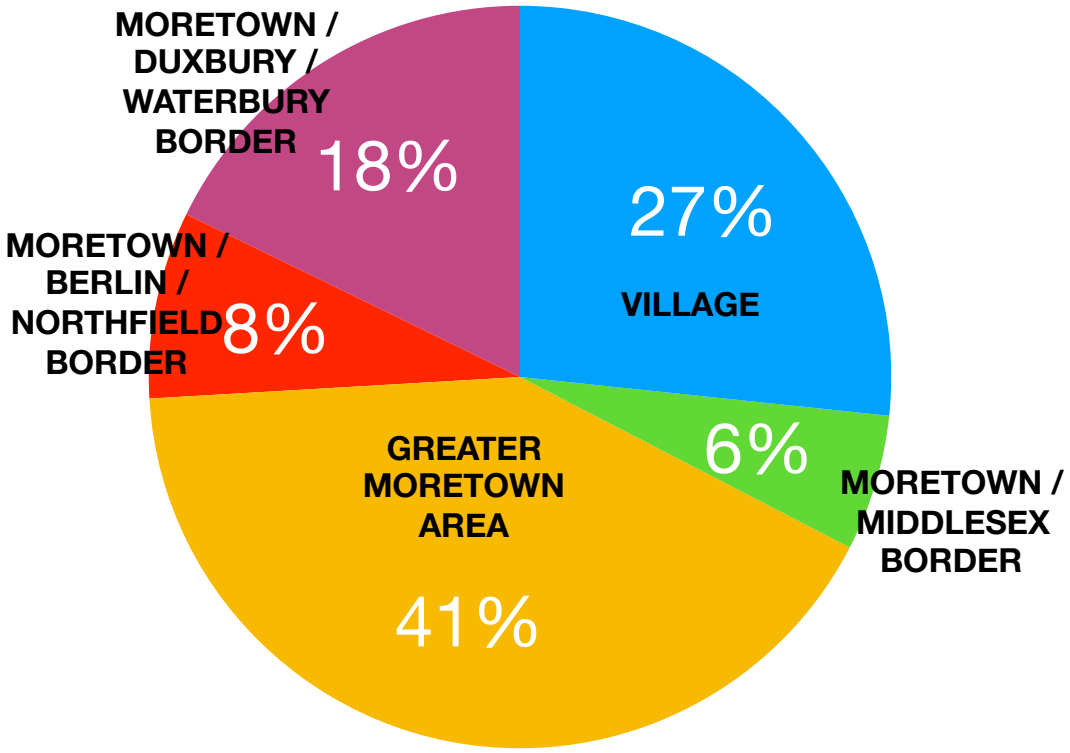
Soil Mapping: http://websoilsurvey.nrcs.usda.gov

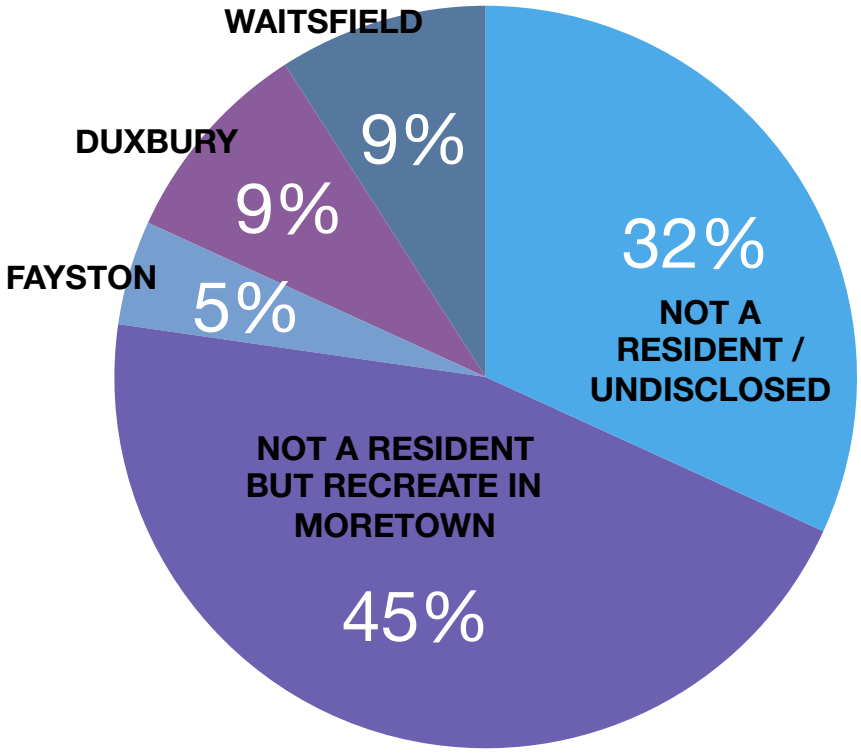
Provides soil data and information produced by the USDA."

2022
MORETOWN RECREATION COMMITTEE COMMUNITY SURVEY RESULTS

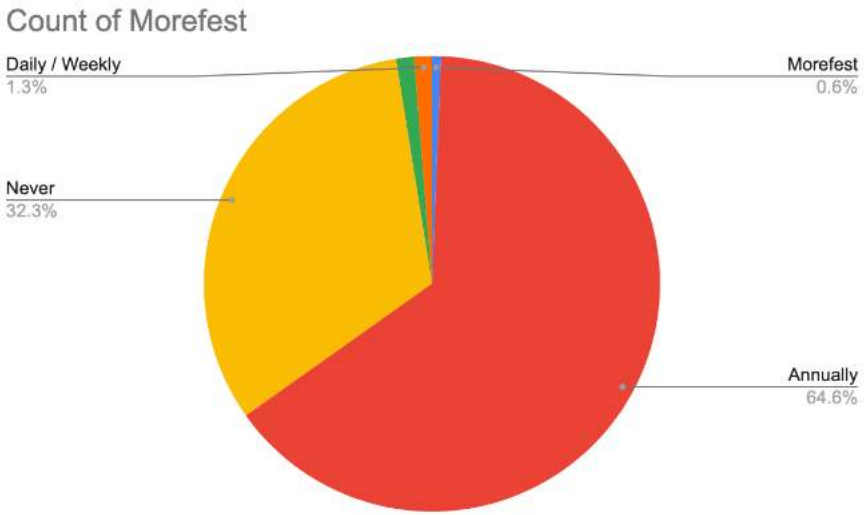
MORETOWN RESIDENT?

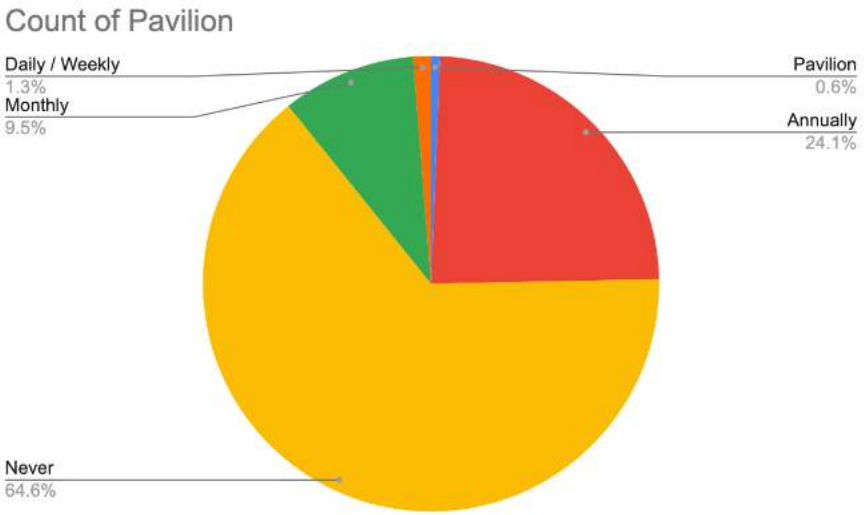


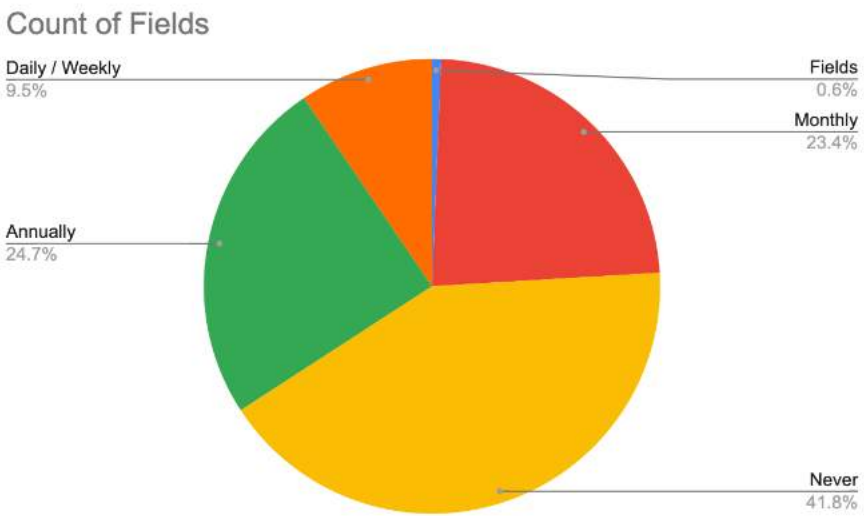


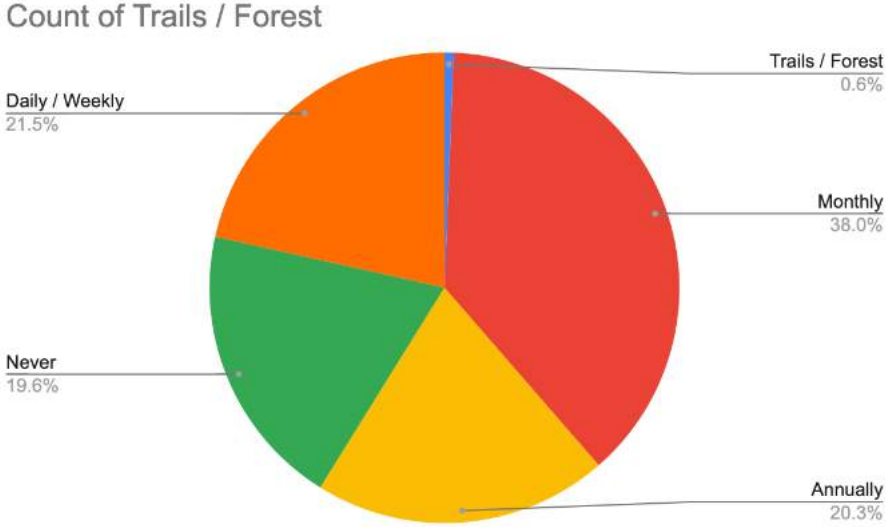


HOW OFTEN DO YOU USE TOWN OWNED ASSETS?

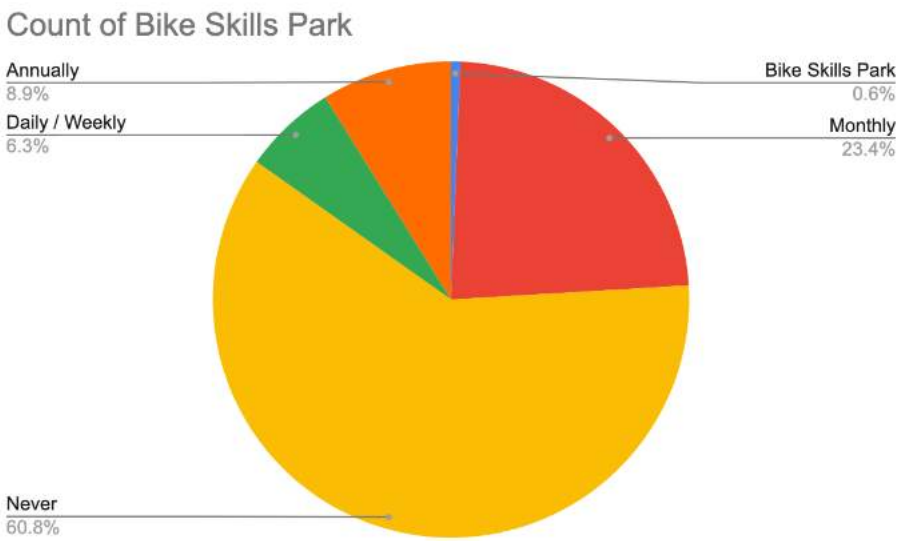


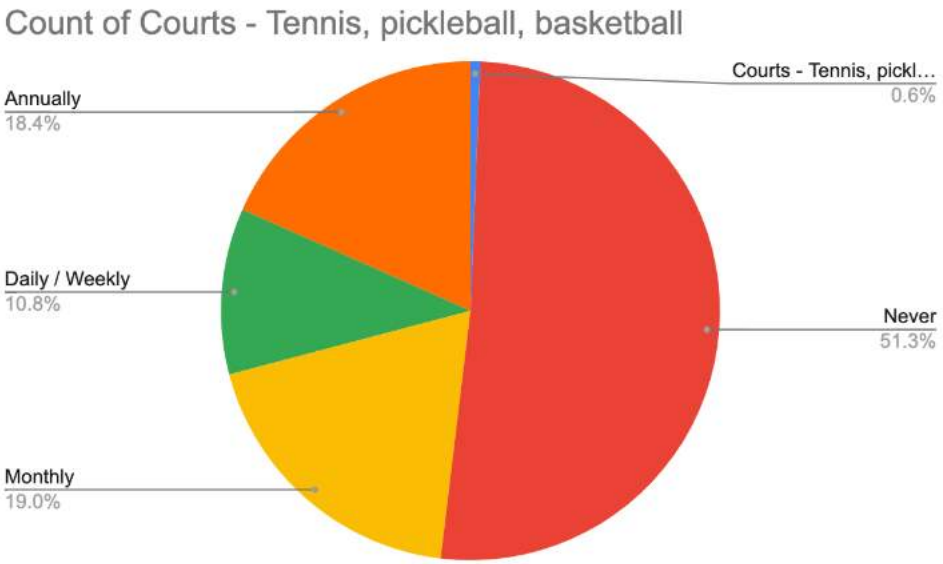


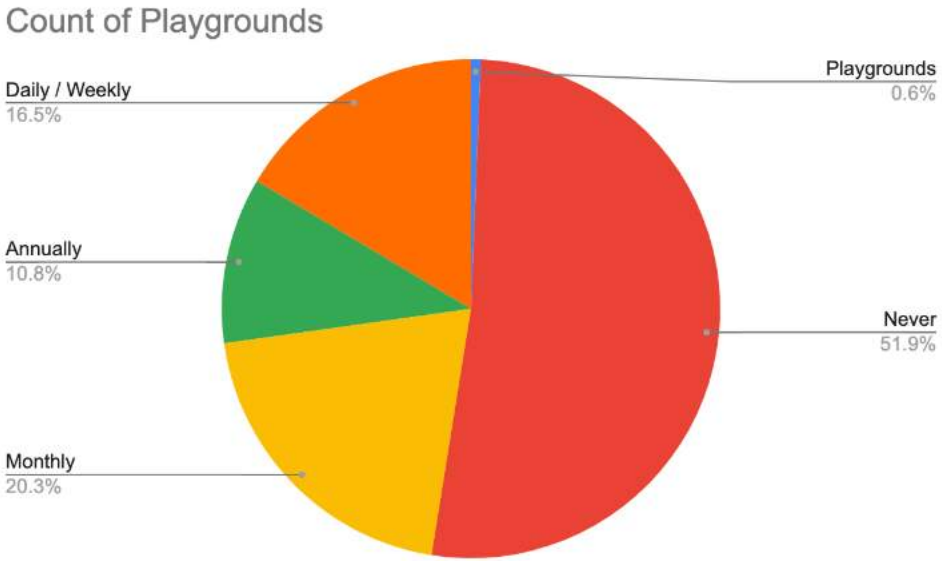




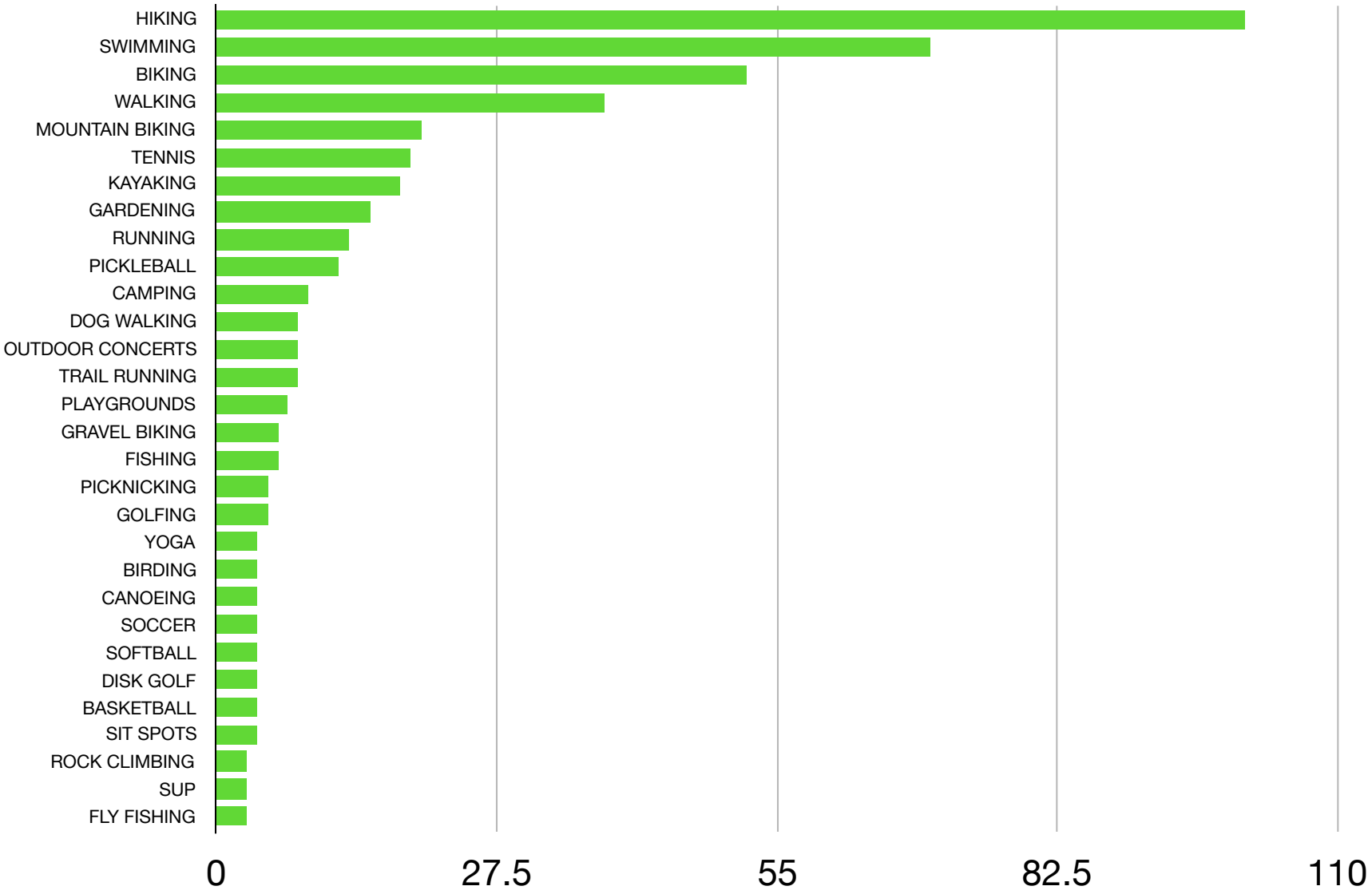
HOW OFTEN DO YOU USE TOWN OWNED ASSETS?



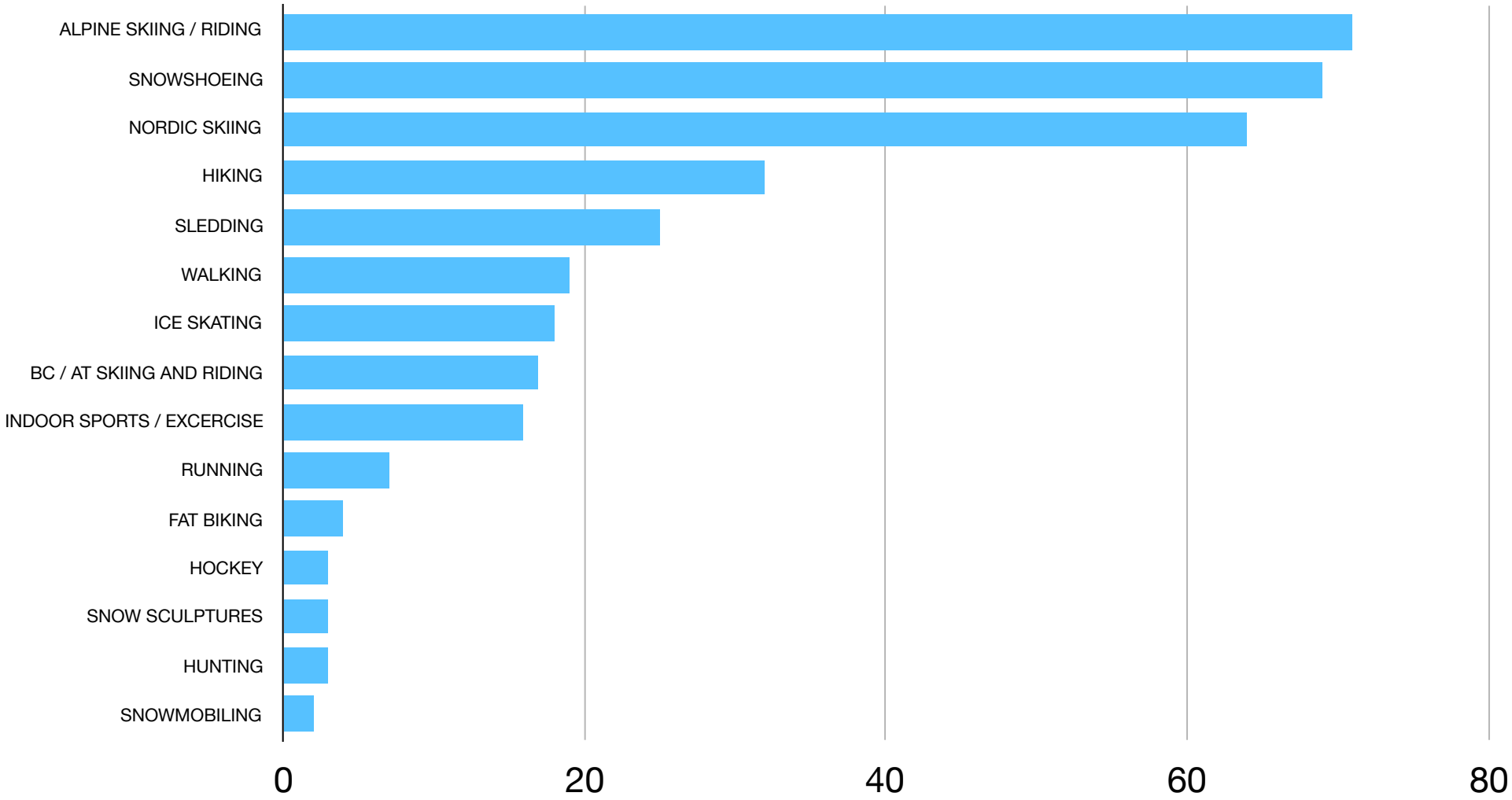




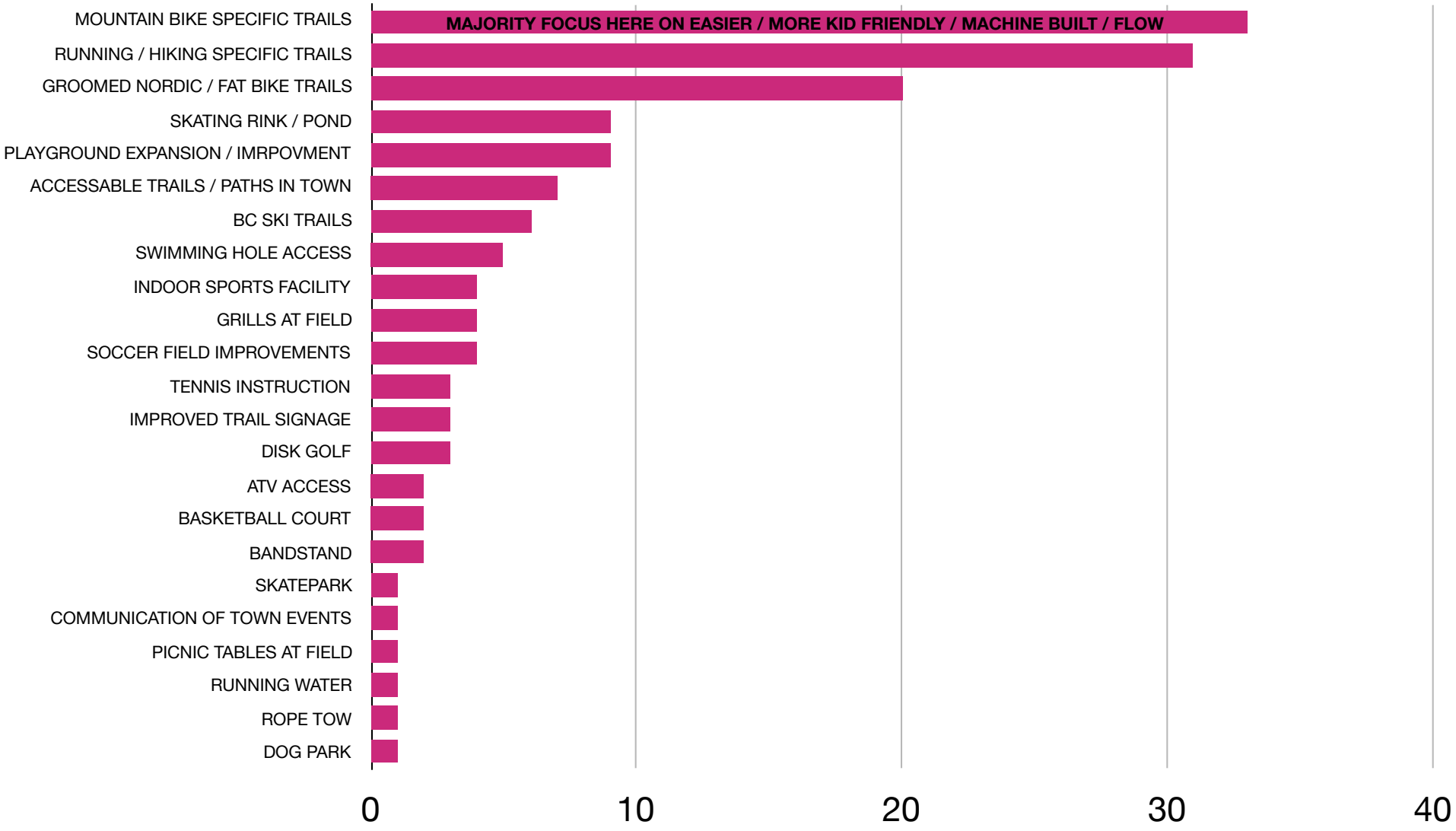
TOP 30 FAVORITE SUMMER ACTIVITIES



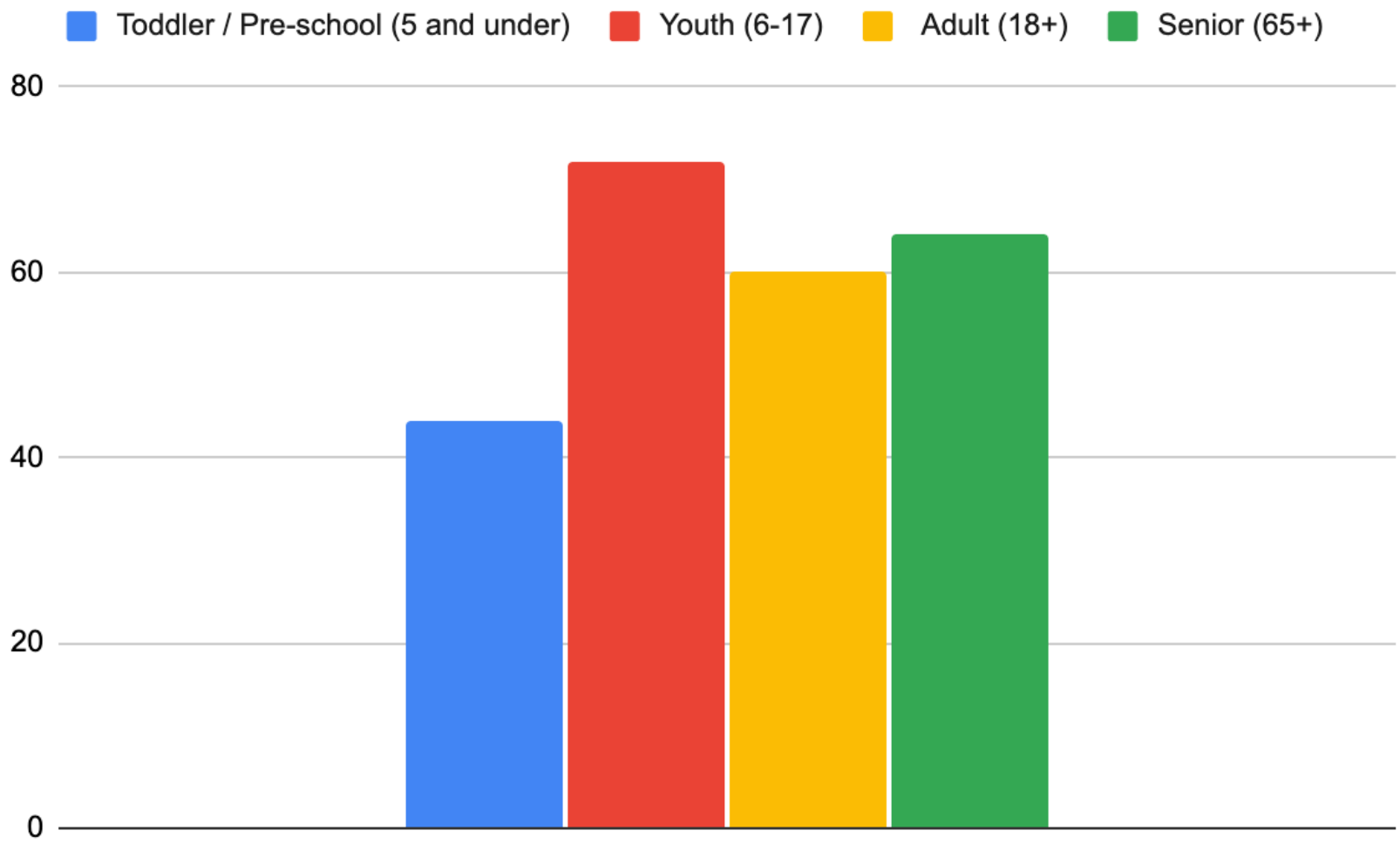
TOP 15 FAVORITE WINTER ACTIVITIES



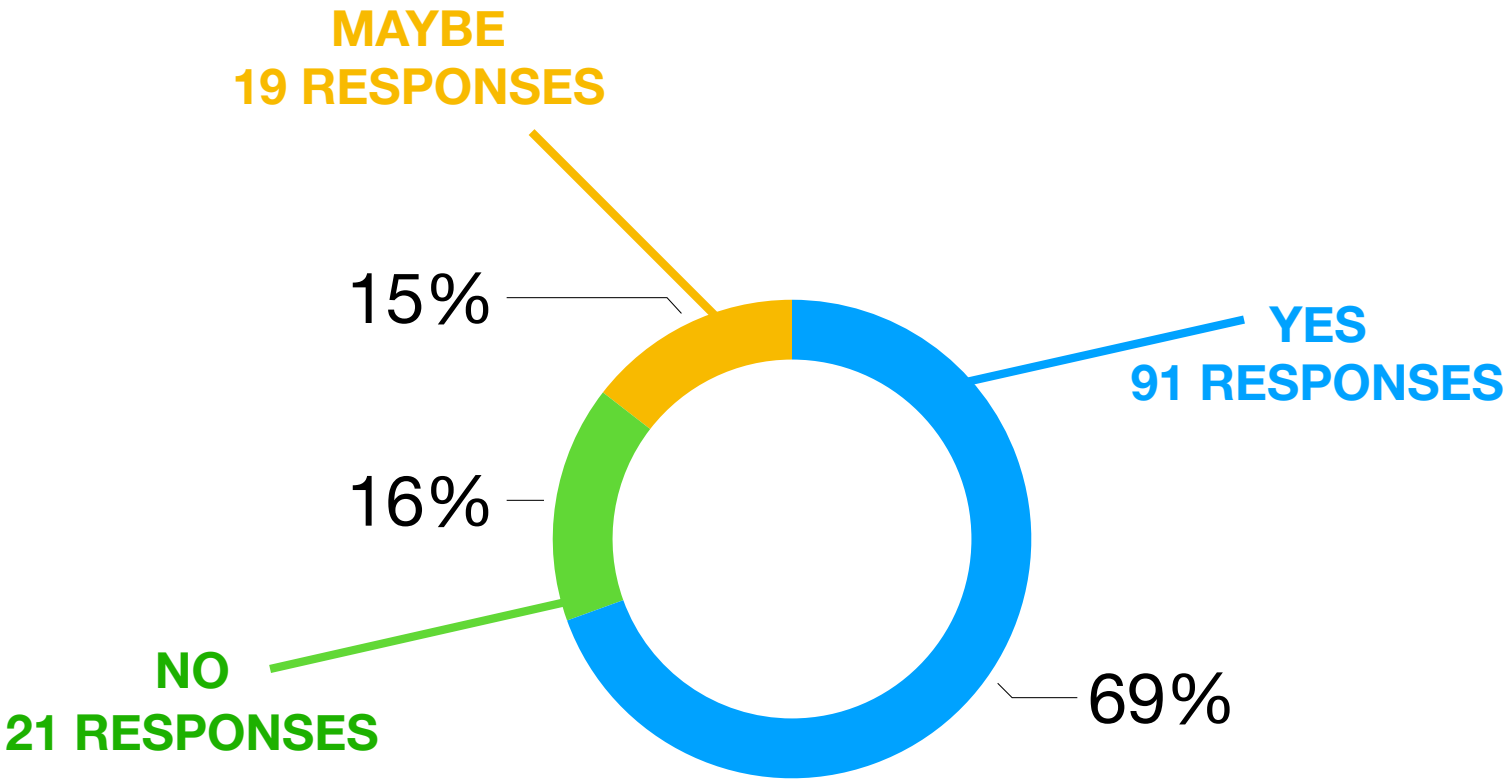
WHAT SHOULD BE MADE AVAILABLE, MORE AVAILABLE OR MORE ACCESSIBLE?



IN WHAT AGE RANGE WOULD YOU LIKE TO SEE MORE RECREATIONAL OPPORTUNITIES?

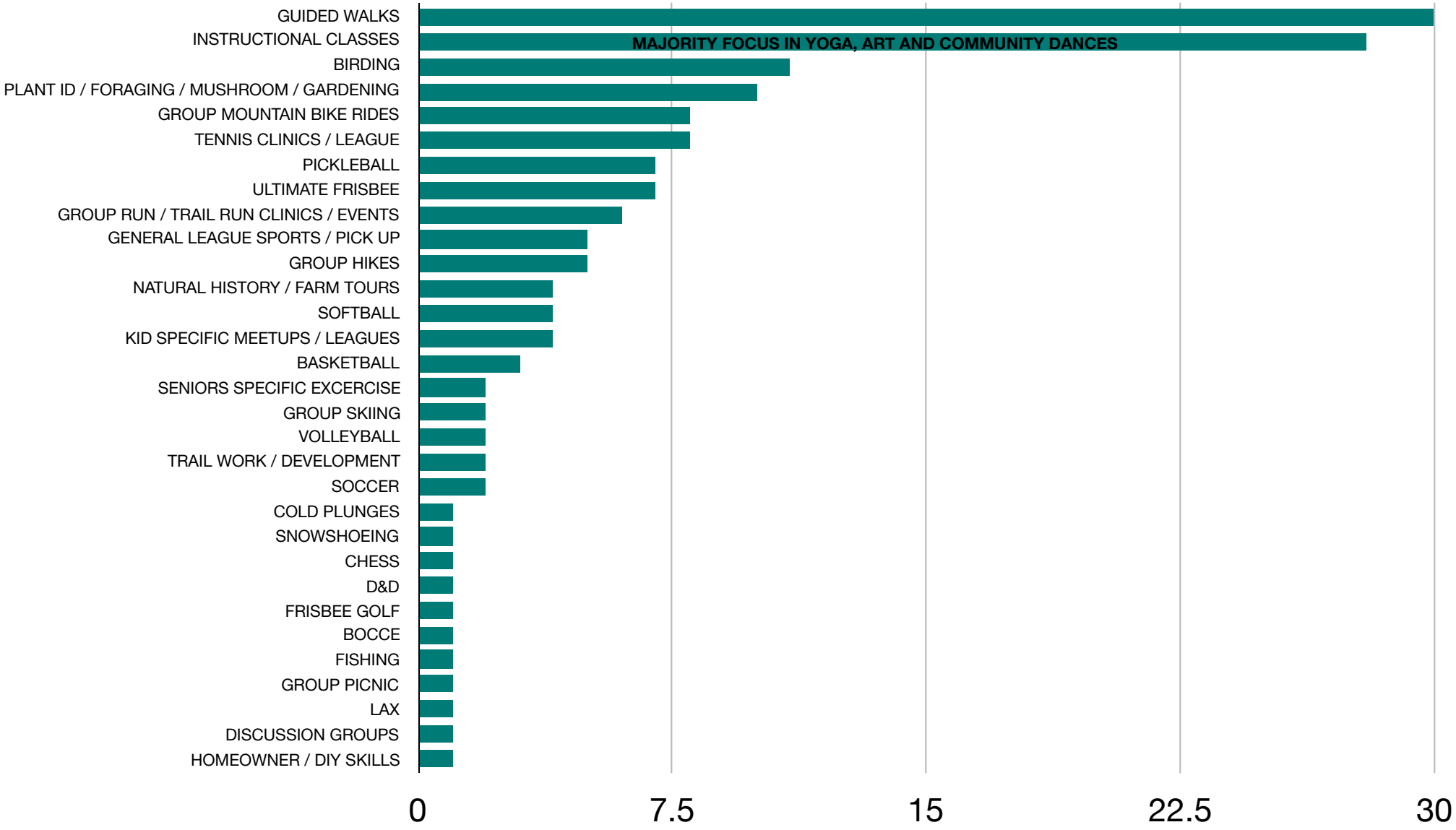


WOULD YOU PARTICIPATE IN GROUP ACTIVITIES IF OFFERED?

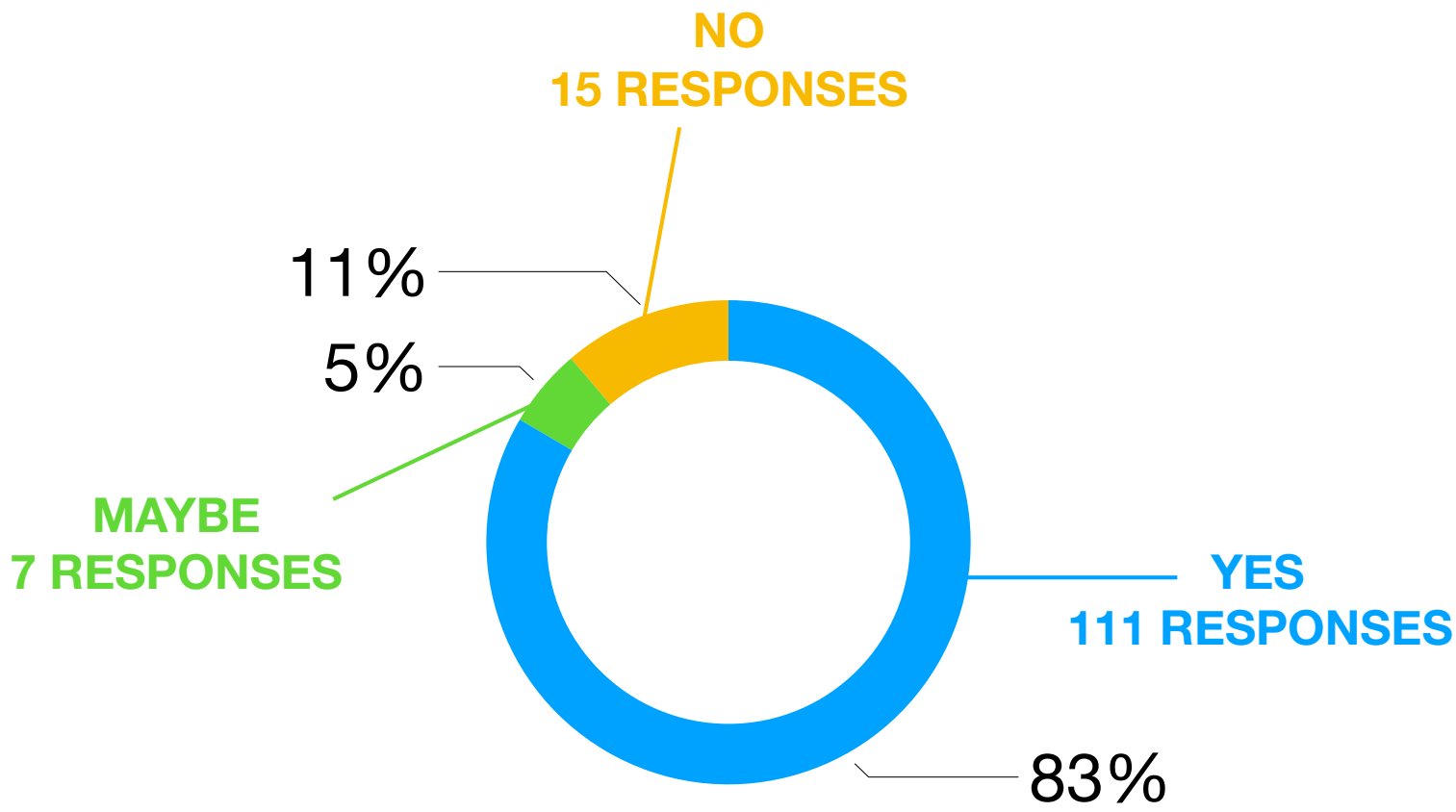


DETAILED IN NEXT SLIDE

WHAT GROUP ACTIVITIES ARE OF THE MOST INTEREST?

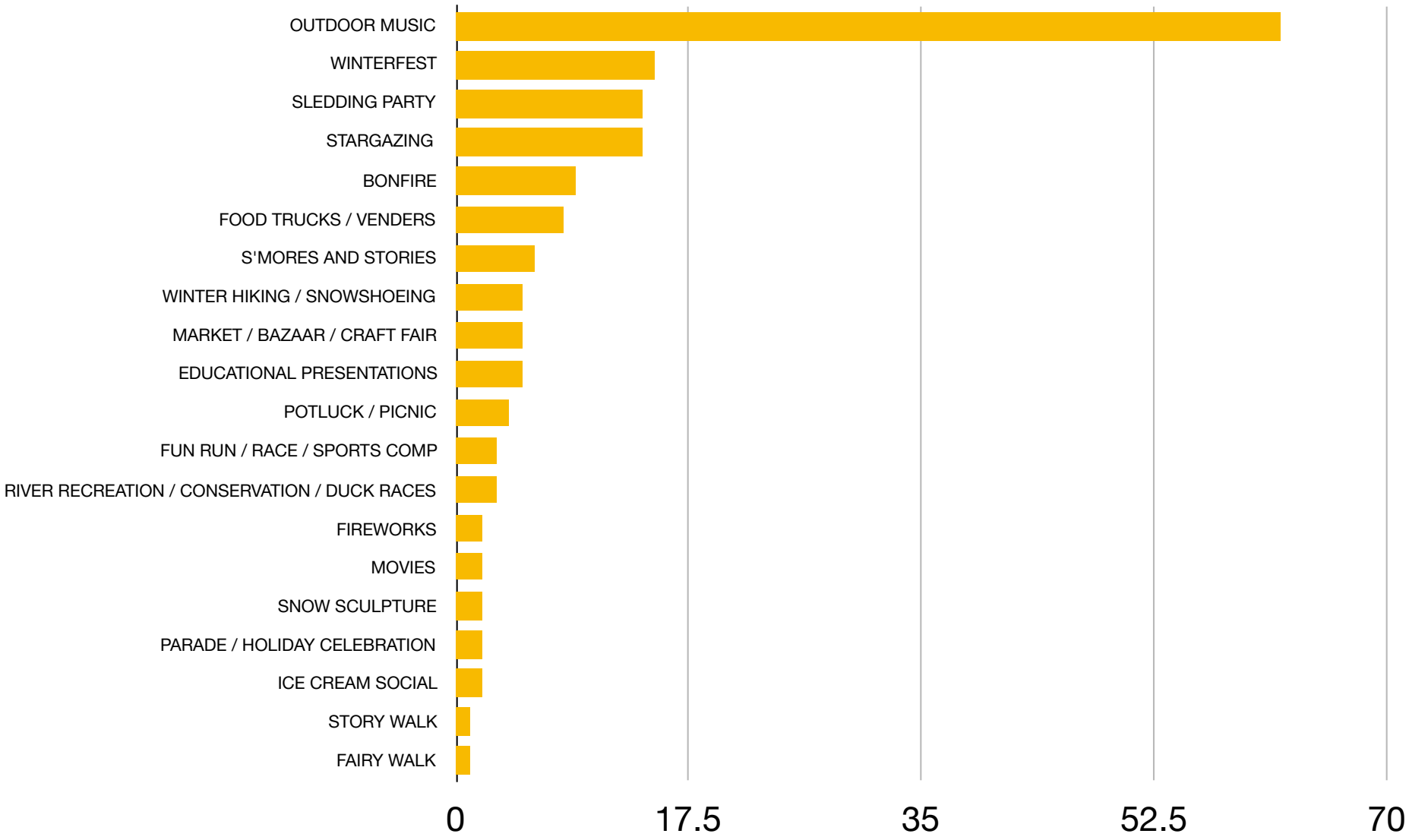


WOULD YOU PARTICIPATE IN SPECIAL EVENTS?



DETAILED IN NEXT SLIDE

WHAT SPECIAL EVENTS ARE OF THE MOST INTEREST?



WHAT RECREATIONAL FACILITIES IN MORETOWN SHOULD BE IMPROVED OR ENHANCED?