Forest Management Plan

SILVER LAKE TOWN FOREST

GEORGIA, VERMONT

Original Plan Written October 2015
Amended for Transfer to Town December 2016
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Updated December 2024

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Introduction from the Georgia Conservation Commission

Within Silver Lake Woods, many signs and vestiges of recent and not-so recent human activities are evident. Going back in time, these include:

> The recreational trails with their boardwalks and bridges; power line transmission lines and cleared right-of-way; deer stands; hardwood stumps; exhausted farm fields grown to white pine and hardwood or planted to softwood plantations; milkshed, boiling shed, farmhouse and dairy barn foundations; barbed wire fences; smoothed cropland; rock piles and stone walls; old apple orchards; cellar holes and stone-lined well.

Much more human activity had occurred on the parcel well prior to the appearance of these features. This was before the concept of personal land ownership became the norm. For centuries, use of the land by indigenous peoples did not leave lasting evidence, as the emphasis was on resource maintenance rather than extraction and depletion.

A forest is the community of plants and animals living within it, trees being the framework. The course laid out in this plan will focus on managing the forest with the objective of nurturing it over time. In part, this will involve exchanging some of the trees that grew by default from the old fields with those more representative of the land's natural community, thereby creating a healthy, diverse forest.

I. Property Data Summary

Prepared for:	The Georgia Conservation Commission, Town of Georgia
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Phone:	(802) 370-0765
Email:	kcminck@gmail.com
SPAN #:	237-076-11256
Town Where Land is Located:	Georgia, Vermont
Grand List Acreage:	162 acres
Ortho Photo Number:	#108244, 104244; 2008
Sampling Method:	variable radius plot sampling; 10 baf prism
Inventory Date:	November 19th 2024

II. Plan Introduction

This Forest Management Plan for Silver Lake Woods 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 meet the Management Planning requirements associated with the Conservation Easement held by the Vermont Land Trust on the parcel
5. To identify any resources which may aid in the management of the Silver Lake Forest
6. To outline a comprehensive Schedule of Management Activities for plan implementation

III. General Description

Silver Lake Woods is located along the Georgia-Fairfax town line. Access to the parcel is via a Class IV extension of Silver Lake Road (Town Hwy 25) at the intersection of the Blake Road. A parking area for public access is located at the southern end of the Class IV extension, which extends approximately .2 miles to the north. The parcel is listed at 162 acres, with 5.5 acres encompassing the VELCO utility right-of-way. Of the remaining land, approximately 89 acres are designated as productive forest prescribed for active vegetative management/timber harvesting focused on the objectives outlines herein. The remaining 66 acres are designated reserve areas due to sensitively and ecological function. Future work in these areas will be limited to vegetative management with the sole aim of invasive species control.

Terrain on the property ranges from gradually sloping to very steep along a series of cliffs, shallow ledge outcrops, and talus slopes found in different areas. Silver Lake sits beyond the north end of the parcel. Silver Lake is an approximately 28-acre body of water that has been dammed, and the City of St. Albans owns it as a supplemental water supply. The Fairfax town line forms the eastern boundary of the parcel and bisects Silver Lake.

Land Use History[1]

The Silver Lake parcel was originally settled in the late 1700s by the Purmort and Blake Families, originally from New Hampshire. The Blake property was at the corner of modern-day Blake Road and the class 4 section of modern-day Silver Lake Road. The Purmorts lived nearby at the very end of Silver Lake Road. One of the first records of Silver Lake is in the 1871 Beers atlas, and at that time, it was known as either Blake's Pond (named after the Blake family) or Daniel's Pond (the Daniels family owning the lake property on the Fairfax side). In 1912, 16.5 acres of the property on the pond were sold to St. Albans, which facilitated the creation of Silver Lake a few years later.

The farming history of the Silver Lake parcel follows the general trend seen in Vermont from the late 1700s to the mid-1900s, including the rise and fall of sheep and small family dairy farms. Beginning with the settlement of the property in 1797, the land was used for farming Guernsey cattle. Today, there are still a few physical remnants of the old farming operations at Silver Lake, including stone walls and cellar holes dating from the mid-1800s, or even to the initial settlement by the Blake Family in at the end of the 1700s. Also found on the parcel is a square concrete structure, which was likely used for cooling milk cans (a standard practice before the advent and adoption of the bulk tank in the 1950s, which lead to the large-scale loss of small family dairies across Vermont).

The parcel changes hands numerous times in the last 200+ years, including a sale to Swanton Lumber in 1944. In the years which followed, the present softwood plantations were established and commercial harvesting within the second-growth forest (which was allowed to establish after agricultural abandonment) was conducted at various intervals. Chris and John Moseley were the most recent landowners before the Town of Georgia. The Moseley brothers started talking with the Georgia Conservation Commission in 2011 about selling part of their property and went through with the sale about five years later. The parcel was purchased by the Town in 2017 and subsequently conserved with

[1] Information included here is a summary of more detailed historical information four in the Silver Lake Woods Assessment prepared for the Georgia Conservation Commission by the UVM Field Naturalist Program in May 2023.

the Vermont Land Trust, supported by funding from the Vermont Housing and Conservation Board. Today, the Silver Lake Woods spans 164 acres and abuts Silver Lake (with St. Albans still owning Silver Lake itself, remaining as a backup water supply).

Biophysical Region and Soils

The property is located at the eastern edge of 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 Woodstock rock-outcrop complex, Cabot and Peru series. ***Woodstock*** soils make up about 30% of Franklin county soils. The Woodstock out-crop soils, which make up the majority of the eastern portion of the property, are a mix of Woodstock, Tunbridge, and Stowe soils that are intermixed with a bedrock primarily composed of Schist. The Schist bedrock is generally low in essential nutrients, but local sources of enrichment do exist. The bedrock will make up 40-50% of the area, with the Woodstock soils making up another 40%. The Tunbridge and Stowe soils are minor components. This soil type is excessively well-drained, with pockets of deeper loamy soil that has accumulated in undulating depressions over the years since the last glaciation. They are relatively shallow to bedrock (12-20"), potentially restricting root development, and are excessively to somewhat excessively well drained. The productivity on Woodstock soils is good, especially where soil had accumulated in the many hollows and between rock outcroppings. Woodstock soils have a forest productivity rating of II. ***Cabot*** soils are extremely stony and formed in glacial till that is derived from mainly schistose rock. These soils are deep and somewhat poorly drained and commonly have a fragipan at a depth or 12-15", creating a perched water table and seasonally wet soils or ponding after periods of heavy rain. These soils also have a productivity rating or II. ***Peru*** soils are deep, moderately well drained fine sandy loam and can be stony to extremely stoney. They formed in glacial till derived from quartzite, phyllite and schistose rock. Like Cabot soils, they commonly have a fragipan, though deeper at about 20" which may result in a seasonally high water table as well as prevent foot penetration. These soils are found on the slopes of the Green Mountains and in the Champlain Valley, and

also have a forest productivity rating of I, or highly productive. These soils are not considered suitable for farmland by today's standards, but were farmed in the 1800's.

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.

The Silver Lake Town Forest is subject to a Grant of Development Rights and Conservation Restrictions (**Conservation Easement**) held by the Vermont Land Trust (VLT) and the Vermont Housing and Conservation Board (VHCB). The conservation easement is a legally binding agreement that restricts commercial and residential development and protects ecological features but allows for recreation, forestry and many other compatible uses. The primary purposes of this Easement are to conserve productive forestland, wildlife habitats, biological diversity, natural communities, riparian buffers, wetlands, soil productivity, water quality and native flora and fauna, the ecological processes that sustain these natural resource values, as well as to preserve non-motorized, non-commercial recreational opportunities, open space values, and scenic resources. If the town would like to harvest timber, wood products, commercial non-timber forest products, or establish and operate a maple sugaring operation then they must develop a forest management plan that is approved by the easement holders. Any forest management must be done under the supervision of a professional forester. The forest management plan shall be updated every 10 years or at an interval agreed upon by the town, VLT and VHCB.

Management of the Silver Lake Forest will also seek to increase forest carbon stocking in the forest while also increasing the resilience of the forest carbon stored on site[2]. A variety of forest management

[2] Authorship of this section by Keeton, Hancock 2019

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[3] 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 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.

[3] 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

This plan is also intended to meet the management planning requirements subject to the grant of development rights and associated conservation easement held by the Vermont Land Trust. As a condition of that easement, approval of this plan by the Land Trust is required prior to the execution of any work prescribed herein.

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.

The Silver Lake property is part of the Malletts Bay Lake Segment, with streams connecting to Beaver Meadow Brook, draining into the Lamoille River, which feeds into Lake Champlain. The dominant hydrological features include north-south perennial streams, a beaver wetland complex, plus seasonally flooded seeps, vernal pools, swamps, and wet meadows with wetland characteristics. As previously mentioned, the Silver Lake parcel falls into the Water Supply Source Protection Areas-Surface Water; therefore, maintaining healthy and functioning hydrologic processes is a priority

A Riparian ESTA (*Ecologically Significant Treatment Area*) has been designated along the main north-south perennial drainage originating from the dam at the southern end of Silver Lake. The ESTA encompasses an approximate 50-ft. buffer around the stream channel, and is based on field evidence, as well as available LiDar data showing where the fluvial erosion hazard area exists. The ESTA has also been designated around the wetlands and beaver pond complex in the southeastern portion of the parcel. While most riparian areas are well suited for some degree of active forest management, others have characteristics making them ecologically inappropriate for timber harvesting and warrant designation as ESTAs. The lands adjacent to streams, rivers, lakes, and ponds are specialized ecological areas that provide numerous functions, including protecting water quality and aquatic habitat, providing terrestrial wildlife travel corridors, supporting significant natural communities and adjacent wetlands, and protecting channel-forming processes and channel stability. Riparian areas are generally managed according to Acceptable Management Practices (AMPs) to protect surface waters from harmful discharges, but these riparian zones on the property deserve special treatment to protect riparian functions. The areas designated as a Riparian ESTA are based on stream channel size and character and proximity to surface waters/wetlands. The significant contributions to habitat and connectivity also support this designation. ***The Riparian ESTA on the property will be considered a no-cut zone***, with invasive species management practiced as required and feasible, and vegetation management limited to that which supports the implementation of future *Strategic Wood Additions* (p.11), or other stream restoration activities. In addition to the designated ESTA, the lands containing and buffering the beaver ponds and surrounding wetlands are protected in the aforementioned 'Conservation Easement' (p.6), co-held by the Vermont Land Trust and Vermont Housing and Conservation Board, by a *Wetland Protection Zone*, and the two perennial streams and a 50' buffer are protected by a *Riparian Buffer Zone*. The designated ESTA mirrors these protections.

A 100 ft. minimal cut buffer should be placed on all other 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.

Strategic Wood Addition

Mature forests naturally contribute large woody material to streams, where it provides habitat for fish and other aquatic organisms and contributes to natural stream functions. Strategic wood addition is '*strategic'* in that it addresses a stream function or habitat deficiency and is conducted in a stream reach where the added wood is likely to stay and have a lasting, beneficial impact, mimicking (or accelerating) natural processes. The trees that are felled into the stream are carefully selected and positioned to maximize benefits and stability. Strategic wood addition includes a variety of techniques that can be used to securely add large woody material to streams. In most cases, riparian trees are felled directly into the stream using a chainsaw, although trees could be transported to the stream from upland sites. Strategic wood addition includes, but is not limited to, chop-and-drop, which is a technique that can be used on streams where the riparian trees are large relative to the channel. In these small streams, manipulation of the downed trees is not necessary to stabilize them. Strategic wood addition in larger streams is often conducted with the method known as chop-and-grip, which involves the use of a grip hoist to position downed trees in secure locations so that they will be less likely to move during high flow events.

Large wood in the active channel directs the flow of water and material and creates pools and cover that trout and other fish species use for feeding and for refuge from predators and high flows. Large wood increases stream stability, channel roughness, and floodplain access. Wood structures also help reduce nutrients downstream through sediment storage and nutrient processing. In this age of increasing flood frequency and severity, restoring large wood loading to upland streams can benefit not only the aquatic organisms in the stream but also humans living downstream. Large wood can improve floodplain connection in upstream, undeveloped areas, thereby potentially reducing flood impacts downstream through flood flow storage and sediment retention. It can also help to reduce nutrient loading downstream.[4]

The Georgia Conservation Commission, in partnership with The Franklin County Natural Resource Conservation District and the Vermont Land Trust, is developing a SWA project which will target a section of stream on the Silver Lake Woods parcel which drains from a culvert in the VEC right-of-way to the confluence of the beaver pond outflow. This incised stream (approximately 433' in length) runs through one of the softwood plantations which encompass Stand 2 and is a perfect candidate for this work—exhibiting bank erosion and undercutting in a manner which disconnects the waterway from the adjacent floodplain. Work is currently underway to further define next steps and incorporation with the silvicultural prescription for Stand 2 included herein.

[4] *Vermont Strategic Wood Addition Handbook*, Jud Kratzer, Vermont Fish and Wildlife, June 2020

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 most significant features of the property are the important wetland habitat associated with Silver Lake, the southern beaver pond(s), and adjacent wetlands. Beavers create critical habitat for a diversity of wildlife, including muskrats, otters, raccoons, and moose. Waterfowl in particular are quite dependent on Beaver ponds. Mallards, wood ducks, and black ducks thrive in areas of Beaver impoundments. Beaver ponds also provide critical habitat to red-winged blackbirds, Great Blue Herons, and a variety of amphibian and reptile species. Beaver ponds and wetlands provide important wildlife habitat. In addition to creating important habitat, beavers activities such as rooting, feeding, and digging help to circulate nutrients within the flowage, and the dams they build help to reduce flooding and erosion. Typically, a beaver colony will utilize an area until their food runs out, at which time they will move up or downstream to where food is available. After a time, the abandoned dam will break releasing the impounded water allowing a sedge meadow to emerge. Eventually this sedge meadow will become re-established with woody plants and the beaver will return. This natural cycle is important to the health of the beaver and all the animals that are associated with beaver ponds. Artificially impounding a beaver pond will not allow the cycle to run its course and the health of the ecosystem will be diminished. The pond will eventually start to fill in and become stagnant. Many of the wildlife species that utilized the beaver impoundment would no longer find the pond as beneficial. One heron nest was noted in this pond during the present inventory.

The property has a number of other 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, beech, hop hornbeam, serviceberry, yellow birch, thorn apple, and black cherry. Also noted during the inventory were scattered apple trees found around the softwood plantation and open areas around the historic farmstead. 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 sugar maple, as well as larger diameter pine and hemlock, found in Stand 1 and portions of the designated reserve areas 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.

Much of the parcel is also part of a large state mapped deer yard which extends west to the Bovat Road requiring special considerations. These include leaving a dense crown closure, protecting travel lanes (ideally they should be 200 ft. wide, comprised of dense softwoods cover, and located near streams), maximizing and perpetuating the area of shelter, and providing preferred, accessible, browse. The area should be kept as diversified as possible, achieved by releasing regeneration and overtopped understory, thinning poles and small saw timber, and harvesting large sawtimber to stimulate regeneration. When these distinctly even-age practices are applied to many small, homogeneous patches by area regulation, uneven-aged structure results (*Management Guide for Deer Wintering Areas in Vermont* 1990. Vermont Department of Forests, Parks and Recreation and Department of Fish and Wildlife). It's important to note that deer also act as biological stressors on the landscape given the impact of herbivory (browse) on hardwood regeneration, especially maple, ash, and oak seedlings. While management in portions of the parcel (specifically within the mapped reserve areas) will focus on providing continuity of cover—ensuring an east-west travel corridor across the parcel, as well as maintaining interior bedding habitat)—management in other areas will be directed at discouraging deer. The activities including using slash/tops from future logging activities to preclude access by deer and protect hardwood regeneration. Physical barriers such as tree tubes may also be employed to protect future enrichment plantings (p. 26-27). Hunting is also allowed and encouraged on the Silver Lake parcel as a mechanism for population and impact control.

A number of seeps are also found on the parcel. A seep is a common but small community occurring on slopes or at the base of slopes, in coves or on benches. Groundwater discharge is evident at the margin of the seep. Hardpan or bedrock is a common impediment to downflow of water causing the groundwater to flow horizontally and discharge at the surface. Seeps are often the headwaters of perennial streams and have often been used as sites for spring boxes that supply water to homesteads. Groundwater temperature in this region is usually within a few degrees of 47 degrees Fahrenheit. The flow of these warmer waters to the surface results in earlier spring growth and a winter water source. These sites are important for many species of wildlife. Characteristic amphibians include Spring Salamander, Northern Dusky Salamander, and Two-lined Salamander. The rare petalwing dragonfly is associated with seeps, and seeps are very important sites for Black Bear to feed in the early spring. Wild Turkey also frequent these through the winter to graze on forbs that may persist near the warmer water.

Portions of the Silver Lake parcel, specifically those areas around the old farmstead, 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 around the former farmstead, as well as the 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.

The UVM Field Naturalist report for the Silver Lake parcel completed in May 2023 identified two small Vernal Pools with juvenile and adult eastern newts in one pool, and wood frogs and spotted salamander eggs present in both. A November 2024 investigating of the sites found evidence of fingernail clams present in the duff and leaflitter of the mapped pools. Future active management within certain distances of these 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 Georgia Town Forest property**.**

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 May 2023 assessment[5] of the Silver Lake Parcel noted that on-the-ground bird observations and eBird records collected since spring of 2020 have revealed a diverse array of migratory and breeding birds in SLW. Although this wildlife assessment was conducted out of season for conclusive evidence of current bird breeding, regular observation of common merganser and wood duck pairs at the beaver pond and on Silver Lake suggest the potential for limited waterfowl nesting on-site. A male swamp sparrow was also observed singing in the tall grass marsh west of the beaver dam, potentially indicating breeding habitat for this bird - a species of high conservation priority in northern forests.

Over one hundred and twenty other bird species have been reported in on the Silver Lake parcel. Two species documented on site, the blackpoll warbler and the common grackle, are near-threatened species. Blackpoll warbler are most likely using Silver Lake woods as a migratory stop, as they prefer boreal forest habitats. Further observations of common grackles are needed to determine if they are foraging, migrating, or breeding on site. Evening grosbeak, a vulnerable species, was also observed. Their populations are declining dramatically, especially in the eastern United States. Though they have been reported to nest in deciduous woodlands, it is quite uncommon as they prefer to breed in mature or second-growth coniferous forests.

Eleven of the twelve Audubon of Vermont designated 'Birder's Dozen' have also been reported on the parcel. These include chestnut-sided warbler, white-throated sparrow, yellow-bellied sapsucker, Eastern

[5] Silver Lake Woods Assessment prepared for the Georgia Conservation Commission by the UVM Field Naturalist Program in May 2023.

wood-pewee, blue-headed vireo, veery, wood thrush, black-throated warbler, black-throated green warbler, scarlet tanager, and Canada warbler. In total, 27 of the 40 Audubon Responsibility Birds of the Northern Forest have been documented at Silver Lake Woods – species of high conservation priority in New England.

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 during include a number old stone walls, both interior and along boundary lines. These should be protected during any future harvesting operations on the parcel. Evidence of the former homestead(s) on the parcel are also present, including cellar holes and barn foundations. Clearing some of the vegetation close to the foundations and removing non-native shrubs

would highlight the old homestead and provide an opportunity to enrich the educational potential of the site. However, that may encourage greater human interaction and climbing on the foundation. The Commission may consider installing signage to inform the public of this aspect.

Recreation and Forest Roads

There are approximately 1.8 miles of trails located on the Silver Lake parcel. These include historic farm/forest roads (the *Purmont* and *Blake* trails), as well as narrow footpaths (the *Kipling* and *Wilcox* trails) which offer great viewpoints of natural features, such as the numerous streams and talus woodlands, and cover most of the property. They offer excellent recreational opportunities for local visitors, from hiking to trail running to birding. The condition of the trails varies, with portions requiring some form of maintenance or improvement for the long-term sustainability of natural and recreational resources.

Trails along the eastern side of the property traveling through the softwood plantations and up into the higher elevation areas require the most amount of work. The issues associated with the trails are due to them being old farm/forest roads, which were usually built perpendicular to slope contours or in a straight direction uphill. Soil erosion from water flowing on the trails is likely the biggest impact and will continue to degrade and channelize the trail if not addressed. Soil erosion in this area could potentially put the nearby stream at risk of increased sedimentation. These areas of trail lack an ample amount of water bars, broad based dips, or drainage turn outs which can decrease the volume and velocity of water flow on trails by sending water off to the side into a vegetated area for absorption.

Two proposed trail extensions are currently planned for the parcel. The first extension in the northwestern part of the property (extending the 'Wilcox' trail north to the parcel boundary) would upgrade an old woods road to add approximately ⅓ miles to the current network of trails. The area poses some challenges due to slope and condition, requiring vegetative management, smoothing, and installation of drainage structures. This work could also include a small foot-trail extension to the east of the current road leading up to the rocky-hemlock summit closer to Silver Lake.

The second, smaller, trail extension would create a footpath from the lower part of the Blake Trail to the beaver pond complex, offering a unique educational opportunity for visitors to learn about ecosystem engineers as well as provides an excellent bird-watching area. Access into this area could come through a portion of the Softwood Plantation. The soils of this area are somewhat wet and soft underfoot, and trail creation would require a thoughtful design to minimize soil impacts and sedimentation into the nearby stream.

These trails all 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.

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 seven 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.

Eutypella 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.

Beech bark disease

This disease is an insect/fungal association. The beech is first infected by a very small scale insect that exudes a white waxy substance that covers the insect and is readily visible to the naked eye on the tree. Usually in a few years the fungal associate of this disease complex enters the tree through the feeding wounds the insect has created. This fungus produces small red fruiting bodies that mature in the fall and become readily visible on affected trees. Over time a pocked mark appearance develops on the stem where callus tissue is produced to wall off the points of infection as the fungus spreads. Mortality in the tree usually takes several years as the fungus spreads and eventually disrupts the vascular system of the tree, as well as making it susceptible to attack from other diseases or forest pests. Some research indicates that extreme cold will kill the scale insect, which may explain why disease-free beech can be found in colder pockets. No control measure for this disease is known at this time. Diseased beech may be removed from the stand during associated treatments. Clean, healthy beech should be retained to the greatest extent possible.

Beech Leaf Disease

This is a pest of future concern on the Silver Lake Woods parcel, not yet documented on the property or in the surrounding landscape, but which has been recently confirmed in southeastern Vermont. Beech leaf disease (BLD) was first discovered in North America in 2012 in Ohio. It has since been detected in Pennsylvania, New York, Connecticut, Massachusetts, and Rhode Island. BLD affects both American and European beech trees, and causes leaf deformation, dieback, and potential mortality of infested hosts. All ages and size of beech are affected, although the rate of decline can vary based on tree size. In larger trees, disease progression is slower, beginning in the lower branches of the tree and moving upward. In smaller trees, disease progression can be rapid which leads to high mortality of saplings and understory beech. The causal agent of BLD is an introduced nematode from Japan, *Litylenchus crenatae mccannii*. Symptoms include a dark striping pattern which appears on the leaves, parallel to the leaf veins. The darkened area is slightly raised and is thicker than the rest of the leaf tissue, most apparent when viewing from below. As the disease progresses, dieback starts on lower branches and processes upwards. Coupled with Beech Bark Disease, BLD poses a significant threat to the continued maintenance of the species as part of Vermont's forests, the loss of which would significantly degrade biodiversity and wildlife habitat. Current treatment options are new and considered experimental.

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 it's likely that additional confirmations will be made in the Fairfax/Georgia area in the coming years. 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 recent 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 Silver Lake property comes from the presence of invasive species noted on the parcel, primarily buckthorn, multiflora rose, Japanese barberry, wild parsnip, goutweed, honeysuckle, and phragmites, as well as Japanese knotweed (which have been noted in the area adjacent to Silver Lake Woods). 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.

The Georgia Conservation Commission, in collaboration with the Vermont Land Trust, has developed an Invasive Species Control Plan for the Silver Lake Woods parcel, found in appendix VI. Past control efforts have involved contracting with professional pesticide applicator to treat buckthorn, primarily in the areas between the Blake Trail and beaver dam, in the vicinity of the old farm foundations, and in the old orchard area just north of the foundations and east of the Purmont Trail. Planned efforts working with a certified applicator include addressing phragmities in the area of the beaver dam. Volunteer efforts directed at invasives control in 2024 have included:

- Hand-cutting of a small phragmites patch just north of the power line along the Silver Lake outflow. This will be repeated in subsequent summers until the patch does not re-grow.
- Hand pulling of buckthorn on the west side of the Purmont Trail, north of the power line
- Hand pulling of buckthorn along the Class 4 road
- Hand pulling of buckthorn in the softwood plantations between the Blake Trail and beaver pond
- Cutting of wild parsnip and multi-flora rose at the parking lot.

The Conservation Commission has also installed signage at the Silver Lake Woods parcel to inform forest users about invasives, and the control efforts being undertaken.

Monitoring is most important in open areas and along wooded edges/roads. 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 Silver Lake property 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 Georgia Town Forest property is fair, with lines noted during the present inventory delineated by stone walls or old barbed wire fencing. Posted signs were also noted along most lines.

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 26 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:** 83.2
Stand One: Pine-Hemlock-Hardwood	**Data Points:** 16

Stand Type: Pine-Hemlock-Hardwood (northern red oak 22%, eastern white pine 19%, red maple 16%, sugar maple 15%, white ash 11%, eastern hemlock 6%, American beech 4%). Also present in the stand is paper birch, yellow birch, black cherry, red pine, big tooth aspen, quaking aspen, hop hornbeam, butternut, bitternut hickory, American elm, serviceberry and striped maple.

Description: This stand is the largest on the parcel, encompassing the central and western portions of the property. Structure and species dominance varies within the stand based on management history, as well as soils and topography, but given the general uniformity of condition and future management strategy the area will be managed as one unit going forward. The overstory of the stand is comprised of medium to large sawtimber sized white pine and hemlock at variable density (with hemlock predominant along steeper ridges characterized by shallow soils and outcrops) with red maple and red oak the primary canopy associates throughout. White ash and sugar maple become significant canopy associates at the northern end of the stand. Stem quality on the pine component varies, with many stems exhibiting past damage by the pine weevil, evidence of red rot, and/or excessive lower branching resulting from an open-growth condition. The co-dominant canopy class is comprised of small sawtimber sized red oak, sugar maple, yellow birch and red maple, with small to medium sawtimber quaking aspen noted in some areas. The intermediate canopy features well-formed poles of red oak and sugar maple with black cherry and yellow birch. Beech is also found though the intermediate canopy in northwestern portions of the stand. Terrain is variable, with a series of north south ridges bisecting the stand and dividing portions of the Reserve Forest area.

Regeneration: Generally good, with saplings of white ash, sugar maple and beech found in most of the understory. Seedlings of oak and sugar maple are also abundant in some areas, with bitternut hickory and hop hornbeam also notes.

Natural Community Classification: *Mesic Red Oak-Northern Hardwood*: These forests are typical of the north woods, and differ from the southern oak forests as they lack white oak and hickories. They usually occur in warm, dry microclimates such as south facing slopes and well-drained soils. Natural disturbance and regeneration of oak include single tree fall, and the downward movement of oak seed. Fire may play a role in the continuing presence of the red oak component. A large diameter red oak may have a crown diameter of 70 feet. A single tree fall of a tree this size will produce a large gap in the canopy. This community needs more study to determine successional trends, and the longevity of the red oak. There are no examples of undisturbed stands of this community. This forest may succeed to a *Hemlock-N. Hardwood* type.

Some portions of the stand may also be classified as a *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: two-aged/developing uneven-aged

Size Class: poles to large sawtimber

Stocking: Well-stocked; between the A and B-lines on the even-aged Mixed Wood stocking guide and above the recommended residual stocking level for an uneven-aged Mixed Wood stand.

Approximate Stand Age: variable to 100+ years with hardwood legacy component 150+ years

Stand History: Stump evidence suggests the last significant treatment in the stand occurred 15-20+ years ago, with some limited harvesting in the southern portion of the stand around 10-12 years ago.

Forest Health: Limited buckthorn seedlings were noted in the understory at the southern end of the stand and along some interior trails, with the greatest density of larger stems found along the margins of the utility Right of Way. A significant portion of the overstory pine component exhibits past damage by the pine weevil, as well as evidence of red rot. Quality in the older red maple component also varies with many stems exhibiting poor form which may result in snaping or breakage from disturbance events such as wind or ice loading.

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

Acceptable Growing Stock/acre: 101 ft^2/ac. **Total including UGS/acre:** 145 ft^2/ac.

Stems/acre: 174 **Mean Stand Diameter:** 13.1 inches

Slope: 3-60% **Aspect:** variable **Site Index:** by soils

Site Class: II, I **Soils:** Woodstock rock-outcrop complex; Peru extremely stony fine sandy loam; Cabot extremely stony fine sandy loam.

Management Objectives: Manage on an uneven-aged basis for the enhancement of forest resiliency and structural complexity, the maintenance of ecological function, the production of high quality sawtimber, and the enhancement of wildlife habitat, all while maintaining recreational opportunity.

Silvicultural Prescription:
It's recommended that an *Expanding-Gap Irregular Shelterwood* treatment be conducted in the stand to gradually remove the lower quality larger diameter white pine and at-risk red maple in the overstory, accelerate growth rates on higher quality stems in the co-dominant and intermediate canopy classes, release established regeneration, and recruit a greater species diversity of regeneration in newly created larger gaps.

A *Shelterwood* harvest traditionally involves the gradual removal of the entire stand in a series of partial cuttings. Natural reproduction starts under the protection of the existing older age cohort and is finally released when it becomes desirable to give the new age class full use of the growing space (at which point

the older age cohort is removed). Trees that are left during partial cutting may be chosen not only as a seed source or protection for the new stand, but also for their capacity to increase in value. The largest, most vigorous and best-formed individuals of desirable species are retained until the final cutting.

In an *Irregular Shelterwood* system forest cover is retained over a longer period (indefinitely for a portion of the original age cohort, allowed to live out their biological life span as legacy trees) resulting in a more structurally complex uneven-aged condition (so that instead of two age classes the stand has three or more). The more complex structure can increase habitat complexity, increase carbon storage, and help the stand better adapt to the impacts of climate change. Specially, the treatment is designed to reduce the risk of long-term impacts of disturbance events by altering forest structure to reduce the severity of wind and ice damage; to maintain and create refugia by establishing biological reserves; to enhance species and structural diversity in promoting a variety of age classes and restoring a diversity of native species; to promote landscape connectivity by maintaining habitat corridors; and to facilitate community adjustments through species transitions which favor or restore native species that are expected to be adapted to future conditions.

The proposed treatment would harvest groups approximately .25 acres in size over approximately 12% of this area (about 10 total acres in group area, or about 40 total groups) to establish new cohorts of pine and of hardwood regeneration, or to release advanced regeneration already established in the understory within the groups. Groups should be located to remove clusters of low quality, low value, and high-risk stems—specifically white pine, red maple, paper birch, and aspen. Snags may be recruited by girdling a portion of the poor-quality dominants. Retention may be utilized within gaps to enhance structure, specifically maintaining red oak where appropriate (while also encouraging the establishment of additional oak regeneration). A portion of the worst quality cut stems will be left in the woods to contribute to coarse woody debris volumes. Subsequent treatments in the stand would expand the initial gaps where regeneration has become established. Expansion may be irregular and not necessarily a perimeter expansion. *Crop Tree Release* may be utilized in the matrix between the newly created gaps to increase growth rates on quality stems in the intermediate and co-dominant canopy in order to increase crown expansion/mast production of the red oak and sugar maple component, as well as cherry and yellow birch. The residual basal area in the stand should be no lower than 100 ft^2/ac. This prescription is integrated from work developed in partnership with Audubon Vermont which is specifically designed to enhance the habitat for priority species of concern. (***Integrating Timber/Habitat Songbird Management, Stand Condition 2, Silvicultural Option 2A***).

Work in those portions of Stand 1 which fall within the designated Riparian ESTA will focus on invasive species control efforts, as well as any potential future vegetative management to support the implementation of future strategic woody additions (described on p.11).

Slash management: Tops and other debris 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.

Enrichment Planting: It's recommended that following the execution of this harvest, enrichment planting be conducted within a portion of the newly created gaps to accelerate the establishment of the next age cohort. '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 Silver Lake 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 Silver Lake forest (such as oak and hickory) or species whose within whose range the parcel sits but are not currently present (such as red spruce). Planting may also include the introduction of specific genotypes which are well-adapted to specific biological stressors, such as blight resistant American Chestnut.

Woodcock Habitat Enhancement: In addition to the work outlined above, a portion of the stand surrounding the old farmstead at the southeastern corner of the stand will be managed to enhance the habitat for American Woodcock, following the principles outlined on p. 13-14. While a detailed plan for this work has yet to be developed, this will include regenerating some portion of the adjacent early successional shrub/alder growth, likely using a mulcher or grinding head (sometimes referred to as a brontosaurs brush mower). The area total impacted/cut will be less than ½ acre in size, and may take the form of irregular patches or strips. Cutting will also account for the mapped Riparian ESTA present adjacent to the site. The mulching head may also be used to set-back young growth in and around the existing opening to better allow regular brush hogging aimed at maintenance of the area for the male woodcock courting ritual.

Product: Sawtimber, pulp and cordwood

Cutting Cycle: 12-15 years

Desired diameter: 22 inches red oak

Sawtimber Volume/acre: 8,577 bd.ft/ac.

Cordwood Volume/acre: 32 cords/ac.

Map Area: 2	**Acreage:** 5
Stand Two: Softwood Plantation	**Data Points:** 3

Stand Type: Softwood Plantation (red pine 37%, Norway spruce 22%, eastern white pine 17%, red maple 11%). Also present in the stand is sugar maple, northern white cedar, paper birch, and white ash.

Description: This stand comprises four areas in the southeastern portion of the parcel comprised primarily of planted Norway spruce, red pine and white pine. Swanton Lumber established the plantations sometime after purchasing the property in the 1940s. Younger pole sized black cherry, white pine, and striped maple appear throughout the intermediate canopy at varying density. Buckthorn saplings occur closer to the homestead and beaver wetland complex.

Regeneration: Variable/inadequate; hardwood saplings, including white ash and American beech, are established along the margins of these areas, and red maple, sugar maple, white ash, and beech regeneration are frequent seedling species in portions of the understory, however deer browse is limiting successful development.

Natural Community Classification: Unclear at this time given the management history of the stand, but likely *Northern Hardwood* or *Mesic Red Oak-Northern Hardwood*

Age Structure: even-aged

Size Class: small-large sawtimber

Stocking: Well-stocked

Approximate Stand Age: 60-70 years

Stand History: These plantations were established starting in the late 1940s or early 50s. No stump evidence was noted in the stand, but spacing suggests some past tending was conducted following establishment. No recent treatment has occurred.

Forest Health: Pine weevil damage is variable on the white pine and spruce component, with over 40% of the growing stock designated as unacceptable. Spruce gall is also found. Buckthorn was noted in the area surrounding the plantations, as well as in portions of the understory. If the commission continually managed and treated buckthorn, sugar maple would likely replace it. Japanese barberry and multiflora rose are other non-native species within the plantation. Low deer preference shrub occurrences, such as these non-native species, indicate higher levels of deer browse.

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

Acceptable Growing Stock/acre: 127 ft^2/ac. **Total including UGS/acre:** 204 ft^2/ac.

Stems/acre: 229 **Mean Stand Diameter:** 12.8 inches

Slope: 3-8% **Aspect:** south **Site Index:** by soils

Site Class: I, II **Soils:** Peru stony fine sandy loam; Westbury fine sandy loam

Management Objectives: Manage on an uneven-aged basis for the restoration of ecological function and forest health, production of quality sawtimber, and the enhancement of wildlife habitat.

Silvicultural Prescription: Those portions of the plantations within the designated Riparian ESTAs will be managed as no-cut zones, with tree removal limited to 1) only those stems which present a potential hazard to recreational trail users, and 2) vegetation management to support the implementation of strategic wood additions and ecological restoration (described on p.11).

In those portions outside the ESTA, it's recommended that *Group Selection* harvesting be employed to create variable sized canopy openings no greater than ¼ acres over approximately 15% of the designated stand area, with thinning in the stand matrix to reduce stocking levels, maintain vigor and growth, and allow for greater crown expansion on the softwood component. Within groups, all stems greater than 5" in diameter should be harvested, with the exception of structurally significant or mast bearing trees which should be retained to enhance habitat value. Intermediate crown thinning may be conducted in the matrix of the stand. The residual basal area in the stand should be no lower than 130 ft^2/ac. following the treatment.

Subsequent treatments may continue to employ group selection to release advanced regeneration, diversify stand structure, and continue the transition of this stand to a more native suit of species more suited to the site. A portion of the red pine and Norway Spruce (about 10%) may be selected for retention in perpetuity as legacy trees and a testament to land-use history of the area.

As with work in Stand 1, this treatment is designed to reduce the risk of long-term impacts of disturbance events by altering forest structure to reduce the severity of wind and ice damage; to enhance species and structural diversity in promoting a variety of age classes and restoring a diversity of native species; and to facilitate community adjustments through species transitions which favor or restore native species that are expected to be adapted to future conditions. Much of the growing stock in these plantations already exhibit low vigor and poor structural integrity, making them highly susceptible to disturbance events. Without a younger age class in place, such events could lead to a proliferation of invasive species which would greatly reduce the long-term health and productivity of the stand area and future forest.

As with Stand 1, enrichment planting may be considered in the Softwood Plantations under the same objective and implementation framework.

Product: Sawtimber and pulp

Cutting Cycle: 10-12 years **Desired diameter:** 18 inches red maple

Sawtimber Volume/acre: 13,360 bd.ft/ac. **Cordwood Volume/acre:** 51 cords/ac.

Map Area: Reserve Forest	**Acreage:** 15.5
Northern Talus Woodland/Hemlock Forest	**Data Points:** 5

The reserve forest area on the Silver Lake parcel (shown in orange hatching on the Forest Stand map) encompasses three distinct areas on the parcel: the talus slopes and the adjacent ledge/cliff areas which extend through the west-central portion of the parcel; steeper hemlock dominated uplands and outcrops around Silver Lake; and a small area in the southeastern portion of the parcel where the surrounding landscape context/hydrology makes access and active management potentially damaging to water quality.

Northern Hardwood Talus Woodland

Areas where large boulders have accumulated below cliffs (such as those areas found along the east side of the Purmont Trail) are characteristic of Northern Hardwood Talus Woodlands. The talus woodlands at Silver Lake is relatively small, but provide critical a habitat for a diversity of plant and animal life. The habitat is characterized by steep, west-facing talus slopes and rocky outcrops surrounded by dense mixedwood forest, and adjacent to a small stream. Shallow soils accumulate in the cracks of the talus where stunted yellow birch and eastern hemlock often grow. Other common tree species include white ash and basswood. Shrubs include red-berried elder and mountain maple. Polypody and marginal wood fern are frequent along the talus. Lichens and bryophytes (mosses) are also common in this natural community. Porcupines, bobcats, coyotes, and raccoons have all been documented in these areas on the Silver Lake forest. This natural community would be state listed as an S3 community. High-quality examples are uncommon in the state but not rare.

During the early months of 2023[6], wildlife cameras recorded dozens of occurrences of porcupine on both the talus slope and the north/south running ridgeline above. Winter dens, scat, and heavily used footpaths were identified throughout the site. Hemlock trees, a favorite of porcupine, were located on top of the ridge showing significant signs of feeding activity. In addition to nipped twigs and freshly chewed bark, some trees also display signs of porcupine feeding from past years in various stages of healing. A large, de-barked deciduous tree showing the characteristic blonde-color of recently exposed heartwood, and fresh wood chips from active feeding was observed adjacent to the stream at the bottom of the talus slope. Evidence clearly points to a well-established population of porcupines within this site. At least one juvenile porcupine was observed on camera, as well as what appears to be several different adult individuals. High density living arrangements are uncommon amongst porcupines, and therefore demonstrate the exceptional quality of this habitat for the species.

Also caught on wildlife camera was one night-time occurrence of an eastern bobcat, and multiple signs of bobcat scat were identified on a nearby ridge featuring a well-worn game trail. These animals are common in Vermont, but they are rarely seen. The talus slopes and rocky ridges of Silver Lake Woods offer potential prime habitat for denning and courtship, with mating typically occurring in late March or early April. However, given the limited quantity of evidence observed, and the wide-ranging nature of the animal, it is also plausible that the Silver Lake property is only intermittently occupied by bobcats, being utilized primarily for food resources as one part of a larger range.

[6] Silver Lake Woods Assessment prepared for the Georgia Conservation Commission by the UVM Field Naturalist Program in May 2023.

Lastly, single occurrences of two other species of mammal, fisher and coyote were also recorded on camera at this site in February 2023. Fisher and coyote both play an important ecological role in regulating herbivore behavior and population size. The fisher is especially a sign of a healthy, functioning ecosystem. Fisher is widely known to be one of the only active hunters of porcupine, which may explain its appearance on camera investigating a frequently used den.

For these reasons—ecological sensitivity of the natural community and the high quality of the wildlife habit found here—the Talus Woodland areas will be designated as part of the reserve area, and managed as a no-cut zone, with vegetative management limited to invasive species control as required and feasible. Future recreational trail development should avoid this area due to its sensitivity. The existing Purmont trail provides excellent viewing of the area from the west.

Hemlock Forest

This natural community is found around the steeper slopes and outcrops around Silver Lake and along the western boundary of the parcel. This species composition of this forest community has 75-100% hemlock, with beech, sugar maple, yellow birch, red spruce, and white pine mixed in. Red maple is present in earlier successional stands or in disturbed stands. Hemlock is a late successional species and possibly the species that has the longest biological age in Vermont. Individual trees can live to be 600-1,000 years old. Hemlock forests usually occupy small areas such as steep sided ravines. Soils are occasionally wet and often have a hardpan, resulting in shallow roots. Windthrow is a common natural disturbance in this community. Seeps are often common in the small saddles between the hemlock dominated ridges on the property.

These areas on the Silver Lake parcel are critically important for maintaining water quality, while also providing significant habitat benefit. Those potions within the mapped reserve area serve as an east-west travel corridor where softwood canopy density allows for greater winter deer yard opportunity. The areas will be managed as a no-cut zone, with vegetative management limited to invasive species control as required and feasible, as well as vegetative management associated with the maintenance or expansion of recreational trails.

Future monitoring for Hemlock Wooly Adelgid (HWA) is recommended and encouraged within the reserve area (as well as on the property as a whole). HWA is a small, aphid-like insect that feeds on hemlock species in North American. It has "wool" attached to the twig of hemlock trees, not attached to the needles. HWA is immobile when covered in wax - they are waxy, not silky or stretchy. HWA is wispy like a cotton ball and does not look painted on like pine sap. High-value trees can be treated, though cost makes this an unrealistic landscape scale management strategy. Insecticides don't provide long-term protection, so treatments will need to be repeated. Where HWA has been found in southern New England and the Appalachians it has been devastating to the population. To date, colder winter temperatures appear to have stalled the insect's advancement north in the state (currently only confirmed in southern Vermont), however the impacts of climate change may eventually allow for greater spread north.

Machinery Exclusion Area

The remaining small reserve area in the southeastern corner of the property is designated as an exclusion zone given the nature of its landscape context, being surrounded by beaver pond(s) and associated

wetlands, as two streams with designated *Riparian Ecologically Significant Treatment Areas.* Equipment access poses a significant disruption of hydrology and water quality, as well as the associated wildlife habitat. The area will be managed as a no-cut zone, with vegetative management limited to invasive species control as required and feasible. No new recreational trail development is planned for this area due to its sensitivity.

Taken as a whole, designation of the Reserve Forest areas is designed to employ the adaptation strategies of maintaining or creating refugia by establishing reserves for at-risk and displaced species; enhancing species and structural diversity by establishing reserves to maintain biological diversity; and promoting landscape connectivity by creating and maintaining habitat corridors.

VII. Schedule of Management Activities

AREA	YEAR	MANAGEMENT ACTIVITY
ALL	2025	Paint boundary lines
ALL	2025-27	Additional Recreational Trail Development/AMP Installation
2	2025-26	Strategic Woody Additions Implementation
1, 2	Ongoing	Invasive Species Control
1	2025-26	Expanding Gap Irregular Shelterwood
2	2025-26	Group Selection
1, 2	2026, 2027	Enrichment Planting
Reserve	Ongoing	Invasive Species Control on an Area Basis per Control Plan
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.