Forest Management Plan

SOUTH HERO TOWN FOREST

SOUTH HERO, VERMONT

October 2025

Prepared by: Charlie Hancock
Franklin & Grand Isle County Forester
VT Dept. of Forests, Parks & Recreation
(802) 917-2711/charlie.hancock@vermont.gov
Vermont Licensed Forester 148.0121863

Table of Contents

I. Property Data Summary

Prepared for:	Conservation Commission, Town of South Hero
Address:	c/o Mark Naud PO Box 175 South Hero, VT 05486-075
Phone:	(802) 363-3310 (Mark Naud)
Email:	mnaudlaw@gmail.com
SPAN #:	603-189-10723
Town Where Land is Located:	South Hero, Vermont
Grand List Acreage:	95.77 acres
Ortho Photo Number:	#088236; 2007
Sampling Method:	variable radius plot sampling; 10 baf prism
Inventory Date:	September 12th 2025

II. Plan Introduction

This Forest Management Plan for the South Hero Town Forest is designed:

1. To identify property objectives within the framework of landowner goals
2. To analyze the timber and non-timber related natural resources on the property
3. To make management recommendations (both active and passive) that may be possible in light of current stand conditions, aimed at increasing forest health and productivity, enhancing wildlife habitat, and guiding adaptation and resilience to the impacts of a changing climate
4. To identify any resources which may aid in the management of the South Hero Town Forest
5. To outline a comprehensive Schedule of Management Activities for plan implementation

III. General Description

The South Hero Town Forest is located in the northeastern portion of the Town of South Hero, south of Rt.2 and east of South St. Access to the parcel is from Lavin Lane, which dead-ends at a small parking area intended for public access at the Property. Access to forested portions of the parcel is from a trail originating in the southeastern portion of the meadow. The parcel is listed at 95.77 acres, with approximately 23 acres of open land, and the balance in forest. The parcel is bisected by a Vermont Electric Cooperative utility right of way. Terrain on the parcel is generally flat, with a slight northerly aspect. Vegetative diversity on the property is driven principally by soils and soil hydrology, with the current composition and structure heavily influenced by land use history and gradual agricultural abandonment over the last 60-70 years.

The property was acquired by the Town in 2024 with ARPA grant funds as part of a Village Wastewater Initiative. Analysis to date suggests that Stand 2 and portions of Stand 1 south of that area may be suitable for a secondary treatment and/or sub-surface drip disposal infrastructure and may be developed for that purpose. As such, future amendments to this plan may be made to accommodate such activities, designating those portions as intensive use areas not managed for forest related objectives.

Land Use History

The 1962 imagery for the property shows that the entire land area was cleared and in agricultural use at that time, with scattered trees or clusters of trees present presumably for shade in pastured areas, as well as along fence lines. The large diameter Burr Oak (discussed on pages 7-8 and 17-18) are clearly visible. While cleared, the large wetland complex present in the southern portion of the parcel (designated as an ETSA, pages 22-23) is still easily differentiated due to soil composition and use (generally characterized as low-quality pasture). 1974 imagery for the parcel shows the gradual establishment of trees occurring, primarily in the northern portion and southwestern corner of the parcel, presumably due to these areas being abandoned from pasture. The long rectangular field (presently mapped as Stand 2) is still clearly visible (it's unclear if this area was ever cropped, but depth to bedrock could limit crop potential for tillage. The large wetland complex shows dense young tree growth at that time. 1985 imagery for the parcel shows that pasturing was still likely occurring in the southeastern portion of the parcel north and south of the power line corridor. The southwestern corner is fully vegetated, as is the area surrounding the mapped vernal pool adjacent to Stand 2 area. Northern areas also appear to have significant tree growth.

Biophysical Region and Soils

The property is located in the Champlain Valley biophysical region. Thousands of years ago, as the glaciers retreated to the north, the Champlain Valley was lying under first the fresh water glacial Lake Vermont and then the salt water of the Champlain Sea. The water had a profound impact on the soils found here today. Many of the soils found in the valley are "lacustrine", or water deposited. These soils are made up of fine sediment, sand and gravel that were carried in the water. Water moving at fast speeds is able to hold larger pieces, like gravel, but as the water slows down the largest pieces fall out. Fine sediments lay in the water until it is nearly motionless. This is why there is gravel and rocks in streambeds and clays and fine sediments in lake bottoms. As the glaciers retreated, salt water flowed in from the north, converting the lake to a smaller sea and depositing the sand we can find mixed in the soils today. The underlying bedrock is composed of carbonate-rich rock with some quartzite. The carbonate

rich bedrock weathers easily and releases calcium and other important nutrients into the soil, making it very fertile. Glacial rebound gradually diminished the inland reach of the sea water to its present extent. The sea was eventually cut off from the St. Lawrence Seaway, and in time the salt water was replaced by the fresh water of Lake Champlain. The hills within the Champlain Valley were not flooded by either Lake Vermont or the Champlain Sea, but were scoured by the glaciers as they retreated north. This left the glacial till that the soils in these areas are made up of. The soils found on hilltops have much in common with those found in the Northern Green Mountains. Today, the Champlain Valley is low, warm, and comparatively dry. The soils, climate, and vegetation have more in common with the lowlands surrounding the Great Lakes than the Green Mountains.

The dominant soils found on forested portions of the property are of the Benson, Amenia, Kendaia, and Covington series. ***Benson*** (BeB, BeC) soils are a shallow, rocky, somewhat droughty, well-drained soil that overlies limestone or calcareous shale. Benson soils have a forest productivity rating of II, or as having moderate productivity. ***Amenia*** (AaA, AbB) soils are a very deep, moderately well-drained loam formed on uplands from limestone material and glacial left by glaciers. They are usually located next to the more droughty shallow Benson soils. Amenia soils have a forest productivity rating of I, or highly productive. The ***Kendaia*** (KcA, KbA) series is a wet, dark loam formed from high lime materials left by glaciers. In most years these soils are wet for a long time in spring and fall. ***Covington*** (CbA) soils are very deep and very poorly drained, formed in calcareous glaciolacustrine and estuarine clays on glacial lake plains. Covington clay is wet for a long time in the spring and fall. These soils have a high natural fertility, but are limited by the wetness, found most extensively in grand isle county in association with the Benson series. Covington soils have a forest productivity rating of III, or having low productivity.

Community Objectives

Long term objectives for the property are to conserve the land in a forested condition, and to practice long-term forest stewardship that increases the health of the forest and the quality of the timber resource. Primary objectives also include enhancing wildlife habitat for a number of species, maintaining forest aesthetics associated with the recreation use of the property, and implementing practices which better adapt and build the resilience of the forest to the impacts of climate change. Management will also incorporate the following principles of sustainable forest management:

1. To maintain the long-term integrity of the forest ecosystem, including the following components: soil productivity, riparian buffers, native biodiversity, naturally occurring community and species mix, control of invasive species, and retention of appropriate numbers and size range (including large diameter) examples of coarse woody debris and standing large trees, both living and dead, in various stages of cavity formation, snag development, and decay ***(it should be noted that all low-grade material cut, otherwise marketable as pulp or chip wood, will be retained in the forest during all future harvesting work in the stand to help meet these objectives, also outlined on pg. 9 of this plan)***; and

2. To use silvicultural techniques and prescriptions which use the structure (e.g. vertical structure and crown closure), function (e.g. age class distributions, special habitats or food sources, and riparian buffers), and dynamics (e.g. gap size, distribution and rates of formation) of the natural forest as a model for guidance. These examples are not intended to be limiting or all inclusive, but rather illustrate issues to be considered in forest management planning since knowledge about sustainable forestry will continue to evolve and the specificity of mimicking natural forest

processes may vary depending upon location and any specific goals for wildlife and biodiversity management.

Management of the South Hero Town Forest will also seek to increase forest carbon stocking in the forest while also increasing the resilience of the forest carbon stored on site. A variety of forest management principles and silvicultural approaches can be used to maintain or increase carbon stocks in actively managed forests. Carbon forestry can accommodate active timber management. But to increase stocking, generally this requires somewhat lighter, smaller, and less frequent harvests compared to intensively managed forests. The specific mix of management approaches (ranging, for example, from no-cut zones to more actively managed stands) and silvicultural systems (e.g. uneven-aged, multi-aged, and even-aged) should be developed in consultation with a professional forester and stipulated clearly in forest management plans.

A variety of silvicultural guides[1] can help inform choice of silvicultural system where multiple objectives are desired, including carbon, timber, wildlife, and others. Generally, these may incorporate elements of the following principles favoring accumulation of carbon storage over time:

1. Efficient timber harvest scheduling over time and space to ensure that net annual removals are at or below the net annual carbon stocking increment for a property overall;
2. Incorporation of no-harvest or minimal harvests zones, such as riparian buffers and ecologically significant treatment areas;
3. Use of extended rotations, where harvest rotations or entry cycles for individual stands are lengthened;
4. Use of carefully designed intermediate treatments, such as stand improvement thinning, variable density thinning, and crop tree release methods, that enhance stand quality, health, and growth over time;
5. Use of retention practices in regeneration harvests. These practices retain "biological legacies" of all sorts (e.g. live and dead trees, standing and downed material, and soil organic matter) over multiple rotations or entry cycles. A wide variety of retention practices are available for northern hardwood, conifer, and mixed-woods forest types, including modifications of even-aged (e.g. dispersed and aggregated tree retention within harvest units), multi-aged (e.g. irregular shelterwood method), and uneven-aged (e.g. Structural Complexity Enhancement; group or gap-based selection systems with retention). There is no "one-size-fits-all" approach for retention forestry as a means to maintain or enhance carbon stocking. Rather a landowner, working with a professional forester, will want to select the system most appropriate to a given stand, site, and mix of objectives; and
6. Use of monitoring data to track changes in stocking over time and to update timber harvest schedules and management plans accordingly.

Management Planning

This management plan is intended to be a guide in the ongoing management of the forest resources. It is designed for the 20-year period 2025-2035, with re-evaluation and updating on a ten-year cycle. A

[1] https://www.fs.fed.us/nrs/pubs/gtr/gtr_nrs132.pdf
https://vt.audubon.org/sites/default/files/silviculture-options_0.pdf
https://www.nnrg.org/wp-content/uploads/2015/03/Franklin_etal_2007_ecoforestry.pdf

Schedule of Management Activities (Section VII) is included which specifies silvicultural treatments and other work for the 20-year period. Activities suggested for the immediate ten-year period (2025-2035) are more detailed and specific than the following period. It is intended that upon re-evaluation activities for the subsequent ten years be more clearly defined. It is understood that modifications to the plan activities or schedule may be necessary as landowner objectives change

V. General Land Management Requirements

Forestry

Landowner objectives identify long term forest management that increases the health of the forest and the quality of the timber resource in concert with other objectives, primarily concerning wildlife, recreation, adaptation, and resilience. As is evident on the property, there are a mixture of desirable and undesirable species, well-formed and mis-shaped trees, healthy and diseased trees, young growing stock, and mature timber. Management activities on the property are designed to remove defective and over-mature trees not retained as legacies, as well as a portion of the mature sawtimber, releasing quality stems in the understory while at the same time maintaining an ideal stocking for the production of high quality saw timber. Thinning is recommended in areas which have become over-stocked or are reaching a fully stocked condition in an effort to increase tree growth and vigor, and allow for full crown development. Harvests will also allow for the advancement of established regeneration, though regeneration is generally not a problem on the property. Species to be managed for on the property include sugar maple, white ash, northern red oak, red maple, black cherry, yellow birch, American beech, basswood, bitternut hickory, service berry, hop hornbeam, eastern white pine and eastern hemlock. Trees should be selected based on stem character and crown development, as well as overall health and vigor. Amenities to wildlife such as mast, browse and cover should be considered as well. Both even-aged and uneven-aged silvicultural techniques will be implemented on the property. Other stands will be converted to an uneven-aged structure in the future. Specific recommendations based on the inventory conducted, follow in Section VI.

In an even-aged system the goal is to create large disturbances that result in the establishment of shade intolerant species such as pine, oak, birch or aspen. This system is also appropriate for natural communities that in nature regenerate after larger disturbances from wind or insect defoliation such as spruce-fir. The shelterwood system is an even-aged method for regenerating more shade tolerant species. An overstory is retained in the stand until the desired regeneration has become established. In all even-aged methods the overstory is eventually removed. A delayed shelterwood could retain a component of the overstory.

In an all-aged management system the goal is to mimic an undisturbed natural forest. In an undisturbed site, the trees will grow to biological maturity and die as individual trees or in small groups due to minor wind-throw events. In Vermont, the climax types that regenerate themselves and develop an all-aged system are northern hardwood (beech-birch-maple), hemlock, and red spruce. This natural disturbance paradigm for management coincides with small, frequent disturbances forming canopy gaps that result in diverse mosaic of age classes dominated by late successional species.

The all-aged system has an equal distribution of stand basal area in each of the following age classes: sapling, poles and sawtimber. The sawtimber class is further broken into small, medium and large

sawtimber. All-aged management is generally more intense in terms of planning, and number of treatments over time than even-aged management; however, the all-aged silvicultural techniques have less overall impact to the site. The amount harvested at each entry is less than in an even-aged harvesting system. The all-aged system is also more aesthetically pleasing because large diameter trees are always retained to maintain the size distribution. These large diameter trees include final crop trees that will bring the highest return for timber, as well as trees that will be retained for their wildlife or aesthetic value. These latter trees will not be cut but left to natural senescence.

Water Quality

One of the most critical measures of a healthy forest is the ability to produce clean, clear water. Aquatic habitats in Vermont represent a large contribution to the state's biological diversity, and they are the highest priority for conservation. The protection of rivers and streams, lakes and ponds, seeps, vernal pools and other wetlands is crucial for the maintenance and improvement of Vermont's water quality and aquatic habitat, supporting a host of amphibians, reptiles, invertebrates, plants, fish, and mammals. Careful management of all forestry activities on the property is of high importance as run-off into waterways can lead to increased turbidity and reduced available oxygen content. A lack of shade can also increase water temperatures.

A 100 ft. minimal cut buffer should be placed on all perennial streams encountered during any future harvest operations, within which stocking levels should be maintained at or above the B-line on the Northern Hardwood stocking guide, with canopy openings extending into the buffer no more than 0.2 acre in size. A similar buffer at 50 ft. should be placed on all ephemeral/intermittent streams potentially encountered during any future harvesting activity. In addition all Acceptable Management Practices (AMP's) will be in place during any logging operation to prevent discharge into water bodies or sources.

Wildlife Habitat

With some exceptions, wildlife can benefit from careful manipulation of the land. Forest management activities will create openings in the forest canopy, create slash for cover, and stimulate re-growth for wildlife browse and fruit and seed production. In general, the more diverse the flora (vegetation) in an area is in species and richness, the healthier and more diverse in fauna (wildlife) it will be.

The property has a number of habitat characteristics that are beneficial to several wildlife species. There are abundant hard and soft mast species found on the property including northern red oak, burr oak, swamp white oak, serviceberry, yellow birch, and black cherry. Also noted on the property are scattered apple trees found along the margins of the open land, as well as in the forest interior. These trees are potentially used by many game species, including white-tailed deer, fox, fisher, porcupine, ruffed grouse, snowshoe hare, cottontail rabbit and grey squirrel. Apple trees also provide good habitat for woodcock and many song birds including blue birds, fly catchers, robins and orioles. Ensuring that a tree gets direct sunlight is the most effective way to enhance its productivity. In order to maintain the health of these trees periodic re-evaluation and thinning from overhead competition should be carried out. Pruning of all dead and diseased branches should also be a priority. The best time of year to prune fruit trees is in March or April, after the damage of severe cold has passed, but before the tree blooms.

Another important feature of the property are the large diameter remnant oak and maple, as well as larger pine, found in portions of Stand 1 that have the potential to develop into den or cavity trees, if they are not

already. Where appropriate, these trees should be retained as "*Legacy Trees*". Legacy trees are trees that are intentionally retained in the forest until they reach the end of their biological life span. In addition to providing dens or cavities, they also provide an important food source for woodpeckers that feed on the insects inhabiting them. Large branches or entire trees of this diameter that have fallen to the forest floor provide important down woody debris for use by small mammals and several amphibian species. Fisher is one species that prefers fallen hollow logs for denning and rearing young. ***Targets for Snag and Course Woody Material Retention:*** *Snags and cavity trees*: Retain and recruit a minimum of four secure snags or cavity trees per acre. These should include a diversity of diameters and sizes ranging from 5 to 6 inches to over 24 inches. Ideally, on each acre one snag over 24 inches should be retained or developed. *Downed woody material*: An ideal target would be to leave three to five stems at least 18 inches in diameter and 10 stems at least 14 inches in diameter per acre. All should be at least 16 feet long.

Portions of the South Hero Town Forest offer opportunity for management specifically focused on ***Woodcock*** and ***Ruffed Grouse***. Ruffed grouse are associated with early successional hardwoods such as aspen and paper birch. The best grouse habitat includes three distinct age classes of forest (0-10, 10-25, 25+ yrs) within a 10-15 acre area. Grouse habitat is further improved by interspersed grassy areas, apple trees, and patches of softwood. Grouse feed on a variety of plants and insects. Grasses are the preferred plant in the spring and summer, and in the fall and winter, they eat twigs and catkins of many trees and shrub species including aspens, birches, cherries, apples, hop hornbeam, oaks, hawthorns, dogwoods, and viburnums.

Grouse requirements include breeding, nesting, brooding and roosting habitat. Breeding cover consists of 15-25 year old hardwoods with a few scattered logs used for drumming sites. Drumming sites must have overheard cover to protect the bird from avian predators. Horizontal cover in the form of logging debris is important to protect the bird from fox and other ground predators. Brooding cover is typically in bushy areas or regenerating stands. The abundant herbaceous component generally found in these brushy sites provides the high energy demands of the brood. Roosting habitat is mostly in the mature forest component. Both hardwood and softwood are used for roosting. There is less predator attack in hardwoods, but there is better winter cold protection in the softwood stands. There are no specific requirements for nesting.

Woodcock may use the same habitat as grouse (especially those areas associated with grouse brooding habitat), with feeding, nesting, and brood rearing of Woodcock all take place in generally the same cover (the differentiation being that Woodcock also need open areas for their courtship ritual, which includes a unique flight display). The best location for a woodcock management unit would be in an area where the soils are more poorly drained, these areas being best suited to their feeding behavior which involves using an articulated beak to poke long, thin breaks into the soil, feeding primarily on worms as well as small invertebrates such as beetles, ants, spiders, and crickets. A traditional management technique for Woodcock habitat is creating successive strip or patch cuts in alder dominated areas on a 5-10 year rotation to maintain this early successional habitat type.

The maintenance of the ***open land and edge habitat*** on the property—centered on the northern meadow and power line corridor—is also important, and should be taken into account in terms of management. An edge is defined as an area of horizontal or vertical variability. The distinct differences in horizontal diversity between field and forest, along with the transition zone, provides a greater number of habitat

niches for a greater diversity of wildlife species. Some wildlife species that may be found in this forest type include white tailed deer, fox, raccoon, skunk, long tailed weasel, and ermine. Birds include several raptor species, including hawks, screech owl, great horned owl, as well as ruffed grouse, wild turkey, woodpeckers, several species of wren, flycatcher, waxwing, thrush, vireo, warblers, goldfinch, sparrow, and tanager. Management should retain patches of softwood cover along these edges, and soften or feather these edges to decrease negative effects caused by predation and nest parasitism. Additional blue bird boxes could be placed around the margins of the meadows in an effort to provide additional nesting cavities. Boxes should be cleaned each spring prior to the arrival of the next years birds.

Vernal Pools

Vernal Pools (generally less than one acre) are small temporary bodies of water that occur in natural basins within upland forests and are underlain by a relatively impermeable layer such as bedrock. Run-off from spring rains and melting snow fill these depressions with water that persists until summer. The seasonal pattern of flooding and drying makes them a critical habitat for invertebrates and amphibians that define this natural community. Vernal pools typically have no permanent inlet or outlet streams and have very small watersheds. These temporary pools generally last only a few months (at least 2½ months) and then disappear by the end of summer, although some pools may persist even longer in wet years. During their dry period, vernal pool depressions may be recognized by sparse vegetation, by stained leaves marked by seasonal high water, and by soils that have more wetland characteristics than do the surrounding upland soils. The periodic drying means that there are no fish in vernal pools, but there is a unique assemblage of species that typically includes specialized insects (caddis flies), mollusks (fingernail clams), and other invertebrates (fairy shrimp), being probably the best known amphibian breeding habitat. Amphibians known to use vernal pools for breeding in Vermont include wood frog, spring peeper, spotted salamander, Jefferson's salamander, blue-spotted salamander, and red spotted newt. Vernal pools typically lack trees but are shaded by trees growing in the surrounding upland forest, keeping the pool cool and minimizing evaporation. The vegetation that grows in vernal pools is highly variable in composition. Vernal pools and the animal species that depend on them are threatened by activities that alter the hydrology and substrate of the pools, as well as any significant alteration of the surrounding forest.

Analysis by the firm VHB in 2015 identified a moderately sized Vernal Pool in the central portion of the parcel (approximate location shown on the Forest Stand Map). Further observation is recommended in the spring of 2026 to determine pool function and whether successful amphibian breeding is occurring. Future active management within certain distances of the pools (the *Vernal Pool ESTA* and *Vernal Pool Life Zone*) will be restricted, the language of which is given here and will direct future work in these areas:

1. Vernal pools themselves and their immediate edges will be left undisturbed.

2. That area within 100-ft. of the Vernal Pools will be designated as a *Vernal Pool ESTA.* Within this ESTA harvesting of single, exceptional quality trees is allowed provided the residual stocking level equals or exceeds the A-line as determined by applying the protocol set forth in the current USDA Forest Service Silvicultural Guidelines for the Northeast. Specific actions directed at enhancing habitat structure, specifically the recruitment of large coarse woody debris may be

conducted. No new woods road construction will take place within the 100 ft. buffer area. Those actions specifically directed at Invasive Species control (if needed) as also permitted.

3. Adjacent to the 100-ft. buffer described above, an additional 500-ft. is established to the perimeter, described as the *Vernal Pool Life Zone*, to be managed as part of the greater Stand as described.. Within this secondary buffer timber harvesting is permitted, but amphibian needs will be addressed through silvicultural prescriptions which advance the goal of developing and maintaining a forest structure and downed CWD similar to mature conditions by using silvicultural techniques to replicate disturbances that create the small gaps typical of this forest community.

In addition, whole tree harvesting is prohibited within both the *Significant Wildlife Habitat ESTA* and *Vernal Pool Life Zone*.

Rare, Threatened or Endangered Species

A rare species is one that has only a few populations in the state and that faces threats to its continued existence in Vermont. Rare species face threats from development of their habitat, harassment, collection, and suppression of natural processes, such as fire. The Vermont Fish and Wildlife Department uses a ranking scheme that describes the rarity of species in Vermont. The range is from S1 (very rare) to S5 (common and widespread). Species are assigned a rank based on the number of known occurrences, the population size, and the degree to which the populations are threatened. For example, creeping juniper and lake sturgeon are S1 species, whereas sugar maple and raccoons are S5 species. Using this system, biologists and other experts assign an S1 rank to a species when it may occur in five or fewer populations in the state and/or when the species is threatened with extinction. Rare species with six to 20 populations are given an S2 rank; threats are also considered. Species with 21 to 100 populations are assigned a S3 rank and are generally considered to be uncommon or a watch-list species. The Vermont Non-game and Natural Heritage program (NNHP) part of the VT Fish and Wildlife Departments Wildlife division, maintains an inventory of Rare, Threatened and Endangered (RTE) species in Vermont. No occurrence of RTE species or natural community has been noted on the South Hero Town Forest, however Sweet Joe-pye Weed (*Eutrochium purpureum var. purpureum*) has been documented along the power lie corridor just east of the parcel. Sweet Jow-pye Weed has an S2/S3 rank, and is considered rare/uncommon.

Neo-Tropical Songbird Habitat

Songbird habitat is discussed separately from the general wildlife habitat in an attempt to highlight its special nature. Some neo-tropical songbirds are currently in decline for a variety of reasons, some due to habitat loss in the breeding territory and some due to habitat loss in wintering grounds. Northern Vermont is breeding habitat for these songbirds. Providing optimum breeding habitat will go a long way in allowing long term success for these species. The following songbirds are the species considered "responsibility birds" by Audubon Vermont (The Birder's Dozen): American woodcock, yellow-bellied sapsucker, eastern wood-pewee, blue-headed vireo (stable), veery, wood thrush, chestnut-sided warbler, black-throated blue warbler (stable), black-throated green warbler, Canada warbler, white throated sparrow, and scarlet tanager (stable).

The following management practices may be implemented to maintain and improve habitat for these at-risk songbirds. It is important to understand that not all practices can be implemented on every property. Specific management practices will be highlighted in each stand description where applicable.

1) Create and enhance vertical structure; one way to accomplish this is to manage using single tree and small group selection silviculture, and to create small gap openings in the forest canopy.

2) Limit management activities to late summer, fall or winter, to minimize impact on nesting birds.

3) Keep forest buffers along streams.

4) Retain a percentage of fruit bearing overstory trees when harvesting, including beech, oak and black cherry, as well as mid layer trees such as serviceberry and apple where present.

5) Retain deadwood including standing snags and downed trees. Dead or dying trees will provide roosting, perching, foraging and nesting sites for roughly 40 bird species.

6) Soften edges between habitats. Negative edge effects caused by predation and nest parasitism can be minimized by feathering the edge, or developing irregular shaped edges.

7) Maximize forest interior. Forest blocks greater than 50 acres will increase the diversity of birds your woodlot can support. Forest interior is defined as habitat that occurs in unbroken forest at least 200-300 feet from the habitat edge. This is important for species such as scarlet tanager, black-throated green and black-throated blue warbler, and eastern wood-pewee.

8) Conversely, retain early-successional forest habitat. Early-successional habitat may be accomplished through patch cutting or managing abandoned agricultural land. Patch cuts may be created for early successional bird species such as chestnut-sided warbler, veery, and woodcock. The woodcock needs specialized habitat and where applicable will be discussed in detail in the stand descriptions.

Aesthetics and Cultural Resources

Aesthetics is a factor that should be taken into account while completing any type of project on the property, whether it is forestry, wildlife or recreation-related. Aesthetically important areas should be maintained and enhanced. Unique natural features such as unusually large and unique trees and shrubs should be preserved in their natural state. Individual large trees may be identified as “Legacy Trees” that will remain in the stand throughout all harvesting operations. These trees should be retained for aesthetics, as seed trees, and as future den and cavity trees for wildlife use.

Cultural resources documented on the property to date are limited to old fence lines, remnants of the land’s agricultural history.

Recreation and Forest Roads

Trail access to wooded portions of the property is currently limited to an old farm road which heads south from the meadow, paralleling the western parcel boundary, and terminating at the power line corridor. Populations of poison/wild parsnip (*Pastinaca sativa*) are very high along the trail (as well as in the meadow), making recreational use during late spring/summer/fall months challenging as the leaves, stems, flowers, and fruits of the plant cause intense, localized burning, rash, severe blistering, and

discoloration on contact with the skin on sunny days. This is not an allergic reaction, it is a chemical burn caused by the sap, brought on by an increase in the skin's sensitivity to sunlight. Affected areas can remain discolored and sensitive to sunlight for up to two years. This reaction is not brought on by contact with the foliage of the plant, only by contact with the sap.

Trails provide potential opportunity for activities such as walking, wildlife viewing, snow shoeing, and cross-country skiing, in addition to aiding in any future harvest or forest management operations. Woods roads may be kept clear by hand or cleared and stumped using a dozer or excavator. Trail improvements may be made at any time, and future harvest operations should require upgrades. All future treatments on the property should seek to maintain points of interest along these trails, such as specimen trees and cultural resources. Efforts to control parsnip populations will also be necessary. Options include mowing and direct herbicide application in late spring/early summer.

Forest Health

While a number of forest pathogens/pests were noted on the property, there were no overtly significant forest health issues noted at the time of the inventory. Most pests are associated with over-mature trees and the defect inherent in old timber. As harvesting activities periodically remove defective trees, the opportunity for disease infection and insect attack on residual timber is decreased. Future management for insect and disease control will focus on the timely removal of mature and over-mature trees not retained as legacies to maintain the population of insect and disease organisms to a tolerable level. No forest health issues were noted at levels of concern during the present inventory, however six of the specific diseases/pests noted on the property at present include:

Sugar maple borer

This insect infects pole-sized sugar maple trees that are stressed from overcrowding or suppression in the understory. Damage is caused by the larvae of the insect that feeds under the bark, creating a ridged wound across the main stem. While rarely killing the trees, this severely damages timber quality and overall value of the tree. The best defense against the pest is to remove infected trees during associated work, and maintaining stocking levels that allow for optimum growth and increased vigor. With sound forest management the likelihood of an infestation of this pest is unlikely.

Eutyepella canker

This canker is associated with a fungus that attacks pole and sawtimber sized maples. All maples are affected, though sugar maple is the most common host. Once infected, the pathogen remains in the tree for many years, developing a large concentric, calloused canker and severally deforms the tree, often giving the affected portion of the stem a humped or cobra head looking form. The canker not only reduces timber quality, but creates a weak point often leading to stem breakage. The most effective control of this pathogen is removing infected trees from the stand to remove the source of inoculum and limiting spread of the disease. As with most pathogens, the best defense is also to practice sound management that maintains a vigorous stand.

Pine Weevil

This a common pest in old field situations which have regenerated in pine. The adult weevil lay its eggs in the top leader of an overstory white pine, usually during the younger stages of the trees development.

When the larvae emerge they feed on the leader and kill it. The branches in the next whorl then compete for dominance, which leaves the tree with multiple stems or a very crooked stem. Where appropriate, these trees may be retained as legacies to enhance stand structure and provide habitat features.

Red Rot

Also known as red ring decay this disease attacks the heartwood of living conifers, usually targeting older trees. Infection by the fungal pathogen *Phellinus pini* occurs primarily through dead branch stubs, though sometimes open wounds provide a point of entry. Decay appears as discoloration of the heartwood (typically a reddish color), severely degrading the lignin (essentially what holds the cells together). Advanced decay appears as elongated white pockets parallel to the grain separated by apparently sound wood, eventually merging into a mass of white fibers. Sometimes bell or hoof-shaped conks appear on the main stem. No effective control strategy is known for infected individuals. Trees exhibiting symptoms should be harvested to prevent further reduction in value. This disease typically appears in multiple trees in one area, so group selection is recommended.

Butternut Canker

Butternut canker is a highly virulent disease that is putting the species at risk of extinction in Vermont. There were several butternut found throughout the eastern portion of the property during the present inventory that appear to be in excellent health. One recommendation to the landowner is to consider opening areas around healthy butternut on the property to allow from greater crown expansion and the establishment of butternut seedlings, as they need direct sunlight to germinate and become established. The maturing forests of Vermont, along the prevalence of butternut canker, are limiting the future of this species in our region. Making larger openings around butternut on the property will give them a greater chance of survival.

Emerald Ash Borer

Emerald ash borer has been confirmed in all but Essex County in Vermont, and is widespread throughout the Champlain Islands. Emerald ash borer was first discovered in the Detroit, Michigan area in 2002, though it is believed to have arrived in the 1990's. EAB is now known to be established in 32 states and three Canadian provinces. The beetle is about one half an inch and metallic green. Its larvae tunnel through the wood just under the bark of ash trees; killing the tree by cutting off the flow of nutrients. Healthy ash trees can die within 1-4 years of showing their first sign or symptom. All species of ash trees are susceptible.

As part of the ongoing response to the discovery of the Emerald Ash Borer (EAB) within the state, Vermont has joined the United States Department of Agriculture (USDA)'s 31-state quarantine boundary. The quarantine will help reduce the movement of infested ash wood to un-infested regions outside of Vermont's borders.

Management should account for the potential impact of this pest, both economically and ecologically. General recommendations for management are found in the individual Stand Recommendations herein, as well as in the *Use Value Appraisal Standards for Forest Management Related to Emerald Ash Borer Infestations*, found in the appendix to this plan. Specific recommendations by stand are found in Section

VI of this plan. Additional information on EAB can be found at https://vtinvasives.org/land/emerald-ash-borer-vermont, as well as in the appendix of this plan.

Invasive Species
Perhaps the greatest potential threat to forest health on the South Hero Town Forest comes from the presence of invasive species noted on the parcel, primarily buckthorn, multiflora rose, Japanese barberry, honeysuckle, wild parsnip, and garlic mustard. These are highly invasive species that can take over portions of the understory from native plants (greatly limiting long term development of the stand) and thrive in open sunlight common to stand openings and edges.

Populations on the Town Forest property are extremely high, only limited by areas with a dense softwood canopy of pine or cedar (where the species are present, but at a low density and stunted development) or within the mapped ESTA where (in most years) saturated soil and/or standing water has limited their establishment.

It's recommended that a control plan and associated budget be developed to address invasive populations on the parcel. Complete eradication is unlikely, but a combination of mechanical removal (hand pulling/digging), cutting or mowing, and/or herbicide control can reduce populations to a degree which allows for ecological function and stand development. Long term, cultural control efforts—which seek to develop forest structures which are unfavorable for the establishment of these species—should be the objective. Invasive species control addresses key strategies for adaptation and resilience, specifically by reducing the incidence of biological stressors.

Climate Change Adaptation
While climate change is expected to have a number of wide-ranging impacts on the forests of Vermont, specific impacts identified that are of particular concern to the property include: Extreme and variable precipitation, shorter winters, changes in tree species ranges, and increased risk of natural disturbance. These impacts will create challenges to meeting landowner objectives.

In response to the threat of climate change forest management on the South Hero Town Forest will adhere to the following Adaptation Strategies and Approaches:

1. Sustain Fundamental Ecological functions
2. Reduce the impact of existing biological stressors
3. Protect forests from severe fire and wind disturbance
4. Maintain or create Refugia
5. Maintain and enhance species diversity and structural diversity
6. Increase ecosystem redundancy across the landscape
7. Promote landscape connectivity
8. Enhance genetic diversity
9. Facilitate community adjustments through species transitions
10. Plan for and respond to disturbance

A full list of Strategies and Actions is included as an appendix to this Management Plan (*Adaptation Strategies and Approaches (Butler et al. 2014)*. Many of these are addressed in this plan with targeted strategies address in the individual stand descriptions and treatment prescriptions.

Logging Practices

Management objectives identify the maintenance of healthy wildlife habitat, enhanced recreational opportunity, and aesthetics as complimentary uses with the objectives conservation, resiliency and adaptation, and timber management. In order that these objectives are met, the use of experienced and capable logging contractors is essential. A clear understanding of stand treatment, and the selection and marking of trees for removal is required. Care should be exercised to minimize residual stand damage, maintain pleasing aesthetics, and work in accordance with Vermont water resource protection and general forestry regulations. The most important components of forest management and timber extraction include the sustainable management of the timber resource. This is best accomplished by working with a forester with knowledge of the land and a clear understanding of both the owner's wishes and the proper silvicultural techniques to meet those goals. The marking of the trees to be removed is a critical component. Even the best loggers have an inherent conflict in deciding which trees to cut. For the logger economics is a priority. In the same vein, it is important to make sure that the forester is working with the landowner's best interest. The marking and administration of the job should not be related to volume or value of the timber that is cut. The second most important component of a logging operation is the amount of residual damage to the stand. Careful road layout, the right equipment for the job, and the ability of a skilled logger to economically perform the job in a careful manner will result in less damage and higher future value of the timber. The third critical component is the condition of the roads and landing during and at the end of the job. Water quality standards should be strictly kept, and the erosion controls properly placed to last until at least the next cutting cycle.

Boundary Maintenance

Boundary line review and painting should be carried out on a periodic basis. Usually seven to ten years between paintings will suffice. Painting the boundary lines helps to insure that no violation of timber rights will occur from adjoining lands. Well-maintained boundary lines also reduce the necessity for future re-survey of specific boundary lines, or the entire property. Boundary line condition on the South Hero Town Forest property is fair, with most lines delineated by split rail or barbed wire fencing.

To prevent future confusion over line location, it is recommended that the northern line be painted with good quality boundary paint on a ten-year cycle, with the next round of work due in 2025. In addition, all corners should be located and painted at that time. To prevent confusion over boundary line location it is recommended that the landowner complete a boundary line review every three or four years. During the review, note areas that require additional painting to ensure the integrity of the boundary lines.

VI. Stand Analysis

For management purposes, forestland is divided into stands, which are defined as areas of relative similarity (such as age, species, topography, etc.), and can be treated uniformly. Stands are identified on the Forest Stand Map located at the end of this report. The Stand Analysis for each unit is included in this section and contains a description, acreage, management objectives and recommendations. Stand analysis data, collected in the field cruise, is included to quantify the unit characteristics and monitor changes associated with future growth. The estimated sawtimber volume and cordwood volume is indicated. A total of 12 inventory plots were taken on the property, with a relative density of about one plot for every five forested acres.

It should be noted that stocking levels referring to the A, B, or C-line are given for every stand as a point of reference. These stocking levels are based on guides developed for even-aged stands and used for even-aged management. Recommended residual (post-treatment) basal areas and size distribution curves are used as a guideline for all-age forest management. The residual basal area for all-aged hardwood stands is recommended to be 65-75 ft^2/acre; for stands with 25-65% softwood the residual basal area is recommended to be 80-120 ft^2/acre. Management recommendations in this plan will utilize both even-aged and all-aged silviculture methods.

Stands are separated in part due to past logging history, but also due to soils, and the Natural Community Type that is prevalent in that stand. Natural Communities are distinguished from Stands as the stand type may be the result of human influence. Natural communities are a result of soils, weather, moisture, and glacial action and characterized as the interacting assemblage of organisms, their physical environment, and the natural processes that affect them. Stands are a result of past cutting history, age and species composition. Natural community types will be listed for each Stand where they can be determined, and are our best attempt at defining how different forest types exist naturally. Many natural resource managers are attempting to manage lands according to the natural community type and the natural disturbance regimes that affect them. Natural Community identification and descriptions are based on the book Wetland, Woodland, Wildland, A Guide to the Natural Communities of Vermont, by Elizabeth Thompson and Eric Sorenson.

Soils are one of the most important characteristics of forest ecology as the soils determine species, composition, growth rate and management strategies. There are 4 site productivity classes (rated by number I to IV, ranging from high to non-productive), which indicate the growth in volume per acre per year.

Map Area: 1	**Acreage:** 50.8 (calculated)
Stand One: Pine-Hardwood	**Data Points:** 10

Stand Type: (eastern white pine 34%, green ash 20%, silver maple 12%, quaking aspen 10%, red cedar 8%, red maple 4%). Also present in the stand is swamp white oak, burr oak, American elm, northern white cedar, northern red oak, scotch pine, sugar maple, black cherry, butternut, bitternut hickory, cottonwood, and red osier dogwood.

Description: This stand encompasses the majority of the forested area on the parcel. Structure and composition vary some within the stand due to the staggered nature of agricultural abandonment, but generally the area is characterized by variable density small to medium sawtimber sized white pine through the dominant canopy, joined in southwestern areas by large diameter burr oak, silver maple, and aspen. The co-dominant and intermediate canopy is comprised of pole sized green and black ash (with black ash more dominant south) with silver maple, red maple, elm, and cedar. Sugar maple, black cherry, hickory, and northern red oak are found in northern sections where soils are better drained. Small inclusions of scotch pine are found, suggesting that portions of the area were planted following agricultural abandonment. White pine found adjacent to scotch pine may also have been planted, however most of this species component appears to have developed from natural regeneration, having a multiple stemmed growth form common to old field pine.

Regeneration: Seedling regeneration is limited in most of the stand due to the high density of invasive species present throughout the understory. Ash saplings are present in some areas, and saplings of both white oak and red oak are found developing at a variable density into the midstory in southwestern portions of the stand. Bitternut and shagbark hickory are also found in portions of the midstory.

Natural Community Classification: *Valley Clayplain Forest*: The Clayplain forests once dominated the fertile clay and silt soils of the Champlain Valley, but have mostly been converted to agriculture. This forest is today very rare. The Clayplain forest is usually a mix of more Mesic or dry clayplain and wet clayplain (see below) where the mesic type is on higher ground and the wet variant is found in hollows and depression within the mesic matrix. The canopy in Clayplain Forests is a diverse mixture of trees, including most commonly white oak, red oak, red maple, white pine, shagbark hickory and white ash. Associated species include sugar maple, beech, swamp white oak and bur oak. Barren strawberry is a common spring ephemeral found in the understory indicative of this community.

Portions of the stand may also be classified as *Wet Clayplain Forest*: This community is closely associated with Valley Clayplain Forests and is often not differentiated from it. The wet Clayplain forest soils are poorly drained, frequently flooded and classified as wetland. The dominate overstory trees include swamp white oak, red maple, green, and white ash. White oak, shagbark hickory, white pine, elm, and black ash are also commonly present. Most of the intact clayplain forests remaining are found on moister soils that were more difficult to farm.

Mesic Maple-Ash-Hickory-Oak forest: (see Stand 2 for description)

Age Structure: even-aged/two-aged with legacy component

Size Class: poles to medium sawtimber, with large diameter legacy component in some areas

Stocking: Adequate; around the B-line on the even-aged Northern Hardwood stocking age

Approximate Stand Age: 30-65 years with legacy trees between 125-150+ years old.

Stand History: This entire area was cleared for agricultural use through the early 1900s, with phased agricultural abandonment beginning in the late 1950s/early 1960s. No evidence of active management on the parcel since reforestation was noted during the present inventory.

Forest Health: Past weevil damage is noted on the majority of white pine in stand, with red rot also present to varying degrees. Invasive species dominance in the understory is the primary concern as emerald ash borer causes wide-spread mortality through the overstory, releasing those plants already established and creating an environment favorable to their proliferation. Emerald ash borer is beginning to cause wide-spread mortality of the species in the stand.

Access Distance: Less than one mile to all portions of the stand

Acceptable Growing Stock/acre: 30 ft^2/ac. **Total including UGS/acre:** 71 ft^2/ac.

Stems/acre: 7.5 inches **Mean Stand Diameter:** 9.5 inches

Slope: 0-8% **Aspect:** north **Site Index:** by soils

Site Class: II-III **Soils:** Kendaia very stoney silt loam; Amenia very stony silt loam (north); Covington silty clay loam (south)

Management Objectives: Manage on an uneven-aged basis for the maintenance of forest health and wildlife habitat, while ensuring the provision of recreational access. Timber management is a secondary objective in the stand, with the potential for any commercial harvest activity likely decades into the future.

Silvicultural Prescription: Given the dominance of invasive species present through the understory and midstory, as well as the looming threat of Emeral Ash Borer and the impending mortality of the species, no treatment effecting the overstory is recommended at this time (as increased light levels from cutting will further exacerbate the invasive species issue).

Instead, it's recommended that invasive species control be conducted in the stand as feasible over this next planning cycle, targeting a specific area in the understory with each phase of treatment, eventually working through the entire stand. Control options include mechanical control (cutting and/or excavating the root systems—a task which is unlikely given the prevalence of the issue), and/or chemical control. Cut stems may be treated with Round-up (Glyphosate) to reduce the incidence of re-sprouting. A more aggressive chemical control treatment may also be used, treating a defined portion of the stand on an annual basis with Pathfinder II (triclophor), which is applied to the lower portion of the stem and kills the

plant standing. This option would require the involvement of a commercial pesticide applicator as this chemical is not available without a license. In either case it's recommended that the Conservation Commission see funding to assist. Treatment of invasives is ranked as the highest priority for active management on the parcel.

Ash accounts for approximately 20% of the stand's stocking (though it is found at higher density in some areas). Most of the ash is in the pole class. Given the mean diameter of this species component and size of the stand (as well as access considerations associated with seasonally wet soils) a commercial harvest is not feasible or recommended. If (of when) the ash component is removed through mortality, if no understory is established the stand will continue to face the prospect of being taken over by invasive species, which thrive in increased light levels where no competition exists. Additional decline and mortality in the elm component will exacerbate this. It's recommended that, if feasible, the Commission conduct enrichment planting in the stand. 'Enrichment planting' refers to the practice of planting additional tree species within an existing forest to enhance its biodiversity, ecological function, and often it's carbon sequestration and storage potential, by introducing native species which might be underrepresented in the current stand. This is particularly relevant in the context of climate change as it can help restore degraded forests and promote a more resilient ecosystem. Enrichment planting on the South Hero Town Forest would involve selecting native species well-suited to the site and projected future conditions, as well as genotypes (seed sources) from the next seed zone south (zone 94 on the Eastern Seed Zone Map). These may be species already present in the forest (such swamp white oak, burr oak, red oak, and shag bark hickory) or species whose within whose range the parcel sits but are not currently present. Protection measures (such as tree tubes) will likely be necessary as deer populations in the islands are incredibly high, resulting in significant herbivory and loss of hardwood regeneration in the understory.

Regarding ash mortality related to Emerald Ash Borer: It's recommended that no ash salvage take place in the stand. The theory is that when the ash matchstick from mortality, it will create a barrier to deer movement and browse, giving regeneration (including new ash saplings) an opportunity to emerge above the invasive plants. If some invasive plant management could occur prior to ash mortality that would be beneficial.

Slash management: Tops and other debris from any future cutting on the property should be pulled from within 30' of the main (mapped) woods roads and trails. Within the stand interior and away from main recreational corridors, it's recommended that tops be left high and distributed across the understory to discourage deer browse, which is a significant limiting factor to the successful regeneration and development of priority tree species such as oak and maple.

Product: Sawtimber, pulp, cordwood

Cutting Cycle: 15-20 years

Desired diameter: 22 inches oak, hickory

Sawtimber Volume/acre: 1,182 bd.ft/ac.

Cordwood Volume/acre: 9 cords/ac.

Map Area: 2	**Acreage:** 5.5 (calculated)
Stand Two: Pioneer	**Data Points:** 2

Stand Type: Pioneer: species present include grey birch, red cedar, northern white cedar, red osier dogwood, paper birch, green ash, willow, quaking aspen, staghorn sumac, bitternut hickory, shagbark hickory, northern red oak, white pine, and American elm.

Description: This area encompasses a long north-south field along the western parcel boundary in the central portion of the property. The area is characterized by a semi-open structure, with inclusions of pole sized birch and cedar. Much of the area is dominated by shrub sized honeysuckle, buckthorn, and multiflora rose, though hardwood stems including hickory and oak are present in limited quantities, as is dogwood, pine, and sumac.

Regeneration: Regeneration is not a concern at this stage of the stands development

Natural Community Classification: *Mesic Maple-Ash-Hickory-Oak forest*: These forests are a mix between the Rich Northern Hardwood forests common in Vermont and the Central hardwood Forest of the Appalachians to the south. The climate of Lake Champlain allows these more southern species to exist in Northern Vermont in areas close to the Lake. This natural community is poorly understood and more research is needed. Though not rare, it is uncommon due to the limited range as restricted by climate. This is a related community to the Clayplain forest with similar species but growing on non clay soils.

Age Structure: even-aged

Size Class: saplings/poles

Stocking: Understocked

Approximate Stand Age: 15-30 years

Stand History: This area was formerly in open agricultural use, allowed to begin reverting to forest in the late 1980s or early 90s.

Forest Health: Mature seed bearing honeysuckle, buckthorn, and multiflors rose are found throughout. Wild parsnip is also present in more open portions of the area.

Access Distance: Less than one mile to all portions of the stand

Acceptable Growing Stock/acre: ft^2/ac. **Total including UGS/acre:** ft^2/ac.

Stems/acre: > 250 **Mean Stand Diameter:** < 6 inches

Slope: 0-8% **Aspect:** north **Site Index:** by soils

Site Class: II

Soils: Benson rocky silt loam over shaly limestone; Amenia silt loam

Management Objectives: Manage on an uneven-aged basis for the maintenance of forest health and wildlife habitat, while ensuring the provision of recreational access.

Silvicultural Prescription: This stand may be managed to maintain the young forest and semi-open condition specifically to support populations of focal species such as Golden-wing Warbler (though associated species benefiting would include White-throated sparrow, Chestnut sided warbler, ruffed grouse, and American woodcock).

Golden-wing warbler require low (less than 2 feet) shrubs for nesting, medium (4-6 feet) shrubs for foraging and cover, and sing on perch trees over 15 feet. The goal of the work is to create and maintain this habitat condition. Mechanical clearing (grinding with a mulching head) should be used to remove large mature invasive plants, as well as the majority of the green ash, elm, and aspen component. Larger pine and white cedar cover should be maintained. Small inclusions ("habitat islands") of dogwood present 1-5 feet high should also be retained, as well as high-value soft mast producing trees and shrubs, and perch sites of ash and other scattered hardwood. "Leggy" dogwood (over 6 ft.) will also be cut to stimulate regeneration. High value hard mast trees (also with future timber value) including swamp white oak, red oak, burr oak, and hickory will be retained. The site would be allowed to regenerate naturally, and brush hogging may be used in portions of the stand to maintain the vertical structure and keep down invasive species. Herbicide control should also be executed in the stand to combat invasive species. Some of the larger trees (aspen not retained as perch trees) will also be cut to regenerate for a woodcock focus.

Product: n/a

Cutting Cycle: 10-40 years

Desired diameter: n/a

Sawtimber Volume/acre: n/a

Cordwood Volume/acre: n/a

Map Area: 3	**Acreage:** 8.5
Ecologically Significant Treatment Area	**Data Points:** n/a

ESTA – Forested Wetland: Silver Maple-Green Ash Swamp/Emergent Cattail Marsh

Description: This area is found in the southern portion of the property where Covington soils dominate, and is part of a large swamp complex which extends south off the parcel to Landon Road. These soils are very deep and very poorly drained, formed in calcareous glaciolacustrine and estuarine clays on glacial lake plains. Covington clay is wet for a long time in the spring and fall, with standing water also found through much of the year. The area on the Town Forest parcel is characterized by pole sized silver maple, green ash, and black ash. Swamp white oak and red osier dogwood are also noted, as well as scattered winterberry holly developing in portions of the under and midstory. Hydric obligates such as sensitive fern, cinnamon fern, sedge, iris, and horsetail are found through the understory. Inclusions of cat-tail are also found.

Regeneration: Inadequate

Natural Community Classification: *Red or Silver Maple-Green Ash Swamp*: Most examples of this community are found in the Champlain Valley of Vermont, primarily adjacent to Lake Champlain but also on the floodplains of rivers. Common hydrological characteristics are long spring flooding and saturated soils during the remainder of the growing season. Organic soil deposits separated from the lake by sand or shale berms commonly define the community, with a ground surface ranging from having distinct hummocks and water filled hollows to relatively flat. Forest structure usually resembles that of a floodplain forest, especially where silver maple is the dominant tree and forms a high canopy of spread crowns. Often red maple and silver maple will hybridize. Green ash important component of the canopy. Other common trees include cottonwood, swamp white oak, yellow birch, slippery elm, American elm and, occasionally, black ash. Sensitive fern and Drooping Sedge are common in the understory. Rare and uncommon plants found in this community include yellow water-crowfoot, nodding trillium and Gray's sedge. Portions of the area may also be classified as *Red Maple-Black Ash Swamp*: This community type is widespread and n of the most common wetland types.

Age Structure: even-aged

Size Class: poles

Approximate Stand Age: 50-60 years

Stand History: This area was formerly cleared and managed as low-quality pasture, allowed to revert to forest beginning in the late 1960s or early 1970s.

Forest Health: Emeral ash borer is begging to cause wide-spread mortality of ash in the stand

Access Distance: Less than one mile to all portions of the area

Slope: 0-3% **Aspect:** flat/north **Site Index:** by soils

Site Class: III **Soils:** Covington silty clay loam

Management Objectives: Manage on an uneven-aged basis for the maintenance of forest health and wildlife habitat.

Silvicultural Prescription: A combination of soil hydrology and crown closure has led to a general absence of invasive species within this area. With the advent of Emerald Ash Borer and the increased nature of prolonged periods of draught expected to increase in northern Vermont as a result of shifts in climate this natural defense may wane in effectiveness. Invasive control efforts may become necessary, with specific monitoring for phragmites recommended in the area. Enrichment planting (such as that described in Stand 1) may be conducted to establish additional stems of species such as swamp white oak, winterberry holly may be conducted to accelerate the re-establishment of woody cover following the loss of ash.

VII. Schedule of Management Activities

AREA	YEAR	MANAGEMENT ACTIVITY
ALL	2025	Paint boundary lines
ALL	2025-26	Develop invasive species control plan with associated funding Framework to ensure sustainability of efforts
Stand 1	2026-35	Invasive species control focusing on defined portion of the stand on an annual basis. Enrichment planting as capacity allows.
Stand 2	2027	Early Succession Habitat maintenance and invasive species control, likely a chemical application in year one following mulching head treatment with follow-up spot treatment year two
Stand 2	2028-35	Brush-hogging open portions of the stand on an annual basis each fall
Stand 3	Ongoing	Monitoring for invasive species establishment; control measures as required
ALL	2035	Re-evaluate and update management plan

Note: Management recommendations allow for carrying out the individual prescribed activity within three years, before and after the recommended date.