NORTHWOODS STEWARDSHIP CENTER

FOREST MANAGEMENT PLAN

Mountain View Country Club

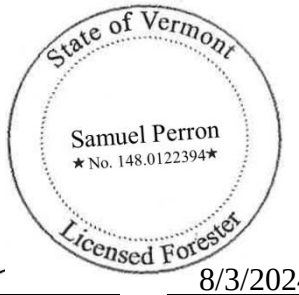
for their 78.3 acre property located at

112 Country Club Rd, Greensboro VT

Orleans County

Prepared by:
Sam Perron ~ NorthWoods Stewardship Center
P.O. Box 220, East Charleston VT 05833
(802)723-6551 x302

*Plan for intended management in years **2024- 2034***



Sam Perron, *VT Licensed Forester* *Date*
Forester #148. 0122394

EXECUTIVE SUMMARY

The Mountain View Country Club (MVCC) owns 78.3 acres of land, with the majority of that acreage being a golf course and associated buildings and recreational areas. When the golf course was first established in 1898, the entire parcel was open farmland, mainly cow pasture. Since then, approximately 19 acres has returned to forest, with an additional ~7 acres in open meadows, old apple orchard, and other natural conditions. As these forested areas reach an age where older trees are maturing (sometimes declining), it is appropriate to consider a plan for the coming decades to manage the forested areas of the parcel. This Forest Management Plan is intended to serve that purpose, providing descriptions of the current forest condition and a plan for forestry activities in the next 10 years.

The MVCC's goals for managing the forestland include:

- Maintaining the aesthetic and recreational values of the club's land as a safe, family-friendly recreational space
- Increasing biodiversity and resilience in a changing climate, to ensure a healthy forest for decades to come
- Manage invasive species and other stressors that can impact forest health
- Plan forest activities that won't incur excessive costs for the club

The core of this plan centers around creating and maintaining a healthy forest. This concept is described in detail throughout the plan. A healthy forest is one that supports a diversity of species (flora and fauna) that are native and well-adapted to site conditions. Forests need to be resilient to storms, pests, pathogens, and other stressors that can damage trees and soils. Healthy forests have habitat features that develop over time, including varying ages and sizes of trees, downed wood, standing dead trees (critical habitat for many wildlife species), and understory vegetation (protecting soil and providing cover for wildlife). Collectively, this healthy forest condition often looks messy to the human eye. This forest management plan aims to explain why and how a healthy forest should be managed.

This plan describes several distinct areas of the property, referred to as forest stands, which are numbered and shown on the attached map:

- Mixedwood forest, primarily cedar and softwoods interspersed with hardwoods, found in the center of the parcel and along Country Club Rd *(Forest Stand 1)*
- Hardwood forest, mainly sugar maple, along the western side of the golf course *(Forest Stand 2)*
- Mature white pines found along the southeastern boundary *(Forest Stand 3)*
- Younger, shrubby and sapling-stage hardwoods and mixed forest along Breezy Ave and Hardwick St *(Forest Stand 4)*
- Old apple orchard, meadows and shrubby field edges *(Open Land)*

Recommended management in the next 10 years includes:

- Removing invasive plants including oriental bittersweet, shrub honeysuckle, and common buckthorn.
- Monitoring and considering removal of "watchlist" species (which may become invasive) including coltsfoot, wall lettuce and spotted knapweed
- Harvesting 10-20% of the white pines in *Forest Stand 3* to reduce risk of dieback and allow new growth of a variety of hardwood and softwood species
- Maintaining native understory plants (seedlings, saplings, shrubs and herbaceous cover) where it doesn't interfere with golf course maintenance

- Optional projects if funding allows (beneficial but not necessary for the forest):
    - Planting tree seedlings in areas where natural regeneration is not successful, and/or to convert open land into forest. Planted species should be site-appropriate and adapted to future climate conditions.
    - Thinning around desirable crop trees, known as crop tree release (CTR) in *Forest Stands 1,2 and/or 4*
    - Late-summer or fall mowing of open land (meadows, old orchard) to maintain early-season wildlife habitat for birds and pollinators
    - Maintaining and possibly expanding a trail network in the forested areas for winter and/or year-round recreational use

INTRODUCTION

Purpose
This forest management plan is intended to serve the following purposes for the Mountain View Country Club:

- Provide a detailed description of the forested areas of the land
- Provide information that may be shared with members, staff, board and committees regarding activities in the forested areas
- Establish a schedule for management work in the forested areas for the coming decade (2024 through 2034)
- Serve as a reference for management work, including details about forest management and additional resources

While this plan makes reference to other areas of the land, it is not intended to be a management guide for fairways, greens, gardens, landscaping, structures or other developed areas.

Process
In 2023-24, the MVCC decided to formalize a forest management plan for the wooded areas of the club's land, at the request of President Rick Ely. MVCC approached several consulting foresters for proposals, and selected the NorthWoods Stewardship Center as the consultant to prepare this plan in summer of 2024. The planning process has included:

- Meeting with the MVCC Forestry Management Working Group, grounds staff, and the Orleans County Forester to establish goals for the forest
- Mapping the parcel and collecting forest inventory data
- Evaluating eligibility for Vermont's Use Value Appraisal (UVA) Program (not eligible as descsribed later in this plan)
- Reviewing and revising draft plans and maps with the Forestry Management Working Group and President
- Presenting the final management plan to MVCC members for feedback and discussion

Contacts
NorthWoods Stewardship Center consulting forester Sam Perron: (802)723-6551 x302

forestry@northwoodscenter.org

Orleans County Forester Jared Nunery - (802)595-5754, jared.nunery@vermont.gov

TABLE OF CONTENTS

MANAGEMENT GOALS AND OBJECTIVES

Forestry activities on the MVCC land should:

- Support the MVCC Mission as a family-friendly, recreational Club.
- Create a more diverse woodland environment over the next 20 to 30 years.
- Create a woodland that is sustainable in the context of a changing climate.
- Maintain the aesthetic beauty of the Club implying the presence of both deciduous and coniferous trees.
- Provide a safe playing experience for the membership.
- Mitigate the introduction and expansion of invasive species.
- Not impose a cost burden on the Club inconsistent with current fee levels.

In addition to the priorities above, forestry activities may also:

- Consider the opportunity for managing the woodland to encourage bird life.
- Consider the potential of developing a ski / snowshoe trail to allow members to explore the woodland in winter without impacting sensitive parts of the golf course such as the greens.
- Consider the opportunity for deriving some economic benefit for the club from lumber extracted as part of the operations to deliver the primary objectives.

PROPERTY OVERVIEW

Landowner: Mountain View Country Club

Mailing Address: PO Box 97, Greensboro VT 05841

Telephone: (802)533-7477 (Proshop)

Email: proshop@mvccvt.com (Proshop)

County: Orleans County

Grand List Acres: 78.3ac

Town Parcel ID: 058-0112

SPAN: 264-083-10649

Biophysical Region: Northern Vermont Piedmont

PARCEL RESOURCE INFORMATION

Overview

The Mountain View Country Club (MVCC) owns a 78.3 acre parcel of land, primarily used for a golf course, tennis courts and other recreational activities. A clubhouse, maintenance shop and smaller outbuildings are located on the parcel. Situated on a gradually sloping hillside, the property overlooks Caspian Lake with northward views of the lake.

Within the ~78 acre parcel are several forested areas, ranging in size from ~0.5 to 9 acres in size and totaling ~19.7 acres. Additional areas of open, undeveloped land include meadows, an old orchard, powerlines and shrubby woods edges.

The majority of the land is maintained for the golf course and other recreational uses. These areas are managed by the Superintendent and are not described in this plan. Some general guidelines for tree planting and care are included in this plan.

Landscape Context & Biophysical Region

The MVCC parcel is located in the Northern Vermont Piedmont Biophysical Region – a region known for its gentle rolling topography, a moderate to cool climate, rich soils, abundant rivers and lakes, and northern hardwood forests. These traits were appealing to early European settlers, resulting in abundant farmland and small villages that still exist today.

The landscape around MVCC includes a mix of forest, farmland, open land and developed lots (houses, businesses, etc). This limited connectivity with larger forest blocks makes the MVCC forest unsuitable for wildlife species and ecological functions that require large, intact forest blocks. Although this large-forest ecology is lacking, a diversity of habitats on a smaller scale can still provide valuable habitat, especially for bird species, which are highlighted in this plan.

Use Value Appraisal (UVA) Eligibility
The parcel was assessed for UVA eligibility, based on minimum acreages and other criteria set forth by the UVA program. A site visit with Orleans County Forester Jared Nunery confirmed that mapping was accurate.

The parcel was determined to be NOT eligible. UVA requires a minimum of 20 acres of forests on productive soils that can be managed for timber; the MVCC parcel has a total forested area of 19.7 mapped acres (19.0 acres when prorated to match the grand list), and of that, approximately 18.9 mapped acres (18.3 acres prorated) would qualify as forests on productive soils.

In the future, the parcel could be eligible for UVA if ~1.8 acres of open land were successfully reforested with 350 stems/ac or more of commercial tree species, and managed for future timber harvesting. This would likely require tree planting and continued care of those trees for several years until they establish. It would also require changes to how the club uses and maintains open land (meadows, forest edges).

If enough area is reforested in the future to enroll in UVA, the following estimated tax savings are anticipated (information provided by Greensboro Town Lister and calculations by MVCC member Chris Steel):

- Land is currently assessed at around $2,636 an acre for our 76.3 acres of land excluding the clubhouse etc. That implies an FMV for the 25 acres of $65,900. If a current use valuation of that acreage was applied at $187 per acre that would yield a value of $4,675 and an overall reduction of $61,225.

- Applying a 2% tax rate to that $61,225 would give a reduction in taxes of $1,225 annually and a total discounted value of that reduction (assuming the reduction remained constant) of some $24k in perpetuity.

Boundaries
Property boundary marking varies across the parcel:

The northeastern, northwestern and western boundary mostly follow roads, providing easily recognized boundaries.

Boundaries near the adjacent fire station are obvious from changes in land use, although corner pins were not found here and may be hidden in underbrush.

The southern and southeastern boundaries have corner pins that are flagged and easily found in most areas. Some scraps of flagging, old blazes, old wire fence and other boundary evidence is found along these lines although it is not always obvious.

The southern boundary deviates slightly from the line shown on the tax map.

Boundaries were not checked around a small area of the parcel to the east of Country Club Rd, where there is a parking lot and tennis courts.

Boundaries on the attached map are based on GPS locations of corner pins found (+/- 20-30 foot accuracy). No deed research or in-depth boundary identification was done while preparing this management plan.

By law, new boundary blazes can only be cut into trees by a licensed land surveyor, but landowners and foresters may re-paint existing blazes or add flagging to make boundary lines more visible. For definitive identification of property boundaries, or where boundaries are disputed, a licensed surveyor should be consulted.

For ease of finding boundaries in the future, it is recommended that boundary paint and/or flagging be replaced periodically (every 5-10 years) to mark corner monuments and boundary lines. This is particularly important before any management work occurs on the MVCC land or adjacent lands.

History and Cultural Resources *(excerpt from MVCC website 2024)*
"Playing golf first began in 1898, when three men, prompted by Mrs. McKenzie, prepared three holes in a pasture between the Town Hall and the lake. Improvement the next year increased the course to five holes, each provided with a tomato can hole. Not satisfied with this progress Arthur Wheeler and his loyal friends laid out a new course on Tolman farm land where the club is today. It had been, and continued to be, pasture for cows. Furthermore, the surface was rough with hundreds of rocks, moss and shrubs of substantial size. These provided numerous devilish hazards. Nevertheless, by 1903 there were twenty-six stalwart members. They built a small clubhouse in 1906 with a small fund of $50. Members are said to have played every day but Sunday.

MV-1001 The oldest known Club photograph. Apparently this group has just finished playing a tournament using a single club. This used to be a popular format. The gentleman in the center/front is Bliss Perry, one of the original club founders.

Soon came a time when their skills were such that they sought outside competition. The first match was scheduled with St. Johnsbury reached by walking to Greensboro Bend, taking a train to St. Johnsbury, and a bus to the golf course. Later matches were with Barre and Montpelier. All of this was great fun and stimulated camaraderie lasting until today.

It was not until 1908 that the club built a tennis court, and added a second in 1914. Better courts around the lake made tennis at the club of little consequence until a renewed effort in the mid 1930's brought the game in near popularity with golf. But this occurred only after winning a battle with reluctant golfers. Since the War both sports have thrived along with numerous other activities provided for children, and social gatherings for everyone – picnics, dances, card parties, and of course the Annual Meeting. With all of this it naturally occurred to many that the club needed a much larger clubhouse.

During the latter part of the century the membership became so large that there were tournaments in tennis and golf almost every week, so that the pioneering spirit of competitive games played elsewhere has tended to cease. Even so, all outsiders are welcome to play on club facilities (with modest charges). In the past decade the golf course has greatly improved in quality under the care of professionals, and this is true of the tennis facility. New land purchases have provided space for practicing golf, and the tennis courts now number seven. There are currently 350 club memberships.

No club is perfect, but Mountain View comes closer to it than most. Its good quality arises from an honest desire to have a friendly atmosphere undisturbed by overbearing regulations, a reasonable code of conduct, informal attire, and a genuine desire of all members to help in carrying on the numerous summer events. It would surprise the founders if they could see what their early efforts brought forth after 100 years.

In 2005, the club built a new clubhouse with cedar clapboards and deep porches."

The forested areas found on the MVCC land in 2024 grew from the farmland described above, after agricultural use ceased and unmaintained fields regrew with trees. Some sugar maples and other older trees were likely here for much longer, kept as roadside trees, hedgerows and possibly part of a small sugarbush.

In winter of 2022-23, the club engaged local logger Terry O'Connor to remove some of the dead trees and permitted the logger to harvest some healthy trees. The patchy logging created a "shelterwood" effect, with varying density of trees remaining. This logging was done with little damage to remaining trees, and high-quality trees were left un-harvested. These remaining trees and varying sunlight on the forest floor provide opportunity for a diverse, healthy and productive forest in coming years, as described throughout this plan.

The club's Super, Steve Parker, and grounds staff periodically maintain trees and forest edges near the golf course. This work includes removing dead/unhealthy trees, planting new trees, re
moving brush/understory along fairway edges and other activities.

Roads, Trails and Access
Primary access to the MVCC land is from Country Club Rd (main parking lot and clubhouse), Breezy Ave (maintenance shop) and Hardwick St (woods and open land on the south and west sides of the parcel).

A network of gravel paths provide access to the golf course and facililties, mainly for recreation and groundskeeping.

Access for forest management must be done carefully to avoid damage to the golf course and other landscaping. Winter logging during frozen-ground conditions can reduce damage, and skidding across fairways may be reasonable when ground is solidly frozen and there is snow cover to protect the soil and grass. Sensitive areas such as golf greens, garden beds, etc. should be avoided with logging equipment at all times of year.

Roads and trails used for timber harvesting on forestland in the Current Use program must follow guidelines set forth in *Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont* (available online at https://fpr.vermont.gov/forest/managing-your-woodlands/acceptable-management-practices). These guidelines are referred to as "AMPs" throughout this plan.

Recreation and Aesthetics
With recreational use as a primary goal of the MVCC, the aesthetics and enjoyment of members while they're at the club's land is of great importance. Aesthetics of buildings and landscaped areas are not addressed in this forest management plan. However, forest-based recreation is described here, including options for recreational trails and consideration for the visual impacts of any future forest management.

Existing trails are maintained through the forested areas, primarily used by the Superintendent and grounds staff. These trails could be maintained with mowing and minimal improvements as recreational walking/skiing/snowshoeing trails.

These trails would be particularly well suited to cross-country skiing and snowshoeing. A network could be established by linking existing forest trails with potential groomed trails through fairways and open areas (avoiding greens and sensitive areas). Additional signage, possibly removed in summer, would be needed to guide visitors on these trails. Few, if any, new trails would need to be cut in wooded areas to create this network. Cutting additional trails may create a less inviting user experience if trails are too dense and confusing to navigate. The following recommendations apply when reclaiming old trails (or cutting new trails if desired):

- Route trails to keep slopes at ~10% or less when possible
- Install waterbars as needed to prevent erosion on slopes. Acceptable Management Practices (AMPs) for logging may be used for spacing waterbars. Routing trails to include natural grade reversals can reduce the need for waterbars while also minimizing erosion
- Allow adequately wide corridors and sweeping turns to be suitable for winter grooming equipment
- Avoid wet soils that may not freeze consistently in winter
- Install signage (permanent or seasonal) and create a trail map to guide visitors

Forest aesthetics are in the eye of the beholder. Foresters, ecologists and wildlife biologists all recommend a forest structure that looks “messy”, with abundant downed wood, shrubby undergrowth, some standing dead trees, and a variety of sizes/species of trees. This may appear unpleasant to visitors, but this visual impact can be addressed with the following strategies:

- Interpretive signage explaining the values of habitat features such as downed wood, brush piles and standing dead trees (also called snags)
- Maintaining trails and trailsides in a more manicured condition while allowing forested areas beyond the trail to grow in a natural, messy condition
- Avoiding damage to trees during logging and mowing, which is both unsightly and unhealthy for the trees
- Protecting soils and trails from rutting, erosion and other damage
- Retaining and thinning around healthy, visually appealing trees near trails and forest edges
- Favoring native tree, shrub and herbaceous plants that are well adapted to site conditions and likely to remain healthy in future climate conditions

Soils
Generally well-drained and somewhat calcium enriched, as indicated by bedrock geology and species composition. Rich site indicators like blue cohosh are not abundant, suggesting that soils are only receiving a small amount of bedrock-derived soil nutrients.

Mapped soil types include:

- 3C - Vershire-Lombard complex, 8 to 15 percent slopes, rocky
- 6D - Vershire-Lombard complex, 15 to 35 percent slopes, very stony
- 17B - Buckland loam, 3 to 8 percent slopes
- 59C - Cabot silt loam, 8 to 15 percent slopes, very stony (a very small area in the northeastern corner)

Hydrology
The MVCC property lies in the headwaters of the Lamoille River watershed. Although a few small seeps and drainages, and one human-made pond are found on the parcel, no significant streams or other hydrologic features were found.

Groundwater seepage is most noticeable in Cabot and Buckland soils, where a shallow hardpan layer in soil is the likely cause of a perched water table. These soils tend to be wet most of the time, especially Cabot soils which have a poorly drained soil texture (compared to Buckland soil's sandier texture).

Bedrock Geology
Bedrock underlying the MVCC property is mapped as phyllite and metalimestone. This bedrock type stretches through the Northern Vermont Piedmont region, and is known as the Waits River Formation.

Waits River Formation is known for high concentrations of calcium carbonate, typically resulting in soils that are rich in calcium and other plant nutrients. Where groundwater brings this nutrient enrichment to the surface, it provides excellent growing sites for species like sugar maple, white ash, basswood and cedar, all of which are found in the MVCC forest.

Bedrock influences may be masked in the current landscape where soil enrichment is swayed by groundwater movement (leaching and deposition—areas of higher and lower nutrient availability), vegetation, soil type and other factors. Some areas of the MVCC property appear less nutrient-enriched than bedrock suggests. This may be caused by a shallow "hardpan" layer in some areas that restricts movement of water between bedrock and surface soils. Groundwater movement and drainage may also influence this.

Important Natural Features and Rare Species/ Natural Communities
No rare, threatened, or endangered (RT&E) species or uncommon natural communities are known to occur on the site (*Vermont ANR Atlas 2024*).

Wildlife Habitat
The following features in the MVCC forest provide functional wildlife habitat and other ecological values. These features are currently present, and future management should maintain and enhance these:

Wildlife habitat features (currently present or to be enhanced by forest management) are described below:

- ***Downed Wood*** – Logs, branches, and twigs that fall to the forest floor provide habitat for small mammals, insects and amphibians. Decaying wood also contributes to nutrient cycling in soils and builds soil organic matter, which in turn supports greater soil health and water/nutrient retention. In an ecologically intact forest, varying sizes of downed wood should be present, and varying stages of decay, to provide all of the benefits listed above. This ecological feature can be enhanced in the future by leaving branches and low-value logs in the woods during harvests, and by allowing natural disturbance to create windthrow.

  Past management has done a good job of this, with naturally fallen pine logs in Stand 3 and slash/cull logs left during recent logging in Stand 1.

- ***Canopy Gaps and Structural Diversity*** – Natural disturbances from storms, tree mortality, and other factors creates small canopy gaps (typically ~0.1-0.5 acres in size) in natural forests. Over time, these gaps fill in with seedlings and saplings that respond to the increased light, and gaps form in other areas of older forest. This shifting mosaic of gaps and different ages of trees/shrubs creates a diverse array of wildlife habitats and builds forest resilience by having areas that are less susceptible to specific types of storms, pests, pathogens, etc.

  Future management can mimic this disturbance pattern and restore structural diversity in forests that generally have fewer age classes. Silvicultural timber harvests recommended in this plan are designed to achieve this goal.

- ***Mast Producing Trees and Shrubs*** - "Mast" refers collectively to the nuts, seeds, buds, or fruits of woody plants that are consumed by wildlife. Certain trees and shrubs are considered high value mast producers due to the volume or quality of mast produced, and/or the number of wildlife species known to benefit from them.

  Valuable mast producing tree species on the MVCC property include apple trees (woods edges and old orchard), black cherry (scattered throughout). Several shrub species, mainly found in field edges and logged gaps, also provide mast, including choke cherry, raspberries/blackberries, and dogwoods.

  Several invasive species of shrubs and vines produce berries. However, research has found these to be of lower value to wildlife, and in some cases even detrimental to health of wildlife such as songbirds.

- ***Legacy Trees***- Very large, older trees (>20"dbh) with extensive canopies offer unique wildlife values, such as vertical structure, abundant nesting and foraging sites, abundant seed/food sources for wildlife, seed source for regeneration, and other values.

  Several legacy sugar maples are found in Stand 2, and some of the larger pines in Stands 1 and 3 should be retained as legacy trees.

- ***Snags and Cavity Trees***- Snags (standing dead trees) and live trees with hollow cavities provide many benefits to wildlife. While these trees have little or no value for timber, they server as forage sites for woodpeckers; shelter for bats, cavity nesting birds, porcupine, and fisher; and open perches for raptors. When snags fall, they continue to benefit the forest for many years by contributing organic matter to soils, carbon storage, sites for nitrogen-fixing bacteria and mychorrizhal fungi, nurse logs for tree seedlings, and water storage.

  Retaining snags and cavity trees during future management can enhance this feature. Large-diameter snags and cavity trees are especially valuable and uncommon; some large white pine snags occur on the MVCC property in Stand 3. Younger forested areas are notably lacking snags, and recent logging removed some of the dead softwoods in Stand 1.

Climate Resilience and Adaptation

Climate change in Vermont is impacting forests, trails, and ecological function, and these impacts are likely to become much more pronounced in coming decades. Future changes in the Vermont climate, and associated impacts, are predicted to include *(VT FPR 2015)*:

- More frequent, intense storms with higher rainfall, wind and ice accumulation
- Increase in flood events as a result of storms
- More frequent and intense periods of drought
- Invasive plant pressure
- Shorter winters, longer growing seasons, and warmer average temperatures (with increased variability in temperatures)
- Loss of suitable habitat for northern species (trees, vegetation, wildlife) and changing natural communities
- Possible disruption of migratory patterns and pollinator activity as a result of phenological changes

As a result of these changing conditions, individual species of flora and fauna will respond differently, potentially moving to different geographic locations or using different habitats, with their movement varying based on species-specific traits. In contrast, some features are largely static: geology, landforms, water bodies and wetlands. This movement of species in the landscape will likely result in different types of future natural communities, not simply moving natural communities northward on the map (*Thompson, Sorenson & Zaino 2019*).

Actions on the MVCC property that can mitigate climate impacts include (*VT FPR 2015*):

- Promoting species diversity, being sure to maintain components of future-adapted tree species such as white pine, red maple, American basswood, and black cherry (*NIACS 2021*), as well as providing refugia for species likely to be hardest-hit such as red spruce, white ash, black ash.
- Maintaining structural diversity and a mix of tree age classes, allowing forests to respond to storms and pests/pathogens with less widespread damage
- Building robust drainage structures on trails, to minimize erosion and runoff during heavy rain events

- Controlling and monitoring invasive plants sooner rather than later, to reduce invasive pressure as other forest stressors increase
- Increasing forest cover in riparian areas to maintain cold-water stream temperatures, to maintain wildlife habitats, and to stabilize soils during flood events
- Maintaining overall forest health and ecological function, using sustainable forestry practices described throughout this management plan, and maintaining connected forests at a landscape scale. This may be the most important strategy to reduce the combined impacts of the many forest stressors that are likely to accompany climate change

Invasive Species

Certain species of non-native flora and fauna have been found to cause harm to the environment, economy and/or human health. These species are listed as "invasive" and future management should remove existing invasive species where present, and avoid bringing new invasive species to the property.

The following invasive plants were found in 2024. ***See attached fact sheets*** and visit www.vtinvasives.org for additional information.

- **Asiatic bittersweet** is a woody vine that grows in a low, creeping "carpet" in open areas and can also grow into the canopy of trees. This invasive plant is found abundantly in southern New England, and currently less pervasive in northern Vermont. Patches of Asiatic bittersweet were found in the open, unmaintained woods edges to the southwest of the clubhouse. Removal of these plants should happen as soon as possible to avoid further spread, which would likely damage trees and incur higher costs to remove as it spreads to more areas.
    - ***Recommended actions:*** hand-pulling repeatedly throughout the growing season, focusing on late-summer and fall. Dispose of plants where they won't re-root. Avoid transporting berries to new locations where they may germinate. Herbicides may be used to control bittersweet, and this work must be done by a Vermont Certified Pesticide Applicator. For the current population at MVCC, foliar spraying would be the most appropriate herbicide treatment due to the low, spreading growth habit.

- **Shrub honeysuckle** includes four species that are known to be invasive. All invasive shrub honeysuckles look relatively similar, and at least one species was found in the hedgerow near the MVCC maintenance shop. These plants often spread in hedgerows and woods edges, with birds and wildlife transporting berries to new locations. For this reason, there are likely to be more invasive honeysuckle shrubs than mapped, and further searching is recommended. There are several native honeysuckle species in Vermont and should not be removed if found, although none were observed on the MVCC property. Invasive honeysuckles are recognizable by a hollow pith in the center of the twigs, visible by cutting off a medium-sized branch. Native honeysuckles have solid, spongy white piths in twigs.

- ***Recommended actions:*** digging large shrubs and hand-pulling small shrubs to remove roots can be very successful for controling small populations of honeysuckle. This may be done any time when the ground is not frozen. Care should be taken to remove all roots, and to avoid moving berries to new locations.

- **Common buckthorn** is a shrub that can grow to a small tree, similar in size and appearance to an apple tree. One small buckthorn was found and pulled near the MVCC maintenance shop in 2024. This shrub, and a similar invasive glossy buckthorn, are often spread by berries that are carried by birds and wildlife. Continued monitoring is recommended to look for, and remove, any additional buckthorn and to look for larger seed-producing buckthorn. These species can be difficult to recognize, and often blend in with native species such as chokecherry, dogwood and apples which have benefits for wildlife and should be kept when possible. Attached fact sheets and apps such as iNaturalist Seek or PictureThis can help identify buckthorn species.
  - ***Recommended actions:*** look through hedgerows and woods edges each year (if possible) to find any additional buckthorn. Hand-pull if any are found, taking care to remove roots. If larger shrubs/trees are too large to pull, a cut-stump herbicide treatment by a Vermont Certified Pesticide Applicator is recommended.

- **Wall lettuce** is a watchlist species, meaning that it is not yet listed as invasive, but may cause harm if it spreads through a forest. This species is found in moderate abundance through the forested area in the center of the parcel (Forest Stand 1).
  - ***Recommended actions:*** There is currently limited information about managing this plant. It appears to spread abundantly by seed, and pulling plants in early-summer before they set seed may help reduce populations. These areas should be monitored to see if these plants continue to spread, or if they are reduced by natural competition from native plants.

- **Coltsfoot** is a watchlist species, and was found in the open area within Forest Stand 1 that appears to have been used as a log landing. This herbaceous plant grows low to the ground, and yellow flowers emerge early in spring before leaves come out. It is often seen along roadsides and can invade streambanks and other disturbed areas.Unlike the species above, this plant spreads mainly through root and rhizome fragments when soil is moved through excavating or on tires of equipment.
  - ***Recommended actions:*** avoid excavating, grading or other soil disturbance where this plant is present. Avoid mowing this plant, since that may also spread fragments. Hand pulling is difficult due to the abundant rhizomes. Foliar herbicide treatments may be done by a Vermont Certified Pesticide Applicator if desired.

- **Spotted knapweed** is a watchlist species, and has been observed by MVCC members. It is a perennial herbaceous plant with a deep taproot and a distinctive flower similar to a thistle, but distinguished by different leaves.
  - ***Recommended actions:*** avoid mowing when plants have seeds. Monitor for further spread. Consider removing plants by pulling (making sure to remove the entire taproot) or herbicide foliar spraying.

- **Emerald Ash Borer (EAB)** is an invasive insect that was first found in Vermont in 2018 and has been spreading throughout the state. Although ***NO symtoms of EAB were observed on the MVCC property in 2024***, it is likely to spread to the area in the next 5-10 years. Ash is a relatively small component of the MVCC forest overall, making up 2.8% of stocking in Stand 1 and 0% of Stand 3 (by basal area). White

ash is a significant component in Stand 2, with 18.2% of stocking, although this is a small area.

- **Recommended actions:** monitor health of ash trees for any signs of EAB, such as "blonding" by woodpeckers, canopy decline, or exit holes/larval galleries under bark. Other native pests and pathogens may cause similar symptoms; see attached fact sheet for details. Ash trees should be kept as long as possible, rather than pre-emptively cutting them before EAB arrives. Cutting trees does not stop the spread of the insect through the region, and keeping healthy trees may provide genetically diverse seed source for future ash trees that may have resistance to EAB. Retain high basal area (near A-line) in Stand 2 in anticipation of ash dieback in the next ~10 years.

Trees in Landscaped Areas

This management plan focuses on growing and harvesting trees in forested areas. However, the following recommendations may be useful for maintaining healthy, aesthetically appealing trees in the golf course and other areas of the MVCC property. These include individual trees and rows of trees between fairways/greens, hedgerows along roads, and trees near buildings and tennis courts. General recommendations include:

- Favoring long-lived, structurally strong trees that will grow for many decades while withstanding storm damage
- Periodically planting (or cultivating naturally established seedlings/saplings) new trees so they can establish before other nearby trees start to decline. This is lower-cost and often more successful than replanting large trees
- Protecting tree bark, stems and roots from damage. Mowers and string trimmers can damage tree bark
- and shallow roots, leading to disease and decline
- Pruning trees for structurally sound branching (working with a professional arborist to prune larger trees)
- Monitoring trees for signs of decline including twig dieback and species-specific diseases/pathogens
- Retaining and planting native, ***site-appropriate species*** including:
    - Sugar maple
    - Red maple
    - Black cherry
    - Yellow birch
    - Northern white cedar
    - Red spruce
    - Basswood
    - White pine

- Increasing the proportion of trees that are predicted to adapt well in future climate conditions. This could include species that are currently found in the MVCC forest, as well as species that are native to the region but not currently found on the MVCC parcel (noted with an asterisk*). Note the distinction that the list above are site-appropriate species (soils, current climate, etc) versus the list below of ***future climate adapted species***:
    - Red maple
    - Black cherry
    - White pine
    - Basswood
    - Black birch*
    - Northern red oak*
    - Shagbark hickory*

Principles of Ecological Forestry

Many forest landowners want to balance multiple goals, including ecosystem health in balance with human needs, just as the MVCC aims to do. This integrated approach is referred to in recent publications as "ecological forestry", and the following general guidelines can be applied in the MVCC forest:

- Managing for structural diversity (varying ages and sizes) and species diversity in native trees, shrubs, and understory plants in the forest
    - Establishing an irregular/uneven-aged forest condition that supports periodic commercial timber harvesting while enhancing structural diversity
    - Promoting native, site-appropriate, commercially valuable tree species
    - Improving forest health, tree quality and regeneration with periodic stand improvement harvests
- Allowing old-forest characteristics such as legacy trees, tip-up mounds, downed wood, late-successional species and structural diversity to re-establish over time, in balance with other management goals
- Maintaining wildlife habitat features (described above) including standing dead trees, downed dead wood, legacy trees, cavity trees, mast producing trees/shrubs, and forest cover around wetlands/waterways
- Minimizing disturbance to wetlands, seeps, streams or other hydrologic features
- Removing invasive plants when possible, and monitoring for future spread of invasive plants or insects
- Observing surrounding forest types and land uses, and considering how management of the MVCC property can contribute to regional ecological values

SOFTWOOD/MIXED FOREST *(FOREST STAND 1)*

Acres (mapped): 10.8
Acres (pro-rated): 10.4

Natural Community Type(s):
Northern Hardwood Forest
Possible other Northern Hardwood variants. Natural communities have been significantly altered by past agricultural land use

Description
This area, labelled as "Forest Stand 1" in this plan, includes the large u-shaped patch of forest in the center of the golf course, as well as a smaller swath of similar forest to the northeast along Country Club Rd.

Partial logging occurred in this area in winter of 2022-23 as described earlier in this plan. The result is a somewhat patchy forest with conditions including:

- areas of closed-canopy, mainly dense cedar trees 6-10" diameter, with other species interspersed (white ash, red maple, red spruce, and larger white pines). These areas are shady with very little understory growth.

- areas that were thinned, apparently removing mature/declining softwoods and retaining healthy trees with a mix of species including white pine, red spruce, white spruce, yellow birch, red maple, black cherry and quaking aspen. A few red pine and scots pine are found near the edges of this stand, likely planted or seeded in from nearby planted stands when the farm was reverting to forest.

- canopy gaps where clusters of trees were harvested, allowing more sunlight to reach the forest floor. These areas have more dense undergrowth of shrubs, seedlings/saplings and herbaceous plants including raspberries, blackberries, grasses, ferns and other understory plants. Regeneration of tree species includes red maple, quaking aspen, sugar maple, yellow birch, paper birch, gray birch, balsam fir and other species. Some seedlings/saplings have regenerated from stump sprouts, and low to moderate deer browse was found.

- Large-diameter white pines (14-20" diameter) are found scattered throughout. These legacy trees are useful for wildlife as described earlier in this plan. In future management, some of these trees should be retained for these ecological values and allowed to die, creating future deadwood habitats.

Recent logging removed merchantable logs, and piles of slash (small branches and un-merchantable wood) were left in piles. While these piles may appear unsightly, they provide value for wildlife habitat, carbon storage

and soil nutrient cycling as described earlier in this plan. Where possible, these slash piles should be left in place or dispersed in the woods to decompose.

Age Class Structure: Even aged, estimated at 60-80 years old, with regeneration (0-10 years old) and legacy trees (estimated at 80+ years old)

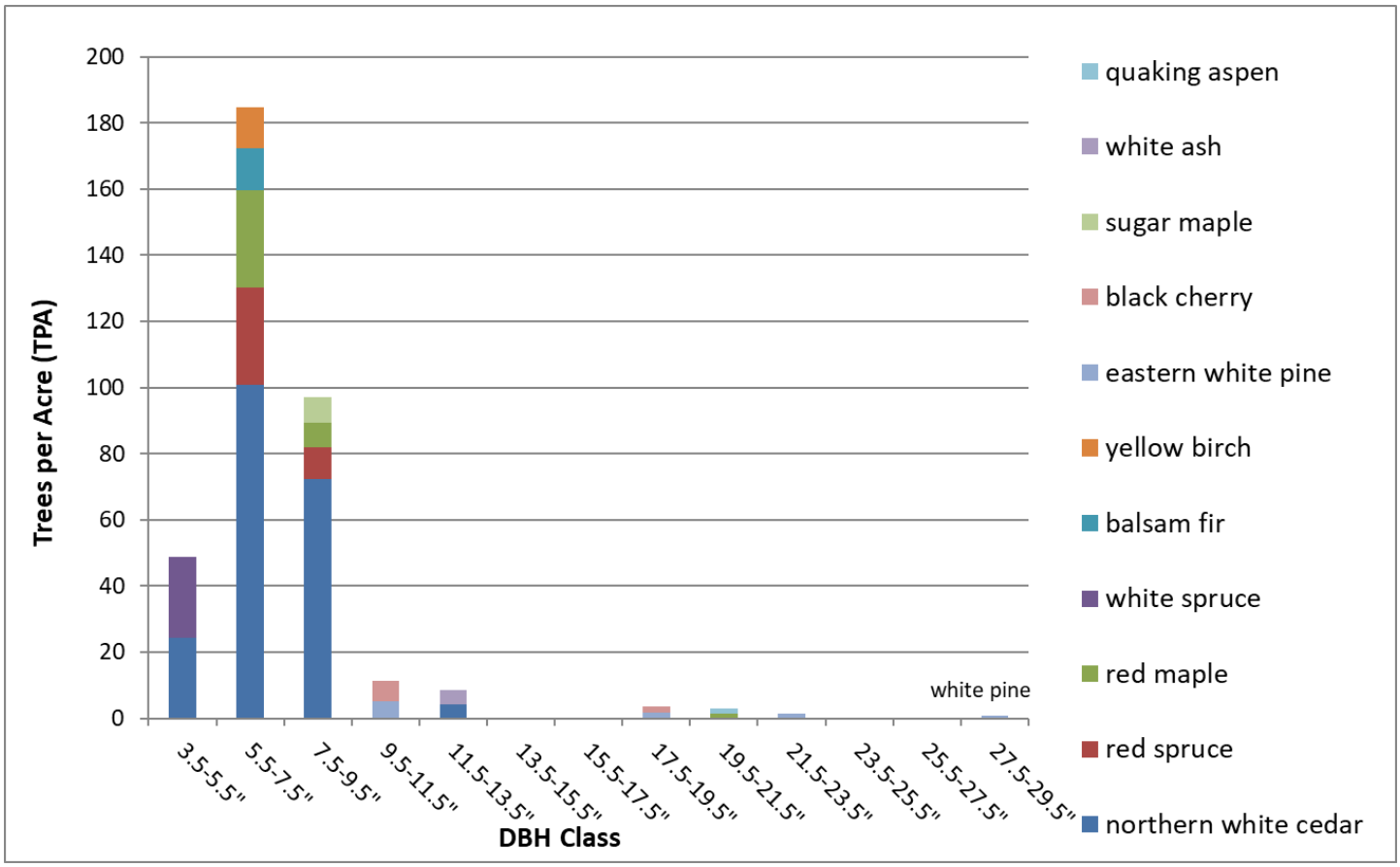
SILVICULTURAL DATA

Sampling Method: Variable radius plots (BAF 20, all stems >/=4"dbh)
Sampling Date: July 2024
Number of Plots: 6 (1 plot per 1.8 acres)

For all live intermediate-dominant trees >3.5"dbh:

Total BA: 120 ft^2/acre
AGS BA: 60 ft^2/acre (50%)
Total TPA: 359 trees/acre
AGS TPA: 168 trees/acre (47%)
Quadratic Mean Stand Diameter: 7.8"

Stocking Level – 66% canopy closure. Adequately stocked, slightly above B-line on mixedwood stocking chart (Leak et al 2014). Actual stocking is likely B-line or slightly below based on high proportion of softwood.



Group	Species	% of Total Basal Area	Sawlog (bf/ac)	Pulpwood (cords/ac)	Total (cords/ac)
Hardwood	*red maple (Acer rubrum)*	*11.1*	*0*	*3.0*	*3.0*
	black cherry (Prunus serotina)	*5.6*	*0*	*2.0*	*2.0*
	quaking aspen (Populus tremuloides)	*2.8*	*0*	*1.0*	*1.0*
	sugar maple (Acer saccharum)	*2.8*	*0*	*1.0*	*1.0*
	white ash (Fraxinus americana)	*2.8*	*196*	*1.0*	*1.0*
	yellow birch (Betula alleghaniensis)	*2.8*	*0*	*1.0*	*1.0*
	Hardwood Total	***27.9***	***196***	***9.0***	***9.0***
Softwood	*northern white cedar (Thuja occidentali*	*47.2*	*220*	*10.0*	*10.0*
	eastern white pine (Pinus strobus)	*11.1*	*1,496*	*2.0*	*5.0*
	red spruce (Picea rubens)	*8.3*	*0*	*2.0*	*2.0*
	balsam fir (Abies balsamea)	*2.8*	*150*	*1.0*	*1.0*
	white spruce (Picea glauca)	*2.8*	*0*	*0.0*	*0.0*
	Softwood Total	***72.2***	***1,866***	***15.0***	***18.0***
Grand Total		***100.1***	***2,062***	***24.0***	***27.0***

REGENERATION

Sampling Method: subjective observation
Number of Plots: --
Seedling Density: variable based on management history. Closed-canopy areas have very sparse regeneration. Logged areas and gaps have 1-5,000 stems/ac (estimated)
Sapling Density: generally sparse. Most regeneration is still in seedling size class, but some are growing into small sapling class.
Primary species: balsam fir, red maple, sugar maple, striped maple, quaking aspen, yellow birch and other species.

CURRENT AND DESIRED FUTURE STAND CONDITION

Long Range Silvicultural Objectives: Uneven-aged or irregular age class structure with a mix of site-appropriate native species including sugar maple, yellow birch, white pine, northern white cedar, red maple, black cherry and other species. Management should favor high-quality stems and healthy trees, while also retaining standing dead trees for wildlife habitat.
Cutting Cycle: 15 years
Diameter Objectives for Principle Species:

12-16" – white spruce, balsam fir
16-20" – cedar, red maple, black cherry, aspen, red spruce
20-30"+ – white pine, sugar maple, yellow birch, white ash (may retain trees beyond economic maturity for large-tree wildlife habitat)

PLANNED TREATMENTS

No commercial timber harvesting is recommended in the next 10 years. The largest trees in this stand provide ecologically valuable "old forest" function and should be retained. Logging in 2022-23 established areas of new regeneration which are still responding. Based on a 15 year cutting cycle, the next entry is expected to be around 2037-38.

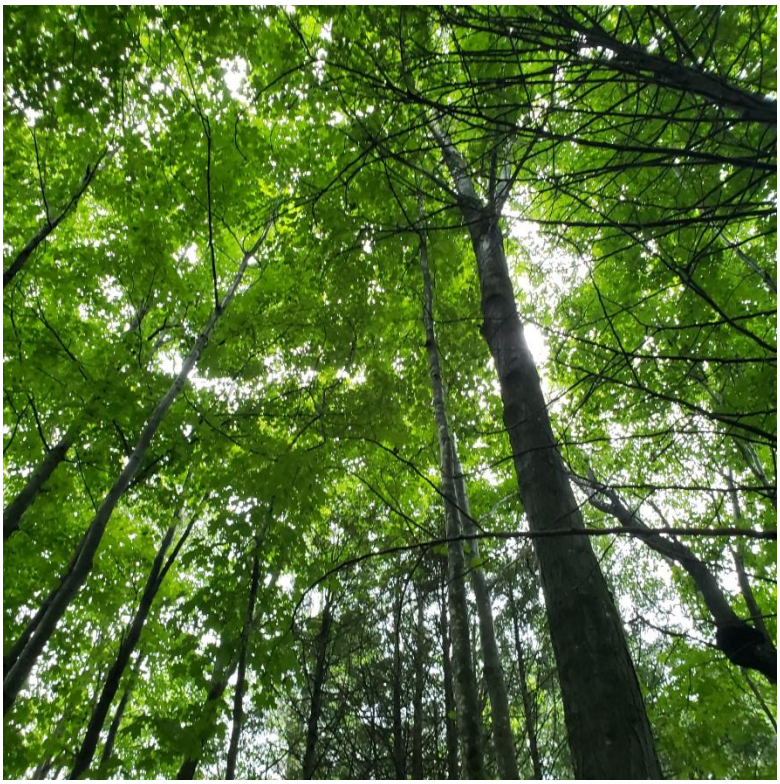
Other Optional Management

Crop Tree Release (CTR) may be done where high-quality trees and trees of desirable species are crowded by dense canopy cover around them. These areas tend to have smaller diameter trees (6-8") and an abundance of cedar. Species to favor include cedar (thinning dense canopies), red maple, red spruce and other species. This work is likely to be non-commercial or may harvest some small-diameter cedar sawlogs. Care should be taken to retain the highest quality trees, and to prevent damage to these trees.

Trail maintenance (maintaining existing trails and possible development of winter ski/snowshoe trail network) and ***invasive plant control*** (wall lettuce and coltsoot, watchlist species of low/moderate concern) may be completed as described earlier in this plan.

NORTHERN HARDWOODS *(FOREST STAND 2)*

Acres (mapped): 4.6
Acres (pro-rated): 4.4



Natural Community Type(s):
Northern Hardwood Forest
Possible other Northern Hardwood variants. Natural communities have been significantly altered by past agricultural land use and edge effects

Description
Two separate areas of hardwoods are included in Forest Stand 2:

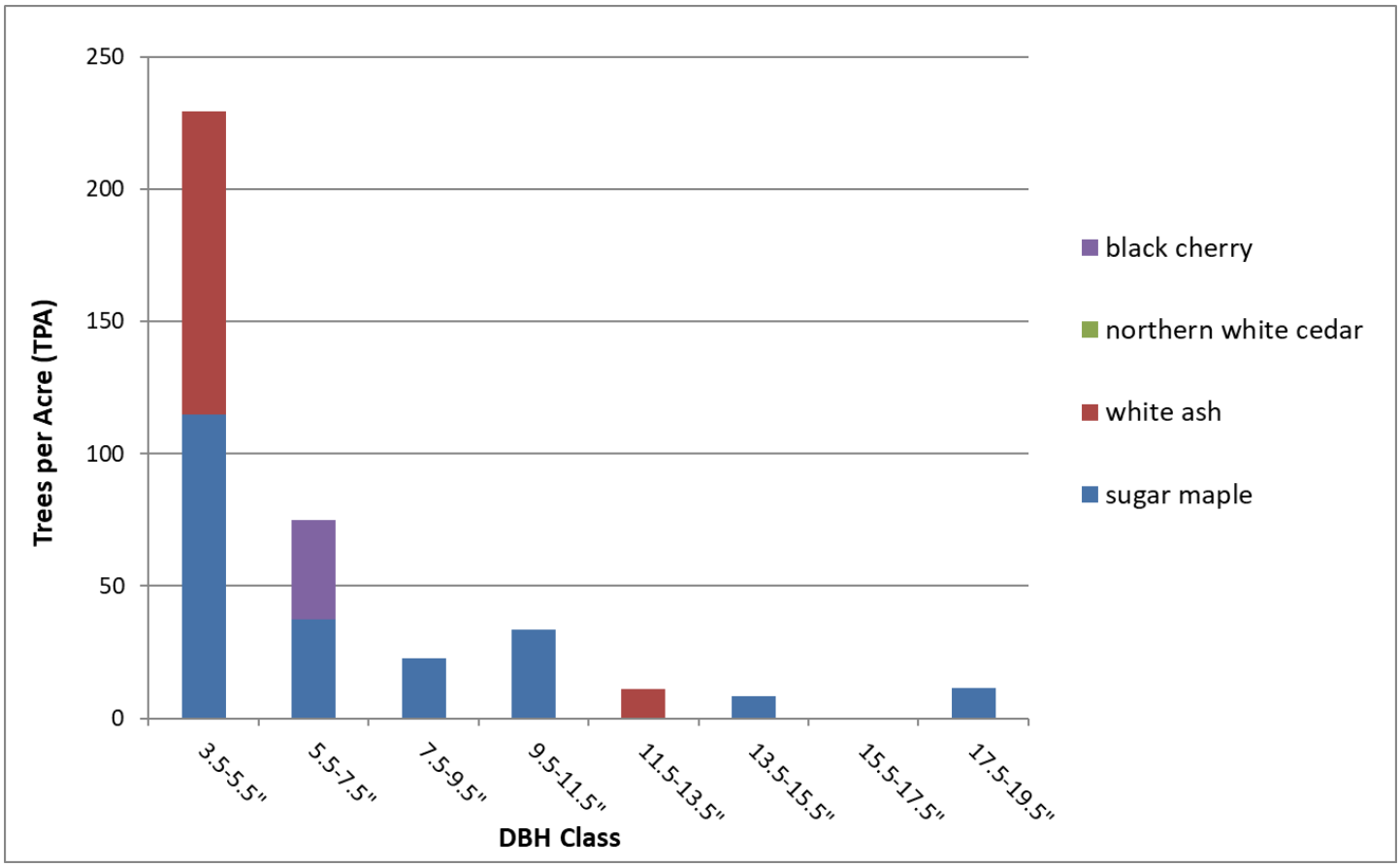
- ~3.5 acres between the golf course and Hardwick St, mainly sugar maple with scattered black cherry, white ash, balsam fir, cedar, yellow birch and other species. Older trees (almost entirely sugar maple) are 16-20"+ diameter and may have been part of a sugarbush many years ago. The largest roadside trees are up to 40" diameter. Smaller trees (3-6" diameter) likely regenerated in gaps from previous logging or natural disturbance. Most areas have a closed canopy with little undergrowth, although some areas have white ash seedlings, chokecherry, and balsam fir seedlings/saplings.

- ~1.0 acres in a narrow swath between the golf course and the eastern property boundary. This area has a mix of hardwoods, mostly 10-12" diameter sugar maple, white ash, birch and other species.

Age Class Structure: Even aged, estimated at 60-80 years old, with regeneration (10-20 years old) and legacy sugar maple (estimated at 100-150+ years old)

SILVICULTURAL DATA

Sampling Method: Variable radius plots (BAF 20, all stems >/=4"dbh)
Sampling Date: July 2024
Number of Plots: 2 (1 plot per 2.3 acres)
For all live intermediate-dominant trees >3.5"dbh:
Total BA: 110 ft^2/acre **AGS BA:** 70 ft^2/acre (64%)
Total TPA: 391 trees/acre **AGS TPA:** 116 trees/acre (30%)
Quadratic Mean Stand Diameter: 7.2"
Stocking Level – 91% canopy closure. Fully stocked, near A-line on northern hardwood stocking chart (Leak et al 2014)



Group	Species	% of Total Basal Area	Sawlog (bf/ac)	Pulpwood (cords/ac)	Total (cords/ac)
Hardwood	*sugar maple (Acer saccharum)*	*72.7*	*3,097*	*17.0*	*23.0*
	white ash (Fraxinus americana)	*18.2*	*1,089*	*1.0*	*4.0*
	black cherry (Prunus serotina)	*9.1*	*0*	*2.0*	*2.0*
	Hardwood Total	***100.0***	***4,186***	***20.0***	***29.0***
Softwood	***Softwood Total***	***0.0***	***0***	***0.0***	***0.0***
Grand Total		***100.0***	***4,186***	***20.0***	***29.0***

REGENERATION

Sampling Method: subjective observation
Number of Plots: --
Seedling Density: sparse, with occasional patches of white ash, balsam fir up to ~1-3,000 stems/ac (estimated)
Sapling Density: sparse, with patchy large saplings (3-4" sugar maple, white ash and occasional beech) established in older canopy gaps
Primary species: white ash, sugar maple, balsam fir

CURRENT AND DESIRED FUTURE STAND CONDITION

Long Range Silvicultural Objectives: Uneven-aged or irregular age class structure with a mix of site-appropriate native species including sugar maple, white ash, basswood, yellow birch, northern white cedar, red maple, black cherry and other species. Management should favor high-quality stems and healthy trees, while also retaining standing dead trees for wildlife habitat.

Cutting Cycle: 20 years (extended to allow for slower growing species and small acreage)

Diameter Objectives for Principle Species:

16-20" – black cherry

20-30"+ – sugar maple, white ash (may retain trees beyond economic maturity for large-tree wildlife habitat)

PLANNED TREATMENTS

No commercial timber harvesting is recommended in the next 10 years. The largest trees in this stand provide ecologically valuable "old forest" function and should be retained. Other areas are adequately stocked for continued growth.

Other Optional Management

Crop Tree Release (CTR) may be done where high-quality trees and trees of desirable species are crowded by dense canopy cover around them. In Stand 2, this includes areas with 6-10" diameter sugar maple, white ash, black cherry and cedar. This work is likely to be non-commercial or may harvest small volumes of firewood (up to ~1-3 cords). All species should be retained, making sure not to reduce species diversity even if that means retaining some lower-quality cherry and ash trees. In general, trees should be selected to retain the highest quality trees, and to prevent damage to these trees.

Recreational trails through this area may be maintained or improved, possibly connecting with a winter trail network that would be primarily in Forest Stand 1, described earlier in this plan.

WHITE PINES *(FOREST STAND 3)*

Acres (mapped): 2.0
Acres (pro-rated): 1.9

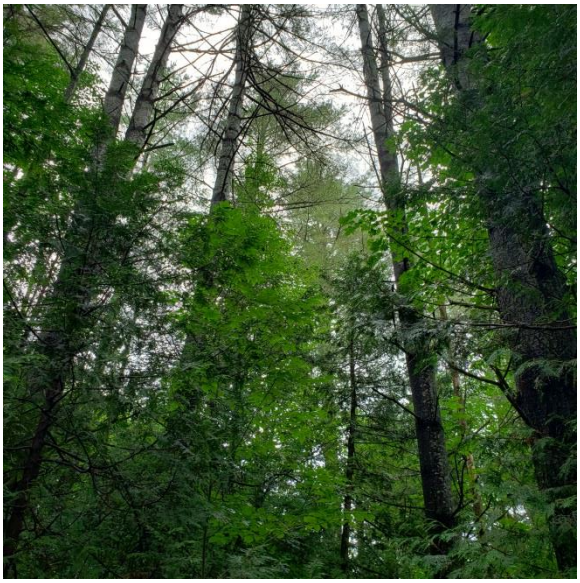
Natural Community Type(s):
Northern Hardwood Forest
Possible White Pine-Northern Hardwood Forest or other variant. It is unclear whether white pine is an artifact of past agriculture, or if it will persist as a species in this forest

Description
Forest Stand 3 is a narrow strip of forest along the southeastern property boundary, mostly forested with 14-18" diameter white pines. Although the neighboring parcel is also forested (young hardwoods, with partial logging in past years).

Where pines have declined and occasionally been felled in the past ~10-20 years (dying/hazard trees near the golf course), canopy gaps are regenerating with 10-20 foot tall, 1-4" diameter sugar maple, red maple, white ash and balsam fir.

Understory plants include Canada mayflower, sedges, and occasional other herbaceous plants.

A small section of this stand has dense cedar, with some white spruce.

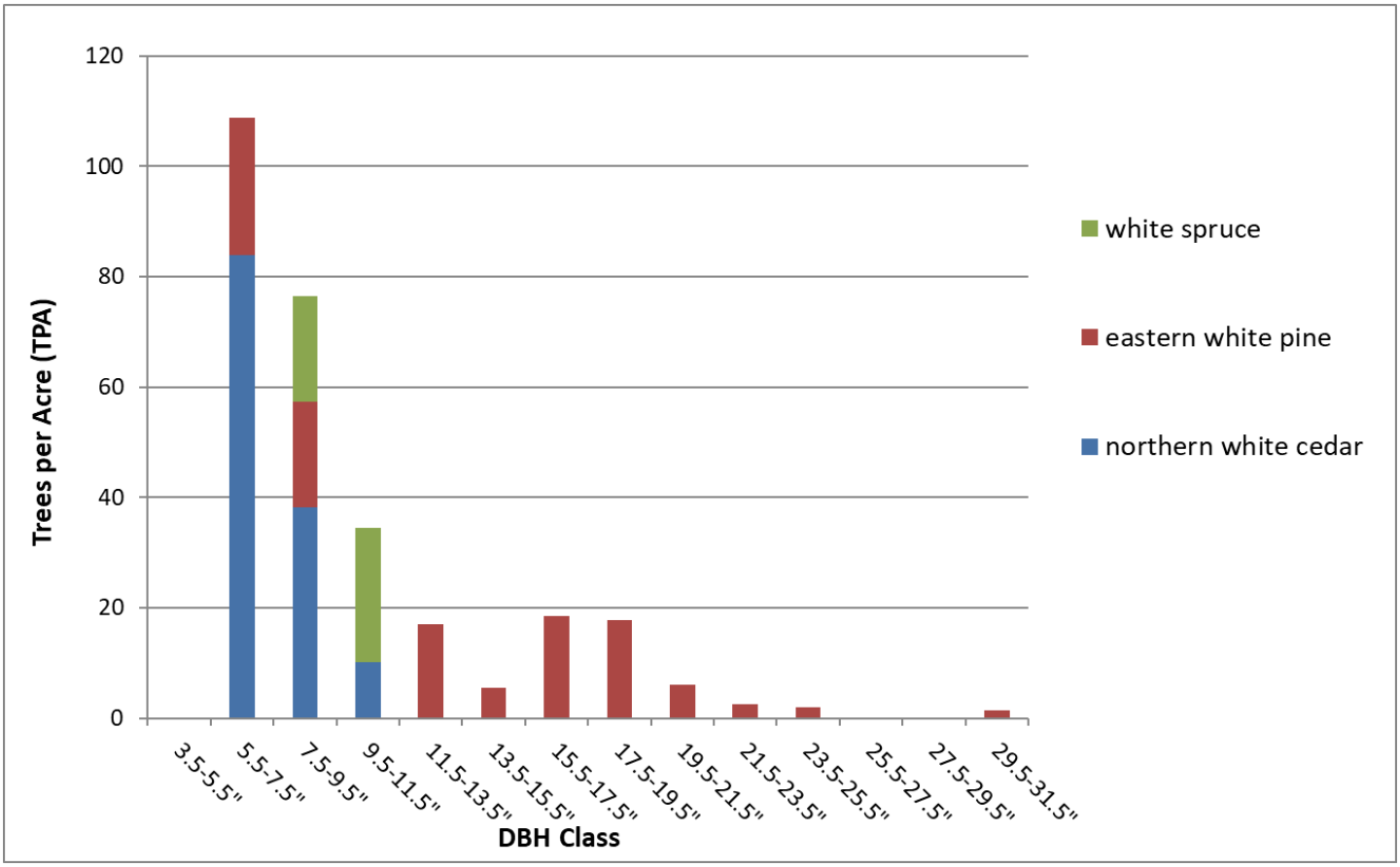


Fallen white pines have created abundant deadwood on the forest floor in some spots, including large-diameter logs that create valuable wildlife habitat and help stabilize soil on steep slopes.

Age Class Structure: Even aged, estimated at 60-80 years old, with regeneration (10-20 years old)

SILVICULTURAL DATA

Sampling Method: Variable radius plots (BAF 20, all stems >/=4"dbh)
Sampling Date: July 2024
Number of Plots: 3 (1 plot per 0.7 acres)
For all live intermediate-dominant trees >3.5"dbh:
Total BA: 187 ft^2/acre **AGS BA:** 140 ft^2/acre (75%)
Total TPA: 290 trees/acre **AGS TPA:** 167 trees/acre (58%)
Quadratic Mean Stand Diameter: 10.9"
Stocking Level – 74% canopy closure. Adequately stocked, between A- and B-line on white pine stocking chart (Leak & Lamson 1999)



Group	Species	% of Total Basal Area	Sawlog (bf/ac)	Pulpwood (cords/ac)	Total (cords/ac)
Hardwood	***Hardwood Total***	***0.0***	***0***	***0.0***	***0.0***
Softwood	*eastern white pine (Pinus strobus)*	*67.9*	*14,807*	*19.0*	*47.0*
	northern white cedar (Thuja occidentali	*21.4*	*517*	*8.0*	*9.0*
	white spruce (Picea glauca)	*10.7*	*1,003*	*5.0*	*7.0*
	Softwood Total	***100.0***	***16,327***	***32.0***	***63.0***
Grand Total		***100.0***	***16,327***	***32.0***	***63.0***

REGENERATION

Sampling Method: subjective observation
Number of Plots: --
Seedling Density: sparse
Sapling Density: variable, with little to no regeneration under closed-canopy pines, and 1-3,000 stems/ac (estimated) in canopy gaps
Primary species: red maple, sugar maple, white ash, balsam fir

CURRENT AND DESIRED FUTURE STAND CONDITION

Long Range Silvicultural Objectives: Uneven-aged or irregular age class structure with a mix of site-appropriate native species including white pine, sugar maple, white ash, yellow birch, northern white cedar, red maple, black cherry and other species. Management should favor high-quality stems and healthy trees, while also retaining standing dead trees for wildlife habitat.
Cutting Cycle: 20 years (extended to allow for regeneration of hardwoods and small acreage)
Diameter Objectives for Principle Species:

12-16" – white spruce
16-20" – cedar
20-30"+ – white pine (may retain trees beyond economic maturity for large-tree wildlife habitat)

PLANNED TREATMENTS

Small Group Selection Harvest (2025-27)

One or two small group selections could be harvested in Stand 3. These harvest areas should remove overstory pines to create canopy openings ~0.1 to 0.2 acres in size, located to release advance regeneration of sugar maple, red maple, white ash and other species. Lower-quality and low-vigor pines should be harvested, whereas the healthiest, high quality pines should be retained. Total harvest are should be ~0.2-0.4 ac (~10-20% of the stand).

This harvest is estimated to yield ~3-6 MBF white pine sawlogs and ~6-12 cords of softwood pulp. These are very rough estimates; actual product will vary depending on trees marked for harvest and loggers' utilization.

Income from timber harvests is highly variable, depending on logging operational costs and markets at the time of harvest. As a rough estimate of income using 2023 stumpage prices (VT FPR), this harvest could generate ~$380-$760 of income for MVCC, although actual stumpage is likely to be lower due to small scale, and forestry consulting fees (estimated at ~$350-400) would be deducted from stumpage. So, this harvest is likely to generate no net income for the club, or may cost more than products harvested. These cost estimates are NOT final, and should be negotiated with the logger and forester when harvest is contracted.

Property boundaries should be marked accurately prior to harvesting.

Due to the small volume harvested, this may not be commercially viable for a logger, or may not generate much/any income for the club. Although this logging would not generate significant revenue, it would benefit the health and diversity of the forest, while reducing the risk of the entire pine stand declining at the same time in the future.

If logging operations would cost significantly more than product sales (ie the club would have to pay a logger to do the work), this harvesting may be delayed. If that is the case, individual declining/hazard trees may be felled periodically to release regeneration similar to the approach described above. This would likely create smaller gaps (~0.05 ac) over a few years and may not effectively release regeneration.

Other Optional Management

Wall lettuce, a watchlist invasive plant, may be pulled and/or monitored for further spread, as described earlier in this plan.

YOUNG HARDWOODS/MIXED FOREST *(FOREST STAND 4)*

Acres (mapped): 2.3
Acres (pro-rated): 2.2

NED Cover Type(s):
n/a

Natural Community Type(s):
Northern Hardwood Forest
Possible seepage forest or other variants. Powerline clearing and edge effects have significantly altered natural communities

Description
Two small, forested areas near roads/powerlines are distinguished by their relatively young growth (mostly 2-4" diameter trees/shrubs with scattered residual larger trees). Species include balsam fir, striped maple, gray birch, red maple, quaking aspen, yellow birch, cedar and other species. Residual older 10-15" trees include red maple, yellow birch, black cherry, white ash, white spruce and other species. Wetter soils near Hardwick St have more shrub willow and balsam poplar.

These areas are not well suited to active forestry (future logging) due to small areas, edge effects, wet soils and low quality trees. Future management should focus on retaining forest cover for aesthetic buffers along roads and wildlife values.

Age Class Structure: Even-aged, estimated at 20-40 years old

SILVICULTURAL DATA

No overstory inventory data collected due to small and variable forested areas, and predominantly sapling-sized trees

REGENERATION

Sampling Method: subjective observation
Number of Plots: --
Seedling Density: sparse
Sapling Density: dense, estimated 2-5,000 stems/ac (main cohort)
Primary species: balsam fir, striped maple, gray birch, red maple, quaking aspen, yellow birch, cedar

CURRENT AND DESIRED FUTURE STAND CONDITION

Long Range Silvicultural Objectives: Irregular forest structure with varying ages, sizes and species of trees. Passive forest management, allowing natural growth/decline of trees, with options for promoting some trees/species for aesthetics and wildlife values (crop tree release) and hazard tree removal near buildings, roads and powerlines

Cutting Cycle: n/a

Diameter Objectives for Principle Species: n/a

PLANNED TREATMENTS

No commercial timber harvesting is recommended in the next 10 years. This stand is not well suited to timber management, and no over-mature hazard trees were observed while preparing this plan.

Other Optional Management

Crop Tree Release could be done to promote individual trees with aesthetic and wildlife values. This should favor long-lived, site-appropriate species, especially those that are likely to adapt well in a future climate. Species should also be tolerant of the wet soils and shallow hardpan found in much of this stand. Red maple, yellow birch and red spruce may grow well here. Sugar maple and basswood may grow well in better soils. Early-successional species including paper birch and aspen may be released, realizing that they are shorter-lived but may still provide an aesthetically appealing forest for the next few decades.

ORCHARD, MEADOWS AND SHRUBLAND *(OPEN LAND)*

Acres (mapped): 7.2
Acres (pro-rated): 7.0

Description
These areas are not forested, but have shrub/open conditions that can be managed in a "natural" condition for wildlife habitat and other values. Conditions vary and several different areas were mapped throughout the MVCC parcel:

- An open log landing in the wooded area of Forest Stand 1. This appears to have been open and stumped prior to the 2022-23 logging, likely used as a stump-dump or other landscaping purposes. The recent logging expanded this canopy opening to ~0.5 acres. This area has grown in with raspberries, blackberries and old-field herbaceous plants (grasses, dock, etc). Coltsfoot, a watchlist species, was found in this area.
- Powerlines near Breezy Ave and Hardwick St are maintained with a ~30-40' wide open corridor. These areas have varying amounts of shrubby/herbaceous regrowth and are cleared periodically by utility companies.
- An area of old apple apple orchard and unmaintained meadow along Hardwick St, adjacent and interspersed with Forest Stand 2.
- Unmaintained grassy/shrubby areas along the edge of the golf course, mainly in the northern part of the parcel near the clubhouse. This area has several patches of invasive Asiatic bittersweet, described earlier in this plan.

Management Considerations
These areas can provide useful habitat for pollinators, birds and other wildlife. ***Leaving these areas un-mowed, or mowing every 1-3 years in the late-summer/fall***, allows wildflowers and other plants to produce flowers and seed.

Invasive plant control is highly recommended, as described earlier in this plan. Species of concern include Asiatic bittersweet (highest concern), shrub honeysuckle (moderate concern) and buckthorn (removed, monitor for additional plants). These areas are likely to have new invasives establish, and annual monitoring is recommended to find new invasives when they establish.

Reforestation tree planting could be done to reforest any areas,

and could be done to meet UVA eligibility requirements described earlier in this plan. To be eligible for UVA in the future, a minimum of 1.8 acres of open land would need to be planted with commercial tree species. UVA eligibility requires a minimum of 350 trees/acre; since most tree plantings have significant mortality, planting 400-450+ trees/ac is recommended. Protection from deer browse and control of competing vegetation (mowing or herbicide spot treatments) may be needed to establish planted trees. Recommended species are those that can tolerate field competition including white pine, red spruce and cedar. Other native, site-appropriate species may be planted as well including red maple, sugar maple, yellow birch and others. Future adapted species including black birch, red oak and/or shagbark hickory may be planted as well.

MANAGEMENT SCHEDULE (2024-2034)

Year	Stand	Recommended Management	Acres	*Other Optional Work*
2024	Open Land	Invasive Plant Control*	~0.1 (bittersweet) and scattered honeysuckle/buckthorn	
2025-2033 (annual)	Open Land	Invasive Plant Control – follow up*	~0.1 (bittersweet); monitor for other invasives throughout	
2025-2027	3	Group Selection Harvest	~0.2-0.4 ac (harvest areas)	
Any Year(s)	1	--	--	*-Crop Tree Release* *-Watchlist plant control (wall lettuce, coltsfoot)* *-Trail maintenance* *-Establish winter trails*
	2	--	--	*-Crop Tree Release* *-Trail maintenance* *-Establish winter trails*
	3	--	--	*-Watchlist plant control (wall lettuce)*
	4	--	--	*-Crop Tree Release*
	Open Land	--	--	*-Monitor and control invasive plants* *-Late-summer/fall mowing to maintain meadow habitat* *-Reforestation planting to meet UVA eligibility requirements (1.8 ac at 350+ stems/ac)*
2034*	All	10-Year Forest Management Plan Update	26.9 ac (forest/open land)	

**These management projects may be eligible for cost-share funding from the Natural Resources Conservation Service (NRCS). To apply for funding, contact the Newport, VT NRCS Field Office at (802)334-6090*

OPTIONAL REFORESTATION TREE PLANTING* (2024-2034)

See footnotes on next page

Year	Planting Location	Quantity and Species	Bare Root Tree Cost**	Deer Protection Material Cost***	Labor Cost**	Total Cost**
2025	FS 1 - canopy gaps from recent logging (~0.3 acres)	10 sugar maple 10 red spruce 10 American basswood 10 northern red oak 10 black birch 10 shagbark hickory *60 trees total*	$300-$600	$840	$900	$2,040-$2,340
2028	FS 3 – post-harvest planting in group selection areas (~0.2 ac without natural regeneration)	15 northern white cedar 15 red spruce 15 northern red oak 15 sugar maple 15 yellow birch 15 white pine *90 trees total*	$450-$900	$1,260	$1,350	$3,060-$3,510
2031	FS 1,3 – additional planting to supplement regeneration in gaps	15 sugar maple 15 red spruce 15 American basswood 15 northern red oak 15 black birch 15 shagbark hickory *90 trees total*	$450-$900	$1,260	$1,350	$3,060-$3,510
Any year(s)	Open Land – reforestation for UVA eligibility (minimum 1.7 ac prorated)	150 northern white cedar 150 red spruce 150 sugar maple 150 red maple 50 black cherry 50 yellow birch *750 trees total. Survival of 350+ stems/a of commercial tree species required for UVA. Planting quantity allows for 20% mortality.*	$3,750-$7,500	$10,500	$11,250	$25,500 - $29,250
2034	*Evaluate survival of tree planting in next forest management plan to create ongoing planting schedule*					

**This table includes tree planting only in forested, regenerating areas. It does not include landscaped areas within the golf course. Reforestation tree planting is intended to supplement existing natural regeneration by increasing species diversity and adding future climate adapted species.*

***Material and labor costs are approximate, based on 2024 pricing. Pricing is based on 3-5 foot tall bare root trees sourced from northeastern tree nurseries. Labor includes planting, watering and installing deer protection cages. Pricing may vary substantially with different tree nurseries and/or planting contractors. These projects may be undertaken by MVCC staff and/or volunteers. Planting smaller trees (1-3 foot tall) could substantially reduce cost with the tradeoff of likely lower survival rates.*

****Deer protection is optional and is recommended to increase survival. Materials include grade stakes, hardware cloth (wire mesh) and fasteners, used to build cages around trees to protect from deer browse until trees are above browse height (6-8 feet tall). Cages must be maintained by removing grass inside the cages that could retain moisture and cause rot, and should be removed entirely when trees are above browse height. Labor for maintenance and removal after installation is NOT included in cost estimate.*

APPENDIX A: METHODS

The field survey for this plan was completed in July 2024 by Sam Perron of the NorthWoods Stewardship Center.

Property boundary mapping and stand delineation were done in ArcGIS, using tax map parcels as for initial drafts and revising boundaries/stands based on field mapping with GPS.

Plots locations were randomly selected in ArcGIS and located in the field using a Garmin 76Csx GPS unit. Stand boundaries were later adjusted based on fieldwork findings.

Variable radius sampling was conducted at each plot using a 20 BAF angle gauge, recording all "in" trees (including snags) >/=4"dbh. Diameters were measured in 1-inch size classes using a Biltmore stick. Tree species, acceptability, canopy position, timber product and health notes were recorded.

Other general information gathered throughout the stand included forest health issues, cultural features, surface waters, special habitat features, soil and bedrock, past land-use, wildlife evidence, and plant species. Digital photographs were taken at representative locations. Data were processed using Microsoft Excel and NED-2 forestry software.

In drafting the management plan and maps, GIS layers acquired from the Vermont Center for Geographic Information were also used, including aerial imagery, bedrock, surficial geology, E911 roads, surface waters, Vermont Significant Wetland Inventory, Orleans County soils (NRCS), landcover types, deer wintering areas, VT RT&E species and natural communities, 20-foot contours, and core habitat.

APPENDIX B: NOTES ON STAND DESCRIPTION CATEGORIES

Acres (mapped) - acreage as measured in ArcGIS

Acres (pro-rated) – mapped acreage adjusted such that total parcel acreage matches town tax assessor's listed acreage

NED Cover Type - Tree associations as determined by NED-2 forestry software based on overstory inventory data.

Age Class Structure - Even or Two-aged = two or less distinct classes of trees separated by no more than 20% of the stand rotation age, Uneven= at least three distinct classes of trees separated by at least 25 years in age.

Site Class - Site class is a broad designation of forest productivity based on annual volume production, site index and/or other factors. In most cases, site class was determined using site index predictions for soil types, which were compared to a site class table available in the Current Use program manual.

Soils: Soil descriptions are based on mapping completed by the Natural Resource Conservation Service (NRCS), obtained from the web-based soil survey (http://www.soils.usda.gov/survey/) or from staff at Vermont's NRCS county offices.

Stocking Level: A measure of stand density relative to a desirable goal. Stocking is based on Basal Area, Trees Per Acre and mean tree diameter, plotted on a chart specific to forest type. Stands falling above the A-line on these charts are considered overstocked and in need of thinning to achieve maximum tree growth and development. Stands between the A and B line are considered well stocked, while those below the C-line are understocked.

Basal Area (BA): The cross-sectional surface area (basal area) of all trees at 4'6" high on the trunk (units are square feet per acre).

AGS BA: Acceptable Growing Stock refers in this plan to all healthy stems that are capable of eventually producing a minimum of one 12-foot sawlog or two 8-foot sawlogs. AGS BA per acre is given in square feet (along with the percent of total basal area that AGS represents).

Quadratic Mean Stand Diameter: The diameter of the tree of average basal area in the stand.

Diameter at Breast Height (DBH): measurement of a tree's diameter at 4.5 feet above ground

APPENDIX C: SILVICULTURAL TERMS

Crop Tree Release (CTR): An intermediate treatment where individual high-quality residual trees are identified and competing trees are removed on 1 to 4 sides (harvested, felled and left in place, or girdled). Crop Trees are typically selected based for desirable timber species, minimal timber defect and future growth potential (most beneficial when applied in pole-sized stands). Crop Tree Release differs from Crown Thinning in that removal of competing trees focuses on releasing specific, scattered crop trees rather than reducing basal area over an entire area.

Crown Thinning: An intermediate treatment in which some trees are removed from part or all of a stand, allowing more growing space (physical space and access to light, water and/or nutrients) for residual trees. Residual trees should be of a desirable species, have good form (or other non-timber value, such as wildlife structure or mast production), and exhibit good vigor (ideally with >25-30% live crown and minimal branch dieback). Crown Thinning is considered "Commercial" if timber products are harvested and sold/used, or "Pre-Commercial" if thinned trees left in place (see Pre-Commercial Thinning).

Variations on Crown Thinning:

- Thinning from below- removal of suppressed, intermediate, or trees of smaller diameter until desired basal area is achieved
- Variable Density Thinning- similar goals to Crown Thinning, but where distribution of residual trees is patchy. Typically intended to generate understory vegetation response in more heavily thinned areas, creating more diverse vertical structure; may also be applied in stands where quality of growing stock is patchy or variable.

Group Selection: A Regeneration Treatment for establishing or maintaining uneven age class structure, in which all trees are removed from "group" areas of up to 2 acres in size. Several separate groups may be harvested in a stand during each entry, with the stand being regenerated incrementally over the rotation period. Group Selections smaller than $1/4^{th}$ acre promote more shade tolerant species, while larger group selections promote more mid-tolerant species.

Related terms:

- Rotation- the length of time taken to regenerate an entire stand, typically 50-150 years.
- Cutting Cycle- the time between harvesting entries, typically 5-20 years (number of cohorts, or age classes, can be estimated by dividing Rotation by Cutting cycle).

Intermediate Treatment: Any of the strategies used during a stand rotation to improve growing stock, reduce competition or otherwise alter stand dynamics without establishing a new cohort of trees. Specific techniques include Pre-Commercial Thinning, Crown Thinning, and Crop Tree Release.

Irregular Shelterwood: A group of Regeneration Treatments in which overstory cover is maintained in regenerating areas for longer than 20% of rotation length, leading to multiple age classes and diverse structure.

Types of Irregular Shelterwoods (as described by Vermont UVA Program):

- Expanding Gap Irregular Shelterwood- first entry establishes Group Selections, which are expanded incrementally in subsequent entries until the entire stand is harvested. Edge shade diversifies structure/age classes more than a traditional Group Selection system.
- Extended Irregular Shelterwood- similar to even-aged shelterwood systems where regeneration is established under a sparse overstory, but overstory shade trees are retained through more than 20% of the rotation (rather than ~10% in even-aged shelterwoods).

- Continuous Cover Irregular Shelterwood- regeneration occurs constantly as overstory trees are thinned/removed.

Mast Tree Release: Application of Crop Tree Release principles to enhance wildlife habitat, where retention trees are chosen for mast-producing value rather than timber quality. Regionally preferred species include American beech, black cherry, butternut, sugar maple and yellow birch.

Pre-Commercial Thinning: Application of Crown Thinning principles where removed trees are unmerchantable due to size or quality. Typically used in small-diameter stands to promote desirable tree species and/or well-formed individuals. Also referred to as TSI (Timber Stand Improvement).

Regneration Treatment: Silvicultural treatments in which overstory trees are removed to release existing regeneration (advance regeneration) or provide an area for new seedlings to germinate. Although regeneration may respond incidentally to Intermediate Silvicultural Treatments, Regeneration Treatments are specifically intended to establish a new cohort (age class of trees). Prescribed treatments may include Single Tree Selections, Group Selections, a Shelterwood, an Irregular Shelterwood (various methods), or Clearcuttting. Planting or site preparation (scarification, etc.) may also be prescribed as part of a Regeneration Treatment.

Single Tree Selection: A Regeneration Treatment for establishing or maintaining uneven age class structure, in which single large trees are harvested throughout a stand, creating openings in the forest canopy where regeneration can establish. Similar to Group Selections except that smaller canopy gaps favor more shade-tolerant species. See Group Selection definition for related terms.

APPENDIX D: SOURCES USED

Leak et al. 2014. *Silvicultural Guide for Northern Hardwood Types in the Northeast* (revised). USDA-USFS-NA-FES. Leak, Yamasaki, Holleran. General Technical Report NRS-132.

Natural Resources Conservation Service, United States Department of Agriculture. *Soil Fact Sheet* (various soil types). 2005.

Robinett, Molly and Deborah G McCullough. Michigan State University. 2018. *White ash (Fraxinus Americana) survival in the core of the emerald ash borer (Agrilus planipennis) invasion*. Canadian Journal of Forest Research 49:510-520.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. *Web Soil Survey*. Available online at http://websoilsurvey.nrcs.usda.gov/.

Sorenson, Eric and Robert Zaino. 2018. *Vermont Conservation Design: Maintaining and Enhancing an Ecologically Functional Landscape.* Vermont Fish & Wildlife Department and Vermont Agency of Natural Resources. Available online at https://vtfishandwildlife.com/node/201.

Thompson, Elizabeth H., Eric Sorenson and Robert Zaino. 2019. *Wetland, Woodland, Wildland- A Guide to the Natural Communities of Vermont; Expanded Second Edition.* Chelsea Green Publishing, White River Junction VT.

Vermont Agency of Natural Resources. 2015. *Riparian Management Guidelines for Agency of Natural Resources Lands*. Available online at http://fpr.vermont.gov/about_us/rules_regulations.

Vermont Center for Geographic Information. *Vermont Open Geodata Portal*. 2024. *[various data downloaded for mapping]* Available online at http://geodata.vermont.gov/.

Forest Management Map

for the

Mountain View Country Club

located in

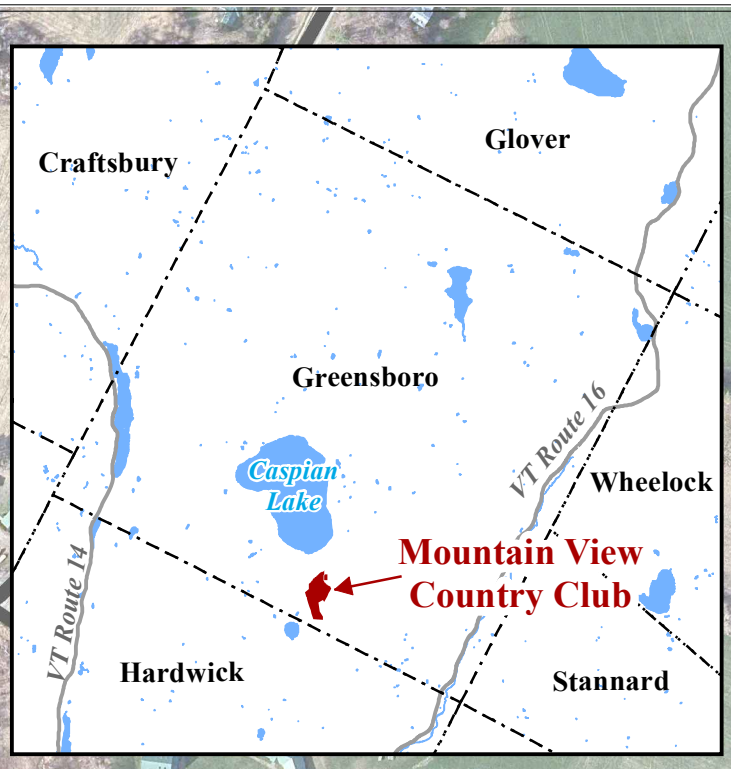
Greensboro, VT

SPAN 264-083-10649

Map by: Sam Perron - NorthWoods Stewardship Center

August 2024

NORTHWOODS STEWARDSHIP CENTER



Breezy Ave
FS 4
bittersweet
Open Land
bittersweet
bittersweet
buckthorn & honeysuckle
honeysuckle
9
1
8
FS 1
wall lettuce
7
Open Land
wall lettuce
Open Land
coltsfoot
FS 4
spotted knapweed
2
Country Club Rd
FS 1
wall lettuce
Open Land
FS 2
3
FS 2
Hardwick St
6
FS 3
wall
4
5

Acreage Chart

Grand List Acres	78.3		
Non-forested Acres	52.3		
Forested/Open Land Grand List Acres	26.0		
Forested/Open Land Map Acres	26.9		
Pro-ration factor	0.966543		

Area	Type	Map acres x	Factor =	pro-rated acres
Open Land	meadow, orchard, powerline and shrubland	7.2	0.966543	7.0
Forest Stand 1	softwood/mixed	10.8	0.966543	10.4
Forest Stand 2	northern hardwoods	4.6	0.966543	4.4
Forest Stand 3	white pine	2.0	0.966543	1.9
Forest Stand 4	young hardwood/mixed	2.3	0.966543	2.2
	Forested Subtotal:	***19.7***		***19.0***
	Map Total:	**26.9**	**Grand Total =**	**26.0**

Parcel Boundary
Forest Stand
Powerline
Trail
Invasive Species
Watchlist Species
Wetland
Lakes, Ponds and Streams
VT Significant Wetlands Inventory
Golf Course Holes

Yards
0 50 100 200
N W E S
Scale 1:3,600
VT State Plane NAD 83

Note: this map is not a survey and intended only as a reference for forest management

BITTERSWEET

invasive fact sheet

© Stacey Leicht/IPANE

Asiatic bittersweet invades Vermont's forests and fields. It is **easy to see in the fall** when its red and yellow fruit lines its vines.

Recognize Asiatic bittersweet

© John Randall/The Nature Conservancy

light green, alternate leaves that spiral around stem

woody stem

fruit: yellow outer cover with inner red flesh

© Leslie Mehrhoff/IPANE

DID YOU KNOW?

The leaf shape and fruit color of Asiatic bittersweet (*Celastrus orbiculatus*) have a very similar appearance to the native Vermont vine, American bittersweet (*Celastrus scandens*). The best way to distinguish between the two plants is by the location of the flowers and fruits on the stem. On the invasive Asiatic bittersweet, they are scattered along the entire stem (above), while on the native American bittersweet, they are found at the terminal end of each stem (below).

Asiatic bittersweet

American bittersweet

Photos © IPANE

BITTERSWEET

Remove

Mechanical control:

For small plants: Hand pull entire plants, including all roots and runners. Place everything into a plastic bag for disposal.

For large plants: Cut climbing or trailing vines close to root collar. Repeat every two weeks.

Chemical control:

Foliar spray: This method is best used for dense populations. In the fall, when native plants are losing their leaves, spray a 2% glyphosate or triclopyr solution on the entire leaf surface of the plant. In order to avoid drift to native plants, spray on calm days.

Cut stump: Cut plant 4 inches from ground in fall. Treat stumps with a triclopyr herbicide. Glyphosate-based products are not strong enough for this plant.

Safe Chemical Application

- √ ***Develop an Integrated Plant Management approach.*** Use chemical control as only ONE piece of your prevention and management strategy.
- √ ***The label found on the herbicide container is the law.*** It indicates the concentrations to use, what protective clothing to wear, how to apply the product, and what environmental and human health hazards are associated with the chemical.
- √ ***Use aquatic formulations within 10 feet of water.*** You need a permit to apply herbicides in wetlands. Do not apply herbicides within 100 feet of a wellhead. Contact VT DEC at 802-241-3761.
- √ ***You need to be certified to apply herbicides on land that you do not own.***
- √ ***Hire a contractor to manage large infestations.*** A good contractor will have the knowledge to help create an effective management plan. For a list of certified contractors, contact the VT Department of Agriculture at 802-828-3482.

DO NOT COMPOST THIS PLANT! Plant fragments can re-sprout.

Replant

Non-invasive Alternatives

© Joseph A. Marcus/Lady Bird Johnson Wildflower Center

trumpet vine
Campsis radicans

© Joseph A. Marcus/Lady Bird Johnson Wildflower Center

Virginia creeper
Parthenocissus quinquefolia

trumpet honeysuckle
Lonicera sempervirens

© Joseph A. Marcus/Lady Bird Johnson Wildflower Center

American bittersweet
Celastrus scandens

© Native Plant Nursery/nativeplant.com

Wise On Weeds!

The Nature Conservancy, Montpelier, Vermont
802-229-4425 x120
www.vtinvasives.org

The Nature Conservancy
Protecting nature. Preserving life.™

Asiatic or Oriental Bittersweet, *Celastrus orbiculatus*

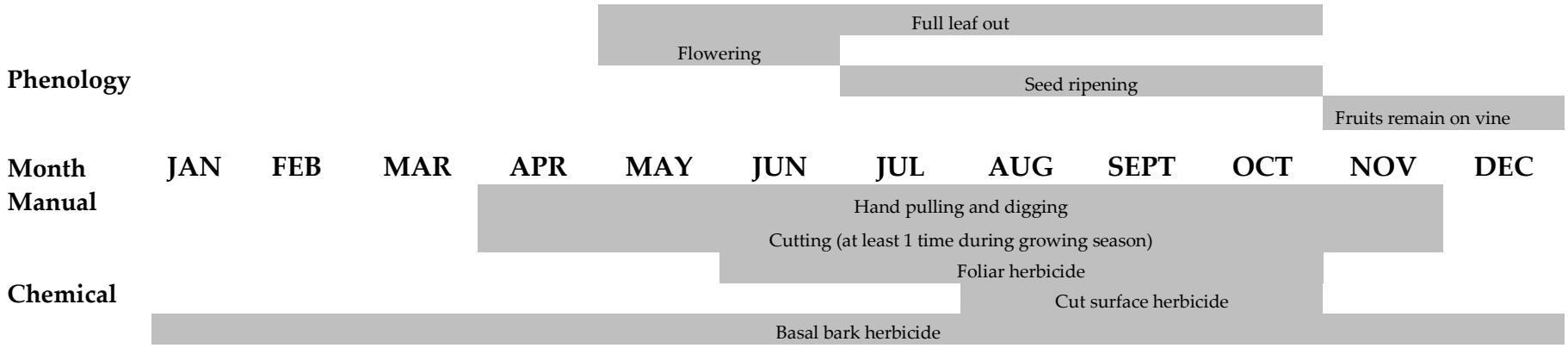
Species Biology and Phenology:

Habitat: Asiatic bittersweet is a cold hardy, deciduous vine. It prefers open woods and disturbed areas. It grows best in partial to full sun, and is shade and flood. It is an aggressive vine that can that can grow rapidly, sometimes greater than 10 feet/year, on vertical structures of various diameters.

Reproductive Strategy: Oriental bittersweet primarily reproduces by seed but can also reproduce asexually (runners, roots, root fragments and root crown can all sprout). Plants are dioecious meaning that male and female flowers exist on separate plants. Insects, primarily bees, and wind pollinate the flowers. Flowers bloom May through June and then fruits are produced in July and October. A plant typically produces >350 fruits and each fruit contains between 3-6 seeds. The seeds have a high germination rate (90%) and remain viable for less than one year. Fruits remain on vine well into the winter.

Dispersal: Asiatic bittersweet's seeds are primarily dispersed by birds and mammals. Humans contribute to the plants seed dispersal by using the plant in wreaths. The seeds can also be moved by water.

Species Phenology and Treatment Options:



Treatment Methods:

Category	Method	Method Description	Considerations
MANUAL	Manual treatment can be moderately effective for treatment of Asiatic bittersweet.		
	Hand Pulling	• Pull entire plant by the base of the stem • Be sure to remove entire root system and runners, otherwise they will resprout • If feasible and fruit is present, bag and dispose of fruits to prevent seed dispersal • Put all pulled vegetation in plastic garbage bags and let plants fully decompose or dispose of in a landfill	• Effective on small plants before the vine begins to climb • Most effective if done when soil is wet • **Extreme caution needs to be taken to remove all roots and runners. Remaining portions of roots system not removed can resprout aggressively. Roots and runners can be quite extensive and very difficult to pull, especially on larger vines**
	Cutting	• Cut vine with clippers or hand saw • Cut at least 1 time during growing season (mid April-mid October) • Repeat for 3-5 years	• Can be used for larger vines • Cutting will need to be repeated annually for several years
CHEMICAL	Active ingredients commonly used in herbicides: Triclopyr. Glyphosate and imazapyr can be used for foliar applications but are not as effective as triclopyr		
	Foliar Application	*If foliar spraying only:* • Foliar spray when plant is fully leafed out • Spray leaf surfaces with low volume backpack sprayer *If foliar wiping:* • Foliar wipe when plant is fully leafed out • Wear a heavy, chemical resistant rubber glove with a cloth glove over the rubber glove • Apply the herbicide to coat the surface of the leaves	*Low Volume Backpack Sprayer* • Herbicides (active ingredient): tricolpyr with surfactant, glyphosate with surfactant, imazapyr with surfactant • Used to target large, dense infestations of Asiatic bittersweet *Foliar Wipe* • Herbicides (active ingredient): tricolpyr or glyphosate or imazapyr with surfactant • Used for infestations that have desirable, native vegetation that will be damaged by drift of a foliar spray or for small infestations
	Cut Surface	• Cut stems in late summer to early fall • Apply herbicide immediately after cutting the exposed surface using a sponge, brush, hand-held squirt bottle or directly pouring • Apply herbicide to at least the outer 20% of the surface	• Herbicides (active ingredient): tricolpyr with surfactant • Used for large vines and infestations where drift to desirable, native vegetation will be damaged by a foliar application

	Basal Bark	• Us a low pressure, low volume backpack sprayer or hand held squirt bottle • Apply herbicide around the entire circumference of the lower 8-18" of individual stems of the plant and include the root collar • Do not spray to the point of runoff	• Herbicides (active ingredient): triclopyr in an oil or oil-water mixture • Recommended for scattered or light infestations of large vines • Used to target bittersweet plants and minimize drift to desirable species

BUSH HONEYSUCKLE

invasive fact sheet

© Leslie Mehrhoff/IPANE

Bush honeysuckle invades Vermont's forests and fields. It is **easy to see in May and June** when its yellow, white or pink flowers are in bloom.

Recognize bush honeysuckle

© John Randall/The Nature Conservancy

thin-petaled flowers

red fall berries

hollow stem pith

© Gary Fewless/University of Wisconsin-Green Bay

opposite, oval leaves

© John Randall/The Nature Conservancy

The Problem

© James Leupoll/USF&WS

- When songbirds build nests in non-native honeysuckle they suffer a higher predation rate than when their nests are built in native shrubs such as arrowwood (*Viburnum dentatum*). This is because honeysuckle stems are sturdier and closer to the ground — raccoons, skunks and other predators can easily scramble up the stems.
- Forest regeneration is severely impacted by honeysuckle infestations. The shrubs form dense colonies in the understory, outcompeting native shrubs and trees.
- Sunlight can no longer reach the forest floor, reducing the diversity and abundance of native wildflower and fern populations.

Wise On Weeds!

The Nature Conservancy, Montpelier, Vermont
802-229-4425 x120
www.vtinvasives.org

The Nature Conservancy
Protecting nature. Preserving life.™

BUSH HONEYSUCKLE

Remove

Mechanical removal:

Hand pull: Any time of year when the ground is soft, especially after a rain, hand pull small plants by the base of the stem. Be sure to pull up the entire root system. Hang from a branch to prevent re-rooting. For larger plants, use a Weed Wrench™. Continue to monitor the area every year for new seedlings.

Cut stump: Cut plants back in the fall or winter. Wrap a few layers of burlap or thick plastic over the stump and tie tightly with twine or rope. Check covered stumps periodically and cut back any new growth.

Chemical removal:

Cut stump: Cut the plant 4 inches above the ground. Use a drip bottle to apply a 18-21% glyphosate solution to the stump within one hour of cutting. This is best done in late summer through winter when plants are transporting resources to their root systems.

Low volume foliar spray: This method is used for dense populations and best left to a contractor. In the fall, when native plants are losing their leaves, spray a 2% glyphosate or triclopyr solution on the entire leaf surface of the plant. In order to avoid drift to native plants, spray only on calm days.

Safe Chemical Application

- √ ***Develop an Integrated Plant Management approach.*** Use chemical control as only ONE piece of your prevention and management strategy.
- √ ***The label found on the herbicide container is the law.*** It indicates the concentrations to use, what protective clothing to wear, how to apply the product, and what environmental and human health hazards are associated with the chemical.
- √ ***Use aquatic formulations within 10 feet of water.*** You need a permit to apply herbicides in wetlands. You cannot apply herbicides within 100 feet of a wellhead. Contact VT DEC at 802-241-3761 for more information.
- √ ***You need to be certified to apply herbicides on land that you do not own.***
- √ ***Hire a contractor to manage large infestations.*** A good contractor will have the knowledge to help create an effective management plan. For a list of certified contractors, contact the VT Department of Agriculture at 802-828-3482.

Replant

Non-invasive Alternatives

© Mrs. W.D. Barnsford/Lady Bird Johnson Wildflower Center

ninebark
Physocarpus opulifolius

© Stefan Bloodworth/Lady Bird Johnson Wildflower Center

winterberry
Ilex verticillata

black chokeberry
Aronia melanocarpa

© David G. Smith/delawarewildflower.org

Virginia rose
Rosa virginiana

© Albert F.W. Vick, Jr./Lady Bird Johnson Wildflower Center

Wise On Weeds!

The Nature Conservancy, Montpelier, Vermont
802-229-4425 x120
www.vtinvasives.org

The Nature Conservancy
Protecting nature. Preserving life.™

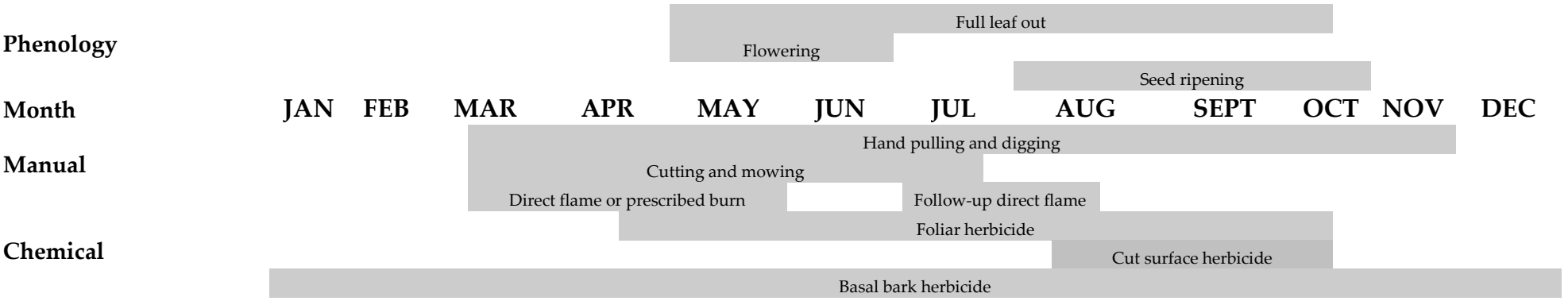
Shrub Honeysuckles

Amur honeysuckle, *Lonicera maackki*
Morrow's honeysuckle, *Loniceria morrowii*
Tartanian honeysuckle, *Lonicera tatarica*
Bell's honeysuckle, *Lonicera x bella*

Species Biology and Phenology:

Habitat: Shrub honeysuckles can be found in forests, abandoned fields, open woodlands, and along roadsides and forest edges. They can also tolerate wet soils and invade places such as bogs, fens and lake shores. They are relatively shade tolerant but are more vigorous in full sun.
Reproductive Strategy: Shrub honeysuckles reproduce mainly by seed but some vegetative re-sprouting can occur in established populations. Plants mature between 3-5 years of age. Each plant produces thousands of berries as fruit, and each fruit contains 2-6 seeds. Seeds can remain viable for 3-5 years.
Dispersal: Seeds are mostly dispersed by birds that eat the berries. Despite providing the bird with feeling full, shrub honeysuckle berries provide little to no nutritional value for birds.

Species Phenology and Treatment Options:



Summary of Treatment Methods:

Category	Method	Method Description	Considerations
MANUAL	Manual treatment can be highly effective for honeysuckle		
	Hand Pulling	• Pull entire plant by the base of the stem • Be sure to remove entire root system • If feasible and fruit is present, bag and dispose of fruits to prevent seed dispersal • Dry or burn all vegetation (most importantly roots) by hanging upside down on surrounding vegetation or piling into a brush pile and burning	• Effective on small-medium sized plants and small infestations • Most effective if done when soil is wet • Remaining portions of roots system not removed can re-sprout • Avoid dragging or piling pulled plants into an area that is currently uninfested
	Weed Wrenching/Honeysuckle Popper	• Remove plant by the base of the stem • Be sure to remove entire root system • If feasible and fruit is present, bag and dispose of fruits to prevent seed dispersal • Dry or burn all vegetation (most importantly roots) by hanging upside down on surrounding vegetation or piling into a brush pile and burning	• Can be more helpful than pulling larger plants
	Mowing/ Cutting	• Use lopper, pruning shears, weed whacker/brush saw or mower to cut the stem as close to the ground as possible • Cut at least 1 times during growing season (mid May-October) • Repeat for 3-5 years	• Cutting/mowing can help slow the spread of honeysuckle • Cutting/mowing will encourage re-sprouting and may need to be conducted for 3-5 years to fully exhaust root system and kill plant • Most effective if followed with foliar herbicide application
	Grazing	Grazing goats or other heard animals might be a viable treatment option. More research is needed.	
	Flame Weeding	Might be a viable treatment option for this plant, especially for young plants or sprouts of cut plants. More research is needed.	
CHEMICAL	Active ingredient commonly used in herbicides: glyphosate or triclopyr		
	Foliar Application	*If foliar spraying only:* • Foliar spray when plant is fully leafed out (May-October) • Spray leaf surfaces with low volume backpack sprayer, or high volume mist blower	*Low Volume Backpack Sprayer* • Herbicides (active ingredient): glyphosate or triclopyr with surfactant • Used to target honeysuckle plants and minimize drift to desirable species

		If cutting and foliar spraying: • Use lopper, pruning shears, weed whacker/brush saw or mower to cut the stem as close to the ground as possible • Cut during early growing season (April and May) • Spray sprouts with a low volume backpack sprayer during late growing season (September and October) or the following year	*Low Volume Motorized Mist Blower* • Herbicides (active ingredient): glyphosate or triclopyr with surfactant • Used for very larger and dense infestations that have little desirable, native vegetation that will be damaged by drift
	Cut Stump	• Cut stems 2-4" above the ground in late summer to early fall • Apply herbicide immediately after cutting the exposed surface using a sponge, brush, hand-held squirt bottle or directly pouring • Apply herbicide to at least the outer 20% of the surface • Monitor and do follow up treatment the following year and as necessary	• Herbicides (active ingredient): glyphosate or triclopyr mixed with surfactant
	Basal Bark	• Us a low pressure, low volume backpack sprayer • Apply herbicide around the entire circumference of the lower 8-18" of individual stems of the plant and include the root collar • Larger stems require the larger (18") treated area • Do not spray to the point of runoff	• Herbicides (active ingredient): triclopyr in an oil or oil-water mixture • Recommended for scattered or light infestations of large plants • Used to target honeysuckle plants and minimize drift to desirable species
	Cut Surface	• Cut stems 2-4" above the ground • Apply herbicide up to one month following cutting using a sprayer, hand-held squirt bottle or directly pouring • Apply herbicide around the entire circumference of the cut surface until wet • Do not apply herbicide until the point of runoff	• Herbicides (active ingredient): triclopyr in an oil or oil-water mixture • Recommended for scattered or light infestations of large plants • Used to target honeysuckle plants and minimize drift to desirable species

Glossy Buckthorn
(Frangula alnus)

VERMONT INVASIVES


Vermont Dept. of Forests, Parks & Recreation


Leslie J. Mehrhoff, University of Connecticut, Bugwood.org


Chris Evans, University of Illinoise, Bugwood.org


Chris Evans, University of Illinoise, Bugwood.org

Key ID Features

Arrangement: alternate

Leaves: smooth edge, oval, dark green, straight parallel veins

Flowers: small pale yellow flowers, 5 petals

Fruit: red berries that turn purplish-black

Stem: thin smooth bark with white lenticels, no thorns

Root: dark red or purple in color

Growth Habit: large shrub/small tree growing up to 25 ft. tall


Rob Routledge, Sault College, Bugwood.org


Leslie J. Mehrhoff, University of Connecticut, Bugwood.org


Chris Evans, University of Illinoise, Bugwood.org

The Impact

Glossy Buckthorn (also called “False Buckthorn”) was introduced to the United States in the mid-1800s as an ornamental plant. It grows aggressively, can shade out competition, and the seeds remain viable in the soil for 2+ years. The seeds can be dispersed by water (able to float), but also have a laxative property which causes the birds and animals that eat them to rapidly digest and disperse the seeds; this both spreads the plant and limits the animals’ ability to absorb nutrients. Glossy Buckthorn can increase the nitrogen content in the soil, which has negative impacts on native species. Glossy Buckthorn limits the herbaceous layer by altering the microclimate near the ground, consequentially reducing habitat and food sources for wildlife.

Quick Facts

Plant Family: Rhamnaceae

Origin: Eurasia, North Africa

Habitat: disturbed areas, forest edges, forest understory, meadows and fields, swamps

Present in Vermont?: yes

Method of Spread: primarily by seeds dispersed via wildlife and water (seeds can float)

Status: Class B Noxious Weed*
http://bit.ly/VTPlantQuarantine

**The Vermont Noxious Weed Quarantine listing means it is illegal to buy, sell, or transport this species in Vermont*

Native Plant Alternatives


Dave Powell, USDA Forest Service (retired), Bugwood.org


John Ruter, University of Georgia, Bugwood.org

Common Chokecherry *(Prunus virginiana)*: food source for birds and small mammals, grows in a variety of soils, used in hedgerows, useful for erosion control

Silky Dogwood *(Cornus amomum)*: purple berries are a food source for songbirds and mammals, grows in moist sites and along stream edges

Invasive: Glossy Buckthorn


Chris Evans, University of Illinois, Bugwood.org


T. Davis Sydnor, The Ohio State University, Bugwood.org

Common Look-alikes

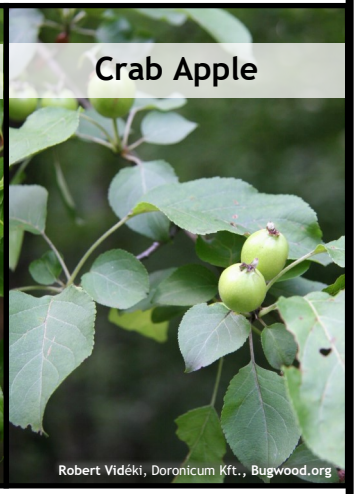
Black Cherry


Robert Vidéki, Doronicum Kft., Bugwood.org

Distinguishing features

Leaf: less distinct veins

Crab Apple


Robert Vidéki, Doronicum Kft., Bugwood.org

Distinguishing features

Fruit: large fleshy fruit

Control Information

To learn more about identification & control options, check out the Gallery of Land Invasives on ***VTinvasives.org*** and these additional resources:

https://mnfi.anr.msu.edu/invasive-species/GlossyBuckthornBCP.pdf

References: EDDMaps Ontario - Species - Glossy Buckthorn, Pennsylvania Department of Conservation and Natural Resources - Glossy Buckthorn, University of Maine Extension: Common Buckthorn vs Glossy Buckthorn

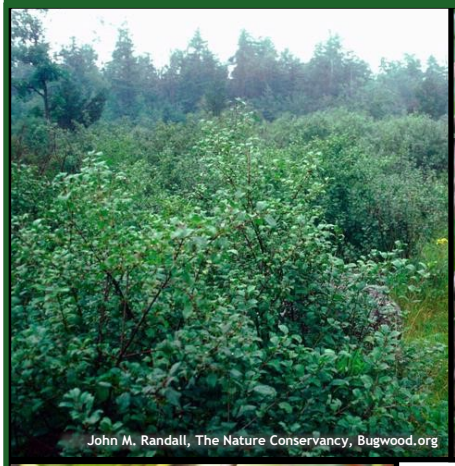
This publication was created in 2019 by the Vermont Department of Forests, Parks & Recreation, in partnership with the Vermont Agency of Transportation and other VTInvasives.org partners.

VERMONT

Common Buckthorn

(*Rhamnus cathartica*)

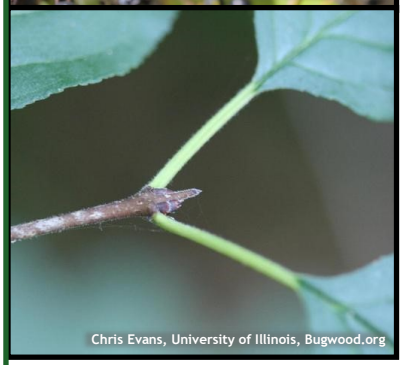
VERMONT INVASIVES


John M. Randall, The Nature Conservancy, Bugwood.org


Chris Evans, University of Illinois, Bugwood.org


Leslie J. Mehrhoff, University of Connecticut, Bugwood.org


Chris Evans, University of Illinois, Bugwood.org


Chris Evans, University of Illinois, Bugwood.org

Key ID Features

Arrangement: alternate (subopposite)

Leaves: finely toothed, glossy, oval, dark green

Flowers: yellowish-green, 4 petals

Fruit: purplish-black and glossy

Stem: thin smooth bark with white lenticels; inner bark orange; thorns

Growth Habit: small tree/thorny shrub that grows up to 20 ft. tall


Chris Evans, University of Illinois, Bugwood.org


Rob Routledge, Sault College, Bugwood.org

The Impact

Common Buckthorn (also called “European Buckthorn”) was introduced to North America in the 1800s as an ornamental shrub and windbreak. It forms thick hedges, crowding and shading out other plants. Common Buckthorn also “leafs out” earlier in the growing season than native forest species, re-sprouts when cut back, and the seeds remain viable in the soil for up to 5 years. It can increase the nitrogen content in the soil, which has negative impacts on native species. The fruits have a laxative property which causes the birds and animals that eat them to rapidly digest and disperse the seeds; this both spreads the plant and limits the animals’ ability to absorb nutrients.

Common Buckthorn also has economic impacts, acting as an alternative host for crown rust fungus (*Puccinia coronate*), which inhibits the quality and quantity of oats, and acts as an overwintering host for the Asian soybean aphid (*Aphis glycines*).

Quick Facts

Plant Family: Rhamnaceae

Origin: Eurasia, NW Africa

Habitat: disturbed areas, meadows and fields, forest edges, forests

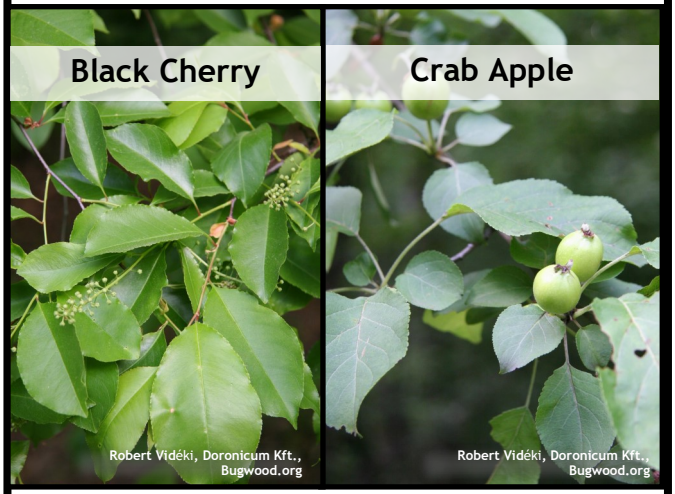
Present in Vermont?: yes

Method of Spread: primarily by seeds dispersed via wildlife

Status: Class B Noxious Weed*
http://bit.ly/VTPlantQuarantine

**The Vermont Noxious Weed Quarantine listing means it is illegal to buy, sell, or transport this species in Vermont*

Common Look-alikes



Distinguishing features

Leaf: alternate

Distinguishing features

Fruit: large fleshy fruit

Native Plant Alternatives

Common Chokecherry *(Prunus virginiana):* food source for birds and small mammals, grows in a variety of soils, useful for erosion control, used in hedgerows

Black Cherry *(Prunus serotina):* food source for birds and mammals, attracts butterflies and moths, grows in a variety of soils, hardwood used in furniture

Control Information

To learn more about identification & control options, check out the Gallery of Land Invasives on ***VTinvasives.org*** and these additional resources:

http://www.ontarioinvasiveplants.ca/wp-content/uploads/2016/06/OIPC_BMP_Buckthorn.pdf

References: EDDMaps Ontario - Species - Common Buckthorn, Ontario's Invading Species Awareness Program - Common Buckthorn, New York Invasive Species Information - Common Buckthorn, Ontario Invasive Species Factsheets (PDFs) - Common Buckthorn, University of Maine Extension: Common Buckthorn v. Glossy Buckthorn

This publication was created in 2019 by the Vermont Department of Forests, Parks & Recreation, in partnership with the Vermont Agency of Transportation and other VTInvasives.org partners.

VERMONT

Common buckthorn, *Rhamnus cathartica*
Glossy buckthorn, *Frangula alnus*

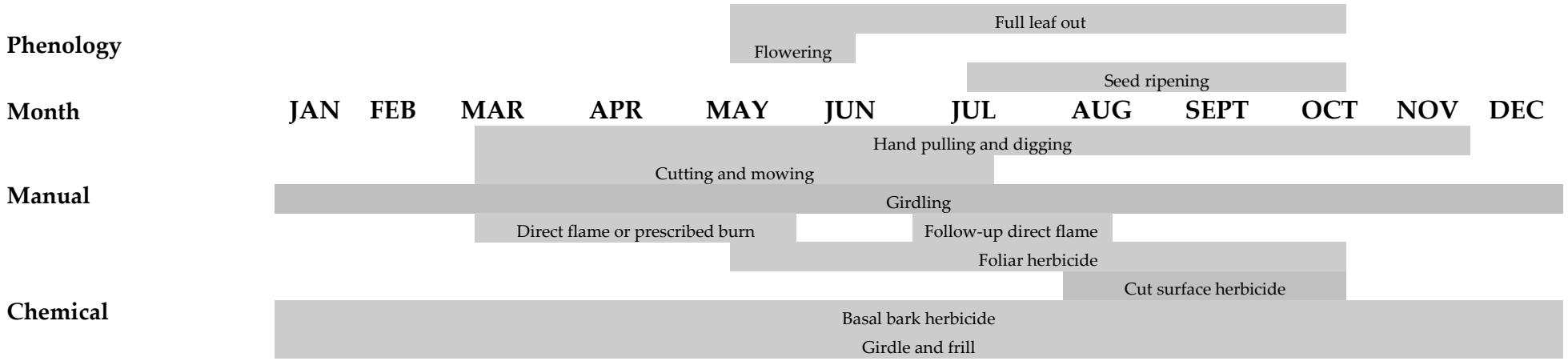
Species Biology and Phenology:

Habitat: Common buckthorn can form extensive monocultures in open woods, pastures, fencerows, roadsides, and in the understory of floodplain and riparian forests. It grows in well-drained soils, preferring neutral to basic soils. Glossy buckthorn typically inhabits wetter, less shaded and more acidic soils than common buckthorn. Typical habitats include alder thickets, calcareous wetlands, sedge meadows, sphagnum bogs, spruce woods and heath-oak woods. Common buckthorn is intermediate to shade tolerant. Glossy buckthorn is less shade tolerant than common buckthorn.

Reproductive Strategy: Buckthorns reproduce by seed but plants can root sprout or regenerate even after they are cut or burned. Plants mature at 5-6 years old. Seed production is prolific. Common buckthorn fruits ripen from August to September while glossy buckthorn fruits ripen earlier—July to August. Seed germination rates are high and germinate well in the shade. Seeds remain viable for at least 2 years.

Dispersal: Seeds contain a chemical that has a severe laxative effect for birds and thus are readily dispersed by birds and small mammals. The dry fruit is able to float in water from 6-19 days depending on the species. Therefore, in areas of frequent and extensive fall and winter flooding, water dispersal may be significant. Common buckthorn retains their fruit into/throughout the winter. Glossy buckthorn fruit falls to the ground more rapidly after ripening, which makes them less visible to birds and thus less likely to be dispersed long distances.

Species Phenology and Treatment Options:



Treatment Methods:

Category	Method	Method Description	Considerations
MANUAL	Manual treatment can be highly effective for glossy and common buckthorn Common and glossy buckthorn do not leaf out as many other non-native invasive plants, however, they typically retain their leaves longer into the late summer/fall, thus making them easy to detect later in the season		
	Hand Pulling	• Pull entire plant by the base of the stem • Be sure to remove entire root system • If feasible and fruit is present, bag and dispose of fruits to prevent seed dispersal • Dry or burn all vegetation (most importantly roots) by hanging upside down on surrounding vegetation or piling into a brush pile and burning.	• Effective on small-medium sized plants and small infestations • Most effective if done when soil is wet • Remaining portions of roots system not removed can re-sprout • Use thick gloves when pulling to avoid injury from spines • Avoid dragging or piling pulled plants into an area that is currently uninfested • Common buckthorn can have a very long trailing root making pulling difficult
	Weed Wrenching	• Remove plant by the base of the stem • Be sure to remove entire root system • If feasible and fruit is present, bag and dispose of fruits to prevent seed dispersal • Dry or burn all vegetation (most importantly roots) by hanging upside down on surrounding vegetation or piling into a brush pile and burning	• Can be more helpful than pulling for larger plants • Common buckthorn can have a very long trailing root making pulling difficult
	Mowing/ Cutting	• Use lopper, pruning shears, weed whacker/brush saw or mower to cut the stem as close to the ground as possible • Cut at least 1 times during growing season (mid April-mid October) • Repeat for 3-5 years	• Cutting/mowing can help slow the spread of barberry but will not eradicate it • Most effective if followed up with foliar herbicide application or direct flame weeding • Winter cutting should be avoided as it encourages vigorous re-sprouting
	Girdling	• Cut anywhere between 5-50" above the ground using a knife, ax, or saw	• Girdling will stimulate re-sprouting so follow-up treatment and monitoring is necessary

		• Cut through the bark into the phloem in a 4-5" wide strip (depending on tree size) • Cut in either a continuous strip or evenly spaced patches • Cut through the bark into the phloem • Peel/knock the intervening bark off the stem	• Girdling can be very labor intensive so is only feasible for small infestations or in areas needing an alternative to herbicide application • Girdling can be paired with a herbicide application
CHEMICAL	Active ingredients in commonly used herbicides: glyphosate or triclopyr		
	Foliar Application	*If foliar spraying only:* • Foliar spray when plant is fully leafed out (May-October) • Spray leaf surfaces with low volume backpack sprayer, or high volume mist blower *If cutting and foliar spraying:* • Use lopper, pruning shears, weed whacker/brush saw or mower to cut the stem as close to the ground as possible • Cut during early growing season (April and May) • Spray sprouts with a low volume backpack sprayer during late growing season (September and October)	*Low Volume Backpack Sprayer* • Herbicides (active ingredient): glyphosate or triclopyr with surfactant • Used to target barberry plants and minimize drift to desirable species *Low Volume Motorized Mist Blower* • Herbicides (active ingredient): glyphosate or triclopyr with surfactant • Used for very larger and dense infestations that have little desirable, native vegetation that will be damaged by drift
	Cut Stump	• Cut stems in late summer to early fall • Cut stems 2-4" above the ground • Apply herbicide immediately after cutting the exposed surface using a sponge, brush, hand-held squirt bottle or directly pouring • Apply herbicide to at least the outer 20% of the surface • Monitor and do follow up treatment as the following year and as necessary	• Herbicides (active ingredient): glyphosate, triclopyr mixed with surfactant • Multiple stems of Japanese barberry can make this application method very labor intensive but is recommended for larger plants
	Basal Bark	• Us a low pressure, low volume backpack sprayer • Apply herbicide around the entire circumference of the lower 8-18" of individual stems of the plant and include the root collar • Larger stems require the larger treated area (18" up	• Herbicides (active ingredient): triclopyr in an oil or oil-water mixture • Used to target buckthron plants and minimize drift to desirable species • This application can be used in colder

		the stem) • Smaller plants (<2″) can be sprayed on one side only • Do not spray to the point of runoff	temperateres (fall, winter, and spring) as long as the treated area is not buried in snow
	Girdle and Frill	• Cut anywhere between 5-50″ above the ground using a knife or saw • Cut through the bark into the phloem in a 4-5″ wide strip (depending on tree size) • Cut in either a continuous strip or evenly spaced patches • Cut through the bark into the phloem • Peel/knock the intervening bark off the stem • Apply herbicide to the cambial layer in the fresh cuts using a paint brush, squirt bottle, or backpack sprayer	• Herbicides (active ingredient): glyphosate or triclopyr
	Cut Surface	• Cut stems 2-4″ above the ground • Apply herbicide up to one month following cutting using a sprayer, hand-held squirt bottle or directly pouring • Apply herbicide around the entire circumference of the cut surface until wet • Do not apply herbicide until the point of runoff	• Herbicides (active ingredient): triclopyr in an oil or oil-water mixture • Recommended for scattered or light infestations of large plants • Used to target large buckthorn plants and minimize drift to desirable species

wall lettuce fact sheet

What is it?
Wall lettuce is an annual herb in the dandelion family that has come to our attention in Lincoln recently and is poised to spread its seeds all over town in summer. Once it gets started, it's hard to stop.

Where does it come from?
Originally from Southern Europe, the Mediterranean, and western Asia. It's invasive in Alaska and the Pacific Northwest and has been spotted in Maine, New Hampshire and now Massachusetts.

What does it look like?
It looks and acts a lot like a common dandelion - it has pointy, dandelion-like leaves, stems that exude a milky sap when plucked, bright yellow flowers followed by hundreds and thousands of wispy seeds per plant that are transported long distances by the wind. You can tell the difference between dandelion greens and wall lettuce leaves by the leaf tip - wall lettuce has a larger triangular leaf tip that is larger than its other lobes; dandelions have a rounded or slightly-pointed tip. Unlike dandelions, wall lettuce flowers grow on a straight, 2-3-foot-tall stem, with leaves growing primarily near the base of the plant. Dandelions have large, round, puffy golden flowers that appear in May; wall lettuce flowers are tiny, five-petaled, light yellow flowers that form in June, then shrivel and produce white seeds with their own 'parachutes' that fly away in the breeze.

Where does it grow?
We're finding it in the deep shade of forests, but It can also adapt to full sun settings. It can handle drought or tolerate frost. It likes the same conditions as garlic mustard, so look for it wherever you pull garlic mustard.

How does it spread?
By airborne seeds that are carried on the wind to far-away places. Sometimes wall lettuce acts like an annual, dying off after flowering and dispersing its seed, but other times it acts like a biennial - with the new seeds forming a rosette of spiky green leaves this year that will turn into a flowering plant next summer.

Why is it so bad?
Because it spreads so many seeds so far. Plants in the shade can produce 500 seeds per plant, and researchers found that plants in the sun can produce up to 11,000 seeds per plant! Seeds can stay viable for 2 years. So wall lettuce can quickly take over an area of land in a couple of seasons. We've seen it go from a few plants in an area one year to carpeting woodlands, mulched shrub and flower beds, bare spots in lawns, and mossy areas. We fear this weed will spread into our unmanaged woodland habitats and dominate - with disastrous effects. We need everyone to look out for it and pull it.

How can you control it?
It's easy to pull it once you know how to spot it. Wear gloves, since the milky sap can irritate some people's skin. Pull gently and firmly by the base of the stem and it should pop out; or use a trowel if you need leverage. If the plant has a flower or wispy seed heads, pull them off and put in a plastic bag for disposal; the rest of the plant can be composted, left on the ground to dry, or placed in a black plastic bag or a tarp to prevent re-growth.
For more info go to **www.lincolnconservation.org**

2014

Butterbur

(*Petasites hybridus*)

VERMONT INVASIVES

Key ID Features

Arrangement: basal

Leaves: large and round (16-28 inch diameter)

Flowers: pink/purple and grow on a spike that emerges in the spring before the leaves appear

Fruit: seeds in a white tuft

Stem: hollow with single leaf

Root: rhizome

Growth Habit: herbaceous perennial

The Impact

Butterbur (also called “Sweet Coltsfoot”) was originally grown as a medicinal herb but escaped cultivation. It spreads aggressively along roadsides and into meadows. Valued for its edible stem in Japan where it is called “Fuki”, Butterbur can be found advertised in garden catalogs despite its invasive growing behavior.

Flowers are produced in the early spring before the leaves appear. Leaves are huge and round, resembling rhubarb but are more heart shaped and grow up to 3 feet in diameter. The leaves shade out native plants, leaving bare soil beneath which can contribute to erosion problems. Butterbur roots go deep, and it spreads by its rhizomes and rhizome fragments.

Quick Facts

Plant Family: Asteraceae

Origin: Europe and Northern Asia

Habitat: disturbed areas, seeps, swamps, river banks and lake shores, meadows and fields, commonly found along roadsides

Present in Vermont?: yes

Methods of Spread: rhizomes

Status: watchlist* species
http://bit.ly/VTWatchlist

**The watchlist has no regulatory force but is used to educate the public about potentially problematic plants*

REPORT IT! *This is an Early Detection Species. Please report any sightings at:* vtinvasives.org/get-involved/report-it

Native Plant Alternatives

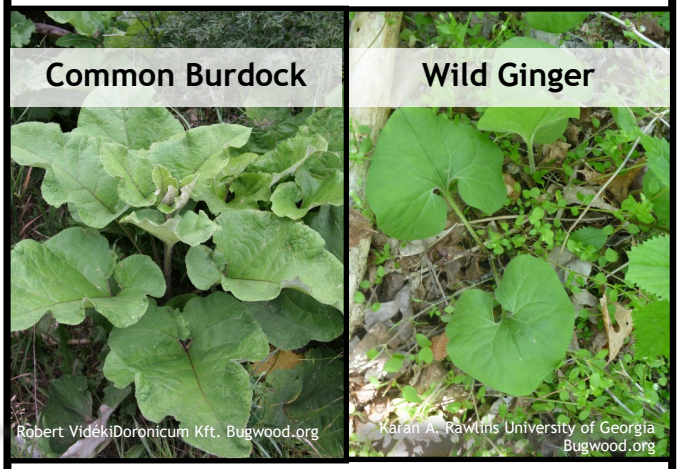

Chris Evans, University of Illinois, Bugwood.org

Wild Ginger *(Asarum canadense):* pollinated by beetles, grows in rich woodlands, aromatic root


James H. Miller & Ted Bodner, Southern Weed Science Society, Bugwood.org

Wild Strawberry *(Fragaria virginiana):* grows in a variety of soils, edible berries

Common Look-alikes:



Distinguishing features

Leaf: elongated shape, tall when it bolts

Distinguishing features

Size: much smaller, up to 8 inches across

Control Information

To learn more about identification & control options, check out the Gallery of Land Invasives on ***VTinvasives.org*** and these additional resources:

https://www.misin.msu.edu/facts/detail/project=misin&id=222&cname=Butterbur

References: Native Plant Trust: GoBotany - Butterbur, Michigan Invasive Species - Butterbur

This publication was created in 2019 by the Vermont Department of Forests, Parks & Recreation, in partnership with the Vermont Agency of Transportation and other VTInvasives.org partners.

VERMONT