

Andrews Community Forest Management Plan

Richmond, Vermont



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Introduction

Acquisition of the Andrews Community Forest

In 2018, the Town of Richmond, with the assistance of Vermont Land Trust, purchased a 428-acre, largely wooded parcel from the Andrews family to create a new community forest. Simultaneous with the sale, a Conservation Easement was conveyed to both the Vermont Land Trust and the Vermont Housing and Conservation Board to protect the property's natural resources and ensure public access in perpetuity.

Governance of the Andrews Community Forest

As a municipally-owned property, the Town of Richmond Selectboard is ultimately responsible for the management and stewardship of the Community Forest. However, this responsibility has been delegated to the Community Forest Stewardship Committee, a seven-to-nine person committee with appointees from both the Conservation Commission and the Trails Committee.

The purpose of the Community Forest Stewardship Committee is to:

- Serve as representatives of the Town in decisions related to management of the Community Forest, with ultimate approval of the Selectboard.
- Oversee management of the Community Forest responsibly and in accordance with the Management Plan and the Conservation Easement.
- Act as a liaison with the Vermont Land Trust when input or approval is needed.
- Lead the management planning process whenever updates are needed.
- Provide regular opportunities for public engagement with the Community Forest and in the planning/management of this community-owned property.
- Educate the public about the Community Forest.

Furthermore, the Steering Committee agrees to strive towards the following guiding tenets:

- Demonstrate an ongoing commitment to providing meaningful public access and outdoor recreation opportunities while simultaneously providing meaningful natural resource protection.
- Demonstrate an ongoing commitment to learning more about the property and its natural history.
- Demonstrate an ongoing commitment by the Committee to work together across differences as representatives of the Town and all of its residents.

By December 2019, the Steering Committee intends to accomplish the following tasks related to Community Forest Governance:

- Establish guidelines about decision-making authority on matters related to the Town Forest, to be presented to and approved by the Selectboard. These guidelines will outline a hierarchy of authority for decision-making at the level of the Steering Committee, Town Manager and Selectboard.
- Establish a policy about use of funds contributed for the management of the town forest by third parties, to be presented to and approved by the Selectboard.
- Open discussions about budgeting for Community Forest management.

By this model, Richmond residents serve as the stewards of the property, guiding and directing its future through this management plan. Further information about the governance of the Community Forest can be found in Appendix A: Steering Committee Bylaws.

Management Plan Development

Upon purchasing the property, the Selectboard established an Interim Community Forest Steering Committee to develop a full management plan for the property and governance structure for the Community Forest, subject to final approval by the Selectboard. The Community Forest Committee prepared an Interim Management Plan to provide short-term guidelines for the management of the property and allow “breathing room” for the development of the full plan. The Interim Management Plan was signed by the Town and approved by the Vermont Land Trust in March 2018 (Appendix F).

Meanwhile, the Town, through a grant from the Vermont Urban and Community Forestry Program, worked to develop the full management plan with the consulting groups SE Group and Arrowwood Environmental. Beginning in 2018, these groups assisted the management plan process by leading the public input process, conducting environmental analysis, and drafting the plan.

The Management Plan must be completed by the end of 2018 to comply with conditions attached to a grant from the US Forest Service.

Public Input Process

Public input opportunities into the management planning process were advertised by email, social media, Front Porch Forum, via signage in Town, and in TimesInk! This process was critical to ensure the Management Plan reflects the interests of Richmond residents, and to give the Committee an opportunity to come to consider and reach consensus on important management issues such as hunting, trail development, trapping, and more. A chart showing the evolution of allowed/prohibited uses in the Community Forest can be found in Appendix C.

Results from the public input process are available on the [Town of Richmond website](#) and participation is summarized below:

- *Visioning Workshop* – A public workshop was held on January 18, 2018 with about 80 community members in attendance. Attendees gave their input on a vision, management balance, and appropriate activities and facilities for the community forest.
- *Visioning Survey* – A survey, open from January to March 2018, asked similar questions to those posed at the workshop. The survey received 317 responses from residents of Richmond and surrounding towns.
- *Stakeholder Interviews* – Small group interviews were held on June 14 and June 18, 2018 to discuss the future of the property with five stakeholder group: hunters/trappers, neighbors, education, trail-based recreation, natural resources, and others. Other interested members of the public were invited to join.
- *Draft Strategies Workshop* – A public workshop was held on July 12, 2018 to present the progress of the plan and hear feedback from the community on draft strategies for the future development and management of the property.

- *Community Forest Committee* – The Community Forest Committee met twice a month through this process. The committee also met as smaller working groups to inventory and plan for each resource in the property.
- *Public Input on Draft Management Plans* -- 44 people attended a presentation of the 1st draft of the management plan on 9/20/18; an additional 14 people submitted comments in writing. The comment period was open for two weeks. A second draft plan will be released on 10/21/18, followed by a two week comment period and including another public meeting.

Future Management Plan Updates

This management plan is intended to a living and evolving document. As the Andrews Community Forest is new to public ownership, there is a need to better understand conditions on the ground and respond to new conditions that may arise . Adaptive management is an iterative cycle of evaluating and learning, adjusting, planning, and doing. The Town should make management decisions based on the latest information combined with the resource management objectives. In addition, the Town should be constantly gathering new information to guide future management decisions and update this plan.

This plan should be updated, at a minimum, every ten years. However, more frequent revisions may be necessary in the early years of municipal ownership as the community’s use of the property evolves. The Committee will plan to discuss once annually whether an update to the Management Plan is needed, and to employ aspects of the “adaptive management model” (Figure 1).

Any changes to the Management Plan must be reviewed and approved by VLT, and any activities on the property which are not contemplated in the management plan must be reviewed and approved by VLT stewardship staff to ensure compliance with the Conservation Easement (Appendix D).



Management Plan

General Property Description

The Andrews Community Forest is a 428-acre largely forested parcel just outside Richmond Village in Chittenden County. The property is a diverse forestland with two small meadows. It has an abundance of hard-mast stands, predominantly oak and beech, that serve as important habitat for many species of wildlife. The forest includes several patches of Dry Oak Forest, Dry Red Oak-White Pine Forest, and Dry Oak-Hickory-Hophornbeam Forest, which are uncommon natural communities in Vermont. The property also has patches of dense hemlock, and those pockets, combined with its low elevation and southerly aspect, reportedly make it a heavily used winter deer yard. Recent timber harvesting and blowdown events have created patches of young forest and early successional habitat in the west and south of the property.

Overall, this forest, especially as part of a larger, connected forest block, is a well-conserved wildlife habitat. The forest is one of eight large parcels that originally inspired the Chittenden County Uplands Conservation Project (CCUCP). The CCUCP is a landscape-scale conservation effort with over a dozen partners working to conserve ecologically and culturally important forest blocks and habitat connectors between and alongside Camel's Hump State Park and Mount Mansfield State Forest. The Andrews Community Forest abuts 6,000 acres of forestland that itself is adjacent to the the 72,000-acre Mt. Mansfield Forest Block. This largely conserved forest block is a critical wildlife corridor and has been

ranked in the top 3% of the state's wildlife habitat blocks by the Vermont Department of Fish and Wildlife.

In terms of water resources, the forest has several headwater streams that flow into the Winooski River and then on to Lake Champlain. The property also includes a small beaver pond and wetlands and at least two vernal pools. The quality of these water resources is directly related to the health of the surrounding forest.

There is a long history of timber management on the forest, as the Andrews family actively managed the forest. Most recently, in 2011 - 2014, timber management occurred on a western portion of the property. Western areas were previously logged in 2001-2003 and eastern areas were logged in 1994-1997 by well-respected Richmond/Huntington loggers Mark and Bruce Moultrou. Going forward, the forest is capable of providing timber and other forest products into the future. Many forest management roads (also called "logging roads," or "skid trails") from previous logging operations still exist on the forest, and despite drainage and other sustainability issues, may serve as a component of a multi-use recreational trail network. The use of these trails for recreation should not compromise or preclude their utility as forest management roads into the future.

Along with the existing logging roads, the forest has potential for a future recreational trail network. There is currently a VAST trail running through the forest and there is potential to connect to existing trails on neighboring properties. There are existing hiking trails on the VYCC property to the east and a public multi-use trail was recently constructed on privately owned land abutting the forest to the northwest.

Other current uses of the property include Maple Wind Farm agriculture and grazing and a Vermont Electric Power Company (VELCO) power line that cuts across the property.

Conservation Easement

The Andrews Community Forest is encumbered by a Conservation Easement ("easement") held by the Vermont Land Trust and the Vermont Housing and Conservation Board (Appendix D). The purposes of the easement are to conserve the property's natural resources and ecological processes, open space values, provide for non-motorized, non-commercial recreation and education, and involve the public in the management of the property.

Vermont Land Trust acts as the primary easement steward. As the primary easement steward, VLT will conduct annual monitoring to ensure activities on the property are consistent with the terms of the easement. The easement steward is also the Committee's primary contact at VLT for reviews and approvals of proposed actions which are not contemplated in the management plan.

The easement requires a management plan and any future changes to the management plan must be reviewed and approved by VLT. Section 1.B. of the Conservation Easement dictates what information the management plan must include. Public input is required by any updates to the Plan.

Public Access

Summary of Town Forest Rules

- **General Rules:**
 - The Andrews Community Forest is open to the public year-round from dawn-to-dusk, with exceptions granted outside of these hours for hunting and other forms of quiet recreation which do not disturb neighboring landowners.
- **Allowed Uses:**
 - Dispersed pedestrian access is allowed the property for uses such as hiking, walking, wildlife observation, or cross-country skiing unless otherwise noted.
 - Trail-based recreational activities, such as hiking, walking, mountain-biking, cross-country skiing, and other uses, are allowed unless otherwise noted. Mountain-biking is only allowed on designated trails.
 - Snowmobiling, restricted to the VAST trail
 - Hunting is allowed on the Andrews Community Forest and is subject to the State of Vermont hunting seasons, rules, and regulations.
 - Temporary tree stands are allowed. Tree stand owners must notify the Chair of the Town Forest Committee that they intend to install a tree stand, place only temporary stands (no screws, fasteners), and should remove stands by the last day of hunting season (muzzleloader).
 - Dogs are allowed on the Andrews Community Forest, subject to the [Town of Richmond Dog Animal Control Ordinance](#).
- **Restricted Uses:**
 - Motorized vehicles are not allowed on the property, except for use by those with physical disabilities, snowmobiles using the VAST trail, vehicles required for property management, or in case of emergency.
- **Prohibited Uses:**
 - Campfires, horseback riding, and camping.
 - Public use of the ACF before dawn or after dusk, or until 11 p.m. with permission of the Steering Committee chair.
 - New trail development without prior approval of the Community Forest Steering Committee.
 - Timber harvest without the adoption of an approved Forest Management Plan.
 - Trapping. Trapping poses a safety hazard to visitors and their pets and at this time is seen as incompatible with recreational and educational off-trail hiking by residents, school groups, researchers and hunters. Exceptions may be granted by the Steering Committee to address animals of concern/natural resource management concerns, and appropriate signage will notify visitors of the trap location and purpose.

Parking

Parking is available off of Route 2 across from Maple Wind Farm, at 1129 East Main Street, Richmond. The parking lot will be expanded in fall 2018 to accommodate 5-6 cars. The community has expressed

concern that this may not be enough parking. The Committee will monitor use of the expanded parking area over the coming year and, if necessary, explore additional parking solutions.

The upper landing area can be used for parking during special events or by request. Members of the community will need to submit a proposal for special parking access to the Committee Chair, with Committee review as needed. Requests will be approved on a case-by-case basis.

Visitors may also access the property by parking at adjacent properties and accessing the Andrews Community Forest by trails. Parking is available to the east at VYCC and the Community Forest is accessible by logging roads and VAST trails. Parking is also available to the west at the base of the Old Jericho Road, and the property is accessed by taking the Old Jericho Road to the top of the Sip of Sunshine trail.

Road Use

Motorized vehicles will be permitted on the VELCO road up to the landing for management purposes or for special events. Above the landing and on the “east road,” only vehicles used in performing management of the Community Forest, VELCO vehicles performing maintenance on the powerlines and access roads, vehicles associated with the use and management of the VAST trail, or vehicles required for use in an emergency will be permitted. Use of any road on the property by motorized vehicle requires permission from the Committee Chair, with the exception of the “east road,” over which Maple Wind Farm has a right-of-way.

Geology, Topography, and Climate

Biophysical Region

The Andrews Community Forest is located in the Northern Green Mountains biophysical region which contains the state’s highest point (Mount Mansfield), coldest climate, and greatest annual precipitation. Across the biophysical region, the bedrock is primarily acidic, composed of non-calcareous schists, phyllites, gneisses, and granofels. At lower elevations in the region, including the Andrews Community Forest, the forests are dominated by Northern Hardwood Forest natural communities. The heavy precipitation and deep snows of the area, especially at higher elevations, feed some of the state’s largest rivers, including the Winooski.

Bedrock Geology

Bedrock is the solid rock responsible for the shape of the mountains and valleys, the local topography. In addition, the bedrock affects the fertility and other properties of the soil above it, determining and impacting the vegetation growing on the site. Bedrock is typically below the soil and visible only in rock outcrops or cliffs.

A location’s bedrock is a direct product of its geologic history – folding, faulting, and other geologic events. Those events determined the collection of rocks and minerals found in that location. Those collections are known as bedrock formations and can be anywhere from a few acres to thousands of acres in size.

The Andrews Community Forest contains both Underhill and Pinnacle bedrock Formations. The western part of the forest, from its northernmost point over is Underhill, and the eastern area is Pinnacle. Both formations are metamorphic sedimentary rocks, formed by sediments collecting at the bottom of an ancient sea, stacking on top of each other, then metamorphosing and compacting into rock during the Taconic Orogeny, the event that created the Green Mountains. As metamorphic rocks, they are typically dense and non-porous and have cracks and visible fractures.

The Pinnacle Formation is made of schistose greywacke rock, metamorphosed from bits of rock, mud, and debris that had already broken down somewhat from their original state. It is gray to buff in color and the stripes of varying layers in the rock are generally visible. The minerals present are quartz, sericite, biotite, and chlorite. The formation dates back at least to the Cambrian Period, 500 to 630 million years ago.

The Underhill Formation is a silvery-green color and a combination of phyllite and schists rocks. The minerals present are chlorite, muscovite, and quartz. Compared to the Pinnacle Formation, the Underhill Formation bedrock also dates back to at least the Cambrian Period but has coarser grains.

Surficial Geology

Surficial geology refers to loose materials deposited above the bedrock layer by wind, water, or glaciers. Like much of the Green Mountain Region, the Andrews Community Forest is covered in rocks deposited when the glaciers receded at the end of the last ice age (roughly 14,000 years ago). Fine silt, pebbles, stones, and boulders of all sizes deposited by glaciers are known as glacial till. The glacial till covers the underlying bedrock surface to form the surface shape of the visible landscape. In addition to glacial till, soil particles deposited by the post-glacial Lake Vermont, which filled much of the Champlain and western Winooski River Valley following the retreat of the Laurentide Ice Sheet up to an elevation of about 600 feet above sea level, cover much of the southern portions of the Andrews Community Forest.

In the Andrews Community Forest, where the bedrock is not exposed, till covers the land and is the source of stones in the forest's rocky soils. The glacial till is thicker in the valleys and thinner in the uplands. Many of the exposed uplands in the forest have experienced significant post-glacial erosion, leaving only rubble and scattered boulders on top of the bedrock.

Topography and Aspect

The Andrews Community Forest stretches over 428 acres of mostly south-facing hillside. Elevations range from just below 400' above sea level at the parking area to about 1240' above sea level in the northern corner. Much of the terrain is steep but there are some flatter areas north of the parking lot and along the forest's southeastern boundary.

Climate

Climate describes the average weather patterns in an area over time, particularly temperature and moisture parameters. Climate is an important consideration in forest management because of its effect on the myriad complex interactions between abiotic and biotic factors that influence forest ecology, and the ability of forests to regenerate, develop, and remain resilient in the face of disturbance. While the Andrews Community Forest is part of the Northern Green Mountains biophysical region, which it has a cooler climate and more precipitation than other portions of the State, it is significantly influenced by the

Champlain Valley biophysical region, which is warmer and features a longer growing season than most other parts of Vermont. Coupled with its southerly aspect, this produces a forest dominated by tree species adapted to warm, dry sites with poorer soils on upper elevations, and those adapted to slightly richer forest soils on lower elevations (due to the influence of Lacustrine deposits).

Management Objectives

- Protect the physical attributes and processes of Andrews Community Forest.
- Ensure that any proposed activities or management actions are appropriate for the physical characteristics of the site.

Management Actions

- Any permanent or semi-permanent improvements should carefully consider the disturbance to the site and the capacity of the site to support the use.
- Minimize disturbance to the site to protect soil and vegetation.
- Slope steepness affects erosion and access for management. Topography should be an important consideration for forest management and recreational uses (i.e. trails).

Cultural History

The Andrews Community Forest property has a rich history - over 200 years of agriculture and forest management. “Gray Rocks Farm,” as it was formerly known, is on the National Register of Historic Places. The farm is a testament to the importance and prevalence of dairy farming in 19th and 20th century Vermont and exemplifies the growth and development of that industry. The land that is now the Community Forest was largely the farm’s pasture and woodlot, and most of the farmland and remains of the historic farm’s agricultural buildings are on land now owned by Maple Wind Farm.

The existing forest parcel, along with 212 additional acres, was first farmed by James Butler, beginning around 1800. He constructed a farmhouse, blacksmith shop, and an English barn before selling the property to Asa Rhodes in 1813. The property remained in the Rhodes family for over a hundred years, passing from father to son.

The 1850 agricultural census indicates that the Rhodes farm was primarily a dairy farm, with 45 cows producing 1,800 lbs. of butter and 15,000 lbs. of cheese annually. As was common in Richmond at the time, the farm also had other livestock – horses, chickens, sheep, and swine. The Rhodes also harvested 125 tons of hay and 200 lbs. of maple syrup annually and grew many different crops: corn, oats, rye, potatoes, peas, and beans.

Over the years, ownership passed first to Asa’s son, Cornelius, and then to his son Edward, around the turn of the century. The farm continued to grow and ultimately thrived as the market for butter and cheese expanded. Given the farm’s success, in 1917, Edward reconstructed the English barn into a large U-shaped barn that more than doubled the space available for the cows. The new barn also added space for horses, a granary, and a milk house and he added a silo for storing cereals elsewhere on the property.

In 1923, Edward Rhodes sold the farm to Clarence Andrews. Andrews continued dairying operations on the property until 1978. The Andrews also operated a successful inn, the Gray Rocks Inn, from 1928 to 1941. Ina Andrews, Clarence’s wife, ran the inn, cooking three meals a day for guests from

Massachusetts, New York, and Connecticut. During this period, the Richmond area was full of small inns for travelers looking to experience the idyllic countryside. The tourism business was vital to the Richmond economy and an important period in the town's history.

The Andrews family also kept a small deer camp, known as "Odds and Ends," on the northern portion of the property. They built a rustic cabin there in the 1950s but stopped using it in the 1990s and eventually had it burned in 2013. Only the metal roof and two 1950s automobiles remain on the property.

Remaining Historical Sites and Features

Today, all that is left of the many farmstead buildings on the community forest parcel is two former farmstead sites with stone foundations. One foundation is on the northwestern side of the property, near the VAST trail. The other remaining foundations are near the end of the eastern farm road. One remaining foundation, set slightly apart, was either a springhouse or a small barn. The adjacent parcel to the east, now owned by Maple Wind Farm, was also part of Gray Rocks Farm. The 1813 farmhouse and barn and the 1830 barn remain.

Management Objectives

- Educate forest visitors about the cultural history of the forest and its context within Richmond.
- Protect remaining cultural features.
- Engage visitors of all ages with the forest's cultural history.
- Continue to expand and enhance the information known about the forest.

Management Actions

- Protect and highlight remaining cultural features in the forest.
- Add interpretive signage about Gray Rocks in the forest, especially at historic sites.
- Encourage future research and study of the forest's cultural history, particularly with local schoolchildren.
- Conduct and record interviews with community elders who remember Andrews Farm.
- Place buffers on main trails located near cultural resources; consider access to cultural resources via spur trails.
- Work with the Andrews sisters to host programs and tours about the cultural resources of the farm.

Upland Natural Communities

Natural Communities are our way of categorizing different vegetation patterns across the landscape. In areas with similar climate, precipitation, soils, geology and topography, reoccurring assemblages of plants dominate. These categories of vegetation are called natural communities and have been described in the book: *Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont* (Thompson & Sorenson, 2000). These natural communities include familiar types such as Northern Hardwood Forests, Hemlock-Northern Hardwood, Dry Red Oak-White Pine, and Red Pine Forests.

Each natural community type is ranked based on its relative rarity on a S1 – S5 scale. Communities with a S1-rank are those types that are extremely rare in the state, such as Alpine Meadows and Pitch Pine Woodland Bogs. S5-ranked communities are common and widespread in the state and include such familiar types as the Northern Hardwood Forests and Alder Swamps. Each occurrence of a natural

community is also ranked based on its quality. “Significant” natural communities are those sites that meet the combination of rarity, size, and quality to represent the best occurrences of their community type in the state.

Natural communities are important because they form the basis for the natural world that we use and interact with regularly. They provide the habitat for all the wildlife that we encounter as well as for myriad rare species. Conserving natural communities is often considered a good “coarse filter” approach for conserving biodiversity in general. Natural communities act as habitat for most of the common and rare species of plants and wildlife.

The Conservation Easement protecting the Andrews Community Forest describes several areas of the property that are uncommon or particularly sensitive, and therefore require special treatment. Natural communities that are uncommon or rare in Vermont will be managed in a more sensitive manner to allow the natural communities that contribute to statewide biodiversity to persist into the future.

Upland Natural Community Types on the Andrews Community Forest

Natural Community	State Rank	Number of Occurrences	Total Acreage
Dry Oak Forest/ Dry Red Oak-White Pine Forest	S3	6	16
Red Pine Forest or Woodland	S2	1	2
Hemlock-Northern Hardwood Forest	S5	1	313
Hemlock Forest	S4	3	18
White Pine-Northern Hardwood Forest	S4	5	314
Mesic Red Oak-Northern Hardwood Forest	S4	5	385

The Ecological Report (Diamond, 2017) provides a good overview of the natural communities present on the Andrews Community Forest. The table above illustrates a breakdown of the upland natural communities present on the forest and their size and abundance. As can be seen from this table, three communities comprise most of the forest: Mesic Red Oak-Northern Hardwood Forest, White Pine-Northern Hardwood Forest and Hemlock-Northern Hardwood Forest. The White Pine-Northern Hardwood Forest occupies much of the southern portion of the forest and is indicative of areas formerly in pasture or other agricultural production. In the northern part of the forest, roughly north of the VELCO

transmission line, the forest is more dominated by red oak and northern hardwoods. These large, matrix forming communities extend well beyond the community forest borders and comprise a portion of the large forest block to the north and east.

Management recommendations for upland communities that are considered significant depend largely on the type of forest, how rare the community is, and how large of an area it typically occupies on the landscape. Occurrences of large, common, communities such as Northern Hardwood Forests and Hemlock-Northern Hardwood Forests are much more resilient to small perturbations than rarer communities that occur in small patches.

The Dry Oak Forest communities present in the northern part of the parcel, though smaller, are excellent examples of an uncommon community type and may be state significant communities. These communities are restricted to the droughty ridges and summits with southern exposure. These sites typically have shallow soils, frequent bedrock outcrops and are more susceptible to disturbance. This, coupled with the fact that they are typically small sites, means that any development or perturbations in part of the community could have a detrimental effect on the entire stand. Clearing of land for recreational activities should be avoided in these areas.

The Dry Oak natural communities, as they are currently mapped, are protected under the property's Conservation Easement. However, due to recent timber harvesting, some areas of significant natural communities, or with the potential to exhibit traits of these natural communities, were altered. Should areas of these natural community types become evident in the recently harvested area, they should be protected with equal measure to those defined in the Conservation Easement. If the extent of these communities is expanded at a later date, Town Committee members should communicate these updates to the Vermont Land Trust stewardship staff.

Management Objectives

- Protect Dry Oak Forest, Dry Red-Oak White Pine Forest, Dry Oak-Hickory-Hophornbeam Forest, Red Pine Forest, and other significant natural communities as well as the ecological processes that sustain them.
- Retain soil integrity, water quality, natural species composition, natural disturbance regimes and natural hydrology.

Management Actions

- Update natural community mapping as more on-the-ground data becomes available; communicate this information forward to VLT.
- With the Ecological Protection Zones, which represent state-significant natural communities, the following Conservation Easement limitations apply (paraphrased):
 - All activities shall incorporate steps to retain soil integrity, water quality, natural species composition, natural disturbance regimes, and natural hydrology;
 - All forest management activities are prohibited without VLT's prior written approval;
 - New roads or trails are prohibited without VLT's prior written approval
- Identify and control exotic species (with approval from VLT)

Water Resources

The Andrews Community Forest is located within the Winooski watershed. Water from forests and fields runs off into the Winooski River, which flows into Lake Champlain. Surface waters on the property include an inactive beaver pond and wetlands, three headwater streams, and two confirmed vernal pools. Maintaining forested riparian cover adjacent to these resources is vital for the protection of water quality and conservation of important aquatic habitat.

Streams and Riparian Buffers

Several perennial streams arise on and meander through the property on their way to the Winooski River. A stream is the full length and width, including the bed and banks, of any watercourse. A stream has a channel that periodically or continuously contains moving water, has a defined bed, and has banks that serve to confine water at low or moderate flows. Streams include not only perennial but also intermittent streams that do not have surface water flow throughout the year and/or throughout the defined channel. Riparian buffers are the width of land adjacent to the watercourse between the top of the bank and the edge of other land uses. Riparian buffers are typically undisturbed areas consisting of trees, shrubs, ground cover plants, duff layer, and an uneven ground surface.

Forested streamside riparian habitats offer a suite of ecological benefits. Forested riparian buffers anchors the stream shoreline and limits streambank erosion, preventing wetland and water-quality degradation. They offer important plant and animal habitat by providing shade and coarse woody debris which provide structural and substrate diversity. They also provide organic matter and nutrients that fuel stream food chains.

Management Objectives

- Maintain and preserve surface and groundwater quality.
- Provide food and cover for aquatic and terrestrial species as well as structural habitat diversity within the stream channel with leaf litter and woody debris.
- Protect channel stability by preventing excessive scour and erosion of streambanks.
- Preserve wildlife travel corridors.
- Buffer aquatic plants and animals from disturbance.

Management Actions

- Protect soil integrity and minimize erosion.
- Protect natural water levels and flows.
- Forestry and agricultural uses of the property shall, at a minimum, comply with the terms of the Conservation Easement and with state and local water-quality regulations.
- Stream Crossings: Stream crossings can have a significant impact on the movement and distribution of aquatic species. The goal of a stream crossing is to accommodate wildlife and aquatic organism movement and to minimize habitat fragmentation. Stream crossings should be designed to maintain the course, the current, and the cross-section of the natural stream channel and maintain existing in-stream conditions. Stream crossings should be strategically located to minimize the number needed and to minimize the impacts to the watercourse. Crossings should be constructed perpendicular to the channel and to span the width of the channel.

Bridges are generally recommended for stream crossings in community forest environments. Culverts often cause changes to channel alignment, channel diversity, and hydraulic conditions, which may degrade habitats above and below the structure. An undersized stream crossing can lead to bank erosion or failure of the structure. Culverts can be designed to maintain natural stream substrates within the structure and minimize disruption to the channel and riparian corridors. Timing of construction, erosion and sediment control planning, and post-construction revegetation are all critical components of a successfully constructed stream crossing.

- **Riparian Buffer Zone:** Maintain 50 foot Riparian Buffer Zone (RBZ) on all perennial streams as required by the Conservation Easement. Any management or use of the RBZ must be conducted in a manner designed to protect soil integrity and minimize erosion, and must incorporate up-to-date ecological knowledge and management practices. Any forest management activities or new stream crossings within the RBZ require approval of the easement steward (VLT).

Agriculture is not permitted within the RBZ.

- Within these buffers, no cutting of trees or operation of logging equipment should occur, except what is necessary to cross streams (as described above) and where existing forest management roads are stable, located within this buffer, and no reasonable alternative trail exists.
- Trail networks should be designed to avoid parallel alignment within a riparian buffer.

Wetland Natural Communities

The Andrews Community Forest sits well above the Winooski River lowlands, occupying the southern slopes of the Green Mountain foothills. This is primarily a landscape of upland communities, with wetlands being confined to the few low areas, narrow benches and areas of groundwater discharge. Overall, the total acreage of wetlands is relatively small, but their rarity makes them that much more important.

Three wetland types have been identified on the Andrews Community Forest, as summarized in the table below. Two of the Shallow Emergent Marshes are on the southern border of the community forest and continue off-property. All three are beaver-influenced wetlands and contain a diverse mixture of open water, herbaceous vegetation and occasional shrubs. The northern marsh sits in a scenic low area surrounded by upland forests. These marshes are significant for a wide range of functions and values including water quality, erosion control and floodwater attenuation. Being part of a public, conserved parcel, they also have the opportunity to be used for recreation and education/research. Perhaps the most important function that they serve is that of wildlife habitat. The mosaic of open water and herbaceous vegetation in a forested matrix is ideal for a wide variety of song birds, raptors, mammals, reptiles and amphibians.

Seeps are small wet areas that are the sites of groundwater discharge which often form the headwaters of small streams. Because this groundwater can flow throughout the winter, they are often the first areas in the spring to harbor green vegetation, making them important for wildlife, including bears. Certain amphibians such as the spring and two-lined salamanders also rely on these wetlands. Providing a cold, clean source of water for downstream surface waters also makes them important for water quality.

Because these wetlands are small, it is difficult to map them remotely. It is likely that more seeps are present on the Andrews Community Forest that remain unmapped.

Wetland Types on the Andrews Community Forest

Natural Community	State Rank	Number of Occurrences	Total Acreage
Seep	S4	3	0.62
Shallow Emergent Marsh	S4	3	5.73
Vernal Pool	S3	4*	0.08

* two vernal pools have been confirmed and are discussed in the Vernal Pool section below

Management Objectives

- Protect and conserve significant wetland resources.
- Prevent wetland and water quality degradation.
- Protect important plant and animal habitat.
- Protect significant wetland functions and values.

Management Actions

- Identify and map wetland resources on the community forest.
- Avoid construction of recreational trails through wetlands.
- Utilize boardwalks and bridges for any necessary wetland crossings.
- Provide wetlands with naturally vegetated buffers.
- Identify and control exotic species.

Vernal Pools

Vernal Pools are seasonally flooded forested wetlands that hold water in the spring and typically dry out by late summer. They typically have six characteristics: 1) they occur in a forested matrix (though there are exceptions to this); 2) they have a seasonal hydrology; 3) they are isolated from surface waters; 4) they are small; 5) they lack fish, and 6) they have vernal pool indicator species present. Vernal pool indicator species are those species that are dependent on these habitats.

Vernal Pools provide critical habitat for a wide variety of amphibians and invertebrates including indicator species such as wood frogs, spotted salamanders, blue-spotted salamanders, Jefferson salamanders, fairy shrimp and fingernail clams. Unlike other amphibians in the region, the eggs of these indicator species do not have any defenses against predation by fish; they are therefore reliant on the fishless aquatic habitat of Vernal Pools.

Like the seepage wetlands described above, vernal pools are also small wetlands that are difficult to remotely map. Two vernal pools have been field confirmed and described in the Baseline Documentation Report (Diamond, 2017) while two others still await field confirmation.

Both of the field-confirmed pools were assessed by Diamond (1997) and are likely state significant examples of vernal pools. Each contained many hundreds of eggs of wood frogs and spotted salamanders and appeared to be stable breeding habitat for these (and many other) species. The surrounding forests are in a moderately good condition, though the northern pool has some recent timber harvesting in the vicinity. Overall, the upland landscape surrounding these pools provides valuable year-round habitat for these pool-breeding amphibians. In order to maintain this habitat, certain management guidelines are recommended.

These two vernal pools are further protected under the Conservation Easement by Vernal Pool Ecological Protection Zones (EPZ), which include a 100' undisturbed buffer, and a 500 foot secondary protection zone where harvesting is allowed, but must have the goal of protecting and enhancing amphibian habitat, and be addressed in the Forest Management Plan.

Management Objectives

- Provide and maintain high quality amphibian habitat.
- Promote and maintain high levels of shade and coarse woody debris.
- Per the Conservation Easement, clearly identify management practices within the EPZ zones in the Forestry Plan.

Management Actions

- Avoid any disturbance or impact to the actual vernal pool.
- Maintain undeveloped and undisturbed 100' primary ecological protection zone and a 500' secondary ecological protection zone around the vernal pools, as described in the Conservation Easement. Pedestrian trails are compatible in the primary EPZ but must be approved by Vermont Land Trust.
- Avoid creating ruts or pools of standing water for recreational trails in the primary EPZ.
- Follow harvest prescriptions in the EPZ's as identified in the Forestry Plan.
- Identify and control exotic species in the vernal pool and surrounding buffer zones.

Forestry

Forest management, in the form of the periodic harvesting of timber, is an important part of land conservation, maintaining the working landscape and supporting the forest products economy in Vermont. The forest products industry, in addition to being economically important in Vermont, supports the maintenance of healthy, intact ecosystems by providing the means for enhancing wildlife habitat, elevating the health and resilience of forested ecosystems, and generating periodic income to fund important stewardship activities. It is also a source of local, renewable resources in the form of forest products. Forest management for timber on municipal lands can serve as a demonstration of responsible, sustainable forest management, educating residents of Richmond and beyond in how to harvest forest resources in a sustainable way.

In the course of a normal timber harvest, choices of which trees to retain and which to harvest are guided by a combination of ecological principles (which tree is “healthier,” which trees are in use, or may be used, by wildlife), human desires (what the management objectives are for a property) and economic ideas (which tree is of a more valuable species or may produce a more valuable product in the future). Through harvesting, the growth potential of the forest is concentrated on the specific trees that exhibit some combination of these values in order to grow these individuals more efficiently, or redirected from trees that have maxed-out their potential value to new regeneration or existing immature trees. The forest is fully capable of executing this selective process on its own through competition and natural mortality events, but it will not necessarily do so in a way that supports the goals, objectives, and values of the Andrews Community Forest and Richmond community, nor will it do so while producing a range of local, renewable resources and economic benefits.

As alluded to above, the harvesting of timber, while it utilizes means which are not entirely equivalent to natural processes, positively interacts with a number of broad environmental concerns. Forest products are a renewable resource which can be sustainably extracted while preserving or enhancing wildlife habitat, forest ecology and other ecological benefits. It does so while providing fuel for heat and electricity, fiber for paper products, and timber for building materials. Harvesting timber also provides periodic income to forest landowners, helping lower development and subdivision pressure on forested lands. Finally, timber sale proceeds can allow landowners to engage in non-lucrative stewardship activities, including ecosystem restoration and wildlife habitat enhancement.

The ability of a forest to respond to, and maintain its health during, disturbance is known as resiliency. Research has shown that forests, in addition to being comprised of myriad independent species, have evolved as systems in many ways. Diverse forests efficiently respond to disturbance, stabilizing nutrients and soil and creating conditions suitable to the growth of subsequent generations of healthy trees. While forests today encounter regular natural disturbance events, the largest sources of disturbance are, and will be into the indefinite future, human-related. In the face of an unstable climate, invasive exotic plants, animals and pathogens, and many other unpredictable problems it is prudent to manage forests for resiliency in the course of any long-term forest management planning. Practically this means managing to encourage diversity, specifically species and structural diversity, at all times. For all the reasons listed above the encouragement of all types of diversity should be paramount in the management of the Andrews Community Forest.

From a forest management perspective, encouraging a diversity of different age classes of trees provides the greatest opportunity for the periodic output of timber from a given area; for example, a forest with a single age class of trees may usually only be harvested all at once, with a long time period between harvests. Forests with a diversity of age classes can provide landowners with income and forest products more frequently, as different age classes periodically mature and require treatment at different times. From an ecological perspective, research has shown that many relatively undisturbed forests consist of trees of several age classes. Encouraging a variety of different age classes and habitat conditions more closely mimics disturbance regimes in an unmanaged forest, allowing us to harness to forest’s natural regenerative capacity to keep itself healthy, vibrant and productive. Managing using “uneven-aged silviculture” also allows us to minimize the scale of our disturbances to forest ecosystems at any one time.

Management Objectives

- Maintain a healthy and productive forest
- Maintain and encourage a diversity of native species, of all taxa
- Maintain and encourage a structurally complex forest
- Protect sensitive natural resources, including water resources, significant natural communities and rare, threatened and endangered species
- Protect the forest from the invasion of exotic, invasive species, including taking steps to control existing populations of invasive exotic plants.
- To use any timber harvesting in the Andrews Community Forest for educational and demonstrational purposes, demonstrating sustainable timber harvesting to residents of Richmond and beyond.
- Enhance wildlife habitat whenever possible.
- Preserve the cultural and historic importance of the responsible stewardship of forested land on a property with a tremendous history, of which forest management has been a part for centuries.
- Conduct all management activities in accordance with Vermont's Acceptable Management Practices to prevent soil erosion, protect water quality.
- Manage forest stands for long rotations, including retaining biological legacy trees and areas of trees indefinitely.

Management Actions

- Create a Forest Management Plan with the County Forester, to be approved by Vermont Land Trust before engaging in any forest management activities.
- Hold educational events around forest management activities to inform the public about the rationale and best practices of sustainable forest management.

Wildlife Habitat

In response to a survey about whether the Town of Richmond should purchase the Andrews Forestland as a community forest, wildlife habitat protection was the most often listed interest of respondents related to the opportunity. Significant information regarding wildlife habitat exists through work completed in the Chittenden County Uplands Conservation Project has been a focus for wildlife study and presents an opportunity for continued study about wildlife use of the forest given the blocks' area and through statewide priority mapping of wildlife blocks. Information on some of the property's natural communities and sensitive features exist from previous work for Vermont's Natural Heritage Program and a four-town, science-to-action, resource inventory completed by Arrowwood Environmental (desktop review). Allaire Diamond, an ecologist from Vermont Land Trust, collected and mapped information on uncommon natural communities and sensitive areas found in two days of field research on the property in the Ecological Report included here as Appendix G.a.. Audubon Vermont conducted a forest bird habitat assessment on the property in July of 2017 and reported its findings in November, 2017 (Appendix G.c.). More on-the-ground ecological study is warranted to fill in any gaps in the aforementioned reports.

Besides the specific habitat elements discussed below, the Andrews Community Forest provides habitat for a range of wildlife species. These include everything from amphibians and reptiles to birds and bats and wide-ranging carnivores such as fisher, bobcat, fox and coyote. White-tailed deer are active

throughout the property, with heavy browse in the seedling, sapling, and shrub layers, and beds in or near hemlock cover. Moose have stripped bark off of striped maples. Bobcat tracks traversed the ledgy dry oak area in the northern corner as well as the edge of the small beaver wetland. Coyote, fox, turkey, fisher, and weasel tracks have been noted. Recent claw marks on American beech trees in at least two areas, as well as tracks and scat on the VAST trail, indicate the presence of black bears.

The following wildlife habitat elements have been identified on the Andrews Community Forest with their approximate boundaries shown on the attached natural resource maps.

Interior Forest and Connectivity

The Vermont Conservation Design (2015), a landscape-level conservation prioritization from Vermont Land Trust and the Vermont Agency of Natural Resources, considers the entire Property to be part of a ‘Highest Priority Interior Forest Block’ providing critical ecological function on a statewide level. The forest is the latest addition to the long-standing 10,000-acre Chittenden County Uplands Conservation Project.

In addition, the entire property is notable in its contribution to Vermont’s physical landscape diversity. Adjacent to other large blocks of conserved land and with connections to the Winooski River valley and its floodplain, this property also plays an important role in landscape connectivity, offering a corridor for wildlife and other species to move.

“Forest interior” habitats are those forests that are distant from human development. The term forest interior is often used interchangeably with the term “core forests”. Forest interior habitat is often defined as being at least 100 meters from the nearest human disturbance such as a road, house, or agriculture. Forest interior habitat is usually characterized as containing less forest “edge” than smaller, fragmented habitats.

Because forest interior habitats are generally large, they can often provide the many life requisites for species, such as black bear, moose, and fisher which have large home ranges and travel extensive distances. Species such as black bear cover large territories in search of a diversity of habitat elements such as wetlands, berry-producing shrubs, mast-bearing food species and remote denning sites and exemplifies the type of wildlife that requires large areas of relatively unfragmented habitats. Community Forests such the Andrews Community Forest, that border on or are connected to other habitat by some type of corridor are more likely to be able to support Vermont’s large-ranged species like black bears and bobcats. Therefore, these lands are more likely to have greater species diversity and the wildlife populations within those forests are more likely to be stable in the long run.

A wide-variety of birdlife in Vermont utilize the larger contiguous forests available only in interior forest habitats. These birds include species such as the broad-winged and red-shouldered hawks, owls, and forest songbirds like the ovenbird, wood thrush, scarlet tanager, pileated woodpecker, and the Canada and black and white warblers. Several of these species suffer from greater nest predation (by animals such as squirrels, raccoons, snakes and other birds) and nest parasitism (by other birds such as the brown-headed cowbird) where nesting grounds are near human disturbance and the habitat edges it creates.

Ledges, Cliffs, Talus and Ridges

Ledge and cliff habitat develops where bedrock outcrops occur in areas of steep slopes. Ledges and cliffs can occur as areas of sheer rock wall or as a broken jumble of rocks and crevices. Though there is no technical distinction, generally ledges are small areas of outcrop within a forested matrix while cliffs have an open canopy and tend to be larger. Talus consists of a field of large rocks that typically develop at the base of cliffs and ledges, though can sometimes occur independently of these features.

Ledges, cliffs and talus can provide important habitat for a wide range of species, depending on the nature and extent of the rock structures. Vertical rock structure (cliffs) can be important habitat for species such as nesting peregrine falcon, common ravens, and the small-footed bat. In areas with broken ledge and talus, the hollows and small caves created by the rock are used extensively by coyote, porcupine, bobcat, fisher and other weasels, ruffed grouse and other wildlife as refugia from inclement weather and for escape cover.

In many areas throughout the northeast, bobcats use ledges for courting and breeding grounds and the broken ledge (often at the foot of a ledge) for birthing and rearing of their young. Broken ledge is considered defendable from predators like the coyote that may try to kill and eat bobcat young. Bobcats, coyote and fisher are reported to also utilize broken ledge when it's cold and snowy as well as when it's hot, for relief from the heat. There is some evidence that ledges facing south and west (areas that generally are more exposed to the sun) may receive higher use by certain species and are more valuable to wildlife.

Mast Stands

Mast refers to the nuts and seeds of trees and shrubs, many of which are eaten by a variety of wildlife. "Hard mast" consists of the nuts of trees, especially those of beech and oak. "Soft mast" refers to the berries of a variety of species including woody plants such as serviceberry and cherry. These food resources may be available only seasonally, usually in fall. A "stand" refers to an area where many of the trees or shrubs are growing together in one area.

The berries and nuts from mast trees and shrubs provide an important and often essential source of food for a variety of wildlife. Black bears may rely on acorns and beechnuts to provide enough energy for over-wintering and the production of cubs. These nuts provide a fat-rich food source to bear, white-tailed deer, wild turkey, squirrels, and many other species of wildlife. As many as 171 species of birds, mammals, amphibians, and reptiles use these beech and oak forests as habitat (DeGraaf et al., 1992).

Deer Wintering Areas

Forests where white-tailed deer congregate during the winter months in Vermont are called deer wintering areas (also known as "deer yards"). Deer use these dense stands of mature or maturing evergreen trees in years with significant snow accumulation. Evergreen trees intercept snow as it falls to the ground generally resulting in shallower snow beneath the canopies of these forests. The overhead canopy of needles also shield deer from the cold. Deer congregate in these areas when snow depths exceed ~15 inches and often remain until the snow melts in spring. The heaviest used wintering areas often have a southern aspect, though stands with a westerly or easterly aspect are also sometimes used.

By providing easier mobility and protection from the cold, deer wintering areas can be critical in limiting the energy expenditures of deer and supporting the continued survival and reproduction of this species along the northern extent of their range – an area which includes Vermont.

Eastern hemlock, balsam fir, and Northern white-cedar stands provide the best cover and food value to deer, but pine and spruce will sometimes be utilized. These winter habitats are also home to bobcat, coyote, and scavenging bear and fisher that come looking for weakened and dead deer in spring. Other animals such as conifer-nesting birds, porcupines and fox also utilize these habitats during other seasons.

Management Objectives

- Provide a diversity of upland, wetland and riparian habitats for wildlife.
- Identify and accurately map significant wildlife habitat elements.
- Identify an appropriate balance of all resource attributes of and uses for the Property.
- Provide a plan for recreation trails with minimal impact on natural resources.

Management Actions

- Interior Forest and Connectivity:
 - Utilize multi-aged silvicultural treatments over the majority of the property. Avoid creating new permanent openings or wide (> 20 feet wide), linear roads and trails. Consider creating 5-10 acres of young forest/early-successional habitat. Although there is currently sufficient young forest habitat on the Andrews Community Forest, the function of this habitat is likely to diminish around the year 2025 due to maturation of the forest. In order to maintain this valuable habitat condition it is recommended to create a new area(s) sometime after 2025.
 - Management guidelines that enhance the value of the forest for a variety of deep forest species such as bear, fisher and a variety of songbirds is recommended. This can include the retention and establishment of older growth forest areas, maintaining a multi-layered forest canopy, the maintenance of downed and standing dead and live woody debris and snags, the maintenance of small natural forest openings and food sources, and the maintenance of canopy closure over trails.
- Ledge, Cliff, Talus and Ridges:
 - A forested canopy should be maintained over these rock habitats that occur in a forested matrix.
 - The selective removal of trees near these habitats is compatible with continued use by wildlife.
 - Ledges are likely to contain very steep slopes and forest management activities should be conducted only in a manner consistent with minimizing the erosion of soils.
 - Maintain a 100' buffer to broken ledge and talus that provide concealment cover for wildlife.
- Mast Stands:
 - Forest management activities that promote the establishment, maintenance, and long-term persistence of these species within the forest should be encouraged.
 - Use of the nut and berry mast by wildlife, particularly sensitive species such as black bear, can be negatively impacted by the presence of human development and many

human activities. For this reason, human access and use of these stands, including recreational activities, should be limited and carefully managed.

- Seasonal restrictions on recreation, such as limiting heavy use by humans during fall (for beech and oak stands) is appropriate. Limit use in fall (Sept 15-Nov 15) in areas exhibiting extensive bear use.
- Trail construction should avoid cutting of mast-producing species.
- Deer Wintering Areas:
 - The Hemlock and Hemlock-Northern Hardwood forest communities on the parcel could be managed specifically to enhance the conifer overstory and hemlock regeneration which would serve to enhance the value of the habitat for wintering deer. The best deer wintering habitats maintain at least 70% closed forest canopy of evergreen trees. Additional forest management activities that are compatible with the continued use of these habitats by deer include the creation of small areas (less than 1 acre) of food production including the promotion of fruit-bearing trees and shrubs, and the creation of young early succession forest.
 - Avoid the introduction of new trails, especially which would be used in the winter, in these forest types.
 - Hiking trails within actively used deer wintering areas should be closed during winter months. Use during other seasons is compatible.
 - Organized recreational activities such as snowshoeing, cross country skiing, and snowmobiling in and near deer wintering areas should be discouraged.

Recreation

The Andrews Community Forest contributes significantly to the town's scenic rural and natural character. The natural communities on the forest are not confined to the human-drawn boundaries of the forest. Therefore, conservation and stewardship of wildlife habitat, water resources, and vegetation must extend beyond those boundaries as well.

The Andrews Community Forest, now as public forested land, is primed to offer recreational opportunities to town residents and visitors. A survey of town residents indicated that many Richmond residents are eager to hike, run, walk, bike, hunt, snowshoe, ski, view birds and wildlife, walk dogs, and picnic in the forest. Richmond's extensive recreational trail system reaches properties abutting on the west and east. Town residents identified connectivity with abutting trail systems to be an important attribute of trail design. The community's management and use of the property must protect the ecological, timber, recreational, educational, open space, and scenic resources of the town and property.

The forest, when owned by the Andrews family, was not posted and allowed hunting, walking, snowshoeing, and skiing. The forest was also managed for timber, leaving logging roads scattered throughout the property. Some of these skid roads are unsuitable for recreational use due to their steep grades; thoughtful trail design will redirect traffic onto trails, reducing use of existing skid roads. Other roads act as important recreational and management corridors throughout the property and remain in use. Those include the recently improved VELCO road, the Maple Wind Farm road on the eastern boundary, and the VAST trail running east-west across the property.

The conserved lands around the community forest create opportunities for a larger, connected trail network. The VYCC campus, which adjoins the property to the east, has a number of short trail loops (pedestrian-access only presently). Their work, along with the Monitor Barn, brings many visitors to the campus. Many of these visitors may be interested in longer trail loops onto the Community Forest and VYCC wants the forest to be a showcase for their trail-building abilities and a “porous” boundary between the two properties. Other surrounding property owners have trails on their property that are open to the public. The committee will seek to develop a trail system that connects to these existing, mapped, public trails. In doing so, management practice will also include working with neighboring landowners to appropriately sign changes in landownership and allowed uses.

The Conservation Easement allows for non-motorized, non-mechanized recreational use of the forest (i.e., walking, snowshoeing, skiing, hunting). Other uses must be included and provided for in this plan to be permissible on the forest. Given the community’s interest in both mountain biking and snowmobiling, as was apparent in the survey and in public forums, such trails will be incorporated in the trail concept for the Community Forest. The VAST trail passes through the forest and snowmobile use will be allowed in the forest on the existing VAST corridor. The Committee will meet with VAST representatives annually to review the use contract and ensure snowmobile use is compatible with the other management goals for the Community Forest.

The trail system should be encouraging of both resident and visitor use. The forest and its trail system shouldn’t be explicitly a destination, but rather an additional amenity that adds to the array of outdoor recreational opportunities that draw visitors to Richmond. Given the forest’s proximity to town, creating a walking/biking connection to the forest from Richmond Village would benefit both residents and visitors. The Committee will work with the Selectboard, the Town Highway Department, and the Richmond Land Trust to explore this option when the timing is appropriate. Furthermore, the Committee will seek to install a bike rack at the entrance to the Community Forest.

The property, when owned by the Andrews family, was open to both hunting and trapping. Many members of the community are still interested in using the property to hunt. A smaller number of residents are interested in using the property for trapping. However, the property did not previously contain recreational trails, such as those proposed for development in the Community Forest. The coexistence of these various uses in the same forest presents a management challenge. The Committee has worked with members of the hunting/trapping community and the trail-based recreation community to consider the ways that these uses might co-exist. The Town will place an emphasis on education about hunting season safety for both hunters and non-hunters. Trapping will not be permitted on the Town Forest because of the safety hazard it presents to visitors and their pets, who may be traveling both on and off trail.

Trail Concept Map

Trails depicted in the Trail Concept Map (Appendix A.a.) are intended as a roadmap to trail construction. While they do not yet exist on the ground, they reflect the approximate desired location of future trails, pending the results of the coarse- and fine-scale ecological assessment outlined below.

This Trail Concept Map is the product of extensive public input and committee deliberation, reflects a compromise of many recreational uses, and achieves the following objectives determined by the Committee to be a top-priority.

The Trail Concept:

- Establishes connectivity between public, mapped trails to the east and west of the property.
- Establishes one long loop from the parking area, and many shorter loops.
- Is intentionally lower density above the powerlines and higher density below the powerlines to place equal emphasis on natural resource protection in the interior forest areas of the property, while still inviting and encouraging public visitation.
- Avoids sensitive natural features whenever possible and gives an appropriate buffer to natural resources, as guided by professional ecologists.
- Provides shorter loops at a lower grade from the parking area to ensure the property is accessible and inviting to people of all ages and abilities.

Trail Development

Trails depicted in the Trail Concept Map (Appendix A.a.) are intended as a roadmap to trail construction. While these do not yet exist on the ground at the time of management plan adoption, they reflect the approximate desired location of future trails, pending the results of the coarse- and fine-scale ecological assessment outlined below.

Trails not appearing on the Trail Concept Map shall not be approved for construction until a new Trail Concept Map is adopted through a full revision of the management plan, which is subject to review and approval by the Selectboard, and the easement holders. The Trail Concept Map shall not be revised independent of the Management Plan.

Trail Construction

- The Community Forest Committee will seek grant funding to support the professional design and construction of trails throughout the Richmond Community Forest.
- When prioritization decisions must be made, projects will be selected based on their utility for the greatest number of people.

Process for Installing Approved Trails

To bring the trail concept from “concept” to “action,” the Committee has agreed to the following process:

- The hired professional trail designer will flag a route that, to the best of their ability, follows the route appearing in the approved Trail Concept Map.
- Arrowwood, or another professional ecologist, will walk the flagged route and a 50 foot buffer on either side to determine whether there are any fine-scale features (rare, threatened, or endangered species) that would be adversely impacted by trail development in that particular location. If there are, Arrowwood (or another professional ecologist) will propose a suitable re-route.
- Once a trail is “cleared” for installation by a consulting ecologist, Committee members will work with RTC, RMT, or a hired trail-builder to install trails which meet standards and designed agreed upon by the Committee.
- The Committee may make minor adjustments to the Trail Concept Map to maintain a 200’ buffer between the trail and known sensitive natural resources, when possible, as identified and mapped in existing ecological assessments. When a 200’ buffer cannot be reasonably achieved the

Conservation Easement terms sets a minimum standard for what is acceptable, and the Arrowwood Environmental Natural Resource Guidance Toolkit offer further guidance. The Committee acknowledges that this 200 foot buffer is aspirational and a “best practice,” but may not always be possible while achieving the basic objectives of the Trail Concept (outlined above). Nevertheless, the Committee shall strive to achieve this buffer.

Assessment:

- The Committee will continue to seek opportunities to work with ecologists to study the impacts of trail-based recreation on wildlife.
- The Committee should continue to survey the community to determine whether the trail system meets the community’s wishes. It will be the onus of the Committee and hired professionals to determine when the community’s wishes are incompatible with the objective to protect the property’s natural resources.

Future Trails:

- Trails not appearing on the Trail Concept Map shall not be approved for construction until a new Trail Concept Map is adopted through a full revision of the management plan, which is subject to review and approval by the Selectboard and the easement holders. The Trail Concept Map shall not be revised independent of the Management Plan.
- The Committee will continue to seek professional guidance about the impact of trail density on wildlife in forested ecosystems.

Recreational Partnerships

- Richmond Trails Committee
- Richmond Mountain Trails
- Cochran Ski Area
- Green Mountain Club
- Maple Wind Farm
- VYCC
- Richmond Land Trust
- Scouts
- Community Senior Center

Management Objectives

- Provide a forest that has opportunities for all interested users (hunters, mountain bikers, walkers, etc.).
- Preserve sensitive areas of the forest and route trails around those areas.
- Provide a trail system that is well-connected to trails on adjacent properties and Richmond Village.
- Support local businesses by offering recreational opportunities.

Management Actions

- **Design:**
 - Phase trail development to ensure trail system provides desired recreation experiences.
 - Conduct an assessment and review of existing logging roads.
 - Route trails away from sensitive natural areas, property boundaries, and cultural resources whenever possible, yet providing for educational opportunities.

- Build and monitor new multi-use trails to standards adopted by the Committee.
- Work with the Selectboard, VTrans, and the Richmond Land Trust to explore a connection from the Town Center to the Community Forest.
- **Steward:**
 - Construct a trailhead kiosk at the parking lot.
 - Create signage about hunting seasons, hunting safety, trail etiquette, agricultural uses of the property, allowed user groups, property ownership, etc. both in the forest and at the trailhead kiosk.
 - Install a bike rack at the entrance to the Community Forest to promote bicycling.
 - Educate the public about hunting seasons and hunting season safety through signage and on digital platforms (Front Porch Forum, Facebook, etc.).
 - Work with neighboring landowners to appropriately sign changes in landownership and allowed uses.
 - Establish a use agreement with VAST (to be revisited annually) to ensure snowmobile use is compatible with the other management goals for the Community Forest.
 - Establish clear signage on all trails and navigational aids throughout the forest (trail markers, blazes, signage, and maps).
 - Work with Richmond Trails Committee and Richmond Mountain Trails to conduct routine trail maintenance. The Steering Committee will coordinate with these groups to organize, advertise, and facilitate trail work days.
- **Monitor** impacts of recreational use on natural resources:
 - Pursue opportunities to learn more about the impacts of trail-based recreation on wildlife and to translate this learning into on-the-ground management practices.
 - Engage recreational groups annually (VAST, Trails Committee, RMT, hunters) to obtain feedback about user group coordinator and conflicts.
- **Explore** future opportunities:
 - Explore how recreation rules may need to be modified in the winter season to accommodate uses like snowshoeing, cross-country skiing, backcountry skiing, and fat-biking.
 - Explore how these uses might affect wildlife and natural resources differently in the winter than in the summer.
 - Explore opportunities for expanding backcountry/glade skiing in combination with forest management.
 - Explore interest in grooming wider trails for public cross-country skiing and fat biking.
 - Explore opportunities to host trail-based events and races on forest trails. Committee members will explore strategies to measure the impacts of these events on forest ecosystems and trail infrastructure, and will seek to employ these before and after events.

Agriculture

Maple Wind Farm, the current farm leasee, is a diversified pasture-based livestock, poultry, and organic vegetable farm. The farm started in 1999 in Huntington, and in 2013, the farm acquired 187 acres of former Andrews/Gray Rocks Farm land to begin Richmond operations. Maple Wind also currently farms eight acres of the community forest. They use the “lower meadow” and a meadow along the powerline right-of-way for grazing cattle. Maple Wind typically grazes 30 adult bovines and 30 calves for 10-16

days per year. The Town and Maple Wind are interested in continuing this arrangement and will negotiate a long-term lease.

Maple Wind Farm has a right-of-way for agricultural purposes over the main farm road on the Andrews Community Forest extending from the Dyer-Chadwick property to Maple Wind Farm's upper meadow. The Town has a right of way over the northern edge of Maple Wind Farm's upper meadow. The VAST trail has operated on a year-to-year basis over sections of both these roads / rights of way. The Town will work with Maple Wind Farm to ensure compatible shared use of these two roads and rights of way.

Maple Wind Farm has placed a high tensile electric fence around their grazing area in the community forest's lower meadow. A gate through the fence will allow for public access to the meadow when the pasture is not is use for grazing. When the pasture is in use, the "cutover trail" will be closed.

There may be opportunities on the forest for a community garden/orchard, and agricultural education and demonstration projects. Under the Conservation Easement, agriculture is permitted where the forest has already been cleared. The Steering Committee will remain open to proposals for alternative uses of the agricultural lands, but would not take lightly the decision to stray from a long-term, mutually-beneficial agricultural partnership.

Agricultural Partnerships

- Maple Wind Farm
- Richmond Farmers Market
- Richmond Community Kitchen
- The Farm at VYCC
- NOFA VT
- Vermont Farm Bureau

Management Objectives

- Recognize the importance of agriculture in Richmond and Vermont's heritage and continue to allow agricultural uses that are compatible with other management goals.
- Promote opportunities for agriculture education and demonstration on the parcel, perhaps in conjunction with Maple Wind Farm or other agricultural entity with a vested interest in the property.
- Develop agreements with Maple Wind Farm to allow coexistence of agriculture and public access.

Management Actions

- Work with Maple Wind Farm to develop a lower meadow use agreement and co-manage the rights-of-way.
- Place signage alerting trail users to the electric fencing.
- Install a gate on the western side of the meadow to allow continued public access across the meadow.
- Explore partnerships with above organizations for educational programming and demonstration projects on the forest.

- Explore opportunities for a community garden in the pastures on the Community Forest.

Education

With its natural features and its cultural history, the Andrews Community Forest will provide enriching educational experiences for community members from elementary school students, to college students, to curious adults.

Parking may be available on the landing area to accommodate larger educational groups and school buses. The Committee is also exploring expanding the lower parking area enough to provide a school-bus turnaround. Instructors interested in using the Community Forest for educational purposes should contact the Steering Committee to discuss parking arrangements.

Possible educational opportunities include:

- Climate monitoring program
- Biodiversity monitoring program
- Trail building and maintenance (in partnership with VYCC)
- Tree/bird identification programs
- Sustainable forestry and forest products education
- Sustainable agriculture education
- School field trips on ecology and cultural history
- Mountain biking skills clinics
- Kids summer camps and after school programs
- Guided hikes and snowshoes on forest ecology
- Orienteering workshops

Potential Partnerships

There are many schools and organizations that the Andrews Community Forest could partner with for educational programming:

- Richmond Elementary School
- Camels Hump Middle School
- Mount Mansfield Union High School
- University of Vermont Field Naturalist Program
- University of Vermont Rubenstein School and Environmental Studies Program
- Vermont Youth Conservation Corps
- Green Mountain Audubon Center
- Boy and Girl Scout Troops
- Maple Wind Farm
- Nature Conservancy
- Essex Technical School
- Richmond Recreation Committee
- Vermont Land Trust
- Vermont Forests, Parks, and Recreation
- Mount Mansfield Modified Union School District (MMMUSD) and MMMUSD summer camps
- Part 2 After School and Summer Camps

- Green Mountain Orienteering Club
- Birds of Vermont Museum

Management Objectives

- Educate local students and community members about natural communities, biodiversity, cultural history, the working forest, and good stewardship practices.
- Engage local students and community members in data gathering/analysis.
- Recognize and take advantage of the educational opportunities created by recreational use.
- Use the forest as a model and example of the value of healthy forests to the community, including educational demonstrations and tours.

Management Actions

- Partner with the schools and organizations listed above to hold programming in the forest.
- Place interpretive signage throughout the forest about natural communities, stewardship, and cultural history.
- Host community events with an educational component.
- Use timber management activities as an opportunity to educate the community about proper forest management.
- Modify educational programming around hunting season.
- Create and maintain locations for birding and viewing wildlife.

Legal Agreements on the Property

There are many agreements, right-of-ways, and easements that will be key to the management of the forest.

Agricultural Lease

Maple Wind Farm is the adjoining land owner and its land includes the remaining acres of the original Andrew farm. Maple Wind Farm has historically used eight acres of what is now the community forest for grazing cattle. For 10-16 days each year, 30 adult bovines and 30 calves graze on the forest's lower meadow and the meadow by the VELCO powerline. Both parties are interested in continuing this arrangement and will explore the possibility of a long-term lease. Vermont Land Trust will need to approve this lease before it is finalized. No long-term agricultural easements on the property will be allowed.

In negotiating this lease, the Committee seeks to retain a crossover trail across the lower portion of the pasture linking the VELCO road with the Maple Wind Farm road. This trail would be open anytime cows are not grazing in the pasture; when cows are grazing, the Committee proposes closing this trail and installing appropriate signage to redirect visitors to other route on the property.

Powerline Right-of-Ways

VELCO

A VELCO powerline runs through the community forest and VELCO owns the right-of-way. VELCO needs road access to the right-of-way on occasion for maintenance and repairs to the powerline. In 2018,

VELCO improved a road from the forest entrance on Route 2 to the powerline; they used the upper landing area to stage their work. Following this work, they re-seeded the landing and the road above the landing, and installed waterbars on the road below the landing. At certain periods, VELCO may need to close some or all of the forest to perform larger projects on the powerline. The Community Forest Stewardship Committee should coordinate with VELCO to prepare for such events and fully inform the public of the closure.

Green Mountain Power

Green Mountain Power has a 75-foot right-of-way adjacent to the VELCO line in the same powerline corridor. Within this corridor, Green Mountain Power manages vegetation. The Committee will work to better understand the vegetation management goals and practices, the landowner's (Town's) rights, to advise the Selectboard to make an informed decision about vegetation management within the Powerline corridor, and to communicate this decision broadly to Community Forest visitors.

Management Objectives

- Create and execute agreements that allow the forest to provide an enjoyable user experience and conserve its resource and partners to carry out their necessary work on the forest.

Management Actions

- Work with VELCO and GMP to understand and select vegetation management strategies in the powerline right-of-ways which are safe, effective, and environmentally responsible.
- Communicate with the public about grazing plans or powerline management activities that may influence the public's experience on the property.
- Manage public use during powerline work or grazing periods to mitigate public safety hazards.
- Establish positive working relationships with Maple Wind Farm, VELCO, and Green Mountain Power to ensure that their use of the property is compatible with public visitation.

Summary of Management Objectives and Management Actions

Theme	Objectives	Actions
Governance	<ul style="list-style-type: none"> ● Serve as representatives of the Town in decisions related to management of the Community Forest, with ultimate approval of the Selectboard. ● Oversee management of the Community Forest responsibly and in accordance with the Management Plan and the Conservation Easement. ● Act as a liaison with the Vermont Land Trust when input or approval is needed. ● Lead the management planning process whenever updates are needed. ● Provide regular opportunities for public engagement with the Community Forest and in the planning/management of this community-owned property. ● Educate the public about the Community Forest. 	<ul style="list-style-type: none"> ● Establish guidelines about decision-making authority on matters related to the Town Forest, to be presented to and approved by the Selectboard. These guidelines will outline a hierarchy of authority for decision-making at the level of the Steering Committee, Town Manager and Selectboard. ● Establish a policy about use of funds contributed for the management of the town forest by third parties, to be presented to and approved by the Selectboard. ● Open discussions about budgeting for Community Forest management.
Cultural History	<ul style="list-style-type: none"> ● Educate forest visitors about the cultural history of the forest and its context within Richmond. ● Protect remaining cultural features. ● Engage visitors of all ages with the forest’s cultural history. ● Continue to expand and enhance the information known about the forest. 	<ul style="list-style-type: none"> ● Protect and highlight remaining cultural features in the forest. ● Add interpretive signage about Gray Rocks in the forest, especially at historic sites. ● Encourage future research and study of the forest’s cultural history, particularly with local schoolchildren. ● Conduct and record interviews with community elders who remember Andrews Farm. ● Place buffers on main trails located near cultural resources; consider access to cultural resources via spur trails. ● Work with the Andrews sisters to host programs and tours about the cultural resources of the farm.
Physical Landscape	<ul style="list-style-type: none"> ● Protect the physical attributes and processes of Andrews Community Forest. ● Ensure that any proposed activities or management actions are appropriate for the physical characteristics of the site. 	<ul style="list-style-type: none"> ● Any permanent or semi-permanent improvements should carefully consider the disturbance to the site and the capacity of the site to support the use. ● Minimize disturbance to the site to protect soil and vegetation. ● Slope steepness affects erosion and access for management. Topography should be an

		important consideration for forest management and recreational uses (i.e. trails).
Water Resources- Streams and Riparian Buffers	<ul style="list-style-type: none"> ● Maintain and preserve surface and groundwater quality. ● Provide food and cover for aquatic and terrestrial species as well as structural habitat diversity within the stream channel with leaf litter and woody debris. ● Protect channel stability by preventing excessive scour and erosion of streambanks. ● Preserve wildlife travel corridors. ● Buffer aquatic plants and animals from disturbance. 	<ul style="list-style-type: none"> ● Protect soil integrity and minimize erosion. ● Maintain natural water levels and flows. ● Forestry and agricultural uses of the property shall, at a minimum, comply with the terms of the Conservation Easement and with state and local water-quality regulations. ● Follow stream crossing and bridge guidelines in management plan. ● Maintain 50 foot Riparian Buffer Zone on all perennial streams (as outlined in management plan and Conservation Easement)
Water Resources - Wetlands	<ul style="list-style-type: none"> ● Protect and conserve significant wetland resources. ● Prevent wetland and water quality degradation. ● Protect important plant and animal habitat. ● Protect significant wetland functions and values. 	<ul style="list-style-type: none"> ● Identify and map wetland resources on the community forest. ● Avoid construction of recreational trails through wetlands. ● Utilize boardwalks and bridges for any necessary wetland crossings. ● Provide wetlands with naturally vegetated buffers. ● Identify and control exotic species.
Water Resources- Vernal Pools	<ul style="list-style-type: none"> ● Provide and maintain high quality amphibian habitat. ● Promote and maintain high levels of shade and coarse woody debris. ● Per the Conservation Easement, clearly identify management practices within the EPZ zones in the Forestry Plan. 	<ul style="list-style-type: none"> ● Avoid any disturbance or impact to the actual vernal pool. ● Maintain primary and secondary ecological protection zones around the vernal pools as described in the Conservation Easement. Pedestrian trails are compatible in the primary EPZ but must be approved by VLT. ● Avoid creating ruts or pools of standing water for recreational trails in the primary EPZ. ● Follow harvest prescriptions in the EPZ's as identified in the Forestry Plan. ● Identify and control exotic species in the vernal pool and surrounding buffer zones.
Forests	<ul style="list-style-type: none"> ● Maintain a healthy and productive forest ● Maintain and encourage a diversity of native species, of all taxa ● Maintain and encourage a structurally complex forest ● Protect sensitive natural resources, including water resources, significant natural communities and rare, threatened and endangered species 	<ul style="list-style-type: none"> ● Create a Forest Management Plan with the County Forester, to be approved by Vermont Land Trust before engaging in any forest management activities. ● Hold educational events around forest management activities to inform the public about the rationale and best practices of sustainable forest management.

	<ul style="list-style-type: none"> ● Protect the forest from the invasion of exotic, invasive species, including taking steps to control existing populations of invasive exotic plants. ● To use any timber harvesting in the Andrews Community Forest for educational and demonstrational purposes, demonstrating sustainable timber harvesting to residents of Richmond and beyond. ● Enhance wildlife habitat whenever possible. ● Preserve the cultural and historic importance of the responsible stewardship of forested land on a property with a tremendous history, of which forest management has been a part for centuries. ● Conduct all management activities in accordance with Vermont’s Acceptable Management Practices to prevent soil erosion, protect water quality. ● Manage forest stands for long rotations, including retaining biological legacy trees and areas of trees indefinitely. 	
Wildlife Habitat	<ul style="list-style-type: none"> ● Provide a diversity of upland, wetland and riparian habitats for wildlife. ● Identify and accurately map significant wildlife habitat elements. ● Identify an appropriate balance of all resource attributes of and uses for the Property. ● Provide a plan for recreation trails with minimal impact on natural resources. 	<ul style="list-style-type: none"> ● See extensive list of management actions in Management Plan.
Recreation	<ul style="list-style-type: none"> ● Provide a forest that has opportunities for all interested users (hunters, mountain bikers, walkers, etc.). ● Preserve sensitive areas of the forest and route trails around those areas. ● Provide a trail system that is well-connected to trails on adjacent properties and Richmond Village. ● Support local businesses by offering recreational opportunities. 	<ul style="list-style-type: none"> ● See extensive list of management actions in Management Plan
Agriculture	<ul style="list-style-type: none"> ● Recognize the importance of agriculture in Richmond and Vermont’s heritage and continue to allow agricultural uses that 	<ul style="list-style-type: none"> ● Negotiate with Maple Wind Farm on the lower meadow lease and the right-of-way. ● Place signage alerting trail users to the electric fencing.

	<p>are compatible with other management goals.</p> <ul style="list-style-type: none"> ● Promote opportunities for agriculture education and demonstration on the parcel, perhaps in conjunction with Maple Wind Farm or other agricultural entity with a vested interest in the property. ● Work through leases and easements to allow for Maple Wind Farm operations and public access and connections in the trail system. 	<ul style="list-style-type: none"> ● Install a gate on the western side of the meadow to allow continued public access across the meadow. ● Explore partnerships with above organizations for educational programming and demonstration projects on the forest. ● Explore opportunities for a community garden on the forest.
Education	<ul style="list-style-type: none"> ● Educate local students and community members about natural communities, biodiversity, cultural history, the working forest, and good stewardship practices. ● Engage local students and community members in data gathering/analysis. ● Recognize and take advantage of the educational opportunities created by recreational use. ● Use the forest as a model and example of the value of healthy forests to the community, including educational demonstrations and tours. 	<ul style="list-style-type: none"> ● Partner with the schools and organizations listed above to hold programming in the forest. ● Place interpretive signage throughout the forest about natural communities, stewardship, and cultural history. ● Host community events with an educational component. ● Use timber management activities as an opportunity to educate the community about proper forest management. ● Modify educational programming around hunting season. ● Create and maintain locations for birding and viewing wildlife.
Legal Agreements	<ul style="list-style-type: none"> ● Create and execute agreements that allow the forest to provide an enjoyable user experience and conserve its resource and partners to carry out their necessary work on the forest. 	<ul style="list-style-type: none"> ● Work with VELCO and GMP to understand and select vegetation management strategies in the powerline right-of-ways which are safe, effective, and environmentally responsible. ● Communicate with the public about grazing plans or powerline management activities that may influence the public's experience on the property. ● Manage public use during powerline work or grazing periods to mitigate public safety hazards. ● Establish positive working relationships with Maple Wind Farm, VELCO, and Green Mountain Power to ensure that their use of the property is compatible with public visitation.

Maps & Appendices

- A. Maps
 - a. Trail Concept Map - zones
 - b. Trail Concept Map - possible trails
 - c. Conservation Easement Map
 - d. Interim Management Plan Map (applicable through 12/31/18)
- B. Chart: Evolution of Allowed/Prohibited Uses Through Planning Phases
- C. Steering Committee Bylaws
- D. Conservation Easement
- E. Baseline Documentation Report
- F. Ecological Assessments
 - a. Andrews Farm Ecological Assessment – Allaire Diamond
 - b. Four Town Ecological Assessment - Arrowwood Environmental
 - c. Forest Bird Habitat Assessment and Management Recommendations (Hagenbuch, 2017)
- G. Results and Comments from Public Meetings
- H. Interim Management Plan (March 2018-December 2018)

References

Arrowwood Environmental Natural Resource Guidance Toolkit. 2018. Vermont Town Forest Recreation Planning.

Audubon Vermont and the Vermont Department of Forests, Parks, and Recreation. 2011. *Silviculture with Birds in Mind: Options for Integrating Timber and Songbird Habitat Management in Northern Hardwood Stands in Vermont*.

Barre Community Forest Management Plan Committee. (2013, 2 27). Barre Community Forest Community Forest Plan. *Community Forest Plan for the Barre Community Forest*. Vermont: Barre Town Selectboard.

Bennington County Conservation District. (2016, January). Final Management Plan, The Greenberg Headwaters Park. Bennington, VT: Town of Bennington.

Degraaf, R.M. et al. 1992. *New England Wildlife: Management of Forested Habitats*. General Technical Report NE-144. Amherst, MA. U.S.D.A., Forest Service.

Diamond, A. 2017. Rapid Ecological Assessment of the Richmond Town Forest. Vermont Land Trust. Richmond, VT.

Hagenbuch, S. (2017, November). Forest Bird Habitat Assessment and Management Recommendations. Huntington, Vermont: Audubon Vermont.

Hawes, Ellen and Markelle Smith. 2005. Riparian Buffer Zones: Functions and Recommended Widths. Yale School of Forestry and Environmental Studies.

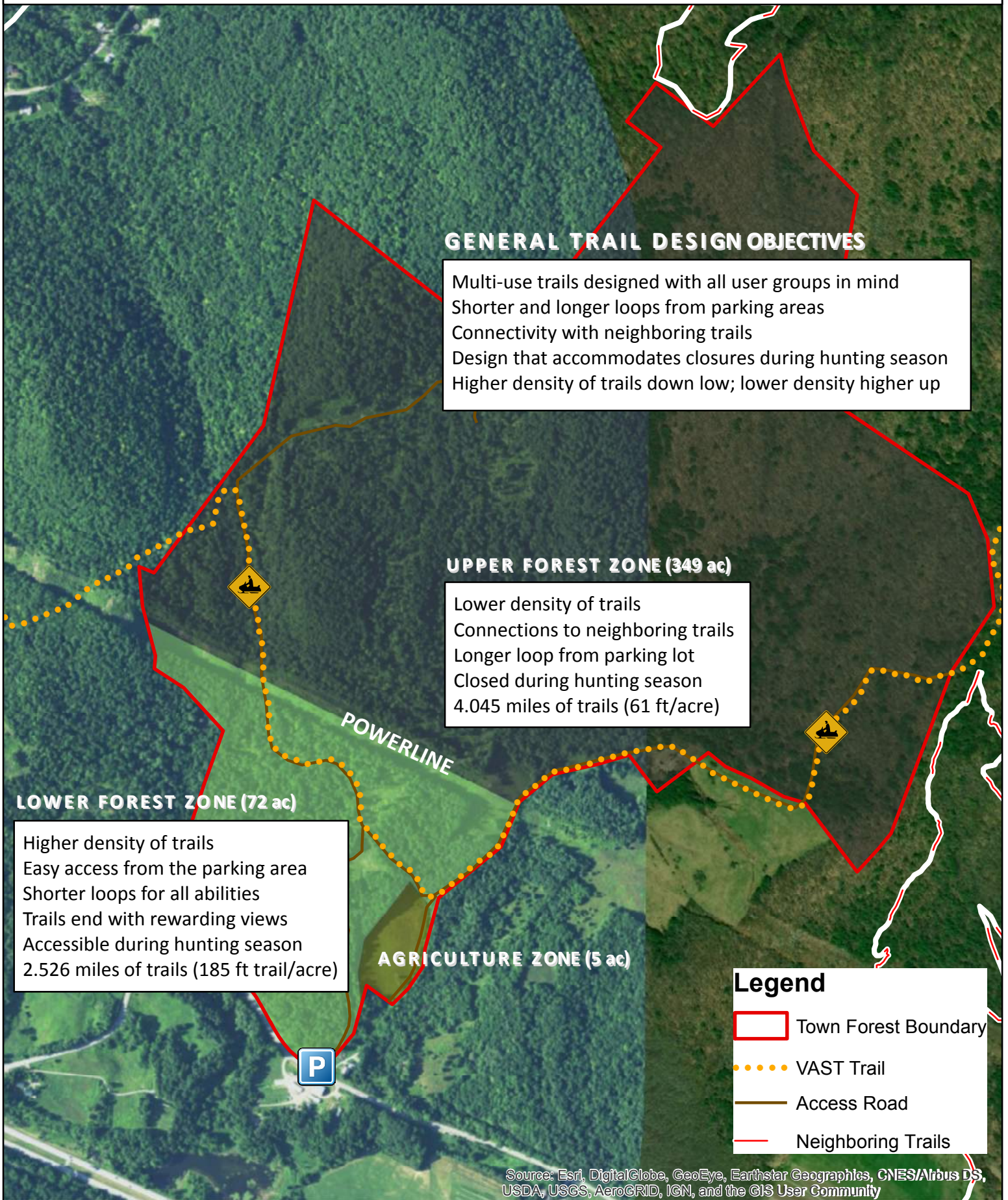
RJ Turner Company. 2008. Eaton Forest Management Plan. Bristol, Vermont: Town of Warren Conservation Commission.

Thompson and Sorenson. 2000. Wetland, Woodland, Wildlife: A Guide to the Natural Communities of Vermont. The Nature Conservancy and the Vermont Department of Fish and Wildlife: Montpelier, VT.

Vermont Department of Fish & Wildlife. *A Landowners Guide: Wildlife Habitat Management for Lands in Vermont*. 2015

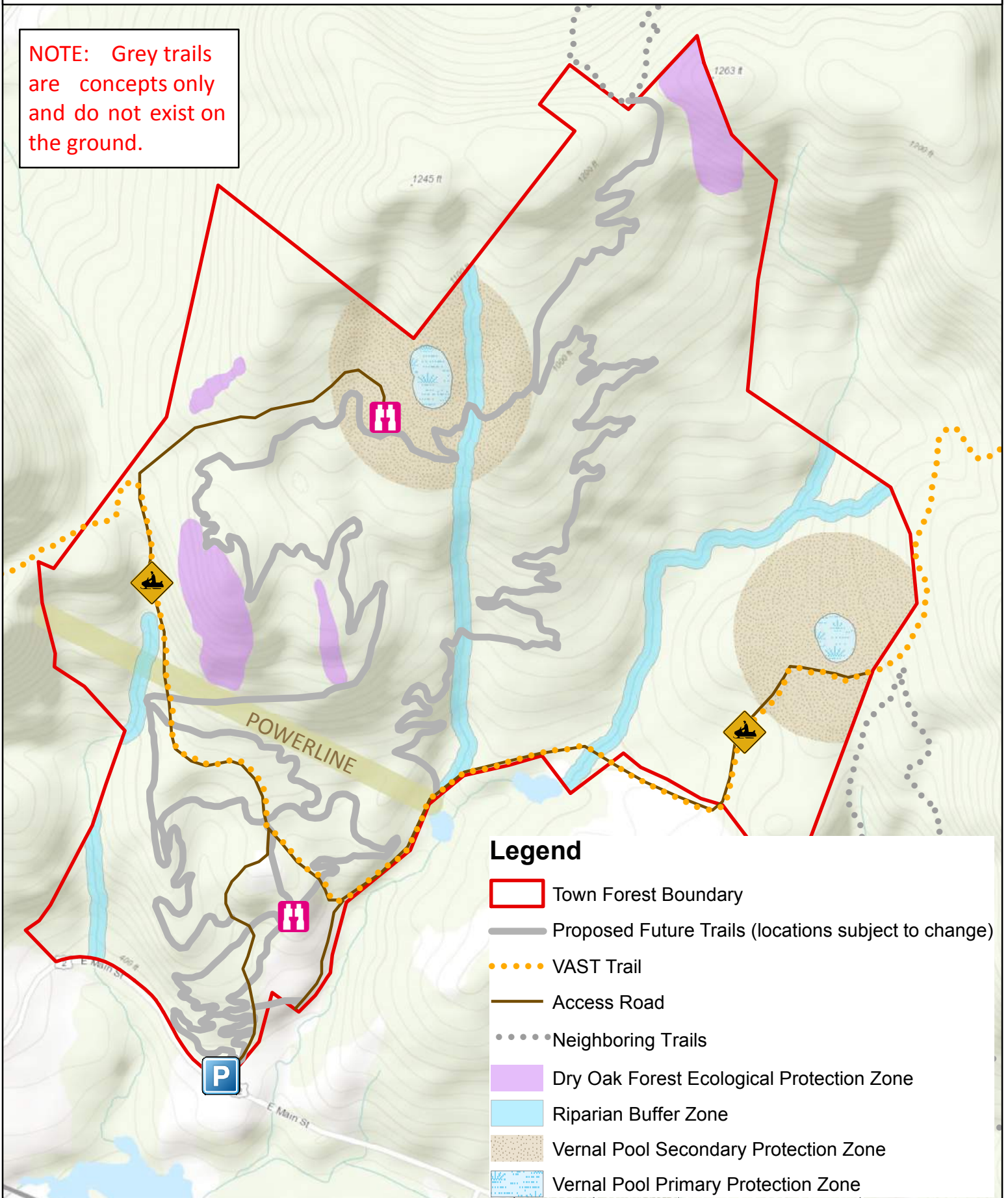
Vermont Department of Fish and Wildlife and the Agency of Natural Resources. *Conserving Vermont's Natural Heritage. A Guide to Community-Based Planning for the Conservation of Vermont's Fish, Wildlife, and Biological Diversity*. 2004

RICHMOND TOWN FOREST TRAIL DESIGN OBJECTIVES



RICHMOND TOWN FOREST TRAIL CONCEPT

NOTE: Grey trails are concepts only and do not exist on the ground.



Vermont Land Trust

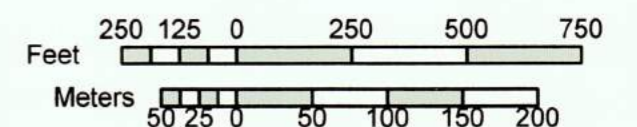
Andrews II Property
Town of Richmond
Chittenden Co., VT

March 2018

VLT Project #131199 VHCB #2017-064-001

The Andrews II Property Conservation Plan is based on the following State of Vermont Base Map 1:5000 orthophoto(s):
Richmond, #112208, 2013;
Richmond North, #112212, 2013.

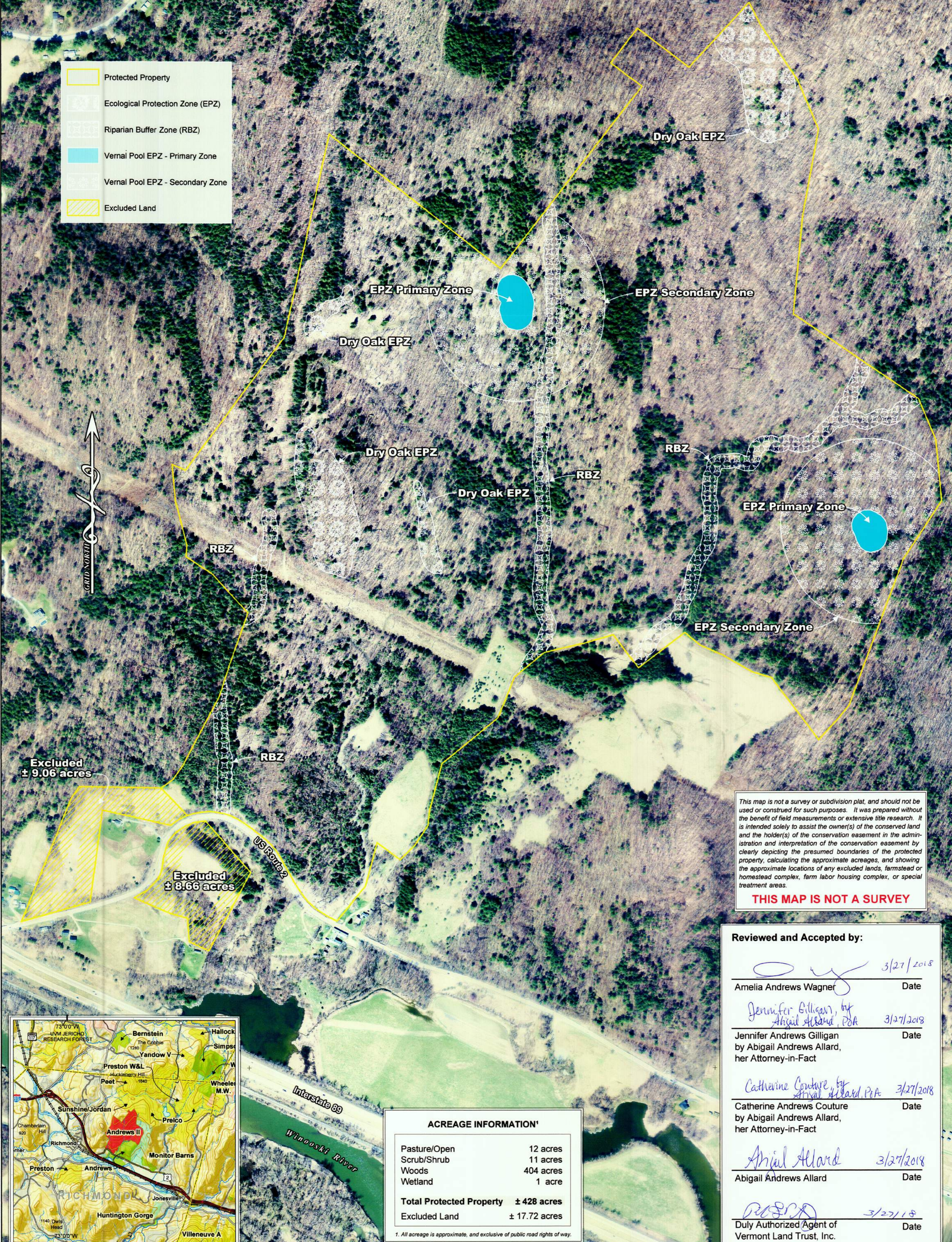
1:5,000 1 inch = 416.7 feet



Reference(s):

- 1) "Plat of 5-Lot Subdivision, Overall Plan, Andrews Farm, 1149 East Main Street, Richmond, Vermont" by Button Professional Land Surveyors, PC, dated 1/5/2013, last revised 5/2/2013, and recorded in Map Slides 133 & 134 in the Richmond Land Records.
- 2) "Plat of Survey for Richard Callahan in the Town of Richmond, VT" by John A. Marsh, dated 4/27/81, revised 1/21/88 and recorded at Book 5, Page 38 in the Richmond Land Records.
- 3) "Forest Legacy Project, Sunshine Jordan, Richmond, Vermont" by Brian P. Lavery, dated September 2009, revised June 2010.

- Protected Property
- Ecological Protection Zone (EPZ)
- Riparian Buffer Zone (RBZ)
- Vernal Pool EPZ - Primary Zone
- Vernal Pool EPZ - Secondary Zone
- Excluded Land

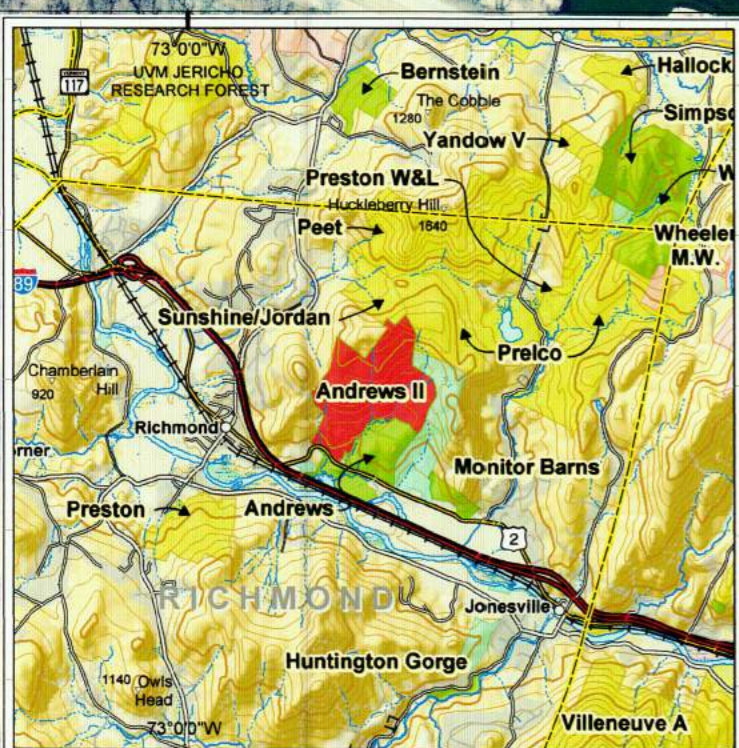


Excluded ± 9.06 acres

Excluded ± 8.66 acres

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

THIS MAP IS NOT A SURVEY



ACREAGE INFORMATION¹

Pasture/Open	12 acres
Scrub/Shrub	11 acres
Woods	404 acres
Wetland	1 acre
Total Protected Property	± 428 acres
Excluded Land	± 17.72 acres

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

Reviewed and Accepted by:

3/27/2018
Amelia Andrews Wagner Date

3/27/2018
Jennifer Gilligan Date
by Abigail Andrews Allard,
her Attorney-in-Fact

3/27/2018
Catherine Andrews Couture Date
by Abigail Andrews Allard,
her Attorney-in-Fact

3/27/2018
Abigail Andrews Allard Date

3/27/18
Duly Authorized Agent of
Vermont Land Trust, Inc. Date

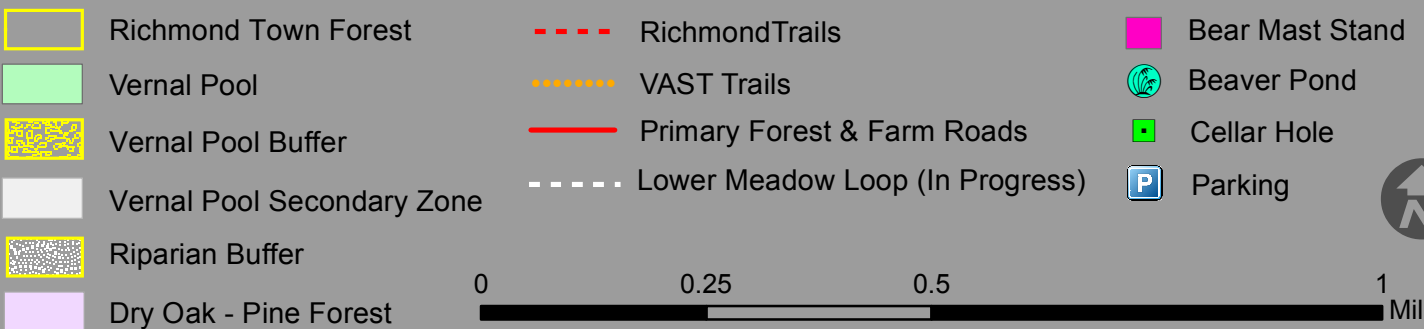
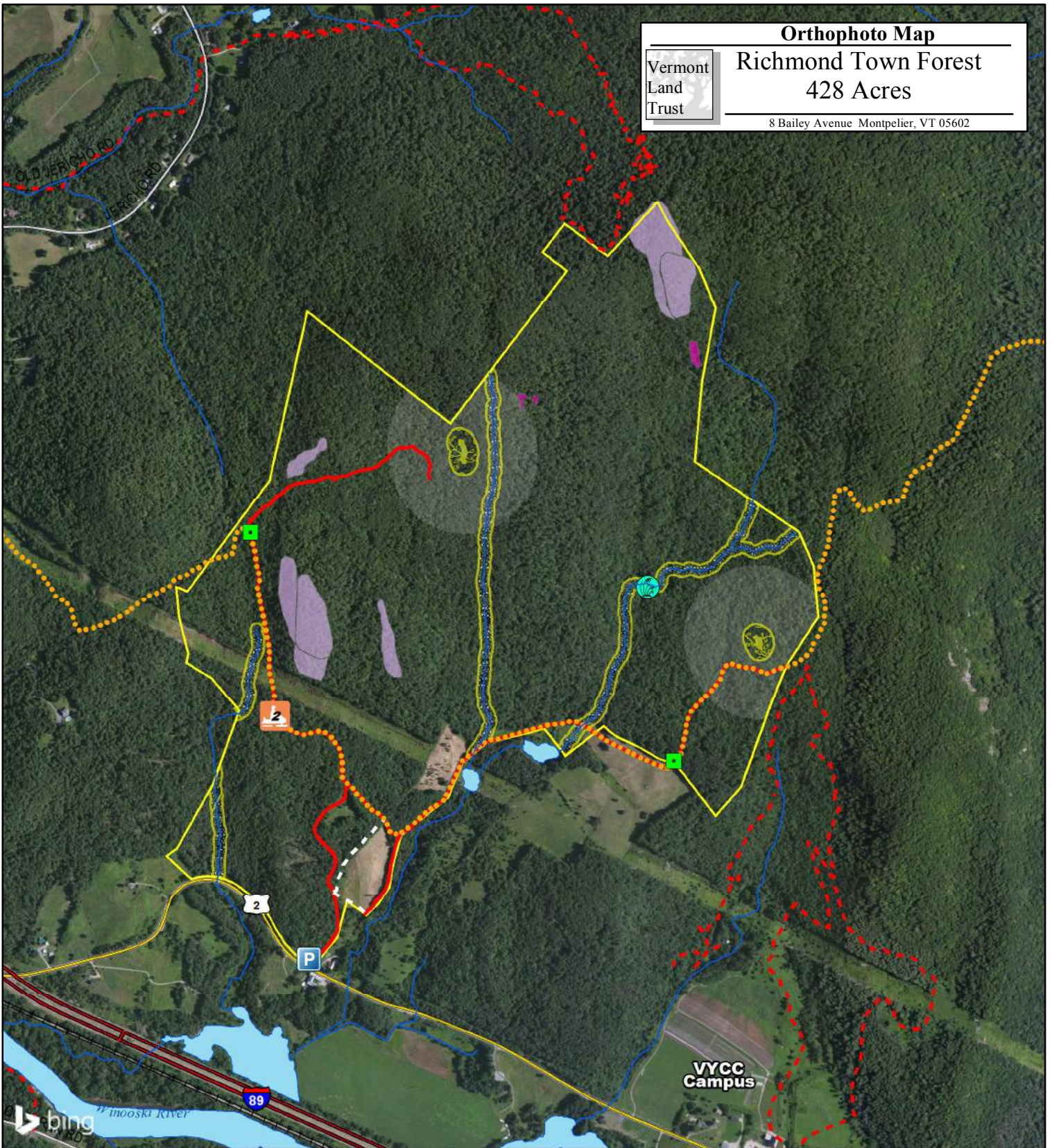
Orthophoto Map

Vermont
Land
Trust

Richmond Town Forest

428 Acres

8 Bailey Avenue Montpelier, VT 05602



Evolution of Major Issues in the Town Forest Management Plan

Topic	Interim Plan	Draft 1	Draft 2	FINAL DRAFT	Issue Summary
Governance	TFSC reports to RCC, which reports to SB	TFSC reports to SB, with two members from each RCC and TC	TFSC reports to SB, with one member from each RCC and TC, and one additional appointee from each committee (does not need to be a member of that committee).	Member terms will be phased (1, 2, 3 year terms)	Desire to achieve "balance" of RCC/TC on the Committee; acknowledgement that this is a big time commitment and a lot to ask for two members of each of those committees, so discussed "appointees" instead; desire to have hunter and neighbor always represented on the committee, too
Hunting	Yes	Yes, with seasonal and geographic restrictions	Yes, with no restrictions except regular Vermont hunting seasons, rules, and regulations.	Modified "dawn-to-dusk" language to protect access to hunters and other "quiet recreationists" outside of the dawn-to-dusk hours.	First draft proposed restrictions on seasons and locations; second draft removes those restrictions. Original restrictions were intended to reduce conflict between hunters and trail users (a concern noted early in the process), but when this translated to restrictions, both groups advocated for these restrictions to be eliminated.
Trapping	No mention	No recreational trapping; only as deemed necessary by the Committee for management purposes.	No recreational trapping; only as deemed necessary by the Committee for management purposes.	Changed "recreational trapping" to "trapping"	Concerns about trapping have been noted by multiple members of the public since the beginning of the process. A few individuals have advocated for recreational trapping. Committee has not heard a suitable strategy for mitigating the risks posed by trapping.
Mountain Biking	No	Yes, with seasonal and spatial restrictions, on established and approved trails	Yes, on established and approved trails		Some seasonal restrictions posed in first draft to accommodate hunting seasons, but both hunters and mountain bikers advocated for relaxing restrictions. Some discussions about mountain bike specific trails, but major concern that trail density would be too great. All proposed trails are multi-use; committee will work with trail groups to counsel users on trail etiquette.
Motorized trail use (snowmobiles)	Yes, on VAST trail only.	Yes, on VAST trail only.	Yes, on VAST trail only.		VAST trail is presently closed to the west so VAST traffic in winter 2018-2019 may be low. VAST users wanted a parking area and turnaround, but lower parking lot does not have enough space to accommodate this. While upper parking lot could accommodate turnarounds, this would require the Town to plow/sand the road, which is not wide enough to accommodate two-way traffic.
Other motorized vehicle use (ATVs, tractors, etc.)	For individuals with mobility disabilities, or for property maintenance.	For individuals with mobility disabilities, or for property maintenance.	For individuals with mobility disabilities, or for property maintenance.		No real concerns emerged throughout the process. Committee identified need to establish ADA-accessible trail from the parking area.
New Trail Construction	No, with two exceptions around the lower field.	Yes, as established per process in management plan and approved by the Steering Committee and VLT	Yes, as established per process in management plan and approved by the Steering Committee and VLT	Addition of language about striving "to maintain a 200' buffer between the trail and known sensitive natural resources, as identified and mapped in existing ecological assessments, understanding that such a buffer may not always be possible while achieving the basic goals of the Trail Concept." Added clarifying language about how new trails are considered; the process by which new trails can be considered.	Major concerns about high trail density and protection of natural resources. Plan emphasizes a process by which new trails will be laid out, assessed by an ecologist, and then built. Also establishes trail system "design goals."

Dogs	No mention	Yes, under owners verbal or non-verbal command, and in accordance with Town Dog Ordinance	Yes, under owners verbal or non-verbal command, and in accordance with Town Dog Ordinance	Modified language to it adheres entirely with the Town Dog Ordinance.	No real concerns emerged throughout the process.
Other topics			<p>Added need to explore how winter recreation impacts wildlife and natural resources differently than summer recreation.</p> <p>Added governance priorities for upcoming year (p4).</p> <p>Added <i>Interim Management Plan and Chart Summarizing Evolution of Proposed Management Actions</i> to appendices</p> <p>Added "add bike rack by parking lot" to recreation management actions.</p>		

Richmond's Andrews Community Forest
Management Committee

~ Bylaws ~

Draft of October 21, 2018

Adopted: _____, _____

1. The purpose of the Andrews Community Forest Management Committee (the "ACF Committee") is to manage Richmond's town forest with the broadest possible representation of the perspectives and interests of the community of Richmond.
 - a. The ACF Committee is charged with management of Richmond's town forest to meet priorities and goals outlined in the Town Forest Management Plan or as directed by the Selectboard or Town Manager.
 - i. Each ACF Committee member shall avail their expertise and background to the forest's management, but are elected to represent the interests of the forest and the town.
 - b. *Line of Authority*: Decisions made by the ACF Committee are presented to the Richmond Selectboard for final approval.
 - c. *Consulting*: Individuals or groups with needed expertise may be consulted on issues requiring specialized review or broader input.

2. Management Committee:
 - a. *Voting Members*: Richmond's *Andrews Community Forest (ACF)* Management Committee (the "ACF Committee") will have 7-9 members with appointments approved by the Richmond Selectboard (SB).
 - i. *Committee Chair and Secretary*: The committee's chair will be nominated by the ACF Committee with 2/3^{rds} majority and put before the SB for approval.
 1. The Committee may choose to select a standing secretary from among members by a 2/3 majority vote, or
 2. The Committee may choose to select a secretary at each meeting by voice vote.
 3. For meetings without a quorum, a standing member may volunteer to act as secretary to record and report minutes.

- ii. *Terms of appointment:* Members shall serve on the ACF Committee for an initial period of one, two or three years, which may be renewed for up to total three (3) year tenure upon approval by the Richmond Selectboard.
 - 1. Appointments to the Committee shall begin on the date of Selectboard approval and shall expire or be renewed on the anniversary of appointment.
 - 2. The Chair and Secretary of the Committee shall maintain a schedule of appointment, renewal and retirement dates for each standing member and track the number of years each member serves.
 - iii. *Renewal/Replacement:* Retirements from the ACF Committee shall be replaced within two (2) months by nomination of a new member and acceptance by the ACF Committee by 2/3rds majority. Within one (1) month of nomination, the new member shall be put before the SB for formal appointment of new members.
 - b. *Delegation:* Of the ACF Committee's voting members, one shall be appointed from the Richmond Conservation Commission (RCC) and one appointed from the Richmond Trails Committee (RTC). Both the RCC and the RTC shall also each recommend an individual that are not members of these committees.
 - i. Members of the RCC and RTC are expected to update their respective committees on a regular basis and to provide comment during ACF meetings to represent those committees' interests and concerns
 - c. *Ex Officio Members:* Additional personnel shall be invited to regularly attend the ACF Committee, including staff from Vermont Land Trust and other organizations with a financial or partnership stake in the ACF.
 - d. *Consulting:* The RCC, RTC and other standing committees of the town or other groups and experts shall be consulted on an as needed basis
3. Regular Meetings:
- a. *Schedule:* Regular meetings of the ACF Committee members shall be held at least monthly at a time and place designated by the Committee Chair. Electronic notice of meetings shall be provided to Committee members at least one week prior to the meeting.
 - b. *Notice:* ACF meetings are open to the public and shall be posted electronically in a public forum in accordance with the State Open Meeting Law, such as on Front Porch Forum and on the town's website. Postings shall be no later than 48hrs before the meeting time.
 - c. *Quorum:* A majority of voting members of the ACF Committee, but no fewer than 5 members, shall constitute a quorum, including at least one member from the RCC and RTC.

- d. *Voting*: Approval of all matters requiring Committee vote shall require affirmation by a two thirds majority of those voting members present.
4. Rules of Procedure:
- a. The ACF Committee shall otherwise follow the most recently amended version of the “Rules of Procedure” adopted by the Richmond Selectboard. These Rules can be obtained from the Richmond Town Manager and/or from the Town of Richmond website.

**GRANT OF DEVELOPMENT RIGHTS, CONSERVATION RESTRICTIONS,
and PUBLIC ACCESS EASEMENT**

WHEREAS, Amelia Andrews Wagner, Jennifer Andrews Gilligan, Catherine Andrews Couture and Abigail Andrews Allard are the owners in fee of certain real property in Richmond, Chittenden County, Vermont, which has landscape connectivity and natural resource, recreational and aesthetic values in its present state; and

WHEREAS, this property contains 428 acres (more or less) of undeveloped land in forestry use with limited agricultural potential, which provides wildlife habitat and landscape connectivity as well as recreational opportunities; and

WHEREAS, this property is situated within the Northern Appalachian ecoregion, a largely intact forested region which spans the Tug Hill Plateau and Adirondacks in New York, northern Vermont, northern New Hampshire, and western and northern Maine where wildlife largely roam freely across much of the landscape; and

WHEREAS, there is increasing scientific consensus that an essential strategy for sustaining regional wildlife populations and counteracting the negative consequences of habitat loss, fragmentation, and climate change on wildlife is to maintain landscape connectivity sufficient to sustain natural patterns of wildlife movement and allow for species migration, relocation, movement, and other forms of adaptation; and

WHEREAS, this property is located within an area that has been identified as important for regional landscape connectivity by the "Staying Connected in the Northern Appalachians" initiative, a collaboration of 21 public and private entities working together to protect and restore landscape connectivity in key habitat linkages across the U.S. portion of the Northern Appalachians region; and

WHEREAS, in order to facilitate the creation of a town forest and imposition of a perpetual conservation easement on the property, together with the benefits that will accrue therefrom, the Town of Richmond is willing to acquire the underlying fee interest in the property.

THEREFORE, KNOW ALL PERSONS BY THESE PRESENTS that **AMELIA ANDREWS WAGNER** of East Charleston, Vermont; **JENNIFER ANDREWS GILLIGAN** of Palmyra, Virginia; **CATHERINE ANDREWS COUTURE** of Broomfield, Colorado; and **ABIGAIL ANDREWS ALLARD**, of North Clarendon, Vermont, on behalf of themselves, their heirs, executors, administrators, successors and assigns (collectively known hereinafter as the "Grantors"), pursuant to Title 10 V.S.A. Chapters 34 and 155 and in consideration of the payment of Ten Dollars and other valuable consideration paid to their full satisfaction, do freely give, grant, sell, convey and confirm unto the **VERMONT LAND TRUST, INC.**, a non-profit corporation organized under the laws of the State of Vermont, with its principal office in Montpelier, Vermont, and the **VERMONT HOUSING AND CONSERVATION BOARD**, a public instrumentality of the State of Vermont with its offices in Montpelier, Vermont, and their respective successors and assigns (collectively known hereinafter as the "Grantees") as tenants in common, forever, the development rights, perpetual conservation easement restrictions, and public access easement (all as more particularly set forth below) in a certain tract of land (hereinafter "Protected Property") situated in the Town of Richmond, Chittenden County, State of Vermont, the Protected Property being more particularly described in Schedule A attached hereto and incorporated herein, but this conveyance shall become effective only upon the conveyance by Grantors of the underlying fee interest in the Protected Property to the Town of Richmond, Vermont.

The development rights hereby conveyed to Grantees shall include all development rights except those specifically reserved by Grantors herein and those reasonably required to carry out the permitted uses of the Protected Property as herein described. The development rights, perpetual conservation easement restrictions, and public access easement hereby conveyed to Grantees consist of covenants on the part of Grantors to do or refrain from doing, severally and collectively, the various acts set forth below to the extent that such acts relate to Grantors and not Grantees. It is hereby acknowledged that the development rights, perpetual conservation easement restrictions, and public access easement shall constitute a servitude upon and shall run with the land but only if the Protected Property is conveyed to the Town of Richmond, Vermont. In the event that the Protected Property is not conveyed to the Town of Richmond, this instrument shall not burden the Protected Property.

39793

RICHMOND, VT TOWN CLERK'S OFFICE
RECEIVED FOR RECORD
MARCH 27 A.D. 2018
At 3 o'clock _____ minutes P M. and recorded in
Book 243 Page 037-051 of Land Records
Attest: Yvonne M. Cairns ASBA Town Clerk

I. Purposes of this Grant and Management Plan

A. Statement of Purposes

1. Grantors and Grantees acknowledge the objective of ensuring the availability of the Protected Property for public use and enjoyment, including, but not limited to, educational, recreational and other appropriate community activities and, to that end, the purposes of this Grant (hereinafter referred to as "the Purposes of this Grant") are as follows:

- a. To conserve productive forestland, wildlife habitats, biological diversity, natural communities, riparian buffers, wetlands, soil productivity, water quality and native flora and fauna on the Protected Property and the ecological processes that sustain these natural resource values as they exist on the Protected Property on the date of this instrument and as they may evolve in the future;
- b. To provide for non-motorized, non-commercial recreational, educational and other appropriate community uses on the Protected Property;
- c. To conserve open space values, and scenic resources associated with the Protected Property for present and future generations; and
- d. To require that management of the Protected Property be guided by a public management planning process.

2. Recognizing that conservation of productive forestland is included in the purposes of this Grant, and that both the resource values of the Protected Property and responsible forest management standards will evolve over time, the forest management objectives of this Grant are to:

- a. Manage forest stands for long rotations which maximize the opportunity for the production of maple sap and/or for harvesting, sustained over time, high quality sawlogs while maintaining a healthy and biologically diverse forest. Grantors and Grantees acknowledge that site limitations, biological factors and public uses may preclude the production of high quality sawlogs, and further that the production of a variety of forest products can be consistent with the goal of producing high quality sawlogs and/or maple sap.
- b. Conduct all sugaring and/or forest management and harvesting activities (including the establishment, maintenance, and reclamation of log landings and skid roads) using the best available management practices in order to prevent soil erosion and to protect water quality.

3. To promote that the Protected Property will be owned in perpetuity by the State of Vermont, a municipality, or other qualified organization, as defined in Chapter 34 or Chapter 155, Title 10 V.S.A., or such other qualified entity approved by the Grantees.

4. These purposes will be advanced by conserving the Protected Property because it possesses the following attributes:

- a. It is a relatively natural and unfragmented forest block that advances the effort to conserve landscape connectivity and wildlife habitat corridors within large forested blocks in the Northern Appalachian ecoregion;
- b. It includes 404 acres of forest available for long-term sustainable management for the production of forest products;
- c. It contains the following natural communities that are uncommon in Vermont: Complexes of Dry Oak Forest, Dry Oak-Hickory-Hophornbeam Forest, Dry Red Oak-White Pine Forest, and Red Pine Forest;
- d. It can be used for numerous recreational, cultural and educational purposes by the public;
- e. It includes streams that, with wooded buffers and natural flow, provide an array of ecological benefits including maintaining water quality and providing corridors for species movement;
- f. It includes upland, wetland, and riparian habitat for wildlife;

- g. It includes two vernal pools, uncommon natural communities in Vermont that provide critical breeding habitat for multiple amphibian species;
- h. It is within one of Vermont's largest blocks of unfragmented interior forest, with connections between this forest block and the extensive riparian features of the Winooski River corridor;
- i. It is in the vicinity of other conserved lands; and
- j. It includes a scenic vista from Interstate 89 and US Route 2.

Grantors and Grantees recognize the Purposes of this Grant and share the common goal of conserving these values of the Protected Property by the herein conveyed conservation restrictions, development rights and public access easement to prevent the use or development of the Protected Property for any purpose or in any manner which would conflict with the Purposes of this Grant. Grantees accept the herein conveyed conservation restrictions, development rights and public access easement in order to conserve these values for present and future generations.

B. Management Plans.

Grantors will, from time-to-time and with assistance from Grantees as reasonably requested, develop comprehensive management plans, including updates, revisions and amendments, for the Protected Property (hereinafter "Management Plans"). The Management Plans shall:

1. Provide for the use and management of the Protected Property in a fashion which is consistent with and advances the Purposes of this Grant;
2. At a minimum, the Management Plans shall include the provisions required under this Grant, identify actions necessary to accomplish the following and shall appropriately balance all the resource attributes of and uses for the Protected Property:
 - a. identify and address the management needs of the recreational uses that may need special or more intensive management focus;
 - b. provide for public access and meaningful recreational links to private and public lands;
 - c. include a forest management plan approved by Grantees in accordance with Section I(C), below, if the Grantors propose to harvest timber or commercial non-timber forest products;
 - d. provide a plan for road, sign, trail and sanitary facility use that has minimal impact on water quality and plant, wildlife and aquatic habitat resources and historic and cultural features;
 - e. provide for the sustainable use of fish and wildlife resources;
 - f. provide for the identification and protection of natural communities, plant, wildlife and aquatic habitat and other ecologically sensitive or important areas; and
 - g. provide, as necessary, for any proposed use of the Riparian Buffer Zone, Ecological Protection Zone and Vernal Pool Ecological Zone consistent with Sections V, VI and VII, below.and;
3. Otherwise be consistent with this Grant.

Prior to the final adoption of each Management Plan, including updates, revisions and amendments, Grantors shall, in consultation with Grantees: (a) secure appropriate public input from the general public, (b) develop the Management Plans in a timely and responsive manner, and (c) provide Grantees with a draft of each such Management Plan for its review and approval prior to adoption as well as a copy of each final adopted Management Plan. Grantees' approval of the Management Plans shall not be unreasonably withheld or conditioned if such Plans are consistent with the terms of this Grant.

C. Forestry Plan.

Grantors shall not harvest timber, wood products, commercial non-timber forest products,

or to establish and operate a maple sugaring operation without first developing a forest management plan. Said forest management plan and any updates, amendments or other changes thereto (collectively "the Forestry Plan") shall be submitted to Grantees for their approval prior to any forest management activity. Grantees' approval of the Forestry Plan shall not be unreasonably withheld or conditioned, if the Forestry Plan has been approved by a professional forester and if the Forestry Plan is consistent with the Purposes of this Grant. Grantees may rely upon the advice and recommendations of such foresters, wildlife experts, conservation biologists or other experts as Grantees may select to determine whether the Forestry Plan is consistent with the Purposes of this Grant. The Forestry Plan shall be consistent with the Purposes of this Grant and shall include at least the following elements (except that, in updates or amendments to the Forestry Plan, those elements of the Forestry Plan which do not change need not be re-submitted to Grantees):

1. Grantors' forest management objectives;
2. An appropriately scaled, accurate map indicating such items as forest stands, streams and wetlands, and major access routes, including, but not limited to, truck roads, landings and major skid trails);
3. Forest stand ("treatment unit") descriptions, including forest types, stocking levels before and after harvesting, soils, topography, stand quality, site class, insect and disease occurrence, previous management history, and prescribed silvicultural treatment including harvest schedules;
4. Description of any sugaring operation, including how management will account for impacts on species diversity and ecosystem health, and impacts on wildlife movement and public access;
5. Plant and wildlife considerations (identification of known significant habitats and management recommendations);
6. Aesthetic and recreational considerations (impact on viewsheds from public roads, trails and places);
7. Historic and cultural resource considerations (identification of known resources and associated management recommendations);
8. Management practices to be applied within Riparian Buffer Zones, established in Section V below, which may include but are not limited to shading, accumulation of coarse woody debris, harvest timing, water crossings and erosion controls;
9. Management practices to be applied within the Vernal Pool EPZ, established in Section VII, which may include but are not limited to shading, accumulation of coarse woody debris, harvest timing, water crossings and erosion controls.

The Forestry Plan shall be updated at least once every ten (10) years (or at such other intervals as Grantors and Grantees may mutually agree) if Grantors intend to harvest timber or other wood products. Amendments to the Forestry Plan shall be required in the event that Grantors propose a treatment not included in the Forestry Plan, but no such amendment shall be required for any change in timing or sequence of treatments if such change does not vary more than five years from the prescription schedule set forth in the Forestry Plan as approved by Grantees. In the event that any treatment unit is substantially damaged by natural causes such as insect infestation, disease, ice, fire, or wind, Grantors may elect to conduct an alternative treatment in which event Grantors shall submit an amendment to the Forestry Plan for Grantees' approval prior to conducting any alternative treatment.

Disapproval by Grantees of a Forestry Plan proposing a heavy cut (as defined below) shall not be deemed unreasonable. Grantees, however, may approve a Forestry Plan or an amendment thereto proposing a heavy cut in its discretion if consistent with the Purposes of this Grant, including for the following purposes:

1. To release an established understory;
2. To permit the planting of different species of trees or the establishment or re-establishment of a field, orchard, or pasture;
3. Wildlife management; or
4. To promote natural regeneration.

"Heavy cut" shall mean the harvesting of wood products below the "C-Line" or minimum stocking level on the Protected Property as determined by applying the protocol set forth in the current U.S. Department of Agriculture, Forest Service Silvicultural Guidelines for the Northeast or by applying a similar, successor standard approved by Grantees.

II. Restricted Uses of the Protected Property

A. The Protected Property shall be used for educational, forestry, non-motorized, non-commercial recreation, habitat conservation, natural area, and open space purposes only, except as otherwise specifically permitted under this Grant. No residential, commercial, industrial or mining activities shall be permitted. Agricultural activities are permitted on that portion of the Protected Property in an existing cleared state. Agricultural activities on the forested portion of the Protected Property may occur only with the prior written approval of the Grantees which may be given, denied or conditioned in Grantees' sole discretion. No buildings, structures, or appurtenant facility or improvements shall be constructed, created, erected or moved onto the Protected Property, except as specifically permitted in both Section III below and the Management Plans.

B. No rights-of-way, easements of ingress or egress, driveways, roads, or utility lines or easements shall be constructed, developed or maintained into, on, over, under, or across the Protected Property without the prior written permission of Grantees, except as otherwise specifically permitted under this Grant. Grantees may grant such permission (with or without conditions) if in their reasonable discretion they determine that any such improvement is consistent with the Purposes of this Grant. Grantors shall not convey use restrictions or other easements on, over, under, or across the Protected Property without the prior written permission of the Grantees.

C. There shall be no signs, billboards, or outdoor advertising of any kind erected or displayed on the Protected Property; provided, however, that Grantors may erect and maintain reasonable signs including but not limited to signs indicating the name of the Protected Property and its ownership by Grantors, boundary markers, directional signs, memorial plaques, informational and interpretive signs, and signs limiting access or use (subject to the limitations of Section IV, below). Grantees may erect and maintain signs designating the Protected Property as land under the protection of Grantees, with the prior written permission of Grantors.

D. The placement, collection or storage of trash, human, hazardous or toxic waste, or any other unsightly, harmful or offensive material on the Protected Property shall not be permitted except at such locations, if any, and in such a manner as shall be approved in advance in writing by Grantees and shall be consistent with the Grant and the Management Plans. The temporary storage of trash generated on the Protected Property in receptacles for periodic off-site disposal, shall be permitted without such prior written approval.

E. There shall be no disturbance of the surface, including but not limited to filling, excavation, removal of topsoil, sand, gravel, rocks or minerals, or change of the topography of the land in any manner, except as may be reasonably necessary to carry out the uses permitted on the Protected Property under this Grant. In no case shall surface mining of subsurface oil, gas, or other minerals be permitted.

F. Grantors shall not give, grant, sell, convey, subdivide, partition, convey in separate parcels, transfer, mortgage, pledge, lease or otherwise encumber the Protected Property without the prior written approval of Grantees which approval may be granted, denied or conditioned – including the condition that the Protected Property be sold for only nominal consideration – in the Grantees' sole discretion.

G. There shall be no operation of motor vehicles on the Protected Property except for uses specifically reserved in Section III below, such as agriculture, wildlife and forest management, education, trail grooming, maintenance, and for safety or emergency purposes, and for certain limited recreational uses as provided in Sections III(A), below. However, Grantors may permit motorized personal assistive mobility devices for use by persons with mobility disabilities on the Protected Property if consistent with the Purposes of this Grant, and as may be required by state or federal law.

H. There shall be no manipulation of natural watercourses, marshes, wetlands or other water bodies, nor shall there be activities conducted on the Protected Property which would be detrimental to water quality, or which could alter natural water level or flow, except as reasonably necessary to carry out the uses permitted on the Protected Property under this Grant. The construction of ponds or reservoirs shall be permitted only upon the prior written approval of Grantees, which approval shall not be unreasonably withheld or conditioned, provided that such pond or reservoir is located in a manner which is consistent with the Purposes of this Grant.

I. No use shall be made of the Protected Property, and no activity thereon shall be

permitted which, in the reasonable opinion of Grantees, is not or is not likely to be consistent with the Purposes of this Grant. Grantors and Grantees acknowledge that, in view of the perpetual nature of this Grant, they are unable to foresee all potential future land uses, future technologies, and future evolution of the land and other natural resources, and other future occurrences affecting the Purposes of this Grant. Grantees, therefore, in their sole discretion, may determine whether (a) proposed uses or proposed improvements not contemplated by or addressed in this Grant, or (b) alterations in existing uses or structures, are consistent with the Purposes of this Grant.

III. Permitted Uses of the Protected Property.

Notwithstanding the foregoing, Grantors shall have the right to make the following uses of the Protected Property:

A. The right to use the Protected Property for all types of non-commercial, non-motorized recreational purposes including, but not limited to, bird-watching, cross-country skiing, hiking, hunting, snowshoeing, trapping, walking and wildlife observation consistent with the Purposes of this Grant and the Management Plan(s). Use of the Protected Property for snowmobiling, and for non-motorized, mechanized recreation such as mountain biking and by animals capable of transporting humans (including, but not limited to, horses) may be permitted in the discretion of Grantors if such uses are regulated in the Management Plans and are consistent with the Purposes of this Grant and are consistent with Section(s) V, VI and VII, below.

B. The right to use and maintain existing unforested areas for agricultural use and to establish, maintain and use fields, orchards and pastures for agricultural uses approved by the Grantees under Section II(A), above, or for recreational, scenic or open space purposes and/or for the purpose of maintaining or enhancing wildlife habitat, plant habitat or scenic vistas or values on the Protected Property, provided that the initial forest clearing activity required to establish such fields, orchards, pastures, wildlife habitats, plant habitats, and/or scenic vistas is approved in writing by Grantees, which may grant or withhold such approval—with or without conditions—if they determine, in their sole discretion, that any such use would be consistent with the Purposes of this Grant, is otherwise consistent with the provisions of this Grant and a is component of the Management Plans, and is consistent with Sections V, VI, and VII below.

C. The right to perform forest management activities, including maple-sugaring, the harvest of timber, other wood products and commercial non-timber forest products, provided that:

- 1) all such activities are conducted in accordance with an approved Forestry Plan meeting the requirements of Section I above;
- 2) all such activities are conducted under the supervision of a professional forester holding at least a bachelor of science degree in forestry from an educational institution with a forestry curriculum accredited by the Society of American Foresters, or a forester or other land manager whose education, experience and qualifications are otherwise approved in advance by Grantees (hereinafter "Professional Foresters"); and
- 3) any maple sugaring operations shall meet or exceed the standards outlined in Sugarbush Management Standards and Tapping Guidelines for Forestland in Use Value Appraisal (adopted in 2014) or successor guidelines as determined by the Grantees.

During any road construction, maintenance or harvesting and skidding of forest products, or activities associated with sugarbush management, Grantors shall at a minimum employ the applicable practices recommended in the publication "Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont," a Vermont Department of Forests, Parks and Recreation publication dated October 22, 2016 (hereafter "AMPs"), or such successor standard approved by Grantees.

Nothing in this clause shall be interpreted to require Grantors to harvest a treatment unit (as defined in Section I(C), above, but only to require that any such harvest be conducted in accordance with the Forest Management Plan or the Amended Forest Management Plan, should Grantors elect to harvest.

D. The right to construct, maintain, repair, renovate, replace, enlarge, rebuild, and use sugaring buildings, together with necessary access drives and utilities exclusively for agricultural, silvicultural and educational uses normally associated with a sugaring operation, on the Protected Property; provided, however, that (a) the structures are used exclusively for maple sugaring using maple sap collected on the Protected Property and related educational purposes, and (b) any new

construction, other than normal maintenance and repair, has been approved in writing in advance by Grantees. Grantees' approval may include designation of a "complex" (meaning an area or areas of the Protected Property within which certain structures are or shall be grouped together) surrounding the structure and shall not otherwise be unreasonably withheld or conditioned; provided, however, that the structure or other improvement is located in a manner which is consistent with the Purposes of this Grant and is otherwise consistent with the provisions of this Grant, including Sections V, VI and VII, below. Grantors shall not deem unreasonable a condition by Grantees that certain structures must be located within a complex which may be designated in the future as provided in this Section III.

E. The right to maintain, repair, improve and replace existing recreational trails, together with the right to clear, construct, repair, improve, maintain and replace new trails, provided that the location, use and construction of such new trails are consistent with the Purposes of this Grant, are consistent with the provisions of this Grant, including Sections V, VI and VII below, and are provided for in the Management Plans.

F. The right to conduct periodic, temporary community and public entertainment events on the Protected Property, including concerts, fairs and celebrations, together with the right to erect tents and other temporary structures for such events; provided that such events shall not result in the clearing of any forested areas and provided further that such events are consistent with the Purposes of this Grant and the Management Plan.

G. The right to construct, maintain, repair and use unpaved parking lot(s) on the Protected Property, including associated access drives and utilities, together with the right to construct improvements normally associated with a parking lot. Grantors shall first obtain the prior written approval of Grantees for the location and size of such unpaved parking lots on the Protected Property, which approval shall not be unreasonably withheld nor conditioned, provided that such location and use shall be consistent with the Management Plans and the Purposes of this Grant.

H. The right to construct, maintain, repair and replace permanent or temporary structures, drives and utilities reasonably necessary to support the uses permitted by this Grant (including modest structures to support public outdoor recreation and/or public outdoor education); provided that such structures comply with the requirements of this Section III(H) and the number and location of such structures, drives and utilities are consistent with the Purposes of this Grant, and are consistent with the provisions of this Grant, including Sections V, VI and VII, below, and the Management Plan.

I. The right to charge members of the public reasonable fees for admission to and use of the Protected Property, provided that such fees are collected only for community and public recreation, education or entertainment events on the Protected Property (including, but not limited to, children's activities, concerts, fairs and celebrations) or such fees are reasonably necessary to support Grantors' management of the Protected Property. Notwithstanding the foregoing, members of the public may not be charged a fee to walk on the Protected Property. The right to charge organizations reasonable fees for recreational use of a portion of the Protected Property provided that such use does not unreasonably interfere with the access of the general public to the Protected Property. Fees shall not be based on place of residency. All fees charged for admission to or use of the Protected Property shall be consistent with the Purposes of this Grant, especially that of public access, and are consistent with the provisions of this Grant, including Sections V, VII and VII, below and shall be provided for in the Management Plan.

J. The right to authorize the temporary commercial or non-commercial use of the Protected Property for recreational (including competition events), private social, community entertainment, educational, agricultural, forestry, or research purposes, provided that any such authorization (i) does not unreasonably interfere with the access of the general public to the Protected Property, (ii) authorizes only uses of or actions on the Protected Property that are not inconsistent with the Purposes of this Grant, and (iii) are provided for in the Management Plan. Included herein is the right, by license, by management agreement, or other instrument, to provide for the conducting, operation, and management of the permitted uses described in this Section III by one or more qualified holders or qualified organizations, as defined in Chapter 34 or Chapter 155 Title 10 V.S.A., or other non-profit entities, provided such license, agreement or other instrument is a component of the approved Management Plans.

IV. Public Access.

Subject to the rights under Section III(l), above, Grantors covenant and agree that the Protected Property shall be available to the general public for all types of non-commercial, non-motorized, non-mechanized dispersed recreational and educational purposes consistent with the Purposes of this Grant (including, but not limited to, bird-watching, cross-country skiing, fishing, hiking, hunting, snowshoeing, swimming, trapping, walking and wildlife observation).

Notwithstanding the foregoing, Grantors may limit or restrict public access to the Protected Property to assure compliance with the requirements of this Grant, to protect natural habitats, or to protect the public health or safety (including, but not limited to, the right to permit, regulate or prohibit fishing, hunting and trapping). If Grantees approve a conveyance of the Protected Property, then Grantees may also require that a separate Grant of Public Access Easement also be conveyed to Grantees in a form approved by Grantees.

V. Riparian Buffer Zone.

The Protected Property includes certain lands and premises lying on either side of perennial streams which shall be subject to special protections as set forth herein to protect the water quality of such waterways and the ecological health of the natural systems associated with such waterways. The location of and the restrictions applicable to these areas as follows:

Those areas on the Protected Property lying within fifty feet (50') of the top of the banks of perennial streams, as those waters may move from time to time, and also including any land located between the said tops of banks and the low water marks of such waterways, shall be designated as Riparian Buffer Zones (hereinafter "RBZ"). The location of the RBZ as of the date of this Grant are generally depicted on the Andrews II Conservation Plan, described in Schedule A attached hereto. Within the RBZ, the goals, prescriptions and restrictions of this Section V are in addition to the provisions of Sections I(C), II, and III, and where inconsistent, the provisions of this Section V shall supersede the provisions of Sections I(C), II, and III.

Specifically, the principal goal for management within the RBZ is the establishment and maintenance of high quality buffers that provide an array of ecological benefits including, but not limited to:

- (i) buffering aquatic and wetland plants and animals from disturbance;
- (ii) preventing wetland and water-quality degradation;
- (iii) providing important plant and animal habitat; and
- (iv) providing organic matter, nutrients, and structure to aquatic systems.

Any management or use of the RBZ shall be conducted in a manner designed to protect soil integrity and minimize erosion, shall incorporate up-to-date ecological knowledge and management practices, and shall be consistent with the principal goal detailed above. Without limiting the foregoing, any forest management activities within the RBZ (including without limitation the installation of new roads and trails) shall require Grantees' prior approval.

There shall be no agricultural activities (including without limitation the grazing or pasturing of animals) within the RBZ, except as may be approved in Grantees' sole discretion.

VI. Ecological Protection Zone.

The Ecological Protection Zone comprises four (4) areas of rare and uncommon natural communities, characteristic of exposed, shallow-to-bedrock, south-facing slopes, including Dry Oak Forest, Dry Red Oak-White Pine Forest, Dry Oak-Hickory-Hophornbeam Forest, and Red Pine Forest. The Ecological Protection Zone consists of approximately sixteen (16) acres, more or less, and is generally depicted as Dry Oak EPZ" on the Andrews II Conservation Plan (hereafter the "EPZ"). The boundaries of the EPZ may be changed from time to time by mutual agreement of Grantors and Grantees, as established by written agreement recorded in the Richmond Land Records and depicted on a new Conservation Plan signed by Grantors and Grantees.

Within the EPZ, the goals, prescriptions, and restrictions of this Section VI are in addition to the provisions of Sections I (C), II and III of this Grant and where inconsistent, the provisions of this Section VI shall control.

1. Protection of the Dry Oak EPZ, as well as the natural communities that naturally develop in the future in the EPZ, and the ecological processes that sustain them, shall be Grantors' highest priority in planning and conducting all activities within the EPZ.

2. Without limiting the foregoing, within the EPZ Grantors shall comply with the following limitations:

- a) All activities shall incorporate steps to retain soil integrity, water quality, natural species composition, natural disturbance regimes and natural hydrology.
- b) All forest management activities are prohibited; provided, however, that limited vegetation management to protect public health and safety or to promote or restore the ecological integrity of the natural community may be permitted with Grantees' prior written approval, which approval may be granted, conditioned or denied in Grantees' sole discretion.
- c) New roads or trails are prohibited without Grantees prior written approval, which may be conditioned, granted or denied in Grantees' sole discretion.

3. In the event the prohibition against forest management activities within the EPZ contained in Section VI(2)(b) above affects the eligibility of the EPZ for enrollment in the State of Vermont's Use Value Appraisal program, or any successor program thereto ("UVA"), then such restriction shall not apply; provided that the forest management activities shall: (i) be the minimal amount necessary to maintain the EPZ's eligibility for UVA enrollment; and (ii) protect the ecological integrity of the natural community.

4. Limited agricultural activities consistent with the Purposes of this Grant and with the provisions of this Section VI may be permitted in Grantees' sole discretion.

5. In the context of acting under this Section VI, Grantors and Grantees may confer about what constitutes the best available ecological science; provided that, Grantees' interpretation thereof shall control.

VII. Vernal Pool Ecological Protection Zone.

The Vernal Pool Ecological Protection Zone consists of two (2) vernal pools and the area around them which is described below and generally depicted as "EPZ Primary Zone" and "EPZ Secondary Zone" on the Andrews II Plan (together hereinafter referred to as "the EPZ"). The purpose and goal of the EPZ is to provide and maintain high quality amphibian habitat, including critical breeding habitat ("the Goals"), by promoting and maintaining high levels of shade and coarse woody debris. The Grantees, in their sole discretion, may release from the provisions of this Section VII all or a portion of the EPZ if the Grantees determine that it ceases to function in a way that meets the Goals, or if the Grantees determine that new scientific knowledge indicates that the limitations and restrictions of this Section are no longer necessary to meet the Goals.

The EPZ Primary Zone shall be subject to the following limitations and restrictions which shall supersede the provisions of Sections I(C), II, and III of this Grant to the extent these limitations and restrictions are inconsistent with those sections:

EPZ Primary Zone: Each vernal pool and the area within its surrounding 100-foot radius as measured from each pool's edges is the Primary Zone of the EPZ. There shall be no agricultural activity within the EPZ Primary Zone other than the collection of maple sap for maple sugaring operations which may be approved or conditioned by Grantees in their sole discretion. No new structures, land disturbance or improvements, with the exception of pedestrian trails as provided for in Section III (E) above, shall be permitted within the EPZ Primary Zone. Within the EPZ Primary Zone there shall be no removal of standing timber or downed wood or disturbance to the pool's hydrology. The only forest management activities which may take place within the EPZ Primary Zone, after first receiving the written approval of the Grantees, which may be granted, conditioned or denied in Grantees' sole discretion, shall be the control of exotic species and activities that enhance amphibian habitat. Any existing structures, roads and log landings may remain but only in their current locations and shall not be altered, expanded or improved beyond their current condition, but relocation may be permitted with the prior written approval of Grantees, which approval may be granted, conditioned or denied in Grantees' sole discretion. New roads for timber harvest may be approved within the EPZ Primary Zone by the Grantees if in their sole discretion they determine that there is no other location that can practically meet the same purpose.

In the event a total prohibition against harvesting and limitations upon forest management activities within the EPZ Primary Zone affects the eligibility of the EPZ Primary Zone for enrollment in the State of Vermont's Use Value Appraisal program, or similar successor program, then those

foregoing restrictions which affect such eligibility shall not apply and, instead, only such minimal harvesting and other forest management activities as are required to maintain such eligibility shall be permitted within the EPZ Primary Zone.

The EPZ Secondary Zone shall be subject to the following additional element of the forest management plan required under Section I(C) of this Grant:

EPZ Secondary Zone: The Secondary Zone of the EPZ is the forested area lying within an additional 500-foot zone outward from each Primary Zone, as depicted on the Andrews II Conservation Plan. Within the EPZ Secondary Zone timber harvesting is permitted but amphibian habitat needs, such as coarse woody debris and shade, shall be addressed in the preparation of forest management plans which shall explicitly state what prescriptions have been imposed to protect and enhance amphibian habitat.

VIII. Enforcement of the Restrictions.

Grantees shall make reasonable efforts from time to time to assure compliance by Grantors with all of the covenants and restrictions herein. In connection with such efforts, Grantees may make periodic inspection of all or any portion of the Protected Property and for such inspection and enforcement purposes, Grantees shall have the right of reasonable access to the Protected Property, upon reasonable advance notice to Grantors. In the event that Grantees becomes aware of an event or circumstance of non-compliance with the terms and conditions herein set forth, Grantees shall give notice to Grantors of such event or circumstance of non-compliance by hand or by certified mail, return receipt requested, and demand corrective action sufficient to abate such event or circumstance of non-compliance and restore the Protected Property to its previous condition. In the event there has been an event or circumstance of non-compliance which is corrected through negotiation and voluntary compliance but which has caused Grantees to incur reasonable, additional costs, including staff time, in investigating the non-compliance and securing its correction, Grantors shall at Grantees' request and upon Grantors' receipt of proper documentation evidencing such costs, reimburse Grantees all such reasonable, additional costs incurred in investigating the non-compliance and in securing its correction. Said reimbursement obligation shall be premised on Grantees showing that Grantors, or persons acting on its behalf, at its direction or with its permission, is the cause of such event or circumstance of non-compliance.

Failure by Grantors to cause discontinuance, abatement or such other corrective action as may be demanded by Grantees within a reasonable time after Grantors' receipt of notice and reasonable opportunity to take corrective action shall entitle Grantees to bring an action in a court of competent jurisdiction to enforce this Grant and to recover any damages arising from such non-compliance. Such damages, when recovered, may be applied by Grantees to corrective action on the Protected Property, if necessary. If the court determines that Grantors have failed to comply with this Grant in bad faith or without reasonable cause, Grantors shall reimburse Grantees for any reasonable costs of enforcement, including court costs and reasonable attorneys' fees, in addition to any other payments ordered by such court. In the event that one of the Grantees initiates litigation and the court determines that Grantors have not failed to comply with this Grant and that such Grantees have initiated litigation without reasonable cause or in bad faith, then such Grantees shall reimburse Grantors for any reasonable costs of defending such action, including court costs and reasonable attorneys' fees. The parties to this Grant specifically acknowledge that events and circumstances of non-compliance constitute immediate and irreparable injury, loss and damage to the Protected Property and accordingly entitle Grantees to such equitable relief, including but not limited to injunctive relief and ex parte relief, as the Court deems just.

The remedies described herein are in addition to, and not in limitation of, any other remedies available to Grantees at law, in equity, or through administrative proceedings. No delay or omission by Grantees in the exercise of any right or remedy upon any breach of Grantors shall impair Grantees' rights or remedies or be construed as a waiver. Nothing in this enforcement section shall be construed as imposing a liability upon a prior owner of the Protected Property, when the event or circumstance of non-compliance occurred after said prior owner's ownership or control of the Protected Property has terminated.

IX. Miscellaneous Provisions.

A. Where Grantors are required, as a result of this Grant, to obtain the prior written approval of Grantees before commencing an activity or act, and where Grantees have designated in writing one of the other Grantees herein or another organization or entity which shall have the authority to grant such approval, the approval of said designee shall be deemed to be the approval

of Grantees. Grantors shall reimburse Grantees or Grantees' designee for all extraordinary costs, including staff time, incurred in reviewing the proposed action requiring Grantees' approval; but not to include those costs which are expected and routine in scope. When Grantees have authorized a proposed action requiring approval under this Grant, Grantees shall, upon request, provide Grantors with a written certification in recordable form memorializing said approval.

B. While title is herein conveyed to Grantees as tenants in common, the rights and interests described in this Grant, including enforcement of the conservation easement and restrictions, may be exercised by Grantees collectively, or by any single Grantee individually, provided that court enforcement action by a single Grantee shall foreclose action on the same issue(s) by the other Grantees who shall be bound by the final determination.

C. It is hereby agreed that the construction of any buildings, structures or improvements, or any use of the land otherwise permitted under this Grant, shall be in accordance with all applicable ordinances, statutes and regulations of the Town of Richmond and the State of Vermont.

D. Grantees shall transfer the development rights, public access easement, and conservation easement and restrictions conveyed by Grantors herein only to a State agency, municipality, or qualified organization, as defined in Chapter 34 or Chapter 155 Title 10 V.S.A., in accordance with the laws of the State of Vermont and the regulations established by the Internal Revenue Service governing such transfers.

E. In the event the development rights or conservation restrictions conveyed to Grantees herein are extinguished by eminent domain or other judicial proceedings, Grantees shall be entitled to any proceeds which pertain to the extinguishment of Grantees' rights and interests. Any proceeds from extinguishment shall be allocated between Grantors and Grantees using a ratio based upon the relative value of the development rights and conservation restrictions, and the value of the fee interest in the Protected Property, as determined by a qualified appraisal obtained at the direction of either Grantors or Grantees in the year of extinguishment. Grantees shall use any such proceeds to preserve undeveloped and open space land in order to protect the aesthetic, cultural, educational, scientific, and natural resources of the state through non-regulatory means.

F. Without limiting the restrictions contained in Section II(F) of this Grant, in any deed or lease conveying an interest in all or part of the Protected Property, Grantors shall make reference to the conservation easement, restrictions, and obligations described herein and shall indicate that this easement and restrictions are binding upon all successors in interest in the Protected Property in perpetuity. Grantors shall also notify Grantees of the name(s) and address(es) of Grantors' successor(s) in interest.

G. The term "Grantors" shall include the heirs, executors, administrators, successors and assigns of the original Grantors, Amelia Andrews Wagner, Jennifer Andrews Gilligan, Catherine Andrews Couture, Abigail Andrews Allard and, upon a conveyance of the Protected Property to the Town of Richmond, the Town of Richmond shall be the Grantor hereunder. The term "Grantees" shall include the respective successors and assigns of the original Grantees, Vermont Land Trust, Inc. and Vermont Housing and Conservation Board.

H. Any signs erected on the Protected Property which mention funding sources shall include the Vermont Housing and Conservation Board and the Vermont Land Trust, Inc.

I. Grantors and Grantees recognize that rare and unexpected circumstances could arise that justify amendment of certain of the terms, covenants or restrictions contained in this Grant. To this end, this Grant may be amended only by mutual agreement of Grantors and Grantees; provided that Grantees determine in their sole discretion that such amendment furthers or does not materially detract from the Purposes of this Grant. Amendments shall be in writing, signed by both Grantors and Grantees, and shall be recorded in the Town of Richmond Land Records. Notwithstanding the foregoing, Grantors and Grantees have no right or power to agree to any amendment that would limit the term of the Grant, or adversely affect the qualification of this Grant or the status of Grantees under applicable laws, including without limitation Title 10 V.S.A. Chapters 34 and 155, Section 170(h) and 501(c)(3) of the Internal Revenue Code, as amended, and regulations issued pursuant thereto.

J. Grantors warrant that Grantors have no actual knowledge of a release or threatened release of hazardous substances or wastes on the Protected Property.

K. Grantors shall hold harmless, indemnify and defend Grantees against any liabilities, claims and expenses, including reasonable attorney's fees to which Grantees may be subjected, including, but not limited to, those arising from any solid or hazardous waste/hazardous substance release or disposal, or hazardous waste/hazardous substance cleanup laws or the actions, or inactions of Grantors as owners or operators of the premises, or those of Grantors' agents. Grantors shall maintain adequate liability insurance covering the Protected Property and the uses thereof, and shall name Grantees as additional insureds thereunder.

L. This Grant shall be governed by and construed in accordance with the laws of the State of Vermont. In the event that any provision or clause in this Grant conflicts with applicable law, such conflict shall not affect other provisions hereof which can be given effect without the conflicting provision. To this end the provisions of this Grant are declared to be severable.


INVALIDATION of any provision hereof shall not affect any other provision of this Grant.

Richard Couture, John Allard and Thomas Wagner, spouses of Catherine Andrews Couture, Abigail Andrews Allard and Amelia Andrews Wagner, respectively, join in the execution, acknowledgment and delivery of this Grant for the purpose of subordinating any and all rights that they may have in the Protected Property, including but not limited to their rights of homestead and other marital rights with respect to the Protected Property.

TO HAVE AND TO HOLD said granted development rights, conservation easement and restrictions, and public access easement, with all the privileges and appurtenances thereof, to the said Grantees, VERMONT HOUSING AND CONSERVATION BOARD, and VERMONT LAND TRUST, INC., their respective successors and assigns, to their own use and behoove forever, and the said Grantors, AMELIA ANDREWS WAGNER; JENNIFER ANDREWS GILLIGAN; CATHERINE ANDREWS COUTURE; and ABIGAIL ANDREWS ALLARD, on behalf of themselves and their heirs, executors, administrators, successors and assigns, do covenant with the said Grantees, their successors and assigns, that until the ensembling of these presents, they are the sole owners of the premises and have good right and title to convey the same in the manner aforesaid, that the premises are free from every encumbrance, except those of record, not intending hereby to reinstate any interest or right terminated or superseded by this Grant, operation of law, abandonment of 27 V.S.A. Ch. 5, Sub Ch. 7; and they hereby engage to warrant and defend the same against all lawful claims whatever, except as aforesaid.


We herein set our hands at Essex Junction, Vermont this 27th day of March, 2018.

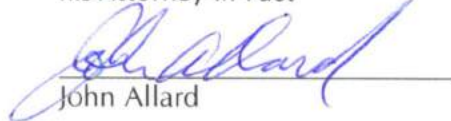
GRANTORS


Amelia Andrews Wagner
Jennifer Andrews Gilligan, by Abigail Andrews Allard, her Attorney in Fact
Jennifer Andrews Gilligan by Abigail Andrews Allard, her Attorney-in-Fact

Catherine Andrews Couture, by Abigail Andrews Allard, her Attorney in Fact
Catherine Andrews Couture by Abigail Andrews Allard, her Attorney-in-Fact


Abigail Andrews Allard


Thomas Wagner
Richard Couture, by Abigail Andrews Allard, his Attorney in Fact
Richard Couture by Abigail Andrews Allard his Attorney-in-Fact


John Allard

STATE OF VERMONT
CHITTENDEN COUNTY

At Essex Junction, Vermont, this 27 day of March, 2018, Amelia Andrews Wagner, personally appeared and acknowledged this instrument, by her sealed and subscribed, to be her free act and deed, before me,


Notary Public
My commission expires: 2/10/2019

STATE OF VERMONT
CHITTENDEN COUNTY

At Essex Junction, Vermont, this 27 day of March, 2018, Abigail Andrews Allard, personally appeared on behalf of herself and as attorney in fact for Catherine Andrews Couture, Richard Couture and Jennifer Andrews Gilligan and she acknowledged this instrument, by her sealed and subscribed, to be her free act and deed and the free act and deed of Catherine Andrews Couture, Richard Couture and Jennifer Andrews Gilligan, before me,


Notary Public
My Commission Expires: 2/10/19

STATE OF VERMONT
CHITTENDEN COUNTY

At Essex Junction., Vermont, on this 27 day of March, 2018, personally appeared Thomas Wagner, and he acknowledged this instrument, by him sealed and subscribed, to be his free act and deed, before me,


Notary Public
My Commission Expires: 2/10/19

STATE OF VERMONT
CHITTENDEN, COUNTY

At Essex Junction., Vermont, on this 27 day of March, 2018, personally appeared John Allard, and he acknowledged this instrument, by him sealed and subscribed, to be his free act and deed, before me,


Notary Public
My Commission Expires: 2/10/19

Approved by the VERMONT LAND TRUST:

3/27/18
Date

By: Paul F. Peterson
Its Duly Authorized Agent

STATE OF VERMONT
CHITTENDEN COUNTY

At Essex Junction, Vermont, on this 27 day of March, 2018, personally appeared Richard F. Peterson, Jr., duly authorized agent of the Vermont Land Trust, Inc., and he acknowledged this instrument, by him/her sealed and subscribed, to be his/her free act and deed, and the free act and deed of the Vermont Land Trust, Inc., before me,

Edward D. Fitzgerald
Notary Public
My Commission Expires: 2/10/19

Approved by the VERMONT HOUSING AND CONSERVATION BOARD:

3/22/18
Date

By: Lawrence W. Mires
Its Duly Authorized Agent

STATE OF VERMONT
WASHINGTON COUNTY

At Montpelier, Vermont, on this 22nd day of March, 2018, personally appeared Lawrence W. Mires, duly authorized agent of the Vermont Housing and Conservation Board, and he/~~she~~ acknowledged this instrument, by him/~~her~~ sealed and subscribed, to be his/~~her~~ free act and deed, and the free act and deed of the Vermont Housing and Conservation Board, before me,

Elizabeth M. Giam
Notary Public
My Commission Expires: 2/10/19

SCHEDULE A
PROTECTED PROPERTY

Being a portion of the lands and premises conveyed to Jennifer Andrews Gilligan, Amelia Andrews Wagner, Catherine Andrews Couture, and Abigail Andrews Allard by Warranty Deed of Everett B. Andrews and Mary Josephine Andrews, dated October 27, 2008 and recorded at Book 186, Page 383 of the Richmond Land Records.

The Protected Property is more particularly described as being all of Lot 1, with all improvements thereon, as shown and depicted on a plan entitled:

“Plat of 5-Lot Subdivision, Overall Plan, Andrews Farm, 1149 East Main Street, Richmond, Vermont”, dated January 13, 2012, last revised January 20, 2013, prepared by Button Professional Land Surveyors, PC, said map of record at Map Slide 133 of the Land Records of the Town of Richmond (“the Survey”).

Being all of the land and premises conveyed to the Grantors by the aforesaid Warranty Deed that remain in their ownership, **excepting and excluding** two (2) parcels: one consisting of 9.06 acres northerly of U.S. Route 2; and the other consisting of 8.66 acres southerly of U.S. Route 2; said parcels being depicted as Lots 5 and 4, respectively, on the Survey; and believed to contain 428 acres, more or less, notwithstanding the Survey.

Reference may be made to said deed and the Survey and the records thereof and to the deeds and records referred to therein for a more complete description.

Meaning and intending to include in this description of the Protected Property all of the Grantors’ land with any buildings and improvements thereon lying northerly of US Route 2 (a/k/a East Main Street), except for the 9.06-acre excluded parcel described above, in the Town of Richmond, Chittenden County, Vermont and believed to contain 428 acres, more or less, notwithstanding the Survey.

NOTICE: Unless otherwise expressly indicated, the descriptions in this Schedule A and in any subsequent Schedules are not based on a survey or subdivision plat. The Grantors and Grantees have used their best efforts to depict the approximate boundaries of the Protected Property and any excluded parcels, complexes or special treatment areas on a plan entitled “Vermont Land Trust – Andrews II Property, Town of Richmond, Chittenden Co., VT, March 2018” signed by the Grantors and VLT (referred to throughout this Grant and its Schedules as “Andrews II Conservation Plan”). The Andrews II Conservation Plan is based upon Vermont Base Map digital orthophotos and other information available to VLT at the time of the Plan’s preparation. Any metes and bounds descriptions included in the Schedules herein are approximate only. They are computer generated and are not the result of field measurements or extensive title research. The Andrews II Conservation Plan and any metes and bounds descriptions herein are intended solely for the use of the Grantors and Grantees in establishing the approximate location of the areas described and for administering and interpreting the terms and conditions of this Grant. No monuments have been placed on the ground. The Andrews II Conservation Plan is kept by VLT in its Stewardship Office. The Andrews II Conservation Plan is not a survey and must not be used as a survey or for any conveyance or subdivision of the land depicted thereon.

Grantors and Grantees do not intend to imply any limitation on the area of land included in this description, should a survey determine that additional land is also encumbered by the Grant. If, in the future, the Grantors or Grantees shall prepare a survey of the Protected Property, of any portion thereof, or of any excluded lands, and that survey is accepted by the other party or confirmed by a court, the descriptions in the survey shall control.

Reference may be made to the above described deed and record, and to the deeds and records referred to therein, in further aid of this description.

VLT # 131199

BASELINE DOCUMENTATION REPORT



Andrews II - Richmond Town Forest

Richmond, Vermont

VLT Project No. 131199
VHCB No. 2017-064-001

Prepared by:
Vermont Land Trust
8 Bailey Ave
Montpelier, VT 05602
(802) 223-5234

 **Vermont Land Trust**
CONSERVING LAND FOR THE FUTURE OF VERMONT

Vermont Land Trust ■ Conservation Stewardship

The Conservation Stewardship Program is staffed by a stewardship director, director of forest stewardship, paralegal, coordinator, stewardship foresters, and regional stewardship managers.

The responsibilities of the Conservation Stewardship Program include maintaining land related records, tracking changes in land ownership, monitoring conserved properties at least annually, photo-documenting land uses periodically, answering landowner questions, interpreting or approving permitted activities, and correcting violations through voluntary compliance or, if necessary, legal proceedings.

This Report Contains the Following Information:

- Introduction and description of the current uses of the property
- Summary of Grantors' and Grantees' rights
- References
- Signature pages
- Conserved property location map
- USGS topographic map
- Orthophoto map
- Conservation Easement map
- Photopoint map
- Photographic Documentation

ANDREWS II - RICHMOND TOWN FOREST PROPERTY Richmond, Vermont

Introduction

The purpose of the enclosed information is to describe the physical features and current land uses of the **Andrews II - Richmond Town Forest** on which the development rights, a perpetual conservation easement and restrictions, and a public access easement are being conveyed to the Vermont Land Trust, Inc. (VLT) and the Vermont Housing and Conservation Board (VHCB). The Grant conveying these rights is to be recorded in the Richmond Land Records.

This report is based, in part, on documentation visits by Adam Piper (Regional Stewardship Manager) for the Vermont Land Trust on July 6, 2017 and on February 2, 2018. Bob Heiser (VLT) and members of the Richmond Town Forest Steering Committee were also present on July 6, 2017. Tyler Miller (VLT) was present on February 2, 2018. Adam assembled the report and digital photographs; maps were prepared by Adam and VLT GIS staff.

Purposes of the Grant

The primary purposes of the conservation easement are to conserve productive forestland, wildlife habitats, biological diversity, natural communities, riparian buffers, wetlands, soil productivity, water quality, and native flora and fauna on the protected property; to preserve the ecological processes that sustain these natural resource values; as well as to preserve non-motorized, non-commercial recreational opportunities, open space values, and scenic resources associated with the protected property.

The purposes of the Grant will be advanced by conserving the property because it possesses the following attributes:

- It is a relatively natural and unfragmented forest block that advances the effort to conserve landscape connectivity and wildlife habitat corridors within large forested blocks in the Northern Appalachian ecoregion;
- It includes 404 acres of forest available for long-term sustainable management for the production of forest products;
- It contains the following natural communities that are uncommon in Vermont: Complexes of Dry Oak Forest, Dry Oak-Hickory-Hophornbeam Forest, Dry Red Oak-White Pine Forest, and Red Pine Forest;
- It can be used for numerous recreational, cultural and educational purposes by the public;
- It includes streams that, with wooded buffers and natural flow, provide an array of ecological benefits including maintaining water quality and providing corridors for species movement;
- It includes upland, wetland, and riparian habitat for wildlife;
- It includes two vernal pools, uncommon natural communities in Vermont, that provide critical breeding habitat for multiple amphibian species;

- It is within one of Vermont's largest blocks of unfragmented interior forest, with connections between this forest block and the extensive riparian features of the Winooski River corridor;
- It is in the vicinity of other conserved lands; and
- It includes a scenic vista from Interstate 89 and US Route 2.

Description and Current Use of the Property

The Andrews family is conserving **±428 acres** in Richmond. This will be their second conservation project and a big step forward in the creation of a Town Forest in Richmond.

The Andrews family's "Gray Rocks Farm" in Vermont's Chittenden County is on the National Register of Historic Places and plays a critical role in defining Richmond's rural character and working landscape. In 2013 after an inter-generational transfer, the family conserved 187 acres of their farmland with the Vermont Land Trust as it was sold to a local, diversified farm family. The Andrews family is now selling the remaining 428 acres of forestland.

The Andrews II land has long been managed as a farm and as a productive woodland. The property is just over 95% forested, with two small meadows. The forestland is diverse, dominated by mixed-wood stands that incorporate hardwood and softwood species. The forestland is accessed on an improved logging road from US Route 2 approximately one mile east of the Richmond village. The property has a network of logging roads and trails, and there are fences maintained by a local farmer around the small meadows. There is also power-line infrastructure, maintained by the Vermont Electric Power Company, along its right of way across the property. There are no additional structures on the property.

This project will enable the Town of Richmond, Vermont to purchase the 428-acre Andrews forestland as a Richmond Town Forest (RTF). The land is well-suited for a town forest given its proximity to the village, extensive wildlife habitat, important natural features, inclusion in an immense and important block of contiguous forestland, significant recreational and educational opportunities, connectivity to existing trail networks, and contribution to Richmond's local economy and scenic, rural character.

Management Plans

The landowner is required to develop a comprehensive management plan including updates, revisions and amendments. The management plan will present a plan for the use and management of the property that is consistent with the easement's purposes, and the management plan will balance all the resource attributes and human use of the protected property. The landowner shall solicit public input from residents of Richmond and the general public. The management plan should be developed in a timely and responsive manner, and VLT shall be provided a copy of each management plan and a copy of each final adopted management plan.

Before any active timber harvesting, sugaring, or other forestry activities may take place, the

landowner must submit a forest management plan (FMP) to VLT for review and approval. The forest management plan must be updated every ten years, and any amended or updated plan must be submitted to VLT for approval before commencing any activities prescribed in the plan. Amendments are required for any proposed change in the treatments prescribed in the approved plan, but no amendment is needed for changes in timing of treatments unless the change in timing is greater than five years. For more information on requirements for the management plans, refer to Section I. B & C of the easement.

Public Access

The Andrews forestland has impressive existing and potential recreational resources. A combination of woods roads and a woodland trail around the lower meadow offer spectacular views to Camels Hump, Vermont's signature peak, for very little effort. A formal loop trail around this meadow would help serve the community's desire to include "something for everyone" as it considers recreation on the Town Forest. There is ample opportunity to expand an existing network of more far-reaching roads and trails that connect to neighboring trail systems. A VAST (Vermont Association of Snow Travelers) trail crosses the property, allowing for groomed winter travel for those on snowmobiles, cross-country skis, or snowshoes. There is an existing connection to the Vermont Youth Conservation Corps (VYCC) trail network to the east.

The Richmond Trails Committee is enthusiastic about the opportunities to design additional trails on the property, and to create new connections, for hiking, mountain biking, and cross-country skiing. Trails on the RTF would be integral to an increasingly linked, town-wide trail network. The Trails Committee has been working with a landowner to the northwest of the property to establish a connecting trail over their Forest Legacy conserved land, linking the Town Forest to existing trails to the Richmond village.

The property will be available to the general public for all types of non-commercial, non-motorized, non-mechanized, dispersed recreational and educational purposes (including bird-watching, boating, cross-country skiing, fishing, hiking, hunting, snowshoeing, swimming, trapping, walking and wildlife observation) and educational activities consistent with the easement's purposes. Any proposed new trails or other uses will be accounted for in the new comprehensive management plan for the property. The landowner may limit or restrict public access to the protected property to assure compliance with the easement, to protect natural habitats, or to protect the public health or safety (including, but not limited to, the right to permit, regulate or prohibit fishing, hunting and trapping). For more information about public access, refer to Section IV of the easement.

Natural Resources

The Andrews II property stretches over 428 acres of mostly south-facing hillside in Richmond, overlooking the Winooski River valley with views to Camels Hump, Mount Ellen, and beyond. Elevations range from just below 400' at the parking area by the property's original homestead along US Route 2, to about 1240' in the northern corner. Metamorphosed sedimentary bedrock, including schist, phyllite, and metawacke, underlies the entire property, as it does under much of the Green Mountains. The property's southerly aspect supports a complex of forested natural communities associated with relatively warm,

dry settings. Large parts of the property were mapped either on the ground or remotely by Arrowwood Environmental in 2013 as part of an ecological inventory of the town of Richmond, and VLT's field work has further refined our understanding of the natural communities.

Mesic Red Oak-Northern Hardwood Forest and Hemlock-Northern Hardwood Forest are the most widespread forest communities here. Red oak, eastern hemlock, American beech, and white pine are the most common species, with sugar maple, red maple and white ash also frequent. Where soils begin to thin out, as they do on convex knobs or gentle ridges and saddles in the upper elevations of the property, smaller patches of Dry Oak-Hickory-Hophornbeam Forest and Dry Red Oak-White Pine Forest occur. In these areas, red oak and white pine dominate, with hophornbeam and serviceberry in the midstory, and an understory that is in places a fairly sparse sedge 'lawn' and in others a more developed organic layer with deeper leaf litter and tree regeneration. Lowbush blueberry is common in the understory of both communities. Where more light can penetrate, whether from a naturally sparse canopy or as a result of human-cleared power lines or timber patch cuts (both of which occur adjacent to patches of these forest types), witch hazel and sweetfern can grow densely. These dry forests in some ways form transitional areas to even drier forest communities: patches of Dry Oak Forest and one small area of Dry Oak Woodland occupy the rockiest, steepest, most exposed adjacent areas. The most notable difference between these communities and those around them is the presence of white oak in the canopy, as well as understory plants characteristic of droughty, shallow-to-bedrock, acidic conditions: these include wintergreen, trailing arbutus, sheep laurel, bracken fern, lowbush blueberry, and American black huckleberry. Rock tripe and toadskin lichens, and polypody ferns, appear on exposed ledges and glacial erratics, and Cladina lichen (sometimes known as reindeer lichen) occurs as well. One small concentration of red pine grows at the edge of a knoll covered by Dry Oak Forest, at the top of a precipitous east-facing dropoff. Shady stands of Hemlock Forest occupy the property's cooler, wetter slopes. In some spots, plants that can indicate slight mineral nutrient enrichment, including round-lobed hepatica and American basswood, occur, which suggests that the bedrock may have some areas that are locally calcium-rich. An inventory during the growing season would provide further insight.

Timber harvest has occurred with varying frequency and intensity throughout the property. While some areas of up to 4 acres have been recently cleared, other portions show little if any cutting in recent decades. For the most part, the areas of Dry Oak Forest and Dry Oak Woodland show minimal signs of cutting, while the matrix communities and likely some Dry Oak-Hickory-Hophornbeam Forest have had recent clearing. A large powerline is continuously kept clear and parts of it include dense stands of witch hazel and sweetfern. The population of American beech here may be in early stages of infestation by beech bark disease, or some trees may have resistance to this threat.

Several perennial streams arise on and meander through the property on their way to the Winooski River. One stream in the southeastern part has been repeatedly dammed by beavers, whose work has resulted in a small open wetland complex.

Two high-quality vernal pools occur on the property. One is tucked into a pocket amid ledgy outcrops beneath a hemlock canopy at about 1000' elevation. At about 5460 square feet in area, and at least 18" deep, it was teeming with incipient amphibian life at our late April visit. Approximately 85 wood frog egg masses, each containing hundreds of eggs, and 86 spotted salamander egg masses, each with up to 100 eggs, were counted here. Recent harvest has come very close to this pool. A second vernal pool occupies a small, sunny depression in hardwood forest at about 770' elevation in the property's southeastern portion, near the VAST trail. We noted about 45 wood frog egg masses and 44 spotted salamander egg masses here, along with several single eggs that may be from other salamander species. A single adult wood frog observed the inventory process. Both pools have coarse and fine woody material in and around them; this material provides important structure for egg-laying as well as terrestrial habitat.

Wildlife have a strong presence elsewhere on the property as well, and our winter visit included an abundance of tracks and sign. White-tailed deer are active throughout the property, with heavy browse in the seedling, sapling, and shrub layers, and beds in or near hemlock cover. Moose have stripped bark off of striped maples. Bobcat tracks traversed the ledgy dry oak area in the northern corner as well as the edge of the small beaver wetland. Coyote, fox, turkey, fisher, and weasel tracks were noted, as were abundant sapsucker holes in tree bark, and a dramatic snowy tableau including a small mammal's trail ending abruptly with the sweep of large feathery wings (potentially owl). Recent claw marks on American beech trees in at least two areas indicate the presence of black bears. One such mast area included at least two clawed trees near a small seepage wetland that may function as a vernal pool. The combination of mast tree species near a wetland that provides fresh water and green plants early and late in the season may be particularly attractive to bears and other wildlife.

The Vermont Conservation Design (2015), a landscape-level conservation prioritization from Vermont Land Trust and the Vermont Agency of Natural Resources, considers the entire property to be part of a 'Highest Priority Interior Forest Block' providing critical ecological function on a statewide level. In addition, the entire property is notable in its contribution to Vermont's physical landscape diversity. Adjacent to other large blocks of conserved land and with connections to the Winooski River valley and its floodplain, this property also plays an important role in landscape connectivity, offering a corridor for wildlife and other species to move. These designations complement the field observations described above.

The easement designates Riparian Buffer Zones, Ecological Protection Zones and Vernal Pool Ecological Protection Zones. For more information, refer to the conservation map and Sections V, VI and VII of the easement.

Inventory of Existing Structures

There are no structures located on the protected property.

Summary of Grantors'¹ Rights and Restrictions

Conservation rights and restrictions allow the protected property to be used for educational, forestry, non-motorized, non-commercial recreation, habitat conservation, natural area, and open space purposes. For the specific restricted and permitted uses included in the easement, refer to the Grant of Development Rights, Conservation Restrictions, and Public Access Easement (referred to as the easement throughout this document).

Summary of Grantees'² Rights

The Grantees' primary intent is to conserve and protect productive agricultural and forestry uses, and secondarily to encourage sustainable management of soil resources. Other goals in conserving this property include promoting non-commercial recreational opportunities and activities and other natural resource and scenic values of the protected property for present and future generations. Aside from holding the development rights on the protected property, the Grantees have the right to periodically monitor the property and enforce the Conservation Restrictions.

This is a summary of the Grantors' and Grantees' legal rights. For a complete description of these rights, refer to the Grant of Development Rights, Conservation Restrictions, and Public Access Easement.

References

- Grant of Development Rights, Conservation Restrictions, and Public Access Easement, Andrews II - Richmond Town Forest Property, 2018
- VHCB Application, Andrews II - Richmond Town Forest Property, 2017
- Forest Management Plan of Andrews II - Richmond Town Forest Property, Brendan Moore for Prentill & Carlisle, June 2011
- Ecological Report, Richmond Town Forest, Allaire Diamond, Conservation Ecologist for VLT, February 6, 2017

¹ Grantors are the landowners, **Amelia Andrews Wagner, Jennifer Andrews Gilligan, Catherine Andrews Couture and Abigail Andrews Allard**, their heirs, executors, administrators, successors, and assigns.

² Grantees refers to the **Vermont Land Trust, Inc.** and the **Vermont Housing and Conservation Board**, their successors and assigns.

We, **Amelia Andrews Wagner; Jennifer Andrews Gilligan, by Abigail Andrews Allard, her Attorney-In-Fact; Catherine Andrews Couture, by Abigail Andrews Allard, her Attorney-in-Fact; and Abigail Andrews Allard**, have signed this Baseline Documentation Report with the understanding and agreement that this Report will be used for, but its use will not be limited to, monitoring the property depicted and described in this Report for compliance with the Grant of Development Rights, Conservation Restrictions, and Public Access Easement, signed by us. We have read this Report and understand it. We agree that this Report, including the maps and photographs, accurately describes and depicts the physical features, relevant site conditions, and current structures and land uses on our property conserved by the Grant. We affirm that there are no activities ongoing on our property that are inconsistent with the Grant.

GRANTORS



Amelia Andrews Wagner

Jennifer Gilligan, by Abigail Allard, her Attorney in Fact

Jennifer Andrews Gilligan by Abigail
Andrews Allard, her Attorney-in-Fact

Catherine Couture, by Abigail Allard her Attorney in Fact

Catherine Andrews Couture by Abigail
Andrews Allard, her Attorney-in-Fact

Abigail Andrews Allard

Abigail Andrews Allard

STATE OF VERMONT
CHITTENDEN COUNTY

At Essex Junction, Vermont, this 27th day of March, 2018, Amelia Andrews Wagner, personally appeared and acknowledged this instrument, by her sealed and subscribed, to be her free act and deed, before me,



Notary Public
My commission expires: 2/10/2019

STATE OF VERMONT
CHITTENDEN COUNTY

At Essex Junction, Vermont, this 27th day of March, 2018, Abigail Andrews Allard, personally appeared on behalf of herself and as attorney in fact for Catherine Andrews Couture and Jennifer Andrews Gilligan and she acknowledged this instrument, by her sealed and subscribed, to be her free act and deed and the free act and deed of Catherine Andrews Couture and Jennifer Andrews Gilligan, before me,



Notary Public
My Commission Expires: 2/10/19

I, **ADAM PIPER**, have signed and prepared this Baseline Documentation Report with the understanding and agreement that this Report will be used for, but its use will not be limited to, monitoring the property depicted and described in this Report for compliance with the Grant of Development Rights, Conservation Restrictions, and Public Access Easement, about to be executed. I affirm that I visited this property personally and that this Report including the maps and photographs accurately describes and depicts the physical features, relevant site conditions, and current structures and land uses on the property conserved by the Grant.

VERMONT LAND TRUST, INC.

By: 

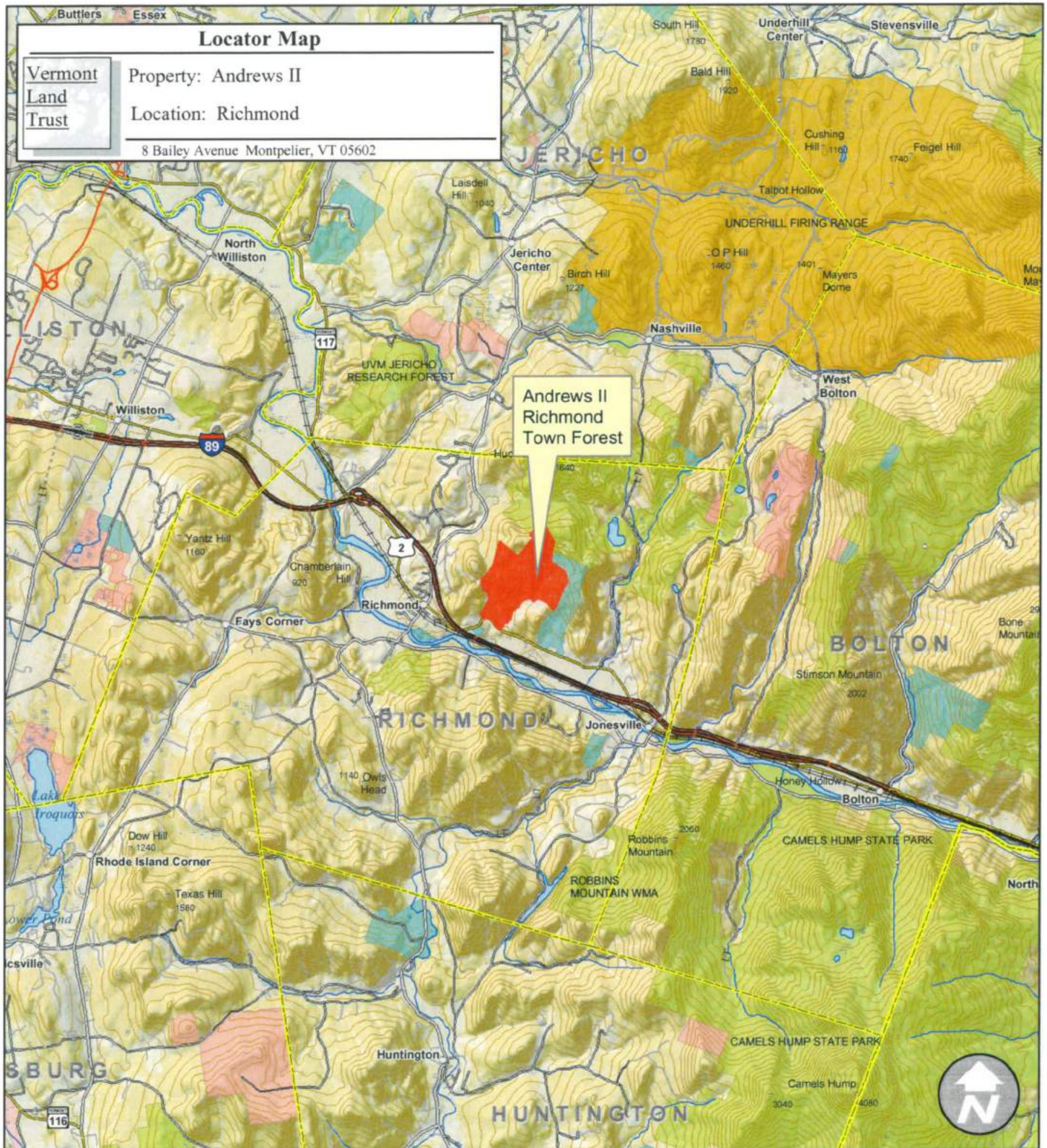
ADAM PIPER
BA, Environmental Science and Policy,
Concentration in Community Planning
University of Southern Maine
VLT training - 2007
BDR preparation since 2007

3/23/18
Date

STATE OF VERMONT
CHITTENDEN COUNTY, ss

At Richmond, this 23 day March, 2018, **ADAM PIPER**, duly authorized agent of the **VERMONT LAND TRUST, INC.**, personally appeared and he acknowledged this instrument, by his sealed and subscribed, to be her free act and deed and to be the free act and deed of the **VERMONT LAND TRUST, INC.**

Before me, 
Notary Public
My Commission Expires: 2/10/2019



1:100,000

Directions to the property from Richmond village: Follow VT Route 2 east (East Main St.) about a mile past the light in the center of town. The parking lot and entrance to the forestland is just before the farmhouse, on the left hand side.

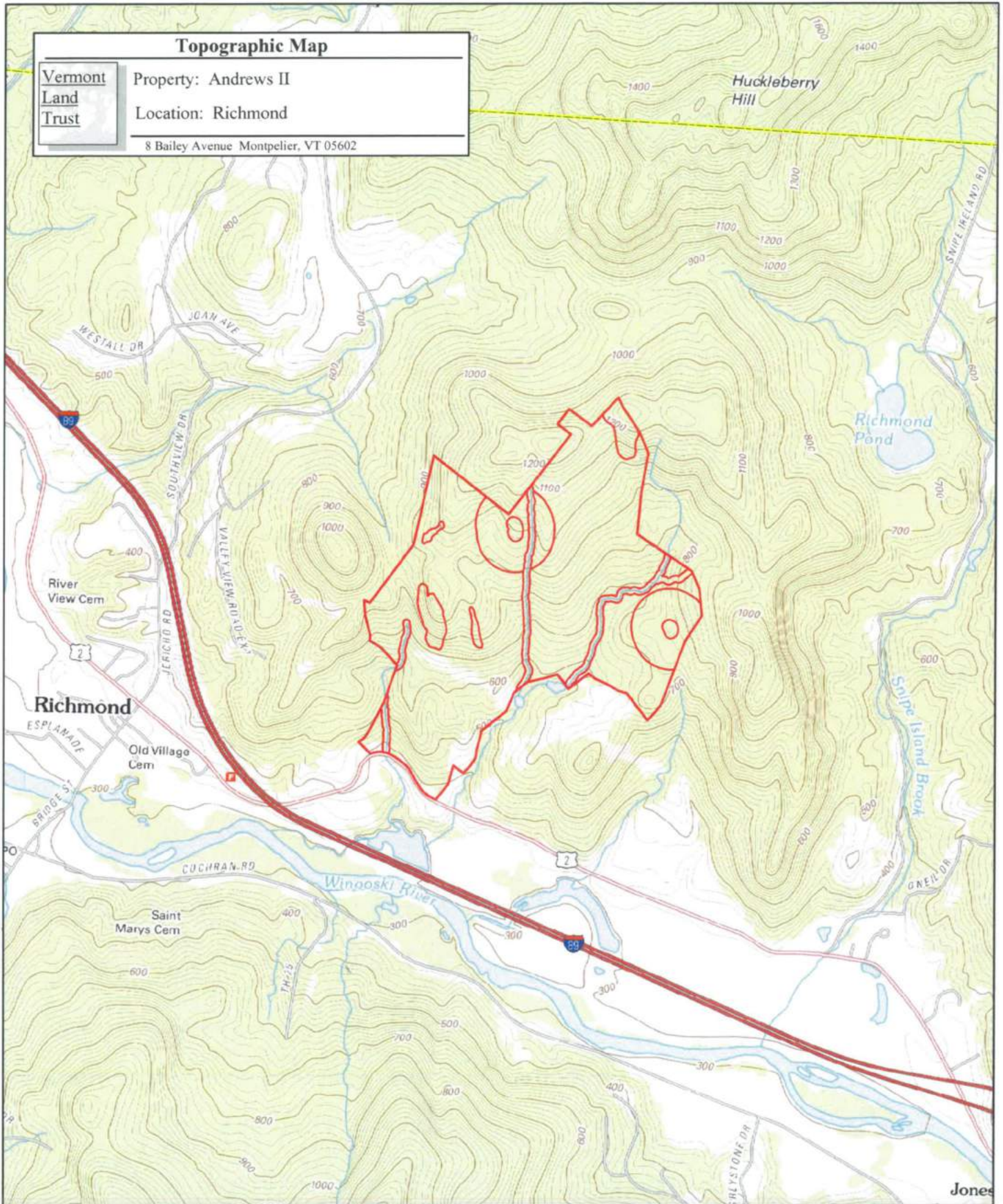
Topographic Map

Vermont
Land
Trust


Property: Andrews II

Location: Richmond

8 Bailey Avenue Montpelier, VT 05602



USGS 7.5 Minute Quadrangles:
Richmond, 1983

 Subject Property

Scale: 1:24,000



Orthophoto Map







Vermont
Land
Trust

Property: Andrews II

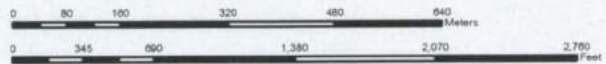
Location: Richmond

8 Bailey Avenue Montpelier, VT 05602



- | | |
|--|--|
|  Protected Property |  RBZ |
|  Excluded |  Dry Oak EPZ |
|  EPZ Primary Zone |  EPZ Secondary Zone |

Scale: 1:10,580



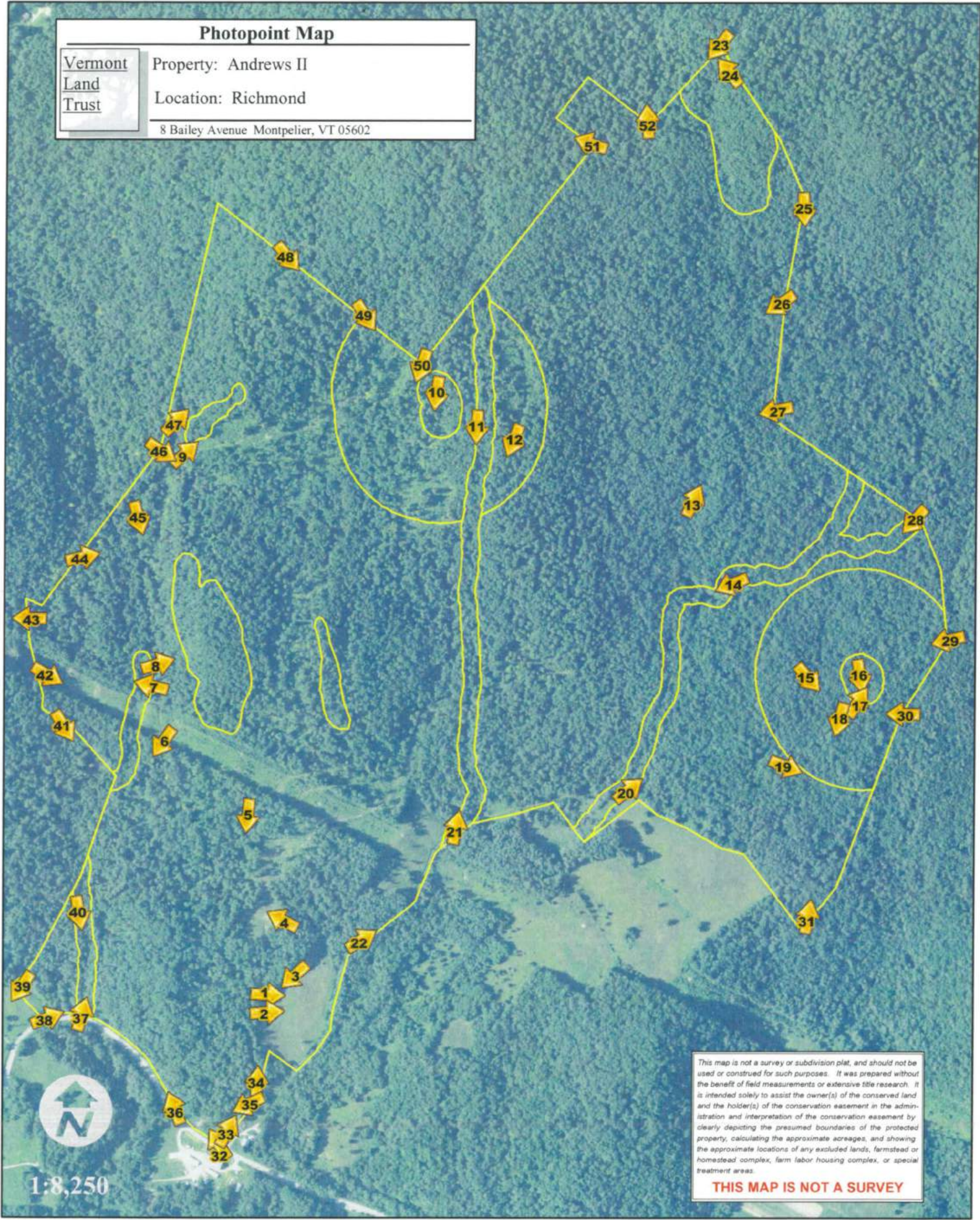
Photopoint Map

Vermont
Land
Trust

Property: Andrews II

Location: Richmond

8 Bailey Avenue Montpelier, VT 05602



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

THIS MAP IS NOT A SURVEY

1:8,250



44°24'12", -72°58'25", 110.0m, 93°
02/02/2018



44°24'12", -72°58'25", 113.0m, 85°
02/02/2018

Photo 1 Subject: Water source.

Photo 2 Subject: Pasture.



44°24'13", -72°58'22", 125.0m, 227°
02/02/2018



44°24'16", -72°58'23", 148.0m, 298°
02/02/2018

Photo 3 Subject: Pasture.

Photo 4 Subject: Log landing.



44°24'23", -72°58'26", 157.0m, 187°
02/02/2018



44°24'27", -72°58'33", 178.0m, 215°
02/02/2018

Photo 5 Subject: Property access.

Photo 6 Subject: Property access.

 <p>44°24'31", -72°58'34", 197.0m, 284° 02/02/2018</p>	 <p>44°24'31", -72°58'34", 203.0m, 73° 02/02/2018</p>
<p>Photo 7 Subject: Property access through RBZ</p>	<p>Photo 8 Subject: Steep incline with Dry Oak EPZ.</p>
 <p>44°24'43", -72°58'32", 232.0m, 48° 02/02/2018</p>	 <p>44°24'47", -72°58'11", 273.0m, 188° 02/02/2018</p>
<p>Photo 9 Subject: Property access and Dry Oak EPZ.</p>	<p>Photo 10 Subject: EPZ Primary Zone.</p>
 <p>44°24'45", -72°58'8", 291.0m, 183° 02/02/2018</p>	 <p>44°24'45", -72°58'5", 292.0m, 202° 02/02/2018</p>
<p>Photo 11 Subject: RBZ inside an EPZ Secondary Zone.</p>	<p>Photo 12 Subject: EPZ Secondary Zone.</p>



44°24'41", -72°57'51", 206.0m, 25°
02/02/2018



44°24'36", -72°57'47", 195.0m, 247°
02/02/2018

Photo 13 Subject: Woodlands.

Photo 14 Subject: RBZ.



44°24'31", -72°57'41", 202.0m, 139°
02/02/2018



44°24'31", -72°57'37", 215.0m, 171°
02/02/2018

Photo 15 Subject: Old car inside EPZ Secondary Zone.

Photo 16 Subject: EPZ Primary Zone.



44°24'29", -72°57'37", 205.0m, 33°
02/02/2018



44°24'28", -72°57'39", 207.0m, 195°
02/02/2018

Photo 17 Subject: Remnant water source of old camp, nonfunctional.

Photo 18 Subject: Debris in EPZ Secondary Zone.



Photo 19 Subject: Old Car.

Photo 20 Subject: RBZ.



Photo 21 Subject: RBZ

Photo 22 Subject: Property access, boundary on the right.



Photo 23 Subject: View from property corner.

Photo 24 Subject: Property corner.

 <p>Jun 30, 2017</p>	 <p>Jun 30, 2017</p>
<p>Photo 25 Subject: Property corner.</p>	<p>Photo 26 Subject: Property marker.</p>
 <p>Jun 30, 2017</p>	 <p>Jun 30, 2017</p>
<p>Photo 27 Subject: Property corner.</p>	<p>Photo 28 Subject: Property corner.</p>
 <p>Jun 30, 2017</p>	 <p>Jun 30, 2017</p>
<p>Photo 29 Subject: Property marker.</p>	<p>Photo 30 Subject: Property access.</p>







 <p style="text-align: right;">Jun 30, 2017</p>	 <p style="text-align: right;">Jun 30, 2017</p>
<p>Photo 31 Subject: View from property corner area.</p>	<p>Photo 32 Subject: Frontage on US Route 2. Informal parking on right.</p>
 <p style="text-align: right;">Jun 30, 2017</p>	 <p style="text-align: right;">Jun 30, 2017</p>
<p>Photo 33 Subject: Property line. Informal parking on left.</p>	<p>Photo 34 Subject: Property access.</p>
 <p style="text-align: right;">Jun 30, 2017</p>	 <p style="text-align: right;">Jun 30, 2017</p>
<p>Photo 35 Subject: View along property access.</p>	<p>Photo 36 Subject: Frontage on US Route 2.</p>



Photo 37 Subject: RBZ.

Photo 38 Subject: Frontage on US Route 2.



Photo 39 Subject: Incredible view.

Photo 40 Subject: RBZ.



Photo 41 Subject: Property boundary on the left.

Photo 42 Subject: Power line ROW.



Jun 30, 2017

Photo 43 Subject: "A" on a tree. Andrews?



Jun 30, 2017

Photo 44 Subject: Property access.



Jun 30, 2017

Photo 45 Subject: Property access.



Jun 30, 2017

Photo 46 Subject: Property corner.



Jun 30, 2017

Photo 47 Subject: Property access.



Jun 30, 2017

Photo 48 Subject: Property line.



Jun 30, 2017



Jun 30, 2017

Photo 49 **Subject:** Property line and Secondary EPZ.

Photo 50 **Subject:** Property corner and Primary EPZ



Jun 30, 2017



Jun 30, 2017

Photo 51 **Subject:** Property corner and engaged citizen.

Photo 52 **Subject:** Property corner.



ECOLOGICAL REPORT: *Andrews II, Richmond*

Allaire Diamond, Conservation Ecologist; Bob Heiser, Project Director. Clarice Cutler accompanied on April visit.

Visit Date: January 31, 2017, April 26, 2017

Report Date: February 6, 2017 UPDATED May 4, 2017

Technology Used: ESRI Collector on Galaxy Note 3

Data: 'NatComm' geodatabase: \\PORO\Landinfo\GIS\Base\Resource\ConsBioInfo

FEATURES OF ECOLOGICAL SIGNIFICANCE

The Andrews II property stretches over 428 acres of mostly south-facing hillside in Richmond, overlooking the Winooski River valley with views to Camels Hump, Mount Ellen, and beyond. Elevations range from just below 400' at the parking area by the property's original homestead along US Route 2, to about 1240' in the northern corner. Metamorphosed sedimentary bedrock, including schist, phyllite, and metawacke, underlies the entire property, as it does much of the Green Mountains. The property's southerly aspect supports a complex of forested natural communities associated with relatively warm, dry settings. Large parts of the property were mapped either on the ground or remotely by Arrowwood Environmental in 2013 as part of an ecological inventory of the town of Richmond, and our field work has further refined our understanding of the natural communities.

Mesic Red Oak-Northern Hardwood Forest and Hemlock-Northern Hardwood Forest are the most widespread forest communities here. Red oak, eastern hemlock, American beech, and white pine are the most common species, with sugar maple, red maple and white ash also frequent. Where soils begin to thin out, as they do on convex knobs or gentle ridges and saddles in the upper elevations of the property, smaller patches of Dry Oak-Hickory-Hophornbeam Forest and Dry Red Oak-White Pine Forest occur. In these areas, red oak and white pine dominate, with hophornbeam and serviceberry in the midstory, and an understory that is in places a fairly sparse sedge 'lawn' and in others a more developed organic layer with deeper leaf litter and tree regeneration. Lowbush blueberry is common in the understory of both communities. Where more light can penetrate, whether from a naturally sparse canopy or as a result of human-cleared power lines or timber patch cuts (both of which occur adjacent to patches of these forest types), witch hazel and sweetfern can grow densely. These dry forests in some ways form transitional areas to even drier forest communities: patches of Dry Oak Forest and one small area of Dry Oak Woodland occupy the rockiest, steepest, most exposed adjacent areas. The most notable difference between these communities and those around them is the presence of white oak in the canopy, as well as understory plants characteristic of droughty, shallow-to-bedrock, acidic conditions: these include wintergreen, trailing arbutus, sheep laurel, bracken fern, lowbush blueberry, and American black huckleberry. Rock tripe and toadskin lichens, and polypody ferns, appear on exposed ledges and glacial erratics, and *Cladina* lichen (sometimes known as reindeer lichen) occurs as well. One small concentration of red pine grows at the edge of a knoll covered by Dry Oak Forest, at the top of a precipitous east-facing dropoff. Shady stands of Hemlock Forest occupy the property's cooler,

wetter slopes. In some spots, plants that can indicate slight mineral nutrient enrichment, including round-lobed hepatica and American basswood, occur, which suggests that the bedrock may have some areas that are locally calcium-rich. An inventory during the growing season would provide further insight.

Timber harvest has occurred with varying frequency and intensity throughout the property. While some areas of up to 4 acres have been recently cleared, other portions show little if any cutting in recent decades. For the most part, the areas of Dry Oak Forest and Dry Oak Woodland show minimal signs of cutting, while the matrix communities and likely some Dry Oak-Hickory-Hophornbeam Forest have had recent clearing. A large powerline is continuously kept clear and parts of it include dense stands of witch hazel and sweetfern. The population of American beech here may be in early stages of infestation by beech bark disease, or some trees may have resistance to this threat.

Several perennial streams arise on and meander through the property on their way to the Winooski River. One stream in the southeastern part has been repeatedly dammed by beavers, whose work has resulted in a small open wetland complex.

Two high-quality vernal pools occur on the property. One is tucked into a pocket amid ledgy outcrops beneath a hemlock canopy at about 1000' elevation. At about 5460 square feet in area, and at least 18" deep, it was teeming with incipient amphibian life at our late April visit. Approximately 85 wood frog egg masses, each containing hundreds of eggs, and 86 spotted salamander egg masses, each with up to 100 eggs, were counted here. Recent harvest has come very close to this pool. A second vernal pool occupies a small, sunny depression in hardwood forest at about 770' elevation in the property's southeastern portion, near the VAST trail. We noted about 45 wood frog egg masses and 44 spotted salamander egg masses here, along with several single eggs that may be from other salamander species. A single adult wood frog observed the inventory process. Both pools have coarse and fine woody material in and around them; this material provides important structure for egg-laying as well as terrestrial habitat.

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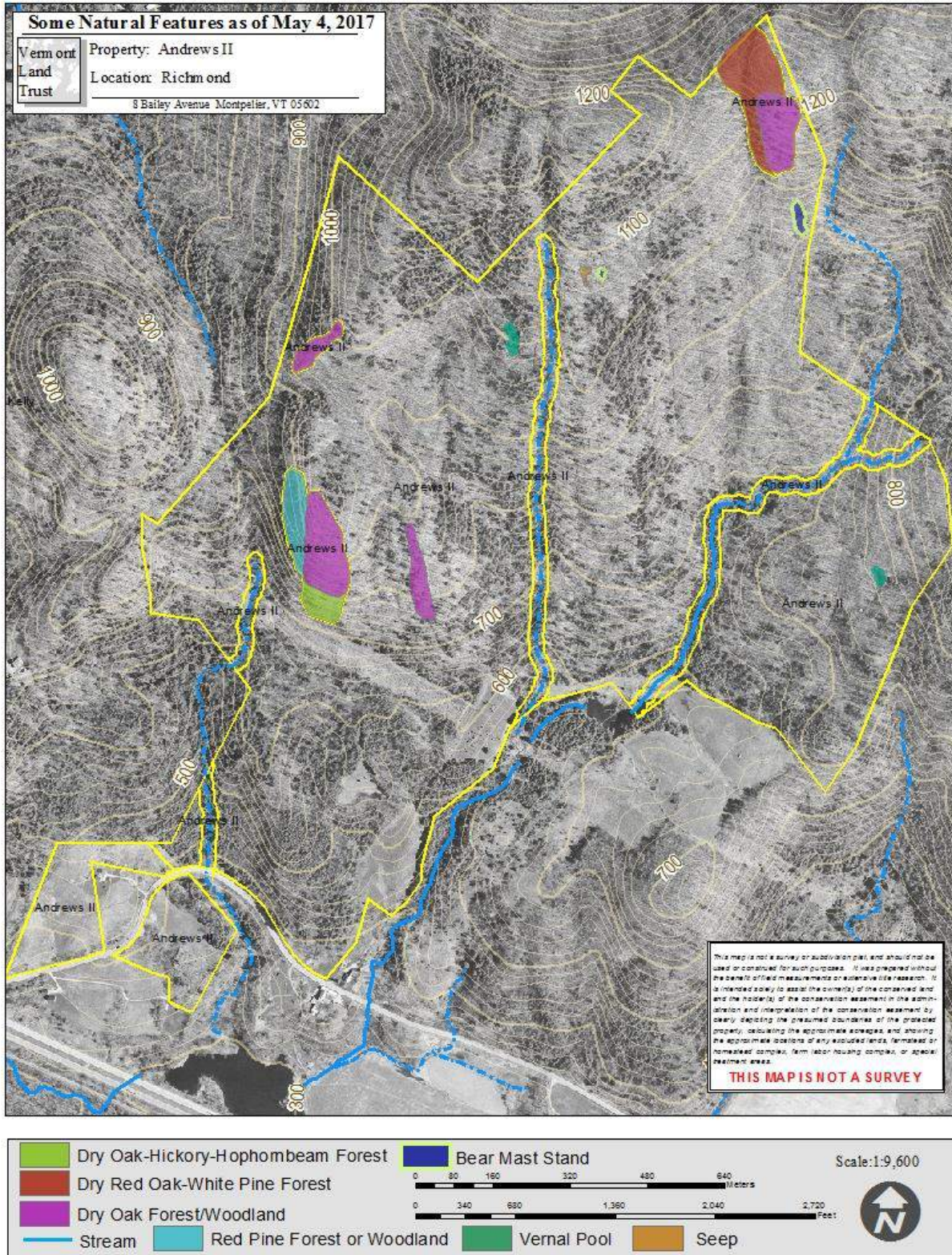
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connectivity, offering a corridor for wildlife and other species to move. These designations complement the field observations described above.



Owl (or other bird of prey) hunting success: tiny mouse or other small mammal prints approach from the top center, ending in a sweep of wings (see feather marks around 4:30 and body marks in the center of the photo) where the bird snatched its prey out of the snow.

MAP.





Science to Action:

Four Town Natural Resources Inventory

Bolton, Huntington, Jericho and Richmond

December 2013



ARROWWOOD ENVIRONMENTAL
950 BERT WHITE ROAD
HUNTINGTON, VT 05462
(802) 434-7276 FAX: (802) 329-2259

Funding for this project was made available by the Chittenden County Regional Planning Commission ECOS grant awarded to the Forests, Wildlife and Communities Science to Action (STA) Project. Additional funding for field work in Richmond was provided by the town of Richmond.

Arrowwood Environmental would like to thank the planning and conservation commissions of Richmond, Jericho, Huntington and Bolton for their support of this project. The STA steering committee was instrumental in providing logistical support, contacting landowners and managing the overall project. Thanks to Everett Marshall and Eric Sorenson at the Vermont NonGame and Natural Heritage Project for providing field data and ranking natural communities. Thanks to the other partners of the project including Vermont Natural Resource Council, Vermont Fish and Wildlife department and Vermont Dept. of Forest, Parks and Recreation. A big thank you to Jon Kart for spear-heading the grant proposal.

Lastly, a thanks to all of the landowners that allowed us access to their lands. There are many beautiful places in the STA study area, and we enjoyed seeing them all!

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1. Project Description

In 2013, Arrowwood Environmental, LLC (AE) conducted an in-depth natural resources inventory in four central Vermont towns (Science to Action: Four Town Natural Resources Inventory (STA)). The purpose of this inventory was to map and assess the natural heritage elements that are important to the preservation of biological diversity in the Towns of Bolton, Jericho, Huntington, and Richmond. This information will be used to inform town planning decisions, further define the towns' sense of community, and to establish priorities for preserving significant resources.

The scope of the STA included the identification, inventory, assessment and ranking of three resource elements: wetlands, upland natural

communities, and wildlife habitat and connecting lands. The inventory process involved three phases: 1) remote landscape analysis; 2) field work and public input; and 3) final ranking and map creation.

The methodology used in mapping and assessing these resources is presented in Appendix 1. The results of the inventory are divided into the three resource areas and presented below, starting in Section 3.

2. Natural Resource Elements Overview

The STA study area contains a wide diversity of wetland habitats, upland communities, and wildlife. Much of this diversity can be explained by putting the STA study area and these resource areas into a regional perspective.



Section 2.1: Upland Natural Communities

The Science to Action: Four Town Natural Resources Inventory (STA)

study area

consists of the towns of Jericho, Bolton,

Richmond and Huntington and sits in north-central Vermont at the juncture of

two very different biophysical

regions, shown in Figure 1. The

boundary between the

Champlain Valley

and the Northern Green Mountains

regions bisects the towns of Jericho and Richmond resulting in a wide

variety of ecosystems, representing

two very different ecological landscapes in the state.

The Champlain Valley is characterized by a relatively warmer climate than the rest of the state; with longer growing season and

higher average temperatures. The main

feature of this biophysical

region is, of course, Lake Champlain.

While the current lake levels have a

significant impact on the region, historic lake

levels have also had a

profound impact on the ecology and vegetation that we see today. Clay

sediments laid down during historic lake levels, expanses of sand

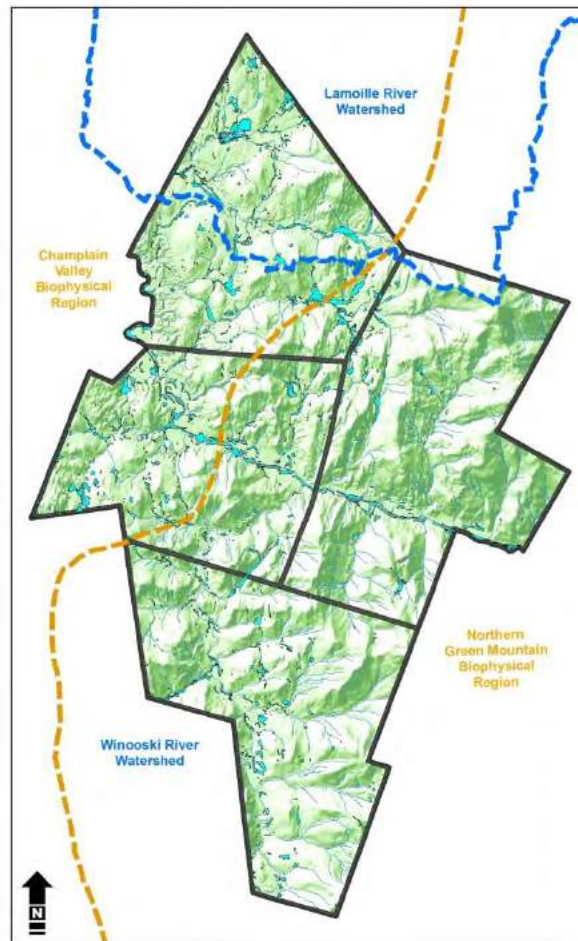


Figure 1: Biophysical and Watershed Areas



deposits from former beaches and deltas, and calcium rich bedrock from former marine sediments characterize this region and set it apart from the rest of the state. Having its origins in the rise and fall of lake waters, the topography of this region is relatively flat. These climactic, geologic and topographic factors give rise to a set of natural

communities that has much in common with locales in southern New England. Oaks and hickories, for example, mix with or become dominant over the maples and beeches. Many rare plants in this region are restricted to the

Champlain Valley and areas in southern New England.

This picture of a warm, relatively flat

biophysical region contrasts sharply with the Northern Green Mountains. This region straddles the spine of the Green Mountains and runs from central Vermont to the Canadian

border. This is a cold,

northern region which includes the summits of the highest peaks in the state. The bedrock is largely schists and phyllites and the soils are predominately acidic glacial tills. It is also a region of topographic extremes and includes the lower

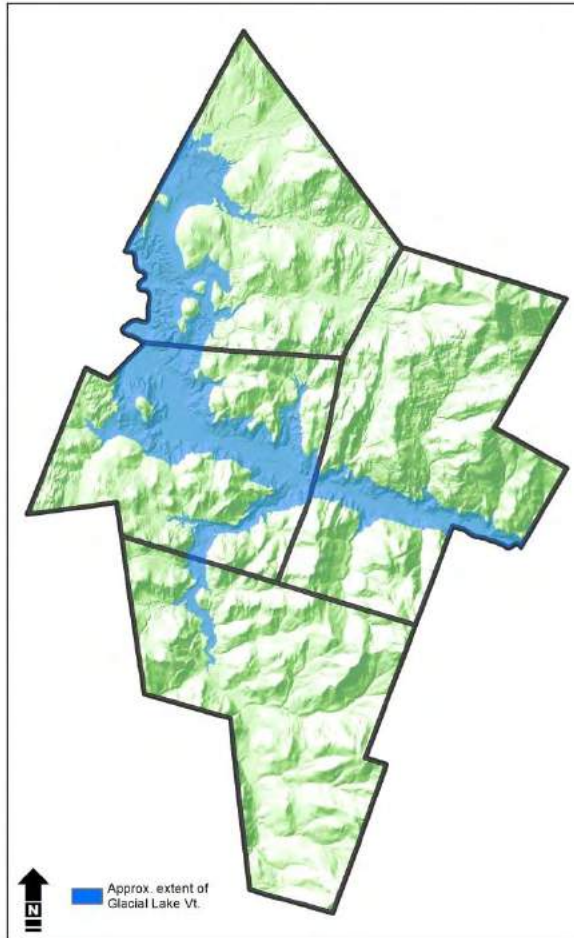


Figure 2: Glacial Lake Vermont



river valleys up to the steepest slopes and peaks. The resulting vegetation in this region is predominately northern in nature and includes sugar maples, beech, spruce and hemlock. As will be seen, upland natural communities in the STA study area are extremely varied and diverse, reflecting these underlying ecological factors.

Section 2.2 Wetland

Resources

The STA study area includes two major watersheds, shown on Figure 1. Most of the study area flows into the Winooski River, while the northern half of Jericho and a few slopes in Bolton flow north into the Lamoille River. This figure also illustrates the differing topography in the study area which has a significant effect on the development of wetland habitats. The large core forests in the mountainous terrain of Bolton and Huntington are cut by rivers and stream channels. Wetlands in this area are confined to the river valleys

and to perched basins and benches on slopes. With the exception of the Winooski River Valley, wetlands are generally small because of the limiting topography. Common wetland types in this area include seeps and mixed forested swamps at the headwaters of mountain streams. Small beaver ponds and marshes can occur in mountain basins while floodplain wetlands are confined to the river valleys.

In contrast, the northwest corner of the study area (Jericho and the northern half of Richmond) contains less extreme topography, wider valleys and more flat ground. This allows for more numerous and larger wetland ecosystems to develop. Indeed, nearly ½ of all the wetlands in the study area occur in this region. These include larger floodplain forests as well as large diverse marshes, forested swamps and beaver-influenced wetlands.

Section 2.3 Wildlife Habitat

The Chittenden County Uplands ("Uplands"), a large, relatively un-



fragmented mountainous terrain, consisting of unhampered wildlife and native plant communities is found along the eastern flank of the STA study area. These forested regions are not only some of the largest contiguous habitats in Chittenden County, but comprise some of the largest un-fragmented forest blocks in the State of Vermont. In eastern Bolton and Huntington there is a block of over 120,000 acres of contiguous wildlife habitat interrupted only by the I-89/Route 2 corridor. This extensive area is largely uninhabited by humans and populated by a wide-variety of wildlife: from Bicknell's thrush found on top of Camel's Hump to the muskrat found on the slow meandering stream bottoms to the west. These wild forests also lay claim to large populations of deep-forest songbirds and large wide-ranging mammals such as black bear, fisher, moose, and bobcat. In addition, their forest-field edges provide habitat for species such as coyote, fox, and ruffed grouse.

The Uplands are of particular significance because of the variety and the abundance of habitats and wildlife that make their home there. The Uplands incorporate the full variety of Green Mountain habitats, from oak and northern hardwood forests to red spruce, white pine and hemlock forests. Wetlands and alpine areas, expansive hillsides and deep ravines are all found here. With ample space, populations of wildlife have room to grow, expand, and to export individuals to new locations within the STA, including movement to areas that contain smaller more fragmented wildlife habitats, some of which may not support viable populations on their own. The Uplands serve as a "source" for wildlife, a place where the reproduction of wildlife exceeds their mortality. Because of this, wildlife populations grow and young animals can venture out of the Uplands into surrounding areas. No matter where one may be in the STA, you may be indirectly benefiting



from the wealth of habitat provided by the wild Chittenden Uplands.

In contrast, the western hillsides, forests, woodlots, and fields of the STA study area border the more urban Chittenden County; yet they serve as the major place where people within the STA interact on a personal level, day to day, with their environment and forests. This is the place that represents the transition from people and their domains to wildlife and their habitats, where people and wildlife co-exist. This is where people gather firewood and maple syrup from their woodlots and where people walk their dogs, hike and ski. The western STA study area also contains many paved and dirt roads; this is where people see, enjoy, and interact with the wildlife they share habitats with. Deer, red fox, coyotes, wild turkey are seen hunting the roadsides and fields. Occasional bear, moose, and fisher are seen in fleeting moments crossing the area's many dirt roads.

The units of contiguous wildlife habitats are smaller to the west and often extend into neighboring towns. However, some habitat units reach over 1000 acres in area and permanent wildlife residents with fairly extensive home ranges such as fisher, coyote and bobcat inhabit these areas. Species such as black bear that have larger home ranges must move about the landscape in search of seasonal foods and other life requisites. The smaller wildlife habitats within the STA study area provide important habitats for the wildlife that live among us. These smaller forests and woodlots provide habitats for deer, red and gray fox, coyote, weasels, cottontail rabbits, groundhogs, gray squirrels and chipmunks. Many songbirds from interior forest specialists to the common edge-loving birds at our backyard feeders also thrive here. In short, this is the wildlife that we see and enjoy in our environment.



3. Wetlands Inventory Assessment Results

As previously noted, the STA study area includes two different Biophysical Regions and a wide array of wetland habitats from low, flat river valleys to higher sloping seepages. The wide variety of resulting wetland communities is summarized in Tables 1 and 2. A total of 22 different wetland communities comprising 3502 total acres were identified in the STA study area. These include dense and large forested swamps, tiny vernal pools hidden in the woods, deep marshes and rare fens. This variety of wetland ecosystems provides for a diverse assemblage of wildlife habitats and performs many functions including flood control, water quality improvement, erosion control, fisheries habitat, education, recreational opportunities, and aesthetics.

Not all wetlands, however, perform all of these functions. Some wetlands may be particularly good at

improving water quality or erosion control. Others, like agricultural field wetlands, may perform no functions at all. An assessment of wetland significance is therefore important to understand which wetlands in the study area are especially important on the ecological landscape.



Table 1. Wetland Acreage Summary Table

		Total Acres				
		BOLTON	HUNTINGTON	JERICO	RICHMOND	TOTAL
Wetland Natural Communities	Agriculture	21.2	41.9	91.7	119.1	274.0
	Alder Swamp	6.6	107.2	207.2	147.3	468.3
	Alluvial Shrub Swamp	0.0	3.0	48.2	0.0	51.3
	Beaver Complex	151.9	56.5	370.8	59.0	638.3
	Cattail Marsh	0.0	0.0	0.2	0.7	1.0
	Deep Broadleaf Marsh	0.0	0.0	13.5	8.1	21.6
	Floodplain Forest	0.0	35.5	60.0	0.0	95.4
	Hemlock-Balsam Fir- Black Ash Seepage Swamp	15.8	14.3	98.1	18.9	147.1
	Hemlock-Sphagnum Acidic Basin Swamp	0.0	0.0	49.7	0.0	49.7
	Northern Hardwood Seepage Forest	15.4	13.7	35.9	12.8	77.7
	Northern White Cedar Swamp	0.0	0.0	15.7	0.0	15.7
	Old Field	7.1	181.9	158.4	228.8	576.2
	Pond	12.9	16.3	26.6	59.8	115.6
	Poor Fen	0.0	0.0	8.5	0.0	8.5
	Red Maple-Black Ash Seepage Swamp	0.3	3.9	34.5	25.5	64.1
	Red Spruce-Cinnamon Fern Swamp	0.4	0.0	0.0	0.0	0.4
	Seep	6.0	36.5	10.4	15.4	68.3
	Shallow Emergent Marsh	51.6	56.7	116.3	93.5	318.2
	Silver Maple-Ostrich Fern Riverine					
	Floodplain Forest	155.7	0.0	53.3	246.9	455.9
	Spruce-Fir-Tamarack Swamp	2.7	9.3	18.2	2.2	32.3
	Sugar Maple-Ostrich Fern Riverine					
	Floodplain Forest	0.3	0.0	11.1	4.9	16.2
	Vernal Pool	1.9	0.9	2.8	1.1	6.7
	Total Acreage Amount	449.9	577.8	1430.9	1044.0	3502.6



Table 2. Wetland Community Summary Table

		Total Number					
		BOLTON	HUNTINGTON	JERICO	RICHMOND	TOTAL	
Wetland Natural Communities	Agriculture	10	45	56	78	189	
	Alder Swamp	7	49	66	61	183	
	Alluvial Shrub Swamp	0	2	6	0	8	
	Beaver Complex	21	5	29	9	64	
	Cattail Marsh	0	0	3	2	5	
	Deep Broadleaf Marsh	0	0	3	1	4	
	Floodplain Forest	0	12	19	0	31	
	Hemlock-Balsam Fir- Black Ash Seepage Swamp	8	6	8	9	31	
	Hemlock-Sphagnum Acidic Basin Swamp	0	0	1	0	1	
	Northern Hardwood Seepage Forest	7	10	5	12	34	
	Northern White Cedar Swamp	0	0	1	0	1	
	Old Field	10	72	80	87	249	
	Pond	16	48	89	45	198	
	Poor Fen	0	0	4	0	4	
	Red Maple-Black Ash Seepage Swamp	1	3	12	4	20	
	Red Spruce-Cinnamon Fern Swamp	1	0	0	0	1	
	Seep	13	37	25	22	97	
	Shallow Emergent Marsh	19	21	67	31	138	
	Silver Maple-Ostrich Fern Riverine Floodplain Forest	22	0	9	29	60	
	Spruce-Fir-Tamarack Swamp	1	4	5	1	11	
	Sugar Maple-Ostrich Fern Riverine Floodplain Forest	1	0	3	2	6	
	Vernal Pool	20	3	32	9	64	
	Total Wetland Community Count		157	317	523	402	1399



***Section 3.1: Significant
Wetland Natural
Communities***

An assessment of the importance of a wetland is done in a number of different ways. First, wetlands can be assessed based on their natural community type. A ranking system used by the Vermont Nongame and Natural Heritage Project (NNHP) involves collecting field data on a wetland's condition, size and landscape context to develop a rank for the wetland (EO-rank). This information is used in conjunction with rarity rank of the wetland type (S-rank) to determine if a site is a significant natural community. Since field data is required for this assessment, only wetland sites that received a site visit were evaluated with this process for this project.

Wetlands can also be significant for the functions and values that they perform on the landscape. Wetlands are capable of performing or providing a total of 10 different functions and values (Appendix 1).

Again, a field visit is the best way to assess a wetland for functions and values. However, a lot of information can be obtained about a wetland from remote sources. AE has developed and employed a remote functions and values analysis that takes into account how a wetland meets certain functions and values criteria. Using the field or the remote wetlands analysis, each wetland in the STA study area was assessed for functions and values. A subset of all wetlands was determined to be significant because of their high degree of functioning.

Table 3 summarizes all of the wetlands in the STA study area that have been determined to be significant as natural communities or significant for functions and values. This includes data from the current STA inventory, previous inventories and NNHP site records. Only those sites that were deemed significant during the current study are discussed in this report. These sites are shown in italics in the table and



Science to Action: Four Town Natural Resources Inventory

discussed on a town by town basis in
the sections below.



Table 3. Significant Wetlands Data Summary Table

Site Name	Natural Communities	Size (Acres)	Location	Significance	Source	Field Verified
Gleason Brook Swamp	Red Spruce-Cinnamon Fern Swamp	1.4	Bolton	SSNC	NNHP	Yes
Pinneo Brook West	Vernal Pool	0.17	Bolton	SSNC	NNHP	Yes
<i>Bolton Riparian Corridor</i>	<i>Silver Maple-Ostrich Fern Riverine Floodplain Forest</i>	127	<i>Bolton</i>	<i>F&V</i>	<i>AE</i>	<i>Partial</i>
<i>Duck Brook Beaver Wetland</i>	<i>Beaver Wetland Complex</i>	49.1	<i>Bolton</i>	<i>F&V</i>	<i>AE</i>	<i>No</i>
<i>Preston Pond Wetlands</i>	<i>Beaver Wetland Complex; Shallow Emergent Marsh; Pond</i>	20.1	<i>Bolton</i>	<i>F&V</i>	<i>AE</i>	<i>Yes</i>
Gleason Brook Beaver Wetlands	Beaver Wetland Complex; Seep	30.5	Bolton-CHSP	SSNC	NNHP	Yes
Summit Pools	Vernal Pool	0.86	Bolton-CHSP	PSNC	NNHP	Partial
<i>Audubon Wetlands</i>	<i>Shallow Emergent Marsh; Hemlock-Balsam Fir-Black Ash Seepage Swamp</i>	8.6	<i>Huntington</i>	<i>F&V</i>	<i>AE</i>	<i>N</i>
<i>Charlie Smith Beaver Wetland</i>	<i>Beaver Wetland</i>	14	<i>Huntington</i>	<i>F&V</i>	<i>AE</i>	<i>No</i>
<i>Delfrate Beaver Wetland</i>	<i>Beaver Wetland Complex</i>	14.2	<i>Huntington</i>	<i>F&V</i>	<i>AE</i>	<i>No</i>
<i>Hinesburg Hollow Wetland</i>	<i>Shallow Emergent Marsh; Old Field; Alder Swamp</i>	49.9	<i>Huntington</i>	<i>F&V</i>	<i>AE</i>	<i>No</i>
<i>Mailbox Trail Beaver Wetland</i>	<i>Beaver Wetland Complex</i>	17.2	<i>Huntington</i>	<i>F&V</i>	<i>AE</i>	<i>No</i>
<i>Sherman Hollow Beaver Wetland</i>	<i>Beaver Wetland; Alder Swamp</i>	10.3	<i>Huntington</i>	<i>F&V</i>	<i>AE</i>	<i>Yes</i>
Burnt Rock Mountain Seeps	Seep	6.2	Huntington-CHSP	SSNC	NNHP	Yes
Cobb Brook Headwaters	Seep	2.9	Huntington-CHSP	SSNC	NNHP	Yes
Preston Brook Headwater Seeps	Seep	6.8	Huntington-CHSP	SSNC	NNHP	Yes
<i>Burnt Rock Beaver Wetland</i>	<i>Beaver Wetland</i>	4.01	<i>Huntington-CHSP</i>	<i>F&V</i>	<i>AE</i>	<i>No</i>
Brown's River Floodplain	Hemlock-Sphagnum Acidic Basin Swamp	49.6	Jericho	SSNC	Mohr	Yes
Cap Hill Marsh	Shallow Emergent Marsh; Deep Broadleaf Marsh	11	Jericho	LSNC	Mohr	Yes
Deluge Forest-Jericho Bend	Silver Maple-Ostrich Fern Riverine Floodplain Forest	52.3	Jericho	SSNC	NNHP	Yes
Leary Road Fen	Poor Fen	1.3	Jericho	SSNC	NNHP	Yes
Lee River Cedar Swamp	Northern White Cedar Swamp	15.7	Jericho	LSNC	Mohr	Yes
Lee River-EAFR	Alluvial Shrub Swamp; Alder Swamp; Silver Maple-Ostrich Fern Riverine Floodplain Forest	76.8	Jericho	SSNC	NNHP	Yes
Mill Brook Marsh	Alluvial Shrub Swamp; Shallow Emergent Marsh; Floodplain Forest	30.9	Jericho	F&V	Mohr	Yes
O P Hill Beaver Wetland	Beaver Wetland Complex	37.3	Jericho	F&V	Mohr	Yes
O P Hill East Swamp	Hemlock-Balsam Fir-Black Ash Seepage Swamp	6.6	Jericho	SSNC	NNHP	Yes
O P Hill- Otter Bog	Poor Fen	6.5	Jericho	SSNC	NNHP	Yes
River Run Beaver Wetland	Beaver Wetland	14.4	Jericho	F&V	Mohr	Yes
<i>Cilley Hill North</i>	<i>Hemlock-Balsam Fir-Black Ash Seepage Swamp</i>	17.7	<i>Jericho</i>	<i>SSNC</i>	<i>AE</i>	<i>Yes</i>
<i>Jericho Center Beaver Wetland</i>	<i>Beaver Wetland Complex</i>	21.2	<i>Jericho</i>	<i>F&V</i>	<i>AE</i>	<i>No</i>
<i>Railroad Swamp</i>	<i>Hemlock-Balsam Fir-Black Ash Seepage Swamp</i>	15.8	<i>Jericho</i>	<i>LSNC</i>	<i>AE</i>	<i>Yes</i>
<i>The Creek Wetland Complex</i>	<i>Alder Swamp; Shallow Emergent Marsh</i>	33.2	<i>Jericho</i>	<i>F&V</i>	<i>AE</i>	<i>No</i>
<i>Nashville Beaver Wetland</i>	<i>Beaver Wetland Complex; Alder Swamp; Hemlock-Balsam Fir-Black Ash Seepage Swamp</i>	235	<i>Jericho and Bolton</i>	<i>F&V</i>	<i>AE and Mohr</i>	<i>Partial</i>
	<i>Silver Maple-Ostrich Fern Riverine Floodplain Forest; Deep Broadleaf Marsh; Shallow Emergent Marsh; Alder Swamp</i>	215	<i>Richmond</i>	<i>SSNC/F&V</i>	<i>NNHP and AE</i>	<i>Yes</i>
<i>Richmond Riparian Corridor</i>	<i>Alder Swamp</i>	22.5	<i>Richmond</i>	<i>F&V</i>	<i>AE</i>	<i>Partial</i>
<i>Snipe Island Alder</i>	<i>Alder Swamp</i>	22.5	<i>Richmond</i>	<i>F&V</i>	<i>AE</i>	<i>Partial</i>
<i>Swamp Road Wetland Complex</i>	<i>Beaver Wetland; Shallow Emergent Marsh; Red Maple-Black Ash Seepage Swamp</i>	43.64	<i>Richmond</i>	<i>F&V</i>	<i>AE</i>	<i>Partial</i>
<i>Richmond Pond</i>	<i>Pond; Alder Swamp; Shallow Emergent Marsh</i>	39.9	<i>Richmond</i>	<i>LSNC</i>	<i>AE</i>	<i>Yes</i>
<i>Gillette Pond</i>	<i>Pond; Alder Swamp; Shallow Emergent Marsh</i>	46.4	<i>Richmond and Huntington</i>	<i>F&V</i>	<i>AE</i>	<i>Yes</i>
Gillette Pond Seeps	Seep	5.26	Richmond-Robbins Mtn. WMA	SSNC	NNHP	Yes

F&V: Functions and Values; SSNC: State Significant Natural Community; LSNC: Locally Significant Natural Community; CHSP: Camel's Hump State Park



Figure 3: Bolton Significant Wetlands

3.1.1 Bolton Significant Wetlands

The town of Bolton contains 15 different wetland community types occupying approximately 450 total wetland acres; approximately 2% of the natural landscape. Seven different wetland sites have been determined to be significant based

on either the natural community or functions and values criteria (See Table 3). Three of these sites which were assessed during the present inventory are discussed below.

Duck Brook Beaver Wetlands

Significance: Wetland Functions and Values



On the eastern border of the Preston Pond CHU (see Section 5.4 Contiguous Habitat Units (CHUs)), along Duck Brook and a tributary, sits a series of 4 beaver-influenced wetlands. Most of these sites are topographically confined to narrow basins. These wetlands are all typed as Beaver Complex wetlands but contain a diverse mixture of open water ponds, shallow emergent marshes, shrub swamps and scattered trees.



Figure 4: The Duck Brook Beaver Wetland sits below steep cliffs

This mixture provides significant wildlife habitat to a wide variety of species including mink, otter, beaver, frogs, salamanders, snakes, deer, bear, moose and a wide variety of songbirds and raptors.

These wetlands are also significant for flood control, water quality, fisheries, exemplary natural communities, and erosion control. Collectively comprising nearly 50 acres, these wetlands provide diversity to this largely forested area.

Preston Pond Wetlands

Significance: Wetland Functions and Values

The Preston Pond wetlands, which are predominantly located on the Bolton Town Forest, include a diverse array of wetland types and habitats. This mixture of open water pond, mixed herbaceous wetlands and early successional shrubs provides a wide variety of wildlife habitat to a large forested area. The undeveloped Preston Pond is a dystrophic pond which contains a



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rare plant on its margins, making them significant rare species habitat. In addition, the trails around these wetlands are used by many people throughout the year, making them significant as a recreational resource. These wetlands are also considered significant for flood control, water

quality, wildlife habitat, fisheries, exemplary natural communities, erosion control and aesthetics. The value of these wetlands to wildlife and human enjoyment has been well documented and recognized by the Vermont Land Trust and town of Bolton over the years.



Bolton Riparian Corridor Wetlands

Significance: Functions and Values

This series of wetlands is the largest and perhaps most significant wetland complex in the town of Bolton. It consists of 14 occurrences of Silver Maple-Ostrich Fern Riverine Floodplain Forests. Comprising approximately 120 acres, these wetlands are tied together by their association with the Winooski River.

This community type is characterized by its association with larger rivers in the state. These types developed with the natural flooding events and have evolved to thrive under such conditions. Because these sites often occupy very productive agricultural land, most of them have been converted to agriculture. Only small fragments of this once abundant community now remain. In addition, because seasonal flooding often exposes the soils in these communities, the remaining sites are typically colonized by non-native invasive plant species.

The floodplain forest site that was visited in Bolton is typical of the somewhat disturbed forests in this landscape position. Early successional tree species such as cottonwood (*Populus deltoides*) and box elder (*Acer negundo*) are present along with silver maple (*Acer saccharinum*) and basswood (*Tilia*



americana). Invasives such as dame's-rocket (*Hesperis matronalis*) and goutweed (*Aegopodium podagraria*) are present in large numbers along with the native ostrich fern (*Matteuccia struthiopteris*) and orange jewelweed (*Impatiens capensis*). This site does have an important "backswamp" which is an area, typically herbaceous dominated, that is lower in elevation than the surrounding forest and provides significant wildlife habitat and flood control.



Figure 5: Low marshy areas in floodplain forests provide excellent wildlife habitat

Despite the early successional and non-native vegetation, this site and others like it often provide significant functions and values to the ecological landscape. These

sites are known to provide an expandable basin for flood waters thereby mitigating the downstream effects of floods. They also prevent erosion along the banks of the Winooski River by providing stabilizing vegetation. This same vegetation shades the waters and provides habitat for fish. These wetlands also provide a buffer between agricultural activities and surface waters, thereby improving water quality.



Figure 6: Floodplain Forest in Bolton with dense Ostrich Fern



These riverine forests provide valuable habitat for a wide variety of song birds which breed in them. They also are used by otter, mink, muskrat and other animals that travel along these river corridors.

The backswamps and old oxbows provide significant breeding habitat for many species of amphibians including mole salamanders, spring peepers and green frogs. Many of these sites along the Winooski River are highly visible, making them

significant for aesthetics. Finally, since many people recreate along the river, often using these wetlands, these sites are considered significant for recreation.

Overall, this series of floodplain forests are an essential part of a healthy, functioning river system. Further work to enhance or restore these wetlands should be encouraged. (See Section 3.2: Management Recommendations)



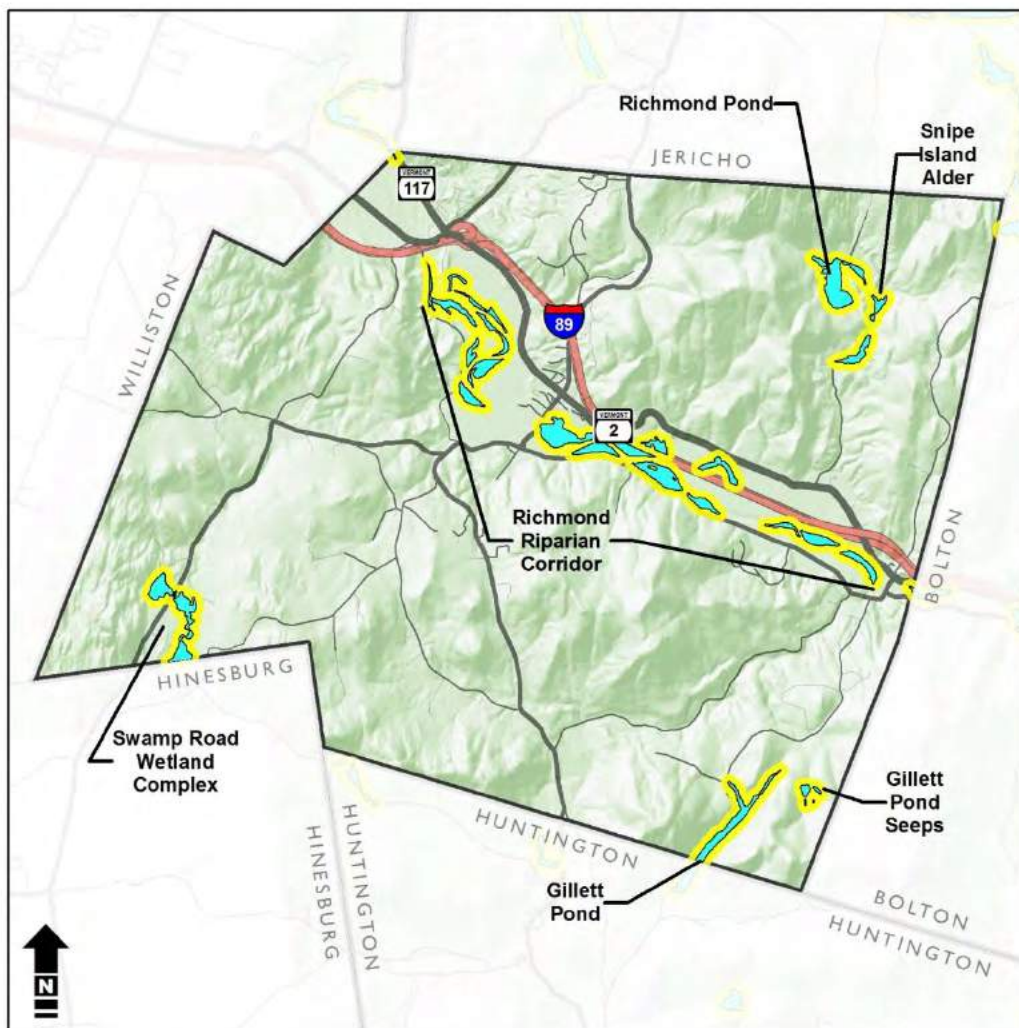


Figure 7: Richmond Significant Wetlands

3.1.2 Richmond Significant Wetlands

The town of Richmond contains 16 different wetland natural community types, comprising 1044 wetland acres. A total of 6 different wetlands or wetland complexes have been found to be significant in Richmond, 5 of which are discussed below.

Gillett Pond Wetlands

Significance: Locally Significant Natural Community, Functions and Values

Gillett Pond and its associated wetlands in the southeast corner of Richmond are a unique assemblage of open water, water lily wetland, deep and shallow marshes and alder swamp. The Pond itself is a shallow,



mesotrophic, low-alkalinity pond which is colonized by common aquatic species such as pondweeds (*Potamogeton spp.*), muskgrass (*Chara sp.*) and common bladderwort (*Utricularia vulgaris*). On the southern end of the Pond, the wetland slowly grades from open water to upland. Across this transition, multiple communities

occupy different zones resulting in the following interesting sequence: 1. Open Water 2. Water Lily Aquatic Community 3. Deep Broadleaf Marsh 4. Shallow Emergent Marsh 5. Alder Swamp 6. Old Field Wetland and 7. Upland.

The large shrub swamp on the southern end of the Pond is dominated by speckled alder (*Alnus incana*). Sedges such as lake sedge

(*Carex lacustris*), tussock sedge (*C. stricta*) and the grass bluejoint grass (*Calamagrostis canadensis*) dominate the herbaceous layer. Hummocks and hollows with standing water are common, especially in the wetter areas of the marsh. While this swamp appears to be in good condition, it does not meet the criteria necessary for designation as



Figure 8: The northern end of Gillett Pond with forested banks

a state-significant natural community. It is, however, considered locally significant.

This entire wetland complex is also considered locally significant for functions and values, containing some of the highest functions and values scores in the study area. These wetlands are especially significant for wildlife, offering habitat to deer, moose, bear, mink,



otter, and a wide variety of song birds. They also provide critical breeding habitat for many species of amphibians including wood frogs and spotted salamanders. These wetlands are significant for erosion control along the drainages they encompass. Being highly visible and used by the public, they are also significant for aesthetics and recreation.

The open water in the pond and persistent vegetation in

the marshes enable these wetlands to filter out excess nutrients and pollutants, making them significant for water quality protection. Overall, this wetland complex is fairly unique in the STA study area in being a highly visible and recreational wetland complex that also provides

significant wildlife and fisheries habitat.

Richmond Pond Wetlands

Significance: Locally Significant Natural Communities and Functions and Values

The Richmond Pond Wetlands are located in the wooded northeast

corner of Richmond and consist of the open water pond, a diverse shallow emergent



Figure 9: Sedges and spotted touch-me-not colonize an old beaver dam on Richmond Pond

marsh and a dense alder swamp

thicket. The marsh is dominated by common bluejoint grass (*Calamagrostis canadensis*), arrow-leaved tearthumb (*Polygonum sagittatum*) and gynandrous sedge (*Carex gynandra*) as well as a wide diversity of other herbaceous species. Tussocks of sedges are common and low areas often



contain standing water. This site appears to be influenced by beaver activity; a dam on the southern end of the marsh has expanded the open water area of the pond considerably over the past few years.

The alder swamp which sits on the northwest corner of the pond is characterized by dense growth of speckled alder (*Alnus incana*). Beneath this shrub layer is an herbaceous layer dominated by lakeshore sedge (*Carex lacustris*) with lesser amounts of orange jewelweed (*Impatiens capensis*) and common bluejoint grass (*Calamagrostis canadensis*). Standing water is common.

There were no invasive species or other human disturbances noted in either of these communities, and both appeared to be in very good condition.

The marsh and shrub swamp themselves are too small to be considered of state-wide significance, but should be

considered locally significant natural communities. In addition, taken as a whole this wetland complex is significant for many functions and values. The most notable of these is wildlife habitat. The combination of open water, herbaceous wetland and shrub swamp offer an extensive variety of habitats to a wide range of species. These include moose, deer, bear, mink, otter, woodcock, grouse, frogs, salamanders, reptiles and a wide variety of songbirds and raptors. The open water in the pond is also significant for fisheries. These wetlands are significant for water quality, allowing sediments to settle out into the pond before reaching Snipe Island Brook and the Winooski River. They also attenuate flood waters by decreasing peak flow into during flood events. Finally, a rare species of rush occupies the shores of the pond, making these wetlands significant for rare species habitat.

Snipe Island Brook Alder Swamps

Significance: Functions and Values



The Snipe Island Brook Alder Swamp site consists of three separate Alder swamps along Snipe Island Brook below the outlet to Richmond Pond. Collectively, these swamps comprise 22.5 acres. They are dominated by speckled alder (*Alnus incana*) with scattered willow (*Salix spp.*) shrubs as well. The herbaceous layer is a

diverse mixture of lakeshore sedge (*Carex lacustris*), common bluejoint grass



(*Calamagrostis canadensis*), sensitive fern (*Onoclea sensibilis*), and pumice aster (*Aster puniceus*). Some standing dead trees are scattered throughout parts of this complex. Snipe Island Brook and its tributaries meander through these swamps, in some cases creating small "backswamps" with open water.

These wetlands are significant for flood water attenuation because they provide a place for the flood waters in the brook to disperse and attenuate flow velocities during high flow events. The wetlands are also significant for water quality, providing a buffer between upland activities and surface water. They

prevent erosion along Snipe Island Brook by providing persistent vegetation which

stabilizes the stream banks.

They are also

significant for wildlife habitat, providing wetland habitat for mink, otter, woodcock, beaver, snowshoe hare, frogs, reptiles and a wide variety of songbirds.





Richmond Riparian Corridor

Significance: Significant Natural Communities and Functions and Values

The Richmond Riparian Corridor consists of a large series of floodplain forests and old oxbow marshes along the Winooski River. As described here, this series of wetlands continues across the entire town of Richmond and includes 13 different examples of floodplain forest and 2 marshes. As mentioned in Section 3.1.1 Bolton Significant Wetlands, floodplain forests are one of the most beleaguered natural communities in the state. Because of the annual flooding, most of these sites contain some of the most productive farmland in the state; and most were converted to agriculture long ago. What remains of these communities are fragments of a once stately, expansive forest. The examples in Richmond, however, are relatively large. Indeed, they are some of the largest, most extensive and highest functioning floodplain forests that remain in the state.

Largely shaped by the Winooski River, these systems contain an array of micro-habitats including the active floodplain areas, levee forests, terraces and backwater marshes. Species dominance varies with these different site conditions but often includes silver maple (*Acer saccharinum*), cottonwood (*Populus deltoides*),



willow (*Salix spp.*), butternut (*Juglans cinerea*), basswood (*Tilia americana*), sugar maple (*Acer saccharum*), and northern hackberry (*Celtis occidentalis*). River-bank grape (*Vitis riparia*), ostrich fern (*Matteuccia struthiopteris*), Wiegand's wild-rye (*Elymus wiegandii*) or wood nettle (*Laportea canadensis*) often colonize the understory.

Because these sites often have disturbed

soils, many non-native, invasive species can also be present. The horticultural escapes dame's-rocket (*Hesperis matronalis*), goutweed (*Aegopodium podagraria*) are often particularly troubling in the interior of the forests, while Japanese knotweed (*Polygonum cuspidatum*) colonizes the riverbanks.

These sites are not only significant as good examples of an uncommon natural community, they are also significant for the many functions and values that they perform on the landscape.

These sites are called floodplain forests for good reason: they flood. And when they do, they attenuate the downstream effects of the flooding by providing an expanded



Figure 11: The interior of a Richmond floodplain forest

basin with woody vegetation that slows the flood waters. Situated as they are on the banks of the Winooski River, these forested communities are also essential in limiting erosion on the riverbanks. The tree canopy provides shade to the river and provides fish habitat as woody debris falls into the water. Many of the sites are located in



between agricultural fields and the river, providing an important buffer where excessive nutrients can be filtered out before reaching the river and, ultimately, Lake Champlain.

Many of these sites are quite visible to the public, making them significant for

aesthetics.

Finally, many of these sites have trails

through them which are used by hikers, bikers and bird watchers. Others are used by people as they swim, boat and fish along the river, making them significant for the recreation function. Overall, the Richmond Riparian Corridor wetlands are an extremely important system of wetlands that are essential to a healthy river system and a functioning ecological landscape.

Swamp Road Wetlands

Significance: Wetland Functions and Values

The Swamp Road Wetland complex

is located in the southwest corner of Richmond and consists of a beaver pond complex, shallow emergent



Figure 12: The floodplain forests along the banks of the Winooski provide multiple functions and values

marsh, and a Red Maple-Black Ash

Seepage Swamp. This wetland complex continues south into Hinesburg where it crosses Swamp Road. The wetland comprises 43 acres and forms the headwaters of Johnnie Brook, which flows north into the Winooski River. Only the large beaver pond west of Hinesburg Road was visited during this inventory. Much of this pond is considered a Water Lily Aquatic Wetland type because it is colonized



by floating-leaved aquatic plants (mainly water shield (*Brasenia schreberi*)).

These and the open water areas are interspersed with islands of cattail marsh.

There are numerous

standing dead trees throughout this wetland. This pond along with the forested swamp and beaver wetland to the south are significant for a number of wetland functions and values, most notably for wildlife habitat. The open water in the pond



Figure 13: The Swamp Road beaver wetland complex

provides habitat for a wide variety of waterfowl, herons, songbirds and raptors.

Mammals such as mink, otter, muskrat, deer and moose also likely use these wetlands. A

host of reptiles and amphibians utilize this habitat as well, including eastern newts, green frogs, bullfrogs, peepers and garter snakes. These wetlands are significant for water quality, flood control, aesthetics, erosion control, and fisheries.



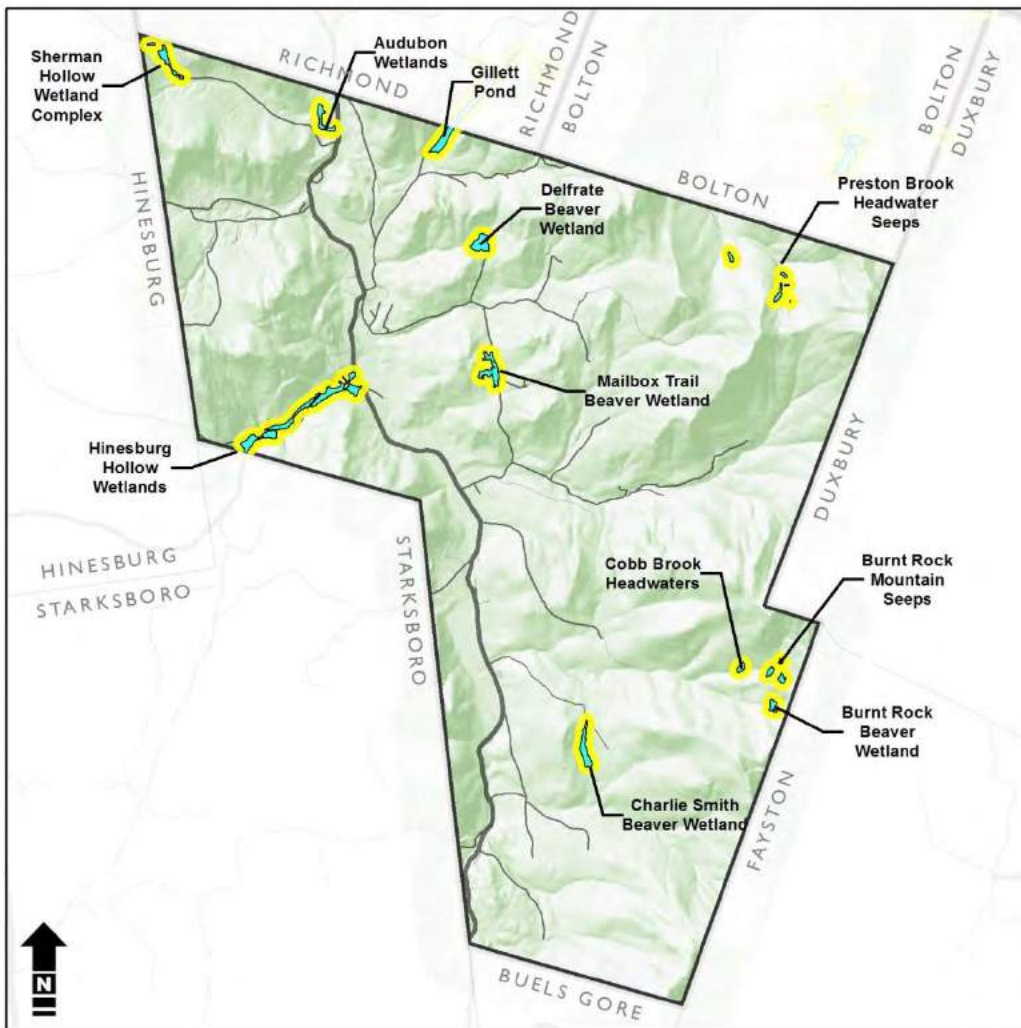


Figure 14: Huntington Significant Wetlands

3.1.3 Huntington Significant Wetlands

The town of Huntington contains 14 different natural community types comprising 577 total wetland acres. A total of 10 different wetland or

wetland complexes have been found to be significant in the town, 7 of which are discussed below.

Delfrate Beaver Wetland

Significance: Wetland Functions and Values



The Delfrate Beaver Wetland sits at the end of Delfrate road in a topographic bowl along the headwaters of a small stream. Like many beaver wetlands, this wetland complex is a mixture of wetland types including open water beaver ponds, shallow marshes and alder shrub swamps. Though this wetland was not visited during this inventory,

valuable wildlife habitat to a wide variety of species, making this wetland highly significant for that function. The open water of the beaver ponds also provides fisheries habitat. Being located near residential development, this wetland is likely significant for aesthetics and recreation. Finally, the persistent vegetation along the

stream stabilizes soils and prevents erosion. Further work, including a field assessment will provide more detailed information about this wetland.

Mailbox Trail Beaver Wetland

Significance: Wetland Functions and Values



Figure 15: The Delfrate Beaver Complex provides valuable wildlife habitat

from remote sources, it appears to be significant for a number of functions and values. The mixture of wetland types present provides

The Mailbox Trail Beaver Wetland sits alongside Taft Road in central Huntington. It is a 17 acre mixture of open water beaver pond, shallow emergent marsh and alder



swamp. Like many beaver ponds, this mixture and interspersed of different vegetation types provides ideal habitat for a wide range of wildlife species. Large mammals such as deer, moose and bear use this wetland for feeding. Amphibians such as frogs and salamanders likely find suitable

soil in place, making them significant for erosion control. Finally, since this is a highly visible wetland, it scores significant for aesthetics.

Charlie Smith Beaver Wetland

Significance: Wetland Functions and Values

The Charlie Smith Beaver Wetland



Figure 16: The Mailbox Trails Beaver Pond

breeding habitat and also attract predators such as snakes, herons, otter and raccoons. The open water of the beaver pond provides habitat for fisheries, which also attract other species of wildlife. This mixture of vegetation is efficient at filtering out excessive nutrients or pollutants before they reach surface waters, making them significant for water quality. Being located along a stream, this wetland vegetation helps to minimize erosion by holding

sits in the southern end of the largest wildlife habitat unit in the study area, the Camel's Hump CHU (see Section 5.4 Contiguous Habitat Units (CHUs)). The matrix of early and late successional forest surrounding the wetland complex provides valuable habitat to wide ranging mammals such as deer, moose, bobcat and bear. These species also likely use the wetland habitats found in the Charlie Smith Beaver Wetland. This complex is a



14 acre mixture of open water beaver ponds, deep and shallow marshes and shrub swamps. Though relatively small as beaver wetlands go, the location of this wetland within the large wildlife habitat unit increases its significance for wildlife. This wetland complex is also significant for erosion control, water quality, recreation and exemplary natural communities.

Audubon Wetlands

Significance: Wetland Functions and Values

The Audubon Wetlands sit along the banks of the Huntington River and a small tributary at the northern end of Huntington. Owned by the Green Mountain Audubon Center, these wetlands receive a lot of use both recreationally and for educational purposes.

At the southern end of the wetland complex, there is a small Hemlock-

Balsam Fir-Black Ash Seepage Swamp. This forested wetland grades into an herbaceous dominated Shallow Emergent Marsh. Further north, the site opens up to include open water from various beaver dams. These open water areas come and go as beaver populations at the site rise and fall. Because of this mixture of wetland types, this site is ranked significant for wildlife habitat. Being located along the banks of the Huntington River and a tributary, these wetlands also help to prevent erosion along these streams and provide some measure of flood water attenuation. They are ranked as moderately significant for water quality function because of their capacity to filter out excess nutrients or pollutants from runoff before they reach surface waters.



Hinesburg Hollow

Wetlands

Significance: Wetland

Functions and Values

The Hinesburg Hollow Wetlands are a series of 15 different interconnected wetlands along Hollow Brook in the southwest corner of Huntington. The wetland, like the



Figure 17: The Hinesburg Hollow Wetland Complex

Brook, crosses the road in numerous places, making for a very visible wetland system which is significant for the aesthetics function. These wetlands consist of Shallow Emergent Marshes, Old Field wetlands and Alder Swamps. At nearly 50 acres, this is one of the largest wetland systems in the town. It serves as an important aquatic linkage corridor between the Huntington River and Lewis Creek watersheds.

It is significant for flood water attenuation along Hollow Brook by

providing an expandable basin for flood waters. It is also highly significant for water quality by providing a buffer between development and the waters of the Brook. The wetland provides significant amphibian breeding habitat and is therefore highly significant for the wildlife habitat function. Finally, these wetlands are significant for erosion control by stabilizing the banks of Hollow Brook.

Sherman Hollow Beaver Wetland



Significance: Wetland Functions and Values

The Sherman Hollow Wetland Complex consists of a beaver influenced wetland and three associated Alder Swamps in the northwest corner of Huntington.



Figure 18: The Sherman Hollow Beaver Wetlands

This wetland complex is 10 acres in size and sits along Sherman Hollow Road. Being a highly visible wetland, this site is significant for aesthetics. The beaver wetland is the largest and most conspicuous of the sites in the complex. It is also the most

diverse, consisting of a series of open water beaver ponds interspersed with shallow marsh. As beaver populations fluctuate, so does the extent of the ponds. This dynamic system creates valuable wildlife habitat for a wide range of

species including fish, song birds, raptors, waterfowl, frogs, salamanders, snakes, deer, moose, bear, mink and otter. This wetland is also significant for erosion control by stabilizing the banks of the brook and water quality by providing a buffer between surface waters and the surrounding landuse.

Burnt Rock Beaver Wetland

Significance: Wetland Functions and Values

The Burnt Rock Beaver Wetland is one of the natural gems in the town



of Huntington. Located at 2260 feet in elevation in Camel's Hump State Park, this wetland system is not easy

wetland system for feeding at different times of the year. Other, smaller animals such as mole



Figure 19: The Burnt Rock Beaver Wetland is a remote wetland that provides excellent wildlife habitat

to get to; but to those that are willing to hike the trail, they are rewarded with views of a beautiful, remote and undisturbed wetland system. Like the Charlie Smith Beaver Wetland, The Burnt Rock Wetland is located within the Camel's Hump Habitat Unit, the largest habitat block in the STA study area. Large, wide ranging mammals such as bear, moose, deer and bobcat likely use this diverse

salamanders, newts, green frogs, snakes, mink and otter also reproduce or feed here. A wide variety of birds such as herons, waterfowl, raptors and songbirds use this habitat. Finally, the open water of the beaver pond provides fisheries habitat. Overall, this is a beautiful, highly functioning wetland system that provides valuable diversity in a largely forested landscape.



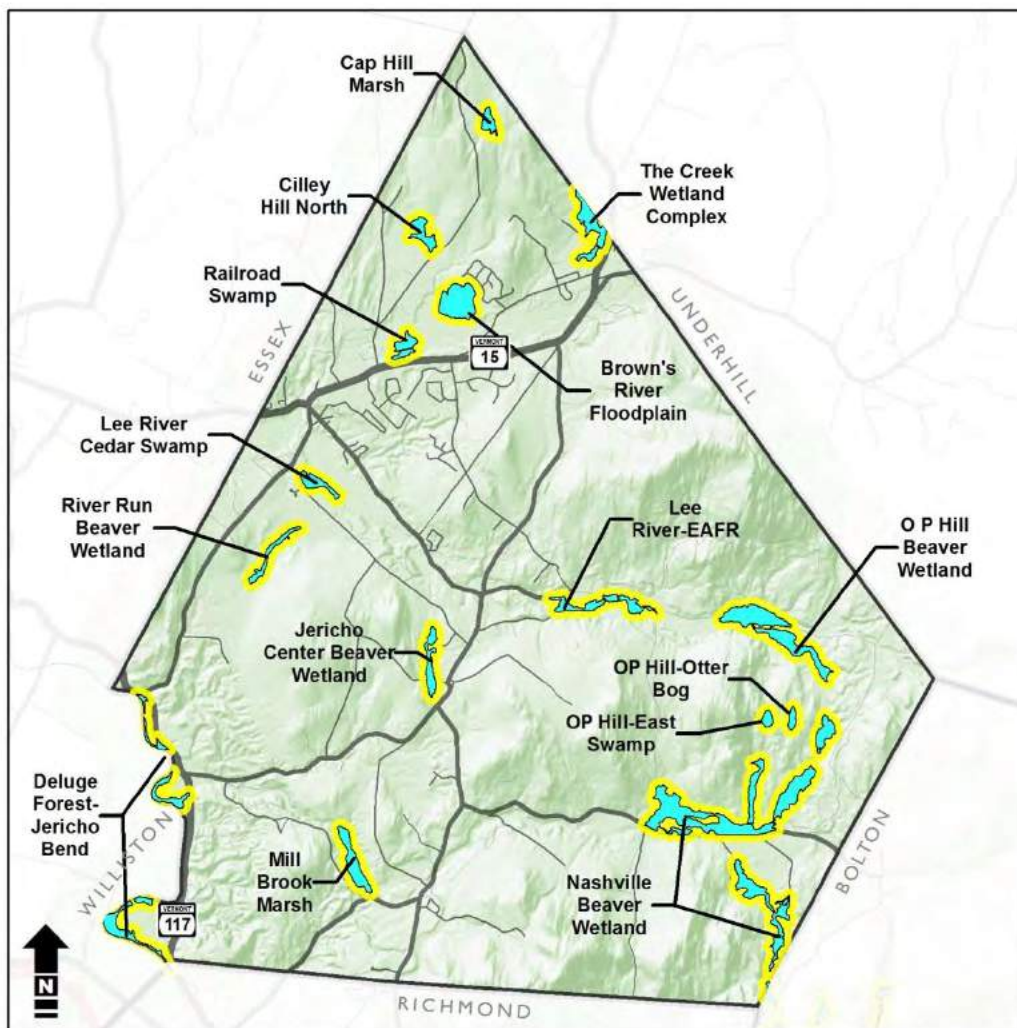


Figure 20: Jericho Significant Wetlands

3.1.4 Jericho Significant Wetlands

The town of Jericho contains the highest number of wetlands and largest wetland acreage in the STA study area. Twenty-two different wetland natural community types comprise a total of 1430 acres in the town. Sixteen different wetland or

wetland complexes have been found to be significant, 5 of which are discussed below.

The Creek Wetland Complex

Significance: Wetland Functions and Values

In Jericho, the Creek Wetland Complex occupies 32 acres of wetland in the northeast corner of



town. However, this is only the southern tip of a very large wetland complex which continues along The Creek and Route 15 into Underhill for another 4 miles. The overall complex comprises nearly 260 acres and includes marshes, shrub swamps and beaver ponds. The section in Jericho consists of an Alder Swamp and two Shallow Emergent Marshes separated by Palmer Lane. Both the marshes and the Alder Swamp appear to be in good condition.

Taken as a whole, this wetland complex is significant for many functions and values. The wetland vegetation holds the soil along the banks of the Creek, thereby limiting erosion and sedimentation of downstream areas. The wetlands attenuate the downstream effects of floods by providing an expandable

basin for flood waters. They also protect the water quality of the Creek by filtering out excessive nutrients and pollutants. The interspersed of different wetland types offers wildlife habitat to a wide variety of species including waterfowl, song birds, raptors, salamanders, frogs, snakes, otter, mink, beaver, deer, bear and moose. The waters of the Creek and wetlands also provide fisheries habitat. Finally, being highly visible, most of this wetland is significant for aesthetics.

Overall, this is a highly functioning, beautiful wetland complex in a highly visible narrow valley.

Jericho Center Beaver Wetland

Significance: Wetland Functions and Values



The Jericho Center Beaver Wetland is a 20 acre wetland complex just west of Jericho Center. The wetland sits along a small stream and consists of a mixture of open water beaver

habitat. The interspersions of different wetland types makes this complex highly significant for wildlife habitat. Being so close to residential development in Jericho Center, this



Figure 21: The Jericho Center Beaver Wetland is located near residential development in Jericho Center

ponds, small areas of deep marsh, shallow emergent marshes, and scattered shrub swamps along the margins. Though not visited during this inventory, this wetland complex appears to be significant for many functions and values. The beaver ponds provide valuable fisheries

wetland and its wildlife is likely enjoyed by many residents, making it significant for recreation and aesthetics. The wetlands provide a water quality buffer to the stream, filtering out excess nutrients or pollutants before they reach the surface waters and, ultimately, the Lee

River. This same wetland vegetation also limits erosion along the banks of the stream by holding the soil in place.

Nashville Beaver Wetland

Significance: Wetland Functions and Values



The Nashville Beaver Wetland is one of the largest, most diverse wetland complexes in the STA study area. This complex comprises 235 acres and consists of 7 different community types including shallow emergent marshes, open water beaver ponds, alder swamps, cattail marshes, sedge meadows, deep broadleaf marshes, and forested swamps. All of these wetlands are associated with the Mill Brook or one of its tributaries in the Nashville area. Most are currently or historically affected by the activity of beavers along these brooks.

It is well known that beaver activity dramatically alters the landscape. These sites are known for their dynamic nature; as beaver populations fluctuate, so does the nature of the wetland present on the site. During high beaver populations, open water ponds may occupy much of the wetland area. As these populations wane, the dams break and the wetland reverts to marsh, then shrub swamp then

forested swamp. At any point during that cycle, beavers may move back into the area and start the process over again. This dynamic and diverse mixture of wetland types provides wildlife habitat to a wide variety of species. Herons, waterfowl, songbirds, raptors, salamanders, frogs, snakes, otter, mink, beaver, deer, bear and moose all use wetland types associated with beaver complexes for food, shelter or breeding.

In addition to wildlife habitat, the Nashville Beaver Wetlands are significant for many other functions. Given that they are located along streams, their persistent vegetation is important for providing erosion control. They also help to protect the quality of the surface waters of Mill Brook by filtering out excess nutrients before they reach the Brook. The beaver ponds provide valuable habitat for fisheries. These sites are considered significant for exemplary natural communities because they are large wetland



complexes containing a wide variety of different wetland types. Highly visible from Nashville Road and Leary Road, many parts of this wetland complex are significant for aesthetics.

Overall, the Nashville Beaver Wetland Complex is a significant wetland complex that plays an important role in the ecology of the area.

Railroad Swamp

Significance: Locally Significant Natural Community

Railroad Swamp is a Hemlock-Balsam Fir-Black Ash Seepage Swamp which is located just north of Route 15 and Jericho village. It is named for the old railroad bed which bisects the swamp. This historic rail bed has significantly altered the hydrology of the wetland such that the site cannot be considered a state significant natural community. However, many parts of the swamp have recovered or appear

to be only minimally effected.



Figure 22: Railroad Swamp is a beautiful and diverse forested swamp

These areas show a swamp that is floristically diverse and in relatively good condition. The vegetation is dominated by hemlock (*Tsuga canadensis*), black ash (*Fraxinus nigra*), and yellow birch (*Betula alleghaniensis*) with lesser amounts of northern white cedar (*Thuja occidentalis*). Some speckled alder (*Alnus incana*) and hemlock shrubs are present, but the real diversity is in the herbaceous and moss flora. As is typical for swamps of this type, there is a lot of hummock and



hollow formation, which leads to micro-habitat diversity.

Species such as orange jewelweed (*Impatiens capensis*), brome-like sedge (*Carex bromoides*), three-seeded sedge (*Carex trisperma*), sensitive fern (*Onoclea sensibilis*) and turtlehead (*Chelone glabra*) are common. Peat mosses (*Sphagnum spp.*) as well as feather mosses (*Thuidium spp.*, *Hylocomnium splendens*, *Pleurozium schreberii*) blanket the forest floor.

Because of these undisturbed areas within the swamp, this site should be considered a locally significant natural community.

Cilley Hill North

Significance: State Significant Natural Community

In northern Jericho, there are three Hemlock-Balsam Fir-Black Ash Seepage Swamps. The Cilley Hill North swamp is the northernmost example of this wetland community type and is considered a state

significant community.



Figure 23: The Cilley Hill North Swamp

Like the others, this swamp is dominated by hemlock (*Tsuga canadensis*), balsam fir (*Abies balsamea*), black ash (*Fraxinus nigra*) and yellow birch (*Betula alleghaniensis*). A mix of these species also forms a shrub layer. The herbaceous layer is dominated by a wide variety of species including sensitive fern (*Onoclea sensibilis*), dwarf blackberry (*Rubus pubescens*), brome-like sedge (*Carex bromoides*), lakeshore sedge (*Carex lacustris*), cinnamon fern (*Osmunda*



cinnamomea) and pumice aster (*Aster puniceus*). Mosses blanket the floor of the swamp, colonizing the high hummocks as well as the low, wet hollows. The tree canopy varies from very dense, creating a dark and shaded micro-climate, to more open, where floristic diversity increases. This is a beautiful, diverse swamp that appears to be relatively undisturbed. Its good condition, landscape position and size warrant the designation of a state significant natural community.

Section 3.2: Management Recommendations

Wetlands are complex systems. The community types that develop on a particular site are the result of the interaction of geology, climate, soils, slope, hydrology, site history, wildlife, and human disturbance (or lack thereof). Of these factors, hydrology is perhaps one of the most significant, complex and most easily disturbed. At the most basic level, therefore, wetland protection starts with protection of wetland

hydrology. In terms of managing wetlands, any activity that disrupts the hydrology of a wetland should be avoided. This can include obvious activities such as filling or ditching a wetland, building roads through wetlands, or development in a wetland. This can also occur in more subtle ways such as skidder ruts through a headwater seep.

For significant wetlands, it is sometimes not enough to just protect the wetland itself. The aim must be to protect the wetland and its functions and values. Depending on the site and the functions, this may require a 50' or even a 100' buffer from development or other activity. As a general recommendation, any activity that negatively affects the listed functions or values of a wetland should be avoided or minimized. In addition, it must be recognized that wetlands have very fragile soils. Any ground disturbance has the potential to disrupt local hydrology and open up



the site to colonization by non-native, invasive species.

While these general wetland management recommendations apply to all wetlands, more specific recommendations based on wetland types are discussed below.

Forested Swamps

Wetlands that are dominated by woody vegetation (shrubs or trees) are generally termed "swamps". The general management

recommendations presented above also apply to these wetlands. However, because many of these sites contain marketable timber, additional recommendations are warranted. The actual loss of a tree from a forested swamp is not something that would typically be detrimental to the community. The challenge comes in how that tree is removed.

Wetland soils are fragile soils. Ruts created by a skidder often disrupt



Figure 24: Goutweed can be a problem invasive plant in many floodplain forests.



local hydrology of the site, expose soils and open the site up to invasive species. These are factors that can significantly degrade the condition of a swamp community. If logging operations are to occur, they should be conducted only when soils are sufficiently frozen and soils are not disturbed. In addition, since these sites are typically "small patch" communities, selective thinning is preferable to clear cutting.

Floodplain Forests

Floodplain forests are some of the most beleaguered natural communities in the state. Having been mostly converted to agriculture, only small remnants of these forests still remain. In addition, most of them are colonized by large populations of invasive species. At the same time, they are one of the most highly functioning wetlands in the area, in a large part due to their close association with the Winooski River. Any further activity that would comprise these systems such as development,

logging or conversion to agriculture should be avoided. Furthermore, many of these sites would benefit from enhancement or restoration activities such as efforts to control invasive species. Also, if there are willing landowners, the re-establishment of floodplain forests on former agricultural lands is a worthy endeavor.

Vernal Pools

Vernal Pools are temporarily flooded wetlands typically found in a forested landscape that retain water for the spring and early summer months and then usually dry up. Despite their small size, these wetlands provide critical wildlife habitat to a wide range of species including wood frogs, spotted and Jefferson salamanders, fairy shrimp and many invertebrates. All of the amphibians that rely on these pools spend most of their lives in the forested habitats which surround the pools. For this reason, the health and functioning of the vernal pool wetland is intimately linked with the



condition of the upland forest surrounding the pool.

Buffer zone and management recommendations for these wetlands are therefore different than for most other wetland types. Much of these management recommendations are based on the work of Calhoun and Klemens (2002) and Calhoun and deMayandier (2004).

spring breeding period and the fall juvenile dispersal period. As mentioned above, the nature of the forest immediately around the vernal pool has a tangible effect on the nature of the pool itself. Shading from surrounding trees can drastically prolong the hydroperiod of a pool. In addition, leaf litter that enters the pool from the surrounding trees forms the basis for

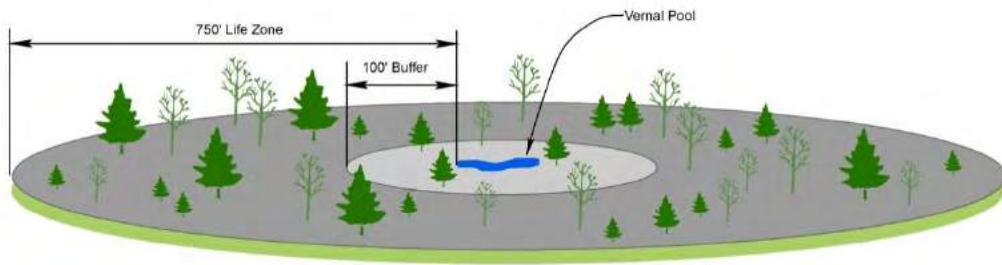


Figure 25: Vernal Pool Zones

The vernal pool system is broken up into zones. The first is the actual border of the vernal pool. Any disturbance or impact to the actual vernal pool should be avoided. The second zone is the Vernal Pool envelope, which consists of a 100' diameter buffer around the pool. The first buffer is important because the density of amphibians within this area is very high both during the

the food chain in the vernal pool ecosystem.

The condition of the forest in this 100' buffer zone is therefore strongly linked to the condition of the vernal pool itself. For this reason, it is recommended that the vernal pool envelope be managed in a way that will not interfere with the functioning of the vernal pool. This includes maintaining a complete



forested cover within this envelope. Light thinning of forest trees is, in most cases, acceptable but should come no closer than 25' to the pool's edge. Since many amphibians require a dense leaf litter on the forest floor with un-compacted soils, logging should occur when the soils are frozen

and there is adequate snow cover. The creation of ruts in this area can often disrupt the

hydrology of the nearby vernal pool.

Development and other barriers to amphibian movement should be avoided within this buffer zone.

The third zone is termed the "amphibian life zone" and is calculated 750' from the vernal pool boundaries. Amphibians that breed in vernal pools spend most of their

adult lives in the forests surrounding their natal pools. These amphibians require a forest with dense leaf litter, decomposing woody debris, un-compacted soils, and adequate canopy cover. Calhoun and Klemens (2002) recommend maintaining 75% forested cover within this life zone to



Figure 26: Ruts in the vicinity of vernal pools can create population "sinks" for amphibians.

retain adequate habitat for forest dwelling amphibians. If logging is to occur in this area, it should occur in the winter when the

ground is frozen and there is adequate snow cover. Ruts that occur in the life zone can fill with water and create population sinks when amphibians lay eggs in the ruts and never reach the more reliable vernal pool. In addition, soil compaction can cause loss of habitat



for many salamanders and should be avoided.

Beaver Wetlands

Beaver wetlands are some of the most diverse wetland systems found in the study area. They perform a wide variety of functions and often provide valuable wildlife habitat. When they occur near development, however, they can also be the most challenging to manage. As with any wetland, the general management recommendations apply: do not disrupt the hydrology and protect the functions and values. For some sites where water quality and wildlife habitat functions are a concern, this

can mean leaving a significant buffer between the wetland and development. When beaver dams threaten roads and houses, management of the wetland becomes necessary. It is best to find a solution to the problem that both prevents damage to infrastructure and preserves the functions and values of the wetland system. Many innovative techniques for accomplishing these goals are outlined in the Best Management Practices for Human-Beaver Conflicts (VT Fish and Wildlife and Department of Environmental Conservation, 2004).



4. Upland Natural Community Assessment Results

The STA study area occurs at the border of two very different biophysical regions. This results in a wide diversity of natural communities which are summarized in Tables 4-5. Up on Camel's Hump, for example, there is an Alpine Meadow surrounded by Krummholz spruce. Rime ice, high winds, extreme low temperatures and a short growing season result in conditions that are so harsh, no vegetation over a foot tall can survive. This contrasts with the warm, south facing slopes of lower elevations where oaks, hickories and red pine form communities that are more common in southern Vermont and Massachusetts than northern Vermont.

Hemlock-Northern Hardwood Forests are the most common mixed forest throughout the study area in both number of occurrences and overall acreage. These forests

typically occupy steep slopes with shallow soils and exposed bedrock, though some notable exceptions are present in Jericho. At higher elevations, hemlock is replaced by red spruce and balsam fir mixed forests. Some of these high elevation montane forests are extensive, spanning areas much larger than the STA study area. The background, or matrix, natural community throughout the study area is the ubiquitous Northern Hardwood Forest. This forest can cover very large areas, with over 40,000 acres present within the study area.

The many small hills present in each of these four towns offer an opportunity to view an interesting ecological gradation. The most mesic (moist) site conditions present on northern exposures and gradual slopes often contain Northern Hardwood Forests. Sites with slight southern exposure typically provide a warmer micro-climate where red oak can compete, resulting in a



Mesic Red Oak-Northern Hardwood Forest. If the site is less mesic, with thinner soils, the Sugar Maple-Hophornbeam community will become established. Finally, on steep southern slopes and summits with shallow soils, none of the northern hardwoods can compete. On these sites, the Dry Red Oak-Pine Forest community becomes established. This is an uncommon natural community in the state (and

in the STA study area) dominated by red oak and, sometimes red or white pine.

The wide variety of communities makes for a diverse and interesting landscape within the STA study area. Some of these communities have been assessed and determined to be significant natural communities. These are discussed in Section 4.1 below.



Table 4. Upland Natural Community Acreage Summary Table

		Total Acres					
		BOLTON	HUNTINGTON	JERICOHO	RICHMOND	TOTAL	
Upland Natural Communities	Alpine Meadow	0.0	4.4	0.0	0.0	4.4	
	Boreal Acidic Cliff	8.1	0.0	0.0	0.0	8.1	
	Boreal Outcrop	5.7	0.3	0.0	0.0	6.0	
	Dry Oak Forest	57.6	93.2	30.4	91.8	273.0	
	Dry Oak Woodland	0.0	0.0	0.0	0.6	0.6	
	Dry Red Oak-Pine Forest	38.9	227.1	53.4	220.0	539.4	
	Hemlock Forest	32.4	9.0	81.2	191.7	314.3	
	Hemlock-Northern Hardwood Forest	1439.3	2931.6	2738.8	4324.8	11434.5	
	Hemlock-Red Oak-White Pine Forest	31.8	2.6	0.0	212.5	246.8	
	Lowland Spruce-Fir Forest	18.0	14.1	198.4	0.0	230.5	
	Mesic Maple-Ash-Hickory-Oak Forest	0.0	53.5	17.4	0.0	70.8	
	Mesic Red Oak-Northern Hardwood Forest	1917.4	165.5	746.3	1170.0	3999.1	
	Montane Spruce-Fir Forest	2635.9	1537.1	0.0	0.0	4173.0	
	Montane Yellow Birch-Red Spruce Forest	2057.0	1700.0	0.0	0.0	3757.1	
	Montane Yellow Birch-Sugar Maple-Red Spruce Forest	68.9	2.4	0.0	0.0	71.3	
	Northern Hardwood Forest	14910.9	12046.1	7237.0	6297.6	40491.6	
	Northern Hardwood Talus Woodland	14.6	0.0	0.5	6.4	21.5	
	Plantation	17.1	127.2	177.9	82.4	404.6	
	Red Pine Forest or Woodland	39.9	0.0	0.0	0.8	40.7	
	Red Spruce-Heath Rocky Ridge Forest	51.8	46.5	16.3	2.7	117.4	
	Red Spruce-Northern Hardwood Forest	856.9	821.4	640.2	286.0	2604.5	
	Rich Northern Hardwood Forest	142.5	0.0	65.9	55.1	263.6	
	River Sand or Gravel Shore	4.8	12.1	10.8	25.5	53.2	
	Rivershore Grassland	2.7	1.7	0.0	7.4	11.7	
	Subalpine Krummholz	0.0	8.1	0.0	0.0	8.1	
	Sugar Maple-Hophornbeam Forest	60.8	49.6	0.0	7.7	118.1	
	Temperate Acidic Cliff	33.7	0.0	2.4	1.5	37.5	
	Temperate Acidic Outcrop	29.6	1.0	0.1	0.1	30.8	
	Temperate Hemlock Forest	12.9	0.0	0.0	23.2	36.1	
	White Pine-Northern Hardwood Forest	168.6	703.9	2416.6	1539.1	4828.2	
	Total Acreage Amount		24657.7	20558.5	14433.5	14546.8	74196.5



Table 5: Upland Natural Community Summary Table (Total Number)

		Total Number				
		BOLTON	HUNTINGTON	JERICO	RICHMOND	TOTAL
Upland Natural Communities	Alpine Meadow	0	2	0	0	2
	Boreal Acidic Cliff	7	0	0	0	7
	Boreal Outcrop	10	2	0	0	12
	Dry Oak Forest	4	4	8	18	34
	Dry Oak Woodland	0	0	0	1	1
	Dry Red Oak-Pine Forest	9	11	11	28	59
	Hemlock Forest	4	1	7	18	30
	Hemlock-Northern Hardwood Forest	58	82	86	124	350
	Hemlock-Red Oak-White Pine Forest	6	2	0	10	18
	Lowland Spruce-Fir Forest	2	2	6	0	10
	Mesic Maple-Ash-Hickory-Oak Forest	0	1	3	0	4
	Mesic Red Oak-Northern Hardwood Forest	29	8	21	47	105
	Montane Spruce-Fir Forest	14	3	0	0	17
	Montane Yellow Birch-Red Spruce Forest	9	6	0	0	15
	Montane Yellow Birch-Sugar Maple-Red Spruce Forest	1	1	0	0	2
	Northern Hardwood Forest	61	113	189	163	526
	Northern Hardwood Talus Woodland	6	0	1	1	8
	Plantation	4	24	28	15	71
	Red Pine Forest or Woodland	12	0	0	1	13
	Red Spruce-Heath Rocky Ridge Forest	13	7	4	2	26
	Red Spruce-Northern Hardwood Forest	78	50	45	29	202
	Rich Northern Hardwood Forest	7	0	16	2	25
	River Sand or Gravel Shore	8	14	31	33	86
	Rivershore Grassland	5	2	0	5	12
	Subalpine Krummholz	0	1	0	0	1
	Sugar Maple-Hophornbeam Forest	2	3	0	2	7
	Temperate Acidic Cliff	35	0	4	4	43
	Temperate Acidic Outcrop	48	2	1	1	52
	Temperate Hemlock Forest	2	0	0	1	3
	White Pine-Northern Hardwood Forest	16	55	161	107	339
	Total Upland Community Count	450	396	622	612	2080



Section 4.1: State and Locally Significant Upland Natural Communities

The methodology for determining state significance is based on the Vermont NonGame and Natural Heritage Project (NNHP) guidelines and is detailed in Section D of Appendix 1. This methodology incorporates information about a community's condition, size and landscape context. These factors taken together with the rarity of the community will determine if the site is considered a State Significant Natural Community. In some cases, sites that fall just below the state

significant standard may be considered "Locally Significant". The locally significant designation puts the community in a local perspective instead of a state-wide perspective.

All of the currently known state and locally significant upland natural communities within the STA study area are compiled in Table 6. This includes data from the current STA inventory, previous inventories and NNHP site records. Only those sites that were deemed significant during the current study are discussed in this report. These sites are shown in italics in the following summary table and discussed on a town by town basis in the sections below.



Table 6: Significant Upland Significant Natural Communities Summary Table

Site Name	Natural Communities	Size (Acres)	Location	Significance	Source	Field Verified
Gleason Brook/Ridley Brook/Preston Brook	Northern Hardwood Forest	17473	Bolton	SSNC	NNHP and AE	Partial
Mayor's Dome	Northern Hardwood Talus Woodland	5.7	Bolton	SSNC	NNHP	Yes
<i>Pinneo Brook Hemlock</i>	<i>Hemlock-Northern Hardwood Forest</i>	<i>295</i>	<i>Bolton</i>	<i>SSNC</i>	<i>AE</i>	<i>Partial</i>
<i>Pinneo Brook Mesic Red Oak</i>	<i>Mesic Red Oak-Northern Hardwood Forest</i>	<i>32.5</i>	<i>Bolton</i>	<i>SSNC</i>	<i>AE</i>	<i>Yes</i>
Pinneo Brook Red Pines	Red Pine Forest or Woodland	9.7	Bolton	SSNC	NNHP	Yes
Pinneo Brook Red Pines West	Red Pine Forest or Woodland	0.94	Bolton	SSNC	NNHP	Yes
Preston Brook Headwaters- Gleason Brook	Mesic Red Oak-Northern Hardwood Forest	55.8	Bolton	SSNC	NNHP	Yes
<i>Bolton Notch</i>	<i>Northern Hardwood Forest</i>	<i>5737</i>	<i>Bolton</i>	<i>SSNC</i>	<i>AE</i>	<i>Partial</i>
Preston Brook Headwaters	Red Spruce-Heath-Rocky Ridge Forest <i>Dry Red Oak-Pine Forest; Mesic Red Oak-Northern Hardwood Forest; Sugar Maple-Hophornbeam Forest; Hemlock-Northern Hardwood Forest; Red Pine Forest; Red Spruce-Heath Rocky Ridge Forest; Northern</i>	70.5	CHSP	SSNC	NNHP	Yes
<i>Resin Ridge</i>	<i>Hardwood Forest</i>	<i>2130</i>	<i>Bolton and Richmond</i>	<i>SSNC; LSNC</i>	<i>NNHP and AE</i>	<i>Yes</i>
Robbins Mountain	Hemlock-Northern Hardwood Forest; Rich Northern Hardwood Forest; Montane Yellow Birch-Red Spruce Forest	997	Bolton and Richmond	SSNC	NNHP	Yes
Mt. Mansfield	Montane Spruce Fir Forest	8014	Bolton- MMSF	SSNC	NNHP	Yes
Gleason Brook-Camel's Hump SP	Temperate Acidic Cliff; Hemlock-Northern Hardwood Forest; Red Spruce-Heath Rocky Ridge Forest; Rich Northern Hardwood; Temperate Acidic Outcrop; Red Spruce-Northern Hardwood Forest; Lowland Spruce Fir Forest; Hemlock Forest	570	Bolton-CHSP	SSNC	NNHP	Yes
Bolton Mountain	Boreal Acidic Cliff	2.9	Bolton-EAFR	SSNC	NNHP	Yes
Bone Mountain	Boreal Acidic Cliff	3.2	Bolton-MMSF	SSNC	NNHP	Yes
Daniel's Notch/Mt. Mansfield	Northern Hardwood Forest	6626	Bolton-MMSF	SSNC	NNHP	Yes
Daniel's Notch/Smugglers Notch/Bolton Mtn	Montane Yellow Birch-Red Spruce Forest	3402	Bolton-MMSF	SSNC	NNHP	Yes
<i>Texas Hill</i>	<i>Dry Red Oak-Pine Forest; Sugar Maple-Hophornbeam Forest</i>	<i>131.2</i>	<i>Huntington</i>	<i>SSNC</i>	<i>AE</i>	<i>Yes</i>
<i>Ravens Ridge Hemlock</i>	<i>Hemlock-Northern Hardwood Forest</i>	<i>460</i>	<i>Huntington</i>	<i>SSNC</i>	<i>AE</i>	<i>Yes</i>

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Mayo Mountain	Dry Red Oak-Pine Forest; Mesic Red Oak-Northern Hardwood Forest	174	Huntington and Richmond	SSNC	NNHP and AE	Yes
Burnt Rock Mountain	Red Spruce-Northern Hardwood Forest	85.6	Huntington-CHSP	SSNC	NNHP and AE	Partial
Camel's Hump Alpine	Subalpine Krummholz; Alpine Meadow	13.3	Huntington-CHSP	SSNC	NNHP	Yes
Camel's Hump State Park	Montane Spruce Fir Forest; Montane Yellow Birch-Red Spruce Forest	7712	Huntington-CHSP	SSNC	NNHP	Partial
Research Forest	Hemlock-Northern Hardwood Forest	500	Jericho	SSNC	AE	Yes
Skunk Hollow	Hemlock-Northern Hardwood Forest; Northern Hardwood Forest	945	Jericho	SSNC; LSNC	AE	Yes
Bald Hill-Jericho	Mesic Red Oak-Northern Hardwood Forest; Dry Red Oak-Pine Forest	381	Jericho-EAFR	SSNC; LSNC	NNHP	Yes
OP Hill	Rich Northern Hardwood Forest	31	Jericho-EAFR	SSNC	NNHP	Yes
Chamberlain Hill	Hemlock-Northern Hardwood Forest	230	Richmond	LSNC	AE	Partial
Gillette Pond Hemlock	Hemlock Forest	18.4	Richmond	SSNC	NNHP	Yes
Huckleberry Hill South	Dry Red Oak-Pine Forest; Mesic Red Oak-Northern Hardwood Forest; Hemlock-Northern Hardwood Forest; Temperate Acidic Cliff; Northern Hardwood Talus Woodland	947	Richmond	SSNC	AE	Partial
Huntington River Hemlock	Hemlock-Northern Hardwood Forest	241	Richmond	LSNC	AE	Yes
Lake Iroquois Northeast	Dry Red Oak-Pine Forest; Mesic Red Oak-Northern Hardwood Forest; Hemlock-Northern Hardwood Forest; Red Pine Forest; Northern Hardwood Forest	879	Richmond	SSNC; LSNC	AE	Yes
Cochran Block	Dry Red Oak-Pine Forest; Hemlock-Northern Hardwood Forest	847	Richmond	SSNC	NNHP and AE	Partial
Huckleberry Hill	Dry Red Oak-Pine Forest	112	Richmond and Jericho	SSNC	NNHP	Yes
Snipe Island Hemlock	Hemlock-Northern Hardwood Forest; Hemlock Forest	896	Richmond, Jericho and Bolton	SSNC	AE	Partial

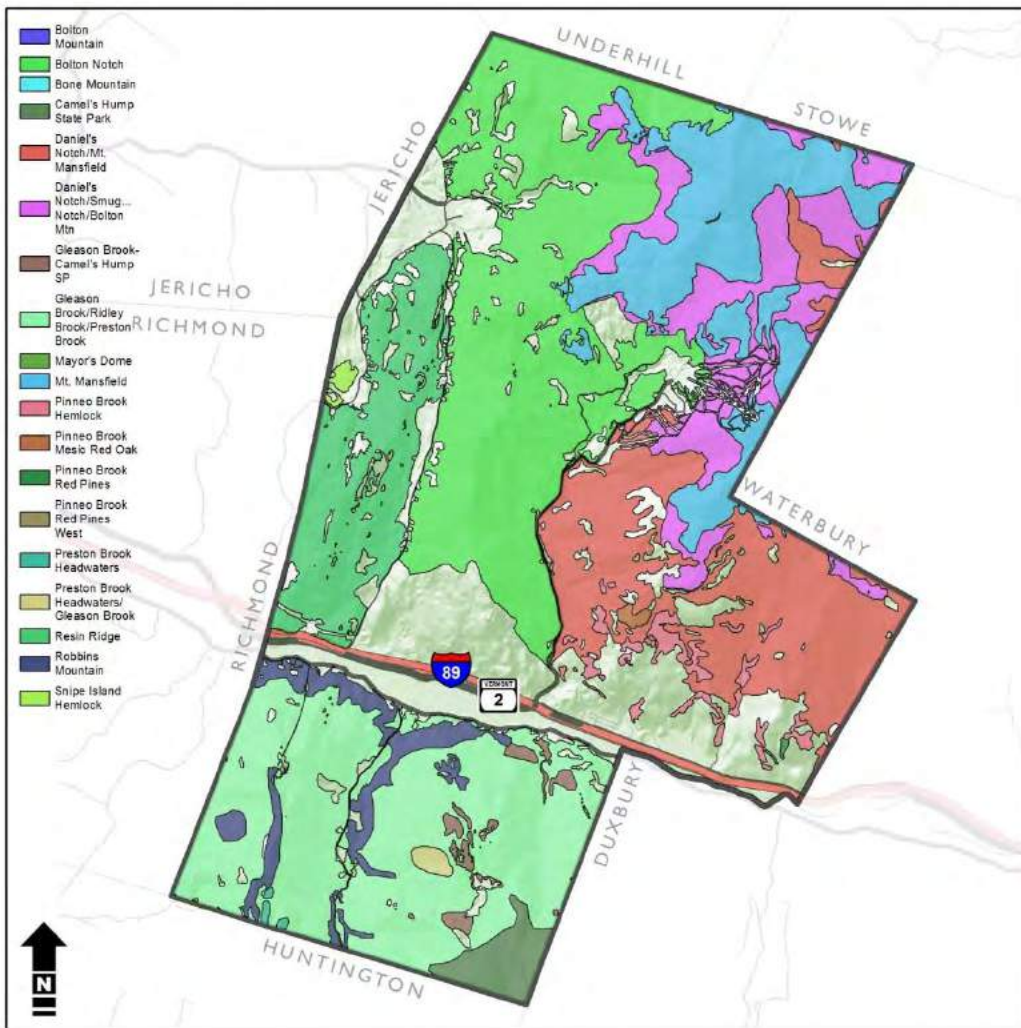
SSNC: State Significant Natural Community

LSNC: Locally Significant Natural Community

CHSP: Camel's Hump State Park

EAFR: Ethan Allen Firing Range

MMSF: Mount Mansfield State Forest



27: Bolton Significant Upland Natural Communities

4.1.1 Bolton Significant Upland Natural Communities

Being home to parts of Camel's Hump State Park and Mt. Mansfield State Forest, the town of Bolton is a town of large forests blocks. Including these state lands, 17 different upland communities have

been determined to be state significant sites, four of which are discussed below.



Pinneo Brook Hemlock

Significance: State Significant Natural Community

The Pinneo Brook Hemlock site is a series of 22 nearby stands of mixed forest on south facing slopes above the Winooski River Valley. The canopy of these sites is dominated by hemlock (*Tsuga*

canadensis) with a mixture of other hardwoods. As is typical for this community, red maple, sugar maple, beech and yellow birch are the most common hardwood components. While those species are present in some areas, the southern exposure of these sites results in Northern red oak (*Quercus rubra*) being common or co-dominant. In some cases, red pine (*Pinus resinosa*) is also found

mixed among the hemlock trees. On sites with steeper slopes and southern exposure, red pine can become more dominant and these forests can grade into the Red Pine Forest community. Since not all of



Figure 28: Hemlock Northern Hardwood Forest at Pinneo Brook

these stands were visited, some of them may have inclusions of red pine. Further inventory is needed to separate out these sites.

With the exception of red oak and occasional red pine, these forests look very similar to Hemlock-Northern Hardwood forests found elsewhere in the state. A sparse shrub layer of canopy species is present and, in some areas, witch hazel (*Hamamelis virginiana*). The herbaceous layer is likewise fairly sparse and consists of wild



sarsaparilla (*Aralia nudicaulis*), Canada mayflower (*Maianthemum canadense*), Pennsylvania sedge (*Carex pensylvanica*) and tree clubmoss (*Lycopodium obscurum*). Surficial rock and occasional bedrock outcrops are common. Forest condition appears to be good; though there were extensive logging operations elsewhere in the area, none in this community. Some areas contained pockets of larger (20"+ DBH) trees but most were smaller.

Overall, this series of stands is a good example of a common community. The influence of the more "southern" species such as red oak and red pine make it unique.

Pinneo Brook Mesic Red Oak-Northern Hardwood

Significance: State Significant Natural Community

The Mesic Red Oak-Northern Hardwood Forest is a fairly broadly defined natural community that is used to denote sites that contain a mixture of red oak with the more

common northern hardwood species such as sugar maple, white ash, American beech and the birches. Depending on the location, these forests can be small stands or large patches reaching hundreds of acres. The Pinneo Brook stand is relatively small at 32 acres. It is likely part of a much larger red oak-northern hardwood community to the south that was not fully assessed during this inventory. Because more work is needed to characterize this larger forest to the south, it was labeled as "Potentially Significant". The Pinneo Brook stand, however, was determined to be a B-ranked example of this type and therefore considered state significant. This stand is fairly typical for this community in the area. It includes areas where red oak is mixed with sugar maple, red maple and American beech. These sites look similar to the more familiar Northern Hardwood Forests, but contain oak in the canopy. Other small areas of this site are much drier and more open, resembling a Dry Oak Forest.



But since these areas are small, they were considered to be part of the Mesic Red Oak-Northern Hardwood Forest.

Overall, this is a nice, if relatively small, stand of a common community. Its rank may be increased if it is found that the larger

Mesic Red Oak-Northern Hardwood Forest to the south is found to be state significant

and connected to this site.

Bolton Notch

Significance: State Significant Natural Community

The Bolton Notch Hardwood forest is a large stand which sits in between the Bolton Valley Access Road and the Notch Road and runs from just

north of I-89 north into Underhill. Mapped only within the town of Bolton, this forest comprises 5737 acres; though from remote sources, it appears that this is less than 1/2 of the total size of the stand. The large acreage that this community occupies explains why this forest type is considered a "matrix" natural community.

Being so large, it was not within the scope of this project to assess the entire community. Field assessments



Figure 29: Northern Hardwood Forest in Bolton Notch

were done in limited areas where landowner permission was obtained (in the vicinity of the Bolton Valley ski resort). As can be expected for a forest of this size, there is a larger amount of variability in the structure, composition and age of the stand. Even the area that was visited



contained pockets of mature sugar maple 40"+ in diameter as well as areas of young forest with tree DBH less than 10". Overall, the canopy is dominated by a mixture of sugar maple (*Acer saccharum*) and American beech (*Fagus grandifolia*). Areas with richer soils may also include American ash (*Fraxinus americana*) and black cherry (*Prunus serotina*). The sub-canopy and shrub layers are likewise variable but typically composed of regenerating canopy species as well as hobblebush (*Viburnum lantanooides*). Common herbs include Evergreen woodfern (*Dryopteris intermedia*), acuminate aster (*Aster acuminatus*), lady fern (*Athyrium filix-femina*) and hay-scented fern (*Dennstaedtia punctilobula*). The composition and abundance of the herbaceous layer, however, is highly variable depending upon local site conditions.

Though this is a common community, the sheer size of this stand is impressive. This site is the

second largest Northern Hardwood Forest in the STA study area but would likely be the largest if mapped into Underhill. From what was seen of this community, this is a large and significant forest worthy of the state significance designation.

Resin Ridge

Significance: State Significant Natural Communities

Resin Ridge is not the largest block of significant natural communities, but it is one of the most diverse. This ridgeline sits north of I-89 in between the Notch Road and Stage Road. Though generally rising up from the Winooski River then dropping down into the Preston Pond area, the topography is fairly variable. Steep southern slopes with shallow soils provide habitat for more xeric (dry) communities, while more protected areas or sites with shallower slopes are home to the more mesic (moist) forests. A total of 7 different community types were mapped within this area, including: Northern Hardwood Forest, Mesic



Red Oak-Northern Hardwood Forest, Dry Red Oak-Pine Forest, Hemlock-Northern Hardwood Forest, Red Pine Forest, Sugar Maple-Hophornbeam Forest and Red Spruce-Heath Rocky Ridge Forest.

The exposed slopes and summits with a southern aspect are the warmest and driest of the micro-habitats found in this area. These sites are occupied by the Dry Red Oak-Pine Forest and the Dry Oak Forest. The only difference between these two types is the presence of red and white pine. At the time of this report submittal, the classification of the oak communities in the state is being revised by NNHP. Preliminary results from the NNHP analysis suggest that all of the dry oak sites in the central part of the state (including the four-town study area) may eventually be lumped into one community type regardless of the presence of pine. These two types will therefore be discussed together.

There are only two small areas within the Resin Ridge site that are mapped as Dry Red Oak-Pine Forests. These are small sites because the species that dominate this community are easily outcompeted when the conditions are not extreme enough. In the case of Resin Ridge, they are confined to narrow areas of ridge where the soils are more shallow and droughty. The canopy of these sites is dominated by red oak, though an occasional white pine is also found. The understory consists of species such as Pennsylvania sedge (*Carex pensylvanica*) and bracken (*Pteridium aquilinum*), both fairly typical for these sites. These sites appear to be in very good condition: they lack invasive species and are free from any recent human alteration. Though they are small, the uncommon nature of this community makes them significant natural communities.



Both the Sugar Maple-Hophornbeam and Mesic Red Oak-Northern Hardwood forests are intermediate between these xeric dry oak sites and the more mesic Northern Hardwood forests.



Figure 30: Sugar Maple-Hophornbeam forests are a mixture of oak and maple

These communities occupy the southern and southwestern slopes in the Resin Ridge area and consist of 13 different stands comprising 330 acres. The canopy is a mixture of red oak, sugar maple, and beech. Lower areas may also contain white ash and basswood (*Tilia americana*). Sites typed as Sugar Maple Hophornbeam may contain only red oak in the canopy with some sugar maple in the sub-canopy and shrub layers. Hophornbeam (*Ostrya virginiana*) is found throughout this

area, but more abundant in the Sugar Maple Hophornbeam sites along with maple-leaved viburnum

(*Viburnum acerifolium*).

The herbaceous layer is likewise somewhat variable. Most sites

are dominated by Canada mayflower (*Maianthemum canadense*), evergreen woodfern (*Dryopteris intermedia*) and wild sarsaparilla (*Aralia nudicaulis*). The driest micro-sites also include species such as Pennsylvania sedge (*Carex pensylvanica*) and rough-leaved ricegrass (*Oryzopsis asperifolia*). These sites appear to be in very good condition, of average age, lacking invasive species and any recent drastic human alteration. Their large size, good condition and



landscape position result in a state significance designation.

Occupying some of the steeper slopes in the Resin Ridge area are forests that are largely mixed conifers and hardwoods. These consist of Hemlock-Northern Hardwood, Red Pine Forest, and Red Spruce-Heath Rocky Ridge Forests. The Red Pine Forests appear to be

limited to the northern part of the area and have been mapped and assessed by NNHP.

Since these sites were not visited during this inventory, no additional information is presented here.

Only two small areas are mapped as Red Spruce-Heath Rocky Ridge forest in the resin Ridge area. These

are areas adjacent to hemlock dominated sites where red spruce is dominant. Spruce is fairly dense and the heath shrubs typically found in this community are lacking or found only in small open areas. Red oak is occasionally mixed in the canopy with spruce. Despite their size, these sites are in very good condition and warrant a state significance designation.



Figure 31: A Red-Spruce Heath Rocky Ridge Forest at Resin Ridge

Hemlock-Northern Hardwood forests, on the other hand, are very numerous at this site, consisting of 9 different

stands and occupying 450 total acres. They are dominated by hemlock, yellow birch, and sugar and red maple. Hobblebush is common in the shrub layer and the herbaceous layer consists of



intermediate woodfern, Canada mayflower and wintergreen (*Gaultheria procumbens*). The sites that occupy the higher and steeper ridges in this area appear to be drier versions of this type. These sites contain red oak as a co-dominant canopy tree and an occasional red pine scattered throughout. Other species such as lower lowbush blueberry (*Vaccinium angustifolium*) more typically found in drier sites can also be found. The sites that were visited appeared to be in very good condition. Trees were moderately sized (12-16" DBH) and no major human perturbation was evident. Because of their size, good condition and landscape position, these sites are considered state significant natural communities. Further work



Figure 32: Hemlock and red pine share dominance in some areas of Resin Ridge

needs to be conducted to determine the extent of hemlock versus red pine types in this area.

The common Northern Hardwood Forest forms the background community to the Resin Ridge area.

The areas that are occupied by this community are typically the more mesic sites with shallower slopes and more northerly aspects. Northern Hardwood forests here consist of 9 stands occupying approximately 1280 acres. While this may seem large compared to the other communities at Resin Ridge, this forest type is the most common in the state, with some examples in the tens-of-thousands of acres. From the areas that were visited, this community appears to be standard example of the type. Dominants



include white ash, sugar maple, yellow birch and scattered red oak. These species, along with hophornbeam are common in the shrub layers. The herbaceous layer is fairly sparse. Hay-scented fern (*Dennstaedtia punctilobula*), Christmas fern (*Polystichum acrostichoides*) and interrupted fern (*Osmunda claytoniana*) are common. Some areas with slight enrichment also include plantain-leaved sedge

(*Carex plantaginea*), jack-in-the-pulpit (*Arisaema triphyllum*) and common maidenhair (*Adiantum pedatum*). The areas that were visited in the southern part of the stand were in good condition. The combination of size, condition and landscape position do not meet the standards for state significant designation. However, this stand should be considered locally significant.



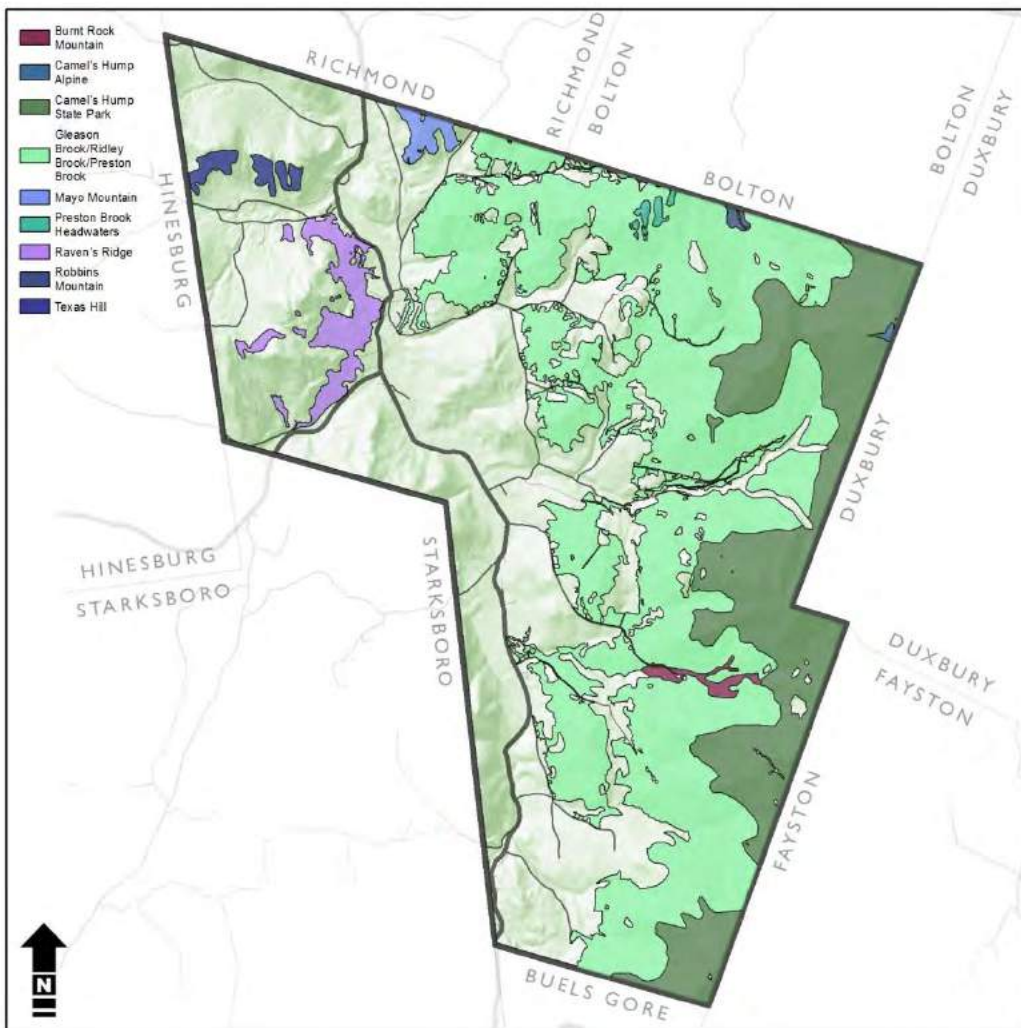


Figure 33: Huntington Significant Upland Natural Communities

4.1.2 Huntington Significant Upland Natural Communities

The upland communities of Huntington are characterized by a large forest block in the eastern half in and around Camel's Hump State Park where montane and northern

hardwood forests predominate. The western half is dominated by smaller forest blocks and includes drier and "warmer" types like the Dry Red Oak-Pine Forests. Overall, 6 upland community sites have been determined to be state significant



sites, three of which are discussed below.

Mayo Mountain

Significance: State Significant Natural Communities

Mayo Mountain is a small summit on the border of Huntington and Richmond.

The steep, slopes of this small area, however, are occupied by very good examples of

Dry Red Oak-Pine and Mesic

Red Oak-Northern Hardwood Forests. As described in the section on Resin Ridge, the Dry Red Oak-Pine Forests are relegated to the sites with southern exposure that have shallow, droughty soils. The example of this community at Mayo Mountain is 109 acres and sits on the lower slopes and steeper upper



Figure 34: The red oak trees on Mayo Mountain stand out in the autumn

slope of the mountain. This community is dominated by red oak, white pine, with lesser amounts of beech, sugar maple, red maple and an occasional red pine. Many of the white pine trees are large and form a "super-canopy" (above the rest of the canopy) whereas most of the

hardwoods are relatively young. The sub-canopy and shrub layer comprise around 20% cover each and consist of canopy species as

well as hophornbeam and striped maple (*Acer pensylvanicum*). The herbaceous layer is sparse, approximately 10% cover and dominated by bracken with small amounts of partridge berry (*Mitchella repens*) and marginal wood fern (*Dryopteris marginalis*). Mosses and lichens occupy about



10-15% cover and consist of *Pleurozium schreberii*, *Polytrichum strictum* and *Dicranum scoparium*, among others. There is a lot of surficial rock and exposed bedrock on these southern slopes. This forest is an uncommon community. It appears to be in good condition and is considered a state significant natural community.

The Mesic Red Oak-Northern Hardwood forest on Mayo Mountain is also found on the southern slopes but occupies areas that are slightly more mesic. The white and red pine are absent from these areas and the red oak is mixed with sugar maple, beech and red maple. Common herbs include Canada mayflower, intermediate woodfern and

partridge berry. This site contains some inclusions of Dry Red Oak-Pine forest, but too small to map out as separate communities. The size, nature and landscape position of this community warrant a state significant designation.

Only the southeastern part of this site was visited during this inventory. Field work should be conducted on communities to the west to determine type and significance. Despite its relatively small size, Mayo Mountain is home to an interesting and significant uncommon community in the state.

Texas Hill

Significance: State Significant Natural Communities



The Texas Hill oak communities sit on the southern slopes of Texas Hill in the northwest corner of Huntington. Most of this hill is occupied by Northern Hardwood Forest. It is only the steeper southern slopes, with their warmer micro-climate and shallow soils, that are habitat

for the Dry Red Oak-Pine and Sugar Maple-Hophornbeam Forests. The Sugar Maple Hophornbeam forests occupy the upper slopes and are both spatial and ecologically intermediate between the drier oak and more mesic northern hardwoods. These sites consist of a red oak dominated canopy with varying amounts of other hardwoods such as sugar maple and white ash in the more mesic micro-sites.



Figure 35: Texas Hill Oak Community with dense huckleberry in the understory

Hophornbeam is abundant in the tall shrub layer throughout this forest. There is only a sparse understory dominated by Pennsylvania sedge (*Carex pensylvanica*). Having been heavily logged about 25 years ago, most of this forest is fairly young, with an average tree DBH of only 5" in some areas. Despite this,

the stand appears to be recovering well and is considered a state significant natural community.

The Dry Red Oak-Pine Forests at Texas Hill occupy the lower, steeper southern slopes. These sites are dominated more exclusively by red oak with only an occasional maple or beech. Canopy cover can range from nearly 100% to more open areas of 60-70% cover. Understory



is dominated by hophornbeam and *Amelanchier sp.* shrubs. Areas that are more open, especially those on the nose of the slope, also contain dense heath dwarf shrubs such as lower lowbush blueberry (*Vaccinium angustifolium*) and black huckleberry (*Gaylussacia baccata*). Herbaceous cover is

relatively sparse and consists of marginal wood fern (*Dryopteris marginalis*), Pennsylvania sedge (*Carex pennsylvanica*) and wild

sarsaparilla (*Aralia nudicaulis*). Mosses such as *Dicranum sp.* and *Pleurozium schreberii* are common non-vascular species. Like the Sugar Maple-Hophornbeam forests, these sites are relatively young. However, they are also regenerating well and appear to be in very good condition. These communities are considered

state significant natural communities.

Ravens Ridge Hemlock

Significance: State Significant Natural Community

The Ravens Ridge Hemlock site consists of the mixed Hemlock-



Figure 36: Hemlock Northern Hardwood Forest at Raven's Ridge

Northern Hardwood forests in the Ravens Ridge wildlife block south and west of

Huntington Village.

Though it

includes 9 different forest stands, the largest and most significant stand is a 400 acre forest adjacent to the village. The topography of the area consists of eastern slopes above the river valley with numerous small plateaus and benches. This is a fairly typical Hemlock-Northern Hardwood community with hemlock co-



dominant in the canopy with sugar and red maple and yellow birch. Some areas of dense hemlock occur, especially on the steeper slopes. The understory is fairly open in many places, with high visibility possible. Only one of the smaller hemlock stands in the Ravens Ridge block was visited. This site is located above the main stand on a south facing slope and is drier than the

hemlock stands below. It contains red oak in the canopy and dwarf blueberry shrubs in the understory. Since only part of this large stand was visited, more inventory is needed. This occurrence of Hemlock-Northern Hardwood forest is notable for its size and good condition. These factors result in a state significance designation.



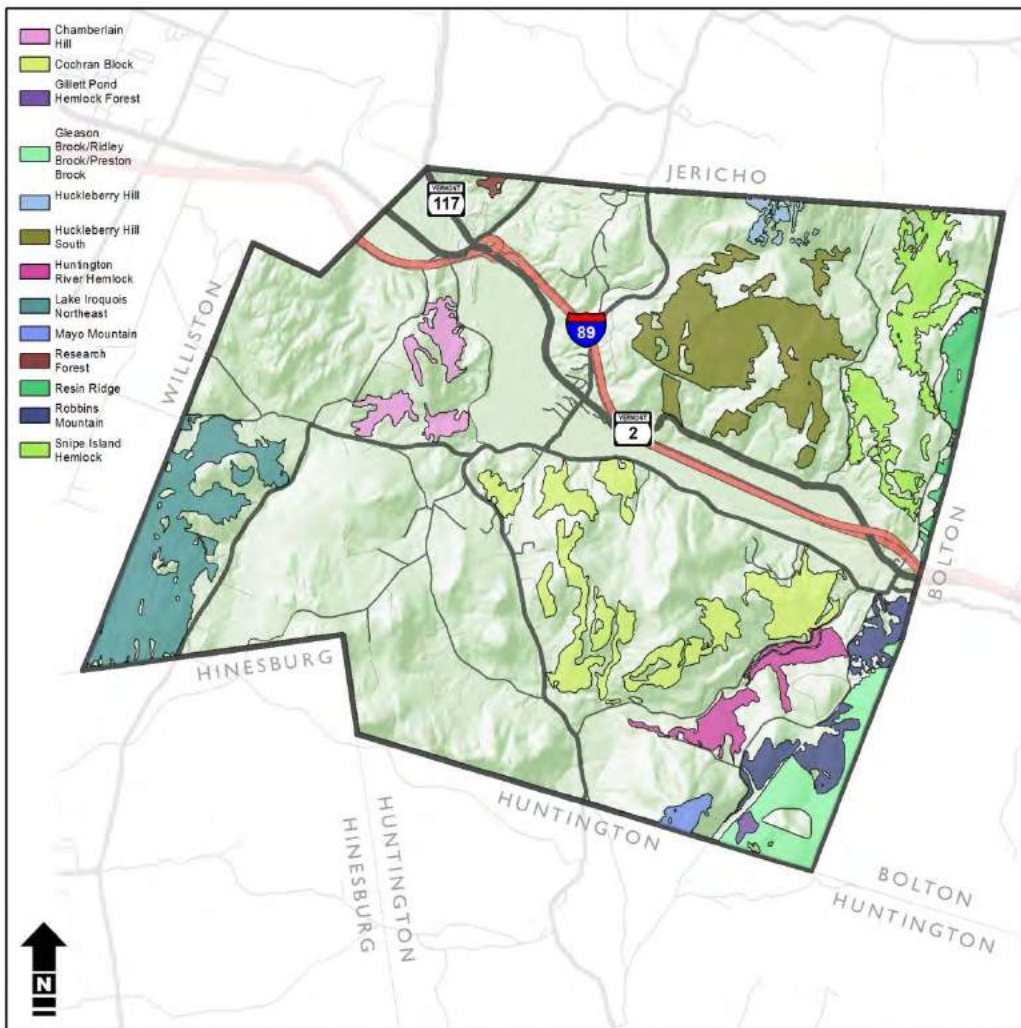


Figure 37: Richmond Significant Upland Natural Communities

4.1.3 Richmond Significant Upland Natural Communities

The upland natural communities of Richmond consist of 21 different types comprising 14,547 total acres. Eight different upland communities have been determined to be state significant sites, six of which are discussed below.

Chamberlain Hill

Significance: State Significant Natural Community

Chamberlain Hill is a small forest block in northwest Richmond above the Winooski River valley. It consists of a mixture of Mesic Red Oak-Northern Hardwood Forest and Hemlock-Northern Hardwood



Forest. The red-oak hardwood forest was not assessed during the present inventory, but one stand of the four Hemlock-Northern Hardwood Forests was assessed and determined to be a state significant natural community.



Figure 38: The Hemlock Northern Hardwood Forest Community

This stand is characterized by very steep west

facing slopes with abundant bedrock outcrops and ledges. The canopy is a mixture of hemlock and yellow birch and the understory is very sparse. Some of the hemlock trees are impressive in stature, reaching 20" DBH. Near the upper and lower margins of this forest, white pine and oak are also present in the canopy.

Overall, this group of hemlock forests consists of 230 acres. Further

inventory work needs to be conducted in the other stands in this occurrence to determine vegetation structure and composition and community condition.

Lake Iroquois Northeast

Significance: Locally and State

Significant Natural Communities

The Lake Iroquois Northeast site encompasses nearly the entire southwest corner of the town of Richmond and most of the forests in the Iroquois CHU wildlife block. The reason that most of these uplands were determined to be significant is that the common communities that are present are quite large and the smaller communities are types that are uncommon or rare. The topography of this area consists of a series of low hills, saddles and



benches. While the northern end is characterized by a shallow north facing slope, the southern end consists of steep south and east facing slopes. These areas giving rise to very different natural communities.

The common, matrix forming Northern Hardwood Forest present throughout this site falls just below the standard for a state significant site. However, because it is large (460 acres) and appears to be in good condition, it should be considered locally significant.

The community with the second largest acreage at this site is the Hemlock-Northern Hardwood Forest. These sites contain 18 different stands and comprise approximately 360 acres. The largest stands of this type are located on the variable slopes at lower elevations. These appear to be more standard Hemlock-Northern Hardwood Forests. Hemlock is co-dominant with northern hardwoods such as red and sugar maple, beech

and yellow birch. The stand that was visited appeared to be in good condition. There was some recent selective logging, but no alterations that would degrade the community condition. Some of these mixed hemlock forests, especially those on steeper slopes and southern exposures, varied from the standard mixed forest in that they were more temperate. The canopy was dominated by hemlock, but co-dominants include less beech and sugar maple and more red oak. In some examples, the "northern hardwoods" are completely absent, having been replaced by red oak. In these sites, red or white pine is also an occasional component. In the map associated with this report, these sites are distinguished from the standard Hemlock-Northern Hardwood Forest, and referred to as Hemlock-Red Oak-White Pine Forest. Since the classification of these is being revised, it is unknown if this type will be recognized as sufficiently different from the standard to warrant its own type.



For the purposes of ranking, these types were considered the same.

Regardless of what we call it, these mixed hemlock forests are extremely variable, extensive and appear to be in very good condition. Taken together, they are considered a state significant natural community.

The Mesic Red Oak-Northern Hardwood Forests in this

block consist of 31 acres. However, since only the

southern stands were assessed during this inventory, only these are included in this analysis and considered state significant. These sites all sit on south or east-facing slopes and are fairly standard examples of this common type. Tree canopy is dominated by red oak, sugar maple, beech and occasional

white ash. There is some logging activity in these forests, but none that appears to degrade the condition of the community.

While red oak is only a co-dominant in the canopy of these forests, it becomes a dominant component in



Figure 39: The Dry Red Oak-Pine community at Lake Iroquois Northeast includes more open "woodland" areas

the adjacent Dry Red Oak-Pine forests. This is an uncommon community, which occupies steep southern slopes of

the hill in the southeast corner of this CHU. On the nose of this slope, stunted red oak and red and white pine form a canopy that is sparse and woodland-like. There is a fairly dense layer of heath shrubs such as lower lowbush blueberry (*Vaccinium angustifolium*) and black huckleberry



(*Gaylussacia baccata*). The herbaceous layer is contrastingly sparse, with only scattered patches of Pennsylvania sedge (*Carex pensylvanica*), common oatgrass (*Danthonia spicata*) and wintergreen

(*Gaultheria procumbens*). Because of the exposed ledge, lichens and mosses thrive, including

Cladonia spp. and *Cladina* spp.,

Pleurozium schreberii and *Dicranum scoparium*. Further down the slope, the forest becomes more typical of the type: pine becomes less common, trees less stunted and the canopy more closed. In this more closed canopy, the Pennsylvania sedge (*Carex pensylvanica*) lawn gains dominance in the understory.

This is a very nice example of the Dry Red Oak-Pine community. The site appears to be free of human disturbance and in excellent condition. Its size, condition and landscape quality together make this



Figure 40: A small Red Pine Forest community at the Lake Iroquois Northeast site

a state significant natural community.

On the summit of this hill, adjacent to the Dry Red Oak-Pine forest, there

is a small, $\frac{3}{4}$ acre example of the Red Pine Forest/Woodland community. This is a rare community type which occurs only in small patches on dry, rocky summits and ridges. It reaches its greatest extent in more southern locales in the state. These communities were likely once maintained by fire. In the absence of fire, other species may out-compete the red pine. The site



on this summit consists of a canopy of red pine with a small amount of red oak. Trees are 30-40' tall and average DBH is around 10". There is a shrub layer of red pine, red oak, Amelanchier sp. and hemlock. Since

this is a forested community, heath shrubs are somewhat sparse. Herbaceous layer is around 25% cover and

consists of bracken (*Pteridium aquilinum*), rough-leaved ricegrass (*Oryzopsis asperifolia*), trailing arbutus (*Epigaea repens*) and wintergreen (*Gaultheria procumbens*). Bedrock outcrops and exposed surficial rocks are common. This site appears to be in good condition. There are no signs of recent human disturbance. This site

is considered a state significant natural community.

Snipe Island Hemlock

Significance: State Significant Natural Communities



Figure 41: A Hemlock Forest at the Snipe Island site

The Snipe Island Hemlock sites consist of two related natural communities: Hemlock-Northern Hardwood

Forest and Hemlock Forest. The Hemlock-Northern Hardwood Forest is by far the larger of the two, comprising more than 880 acres. The part of this large forest that was visited during this inventory was a fairly variable forest. Canopy dominants typically include hemlock, sugar maple, beech and yellow birch. However, some areas also contain more early successional species such



as quaking aspen (*Populus tremuloides*). Shrub layers have moderate cover and consist of the canopy species as well as striped maple (*Acer pensylvanicum*) and red spruce (*Picea rubens*). There is a sparse herbaceous layer comprised of New York fern (*Thelypteris noveboracensis*), Canada mayflower (*Maianthemum canadense*), Christmas fern (*Polystichum acrostichoides*) and tree clubmoss (*Lycopodium obscurum*). Some selective logging has occurred in some of these stands, but none that appeared to have a detrimental effect on the community condition. Taken together, this 880 acres of forest is impressive in size and warrant the state significant designation.

Interspersed within these mixed forests are areas where hemlock alone is dominant. These areas are mapped as Hemlock Forests. While only one Hemlock Forest was mapped in this area, many smaller inclusions likely exist. The 10 ½ acre

stand that was mapped, however, is a beautiful example of the type. This forest is characterized by a canopy of tall, fairly dense hemlock trees and an open, dark, rocky understory. While a few red maple (*Acer rubrum*) and yellow birch (*Betula alleghaniensis*) share the canopy, hemlock is clearly dominant. The herbaceous and non-vascular layers are both very sparse, consisting of a few tufts of intermediate woodfern, shining clubmoss (*Lycopodium lucidulum*) and red-stem moss. Exposed bedrock ridges are common and topography is quite variable. Average DBH of the hemlock is around 10", though some trees reach 16" in girth. There is no sign of human disturbance or recent logging. This site is considered a state significant natural community.

Huckleberry Hill South

Significance: State Significant Natural Communities

The Huckleberry Hill South site is a large assemblage of communities on the hills above the Winooski River



valley. Many of these hills include some steep slopes with southern exposure and host rare dry oak communities and cliffs. The variable topography also includes sites where Hemlock-Northern Hardwood Forest and Mesic Red Oak-Northern Hardwood Forests thrive.

The forests immediately north of the river consist of recovering pasture land that is now occupied by White Pine-Northern Hardwood Forests. Further north, these sites give



Figure 42: A Hemlock Northern Hardwood Forest at the Huckleberry Hill South site

way to a large Mesic Red Oak-Northern Hardwood Forest. This occurrence is approximately 460 acres and is similar to the ubiquitous Northern Hardwood Forest but contains red oak in the canopy. Red oak is able to compete here because of the warmer micro-climate from the

southern exposure. There are some small inclusions of Sugar Maple-Hophornbeam forest where slight topographic changes result in even drier conditions. There are also some more mesic, enriched areas that support herbs such as red baneberry (*Actaea rubra*), wild ginger (*Asarum canadense*) and wood nettle (*Laportea canadensis*). Being a large

forest, there is also a lot of variability in forest management. Some areas are quite young, with average canopy tree DBH around 8-10", while others support larger, more mature stands. Overall, this forest is in good condition and ranks as a state significant natural community.



Interspersed throughout the Mesic Red Oak-Northern Hardwood Forests are 13 stands of Hemlock-Northern Hardwood Forest. Topography in these forests is highly variable and includes various slopes of all aspects, draws and summits. The presence of hemlock in the canopy of these forests hold these sites together, though the hardwood component seems to vary based on slope and aspect. The most



Figure 43: The Huckleberry South site includes some very nice Dry Oak Forests

common hardwood component is a mixture of sugar maple, yellow and white birch and lesser amounts of beech. Red oak is also a canopy component on south-facing slopes. Shrub layers are typically sparse and consist of a few individuals of the species found in the canopy. Herbs are likewise sparse, typically under

15%. Intermediate woodfern, wild sarsaparilla (*Aralia nudicaulis*) and Christmas fern (*Polystichum acrostichoides*) are common components. Like the nearby Mesic Red Oak-Northern Hardwood Forest, these mixed forests are fairly variable. They include stands with large trees as well as areas of active logging. The size, condition and landscape condition

combine to make them state significant natural communities.

As mentioned above, red oak can become a canopy component on the south-facing slopes in this area. When the slopes become steep or on the summits where soils are particularly shallow, red oak can



become dominant. These sites are typed as Dry Red Oak-Pine or Dry Oak Forests and are an uncommon community in the state. Huckleberry Hill South contains approximately 31 acres of this community. All of these sites occur in small patches where conditions are favorable for red oak and occasional red and white pine. Some of these sites are unusual in that they also contain occasional white oak (*Quercus alba*) trees in the canopy, a species that is typically found at lower elevations and warmer micro-climates. There is a sparse shrub layer of canopy species as well as witch hazel (*Hamamelis virginiana*) and maple-leaved viburnum (*Viburnum acerifolium*). In more open areas, heath shrubs such as lower lowbush blueberry (*Vaccinium angustifolium*) and black huckleberry (*Gaylussacia baccata*) are present. The herbaceous layer is variable but typically consists of Pennsylvania sedge (*Carex pensylvanica*) with lesser amounts of wintergreen (*Gaultheria procumbens*), common bellwort

(*Uvularia sessilifolia*), and bracken (*Pteridium aquilinum*). The sites that were visited as part of this inventory were in very good condition. Some were younger forests that were recovering well from past logging operations, others lacked any sign of recent human disturbance. Because of their uncommon nature, size, condition and landscape, these sites are considered state significant natural communities.

Cochran Block

Significance: State Significant Natural Communities

The Cochran Block of upland forests is located in the Cochran CHU adjacent to Richmond Village. These forests consist of Northern Hardwood Forest, Hemlock-Northern Hardwood Forest and Dry Red Oak-Pine communities. The Northern Hardwood Forest in this area was ranked but determined not to be significant because of its (relatively) small size. Both the Hemlock-Northern Hardwood Forest and the Dry Red Oak-Pine forests,



however, have been ranked as state significant communities.

The Hemlock-Northern Hardwood Forests at this site consist of a mixture of hemlock and red oak with lesser

amounts of sugar maple, beech and red maple. In some areas, especially sites with southern

exposure, red oak is the only

hardwood present. Like many examples of this type, the understory is fairly sparse. A few shrubs or regenerating canopy species form the shrub layer and the herb layer consists of a few sprigs or partridge berry (*Mitchella repens*), tree clubmoss (*Lycopodium obscurum*) or evergreen woodfern (*Dryopteris intermedia*). Exposed bedrock

outcrops and surficial rock is common in these sites, especially those on steeper slopes. Most of these stands were in good condition, contained good-sized trees (14-20" DBH), and showed no signs of recent

logging.

The highest hill at this site is located in the southeast corner of this forest block. It is on the south facing



Figure 44: A very nice Dry Oak Forest at the Cochran Block site

slopes and summit of this hill that hemlock gives way to the oak dominated Dry Red Oak-Pine community. The canopy of these sites is dominated almost exclusively by red oak. Lesser amounts of red maple and hophornbeam are sometimes present. There is a tall shrub layer of 30% cover composed of hophornbeam, *Amelanchier sp.*,



red oak and red maple. A variable short shrub layer of lower lowbush blueberry (*Vaccinium angustifolium*) and tree species is present. The herbaceous layer consists of Pennsylvania sedge (*Carex pennsylvanica*), marginal wood fern (*Dryopteris marginalis*), common bellwort (*Uvularia sessilifolia*), and Canada mayflower (*Maianthemum canadense*) and is typically under 25%. Mosses and lichens such as *Polytrichum* sp. and red-stem moss make up 20-30% cover. The slopes of this community are fairly steep, and surficial rock is common. On the nose of the slope, the canopy opens up, trees become more stunted and heath shrubs more common. In some areas, the canopy trees are fairly young, with average DBH around 9". The largest stand, however is more mature with red oak trees ranging from 9-18" DBH.

This is an excellent example of this type, with large, mature trees, undisturbed nature and relatively large size. These factors combined

with the uncommon nature of the community make these state significant sites.

Huntington River Hemlock

Significance: Locally Significant Natural Community

The Huntington River Hemlock-Northern Hardwood Forest is located along the Huntington River in the southeast corner of Richmond. This is a very nice forest which acts as a forested riparian corridor along the river. The canopy is a mixture of hemlock, sugar maple, beech, yellow birch and white ash. Average DBH is 14-16", though there are some larger trees reaching 21" in diameter. Understory shrubs include witch hazel (*Hamamelis virginiana*), hobblebush (*Viburnum lantanoides*) and beech. Herbs are moderately abundant and include intermediate woodfern, partridge berry (*Mitchella repens*), common oak fern (*Gymnocarpium dryopteris*) and wild sarsaparilla (*Aralia nudicaulis*). There are numerous seeps along this steep slope above the river, all which drain



directly into the river. The forest appears to be free of recent human disturbance and in good condition. It falls shy of the criteria for state significance, but its size, condition

and position as a buffer along the Huntington River warrant its designation as a locally significant site.



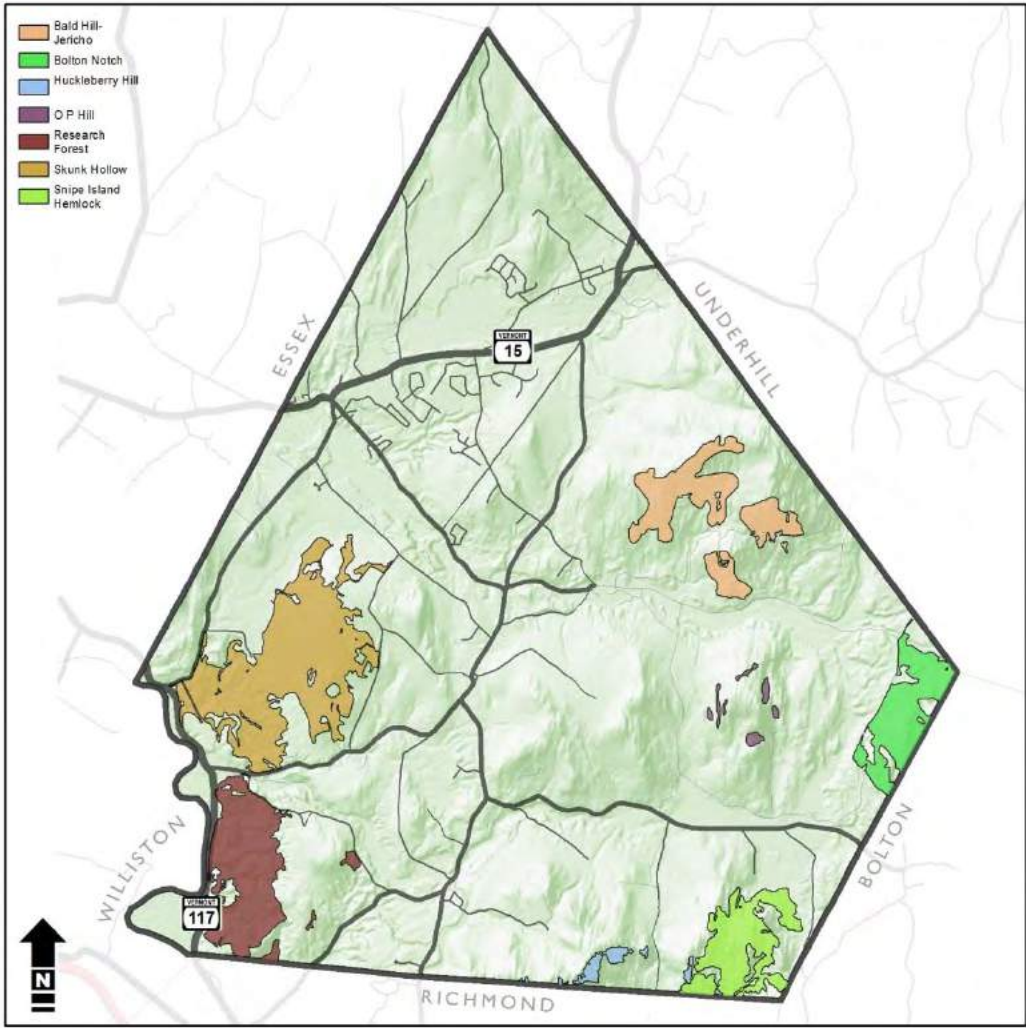


Figure 45: Jericho Significant Upland Natural Communities

4.1.4 Jericho Significant Upland Natural Communities

The upland natural communities of Jericho consist of 17 different types comprising 14,433 total acres. Four different upland communities have been determined to be state significant sites, two of which are discussed below.



Skunk Hollow

*Significance: Locally and State Significant
Natural Communities*

Most of the forests in the Skunk Hollow block consist of two common natural communities, Northern Hardwood Forest and Hemlock-Northern Hardwood Forest. The Northern Hardwood Forest at this site is located in the central part of the forest

block and is characterized by a low summit and shallow slopes with variable aspects. The margins of this forest are recovering from historical agricultural use but the interior of the site appears to be relatively undisturbed. Like most forests of this size, there is a lot of variability based on land use history, current

forest management, topography and soils. Some areas of this forest appear to be typical northern hardwood stand dominated by sugar maple, white ash, beech and yellow birch. However, some areas of enrichment yield inclusions of Rich Northern Hardwood Forest. Other areas contain bitternut hickory (*Carya cordiformis*) and hop hornbeam (*Ostrya virginiana*) and more



Figure 46: The rolling topography of this Hemlock Northern Hardwood Forest is somewhat unique

resemble a Mesic Maple-Ash-Hickory-Oak Forest. Overall, these areas are relatively small and can be included in the larger Northern

Hardwood Forest designation. Using NNHP ranking specifications, this community falls short of the state significance designation primarily because of its size. When compared to the expansive Northern



Hardwood Forests that are found in the state, this 46 acre site is quite small. However, on a town-wide scale, this site fairs quite well. This combined with the overall condition of the forest lead to a locally significant designation.

The Hemlock-Northern Hardwood Forest, located on the southwestern end of the Skunk Hollow Block is quite large for its type, comprising over 480 acres. Most examples of this community type occur on sites with shallow, glacial till soils with steep slopes and frequent bedrock outcrops. These Hemlock-Northern Hardwood Forests are somewhat unique in that the topography is rolling, the soils relatively deep Hartland sandy loams, and there is no exposed bedrock. These differences do not seem to express themselves in different vegetation composition or structure, however. The canopy is dominated by a mixture of hemlock, yellow birch and red maple. There are some areas of Hemlock Forest inclusions where

hemlock is the only tree in the canopy. A moderate sub-canopy and shrub layer of beech and hemlock is typically present. Herbs are very sparse and consist of around 5% cover of partridge berry and intermediate woodfern. This is a relatively young forest, with canopy DBH around 10-12", though some larger trees reach 16" in girth. Numerous recreation trails thread their way through this forest. Overall, these woods appear to be in good condition with no sign of recent, significant perturbation. The size, condition and landscape of this occurrence result in a state significant ranking.

Research Forest

Significance: State Significant Natural Community

The Hemlock-Northern Hardwood Forest that occupies the western half of the Research Forest CHU has much in common with the Hemlock-Northern Hardwood Forest at the Skunk Hollow site. Unlike most occurrences of this community,



which occur on shallow glacial till soils, steep slopes and frequent bedrock outcrops, this example sits on deep glaciofluvial sandy soils with rolling topography. Very few

surficial rocks and no bedrock outcrops are present. The vegetation, however, is similar to



Figure 47: Hemlock Northern Harwood Forest at the Research Forest site

what is found in most examples of this type. The canopy is dominated by a mixture of hemlock, red maple and beech with occasional red oak present as well. On the margins of these forests, white pine can often be found in the emergent canopy. The moderate sub-canopy and shrub layers are comprised of the canopy species. There are occasional forest

openings with young pin cherry (*Prunus pensylvanica*) and striped maple (*Acer pensylvanicum*). Herbs are very sparse and include wild sarsaparilla (*Aralia nudicaulis*),

partridge berry (*Mitchella repens*), beech drops (*Epifagus virginiana*) and Canada mayflower (*Maianthemum canadense*).

These are nice forests, likely the most undisturbed on UVM land. The limited forest management that is occurring has not had a negative effect on community condition. The large size, good condition and landscape position together result in a state significant designation.



Section 4.2 Management Recommendations

The methodology for determining state significance is based on the Vermont NonGame and Natural Heritage Project guidelines and is detailed in Appendix 1. It involves an assessment of a community type, size, condition and landscape context. All of these determinations were based on field work conducted as part of this inventory. If a field visit was not made to a particular community, that community was not ranked, even though remote sources may suggest that the site may be significant. In these cases, a site may have been labeled "Potentially Significant". For most of the larger communities, assessments were made only on a portion of the community for which landowner permission was obtained. For sites that did not meet the criteria for state significance, but were still important ecologic features, the designation of "Locally Significant" was used.

Management recommendations for upland communities that are considered significant depend largely on the type of forest, how rare the community is, and how large of an area it typically occupies on the landscape. Communities are broken up into rarity ranks (S-ranks, see Appendix 1) as well as typical patch size. Large types like the Northern Hardwood Forest occur as matrix-forming forests. Forests like Hemlock-Northern Hardwood Forest occur in large to medium patches and Boreal Acidic Cliffs occur in small patches.

Large, common, matrix-forming communities such as Northern Hardwood Forests are much more resilient to small perturbations than rarer communities that occur in small patches. Activities such as well-planned logging operations would not likely have a detrimental effect on the overall community. Indeed, a forest management plan that incorporates wildlife habitat and mimics natural disturbance regimes



can increase diversity on the landscape and ensure long-term regeneration of the stand. Because they are larger and more resilient, these forests can readily “recover” from most logging operations if they adhere to the Best Management Practices. Maintaining the integrity of these communities is more an issue of limiting the overall fragmenting development that would break up the forests and degrade their condition. For this reason, infringement by residential development on the edges of these communities is not a cause for concern as much as the development of large fragmenting features into the heart of the community.

The recommended management for large-medium patch communities (such as Hemlock Forests and Rich Northern Hardwood Forests) is similar to that presented above for the matrix communities. It differs primarily in the matter of scale. Large fragmenting developments

that cut across or reach into the center of these sites should be discouraged. Some degree of encroachment around the margins of these sites is tolerable as long as it does not impact or degrade a significant section (>20%) of the community. If some impact to these communities is inevitable, development that is clustered near the edges are preferable to those that are scattered over a wider area. Logging operations in patch communities can also occur and not degrade the condition of the stand. However, large clear cuts that may be appropriate in matrix communities are not typically appropriate in these sites. Smaller patch cuts and thinning operations are generally recommended.

Communities that occur in smaller patches such as Dry Red Oak-Pine Forests and Red Pine Forests are generally more sensitive to disturbance than larger patch communities. The site conditions that give rise to these communities



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(geology, soils, slope, aspect etc.) are typically localized. This, coupled with the fact that they are small sites, means that any development in part of the community could have a detrimental effect on the entire stand. Responsible forest

management operations in these sites can also be a challenge. If any cutting is to occur, only light selective logging is recommended. Fortunately, the trees in many of these sites are short, stunted and have very little marketable value.



5. Wildlife Habitat

Assessment Results

The wildlife habitat of the STA study area is defined by Contiguous Habitat Units (CHU). Each CHU is an assemblage of wildlife habitat features such as forested riparian buffers, ledges, deer wintering areas, wetlands, mast stands and early successional habitats which function together as a unit of diverse and relatively continuous wildlife habitat. The largest forested area, often the most valuable wildlife habitat, is the core area (largely free from most human activities). CHUs are largely a human-derived construct (as they are bound by our roads), but they represent the largest contiguous wild areas in the STA study area. The CHUs can be the basis of wildlife management and planning for wildlife in the town.

Section 5.1 CHU Wildlife

Habitat Components

In constructing CHUs, core forest areas are combined with early

succession habitats, forested riparian habitats, wetlands, deer wintering habitat, mast stands, and ledge or cliff habitats. In some cases these specific wildlife habitat features (like riparian areas) may not add new area to the already mapped central core as they are often already subsumed within the core area boundary. In other cases (when they are tangential but not within the mapped core area) they add new area and additional acreage to the CHU. Each of the CHU component features is discussed in detail below.

5.1.1 Core Area

Core habitat is forested wildlife habitat that is far removed from human activities and their artifacts such as roads, houses, and active farmlands. For the purposes of this analysis, it is defined as forested land 100 meters or more from regular human disturbance such as development, open fields and roads. This remote wildlife habitat is qualitatively distinct from small fragmented areas in that it provides



important mating, nesting, feeding, and denning habitats for species that cannot survive in more fragmented landscapes. These animals typically require travel corridors between various landscape patches that provide other distinct habitat elements.

Core habitat is generally characterized as having a lower amount of forest edge habitat. Also in core areas, edge habitat is often “soft” and the result of differences in ecological conditions such as a variable site aspect. In contrast, our human-caused “abrupt or hard” edges, occur where different land cover types meet. Edge habitat, and especially abrupt edge habitat, is characterized by extremes in climatic variables such as temperature and wind speed. Bird species composition and behavior is often different in edge habitat.

A wide-variety of birdlife in the northeast utilizes the larger contiguous forests available only in core areas. These birds include

species such as the broad-winged and red-shouldered hawks, owls, and forest songbirds like the ovenbird, wood thrush, scarlet tanager, pileated woodpecker, and the Canada and black and white warblers. Several of these species suffer from greater nest predation (by animals such as squirrels, raccoons, snakes and other birds) and nest parasitism (by other birds such as the brown-headed cowbird) where nesting grounds are near human disturbance and the habitat edges it creates. Bird populations throughout the STA study area, therefore, benefit from the deep forest “interior” habitat provided by core areas. See Figure 48 for core forested habitat locations.



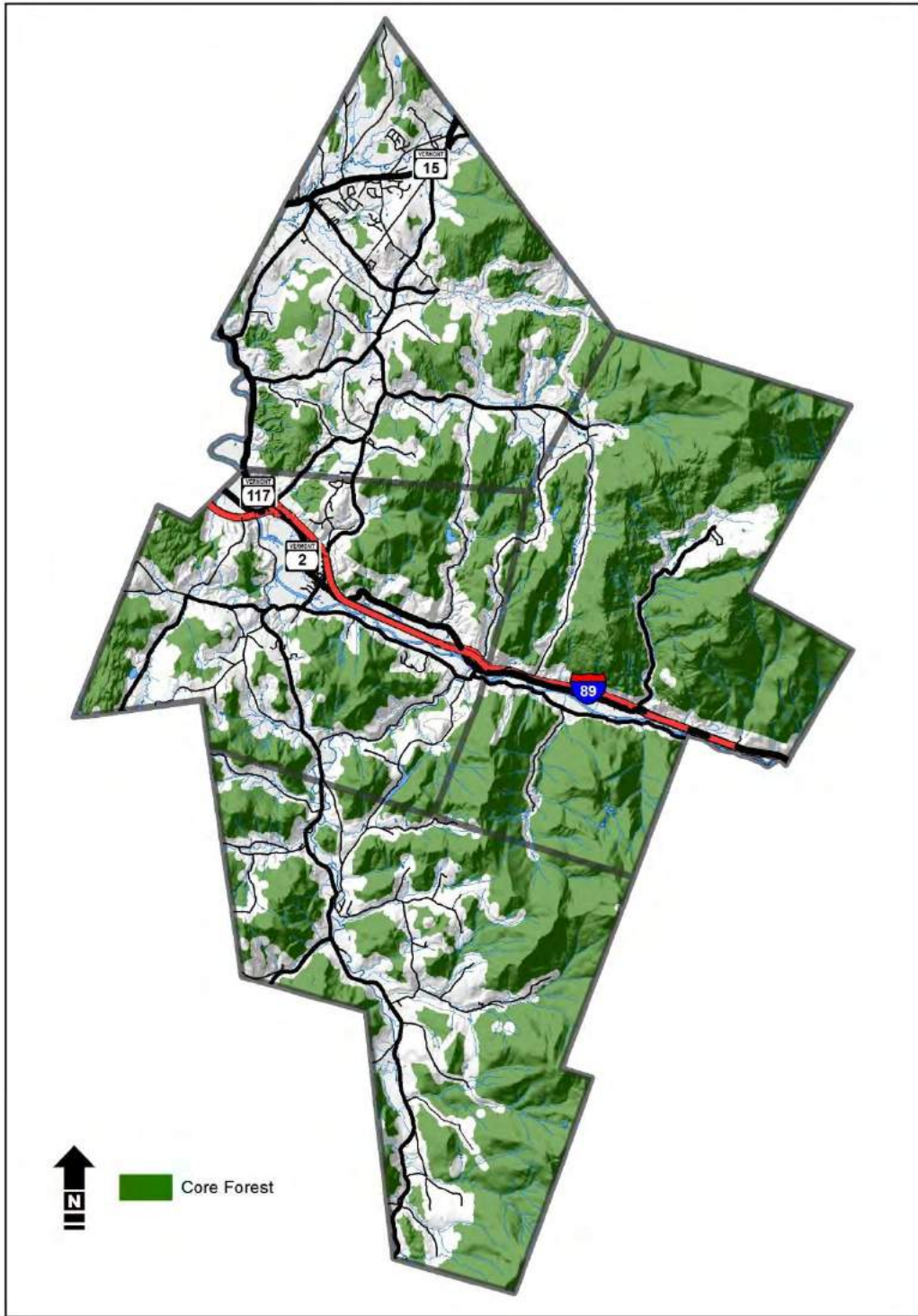


Figure 48: Core Forest Map



Remote wildlife habitat found in core areas can provide the various habitat elements for wide-ranging species such as fisher, bobcat, and black bear. Core areas are often hilly or mountainous, without easy access, and only rarely or seasonally visited by landowners, hunters, and loggers. Wide ranging species thrive in the remote habitat of the core areas.

Core areas are often the most important “source areas” where reproductively active female bear, bobcat, fisher, and coyote can defend territories, have their young and contribute to the overall population of these species. In general, the larger the core area size, the greater the population (and territories) of individual species it can support. Larger populations are generally more stable over longer periods. Core areas often provide the breeding grounds and nurseries that support relatively high populations of these deep forest species. Although most human wildlife observations may be near

town, within our small woodlots and crossing roads, it is these core areas that produce a surplus of young and without them populations would likely decline.

The smaller more fragmented wildlife habitats throughout the STA study area, generally located in the western sections of the STA, are dependent upon these large core habitats, for maintaining stable, self-sustaining populations of species have relatively large home ranges (such as bear, bobcat and fisher). Animals living near humans, roads, pets, hunters, and trappers suffer higher rates of mortality than do animals deep in core wildlife habitats. The long-term maintenance of wildlife populations in large segments of the STA area may be dependent on keeping these core habitats biologically meaningful and free from deleterious fragmentation.

5.1.2 Horizontal Diversity

Horizontal diversity is a measure of the change in vegetative types and conditions across an area of



undeveloped land. These patterns or changes can result from differing bedrock and soil types, or past land use or management activities.

In general, the greater the change in vegetative diversity across an area, the greater the overall species diversity of animals within that area. This applies most directly to mammals, such as fox, coyote, deer, moose and black bear, but horizontal diversity is also applicable to bird species. Mammals and birds often need different vegetative structure and species composition to fulfill various habitat needs throughout a life cycle or season. For instance taller trees may be utilized for singing and feeding activity of a bird while the nesting activities may be focused low in the canopy on smaller saplings or shrubs. Black bear may utilize mid to older American beech trees for fall feeding and then travel to beaver-complex wetlands for spring and summer feeding and utilize areas of dense cover for travel

corridors. A wide variety of habitat types can translate into more prey opportunities for predators. When species specific habitat features on the landscape are not otherwise limiting, an increase in horizontal diversity usually produces an increase in mammalian and bird species diversity. The site context-it's surrounding land-uses, play an important role in determining the influence of horizontal vegetative diversity on animal species richness (diversity of species) as well.

5.1.3 Ledge, Talus and Cliff

Habitat

Ledge habitat is generally associated with steep land and vertical rock structure. Vertical rock structure itself is only valued by a limited number of species such as nesting peregrine falcon, common ravens, and the small-footed bat. If the ledge is broken, that is, with crevices, hollows and caves, it becomes important habitat for a wide-variety of animals.



In many areas throughout the northeast, bobcats use ledges for courting and breeding grounds and the broken ledge (often at the foot of a ledge) for birthing and rearing of their young. Broken ledge is considered defensible from predators like the coyote that may try to kill and eat bobcat young. Bobcats are reported to also utilize broken ledge (similar to coyote and fisher) when it's cold and snowy as well as when it's hot (for relief from the heat). There is some evidence that ledges facing south and west (areas that generally are more exposed to the sun) may receive higher use by certain species and are more valuable to wildlife.



Figure 49: Cave Habitat

Porcupines and raccoons live in hollows, under larger rocks, and in deeper cave-like structures in ledge and talus environments. Fisher and coyote often use these sites for protection from the weather while moving throughout their home ranges. Ruffed grouse and small rodents often utilize these areas for varying periods of time. Figure 48 shows the likely ledge and talus areas that were identified in the STA study area, and more are assumed to exist.



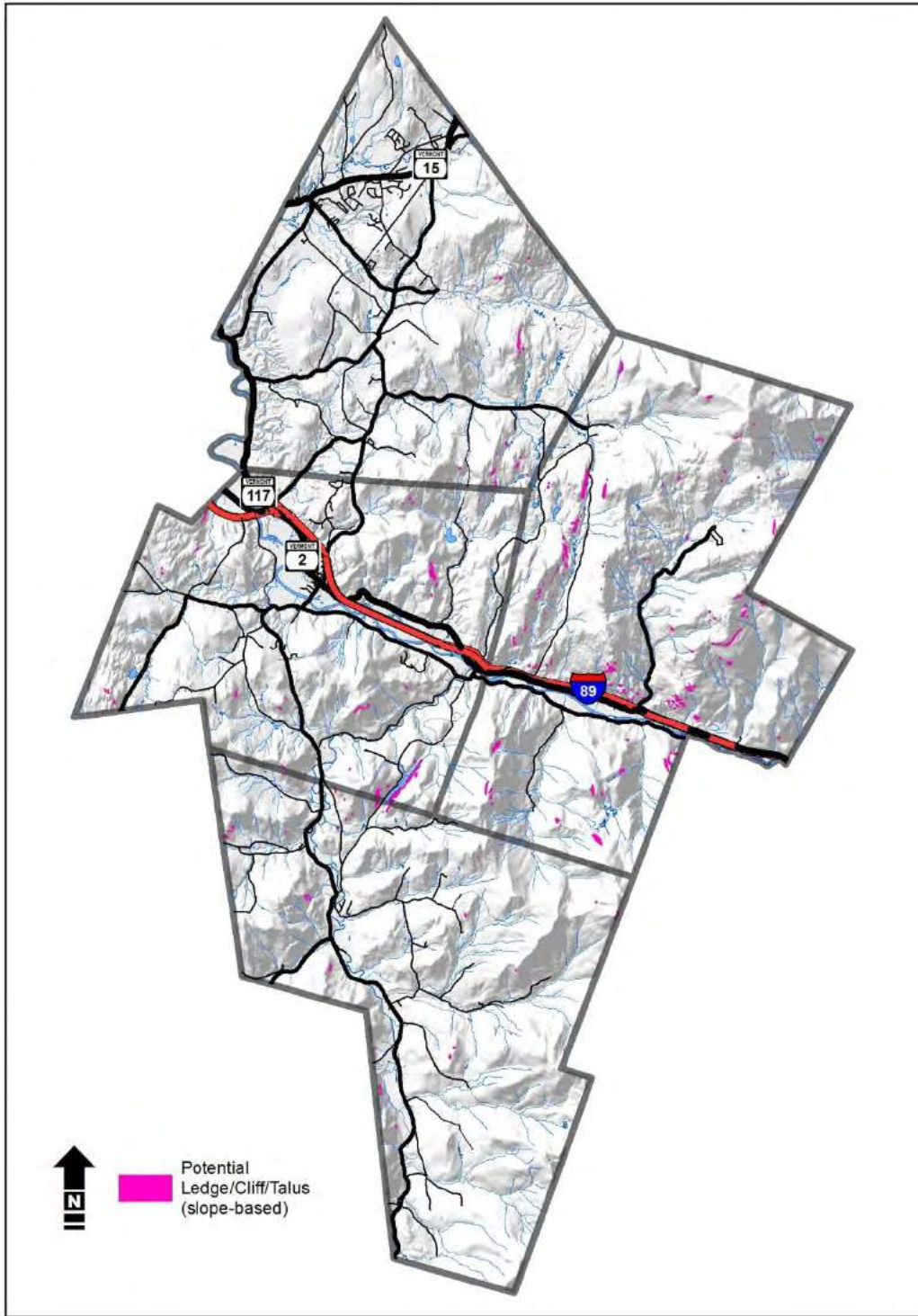


Figure 50: Potential Ledge, Cliff and Talus Habitats



5.1.4 Bear Wetlands

Black bear utilize a wide variety of wetlands during the spring and summer months. Forested, shrubby, beaver-flow wetlands, and forested seeps are sought out for the flush of early vegetation that often grows in these environments. In the early spring, wetlands with ground-water discharge promote an early growth of leafy green vegetation at a time when the trees are still barren of nutritious buds and new leaves. Black bears (as well as deer and turkeys among other animals) will utilize this food source and also search out plant roots, grasses, sedges and ants in these environments. Free flowing water is also available at many of these wetlands. Bear wetlands typically have shrubs or tree vegetation nearby which provide concealment.

Throughout the STA study area remote forested seeps are probably the most heavily utilized wetlands by bear. In many locations these seep wetlands are located in remote areas relatively close to bear denning areas far away from humans. As such, they warrant special protection for their wildlife value.

The wetlands identified as preferential bear habitat in this study represent a mix of wetlands that were either observed in the field to have sign of bear use or were determined to be potential candidates to fulfill bear wetland habitat requirement (i.e. sufficient cover for bear use and potential food resources) based on their community type and cover characteristics.



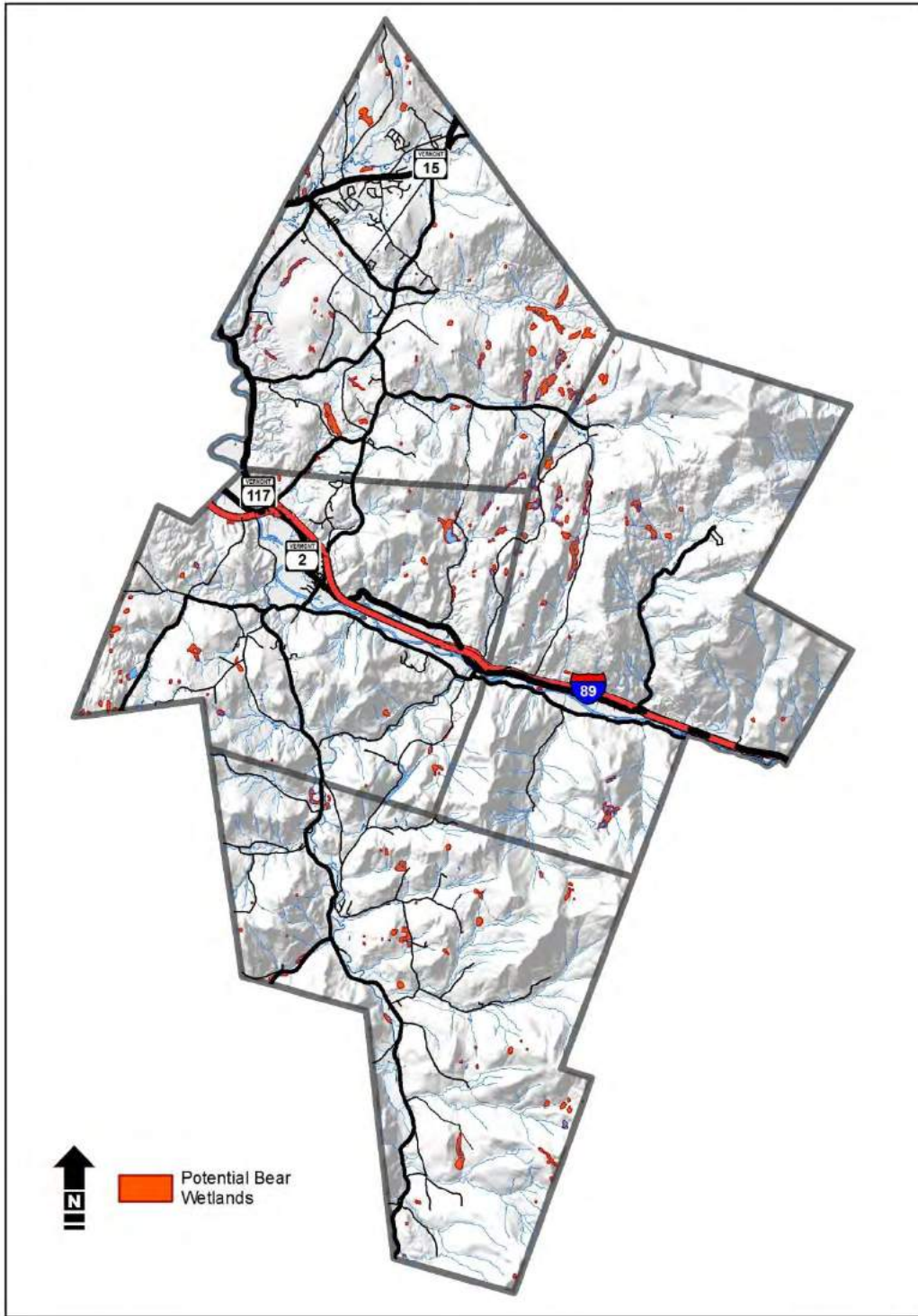


Figure 51: Map of Potential Bear Wetlands



5.1.5 Early Successional Habitat (ESH)

ESH is forested habitat that is characterized by regenerating young, often dense shrubs, saplings or trees. Active forest management or natural disturbances such as disease infestation, ice storms, or wind blow can sufficiently open the forest canopy to sunlight and encourage a new growth of woody vegetation. Old fields and power line ROWs with a substantial shrub component were also identified as ESH in this study. ESHs are important for many species of birds and mammals. Bird species that thrive in areas with tree saplings and shrubs include: the song sparrow and field sparrow, chestnut-sided and golden-winged warbler (rare), common yellowthroat, gray catbird, indigo bunting, brown thrasher, American woodcock, and ruffed grouse.

ESH that is interspersed with older forestland, old fields, and wetlands

harbors many small mammals that are prey for predators. Snowshoe hare, woodchucks, white-footed and woodland jumping mice, and shrews are often found in high densities in areas of successional patches on the landscape. Red and gray fox, coyote, ermine, skunk, raccoon, and bobcat will search these patches for food. Black bears and other animals will utilize these areas extensively in years when berry-producing shrubs are thick with fruit.

Recently, early succession patches within an otherwise forested matrix have been shown to provide feeding habitat to bird species that were otherwise thought to be forest "interior" specialist. These birds visit the fruit and insect rich openings between the end of the breeding season and beginning of migration to bulk up on the copious foods in preparation for the long migratory flights.



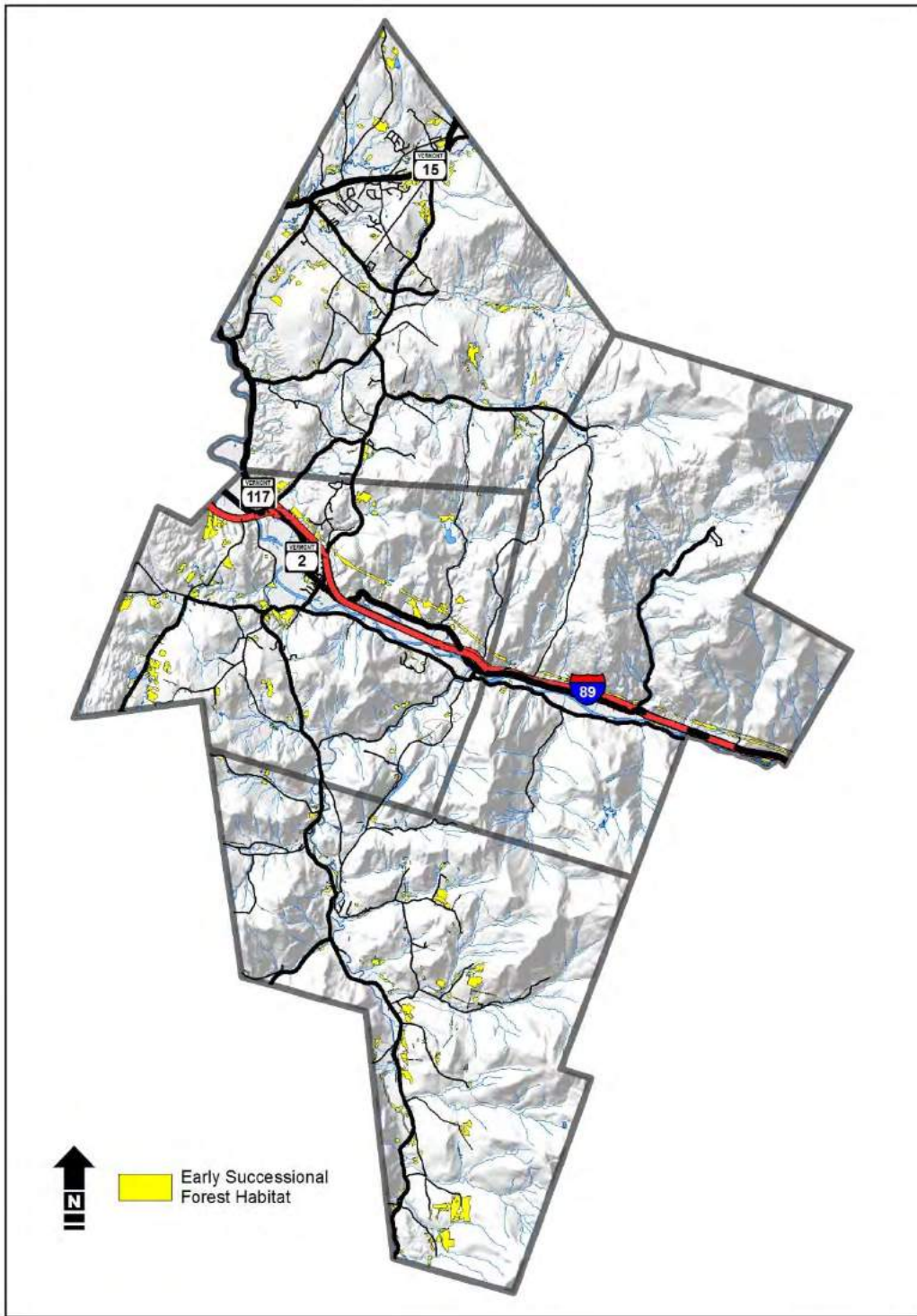


Figure 52: Early Successional Forest Habitat Map



5.1.6 Forested Riparian Habitat

Forested streamside riparian habitats are important for species that utilize the aquatic habitats, terrestrial vegetation and cover that are provided. Riparian forested vegetation anchors the stream shoreline and limits streambank erosion. It also provides coarse woody debris to streams which adds to the stream structural and substrate diversity as well as provides food that fuels stream food chains. In addition, the tree canopy provides critical shade important for maintaining cooler water temperatures necessary for fish survival. The contribution of coarse woody debris (especially during leaf-fall on low order streams) to energy budgets of shady headwaters streams is pronounced.

Amphibians such as the green frog and the Northern dusky and two-lined salamanders live along streams in forested habitat and utilize the adjacent riparian environment. The raccoon and long-tailed weasel use

streamside forested habitats to hunt for food and for denning habitat. The moose and white-tailed deer use streams and streamside forested habitats for cover and water. Aquatic animals such as the river otter and beaver use streamside vegetation for cover, denning and food. Several species of bats such as the little brown myotis and the big brown bat use these environments to hunt for insects. Birds such as the belted kingfisher, wood duck, red-shouldered hawk, snipe, Eastern screech and barred owl, the wood pee-wee and alder flycatcher, American gold finch, tufted titmouse, and the yellow, Canada, and cerulean warblers make extensive use of forested riparian habitats.

Forested riparian areas also function as important travel corridors for a variety of wildlife species. Often these zones are the only treed route affording cover and facilitating movement between areas of larger un-fragmented forest.



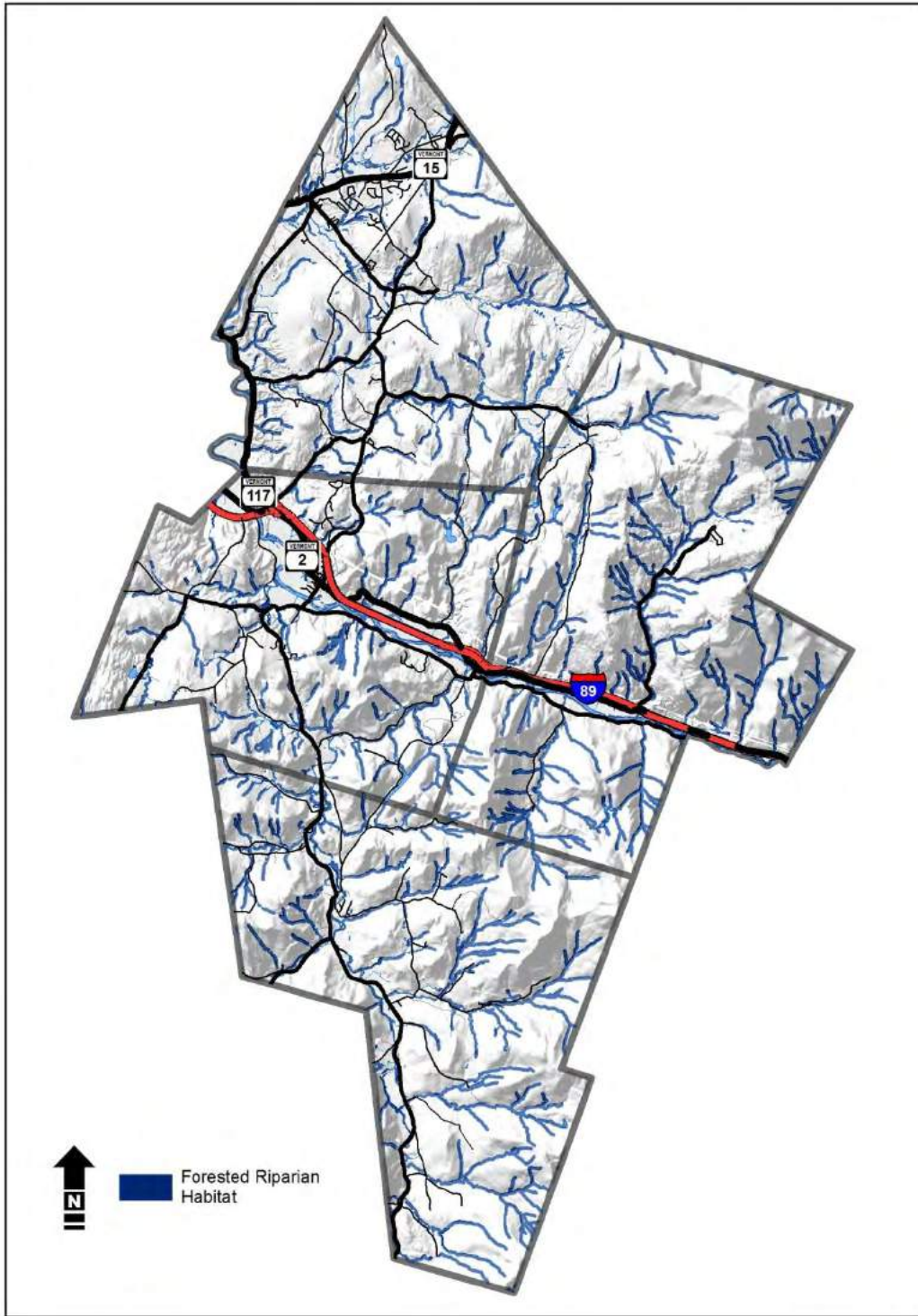


Figure 53: Forested Riparian Habitat Map



5.1.7 Mast Stands

Masting trees are those which synchronize fruit production in an area. Within the STA study area "hard mast" trees are Northern red oak, American beech trees, and to a much smaller degree white oak and various species of hickory. All of these trees, when found clumped into stands, are regularly visited by many species of wildlife.

Various sized beech stands have



Figure 54: Bear clawed beech tree

been identified within the STA study area. Numerous small stands, generally comprising 5-20 bear scarred trees were visited in the field by AE personnel. When beech, oak, and hickory stands are remote, use by black bear is generally higher than stands near human activities. Wildlife attracted to the fruits of American beech (beechnuts) and oak trees (acorns) include squirrels, wild turkey, deer, and bear.

Bear will climb the beech trees in fall to gather beechnuts, leaving scars from their climbing activities. They often return in spring and scavenge beechnuts from the ground under the beech trees. Bears act in a similar fashion in search of acorns and hickories, however, their climbing activities do not usually leave persistent scars and their use is therefore difficult to detect on the tree itself.

This project compiled known mast resources, field identified stands and utilized natural community designations to identify probable



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stands of mast trees. Additional beech stands are likely present on
mast stands, especially American the landscape.



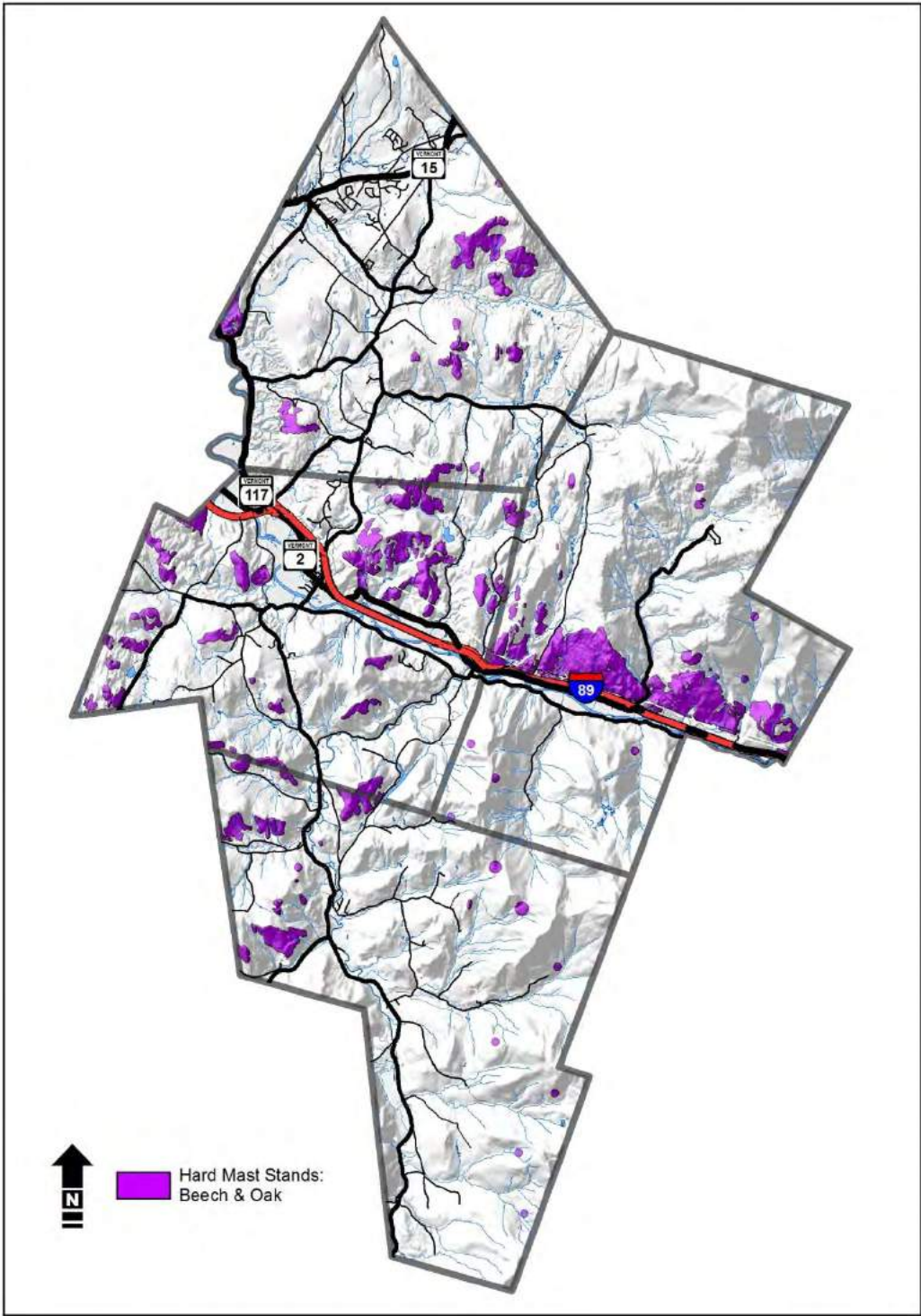


Figure 55: Hard Mast Stands Map



5.1.8 Deer Winter Habitat

In years where significant amounts of snow accumulate in the woods, white-tailed deer utilize evergreen forests for winter habitat. Evergreen trees intercept snow as it falls to the ground generally resulting in shallower snow depths. These habitats offer an overhead canopy of needles that shield deer from the cold. Deer congregate in these areas when snow depths exceed about 15 inches and often remain until the snow melts in spring. These winter habitats can be critical in limiting the energy expenditures of deer and supporting the overall survival of this species in the north.

Within the STA study area deep winter snow cover is more likely to occur in areas at higher elevations, such as in the mountainous regions of Bolton and Huntington. However, it is likely that throughout the study area, years with significant snow cover mixed with cold temperatures tax the deer population. In these years, or over multiple years with

several harsh snow winters, the cumulative drain on deer energy resources can take its toll. For this reason deer wintering habitats are seen as crucially important to the long-term maintenance of deer populations in the STA study region.

Deer winter habitat that faces into the sun (either west or south) is often more valuable than east or north facing areas. Eastern hemlock, balsam fir, and Northern white-cedar stands provide the best cover and food value to deer, but pine and spruce will sometimes be utilized. These deer winter habitats are also home to bobcat, fisher, coyote, and scavenging bears that come looking for live deer to eat during the winter or carrion to scavenge in spring. Other animals such as conifer-nesting birds, porcupines and fox utilize these habitats during other seasons.



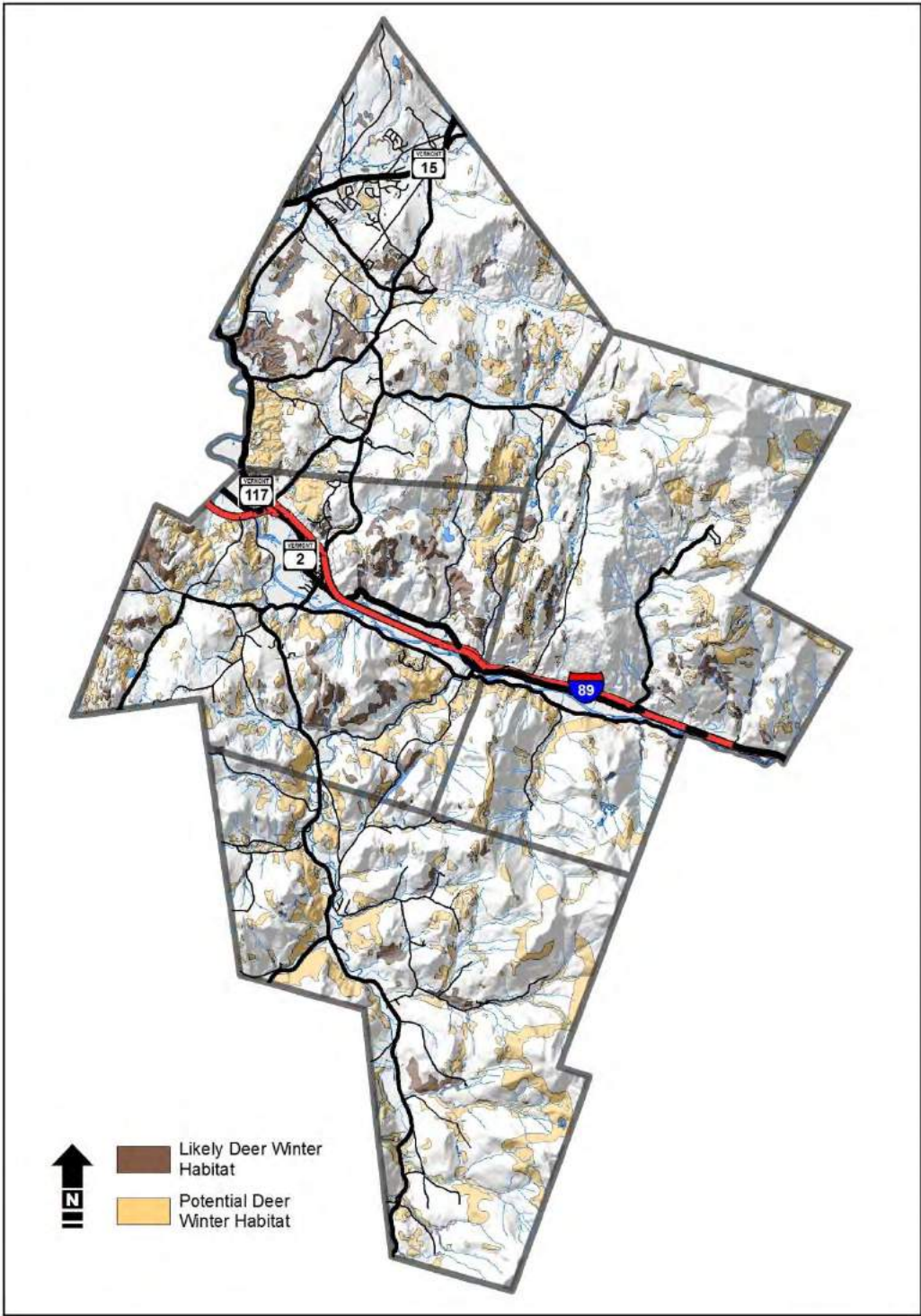


Figure 56: Deer Winter Habitat Map



For this study, potential deer winter habitat was divided into either “likely” or “potential” categories (see Figure 54 above). Likely deer winter habitats are comprised of evergreen dominated forests such as Hemlock Forests and Hemlock-Northern Hardwood forests that have a west, south, or southwest aspect. These natural communities often receive the heaviest deer use and the most consistent from year to year. These “likely” deer winter habitats are those generally sought out in the longest, coldest, and snowiest winters. The strong spring sun in these communities melts snow early and warms cold bodies.

Potential deer winter habitats may be less likely to be used by deer each year-particularly in the coldest and snowiest of years. Some of these communities may not offer the most protection from the cold resulting from a less complete evergreen canopy, the dominance of tree species that do not form a closed protective treed canopy, or

even from having a cold northern aspect. Some of these deer winter habitats may be abandoned in early or mid-winter for other more protective deer habitats and some may function in varying capacity throughout the winter.



Figure 57: Deer Winter Habitat

All winter deer habitats provide some thermal benefits and aid deer in fending off starvation, cold and a continually declining energy budget during the harsh winter and spring months. Energy loss during the winter and spring is cumulative, that is, whatever fat and energy are lost by deer during the early winter months are not available for deer metabolism during late winter and spring. For the most part, it is not until plants produce green leafy



material or ripen buds in spring that deer climb out of their energetic downhill spiral.

Section 5.2 Grassland Bird

Habitats

According to the current tally from the 2003-2007 breeding bird atlas there are over 200 bird species that breed in the State of Vermont. Over 160 of those species were recorded breeding in and around the STA study area. In fact, the northern New-England region is referred to as a “veritable breeding factory” by the Partners in Flight Land Bird Conservation Plan (Rich et al, 2004) for its abundance of breeding neo-tropical migrating bird species.

Due to this extensive list of breeding bird species, discussion of breeding birds in the STA project area is focused primarily on a set of 40 “Responsibility Species” as developed by Audubon Vermont. This list covers a range of species that have a high proportion of their

breeding population within our Atlantic Northern Forest region.

Many of these species are experiencing global declines in



Figure 58: Scarlet Tanager- a core forest bird

population, sometimes severe. However many of these are fairly familiar to anyone who spends a bit of time in the forests and fields of central Vermont. Focus on these species, and their habitat requirements will help insure that these birds, ubiquitous to our region, remain common and that those experiencing sharp declines may be stabilized or restored before being lost for good.



Figure 59: Audubon Vermont- Responsibility Species

Birds of early-succession and old fields	Birds of mature forests
Chestnut-sided Warbler	Ovenbird
Mourning Warbler	Wood Thrush
White-throated Sparrow	Veery
Ruffed Grouse	Eastern Wood-Pewee
American Woodcock	Yellow-bellied Sapsucker
Nashville Warbler	Black-throated Blue Warbler
Canada Warbler	Blackburnian Warbler
Magnolia Warbler	Black-throated Green Warbler
Northern Flicker	Scarlet Tanager
Birds of high elevation and boreal forest	American Redstart
	Chimney Swift
	Northern Parula
Spruce Grouse	Purple Finch
Black-backed Woodpecker	Blue-headed Vireo
Olive-sided Flycatcher	Birds of wetlands and riparian areas
Yellow-bellied Flycatcher	
Gray Jay	
Cape May Warbler	
Tennessee Warbler	
Blackpoll Warbler	
Bay-breasted Warbler	
Palm Warbler	
Boreal Chickadee	
Bicknell's Thrush	
	Swamp Sparrow
	Lincoln's Sparrow
	Rusty Blackbird
	Alder Flycatcher
	Louisiana Waterthrush



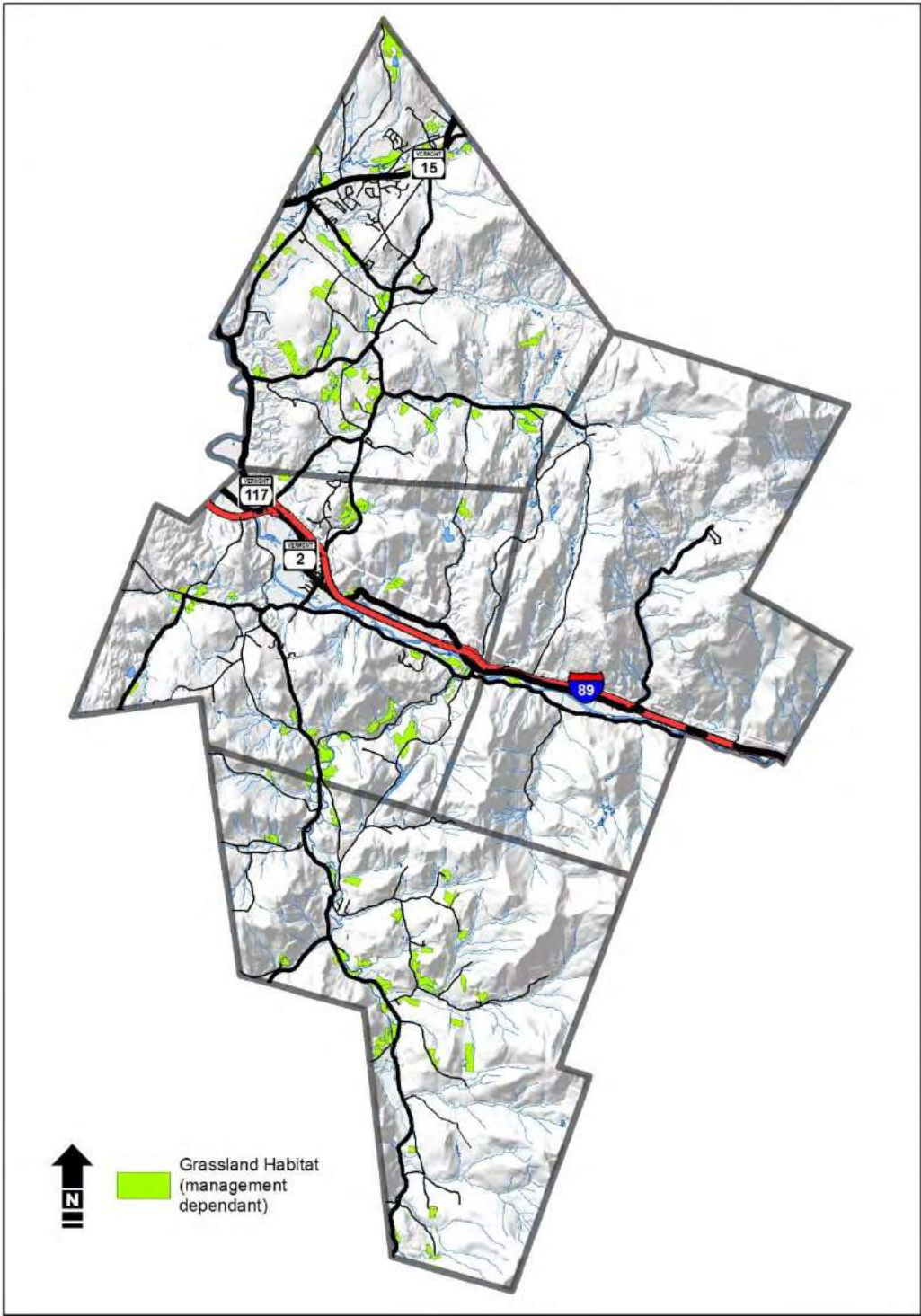


Figure 60: Grassland Habitats



There is a whole suite of bird species that do not utilize forested (or early successional forest) environments to fulfil their breeding requirements. In the STA project area, grassland birds are the largest non-forest dwelling group, and perhaps the assemblage of species most at risk. Grassland bird species utilize open field grasslands, typically of at least 10 acres or larger for their breeding, nesting and feeding. Many of these species are historically more associated with mid-western prairie habitats, but have established a foothold in the open agricultural fields throughout the northeast. These species, such as bobolink, savannah sparrow and grassland sparrow are seeing drastic population declines attributed to a variety of factors. As agricultural practices become more and more mechanized and new genetic modification and nutrient application technologies allow for more frequent grass harvesting,

many young fledglings are destroyed while still in the nest from contact with haying equipment. Add to that the conversion of hayfields to row crops such as corn and soybeans and extensive deforestation of winter habitats in South and Central America, and these species are losing ground quickly.

Grassland habitats were mapped as a component of the STA project based on remote review of cover conditions as apparent in aerial photographs. Since grass conditions are highly temporal and very dependent on current management practices, this is only a snapshot of potential grassland that may be providing habitat for this group of species.



Section 5.3 Travel Corridors

Travel corridors are places where landscape and land use characteristics combine to form an area where wildlife can move across roads to and from different habitat areas. Many species of wildlife utilize a diversity of different habitat and plant community types within their home ranges (or territories). Wildlife move across the landscape for a variety of reasons, most often in search of new territories, food resources, or potential mates.

A good example to illustrate seasonal wildlife movements is that of the black bear in Vermont. The black bear typically moves in spring from its high, remote denning areas to wetlands (often forested seeps) lower on the landscape. In summer, bear will seek berry patches in

openings and along old logging roads within the forest. In fall, bears will move to beech stands, orchards, or corn fields depending on the availability of natural foods in the forest.

5.3.1 General Wide Ranging Mammal Corridors

Many of the wide ranging wildlife corridors identified in this project are located within areas of limited development and contain large, significant habitat features in close proximity to the corridors. As would be expected, wide ranging mammals are likely to find these areas most preferential as movement zones due to the relative lack of human disturbance and the necessities of moving between critical food, cover and/or other habitats. General wildlife corridors for wide ranging species are shown on Figure 61.



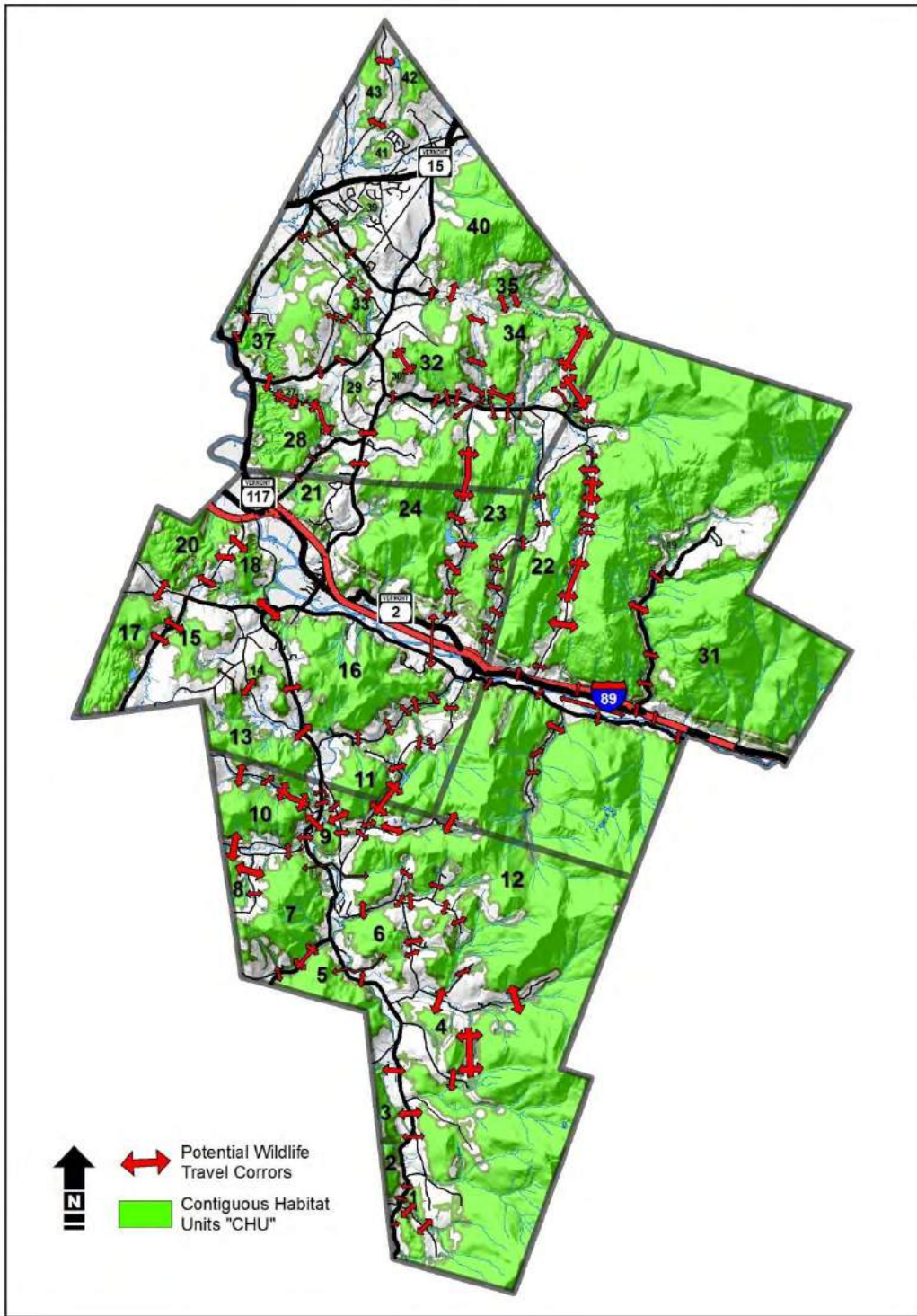


Figure 61: Potential Wildlife Corridors Map



There were few probable corridors identified crossing the more developed areas of the study area such as the Villages of Jericho, Richmond, and Huntington. The limited opportunities for wildlife travel in these developed areas highlight the importance of maintaining and improving what already exists for movement corridors within or directly adjacent to these areas.

Its relatively high traffic volume notwithstanding, there are more crossing opportunities from one side of I-89 to the other than might be expected, mainly due to large areas of unfragmented forest in close proximity to the road. These areas merit additional attention to explore if vehicle collision mitigation, crossing structures and additional safety measures should be considered.

Improvement and expansion of the vegetated buffer conditions of the Winooski River and the tributaries feeding it would greatly assist in

providing travel corridors throughout the STA study area without putting undue burden on agricultural or development activities.

These probable corridors should be field verified and, if used by wildlife, should be considered as high conservation and protection priorities. Additional corridor areas may also be discovered in the course of additional field and more detailed, site-specific remote evaluation.

Land conservation of connecting lands, in conjunction with improved riparian buffers and structures that provide wildlife safe travel, will aid in maintaining a healthy and diverse wildlife population throughout the area.

5.3.2 Amphibian Road Crossing Zones

Busy roads bisect amphibian travel corridors. Amphibians are forced to cross roads to get from upland forest habitat to breeding habitat in the vernal pools and wetlands.



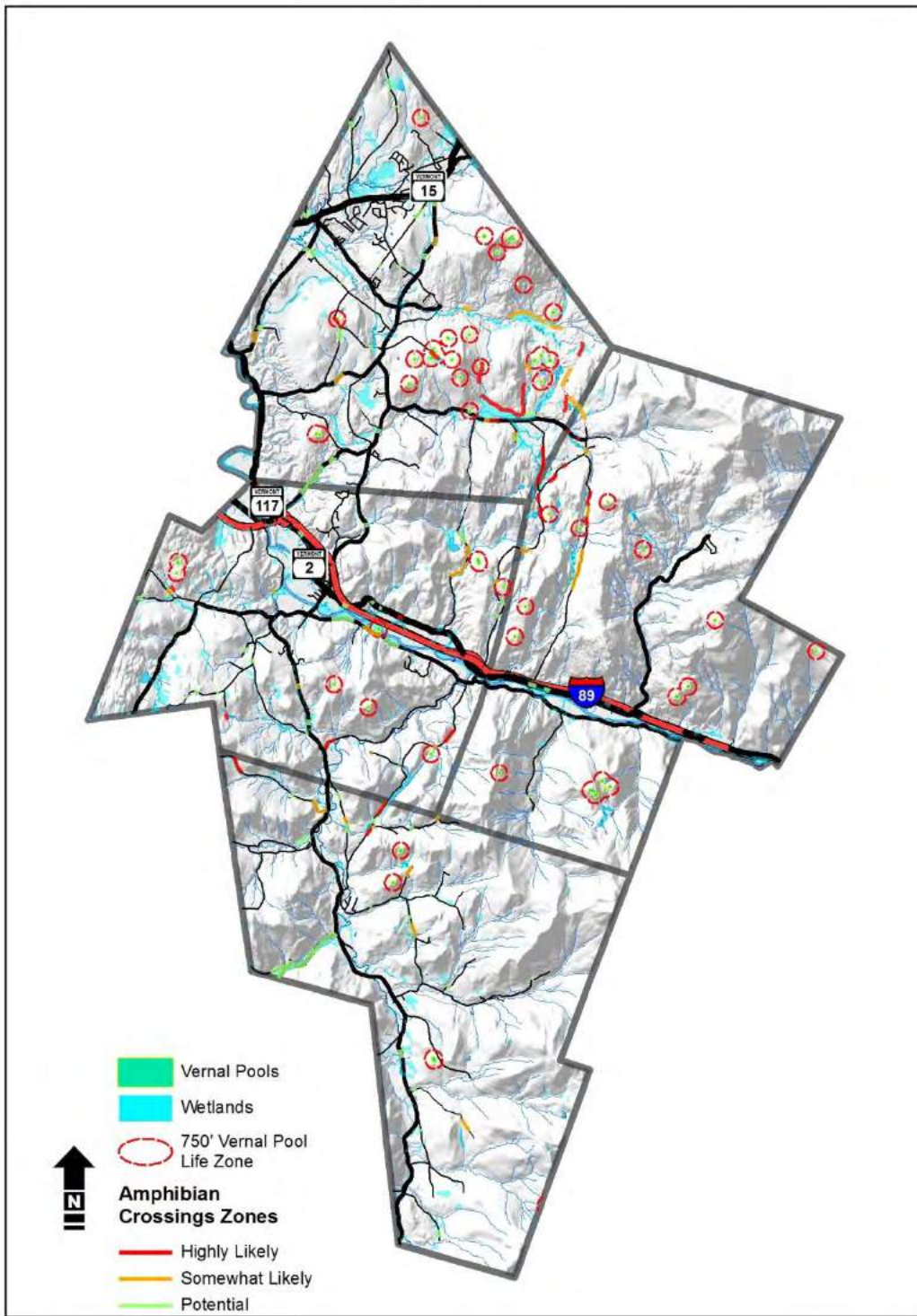


Figure 62: Amphibian Crossing Map



Several potential amphibian road crossings have been identified in the STA study area and are shown in Figure 62. None of these sites have been field verified, although Huntington has been cataloging citizen collected amphibian crossing areas for several years. Field verification requires monitoring these road crossing sites during spring migration of the vernal pool amphibians. By knowing the location of the crossings, townspeople can be made aware that they should drive with care during the migration time. Some towns have organized volunteers to be out on nights of the migration to warn drivers and assist amphibians crossing the roads. Other towns have obtained signage to erect near the sites of the highest amphibian mortality.

Forested travel corridors between forest and vernal pool habitat should be maintained wherever possible to facilitate migration of pool breeding amphibians. Barriers to amphibian

movement such as busy roads, large clearings, or intensive development should be avoided or minimized within these amphibian travel corridors. Small developments (e.g. a single family house), yards, and infrequently traveled dirt roads are often not a major barrier to amphibian movement but may increase mortality and decrease migration success and habitat availability on a meta-population level.



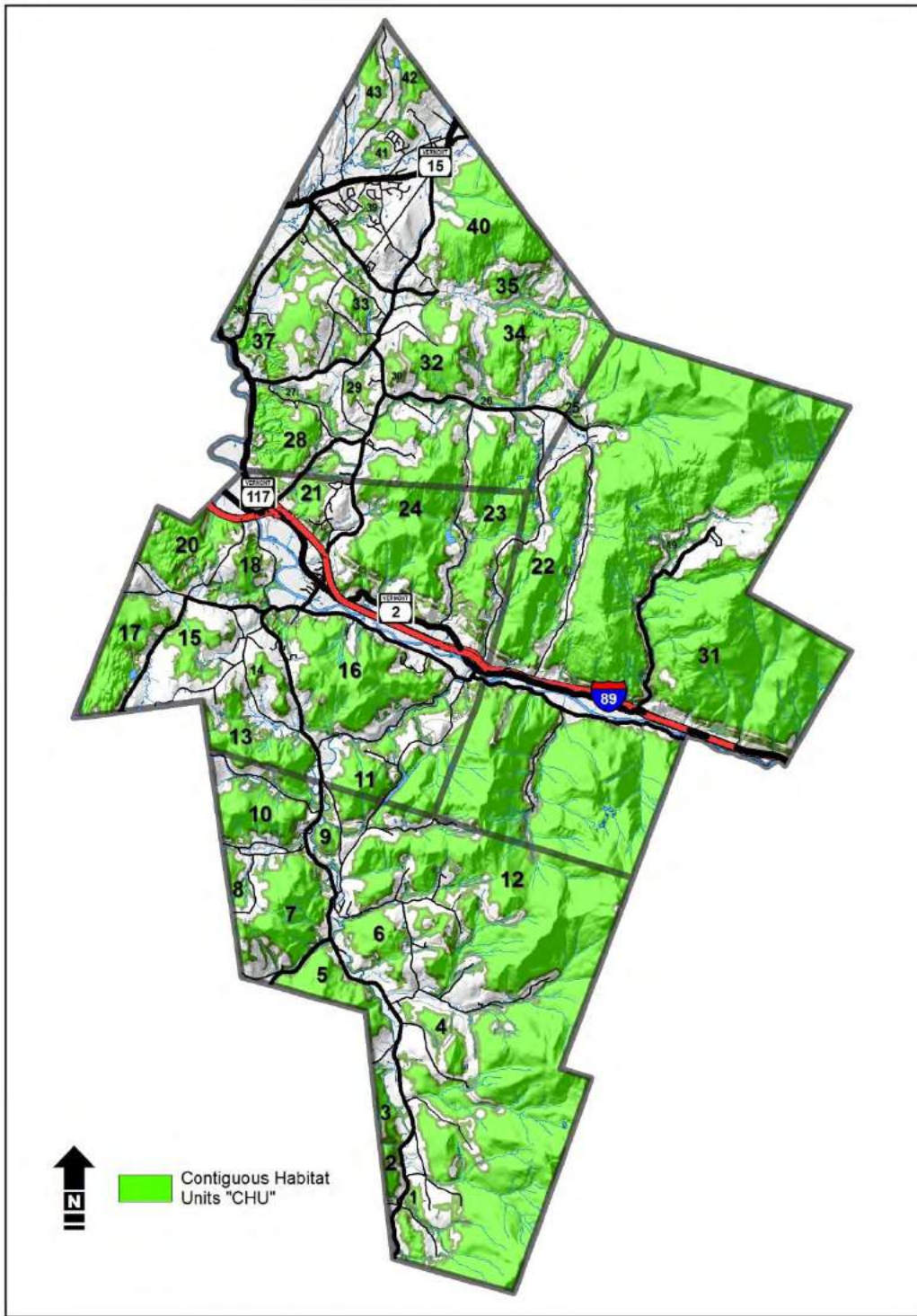


Figure 63: Contiguous Habitat Units Map



**Section 5.4 Contiguous
Habitat Units (CHUs)**

A total of 43 contiguous wildlife habitat units (CHUs) were identified in the study area. The following table provides summary data for the habitat components within the CHUs for the STA study area. A summary data table is provided in Appendix 3 detailing the individual habitat elements within all the CHUs. A discussion of each of the CHUs is provided below. For each CHU a list of habitat features is presented. Features in black are present within

the unit, and those in grey are absent. In addition, species identified from the road tracking surveys are included in list form. The Road Tracking Map, Figure 65 below, presents summary tracking data for the STA study area.

Habitat Feature	Total Amount in all CHUs
Core Habitat	54046 acres
Deer Winter Habitat	16726 acres
Stream	335 miles
Wetland	1981 acres
Early Succession	1422 acres
Forested Riparian	11132 acres
Vernal Pools	52 #
Conserved Acres	30081 acres

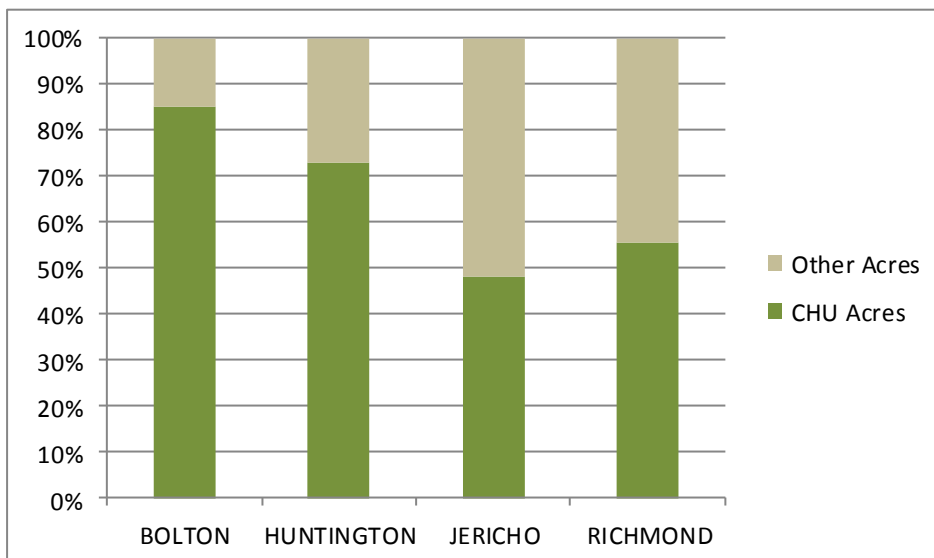


Figure 64: Contiguous Habitat as % of Town Area



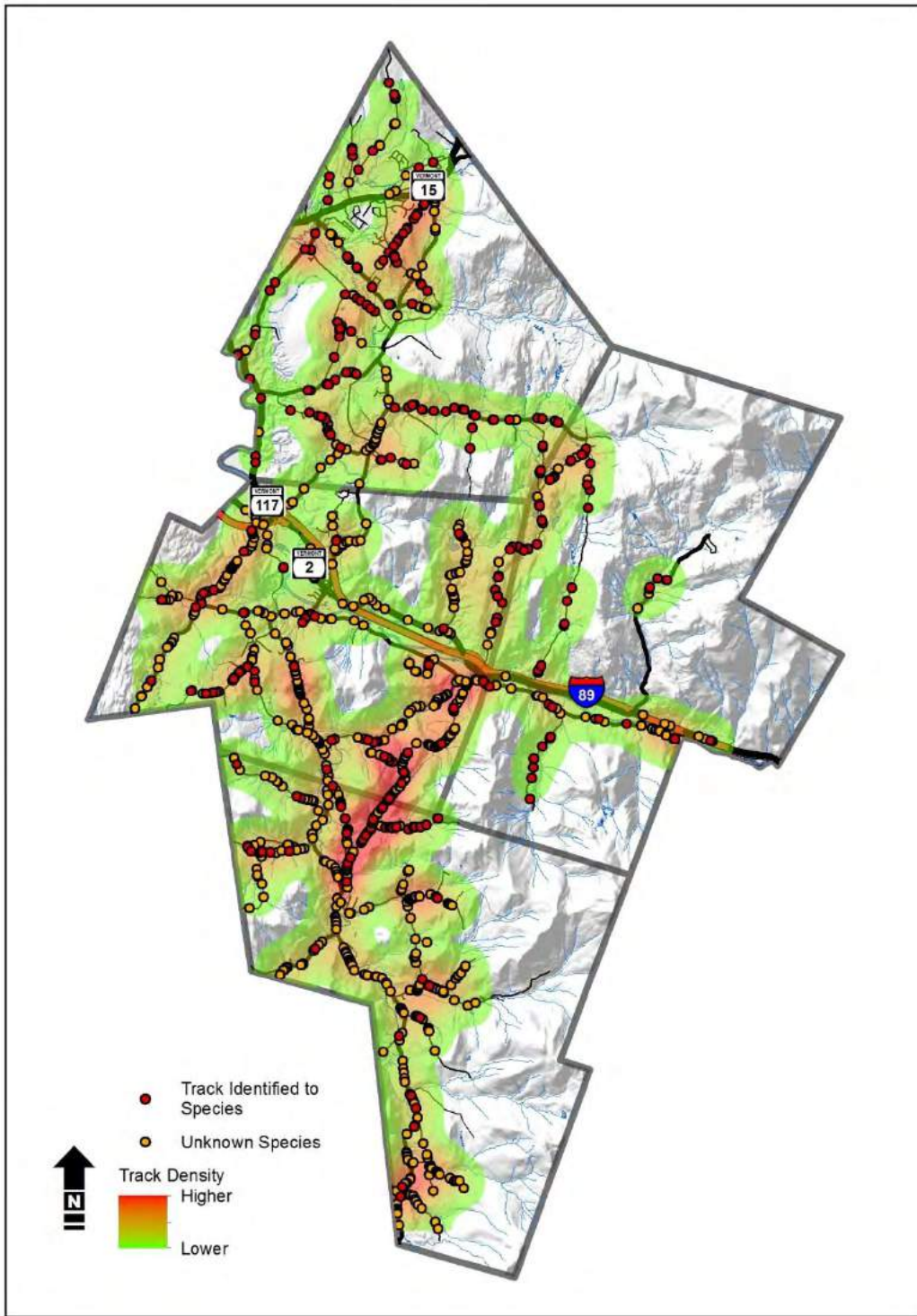


Figure 65: Road Tracking Map



CHU 1: Weaver Brook

Weaver Brook 112 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 0% Conserved

Road Tracking Data (RTD): deer, MU
(Multiple Unknown)

The Weaver Brook CHU is a relatively small 112 acre area located in southwestern Huntington. The CHU is largely surrounded by roads and residential land uses. Upland forests are dominated by northern hardwood forests with white pine mixed in. The area has wetland habitat for black bear and deer wintering habitat but may be isolated so that use of these resources is compromised. The CHU has forested riparian habitat, provides 64 acres of core habitat and has a high horizontal diversity.

CHU2: Brown's Mountain

Browns Mountain 164 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 0% Conserved

RTD: deer, MU

This relatively small 164 acre CHU located in south Huntington extends into Starksboro to the west. The forests are dominated by northern hardwood and mixed hemlock northern hardwood forests. The hemlock forest provides winter habitat for the white-tailed deer and forested riparian habitat along the CHUs streams. The area provides 118 acres of core wildlife habitat and has a moderate horizontal diversity.



CHU3: Shaker Mountain

Shaker Mountain
250 Acres
Core Forest
Deer Winter
Streams
Wetlands
Early Succession
Forested Riparian
Mast
Ledge/Cliff
Bear Wetlands
Vernal Pools
Sig. Natural Comm.
40% Conserved

RTD: mink, deer, MU

CHU4: Huntington Center

Huntington Center
365 Acres
Core Forest
Deer Winter
Streams
Wetlands
Early Succession
Forested Riparian
Mast
Ledge/Cliff
Bear Wetlands
Vernal Pools
Sig. Natural Comm.
0% Conserved

RTD: fisher, turkey

This 250 acre forested area, located in southern Huntington is part of a larger wildlife unit that extends into Starksboro to the west. This area has considerable hemlock and mixed northern hardwood forest and conifer mix, however it's generally eastern aspect may limit the CHUs value as deer winter habitat. The area contains ledge or talus habitat as well as providing forested riparian cover for wildlife and early succession habitat. The CHU contains 148 acres of core wildlife habitat and has a moderate level of horizontal diversity.

This 365 acre parcel is located in Huntington Center and is a transitional forest patch adjacent to a large un-fragmented forest to the east. This relatively small forested area is surrounded by roads, houses and early succession forest and shrubland. The forest is dominated by northern hardwood mixed with red spruce or white pine. Forested riparian forest, ledge or talus habitat, and some deer winter habitat are present. The area contains 138 acres of core habitat that has a high horizontal diversity.



CHU5: Hinesburg Hollow

Hinesburg Hollow
743 Acres
Core Forest
Deer Winter
Streams
Wetlands
Early Succession
Forested Riparian
Mast
Ledge/Cliff
Bear Wetlands
Vernal Pools
Sig. Natural Comm.
20% Conserved

RTD: *mink, MU*

This 743 acre forested patch is part of a larger wildlife habitat in west central Huntington that extends west into Starksboro. The CHU is dominated by northern hardwood forest to the west and mixed northern hardwood and hemlock forest to the east. The area contains extensive potential deer winter habitat that may be limited in its use by its northerly and easterly aspect. The area contains forested riparian habitat and over 500 acres of core habitat with a relatively low horizontal diversity.

CHU6: Mailbox Trails

Mailbox Trails
617 Acres
Core Forest
Deer Winter
Streams
Wetlands
Early Succession
Forested Riparian
Mast
Ledge/Cliff
Bear Wetlands
Vernal Pools
Sig. Natural Comm.
10% Conserved

RTD: *MU*

The Mailbox Trails area is a 617 acre CHU near Huntington center that is surrounded by roads and houses. The forest is dominated by northern hardwood forest with varying amounts of white pine and hemlock admixtures. Mailbox Trails has 316 acres of potential deer winter habitat some of which has southern or western aspects. The Mailbox Trails area contains forested riparian habitat and a bear wetland. The CHU has a high horizontal diversity and provides 573 acres of un-fragmented core wildlife habitat.



CHU7: Raven's Ridge

Ravens Ridge 1323 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 0% Conserved

RTD: mink, multiple deer, MU

Raven's Ridge CHU is a large forested habitat that extends into Starksboro to the west. The area is a mix of oak, hemlock and red spruce forest mixed in with varying amounts of northern hardwood forest. Raven's Ridge contain extensive mast in the form of American beech and red oak trees and likely provides fall feeding opportunities for black bear, as well as a food source for wild turkeys, white-tailed deer and various other mammals and birds. The area contains south and west facing deeryard habitat and extensive forested riparian forest

providing opportunities for mink, coyotes and other streamside wildlife. Over 1000 acres of moderately diverse core wildlife habitat provides a large forest relatively free from human activities.

CHU8: Economou

Economou 196 Acres
Core Forest Deer Winter Streams Vetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 0% Conserved

RTD: multiple deer, multiple mink, MU

The Economou CHU is a relatively small, 171 acre habitat bordering Hinesburg to the west. The area is dominated by northern hardwood forest with a small amount of hemlock following a stream which begins in Hinesburg and flows east into Huntington. The stream's riparian area is dominated by hemlock forest and is a potential



deer winter habitat. The Economou CHU provides 171 acres of core wildlife habitat and exhibits high horizontal diversity. Deer, mink and other wildlife tracks were recorded in or near this CHU.

CHU9: Riverside

Riverside 200 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 0% Conserved

RTD: multiple deer, coyote, fox, fisher, MU

The relatively small, 200 acre Riverside CHU is surrounded by roads and houses. The forest is dominated by northern hardwood forest mixed with oak and hemlock. Ledge and riparian forested habitat are present. The potential deer winter habitat contains some southern and western aspect but it's relatively disturbed nature suggests

limited deer winter use of this CHU. Oak is present within the CHU however given Riverside's relatively isolated and small nature, it is unlikely to be used by wary species such as black bear.

CHU10: Texas Hill

Texas Hill is an 869 moderately sized forested area in northwestern Huntington and continues into Hinesburg forming a large un-fragmented forest block. Texas Hill is dominated

Texas Hill 869 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 10% Conserved

RTD: deer, hare, unknown

by northern hardwood communities, including pockets of rich northern hardwood forest. Lesser amounts of



oak (and red spruce) and northern hardwood admixtures provide fall feeding opportunities for black bear and other forest animals. Extensive ledge habitats as well as forested riparian habitats enhance the area's value for a wide variety of wildlife. There are potential deer winter habitats found within Texas Hill however most are located on northern and eastern slopes. The area provides 689 acres of deep forest core wildlife habitat and the CHU exhibits high horizontal diversity.

Mayo Mountain is a 983 acre forested CHU located on the border of Huntington and Richmond. Mayo is dominated by northern hardwood forest with varying mixes of hemlock and red spruce and some oak forests in the south. Acorns from the area's numerous oak trees may be sought after by area bear, turkey, deer and other wildlife. The CHU contains extensive ledge habitat as well as forested riparian habitat. Deer winter habitats within Mayo Mountain occur on slopes of nearly every aspect and are most likely utilized by overwintering deer on the south and west-facing slopes.

CHU11: Mayo Mountain

Mayo Mountain 983 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 0% Conserved

RTD: multiple deer, fox and fisher, bobcat, mink, hare



CHU12: Camel's Hump

Camels Hump
19162 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 60% Conserved

RTD: multiple deer, fisher, hare, mink and unknown, coyote, turkey

The Camel's Hump CHU, at 19162 acres is the largest continuously forested, un-fragmented habitat in the STA study area extending into Huntington, Richmond, and Bolton. The un-fragmented forest continues even further into Duxbury and Fayston. As might be expected in such a large area, a diverse array of communities can be found here. Hillsides are dominated by northern hardwood forests, upper slopes are covered with montane spruce-fir natural communities, and the top of the highest peak is capped with a rare alpine natural community.

The Camel's Hump CHU contains several mast stands dominated by American beech, wetlands used by bear for feeding, and contains a healthy black bear population. The Camel's Hump area is a source area for wild species, such as fisher, bear, and bobcat in the STA region and beyond, and is likely pivotal in maintaining populations of these wild animals throughout the region. There are numerous ledge and talus habitats and nearly 100 miles of riverine habitat providing over 3000 acres of forested riparian habitat. These extensive, often remote riparian habitats provide space for resident as well as mobile wildlife benefiting from the cover often provided by these habitats. Over 4000 acres of potential deeryard habitats are mapped, and those with west and south-facing aspects are the most likely to be utilized by over-wintering deer. The CHU has extensive marshland and swamp habitat as well as 13 vernal pool habitats. This unit provides 17309 acres of un-fragmented core habitat,



which while having a low horizontal diversity, is large and diverse enough to contain a wide-variety of wildlife. Currently 9736 acres of the area consists of conserved land

Moose in rut are known to frequent the Charlie Smith wetland complex in this CHU. They are likely to utilize wetland complexes throughout the CHU in a similar manner.

CHU13: Sherman Hollow

Sherman Hollow 1111 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 10% Conserved

RTD: MU, deer and hare, bobcat

The Sherman Hollow CHU is a large, 1111 acre CHU on the Richmond-Huntington town line. The CHU is dominated by northern hardwood forest with lesser amounts of

northern hardwood hemlock and red spruce mixtures. The south slopes contain oak mast which be utilized by black bear and other wildlife. The CHU contains ledge and forested riparian habitat. Approximately 869 acres of core wildlife habitat are contained within the CHU which has a relatively low horizontal diversity.

CHU14: Owl's head

Owls Head 236 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 0% Conserved

RTD: multiple deer and unknown, hare

Owl's Head is a small, 236 acre CHU located in Richmond that is largely isolated by roads and houses. The unit is dominated by northern hardwood forest with lesser amounts of red spruce, hemlock and red oak. Acorns provided by the oak may be



utilized by wildlife. Forested riparian forests are present as are ledge habitats.

CHU15: Collin's Mountain

Collins Mtn 485 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 0% Conserved

RTD: multiple deer, hare, unknown, and
mink

The 485 acre Collin's Mountain CHU is located in Richmond and largely surrounded by residential development and roads. This area is dominated by northern hardwood forest, with lesser amounts of white pine and oak mixed in. The oak provides masting food (acorns) for wildlife. The area provides 485 acres of core habitat and the CHU has moderate horizontal diversity.

CHU16: Cochran

Cochran 2265 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 10% Conserved

RTD: multiple hare and unknown

The Cochran wildlife parcel is a large, 2265 acre forested unit located south and east of Richmond Village. The forest consist of extensive northern hardwood forest, some of which is rich, some of which has large areas of oak mixed, and some of which has hemlock and white pine mixed. There are extensive areas containing mast bearing oak trees, as well as over 900 acres of potential deer winter habitat some of which is south and west-facing. There is over 400 acres of early succession forest or shrubland and 2 vernal pools occur within the CHU. The CHU



contains 1815 acres of deep forest, core habitat and the large un-fragmented area compensates for the relatively low horizontal diversity.

CHU17: Iroquois

Iroquois 1064 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 20% Conserved

RTD: hare, fisher, MU

The 1064 acre Iroquois CHU is located in southwestern Richmond and extends into Hinesburg and Williston. The forest is dominated by northern hardwood, some of which is rich, with white pine and hemlock northern hardwood mixes as well. There are considerable amounts of oak and the acorn mast provides food for bear and other animals. There are a few isolated seep wetlands, forested riparian

areas and potential deer winter habitat with favorable aspects. Ledge habitat is present in the CHU. The area contains 925 acres of core habitat and a moderately high horizontal diversity.

CHU18: Chamberlain Hill

Chamberlain Hill 450 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 0% Conserved

RTD: multiple hare and unknown, deer, mink

The relatively small, 450 acre Chamberlain Hill CHU is located just west of Richmond Village. Forest habitat is dominated by northern hardwood mixed with hemlock and oak, and lesser areas of white pine. The oak provides acorns for wildlife and substantial amounts of early succession and riparian forested



habitats within this CHU. Mixed hemlock forest some of which is south and western-facing provides over 200 acres of potential deer winter habitat. There is 199 acres of deep forest core habitat and the CHU has moderate horizontal diversity.

CHU19: Joiner Brook

Joiner Brook 169 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 50% Conserved

RTD: fisher, mink, fox

This small, 169 acre CHU is located in Bolton and is primarily dominated by northern hardwood forest, areas of which are rich northern hardwood forest. The small area has ledge habitat, forested riparian habitat and small areas that are potential deer winter habitats dominated by a

hemlock hardwood forest mix. A potential bear wetland is present as well as 88 acres of core habitat. This CHU has a high horizontal diversity.

CHU20: Yantz Hill

Yantz Hill 976 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 0% Conserved

RTD: MU, hare, deer, mink

The 976 acre Yantz Hill CHU is located in northwestern Richmond and extends a short distance into Williston. The forest is dominated by northern hardwood, with extensive oak, hemlock and white pine admixtures. There is extensive oak mast in this area as well as potential hemlock dominated deer winter habitats some of which are south or west-facing. Ledge habitat and bear wetlands are also found



here. The core habitat is 629 acres and the CHU has moderate horizontal diversity.

The Yantz Hill CHU likely provides important linkage habitat between the STA and forest habitat in Williston.

CHU 21: Southview

Southview 480 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 0% Conserved

RTD: MU

The 480 acre Southview CHU is located in Richmond and Jericho on the western edge of those two towns. This relatively small and isolated wildlife habitat is dominated by northern hardwood hemlock forest. The site has extensive potential deeryard habitat

dominated by hemlock trees. Southview contains a bear wetland and forested riparian habitat. Southview contains 225 acres of core habitat and the CHU has low horizontal diversity.

CHU 22: Preston Pond

Preston Pond 2106 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 20% Conserved

RTD: MU, deer, coyote, weasel, turkey, fox

The large 2106 acre Preston Pond CHU is located in both Richmond and Bolton along Bolton's southwestern edge. This very diverse parcel is dominated by northern hardwood forest (including rich northern hardwood forests) but also contains substantial hemlock, and oak acreage, as well as red spruce and white pine admixtures.



The Preston Pond CHU contains extensive oak mast as well as bear wetlands providing substantial bear habitat. There are several ledge habitats and 5 vernal pools within the CHU. The area contains extensive wetlands including large beaver flowages. The Preston Pond area contains 2145 acres of deep forest core habitat and overall the CHU has a high horizontal diversity.

northern hardwood forest, with oak and pine occasionally dominant. Over 900 acres of potential deer winter habitat are mapped, with hemlock forests occurring on western and south-facing slopes having the greatest potential for winter use by deer. Snipe Island has extensive forested riparian and ledge habitat. The CHU also contains several potential bear wetlands. Snipe Island contains 1711 acres of core habitat and this large CHU has a low horizontal diversity.

CHU 23: Snipe Island

Snipe Island 2145 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 60% Conserved

RTD: multiple mink, deer, MU, fisher

The 2145 acre Snipe Island CHU extends into Jericho, Bolton, and Richmond. The dominant forest cover types are northern hardwood hemlock admixtures, including rich



CHU 24: Huckleberry Hill

Huckleberry Hill
3185 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 40% Conserved

RTD: multiple turkey, coyote, mink, fox, fisher

Huckleberry Hill is a large 3185 acres CHU which straddles the eastern borders of Richmond and Jericho. The area is dominated by northern hardwood hemlock mixed forest with some pine admixtures. The areas of concentrated pine, many with south and west-facing slopes comprise the over 600 acres of potential deer winter habitat in Huckleberry Hill. The red oak common in several areas provide mast foods for bear and other wildlife. Huckleberry Hill contains early succession and forested riparian habitat and wetlands around

Richmond Pond contain habitat and food for black bears. Huckleberry Hill core area is 1717 acres in size and overall the CHU exhibits low horizontal diversity.

CHU 25: Cemetery

Cemetery
102 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 100% Conserved

RTD: mu, deer, coyote

Cemetery is a small, 102 acre CHU located in Jericho and Bolton. This CHU is dominated by northern hardwood forest and a smaller area with northern hardwood and hemlock. The small hemlock forest is a mapped deer winter habitat and forested riparian habitat is also found within this CHU. The beaver-influenced wetlands contain bear habitat, the core area is 52 acres in



size, and overall the CHU exhibits high horizontal diversity.

CHU 26: Nashville

Nashville 118 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 80% Conserved

RTD: Multiple deer, mink, fisher, unknown

The Nashville CHU is a small 118 acre area located just north of Nashville Road in Jericho. This CHU contains some early succession and forested riparian habitat. The majority of the CHU consists of a large, beaver-influenced wetland with significant areas of open water. The CHU has high horizontal diversity.

CHU 27: Mill Brook

Mill Brook 203 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 40% Conserved

RTD: multiple fisher, fox, deer, coyote, weasel

Mill Brook is a small, 203 acre CHU located in southwestern Jericho. The forest is dominated by hemlock northern hardwood forest with white pine in locations. Mill Brook contains early succession and forest riparian habitat. Small amounts of hemlock forest serve as winter habitat for deer. The CHU has a large emergent marsh and floodplain forest which provides bear habitat. The CHU contains 84 acres of core wildlife habitat and exhibits moderate horizontal diversity.



The Mill Brook CHU likely provides one of the few linkage opportunities between the Jericho Research CHU to the west and the larger Huckleberry Hill CHU to the east.

CHU 28: Research Forest

Research Forest 948 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 40% Conserved

RTD: mu, multiple coyote, deer, fisher, fox

The medium size 948 acre Research Forest CHU is located in southwest Jericho. The largest forest areas are dominated by a northern hardwood hemlock mix of trees. Smaller areas of red spruce, white pine and red oak northern hardwood forests are mixed in. This CHU provides extensive forested riparian habitat as well as smaller amounts of mast foods and early succession habitat

for wildlife. This CHU has 2 vernal pools and a wetland that provides habitat elements for black bears present. The Research Forest CHU provides 738 acres of deep forest core habitat but has a relatively low horizontal diversity.

CHU 29: Gravel Pit

Gravel Pit 139 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 30% Conserved

RTD: MU

The small 139 acre Gravel Pit CHU is located in Jericho, and largely surrounded by roads and residential areas. The area is dominated by a hemlock northern hardwood forest. There are small areas of forested riparian areas and deer winter habitat in the CHU. Almost half of the CHU is a hemlock-balsam fir-



black ash swamp. The CHU provides 45 acres of core habitat and overall the CHU has a high horizontal diversity.

CHU 30: Jericho Center

Jericho Ctr 106 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 0% Conserved

RTD: MU, fox

The Jericho Center CHU is a 106 acre area located in Jericho that is transitional with fragmented habitat to the west and wild large forested areas to the east. The forest area is dominated by northern hardwood forest with substantial mixtures of hemlock forest mixed in. Small amounts of early succession and deer winter habitat are found within the CHU. The area also contains a vernal pool. The core habitat is 67

acres and the CHU has a high degree of horizontal diversity.

CHU 31: Bolton Mountain

Bolton Mtn 15192 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 60% Conserved

RTD: multiple weasel, deer, coyote, bobcat

The Bolton Mountain CHU is a vast area comprised of 15, 192 acres located in Bolton. The CHU encompasses wildlife habitat down to 320 ft. asl up to mountaintops over 3600 ft. asl. The hillslopes are draped in northern hardwood forests with areas above 2500 feet dominated by montane spruce-fir forests. The Bolton Mountain CHU contains early succession forests, numerous ledge and talus habitats and 65 miles of stream and extensive



forested riparian habitats. There are both beech and oak mast resources available to wildlife, often in remote areas. The CHU has remote bear wetlands and 6 vernal pools which provide amphibian habitat. There is extensive high elevation forests over 2700' in elevation some of which provides habitat for Bicknell's Thrush and other songbirds. Over 14000 acres of deep forest core habitat in this CHU lends great importance to this CHU as a source habitat for wary, deep forest species throughout the area. Overall the CHU has a low horizontal diversity.

CHU 32: Birch Hill

Birch Hill 886 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 70% Conserved

RTD: mu, fox, mink, deer

The Birch Hill area is a medium sized, 886 acre CHU located in central Jericho. The forest is largely northern hardwood forest, with areas of white pine, red spruce and hemlock mixed in. Birch Hill has deer winter habitat dominated by hemlock, forested riparian areas, and early succession habitat. The CHU contains several small wetlands and seeps. Birch Hill contains 756 acres of core wildlife habitat and overall the CHU has a moderate horizontal diversity.

The Birch Hill CHU likely provides an important stepping stone allowing



wildlife migration between the Skunk Hollow CHU to the west and the Huckleberry Hill and Snipe Island CHUs to the south. This is a smaller CHU than the ones it is connecting but provides important refuge for animals moving between the larger source habitat areas.

CHU 33: Laisdell Hill

Laisdell Hill 374 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 0% Conserved

RTD: multiple deer, mink, fox, unknown, bobcat

The moderately sized 374 acre Laisdell Hill CHU is located in Jericho. The forest is dominated by a mix of northern hardwood and hemlock trees with small areas also containing white pine. Laisdell Hill contains deer winter habitat,

forested riparian habitat, and a small amount of early succession habitat. There are substantial areas of deer winter habitat dominated by hemlock that occur on west-facing slopes and field investigation confirms use by white-tailed deer during winter months. Laisdell Hill provides 177 acres of core habitat and exhibits a high horizontal diversity.

CHU 34: OP Hill

OP Hill 1415 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 100% Conserved

RTD: Not obtained due to access constraints

OP Hill is a 1415 large CHU located in eastern Jericho. OP Hill is dominated by northern hardwood forest with areas of oak, red spruce,



and hemlock mixed in. The CHU has ledge, early succession habitat, and forested riparian habitat as well as oak mast food resources. OP Hill has 239 acres of wetlands, including several large beaver-influenced complexes, a bog, and 4 vernal pools. Bear habitat is found within these wetlands. Red spruce is the dominant canopy tree within the area's deer winter habitats, some of which have south and western aspects. The OP Hill CHU has a moderate horizontal diversity and provides 1010 acres of core wildlife habitat. The OP CHU is 100% conserved due to ownership by the Ethan Allen Firing Range.

The OP CHU likely provides an important stepping stone allowing wildlife migration between the Bald Hill CHU to the north and the Huckleberry Hill and Snipe Island CHUs to the south.

CHU 35: Castle Hill

Castle 275 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 100% Conserved

RTD: Not assessed due to lack of access.

The Castle Hill CHU is a small, 275 acre area located in northeastern Jericho. Northern hardwood forests dominate the area, and smaller areas with mixtures of oak and hemlock are also found. The area provides for deer winter habitat, forested riparian habitat, and a spruce-fir-tamarack swamp and oak mast the latter two which provide food and cover for bears. The CHU contains 215 acres of core habitat and overall has a low horizontal diversity. The Castle Hill CHU is 100% conserved due to ownership by the Ethan Allen Firing Range.



CHU 36: Saxon Hill

Saxon Hill
126 Acres
Core Forest
Deer Winter
Streams
Wetlands
Early Succession
Forested Riparian
Mast
Ledge/Cliff
Bear Wetlands
Vernal Pools
Sig. Natural Comm.
0% Conserved

RTD: MU, multiple fox, mink

CHU 37: Skunk Hollow

Skunk Hollow
1077 Acres
Core Forest
Deer Winter
Streams
Wetlands
Early Succession
Forested Riparian
Mast
Ledge/Cliff
Bear Wetlands
Vernal Pools
Sig. Natural Comm.
20% Conserved

RTD: multiple mink, coyote, fox

Saxon Hill is a small 126 acre CHU located in southwestern Jericho and extends into nearby Essex. The forest is dominated by oak, and oak and hemlock admixtures with northern hardwood forest. The extensive oak provides food mast for bear and other wildlife. The hemlock provides deer winter habitat, ledge and forest riparian habitat is also present. The CHU within Jericho provides 61 acres of core habitat with moderately diverse horizontal diversity.

Skunk Hollow is a large, 1077 acre CHU located in western Jericho. The dominant forest is northern hardwood with significant areas with hemlock co-dominant. Deer winter habitat is dominated by hemlock cover, including south and west-facing slopes. The area contains wetlands with bear food and cover as well as early succession and forested riparian habitat. Skunk Hollow has several remote wetlands including a riverine grassland, emergent marshes, and beaver flowages. The 608 acres of deep forest core habitat is contained



within a CHU with a moderate horizontal diversity.

CHU 38: Lee River

Lee River 157 Acres
<p>Core Forest</p> <p>Deer Winter</p> <p>Streams</p> <p>Wetlands</p> <p>Early Succession</p> <p>Forested Riparian</p> <p>Mast</p> <p>Ledge/Cliff</p> <p>Bear Wetlands</p> <p>Vernal Pools</p> <p>Sig. Natural Comm.</p> <p>0% Conserved</p>

RTD: multiple mink, deer, bobcat, fisher,
MU

The small 157 acre Lee River wildlife CHU is located in Jericho. This site is dominated by hemlock northern hardwood upland natural communities. The CHU contains minor amounts of forested riparian habitat, early succession habitat, and bear wetlands. An alder swamp, spruce-fir-tamarack swamp, northern white cedar swamp and emergent wetlands comprise nearly half of this CHU. This long and narrow CHU has no core habitat and overall this site

exhibits a moderate horizontal diversity.

CHU 39: Jericho

Jericho 159 Acres
<p>Core Forest</p> <p>Deer Winter</p> <p>Streams</p> <p>Wetlands</p> <p>Early Succession</p> <p>Forested Riparian</p> <p>Mast</p> <p>Ledge/Cliff</p> <p>Bear Wetlands</p> <p>Vernal Pools</p> <p>Sig. Natural Comm.</p> <p>20% Conserved</p>

RTD: Multiple deer, fisher, mink, fox

The small 159 acre Jericho CHU is located in north central Jericho. This CHU is situated in a residential matrix and is dominated by northern hardwood forest with pine and hemlock locally present. The hemlock provides deer winter habitat and the site contains forested riparian wildlife habitat. An alder swamp is present along a stream course. The area contains a small 74 acre core wildlife area and overall the CHU has a moderate horizontal diversity.



CHU 40: Bald Hill

Bald Hill 1842 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 40% Conserved

RTD: MU, deer

The large 1842 acre Bald Hill CHU is situated in east central Jericho and continues into Underhill. This is the largest unbroken forested wildlife habitat in Jericho. The Bald Hill CHU is dominated by northern hardwood forests mixed with hemlock and red spruce, and contains large patches with red oak co-dominant. The oak forests provide food for bears and other wildlife. It's been reported that there is a large black cherry on the south slope of Bald Hill that may provide significant wildlife feeding opportunities. The hemlock forests, some with south and west

exposures provide shelter in winter for white-tailed deer. The area provides forested riparian, ledge habitats, early succession shrublands, and contains 5 vernal pools. There are 1708 acres of core habitat located with bald Hill and the CHU has a low overall horizontal diversity. The Bald Hill CHU is 40% conserved due to ownership by the Ethan Allen Firing Range.

CHU 41: Brown's River

Browns River 111 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 0% Conserved

RTD: MU, fox

Brown's River is a small 111 acre CHU surrounded by fields, houses and open lands. The uplands are dominated by northern hardwood and red spruce forest. The majority



of the site consists of a hemlock-balsam fir-black ash swamp. The site also has minor amounts of early succession and forested riparian habitat. Due to the CHU's small size it has a high horizontal diversity and provides 21 acres of core wildlife habitat.

CHU 42: Cap Hill

Cap Hill 344 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 0% Conserved

RTD: MU, multiple deer, fox

The Cap Hill site is a small 344 acre CHU located in northeastern Jericho extending into nearby Underhill. The site is dominated by northern hardwood forest, some of which is rich and some has local concentrations of hemlock. The hemlock forests provide deer winter

habitat some of which is south and west-facing. The area has minor areas of early succession and forest riparian forest habitat. Wetlands, including a large emergent marsh make up over 90 acres of the CHU. The core area is 250 acres in size and overall the CHU exhibits a moderate horizontal diversity.

CHU 43: Cilley Hill

Cilley Hill 293 Acres
Core Forest Deer Winter Streams Wetlands Early Succession Forested Riparian Mast Ledge/Cliff Bear Wetlands Vernal Pools Sig. Natural Comm. 0% Conserved

RTE: MU, multiple deer, fisher, fox, mink

Cilley Hill is a small 294 acre CHU located in northwestern Jericho and extending into adjacent Essex. The site is dominated by northern hardwood forest, some of which is rich northern hardwood forest. This CHU provides minor amounts of



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forested riparian and early succession habitats. A relatively small emergent marsh provides potential habitat for feeding bears.

This CHU provides 219 acres of core wildlife habitat and overall the site exhibits moderate horizontal diversity.

Table 7: CHU Acreage Summary Table

Id	Name	Town	Acres
1	Weaver Brook	Huntington	112
2	Browns Mountain	Huntington	164
3	Shaker Mountain	Huntington	250
4	Huntington Center	Huntington	365
5	Hinesburg Hollow	Huntington	743
6	Mailbox Trails	Huntington	617
7	Ravens Ridge	Huntington	1323
8	Economou	Huntington	196
9	Riverside	Huntington	200
10	Texas Hill	Huntington	869
11	Mayo Mountain	Huntington Richmond	983
13	Sherman Hollow	Huntington Richmond	1111
14	Owls Head	Richmond	236
15	Collins Mtn	Richmond	485
16	Cochran	Richmond	2265
17	Iroquois	Richmond	1064
18	Chamberlain Hill	Richmond	450
20	Yantz Hill	Richmond	976
21	Southview	Richmond Jericho	480
24	Huckleberry Hill	Richmond Jericho	3185
28	Research Forest	Jericho Richmond	948

26	Nashville	Jericho	118
27	Mill Brook	Jericho	203
29	Gravelpit	Jericho	139
30	Jericho Ctr	Jericho	106
32	Birch Hill	Jericho	886
33	Laisdell Hill	Jericho	374
34	OP Hill	Jericho	1415
35	Castle	Jericho	275
36	Saxon Hill	Jericho	126
37	Skunk Hollow	Jericho	1077
38	Lee River	Jericho	157
39	Jericho	Jericho	159
40	Bald Hill	Jericho	1842
41	Browns River	Jericho	111
42	Cap Hill	Jericho	344
43	Cilley Hill	Jericho	293
25	Cemetery	Jericho Bolton	102
31	Bolton Mtn	Jericho Bolton	15192
19	Joiner Brook	Bolton	169
22	Preston Pond	Richmond Bolton	2106
12	Camels Hump	Huntington Richmond Bolton	19162
23	Snipe Island	Richmond Bolton Jericho	2145



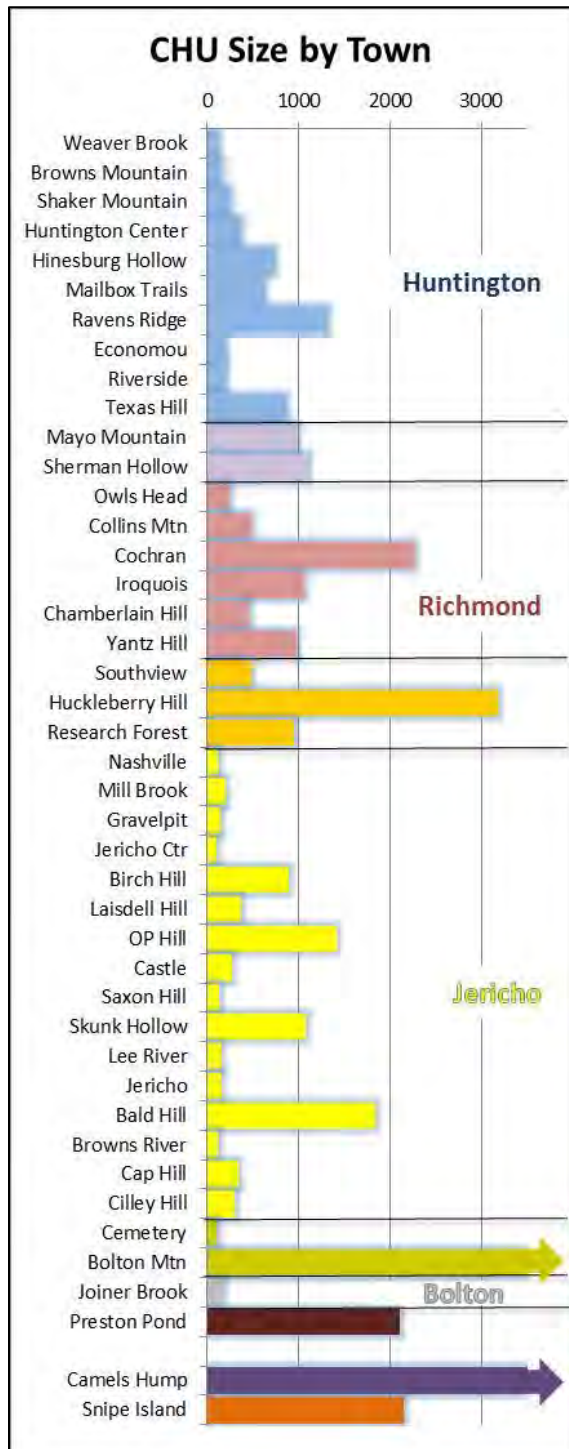


Figure 66: CHU Acreage Summary Graph



Section 5.5 Habitat Overview by Town

5.5.1 Bolton Habitat Overview

The Town of Bolton is notable for its large contiguous wildlife habitat, especially in the east portion of the town. Although the western section of the town is somewhat more fragmented, the whole town is encompassed mainly by only 3 large Contiguous Habitat Units, the smallest of which- Preston Pond, is larger than any of the CHUs in Jericho. Of equal note is the Winooski River valley and associated highways dividing the town as well as the large blocks of un-fragmented forest to the north associated with Mt Mansfield and to the south encompassing Camels Hump.

Even in the western section, wildlife habitat in Bolton is only mildly fragmented and mostly by dirt roads with only low to moderate amounts of traffic. Because of the relatively high elevations and steep terrain in Bolton, large agricultural clearings

are a rarity and single-family homes with limited clearing are the human land-uses that dominate the roadsides. These landscape features combine to form CHUs that are loosely separated, with highly permeable breaks and wildlife populations exhibiting a relatively high exchange of individuals. This is advantageous for wildlife and promotes and maintains a relatively high genetic variability which provides the raw material for genetic adaptability over time.

Again owing to its steep and rugged terrain, numerous potential ledge habitats found are within the town. A wide variety of wildlife, including raccoons, porcupines, bobcats, ravens and other species utilize these unique spaces. While peregrine falcons are known to nest on the cliffs of Bolton Notch, other wildlife gain protection from predators, a moderated thermal regime and places to den and nest within ledge, talus, and caves as well.



Bolton also supports extensive areas of high elevation spruce-fir forests supporting a unique suite of breeding birds. Bicknell's thrush, dark-eyed junco, yellow-rumped, Magnolia, and blackpoll warblers all breed in these forests. The fisher, snowshoe hare, moose, and bear inhabit these sub-alpine forests. Bear often den high up in these remote forests to limit their exposure to humans. In Bolton, bears may, upon leaving their dens, venture down to the extensive wetlands located in eastern Jericho and western Bolton. Bears in these and other wetlands dine on leafy wetland plants that have emerged early as a result of warm ground water discharge.

In the southern third of Bolton, wildlife is greatly limited in its ability to move north across the I-89 highway corridor. And yet, some wildlife does manage to cross this expanse of inhospitable landscape. In effect, the river valley forms a leaky barrier for some wildlife and an

almost complete barrier to others. Occasional deer, moose, bear, fox, and other species of wildlife cross the highway, some of which remain and breed with individuals on the other side. For the most part however, individuals stay on either side of this corridor and home ranges are adjusted to avoid having to cross these areas on any regular basis.

The un-fragmented, remote wildlife habitat in the east is dominated by deciduous forest on the hillsides and conifer forests on mountaintops. This continuous wildlife habitat is part of the 7th largest continuous wildlife habitat block in the State of Vermont. This continuous block of wildlife habitat, just in Bolton alone, provides nearly 15,000 acres of core wildlife habitat largely free from permanent, intrusive human landscape alterations and extensive edge habitats. This remote wildlife habitat remains largely inaccessible to motorized vehicles and sees very little human use. This forest block



serves as the largest “source” habitat for neo-tropical songbirds with large area requirements such as the black-throated blue warbler, wood thrush, and scarlet tanager. These forest blocks are large enough to contain several home ranges of breeding members of deep forest species of wildlife such as black bear, bobcat, fisher, and moose. The maintenance of these areas as un-fragmented wildlands is key to any strategy aimed at conserving viable wildlife populations in Bolton, as well as south into Huntington.

5.5.2 Richmond Habitat

Overview

The Town of Richmond forms a part of the transition from the more urbanized towns in the Lake Champlain lowlands to the west and the wilder more continuous forested habitat within the Green Mountains. In much of the town, hillsides drop precipitously down to the Winooski valley and the I-89 corridor functionally divides the town’s

wildlife habitats into north and south.

The northeast and south-central sections of town contain the largest contiguous wildlife habitats. Wildlife habitat blocks between 2000-3000 acres occur in these areas and provide extensive core habitat for deep-forest songbirds, and large wide-ranging mammals such as bobcat and fisher. However, the largest, most wide-ranging species, such as black bear, may have to seasonally cross fragmenting features such as roads and fields to access distant habitat elements. Richmond does have the habitat to support a bear population and in most years hunters take 1-3 bears in town. There have been repeated bear sightings in southern and eastern Richmond. Richmond has a more robust white-tailed deer population and hunters often take up to 70 deer annually in town. Richmond exhibits a greater degree of fragmentation than all the 4 town inventory area except Jericho, and



thus contains extensive edge habitat conditions and overall favorable conditions for deer and other edge-loving species such as red fox and ruffed grouse.

The key to maintaining suitable habitat conditions in Richmond for large, wide-ranging species such as black bear, bobcat, fisher, and moose, is to keep large forested areas intact as forest. Maintaining these more remote wildlands with habitat conditions that promote occupancy by breeding females is vital to maintaining healthy self-sustaining populations of these animals in Richmond. Many of Richmond's largest wildest habitats extend into the neighboring towns of Huntington, Jericho, Hinesburg, Bolton and Williston. Maintaining these wildlands and the wildlife that prosper there will require coordination between these towns.

5.5.3 Jericho Habitat Overview

Jericho sits at the junction between the relatively urbanized, fragmented Chittenden County to the west and

the large forested expanses of the Green Mountains to the east. Forested regions within eastern parts of Jericho begin extensive core wildlife habitat that extend east into Bolton and continue north into Stowe and Cambridge. These large blocks are "source" areas for bear, bobcat and fisher, and serve as breeding habitats for deep forest songbirds, owls, and forest raptors. Bear can be found in Jericho and it is likely that these large forested core areas form the majority of habitat for territorial breeding female bear. In Jericho, bear that may range over 20-30 sq. miles, likely cross in and out of town, paying no attention to town borders. Eastern Jericho shares portions of the same 15,000 acre forested block already discussed in Bolton.

The northern and southern edges of Jericho contain some larger contiguous habitats that share borders with Westford, Essex, Underhill and Richmond. These areas likely contain wide-ranging



species such as bear and bobcat on a year-round basis. Many of the smaller habitat units, generally located along the well-travelled roads and near Jericho's village centers are also important wildlife habitats. These smaller units are often the woods, shrublands, and wetlands that form the habitats sheltering the wildlife we enjoy seeing on our travels. These smaller forests are also stepping-stone or temporary habitats for wildlife as they move across the landscape to much larger forested areas to the east (Huckleberry Hill over to Bolton Mountain CHUs) and west (Jericho Research Forest and Skunk Hollow CHUs). In general the permeability between the east and west CHUs is not great, the Mill Brook corridor likely provides the most significant linkage and deserves further research.

Jericho supports the highest concentration of vernal pools in the STA study area with over 20 potential vernal pools identified.

The temporary pools support important breeding populations of wood frogs, spotted salamanders and a wide variety of other animals.

5.5.4 Huntington Habitat

Overview

Other than Bolton, Huntington has the least fragmented wildlife habitat within the STA study area. The only areas that present a significant barrier to wildlife movement in Huntington are the villages of Huntington and Huntington Center and immediate surrounding areas. Once out of these villages, road traffic is low enough that road corridors are permeable and wildlife can move across the landscape. The Huntington Road north to Richmond might be an exception to this with comparatively high traffic volumes.

Huntington is similar to Bolton in that the eastern sections of both towns consist of large, unbroken mountainous wildlife habitat that extends into neighboring towns. In eastern Huntington, the large, 19,000 acre forest block extends into



Duxbury, Fayston and Buell's Gore. This large, remote forest expanse contains multiple mast stands, wetlands, ledge habitat, forested riparian habitat, and deer winter habitat. Humans are but visitors in this forest. An area of this size contains multiple breeding home ranges of bear, bobcat, fisher, coyote, fox, moose, and the majority of the full variety of smaller animals as well. The relatively undisturbed core forests provide ample space for multiple breeding territories of a wide-variety of songbirds, including deep forest specialists such wood thrush, ovenbird, and scarlet tanager as well as high elevation songbirds such as Bicknell's thrush, blackpoll warbler and the golden-crowned

kinglet. Huntington has extensive amounts of high elevation spruce-fir forest extending up to 4000 ft in elevation. These wild forests are home, at least seasonally, to the snowshoe hare, fisher, weasels, moose and bear.

In western Huntington, although fragmented by roads, contiguous wildlife habitat remains large enough to contain deep-forest wide-ranging species such as black bear and fisher. However, in order to maintain viable populations of these area sensitive species, wildlife may need to cross roads in search of mates, seasonal habitat elements, and to leave their natal home ranges.



***Section 5.6 Management
Recommendations for
Wildlife Habitat***

**5.6.1 Large Contiguous Habitat
Units**

The Core Habitat Units described above are areas with large core size, substantial forest interior habitat and generally a wide-diversity of wildlife habitat elements. They provide important habitat for large, wide-ranging wildlife such as black bear, habitat for forest interior birds, as well as specific habitat features critical for a wide variety of other species.

- Forest fragmentation in these larger CHUs should be discouraged. Roads, housing and most other human activities should be restricted to the periphery of these units.
- Forest management activities that support a diversity of forest and early succession natural communities are an appropriate use of these areas.

- Roads built to facilitate forest management activities should be allowed to revegetate when management activities are completed in an area.
- Natural connections between the various wildlife habitats/elements within the units should be maintained.
- To maintain deep forest habitat for many declining songbirds, forest clearing and land development should be managed to avoid the extension of edge conditions (a hard break between forested and unforested areas) into the interior of the core forest.

**5.6.2 High Elevation Bird
Habitat**

High elevation songbird habitat is found in 3 CHUs. Bicknell's thrush and other high-elevation birdlife may nest in areas above 2700 ft within these units.

- Any logging and/or land development activities proposed for areas above 2700 ft should



be avoided assessed by a professional biologist to ensure the minimization of impact to Bicknell's' thrush breeding habitat.

5.6.4 Grassland Bird Habitat

As mentioned above, the presence of suitable habitat to support grassland bird species is in decline. The availability of this habitat is dependent upon proper land management. There are a number of resources available to assist landowners in developing management practices that not only provide for successful breeding by grassland species, but also allow continued agricultural use of the land. Audubon Vermont administers the Champlain Valley Bird Initiative, a program aimed at helping landowners manage their land to maintain or increase grassland and shrubland bird species. For more information, see:

<http://vt.audubon.org/champlain-valley-bird-initiative>

Additional information about land management activities that can directly benefit grassland birds is available from Audubon Vermont at: <http://vt.audubon.org>. Communities should consider encouraging landowners to work with Audubon and other partners such as the USDA NRCS (Natural Resource Conservation Service) to provide and maintain grassland bird habitat.

5.6.3 Bear Habitat

Black bear require extensive remote areas to meet their yearly habitat requirements. Large areas without roads must be preserved to maintain sustainable populations within the STA region. In addition, bears must continue to have access to mast stands and forested wetlands. Bear habitat management can focus on beech stands that have documented bear use.

- Mapped beech stands and forested wetlands utilized by bear should be protected from development activities with buffers ¼ mile in extent. A



professional biologist should address potential impacts to bear and their populations in these cases.

- Harvesting of beech that shows current or historic use by bear should be discouraged.

5.6.4 Ledge, Talus, and Cliff Habitats

Ledge, talus and cliff habitats are utilized by nesting birds, resting wildlife, and in some cases denning bobcats and porcupine.

- Human development activities should be discouraged on and near ledges, talus, and cliffs.
- A minimal 100' buffer should be maintained between these habitats and human development activities.

5.6.5 Deer Winter Habitat

These habitats are critical to the survival and maintenance of deer populations in the STA region. Without deer winter habitat preservation, deer populations within the region could decline.

- Deer winter habitats identified in this report should be protected from human activities by 300' buffers.
- A professional biologist should assess potential impacts from human development activities (except forest management activities) proposed within 300' of deer winter habitats.

5.6.6 Forested Riparian Communities

Forested riparian habitats offer important wildlife habitat and provide cover for wildlife movement.

- Wherever possible, forested riparian communities should not be fragmented by human activities.
- Forest management activities in forested riparian communities should utilize selective harvesting techniques only and maintain a continual forest cover.

5.6.7 Travel Corridors

Functioning travel corridors allow for the movement of wildlife across the



landscape. Conservation of wildlife travel corridors is often a difficult undertaking in that much of the negative impact to these features happens slowly over time. The effect on a particular corridor from one residential development, for example, may be small. Over the years, however, as more small development occurs, the once functioning travel corridor may receive less use and eventually disappear. Concrete management recommendations for the travel corridor presented here are, therefore, difficult to develop. The following steps, however, will increase the knowledge about the specific corridors in the towns and enable planners to draw more specific conservation guidelines.

- Conduct field verification studies to identify and characterize the important travel corridors within

STA region and especially those presented in this study.

- Prioritize the importance of these travel corridors for conservation action.
- Take steps to conserve the most important travel corridors by creating isolation buffers around them to maintain wildlife movement patterns.
- Limit development to the outside edge of corridors and encourage screening, natural color schemes and other actions to limit negative effects of development in or near corridors.
- Important black bear corridors are especially vulnerable and may require buffers of up to $\frac{1}{4}$ mile in extent.
- Improve vegetated buffer conditions along rivers and streams to provide protected movement opportunities for wildlife.



6. Conclusions

The STA study area comprises 95,000 acres and consists of a wide diversity of wetlands, upland natural communities and wildlife habitats. The STA study area extends from the top of 4000 ft high mountains down to low-lying wetlands and major rivers, like the mighty Winooski that has carved a valley out of the Green Mountains.

As part of this inventory, 1418 total wetlands were mapped throughout the study area and range in size from a 260 square foot seep to a 235 acre wetland complex. Along the larger streams and rivers, floodplain forests with majestic ostrich-fern and silver maple parallel the water's edge. Isolated vernal pools dot the forested landscape and large forested swamps occupy headwaters and low-lying areas. Together, these wetlands are valuable as natural communities and for the many functions and values that they perform.

Upland communities are similarly varied. A total of 30 different upland natural communities were mapped in the STA study area, comprising 74,197 total acres. Tiny knolls with a 1/3 acre Dry Oak Forest contrast sharply with expansive 12,000 acre Northern Hardwood Forests. Hemlock forest types are abundant on the lower slopes and above rivers while montane spruce and fir type occupy the highest elevations. Of this diversity of upland communities, field assessments resulted in the ranking of 15 different sites with state or locally significant natural communities.

Forty-three (43) distinct contiguous wildlife units (CHUs) were mapped in the towns. Within these, a variety of different wildlife habitat features such as deeryards, ledges and talus habitats, wetlands and forested riparian habitats, early successional habitat and mast stands can be found. Along the western boundaries of the STA study area are



expansive forests providing wildlife habitats that comprise the base of a species-rich, abundant wildlife community that exists largely unharassed by humans and their activities. These areas remain largely unfragmented as deep-forest wildlife haunts where wary species such as bear and bobcat find adequate space for multiple, redundant, adult female territories. These territories serve to replenish the smaller habitats within the STA study area where people and animals co-exist and wildlife populations are rarely self-sustaining. The high elevation spruce-fir forests provide some of this remote wildlife habitat, a place for bear to hibernate, snowshoe hare to thrive, and for species such as the blackpoll warbler and Bicknell's thrush to nest.

From cliffs and krummholz to dry oak and pine woodlands, the diversity of natural communities and wildlife habitats within the STA study area is impressive. This diversity makes for a varied and interesting

ecological landscape for both wildlife to live and humans to explore. Maintaining this natural diversity, both the natural communities and the wildlife that inhabit them, however, is only possible with proper town planning and resource management. It is our hope that this inventory will help assemble the information needed to identify and protect the important natural features of the STA study area and maintain the quality of life for its visitors and residents. Finally, it should be noted that the real power of this inventory and assessment is in the data. Accompanying this report are extensive spatial databases of data accumulated, derived and built in the course of this inventory. There are a myriad of ways to explore, analyze, map and visualize the data provided and many, many more theories to be tested and conclusions to be drawn. We encourage continued use and discovery of this rich dataset in whatever ways possible.



7. References

- Calhoun, A.J.K. and M.W. Klemens. 2002. Best development practices: Conserving pool-breeding amphibians in residential and commercial developments in the northeastern United States. MCA Technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society. Bronx, New York.
- Calhoun, A.J.K. and P.deMaynadier. 2004. Forestry habitat management guidelines for vernal pool wildlife. MCA Technical Paper
- Colburn, E. 2004. Vernal Pools: Natural History and Conservation. MacDoland and Woodward Publishing Co., Blacksburg, Virginia. 426 pp.
- Thompson, E.H, and E.R. Sorenson. 2000. Wetlands, Woodlands, Wildlands: A Guide to the Natural Communities of Vermont. Vermont Department of Fish and Wildlife and The Nature Conservancy of Vermont, University Press of New England.
- Vermont Department of Environmental Conservation, Wetlands Section. Vermont Wetland Evaluation Form. 2010.
- Vermont Fish and Wildlife Department. Nongame and Natural Heritage Program. Synonymy of Vermont Natural Community Types with International Vegetation Classification Associations. January 10, 2012.





Audubon VERMONT

Forest Bird Habitat Assessment

Richmond Town Forest / Andrews Forestland
Richmond, VT

428 GIS acres



Assessment Date:

July 7, 2017

Report Date:

November 2017

Prepared by:

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Bird photos courtesy of the Powdermill Avian Research Center, All About Birds.com, and Charley Eisman (left to right): black-throated blue warbler, chestnut-sided warbler, scarlet tanager, mourning warbler.

Introduction

The purpose of this report is to 1) describe the current habitat types and conditions for forest nesting songbirds on the Richmond Town Forest / Andrews Forestland, and 2) provide management recommendations for integrating habitat management with other ownership objectives in order to enhance the forest's value for songbirds. This assessment is focused on the breeding habitat conditions for "responsibility species" of Bird Conservation Region (BCR) 14, the Atlantic Northern Forest, as identified by Audubon Vermont's Forest Bird Initiative.

Background

Breeding bird surveys have shown that the forests of Vermont and Northern New England are globally important for birds throughout the hemisphere. Our forests are home to the highest concentration of bird species breeding in the continental United States; they are a "veritable breeding factory" for hundreds of neo-tropical migratory birds.

Unfortunately – even though they are still common in our area - many of these birds are experiencing long-term population declines throughout their breeding range. Audubon Vermont's Forest Bird Initiative focuses its conservation efforts on 40 of these forest bird species, known as *responsibility species*. These birds have a high proportion of their global populations breeding in our region, so we have the responsibility – and opportunity - to keep them common before they become threatened or endangered.

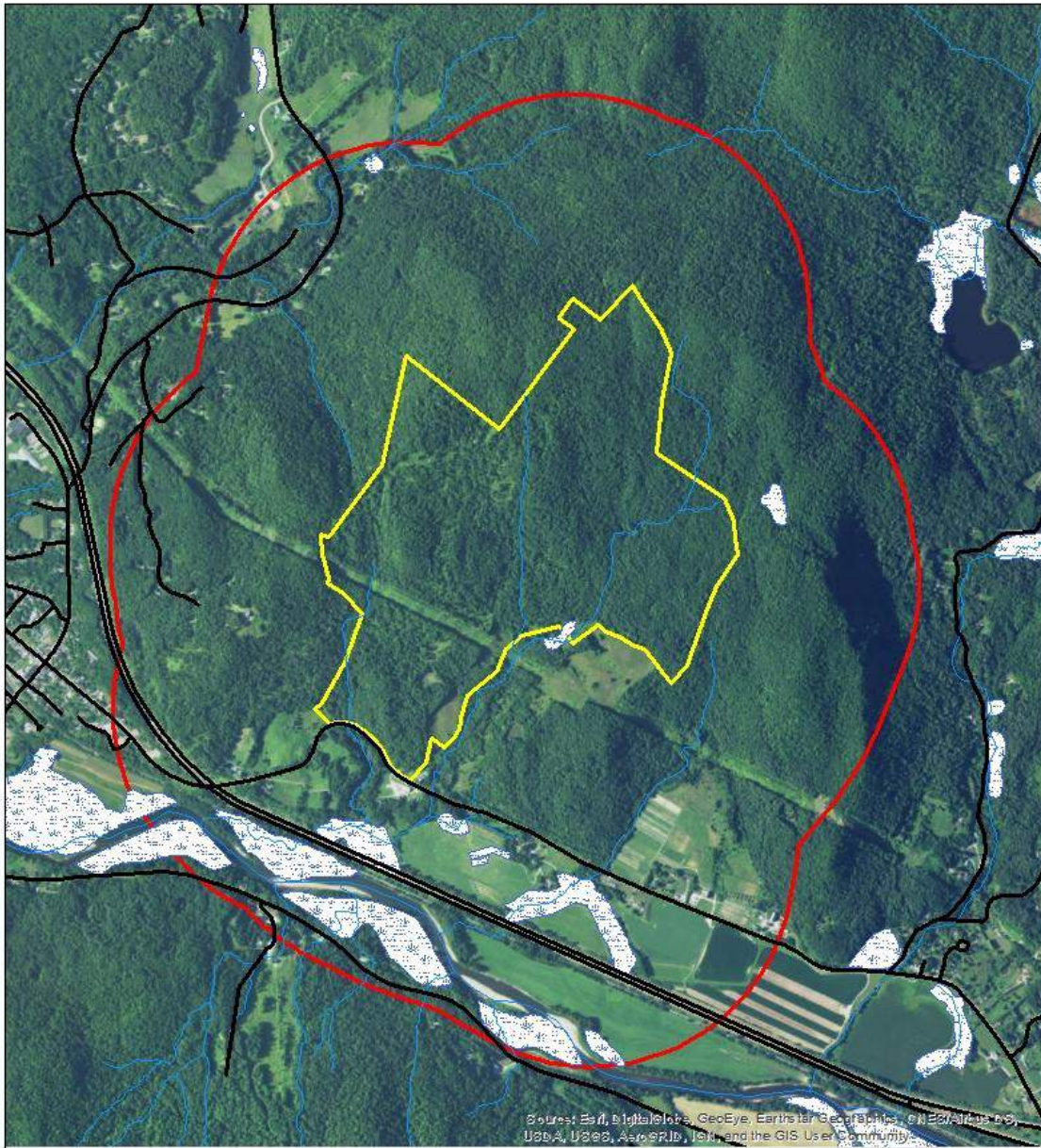
Assessment Methods and Reporting

The inventory and assessment of habitat conditions is based on fixed plot sampling from 20 plot centers, or approximately 1 data point for every 21 acres, supplemented by casual observations.

This report is designed to help inform the creation of an overall management plan for the property. Habitat types have been delineated based on current conditions. Each habitat type includes: a general description; a table of important habitat attributes along with an assessment of their current condition and a short list of bird species associated with each attribute; and list of bird species observed during the assessment as well as others likely to find suitable nesting conditions there. Management recommendations and considerations for maintaining and/or enhancing each habitat type are provided in the context of other stated management objectives for the property. A glossary of terms used in this report can be found as an Appendix.

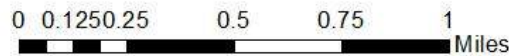
Landscape-Level Considerations

The composition and configuration of the 2,500 landscape that immediately includes and surrounds the Richmond Town Forest affects how birds and other wildlife will use the property and the quality of the habitat they find there. Understanding the landscape context can also help inform management decisions at the stand-level on the property.



Legend

-  Richmond Town Forest
-  2,500 Acre Landscape
-  Stream / River
-  Wetland
-  Road



The following table summarizes the condition of the landscape and its value for the suite of forest responsibility birds:

	Current Condition	Value for Forest Birds
% Forest Cover	>70%	High - Heavily forested landscapes (70+% forest cover) provide the greatest quantity, diversity, and quality of habitat for responsibility birds compared to fragmented and/or developed landscapes.
% Young Forest	Approx. 2%	Low – 2+ acre patches of young forest are important breeding habitat for several responsibility birds including chestnut-sided warbler as well as post-breeding habitat for additional species. Audubon Vermont recommends that < 10% (preferably 3-5%) of a landscape be in this condition at any point in time. Given the composition of this particular landscape a target of 3-5% is deemed appropriate.
Forest patch size	>2,500 acres	High – Large (>2500 acres) patches of contiguous forest provide higher quality habitat for interior-nesting birds like wood thrush that reproduce more successfully away from edges and development. These large forest patches also provide habitat for source populations of birds that may recolonize smaller forest patches if/when they lose their original populations. The Richmond Town Forest is located in the 290,389 acre “Mansfield/Worcester Priority Block” as identified by the National Audubon Society, and a 6,288 acre “Highest Priority Interior Forest Block” as identified by the State of Vermont.

Recommendations based on landscape context

- **Protect interior forest conditions.** Utilize multi-aged silvicultural treatments over the majority of the property. Avoid creating new permanent openings or wide (> 20 feet wide), linear roads and trails.
- **Consider creating 5-10 acres of young forest/early-successional habitat.** Although there is currently sufficient young forest habitat on the Richmond Town Forest, the function of this habitat is likely to diminish around the year 2025 due to maturation of the forest. In order to maintain this valuable habitat condition it is recommended to create a new area(s) sometime after 2025.

Forest Bird Habitat Types and Assessment

Habitat Type 1: Mature Hardwood/Mixedwood Forest

Acres: 394

% of Property: 92%

Forest with an overstory greater than 20 feet tall and >30-50% canopy closure. Canopy tree species are represented by both hardwoods and softwoods. Red maple, eastern hemlock, white pine, and red oak tree species are well represented on the parcel. Less abundant tree species yet valuable habitat elements are yellow birch, black cherry, white birch, and aspen. The combination of hardwoods and softwoods provides habitat for a greater diversity of bird species than hardwoods or softwoods alone would (Figure 1). Yellow birch and red oak are particularly valuable as foraging sites for birds due to the high diversity of native insects that utilize these tree species (Figure 2). White birch and aspen hold high value for cavity nesting bird species. Black cherry offers a minor fruit resource, important to birds during the post-breeding / pre-migration time frame.

Many responsibility birds breed in mature forest habitats where they find nest sites, cover, and food (predominately insects). Typically, the quality of mature forest habitat increases for forest birds as a forest ages and structure diversifies. Pole stands are the youngest type of mature forest habitat and are typically structurally simple and attract a relatively small suite of forest birds including ruffed grouse and American redstart. Older stands with partially to well-developed understory and midstory layers, canopy gaps, big trees, snags, and logs on the ground, attract a much greater diversity of birds including black-throated blue warbler, wood thrush, and black-throated green warbler. The rocky-bottom stream which flows through the eastern half of the property likely serves as nesting habitat for Louisiana waterthrush.



Figure 1. Hardwood dominated mature forest habitat



Figure 2. Red oak is of high habitat value

Habitat Structure

The following table describes desirable mature forest habitat conditions for supporting a diversity of bird species and promoting nesting success, an assessment of their current condition on the Richmond Town Forest, and example bird species that may benefit from the condition.

Desired Habitat Condition	Current Condition	Satisfactory	Needs work	Birds that may benefit	Notes
Generally closed canopy (>70% cover on average)	72% cover	X		Black-throated green warbler, Blue-headed vireo, Ovenbird	
Canopy gaps (≤ 1 acre each)		X		American redstart, Eastern wood-pewee	
Moderate to high density of midstory (6-30') vegetation	50-75% cover	X		Blue-headed vireo, Wood thrush	
Moderate to high density of understory (0-6') vegetation	25-50% cover	X		Black-throated blue warbler, Veery	Higher density preferable
Abundant current and future snags and cavity trees (6 >10" diameter per acre)	<6 snags >10" diameter per acre		X	Northern flicker, Yellow-bellied sapsucker	Figure 3
Abundant coarse woody material on the ground (large logs)	28 pieces/acre	X		Ruffed grouse	Figure 4
Abundant fine woody material on the ground (tops, brush piles)	8 piles/acre		X	White-throated sparrow, Ovenbird	
Vigorous canopy trees		X		Scarlet tanager	
Diversity of native plants; lack of invasive, non-native plants		X	X	All	Minor amounts of Japanese barberry observed wind damaged area (2010) of Forest Stand #1 (FMP 2012)



Figure 3. Small diameter snags are common



Figure 4. Coarse woody material on forest floor

Bird Species

Responsibility bird species observed during the field assessment are noted as “observed”. Those that were not observed but likely to utilize the Habitat Type during the breeding season are noted as “potential”.

Mature Hardwood/Mixed Forest	Confirmed	Potential
American Redstart		x
Blackburnian Warbler		x
Black-throated Blue Warbler	x	
Black-throated Green Warbler	x	
Blue-headed Vireo	x	
Chimney Swift		
Eastern Wood-pewee	x	
Northern Parula		x
Ovenbird	x	
Purple Finch		x
Scarlet Tanager	x	
Veery	x	
Wood Thrush	x	
Yellow-bellied Sapsucker	x	
Additional Species Observed Red-eyed Vireo, Tufted Titmouse, Northern Flicker, Hermit Thrush, Blue Jay, American Robin, Dark-eyed Junco		

Management Recommendations and Considerations

In an effort to integrate forest bird habitat considerations with a multiple use approach to management, the following recommendations are provided:

- Continue to manage the majority of mature forest habitat as mature forest habitat with a focus on enhancing overall forest structure and maintaining plant diversity. Multi-aged silvicultural treatments are preferable although even-aged treatments may have applicability in certain stands or portions of stands. *Silviculture with Birds in Mind: Options for Integrating Timber and Songbird Habitat Management in Northern Hardwood Stands in Vermont* provides a number of options. Those most suitable for the Richmond Town Forest property are:

1B – Variable Retention (Density) Thinning

2A – Expanding Gap Group Shelterwood (groups <1/2 acre preferable to larger openings)

2B – Single Tree and Small Group Selection (groups <1/2 acre preferable to larger openings)

These silvicultural options can help maintain/enhance desirable forest bird habitat conditions for mature forest nesting bird species. They will also assist in developing a higher-quality timber resource for the future.

The most appropriate option and timing of implementation is dependent upon pre-existing stand conditions primarily as they relate to developmental stage/size class and acceptable and unacceptable growing stock levels. This information should come from the detailed forest inventory under the direction of a consulting forester.

- Retain existing large-diameter snags during harvest and consider marking additional trees to be girdled or retained to grow into large-diameter cavity trees that eventually will naturally become snags. Aspen and white birch are good candidates for recruitment.
- Mark some low-value trees 10+ DBH to be cut and left on site for recruitment of additional coarse woody material in the area (e.g. mark 1 cut-and-leave tree per acre). Leave all tops in the woods and do not lop slash.
- When possible minimize harvesting during the breeding season (May – mid-July). Winter (frozen ground) harvesting is preferable as it will not result in direct impacts to nesting birds.
- Develop a plan for managing non-native and invasive plants. Ongoing monitoring and eradication efforts can go a long way toward preventing more significant future infestations. The Vermont program of The Nature Conservancy (<http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/vermont/volunteer/wise-on-weeds.xml>) is among the many sources of useful information related to management on non-native, invasive plant species.

Habitat Type 2: Young Forest

Acres: 27

% of Property: 6%

Forest with an overstory <30% canopy closure. This condition is found in three distinct areas of the property. Two of these areas, in the northwest corner, are the result of a 2011 shelterwood harvest (Figure 5). Combined these two areas encompass approximately 13 acres. The third area is the powerline corridor that bisects the property east to west and encompasses approximately 14 acres (Figure 6). As this area is managed by a local power company authority and will in all likelihood be perpetually kept in a young forest condition, the management recommendations are not intended for the powerline.

In harvest areas residual canopy is comprised primarily of red oak, setting the stage for significant red oak regeneration. This is a very desirable trend in thinking about the future of the property in terms of projected climate change impacts to forest composition. It also maintains/promotes a high-value insect food source on which songbirds can forage. Currently aspen, red maple, and raspberry/blackberry make up the majority of understory/midstory woody stemmed vegetation. In addition to nesting habitat structure the raspberry/blackberry is a valuable post-breeding – pre-migration fruit resource.

The young forest nesting bird community is very different from the mature forest community. The addition of this habitat condition on the property is therefore extremely valuable for diversifying the overall bird community. Additionally many bird species which nest in the mature forest utilize young forest habitats during the post-breeding – pre-migration time frame for both foraging and finding dense cover from predation.



Figure 5. Harvest-based young forest habitat



Figure 6. Powerline young forest habitat

Habitat Structure

The following table describes desirable young forest habitat conditions for supporting a diversity of bird species, promoting nesting success, and providing post-breeding habitat as well as an assessment of their current condition on the Richmond Town Forest, and example bird species that may benefit from the condition.

Desired Habitat Condition	Current Condition	Satisfactory	Needs work	Birds that may benefit	Notes
Dense shrubs and regeneration of tree species	75-100% cover	X		Chestnut-sided warbler, Mourning warbler	
Abundance and diversity of fruit-producing trees and/or shrubs; lack of invasive, non-native plants		X	X	All	Non-native honeysuckle currently exists in the powerline corridor but does not yet appear to have made it to the harvested areas; minor amounts of phragmites on skid trail
Scattered perch trees and snags		X		Northern flicker	Residual trees well represented throughout harvest area although not many are currently snags/cavity trees
Abundant coarse woody material on the ground (large logs)			X	Ruffed grouse	With exception of areas on skid trails, CWM is minimal
Abundant fine woody material on the ground (tops, brush piles)			X	White-throated sparrow	

Bird Species

Responsibility bird species observed during the field assessment are noted as “observed”. Those that were not observed but likely to utilize the Habitat Type during the breeding season are noted as “potential”.

Young Forest	Confirmed	Potential
American Woodcock		x
Canada Warbler		x
Chestnut-sided Warbler	x	
Magnolia Warbler		x
Mourning Warbler	x	
Nashville Warbler		x
Northern Flicker	x	
Ruffed Grouse		x
White-throated Sparrow		x
Additional Species Observed Yellow-throated Vireo, Song Sparrow, Indigo Bunting, Common Yellowthroat, Cedar Waxwing		

Management Recommendations and Considerations

In an effort to integrate forest bird habitat considerations with a multiple use approach to management, the following recommendations are provided:

- The two current areas of young forest habitat resulting from timber harvesting are likely to mature beyond young forest habitat around the year 2025. In order to maintain this ephemeral habitat condition on the property it is recommended to create 5-10 acres of new young forest habitat toward the latter part of the 10 year planning cycle. Young forest areas should be at least 1 acre in size, preferably 2. Options for creating young forest habitat from *Silviculture with Birds in Mind: Options for Integrating Timber and Songbird Habitat Management in Northern Hardwood Stands in Vermont* are:

- 2A – Expanding Gap Group Shelterwood (groups > 1 acre)
- 2B – Single Tree and Small Group Selection (groups > 1 acre)
- 3A – Shelterwood with Reserves

These silvicultural options can help maintain/enhance desirable forest bird habitat conditions for young forest nesting bird species. They will also assist in developing a higher-quality timber resource for the future.

The most appropriate option and timing of implementation is dependent upon pre-existing stand conditions primarily as they relate to developmental stage/size class and acceptable and unacceptable growing stock levels. This information should come from the detailed forest inventory under the direction of a consulting forester.

- Retain existing large-diameter snags during harvest and consider marking additional trees to be girdled or retained to grow into large-diameter cavity trees that eventually will naturally become snags. Aspen and white birch are good candidates for recruitment.
- Mark some low-value trees 10+ DBH to be cut and left on site for recruitment of additional coarse woody material in the area (e.g. mark ≥ 4 cut-and-leave trees per acre). Leave all tops in the woods and do not lop slash.
- When possible minimize harvesting during the breeding season (May – mid-July). Winter (frozen ground) harvesting is preferable as it will not result in direct impacts to nesting birds.
- Develop a plan for managing non-native and invasive plants. Ongoing monitoring and eradication efforts can go a long way toward preventing more significant future infestations. The Vermont program of The Nature Conservancy (<http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/vermont/volunteer/wise-on-weeds.xml>) is among the many sources of useful information related to management on non-native, invasive plant species.

Habitat Type 3: Open/Field

Acres: 6
% of Property: 1%

Open areas on the property take the form of a 1 acre log landing (Figure 7) and 5 acre field. Herbaceous plants dominate and the non-native multi-flora rose was identified in the field. Some open habitats of a minimum size can support nesting grassland bird species such as bobolink. On the Richmond Town Forest property the field area that could be managed to provide nesting habitat are too small to be functional. For the purposes of forest bird habitat, the log landing area is of greater value and may serve as a springtime display ground for American woodcock.



Figure 7. Log landing

Management Recommendations and Considerations

In an effort to integrate forest bird habitat considerations with a multiple use approach to management, the following recommendations are provided:

- Maintain the log landing in an open condition through periodic mowing. Frequency of mowing to be determined by that which is needed to prevent woody stemmed vegetation from encroaching.
- Field should be mowed in accordance with achieving other objectives for the property.
- Develop a plan for managing non-native and invasive plants. Ongoing monitoring and eradication efforts can go a long way toward preventing more significant future infestations. The Vermont program of The Nature Conservancy (<http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/vermont/volunteer/wise-on-weeds.xml>) is among the many sources of useful information related to management on non-native, invasive plant species.

Habitat Type 4: Wetland

Acres: 1.4
 % of Property: <1%

Two areas of wetland currently exist on the property. The first is an abandoned beaver flowage embedded in the mature forest matrix, approximately ¼ acre in size (Figure 8). The small size and structure of this area is not likely to provide a distinct habitat condition capable of supporting wetland bird species. In time, as the margins revegetate, it is possible that white-throated sparrow may find minimal nesting habitat here. The second, more significant wetland area, is located on the southern property boundary (Figure 9). This approximately 1 acre shrub wetland is comprised of alder, willow, elderberry, and herbaceous plants. Although not true young forest habitat, some species that nest in that habitat type were observed here due to similar vegetative structure. The most notable responsibility bird species that may find nesting habitat here is the Canada warbler.



Figure 8. Old beaver flowage



Figure 9. Shrub wetland

Bird Species

Responsibility bird species observed during the field assessment are noted as “observed”. Those that were not observed but likely to utilize the Habitat Type during the breeding season are noted as “potential”.

Shrub Wetland	Confirmed	Potential
American Woodcock	x	
Canada Warbler		x
Chestnut-sided Warbler	x	
Swamp Sparrow		
White-throated Sparrow		x
Additional Species Observed		
Common Yellowthroat, Black-billed Cuckoo, Gray Catbird, American Goldfinch, Rose-breasted Grosbeak		

Management Recommendations and Considerations

In an effort to integrate forest bird habitat considerations with a multiple use approach to management, the following recommendations are provided:

- Develop a plan for managing non-native and invasive plants. Ongoing monitoring and eradication efforts can go a long way toward preventing more significant future infestations. The Vermont program of The Nature Conservancy (<http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/vermont/volunteer/wise-on-weeds.xml>) is among the many sources of useful information related to management on non-native, invasive plant species.
- Beyond monitoring for and managing non-native and invasive plants no active management is recommended for either wetland area.

Terms and Explanations

Big Trees: Live trees great than 19 – 24 inches diameter at breast height (DBH).

Importance for Forest Birds: Big trees are a key characteristic of old forests and high-quality mature forest habitat for songbirds. Researchers in Wisconsin found priority birds were more abundant and successful in forests with >10% of the live basal area in big trees (19+ inches DBH) than in forests with fewer big trees (Managed old-growth silvicultural study (MOSS), Wisconsin Department of Natural Resources, 2013). Structurally-sound, large-diameter trees are important stick nest sites for woodland raptors, such as the northern goshawk. If retained as legacies, these large trees also provide cavity nest sites for large woodland birds including owls and pileated woodpeckers.

Canopy Gap: A small opening in the upper canopy of a mature forest typically the size of one tree crown up to 1/4 acre.

Importance for Forest Birds: Birds such as the eastern wood-peewee forage in canopy gaps, which also allow sunlight to reach the forest floor through the upper canopy stimulating new growth in understory and midstory. Gaps created where trees fall or blow over or are cut down are a normal and important part of a healthy forest and high-quality mature forest habitat.

Downed Deadwood: Coarse woody material (CWM) is downed logs and branches >4 inches diameter. Fine woody material (FWM) is limbs and branches <4 inches diameter including slash.

Importance for Forest Birds: CWM provides perch sites for singing (e.g. by ovenbird) and other male courtship displays, and provides habitat for the insects and other arthropods that are a significant part of the breeding season diet of many birds. Ruffed grouse tend to use CWM >8 inches diameter as drumming perches. When aggregated in piles (e.g tree tops or slash piles) FWM offers a nesting substrate and cover for white-throated sparrows and veeries. Scattered individual pieces have minimal habitat value.

Forest Block: A large area of contiguous forest cover

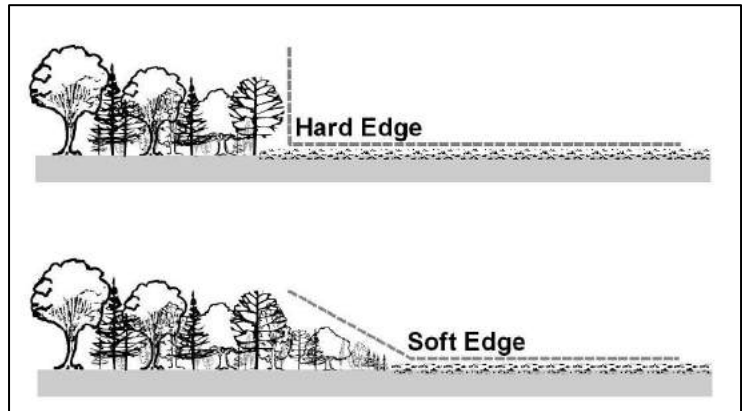
Importance for Forest Birds: Very large (>2500 acres) blocks of contiguous forest provide the highest quality habitat for interior-nesting birds like wood thrush that reproduce more successfully away from edges and development. Large blocks also likely contain the full range of habitat types and conditions required to support most or the entire suite of responsibility birds. Smaller forest patches >500 acres in size provide important habitat in more fragmented landscapes and can connect larger patches. Patches <500 acres in size can still support breeding birds in heavily forested landscapes and area important habitat during the migration season.

Forest Cover: Area of land that is forested or wooded.

Importance for Forest Birds: Heavily forested landscapes (70+% forest cover) provide the greatest quantity, diversity, and quality of habitat for responsibility birds compared to fragmented and/or developed landscapes with lower forest cover.

Forest Edge: The boundary between forest and open land, such as a field or backyard.

Importance for Forest Birds: The transition from low herbaceous vegetation to tree canopy can be considered either a “soft” or “hard” edge. A soft edge is a gradual change in vegetation height moving into the forest. This gradual transition is important for buffering interior forest specialists like the wood thrush from the incursions of nest predators (such as raccoons and skunks) and nest parasites



(such as the brown-headed cowbird) that are frequently found in open and developed areas. A gradually increasing canopy height helps to shield interior-nesting birds from view by predators and parasites. Additionally, the brushy conditions that often develop in a soft edge may provide breeding habitat for young forest habitat bird species including chestnut-sided warbler and white-throated sparrow.

Fragmented Forest: Forest that is broken into small, unconnected patches primarily due to some form of development (e.g. residential, commercial, or major roads).

Importance for Forest Birds: A fragmented forested landscape is more likely to support “generalist” wildlife species, such as raccoons and skunks, which can decrease nesting success of interior-nesting forest birds.

Hardwood Forest: A forest dominated by broad-leaved trees which lose their leaves in the fall.

Importance for Forest Birds: Some breeding birds are associated with hardwood forests, such as chestnut-sided warbler, eastern wood-pewee, and scarlet tanager.

Horizontal Structure: The arrangement of different habitat types across the landscape.

Importance for Forest Birds: A landscape with mature and young forest habitats, open fields, and wetlands would be rich in horizontal diversity. Landscapes with greater horizontal diversity support a greater diversity of breeding forest birds and other wildlife.

Interior Forest: Forest condition that occurs with increasing distance from a forest edge.

Importance for Forest Birds: As perceived from a bird’s perspective, interior forest conditions begin to occur approximately 200-300 feet from a forest edge. At this distance, negative edge-associated effects such as nest predation and parasitism generally no longer occur. Interior-nesting species, such as scarlet tanager, wood thrush, ovenbird, black-throated blue warbler, and blue-headed vireo, have greater reproductive success when they nest away from forest edges.

Invasive (non-native) Plant: A plant that is able to establish on many sites, grow quickly, and spread to the point of disrupting native ecosystems. Often non-native.

Importance for Forest Birds: Non-native, invasive plants, such as bush honeysuckles, buckthorn, and Japanese barberry, present a variety of threats to forest health in Vermont and the northeast. Although some species of native forest birds successfully use these shrubby, woody plant species as nesting sites and eat their fruits, the fruits generally have low nutritional value and the invasive plants reduce the diversity of other nesting and foraging options in forest ecosystems. Overall, non-native, invasive plant species degrade the quality of native forest bird habitat in our region.

Leaf Litter: Dead plant material such as leaves, bark, and twigs that has fallen to the ground.

Importance for Forest Birds: An abundant layer of moist leaf litter is home to an array of insects, mites, and spiders. These arthropods make up a significant component of ovenbird, veery, and wood thrush diets during the breeding season. Ovenbirds also rely upon a deep layer of deciduous litter for constructing their ground nests, and nest site selection is strongly associated with this habitat variable.

Mature Forest Habitat: Forest with a canopy greater than 20 feet tall.

Importance for Forest Birds: Many responsibility birds breed in mature forest habitats where they find nest sites, cover, and food. Typically, the quality of mature forest habitat increases for forest birds as a forest ages and structure diversifies. Pole stands – the youngest type of mature forest habitat - are typically structurally simple and attract a small suite for forest birds including ruffed grouse and American redstart. Older stands with understory and midstory layers, canopy gaps, large trees, snags, and logs, attract a much greater diversity of birds including black-throated blue warbler, wood thrush, Canada warbler, and black-throated green warbler.

Midstory: Live, woody vegetation in the 6-30 foot height range including trees and shrubs.

Importance for Forest Birds: High stem and foliage densities of woody plants in this forest layer provide nest sites, foraging substrates, and protective cover for many forest birds. Stand-wide coverage is desirable but not necessary; well distributed patches are sufficient. The majority of responsibility bird species nest and/or forage within the first 30 feet of the forest. Nests of wood thrush, American redstart, black-throated green warbler, and blue-headed vireo are most commonly found in the midstory level.

Mixed Forest: A forest made up of hardwood and 25-75% softwood tree species.

Importance for Forest Birds: Some breeding birds are associated with mixed forests, such as black-throated blue warbler, Canada warbler, and white-throated sparrow.

Snags and Cavity Trees: Snags are standing dead or partially dead trees that are relatively stable. Cavity trees may be alive or dead.

Importance for Forest Birds: Snags provide opportunities for nesting cavity excavation by yellow-bellied sapsuckers and northern flickers, and existing cavity trees provide potential nesting cavities for chimney swifts. Aspen and birch species are frequently chosen as trees to excavate. Cavities are often made in trees with the heartwood and sapwood decay fungi. Suggested targets for snags and cavity trees

combined in are ≥ 6 per acre, with one tree >18 inches DBH and 3 >12 inches DBH. Branches on snags may be used as foraging perches and nest sites.

Soft Mast: Soft fruits and berries.

Importance for Forest Birds: Fruits including cherry, apple, *rubus* species (e.g. blackberry and raspberry), dogwood, and others are important food sources for forest birds. In the late summer and early fall, after fledging and before migrating, many birds feed on these fruits and the insects that are attracted to them in order to build up critical fat reserves needed to endure long fall migrations.

Softwood Forest: A forest dominated by coniferous trees, usually “evergreen” (the exception being tamarack), with needles or scale-like leaves.

Importance for Forest Birds: Some breeding birds are associated with softwood forests, such as magnolia warbler and blue-headed vireo. Other birds, such as blackburnian and black-throated green warbler, are associated with small clusters of softwood trees called exclusions in hardwood stands. For this reason, maintaining or increasing the softwood component of hardwood stands increases their overall habitat value. Several responsibility species are associated with softwood forests that are dominated by spruce and fir. Bicknell’s thrush is associated with these forests found at high-elevations in the mountains, and species including boreal chickadee, spruce grouse, and black-backed woodpecker, are associated with lowland spruce-fir forests in the northern parts of our region that are characterized by a short growing season and cold climate.

Understory: Live vegetation in the 1-5 foot height range, including tree seedlings and saplings, shrubs, and herbaceous vegetation.

Importance for Forest Birds: High stem and foliage densities of woody plants in the understory provide nest sites, foraging substrates, and protective cover for many forest birds. Stand-wide coverage is desirable but not necessary; well distributed patches are sufficient. Herbaceous plants may also be used by songbirds for foraging and nesting, but generally less so than woody plants. Species in this layer frequently used by birds include sugar maple, American beech, hobblebush, red spruce, *rubus* species, and striped maple. Black-throated blue warbler and wood thrush place nests in this layer, and Canada warbler and veery tend to nest on or near the ground, concealed by dense understory growth. The best breeding habitats for mourning warbler and chestnut-sided warbler are patches of dense, low growth with $<30\%$ overstory cover in patches >1 acre in size (young forest habitat conditions).

Vertical Structure: The complexity of vegetation and other structures as they are vertically arranged in the forest.

Importance for Forest Birds: A forest with a well-developed understory, midstory, and canopy exhibits complex or diverse vertical structure, which offers habitat for a greater array of bird species compared with a structurally simple forest. Non-living features, such as coarse woody material and the microtopography of the forest floor, add to the complexity of vertical structure as well.

Young Forest Habitat: Forest patches greater than one acre in size dominated by a high density of seedlings, saplings, and shrubs less than 20 feet tall.

Importance for Forest Birds: Several responsibility birds and many other wildlife species use young forests during all or part of their life cycle. Chestnut-sided warbler, American woodcock, and magnolia warbler all use young forests during the breeding season. Although these species may be found in patches smaller than one acre in size, research has shown that abundance and nesting success is greater in larger patches. Young forest habitats include regenerating patchcuts, clearcuts, and old fields. Early-successional young forest habitats dominated by intolerant species such as aspen and paper birch are particularly valuable for woodcock and grouse. Shrublands that will never mature into forest, such as those associated with beaver wetland complexes, can also attract species associated with young forest habitats since they have a similar vegetative structure. Recent research has also shown the importance of young forest habitats as post-breeding habitat for birds that nest in mature forest, such as scarlet tanager and wood thrush. Young forest provides dense, protective cover for juveniles, as well as abundant sources of soft mast, which are important pre-migration food sources. Young forest habitats are ephemeral; they generally only persist 10-15 years where forest regenerates after a patch or clearcut and slightly longer on old field sites. Due to natural forest succession and development, the amount of this habitat type is decreasing in our region, which is a threat to the species associated with it.

Introduction

The Town Forest Visioning Workshop and Survey are integral parts of the overall public engagement process for the Richmond Town Forest Recreation Plan, which also includes a series of steering committee and community meetings, as well as input from the Town government and other stakeholders and partnering organizations.

To ensure the greatest possible participation in the visioning process, the same visioning questions were asked at the public workshop and in the survey, although the survey asked a few demographic questions that were not asked at the workshop. Both public engagement methods were primarily focused on understanding the community vision related to the Town Forest, the management balance of the forest, the natural resources present on the site, and future activities in the Town Forest. The workshop results are presented in the photos of the public engagement “boards” completed by the community while the survey results are presented in tables of the combined survey responses. Key findings are reflective of both inputs, and areas of alignment and divergence are highlighted and analyzed.

As the workshop and survey are only one part of the overall community input into the plan, the Visioning Process Results should be considered descriptive of community sentiments rather than prescriptive. While these results should help point the way and direct the development of the plan, they must be measured alongside other community and Town inputs and should not be considered conclusive of the sentiments of everyone in the community.

Public Visioning Workshop

A Public Visioning Workshop for the Richmond Town Forest was held at Camels Hump Middle School on January 18, 2018. The meeting was a drop-in anytime, open house format with questions about an overall vision for the town forest; the balance of recreation, education, conservation/natural resources, and forest products; the natural resources present on the site; and future activities in the Town Forest. Attendees wrote responses on boards, completed dot exercises, and drew their ideas and knowledge on maps. Members of the project team and local steering committee were available for one-on-one chats with attendees, and a general comment box was provided for open-ended feedback. Background/baseline information about the project, the community, and the forest, was also provided. 55 people signed in and an estimated 80 people were in attendance.

Public Visioning Survey

The Public Visioning Survey was launched at the public visioning workshop on January 18, 2018 and remained open through March 26, 2018. An online survey was made available. The community was

Vermont Town Forest Recreation Planning

made aware of the survey through a variety of methods including flyers distributed around town, press-releases and news articles, and email blasts and social media posts. In total, the survey received 317 responses.

Visioning Process Results

Demographics (Survey Only)

Location of Residence

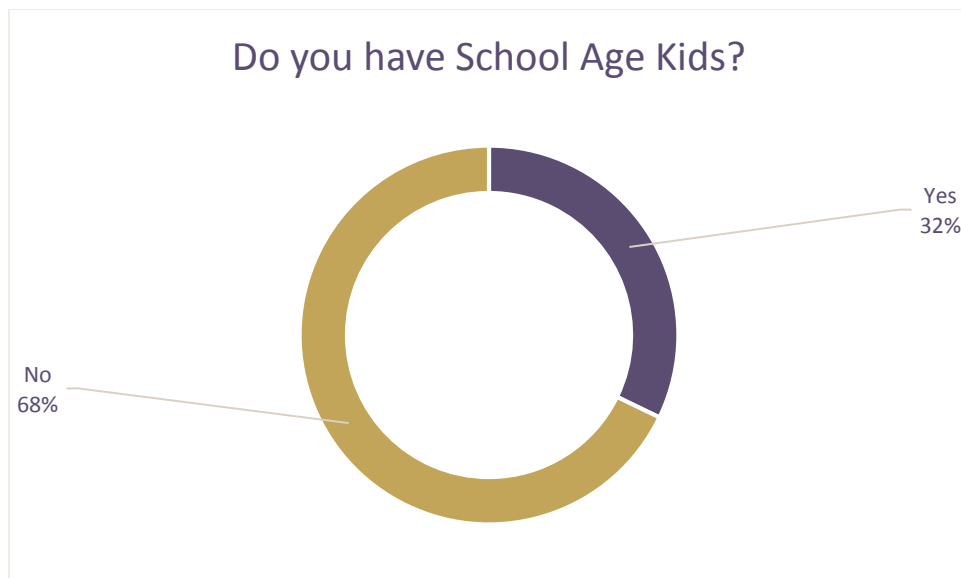
89 percent of the respondents were from Richmond, while 11 percent were residents from neighboring towns, second home-owners, and visitors from afar. Surveys were received from 60 zip codes.

Median Age

Survey results tended to skew towards an older demographic. The median age of survey respondents was 48.8, while the median age of the Town overall is 36.9.

School Age Kids

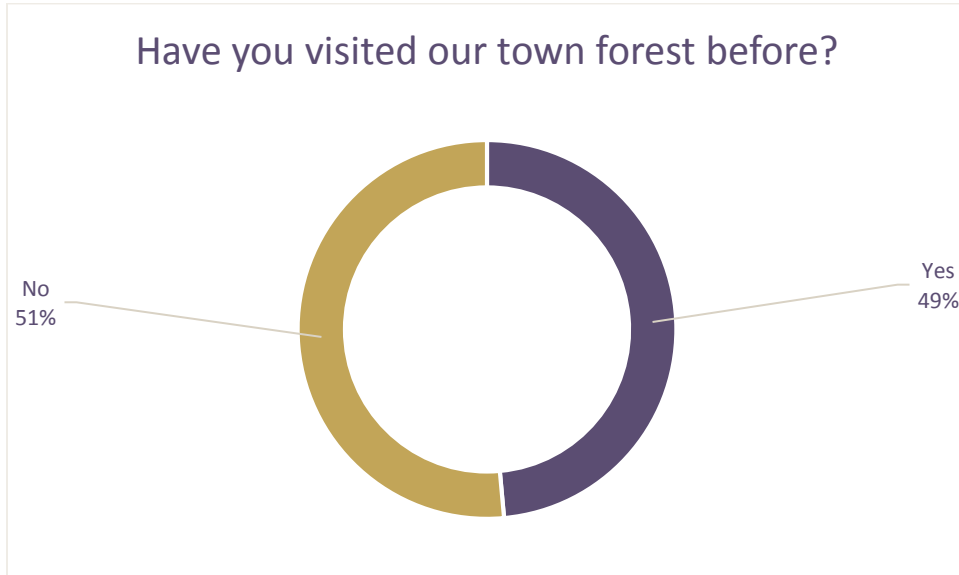
32 percent of survey respondents have school age children, suggesting we received a reasonable sample of families in town. Of those who responded they had school age children, the average number of school age children was 1.86.



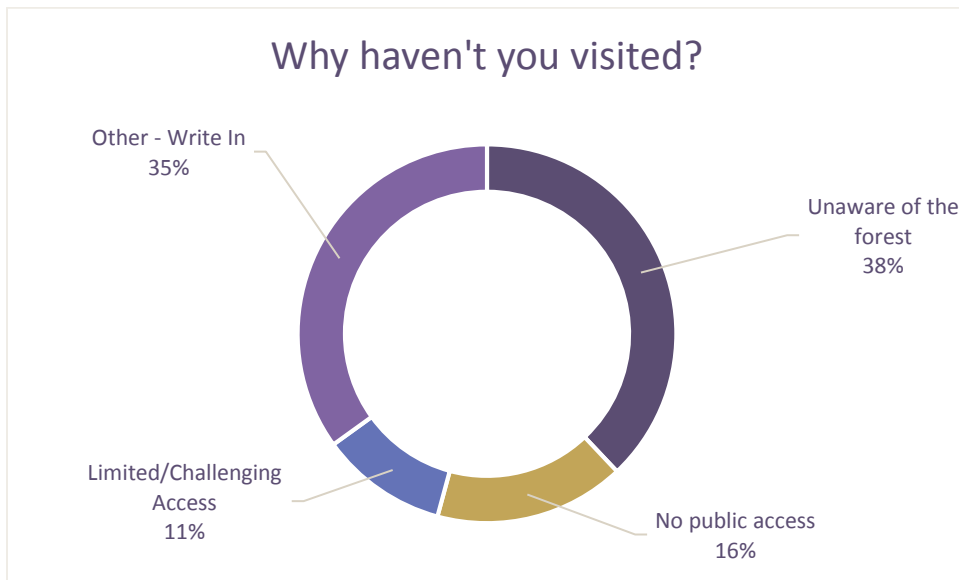
Vermont Town Forest Recreation Planning

Familiarity with our Forest

About half of survey respondents (49%) had visited our town forest before.



Of those who had not visited “Unaware of the forest” was the most common reason for not visiting.



Write in responses included:

- Where are the Maps?
- The town Forest does not yet exist
- Unsure of public access location
- Does not exist yet.....



Vermont Town Forest

Recreation Planning

- Didn't know we could yet
- It's brand new
- not sure whats open and when and for what purpose-hunting season etc
- Richmond does not yet have a town forest
- Busy
- Not yet established
- I live next to a forest so I enjoy that instead of driving to the town parcel.
- I have previously lived in Massachusetts and also spent a great deal of time hiking in New Hampshire. What I have found in Richmond and Vermont in general is a lack of access to get into the forest itself that is safe and walkable. We need more well taken care of safe hiking trails with safe access and the ability to have maps for these trails. I drive around Vermont a lot I just don 't see many places to just stop and park my car like I did in New Hampshire and pick up a trail map right there at the trailhead and walk in safely so I have done no hiking in Vermont at all. I also think that after many of the severe storms we 've had in the last 15 years is large trees never seem to get cleaned up and it's dangerous to walk in an environment like that. So keeping the forest cleaned up a little bit if and when possible it would be a great idea
- Brand new!
- Forest just purchased
- No interest
- haven 't made the time
- Was not able to get to the tours offered. My loss.
- I have hunted and worked the land there for many years but have not visited since the ownership change.
- New to town
- New forest -not yet available
- With so many other easily accessible hiking spots nearby, the town forest is a complicated outing.
- Not open yet
- Not available yet.
- Just being created
- Not sure where access is
- Not sure how to access
- Don't know where it is



Vermont Town Forest

Recreation Planning

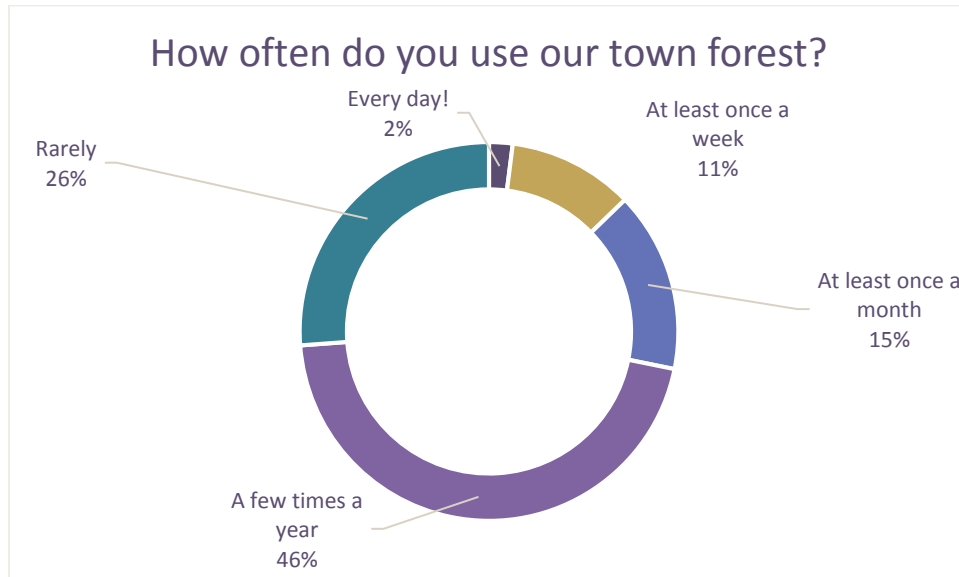
- Only recently designated
- Have not had availability.
- Haven't made it there yet
- not aware of how to access
- Looking forward to it, just haven't yet.
- Forest is brand new. Prefer to hike elevation.
- Haven't found the time
- I don't know where to access it, can I park a car?, whether it's safe for families (because of hunting with guns, bows etc)
- Still working through process
- no particular reason
- I am aware of the forest but I don't know how to access it.
- New to the area
- only recently became town forest
- I'm not exactly sure how to get there or that I'm allowed to yet
- Not sure where it's permissible to go, how to access it, what activities are permitted, are there trails, etc
- cold winter weather
- I was unavailable on the day the land trust gave access.
- It's new - not open for public use yet
- Just haven't gotten there yet but love exploring other natural areas in Richmond
- Just haven't made it yet
- I don't know where it is!
- Haven't gotten there yet
- Newly created
- We do not yet have a town forest.
- Other forests to visit
- Town forest created only recently
- Have disability
- Doesn't exist yet
- Don't know enough about it. Not on fb much
- not sure where or what it is



Vermont Town Forest Recreation Planning

Forest Visitation

Of those who had visited our forest, many visited a few times a year (46%). Some people visited with regularity, either once a month (15%) or once a week (11%).



Survey Respondent Affiliations

The survey asked respondents if they have an affiliation with the Town (Conservation Commission, Town Forest Committee, etc.), interest group (trail club/group, rod and gun club, etc), or partnering organization (land trust, library, school district, etc.). Nearly all respondents (94%) did not have an affiliation. There was a strong showing from Vermont Mountain Biking Association, Richmond Trails, and Richmond Land Trust. Some respondents answered “Yes” but did not report the specific affiliation.

Affiliations included:

- Vermont Mountain Biking Association
- VMBA Richmond mountain trails chapter
- Richmond
- Vmba
- Boy scouts
- GMC
- Catamount Trail Association member
- I volunteer with Green Mountain Adventure Racing Association, a nonprofit that organizes outdoor orienteering events.



Vermont Town Forest

Recreation Planning

Verbatim Responses:

- Im worried about too much recreational development
- More bike opportunities
- Preston - steward and user
- peaceful
- Haven't experienced yet
- Beautiful
- Potential
- Mountain Biking
- recreation
- Trail riding
- Exploring
- None
- hiking
- Hopeful
- Sick mountain bike destination
- Hopeful it involves mountain biking
- Natural State
- A part of the Chittenden Uplands
- birding/hiking
- Natural, mostly undisturbed habitat
- Amazing
- None
- Mountain Biking
- Unmanaged and unimproved
- Recreation
- Bow hunting
- Very familiar with the area and surrounding lands
- Quiet wilderness
- It is NEW
- Elated
- Happy
- Excited
- Log it now to balance tax loss
- None
- None
- Peaceful
- not aware of town forest
- Curious
- no experience
- Future potential
- No town forest yet
- Unaltered woods and hiking
- Curious
- Intimate
- Hunting
- "Iron John" drum circles
- Novel
- Skeptical
- It hasn't been established yet
- rarely
- Nice that I usually encounter not other people
- Less than I would like.
- Necessary
- NA
- Grateful for preserved open space
- Walking in the woods
- Accessible
- Hunting
- None yet.
- South facing, connected to conserved land
- Access
- curious
- Life long. Richmond resident
- Bad parking, great trails! Woof!
- Optimistic
- Never used....not sure where to park or if trails exist
- I'd get kicked out if I went there with a motor
- non-existent
- just finding out about it
- Peaceful
- Hopeful
- Glad it's there



Vermont Town Forest

Recreation Planning

- Undeveloped
- limited
- Natural
- peaceful
- unknown
- Unknown to me
- Passing awareness (that it exists)
- very little
- Hunting
- hopeful
- Anticipatory
- Running
- lacking
- experimental
- interested party
- awareness
- None
- Get outside
- I know it exists, more or less.
- Wild
- Excited for it to open
- Minimal
- nonexistent
- Curious
- we know the planning process has started
- where is it and how do I get there?
- None
- want to hike there
- Good trails
- unaware
- Limited
- new
- Hunting
- None
- Education
- unaware
- Anticipating
- Believe in habitat conservation.
- minimal
- None
- very little
- Limited, nonexistent
- Hunting
- Appreciative
- Positive
- natural retreat
- Would like to know more about it
- recreation
- hiking
- None
- not much
- Unknown
- limited access
- Potential fun and learning
- conservation
- Great
- Rare visitor
- Peaceful
- Not yet
- Unaware
- Enjoy forest and its wildlife
- Unaware
- Too busy
- Too much
- present
- beautiful woods
- I heard of it when this project began
- unformed
- Important nature corridor
- heavily logged but recovering
- Recreation
- Education, habitat
- beautiful
- Appreciation
- love
- Occasional but rewarding
- Enjoyment
- Haven't yet visited because it is still being planned, but am excited to visit the Richmond town forest as soon as it is ready for the public



Vermont Town Forest

Recreation Planning

- peripherally aware
- Beautiful piece of property
- Haven't been there
- Unknown!
- Budding engagement as a recent arrival to town.
- Budding engagement as a recent arrival to town.
- Not involved
- Accessible to town
- Mountain biking!
- respite from town
- non-existent
- Fun and easily accessible
- Where?
- Unknown
- nascent
- unaware
- Excited it's not being developed
- excitement
- Anticipatory
- tranquil
- I was unaware of it
- excited!
- None
- Preserve
- Excited to see how it develops
- Looking forward to using it more
- Can't Wait!
- Interested
- Little. But lots with other towns, especially Hinesburg
- Sanctuary
- Connection
- tranquil
- Limited
- glad to know it's there
- not yet well acquainted
- NA
- Potential
- exploration
- Grateful
- Interested in its use
- A lifetime of enjoying the wildlife
- Blind
- it's not open yet but it was lovely
- It's lovely
- hike
- i worked on the farm
- rookie
- Excited



Vermont Town Forest

Recreation Planning

- non-trail activities are being marginalized by trail proliferation.
- Same... Quiet wilderness
 - Solitude
 - Recreation & Trails for biking, running, & hiking
 - Recreation/wildlife
 - Active
 - Enjoyment and appreciation of natural spaces
 - Use logging roads to create routes for four wheelers and moto cross
 - Nature habitat
 - adventure
 - Peaceful
 - love to hike in the forest
 - Enjoyable
 - would like to go for a walk in it
 - Education
 - Natural
 - Hiking
 - Immersed
 - Preserving the integrity of the forest
 - Hunting
 - Waking the trees and leading them on a mission of vengeance against the orcs
 - Natural experience
 - Economically managed for ALL Richmond residents
 - Place to experience nature in a mature ecosystem
 - trails
 - It would be Nice to not encounter other people
 - Exploring & hiking
 - Education, walking
 - Grateful
 - Forest bathing, nature observations, photography
 - Familiarity
 - Peaceful walking in the woods
 - Utilized
 - Hunting
 - Accessibility, subject to habitat protection
 - Effective land management
 - familiar
 - Let's hunting be allowed
 - playground
 - Lots of connected foot trails. Managed healthy forest. Preserved animal habitat.
 - Conservation
 - I'd love to be able to hike/snowshoe there and experience the forest and its flora and fauna
 - Motorized access
 - Outdoor community recreation space
 - visiting, enjoying
 - familiar with and enjoying
 - Single track trails to vistas and views
 - Peaceful
 - Focus on habitat protection
 - Hope it is preserved
 - Undisturbed (hiking, not mtn biking or ATVS and Snowmobiles)
 - recreation and preservation
 - Natural
 - just as peaceful
 - hiking
 - Understanding what is there and how to access it safely
 - Weekend afternoon activity
 - open to all
 - No biking
 - none
 - hopeful
 - Interactive



Vermont Town Forest

Recreation Planning

- active engagement without motors
- trails
- useable
- Multiple use including agriculture and hunting. I would love to see a community garden in some of the open area.
- visitor
- Great place to walk my dog
- walking trails, recreation
- Enjoying nature
- I would love to explore it and share it with friends.
- Wild
- Community
- experienced
- Magical
- destination for recreation and getting into the woods
- Charmed
- walking/hiking
- I can walk to the trails from town
- nature
- want to hike and snowshoe
- Accessibility and preservation
- User
- enjoying it
- Involved
- Hunting
- Recreation
- Recreation and education
- accessible
- Outdoor adventure
- expanded
- Frequent
- Hunting
- Responsible
- Mountain Biking & Winter Fat Biking Trails
- natural retreat w/walking trails
- Hiking
- Recreation
- hiking
- A local place to hike/walk/run!
- Interested
- more use
- Paint
- readily accessible
- Active
- easy access / parking
- Go to place to hike and have outdoor adventures
- conservation
- Unchanged
- No interest
- Sustainable enjoyment
- Familiar
- extensive stewardship
- Healthy
- Enjoy untrammeled natural resources
- Encompassing
- less people
- Too much
- accessible
- Recreation
- conserved for wildlife
- connected
- Natural habitat
- mature forest structure
- Education
- still beautiful !
- Enjoyment
- inclusive
- hiking
- Observation of environment and species
- Increased accessibility
- Walk/hike designated trails
- Moderate use
- trail running
- Family friendly, learning



Vermont Town Forest

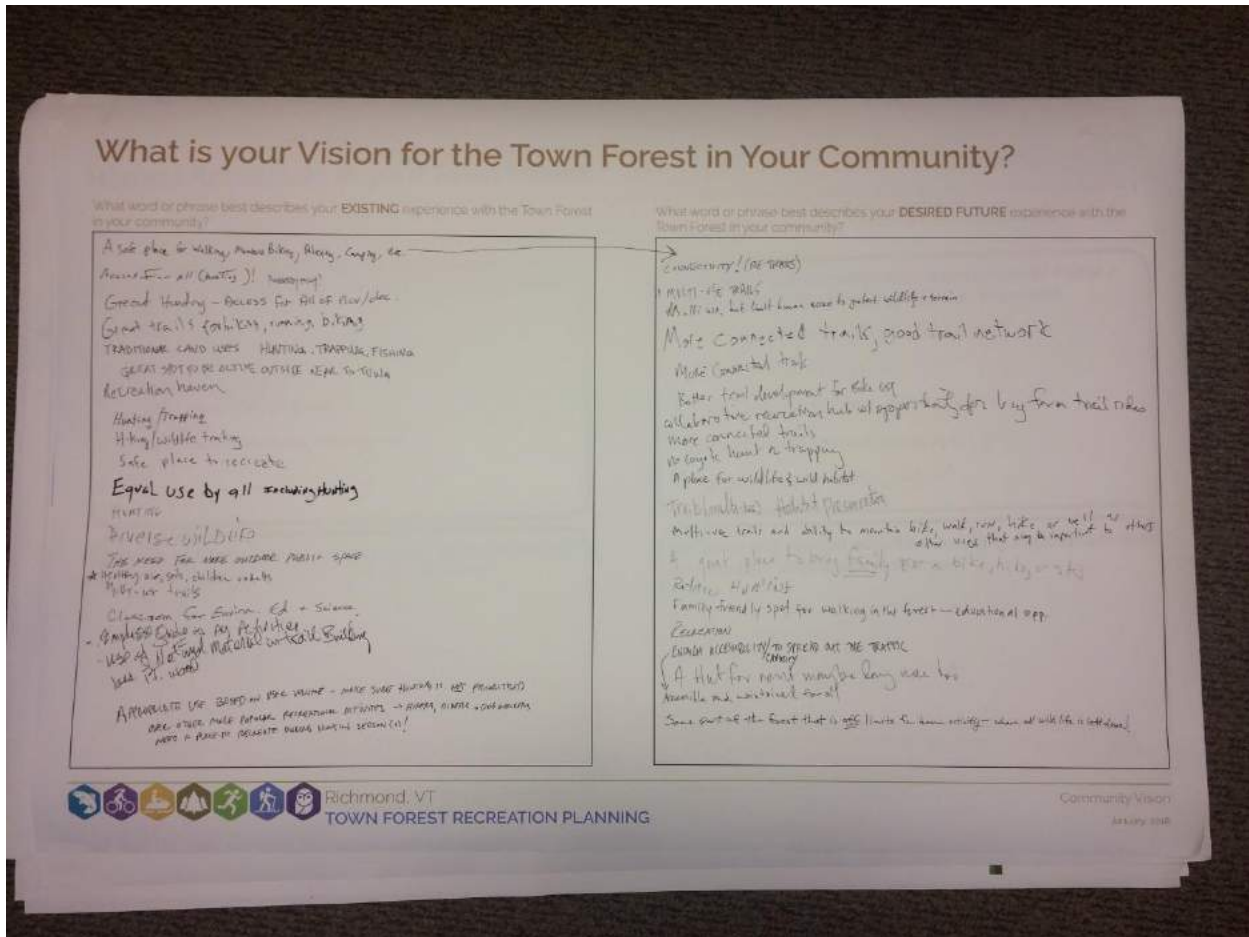
Recreation Planning

- accessible to a variety of people who will then consider themselves stewards of it, truly the collectively owned feeling since not all are lucky enough to 'own' their own land
- Walking, observation of wildlife and environment
- Trails!
- Frequent personal use for recreation, accompanied by engagement in management and preservation activities.
- Frequent personal use for recreation, accompanied by engagement in management and preservation activities.
- participant
- Involved, user
- open for recreation
- More wide spread trail
- Preservation, education and interaction
- better trails
- peaceful exploration by humans and refuge for animals
- Fun and accessible
- Non-motorized recreation accessible and dog friendly
- multipurpose recreation
- Gathering place
- Walking trails
- quiet space
- Recreation
- family memories
- Hiking and nature study
- radical
- Recreation
- Peaceful enjoyment of nature
- hiking
- Mountain Biking
- Participation
- Firewood
- Preserve and provide opportunity to explore
- A great place to run and hike with my kids
- As often as possible
- Trail Running. Parking?
- Remain Interested
- High use
- Recreational sanctuary
- Easily accessible for families
- Respect
- community
- hiking forest trail
- frequent visits
- Walks
- Occasional hiking, snowshoeing
- Multi-use trails / connectors
- cultural connection
- Well-acquainted
- Here for benefit of residents and ecosystem
- hunting
- Pristine recreation area
- Wildlife and land conservation and protection
- Know
- what?!
- Active
- hike
- I want to spend time walking the land
- Keeping the woods
- knowledgeable user
- Easy access to local trails





Public Workshop



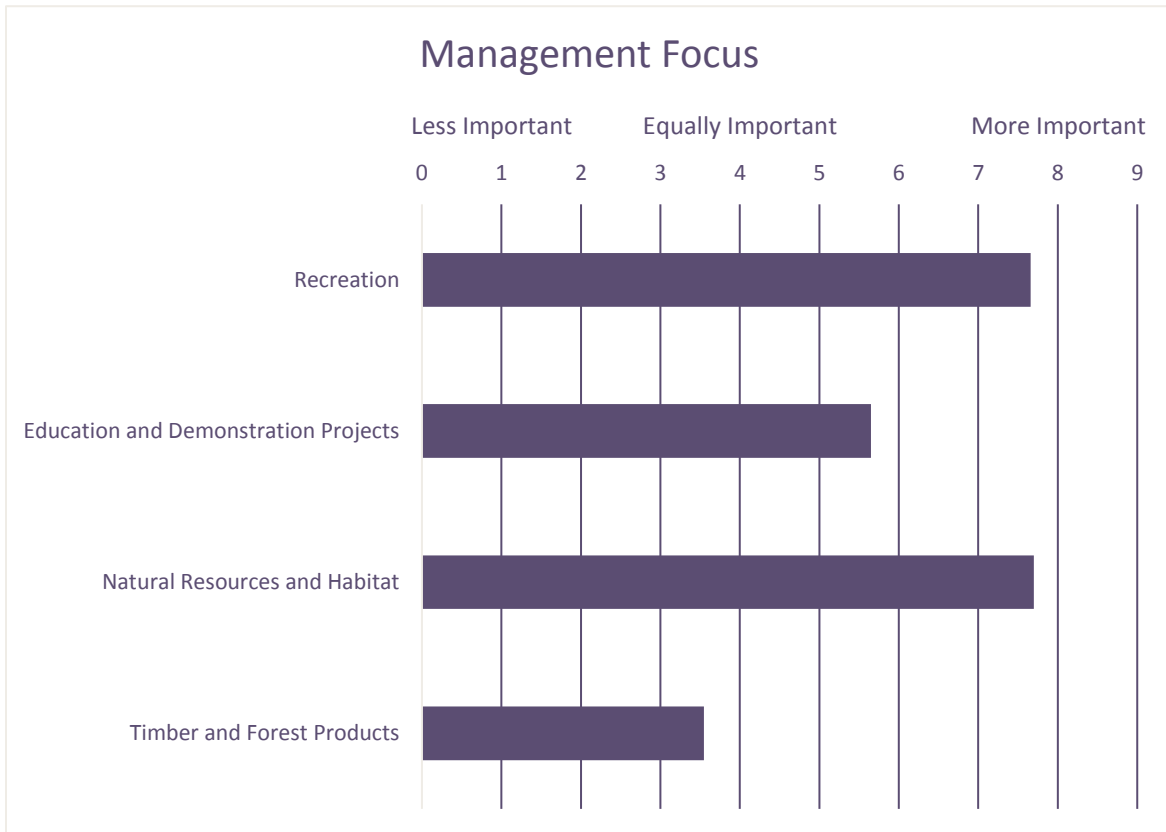
Vermont Town Forest Recreation Planning

Management Balance

Town Forests can be managed to provide a wide range of activities and community values. Four common use areas include Recreation, Education & Land Use Demonstration Projects, Natural Resources & Habitat, and Timber & Forest Products. While most publicly accessible forests provide some measure of all four types of uses, they tend to “lean” in one management direction or another.

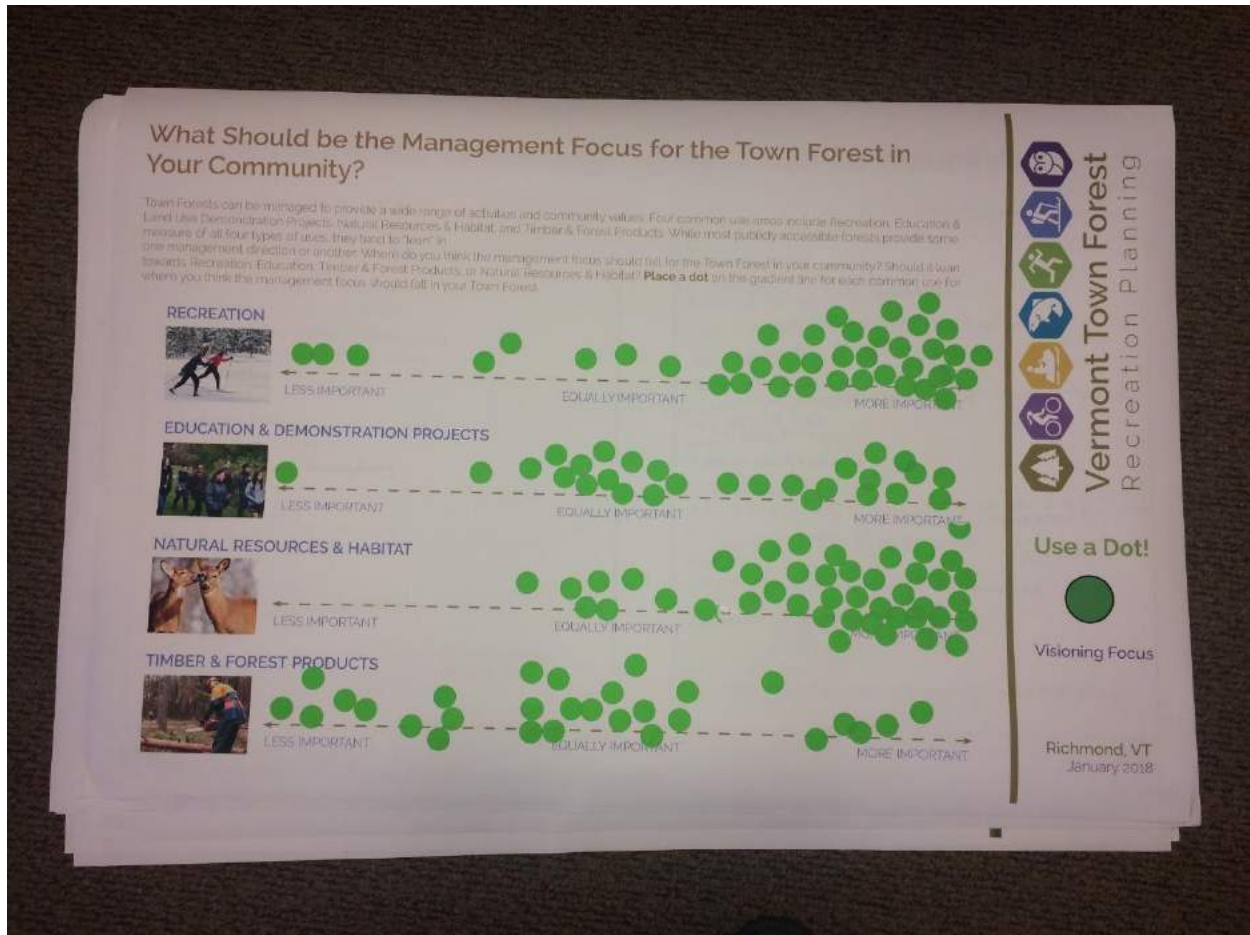
To understand this balance, survey and workshop participants were asked “Where do you think the management focus should fall for the Town Forest in your community? Should it lean towards Recreation, Education, Timber & Forest Products, or Natural Resources & Habitat?”

Survey Responses



Vermont Town Forest Recreation Planning

Public Workshop



Analysis

Both survey respondents and workshop participants highly prioritize recreation and natural resources and habitat. Both groups placed some importance on education & demonstration projects and slightly less on timber & forest products. The workshop participants felt timber was equally important, while the survey respondents leaned less important.

Other Management Considerations

The following write-in questions were asked specifically to Richmond residents as they create a new Town Forest.



Vermont Town Forest

Recreation Planning

Survey Responses

Timber and Forest Products

When asked “Understanding that any potential projects would need to protect significant natural communities and adhere to sustainable forestry practices, what is your vision for timber harvesting and forest products projects in your town forest?” survey respondents answered:

- I have no problem with timber harvesting especially for wildlife habitat that isn't well-represented on nearby public land, as long as it doesn't adversely affect important food sources, winter habitat, etc
- Not necessary
- Sold to a reputable lumber operation to fund the forest's future.
- prefer not
- There is enough logging all over town , would prefer avoid unless necessary
- Timber harvesting when scheduled according to a well written management plan
- Too much timber removal would limit the amount of MTB trails that could be built. More trails, more people, more money!
- If it makes sense in certain areas then go for it
- Select cutting, but enough timber harvesting to make economic sense.
- Managing for forest diversity and health
- Managed forestry that respects existing recreation resources (and does not drop trees on trails, primarily) is chief among my concerns.
- Love it, please use it as a classroom for teaching how forests play a dynamic role in our town economy and environment.
- very limited
- Only the minimum timber harvest necessary to sustain a healthy forest should be allowed.
- Harvest in winter, using best practices, avoid clear cuts, minimize log roads
- Timber harvesting are valuable in both funding town projects and creating sustainable and well managed forests. I believe Ethan Tapper, the current chittenden county forester will be an invaluable resource in guiding the Richmond town forest towards a sustainable and balanced forest economy that includes recreational, educational, and ecological needs.
- I'd love for there to be some cutting, but I don't think it should be seen as a revenue source, more a source for demonstrating sustainable practices.
- Management focusing on restoring structural diversity to the forest. 2. Restoring old field/pasture to forest
- According to Timber Management Plan written by professional forester
- Based on those assumptions, I would be ok with projects on a limited scale, and would hope that the Town would use its stewardship practices as a model for private landowners to use in their own forests.
- Sustainable and connected to recreational use of the land, similar to projects on going at Cady Hill in Stowe and USFS collaboration in RASTA country



Vermont Town Forest

Recreation Planning

- limited
- Only so far as maintaining the community focus. Commercial timber harvesting is in conflict with making a town Forest. And is unsafe if trying to achieve both. Also, commercial interests tend to win due to their revenue generating capabilities and this is for the community.
- Not critical, property has been over harvested and should be allowed to return to natural succession except for public access management
- Benefit wildlife for better hunting opportunities
- Minimal management, or management for habitat enhancement only.
- Minimal
- Maintain the existing deer wintering habitat that is shown on statewide Maps on this property, and make sure recreational use such as hiking or mountain biking cannot adversely impact it during the winter.
- Not sure
- It's important to have a forest management program
- Only if really necessary. Seems like there is a lot of other land to cut logs on. I'd rather pay more tax or whatever than extract some minimal timber value.
- Maximize yields of timber and pulp
- To benefit wildlife
- I am ok with harvesting timber if it makes for a more healthy forest. Def would be against any kind of clear cutting.
- Minimal cutting.
- sustainable harvesting is good so long as animal habitat is not destroyed
- Demonstration of sustainable forest mgmt
- None
- Harvest under environmental guidelines keeping the property accessible
- Any timber harvesting is kept in the community. It is not exported outside of the community.
- I don't think that timber harvest has a place in this area. Included within the preface introducing the survey, 'one of the largest forest blocks in the state', speaks to the importance of this forested area. I don't think any conventional logging practices have a place on this parcel, and if timber harvest is implemented, I propose that the products be used on in special instances; town art pieces, or as learning tools for local schools could fall within the classification of special instances.
- Fine with a state approved management program
- We should focus on making popsicle sticks
- Don;t know enough on the subject
- Make the forest economically positive for the town
- I don't think it should be a priority. It seems that demand is low for timber that's harvested sustainably because of the higher cost.
- Timber harvesting should be part of the plan, but must follow sustainable practices, and there should be penalties for not following those practices.
- Minimal, mimicking natural forest succession (e.g., mimicking forest fires if they would occur if we didn't prevent them, otherwise leaving it alone).



Vermont Town Forest

Recreation Planning

- Selective careful harvesting
- Sustainable
- As long as it's done responsibly, I'm good w it.
- Limited to sustainable healthy forest growth, and wildlife management.
- Health of forest, income to sustain recreational trails, wood for poor families who rely on it, unsure of other possibilities
- Given that it is a town forest, "light touch" forestry, with balanced focus on timber and non timber forest products
- Now hunting
- If it's actually sustainable, that would be ok. I'm concerned it would impact wildlife and recreation.
- Sustainable harvesting OK, with benefits to Town (financial and biomass to heat schools).,
- Development and adoption of a comprehensive forest management plan that include timber harvesting to maintain and improve the forest
- A focus on "high value" timber products, but as much room as possible to provide wood-fuel for town residents.
- I don't view timber harvesting as a priority, but I think it could go hand-in-hand with creating recreation opportunities - cutting trees for trails or thinning trees for skiing.
- I think the forest should be managed, but I hate logging that is excessive and leaves a big mess. I think there is a way to manage for wildlife with certain clearings and thinning techniques. Primary succession is a great educational opportunity for us to see what's going to grow back...
- Careful select cuts and sustainability
- Selective harvest if any
- 25 year plan.
- maintaining the character, responsible logging only
- Sustainability is key. Would like to explore bio-fuels development (wood pellets) possibility.
- Minimal- maybe salvage and/or demonstration? Possibly only harvest or thin if managing for habitat.
- Minimal amount of harvesting as possible
- I would like to see sustainable methods put into place, perhaps used to fund a larger trail system and nature preserve.
- Only as needed to maintain a healthy forest
- I hope it is kept to a minimum but any tree removal should done by local people/companies, who can use the timber locally.
- Please make it less of a complete scar on the landscape like the Green Mountain National Forest in Honey Hollow. That ecosystem is completely wrecked, left to become a weedpatch from compacted soil. What was once beautiful woods is horrible
- Forest should be managed for the wildlife, lots of diversity, edges, brush and fallen tree's should be abundant, small clear cuts, open up apple tree's
- Timber harvesting only to maintain forest health. No commercial harvest.



Vermont Town Forest

Recreation Planning

- I believe the only "harvesting" should be isolated to protect, preserve, and insure overall forest health.
- just enough to maintain health of forest and habitat
- ok
- To clean away dangerous fallen trees if their removal doesn't negatively impact the animals and plants
- Working forests are interesting, as are old- and aging-growth. Don't know what applies here.
- Town Christmas tree firewood raffle of 1 cord at 4th July a few saw logs for town historic building repair small clear cuts for biomass heat that maintain wildlife diversity occasional timber harvest for \$\$
- Habitat.
- Sell the timber to lower our taxes.
- must be thoroughly thought out
- My vision is one of forestry management AS NEEDED and as indicated. This is up to the experts. The question will be, what is needed?
- It is too small of a space. I do not see timber harvesting or forest product projects as the direction for this town forest.
- Limited to only what makes sense for habitat management and forest health
- Timber harvesting should be done for the benefit of all wildlife.
- Not a fan, I've seen what it did to the Honey Hollow area and as a result I haven't recreated there in a few years.
- none - but I could be persuaded as a revenue stream for the town to support the public schools
- I'd rather it was used for recreation and education.
- Minimal harvesting to keep forest healthy or clear trails. Maintain habitat in different stages of growth. Keep it as good animal habitat, while allowing recreation, hunting, and some snowmobile access.
- Educational/nonprofit only
- I don't think making money should be the goal, but I'm in favor of careful logging to maintain a healthy forest.
- Sustainable timber harvesting at period intervals
- Improvement harvests. Could be used to demonstrate SFM to public and provide income to town for further improvements to the forest.
- marked and harvested by forestry experts.
- I feel that the forest should be managed first and foremost with wildlife habitat in mind, with as much recreational access as possible without significantly disturbing habitat--particularly for at risk species. A forest plan that is being managed with those things in mind will require occasional management in the form of low-impact thinning and logging for the purpose of greater forest health. I do not see the long-term value in timber harvesting beyond what is absolutely necessary for ecosystem health.
- Only to pay for what's needed to maintain its use. Net zero cost to tax payers.
- I don't envision this as a use for our town forest.



Vermont Town Forest

Recreation Planning

- Timber has the potential as a renewable energy resource if done so responsibly. However, the opportunity for a town forest that offers recreation, from cross-country skiing to "forest bathing"; personally has a greater appeal and what I assume would be a ripple effect in the local economy (restaurants, outdoor gear, lodging, etc.)
- We agree the forest should be managed and the timber harvested in a responsible manner.
- none, I see it as a recreation resource with timber products only because they need to be harvested
- prefer that is only be to maintain habitat and good forestry practices, not for profit
- Timber harvesting and forestry are necessary for healthy woods. I would like to see the town engage in those activities on a planned scheduled with help of forestry official
- Only if necessary
- Harvesting timber to maintain a healthy forest.
- I feel that timber harvest is important in keeping a healthy ecosystem when done under the supervision of forestry professionals
- I don't have an opinion regarding harvesting
- Keep cutting new growth is always good
- opportunity to demonstrate sustainable forestry and educate town on what that looks like
- Don't really know the forest well enough to comment. But anticipate there being timber harvesting done as needed to keep forest healthy
- Adhere to FSC standards.
- I don't know much about them other than biking through them in Hinesburg Town Forest and they are unsightly.
- This would be a good opportunity to practice sustainable timber harvest, and to provide workshops to teach others how to do this (i.e. UVM Extension -type trainings)
- No timber harvesting nor forest product projects AT ALL!
- 100% oriented towards supporting the natural communities, including leaving dropped wood and standing dead wood. I would HIGHLY recommend seeking guidance from Vermont Coverts.
- Selective cutting to improve visitor experience and trail building.
- periodic culling minimizing impact to the remainder of the forest and ground cover
- Habitat restoration and protection, education about best practices for using land without harming it is very important.
- Good idea as long as it's not clear cutting. Need to do this to manage forest lands
- harvest from a managed woodlands as appropriate
- Great if it provides income for the town
- No opinion
- Harvest trees with monetary value to generate funds for future purchases and use. Provide/sell firewood from dead/dying/damaged trees. Don't just let them rot with no benefit.
- Any culling needs to be done to preserve the forest.
- Regular timber management for healthy forest, income, and local jobs.
- Unless it is a major source, I think keeping the harvesting to a minimum would be best.
- no expertise in this area so can't comment



Vermont Town Forest

Recreation Planning

- I don't have any knowledge or experience in this area.
- It was just hacked, logged significantly, so logging should not be done for another 15-20 years
- Negative ghost rider
- Timber cutting is necessary for sound woodlot and wildlife management. All in moderation
- I'm not in favor of this unless it benefits in forest in the land.
- Something that allows a possibility of a future old growth forest
- would be a great tool/project/learning experience for students interested in forestry or a partnership with a local college/university on management
- I envision that our town forest would not be used for harvesting and forest products
- OK but MUST NOT adversely effect the integrity of the area in terms of highest priority wildlife habitat and connectivity (also called for by Act-171) or adversely affect rare-threatened-endangered species, interfere with significant natural communities
- zero timber harvesting
- heavy, intensive.
- Forestry management to keep the forest healthy.
- I would like the only harvesting to be done for the benefit of the wild creatures.
- A managed forest is useful and healthy. I think we should come up with a management plan that involves selective cutting for habitat, recreation and improving the forest stand for productive timber.
- no timber projects
- Harvest/forest management with a primary goal of restoring mature forest structure.
- Creation of a network of trails that can be used for summer and winter recreation as well as access to the woods for silviculture forestry education and possible maple production education
- As necessary only
- highly managed. out of sight if at all possible
- I'd like the forest sustainably harvested under the guidelines of a professional forester.
- I envision only harvesting timber for the sole purpose of forest management. However, as I think about it, perhaps there is room for harvesting small amounts that could then provide the funds to continue managing the forest. I am a bit conflicted on this one.
- No clear cutting. Careful and sustainable harvesting with absolute protection of species and environment. Avoidance of even temporary obstruction of wildlife corridors.
- Minimal, select cuts and or small, conscientious, habitat-oriented clear-cuts.
- I'm not an expert but I would expect that timber harvesting and forest products projects will be done with sustainable management practices to protect the forest.
- create a community cabin from some of the felled timber somewhere deep in the forest as a destination mountain bikers, hikers/walkers, etc to rest, lunch and learn. It could serve as a setting for education in addition to a rest stop for their adventures in the woods.
- Harvest enough timber to keep the forest sustainable and to provide some money toward management of the property
- not experienced enough to make a call on this



Vermont Town Forest

Recreation Planning

- when it is for the benefit of wildlife habitat or natural communities, i can see selective cutting as an option; otherwise, it seems to me there are many other options for extractive enterprise
- Sustainable, noninvasive, minimal interference with other activities. No clear cutting. No activity in sensitive places.
- Forestry related to keeping our forest healthy and beautiful and around for generations to come.
- Limited to maintenance activities.
- Minimal to keep the forest healthy but not exploit the resources
- Some timber harvesting is fine. Maintaining some open space and edge habitats (blackberries!) is desirable. But I hope that it can be minimal, so the town forest can be used to sequester carbon, and mostly move towards climax over the next couple hundred years.
- if needed to improve the health of the forest, limited harvests could be looked at, but this is a low priority in my opinion.
- It all depends on where you think you are going to cut, but single selection cutting is ideal. More time consuming, not as much potential income coming from it, but the reasons most people around here use the town forest are not for timber harvesting.
- be run by responsible individuals who understand interacting factors in natural world
- Minimal harvesting, but whatever is needed for the health of the woodlands
- If trails are cut, use the timber, but otherwise timber harvesting should be prohibited. Harvesting of smaller, less noticeable forest products like fiddleheads is ok with restrictions. PLEASE, do not allow trapping.
- Only cut what is necessary for natural ecosystem maintenance and for establishing the forest as a community use.
- Minimal. Give wood to poor.
- No more harvesting!! Sections have already been subject to significant cutting; there's no need for additional future timber cuts.
- Limit it to what is necessary for the health of the forest and natural habitats.
- minimal timber harvest
- Kept to a minimum, especially near trails
- A sustainable harvest that could potentially clear the way for a trail system. Try to get the two interests to work together.
- I honestly don't have a lot of knowledge in this particular area. Would love to learn more about it.
- Minimal-to-none timber harvesting unless necessary for health of the forest.
- selective thinning for forest health and modest revenue to support the Town Forest
- Limited to overall forest preservation projects. Used for education/demonstration purposes.
- Sustainability - manage a healthy forest - produce maple syrup - wood produces
- Selective cut for logging and firewood
- Limit harvesting to necessity.
- Only as needed to keep the forest healthy
- I think that any timber harvesting projects should be done in such a way that they do not adversely effect the other uses of the forest. Also, no clear cutting.



Vermont Town Forest

Recreation Planning

- I'd like to see them kept to a minimum and be focused on promoting the health of the Forest
- Follow a sustainable forest management plan
- To maintain the health and sustainability of the forest.
- Not interested in timber harvesting.
- None
- Thoughtful forest stewardship, modeling the least invasive timber harvesting - where the numbers show long term gain outnumbering short-sighted gains.
- keeping the forest healthy; putting the money back into maintaining trails, parking, etc.
- I think it would be great if a community-based sliding scale woodlot for lumber & cordwood were included in the timber harvesting plan.
- Minimal harvesting by local artisans creating value-added goods with a % donated back to the forest
- Minimal, efficient, leaving ecological function as the priority
- As long as it does not harm wildlife habitats or corridors, sensitive flora areas or watersheds/waterways.
- At least one section of the forest should be left unmanaged, i.e. to revert to virgin forest.
- Healthy forests
- minimal, with potential for public observance and public education. public participation in any restoration/re-forestation highly encouraged
- I would like for the Town Forest to have no timber harvest and for the land to be protected for clean water, diverse wildlife, carbon storage in the soil and other natural processes. This is the kind of conservation that is most rare in our state. I can envision limited foraging allowed, such as mushroom and berry picking.
- Low priority
- provide habitat for upland bird hunting
- Nothing that destroys wildlife habitat
- Firewood
- As limited as possible. It is good to leave some forested areas intact.
- Minimum necessary to maintain healthy and accessible.
- I don't see that as an important part of the forest.
- Keeping the woods thinned out, cutting only mature trees..
- limited, timber harvest should directly support those in need in our community.

Experience

When asked "Have you used the site in the past? How? What memories can you share?" survey respondents answered:

- Yes, hunting. It's an important area for some local deer hunters.
- I have skied on this land
- I've mountain biked and I've hunted there before. I have encountered deer and coyotes. I enjoy the dynamic nature of the forests with many different forest types.
- Steep slopes with great views!



Vermont Town Forest

Recreation Planning

- Hinesburg Town Forest has great mountain biking and that should remain. Richmond Town Forest has the potential for great mountain biking and other trail uses, and that should be a priority.
- yes, hiking
- Hiking. The forest is worth protecting and a great place to find peace outside.
- Bike and hike there. It is super sick.
- It is hard to tell exactly where the cite is from the map, however I look forward to exploring it when it becomes the Richmond town forest.
- I've walked in there. It's a beautiful spot!
- I have hiked and explored the property many times in the past decade. My best memories are of wildlife on the back (north-side) of the property.
- last year several times for walking and birding. The map was fine but signage is poor.
- Yes, I have hiked on the land. I've always found it to be a special place, with varied terrain and abundant wildlife sign. On a walk just last week we saw deer, turkey, coyote and porcupine tracks, the latter leading to a den in a small cave. I hope
- Hiked the site numerous times. Beautiful.
- Hunting. A lot of turkeys due to oaks at top of hill. Same for deer. Looks like it was harvested before sale, so hoping some oaks are left.
- Yes, I often hike and hunt this area. I greatly value the remote feel of this forest. One snowy morning, standing on a ridge, I had a black bear walk out from under a thick tangle of trees only a few yards from where I stood. She had been eating beech nuts late into fall, fattening up for winter. Bears, bobcat and coyote all have dens near or on this land and need intact forests and minimal disturbance to thrive. I hope that we can avoid the over-building trails and recognize that one parcel of land can not meet every human need.
- Yes. Hunting.
- Walking through.
- Only twice: once running along powerlines another time on the intro committee walk last Fall.
- Yes, quite unpopulated woods
- I use the site frequently, as it abuts a parcel of land that we use for pasture. I don't have a specific memory, but a culmination of many afternoons spent in old hemlock forests following the traces left behind by a myriad of woodland creatures.
- Yes. hunting
- It's great for drumming
- Just walked near it once
- It's not open to the public yet.
- I haven't been there in years but used it when I lived closer to it.
- I have snowmobiled, biked, and jogged through the forest. Much of the farm land has returned to forest, so although I was usually on trails, I felt almost in a wilderness.
- Yes. Exploring on foot (alone and with my kids) the forested areas north of route 2. Loved it! Can't wait to enjoy it more.
- Just some nice walking through the woods



Vermont Town Forest

Recreation Planning

- In winter have hikes up there in warm sunshine
- I have hiked it many times
- Just visited once. Nice meadow.
- It hasn't really been too open before
- Yes, when it was the Andrews farm they would allow us to bike up there. It's beautiful. It was unfortunate that Wright Preston did not allow biking and ended the trails with a fence.
- Site is in development
- Walking, enjoying nature
- hiking, exploring without getting lost
- hiking bird hunting
- I love running in that forest! It's my happy place that is quiet and somewhat remote.
- Just a couple of walks in 2016 as part of the development of the project.
- I have shot woodchucks and hunted the fields . I have also fished in the cove and collected edible plants from the land.
- This survey does not apply to Richmond as the forest is just being acquired. But walking, hiking, seeing wildlife, and hunting would all be good uses.
- hiking and x/c on and through it. Beautiful forestland
- Yes. I had a nice time skiing through the area one time. It was a while ago, so I don't remember much. I am a mountain biker and runner. My children and I enjoy hopping onto the trails off of Cochran Road with regularity to ride to beautiful spots near the river or in the mountains and just enjoy being in nature.
- I didn't know that we had a town forest. I thought that we are in the process of purchasing the private land.
- Yes. Hiking
- Yes. Hunting.
- Hunting.
- We haven't used this particular site before but are thrilled it's protected.
- Only to "tour" before it became a town forest
- as I understand it, this site is going to be new so this doesn't really apply. I have, however, used other town and land trust land in Richmond for running, biking, walking, exploring, art inspiration, and learning about nature and stewardship my entire life.
- hunted there, worked in woodlands
- I have not, but I'm not very familiar with how to access it.
- yes. hiking. loved it.
- I hiked there last year and got hopelessly lost. We ended high up on Snipe Ireland Rd.
- Yes, VAST trail offers great hiking opportunities
- Unrelated to the real Survey
- The same as above
- That the forest is harvested in order to maintain a healthy forest.
- Hiking
- Yes. I was a close friend of Jennfer Andrews and I participated in "Dog Church" every Sunday, walking the land with a small group and our dogs.



Vermont Town Forest

Recreation Planning

- Yes a walk with Andrews. Typical Vermont walk.
- Hiking, hunting. Seeing my first moose in Vermont. Bobcat tracks.
- We have used the trails and woods in both summer and winter for access to Richmond pond as well as snowshoe outings in the upper reaches of the property.
- nearly every weekend in the woods.
- Yes. Walking with friends. Wonderful experience being in the woods with friends.
- Yes. Very pleasant hikes.
- I have hunted and mountain biked through the land over the years. I have seen moose, bear, deer, coyote, fisher, and several species of hawk there.
- Just one hike as a part of a group learning about the property.
- hiked there a bit on the VAST trails
- I guess I've hike through there unwittingly when hiking around behind VYCC but really i'm not even sure. I love that this represents the protections of larger areas of conserved land that are contiguous
- Accessible forested lands for recreation (Waterbury Perry Hill, Hinesburg, Charlotte Demeter property, etc.) have been some of the most enjoyable parts of living in VT. They've also attracted young people and tourists to utilize these spaces of minimally impactful outdoor activities, bringing economic opportunity with them.
- Yes. Beautiful views, nice walking, good for skiing and potential for nice multi-use (bike, run & hike) trails to connect to other parts of town - from the village core out further.
- I have not personally used this site except to walk around it
- I've used the area for walking the dog, trail running, and mountain biking
- I have not yet used this tract of land.
- I have not had access in the past.
- I have hiked it before a few times. It is a beautiful, unique piece of land that is part of an important wildlife corridor.
- Yes, for hunting, hiking and wildlife observation
- Not yet, though I LOVE the Preston Legacy Forest and find it such a grounding getaway.
- Only one hike so far - memories of diverse habitat, terrain and views. Forest-bathing comes to mind.
- Great up in Richmond and walking/hiking/horseback riding there
- yes. I live on Valley View, so I've enjoyed getting a little lost while bushwacking and finding cool areas that I now know will be part of this
- I've not used it because it was private land and not accessible to the public until just recently.
- Hikes and seeing wildlife
- Yes. It's beautiful in there
- Yes, it is a beautiful place
- hiking, snowshoeing
- Yes I used the site (farm) before, I worked the farm, My favorite memory. Up on top of the hill we called the back meadow ,there was always a wind blowing ...
- Hike, to explore.



Vermont Town Forest

Recreation Planning

Agricultural Use

When asked “Given the historical agricultural use, and that some of the cleared area on the site is currently in use as pasture, what is your vision for potential agriculture activities and partnerships in your town forest moving forward? Any thoughts on CSA’s, community gardens, or other ag uses?” survey respondents answered:

- Sounds great although i worry about very intensive use by any one user group.
- Community Gardens would be a nice additional to the woodland areas of the park
- Agricultural uses should be continued
- Community gardens are nice.
- I always support organic agriculture
- Lease to potential partners, private or public is advisable.
- Fine with the local farmer continuing to use.
- Sounds great.
- oh yes leases for ag as part of the stewardship classroom makes great sense
- As long as mechanized vehicles and pollution are kept to absolute minimum, I have no problem with grandfathering in existing ag operations. Nothing new though.
- Sure.
- A community garden would be wonderful. I would also advocate for a community solar garden that could produce renewable energy for Richmond residents. Grazing of sheep or cattle could still be done, and community gardens could still be planted alongside the panels.
- I would love to see ag uses continue and possibly expand some.
- If parking/access, water and equipment storage can be provided then a community garden would be a great option. My vision for the site does not include corn, but other crops would be acceptable.
- none. It is too far out of the way to be feasible. There are several farms in Hinesburg who already provide CSA opportunities. A community garden would be more useful in town. Maybe NRG could offer some land to use or near USPS.
- In theory those uses would be fine, but they seem unrealistic for our particular site. The pastures are not part of the Town Forest, though the owner has offered to let the public onto them when livestock isn't present, but I doubt for agriculture. The VYCC runs a CSA and farm stand nearby for charitable purposes. I'd hate to have the Town compete with it. I don't think the site has the water needed for a community garden, and it is a bit far from the Village, where the greatest need for a community garden exists.
- I think using existing spaces for agriculture would be fine as long as best practices are followed
- Any CSA would have to be scalable to the larger community. Any small and ceremonial effort will not be cost effective nor would it actually benefit the environment or the community.



Vermont Town Forest

Recreation Planning

- Open meadow is beautiful but does not seem well sited for modern ag use, or CSA. Not a priority, unless truly supports a local ag operation.
- Nope there is enough of that already. Should stay forested and harvested for wildlife and used for recreational activities. Hiking, biking, hunting etc Better farming in winoski flood plain.
- Keep as pasture.
- Great idea for multiuse like CSA and garden
- No
- I am very much in favor of agriculture uses
- I don't see a lot of reasons to use it for ag purposes other than perhaps sugaring. Whole rest of the Andrew's parcel is ag.
- I'm open to all of these ideas
- Encourage old field succession
- Community gardens, picnics
- community gardens
- Would be nice to see animals grazing. Maybe a partnership with VYCC.
- organized but not corporate
- haven't given it any thought yet. this is all brand new.
- Site should try to demonstrate multiple use landscape mgmt, including ag activities.
- CSA's are good.
- As the site is mostly sloped and heavily forested, I don't think there is much additional room for agricultural enterprises. However, if I am wrong, I still propose that current agricultural land be left alone, and no additional land be added to that profile.
- Not interested in gardens
- Hemp
- Grazing for farm animals - to keep it open
- IF THERE IS ENOUGH INTEREST, a community garden like I see throughout Europe
- I don't think it's a convenient spot for a community garden but I would support the Youth Corps maintaining agriculture on that portion of the land.
- I would like to see the return of apex carnivores. If agricultural activities in the remaining open fields would not deter wolves or catamounts, it would be acceptable. Although I'd like people to visit the forest in small numbers, I'd like more diverse wildlife to return.
- Open to ideas from interested parties
- Community gardens Enough CSA's already in the area
- CSAs would be great. As would community gardens.
- As long as there is solid stewardship in place for the agricultural visions and practices and it benefits the Richmond community then all ideas are welcome.
- CSA great, Christmas trees?,
- Capitalize on existing openings for any agriculture, or light touch uses and maybe things like bee keeping, etc. Big emphasis education!
- It should stay agricultural, however that gets accomplished, especially if it helps our community.



Vermont Town Forest

Recreation Planning

- Gardens for town folk
- It's south facing, so pasture and food production for Richmond is OK on presently cleared land.
- Maintain agricultural land as agricultural land including use as pasture lands
- Keep the ag. going!
- Let the people of Richmond decide
- I'm open to seeing areas of the land that are well suited for agriculture being used for those purposes. I don't have any personal desires/visions for ag uses, but anything mentioned seems like a positive use of the land.
- Encourage thoughtful agricultural uses
- Allow farming to continue...a shared use. Rent the pasture land?
- Rent it out. Put up good fences.
- All would be great.
- Water? What about solar farm?
- Community gardening sounds like a nice opportunity people might take advantage of- possibly offering classes like those offered at Ethan Allen Homestead?
- I like the thought of keeping the pastures open for agricultural uses.
- Community gardens or gardens focused on maintaining biodiversity
- I have no problem with locals leasing the pasture land or gardening on the site.
- No expansion
- CSA's Gardens, food for wildlife
- I could see a community or school-managed garden / small farm if there was interest.
- Leave them as natural, necessary habitat to insure protection of wildlife and indigenous flora. I would not be opposed to limited community gardens.
- continued current use but care should be taken not to expand use too much
- ok
- Maybe hold outdoor classes for anyone wanting to go
- Sounds great
- if they can be a net zero cost then beef grazing hay berry patches fruit trees
- Please leave it alone. Use it the way it was used in the past.
- Rent it out to pay for itself.
- Perhaps a community mushroom garden would be a thing. Or a "grow your own" shrub/ornamental tree community garden with a longer term gardening contract?
- No - I think the habitat should be maintained. There is no need to try to farm such land when the richest soils are near the river.
- The pastures are too remote for general community use. They could be leased to Maple Wind Farm and an educational component could be part of the terms.
- As stated above community gardens are a great use.
- I support any and all agricultural use.
- I'm open with leasing the land to any farmers that are interested in it as a revenue stream for the town - esp. if the farmer was willing to use organic methods or otherwise protect the land for future use - CSAs and community gardens are fine too.



Vermont Town Forest

Recreation Planning

- Would love a CSA!
- Not sure how practicable it is for community gardens as forest animals would be an issue. Need to reduce conflicts between people and wildlife. Fields can be laboratories to show students succession.
- Ok with all non profit agriculture
- We would support a CSA/ community garden, but we wouldn't take advantage of it because we have enough garden space at our house.
- Limit ag use to season pasture grazing
- None. There is plenty of ag uses in the area. Early successional forest for wildlife and diversity could be maintained in these areas. Concern about invasive species with ag uses especially community gardens
- any that is agreed on.
- I think ag uses are great, as long as those who are farming are using sustainable farming practices--like crop and grazing rotation, not polluting the river with runoff, and no chemical pesticides or herbicides. I love the idea of community gardens.
- Net zero cost for the taxpayers. It should pay for itself. If not leave it as a forest.
- I haven't considered ag uses for the site.
- Having a section for a community garden would be a wonderful way to meet neighbors with common interests.
- We believe open land is important to a balanced habitat and would like to see it remain in agricultural use as long as hunting in the town forest isn't limited due to the presence of livestock.
- maybe community garden. You first need maps and parking so people know how to get there. Surprised you are asking if we have used it, when there is no signage or way to know where it is.
- community garden is fine. School or camp gardening is good too.
- Community garden may be nice. However, maintaining fields may be a tax burden. I think we should restore the area to its natural wooded environment
- CSA community gardens good
- space for organic community gardens would be great! Free to low income households!
- Community garden would be great. Existing ag use should stay but expansion should only be considered after review
- A community garden would be nice.
- Keep it as it was.
- Any existing ag uses should be supported.
- seems too far out for community garden, but perhaps rent to local beginning farmer? partnership with Intervale farmer training?
- Don't know the site well enough to comment
- I would support community gardens.
- no thoughts
- Community gardens are better when easily accessed and visible to the community. Could pasture land be leased to farmers for grazing, to generate revenue for town?



Vermont Town Forest

Recreation Planning

- Let the pasture go to nature
- I would love to see the pasture used as both a community garden and a hub for people interested in testing out new responsible ag business.
- Community gardens would be awesome.
- Keep it clear, possibly work closely with VYCC to expand CSAs and other community centric open land endeavors
- community gardens are fantastic, especially if coupled with education regarding sustainable farming methods, etc.
- Community gardens for those that don't have access to land is a great idea
- continue multiple uses
- all good
- Ag is good
- Community gardens. Plant, manage and harvest Christmas trees as a source of income.
- Yes, a community agricultural partnership would be fantastic
- Leased for responsible ag use is great. Mowed for hay sales would be great. I'd avoid the community garden as it is an ineffective use of ag acreage and results in inefficient auto travel. Ag use = revenue and local jobs.
- A community garden would be lovely. Offering nature walks to learn more about the area and how to access it easily would be helpful, particularly for new residents or those like me who didn't know about it.
- I like the idea of community gardens.
- Limited use as VYCC offers local areas for the same, as well as Maplewind Farm
- Continued Hunting usage
- A balance of agriculture, standing forest open space will provide the best overall experience for visitors.
- Sharing the land for farming purposes is a good thought. Certainly no big farms.
- Please do a great organic community garden! Or garden co-op (cheaper than a CSA because members divy up work and real expenses, usually overseen by a master gardener)
- no grant farmers
- An organic community garden is the maximum level of agriculture I think is acceptable on town owned forest land
- Good uses as long as they do not adversely affect the integrity of the elements in previous answer
- continued pasture use
- Agriculture is a cornerstone in this community and should be reflected in our town forest.
- Keep cleared areas open.
- Keep agriculture activities active.
- I would like the only use to be for the benefit of the wild creatures.
- I would love to see agricultural uses that are compatible with renewable energy production. Grazing sheep under solar panels. Pollinator plantings with a solar field. Timber harvesting that thins low grade timber for biomass and improves the timber stand.



Vermont Town Forest

Recreation Planning

- Community gardens availability would be good use of cleared land.
- To fully support a CSA or community garden parking will be needed close by.
- As stated earlier I would like to see the property used as an education center for maple production.
- None.. pastures should be allowed to regenerate into forest
- let it go back to nature... wilder the better.
- I would like to see the pasture use continue. Accessibility for community gardens is problematic - I would not like to see gardens in the pasture area. I would love to see cows grazing as I make my way, walking along the trails.
- I like the idea of community gardens and also CSAs. As I am taking this survey I realize that I am in favor of a mixed use forest.
- Agriculture on appropriate lands. CSA and community gardens are great ideas.
- I would encourage allowing pasturing however it may be desired by local farms. It seems illogical to site a community garden there.
- The site does not seem amenable for field crops, due to the slope and large presence of trees and land features (like rocks and ledges). The only ag product I could see there is maple sugaring, depending on the amount of maple trees. I don't really support maple sugaring there. (Allow local producers to keep their operations without competition from the town.)
- It seems that agricultural uses are not mutually exclusive to recreational efforts if planned properly. Walking/biking trails can co-exist with CSA's etc (see Intervale, Kingdom Trails, Catamount, etc).
- We have several CSA's already so I don't see a need for more. There is a need for community gardens. A partnership with a local farmer would be okay.
- CSAs would be beneficial
- Education
- The cleared areas are appropriate for ongoing agriculture of a sustainable nature(replacing nutrients etc.) CSA's and community gardens are good uses.
- A community garden would be great! A community orchard? Or berry farm?
- Any activity that would preserve the integrity of the pasture land and not interfere with the wildlife.
- Maintaining some open space, some ag use is fine.
- I wouldn't expand the agricultural use beyond what is currently used, but would support continuing the pasture.
- Community gardens would be great
- I think it would be a fantastic idea to have a small portion of this land be used to support our community with garden plots, or CSA-style plots
- yes to community gardens!
- CSAs are a good use of former pasture land
- No
- Community garden is nice



Vermont Town Forest

Recreation Planning

- Organic farming practices, CSA (organic) and a community garden with no pesticides/herbicides.
- Ag uses would be great, including community gardens, provided it's limited to areas that are currently cleared and in use for agriculture/pastures.
- community garden could be nice, but most people in town can have a garden on their own land if they want one. Perhaps a community garden that grows for the food shelf, or part of summer education program.
- Keeping the small amount of pasture land open would be fine.
- Community garden would be great!
- Whatever keeps people working in the community, this includes working the land.
- CSA +/- community garden would be wonderful! Incorporation of a town "tool library" at this site.
- CSAs and community gardens are always great. A cleared area could also offer a space for large community outdoor gatherings which would be terrific.
- Support expanded Ag use.
- Leave natural
- Lease to farmer
- I would love to see a dog park installed. Richmond has a lot of dogs but no fenced in space for them to safely run off leash.
- Love all these ideas
- No thoughts in particular, seems like something that could be explored by interested parties in the future.
- I support agricultural uses
- Have not considered this
- Community gardens, Ag demonstration sites or learning opportunities would be great
- Would love a CSA.
- If the property is suited to community gardens, that would be a great use
- Presenting examples of partnership with local agricultural groups, and also of other ways like permaculture and woodland gardening.
- community garden space would be wonderful and/or space to grow for the local food shelf
- Keep pasture lands in pasture - community gardens and micro-farm enterprises sound great, as do renewable energy installations.
- Community gardens Demonstration site modeling/studying restorative ag practices
- Community food-growing, if keeping that portion of land open is consistent with ecological recovery. But only wildlife-friendly growing practices, and no use of pesticides.
- Plant pollinator gardens with native species of perennials, shrubs and trees.
- Community garden use should be explored, as there is limited agricultural space in Richmond not already in use.
- Community use



Vermont Town Forest

Recreation Planning

- Community gardens would be great, but better would be community orchards. there's no reason we couldn't grow quite a bit of fruit up there, and we could plan to donate much of it every year to hungry residents in need
- I support a community garden or educational gardens (e.g., medicinal herbs, native edible plants) on existing cleared land. I do not support commercial use of the land for the private profit of anyone, including a CSA or other ag. Private profit motives should not get mixed up with the protection and care of this land for the human community and the natural community.
- I would favor
- CSAs and community gardens would be great.
- Nothing that destroys wildlife habitat
- Forest
- Sure, all of the above if compatible with existing arrangements
- All sound good as long as they are compatible with existing arrangements and agreements
- Maintain use
- Keep using some of the cleared as a pasture. if there is enough extra cleared land hay it for feed for the farm beef herd
- Haven't considered this.
- Community gardens are always a huge plus as well as grazing animals :)

Educational Use

When asked “Given the excellent educational opportunities of the site, what is your vision for education, research, and demonstration programs and projects in your town forest?” survey respondents answered:

- I think it could be a good Demonstration of the value provided not by more infrastructure, but by improving and leveraging the quality and health of the forest, habitat and the experience of being there for a variety of groups who would use it.
- UVM extensions to partner w/ the richmond school district to teach children about environmental topics
- mountain biking lessons
- Good place for it
- Maybe the school could do something.
- not sure
- Whomever/however education can be promote is a good thing.
- Install a weather station so students can monitor data from a highly representative parcel of forest. In particular monitor wind speeds and tree damage over time.
- They should absolutely be used for education on recreation opportunities, forestry, and natural habitat and how those things can easily co-exist.
- for it to be a desired place to come and learn about land stewardship management and working landscapes that are public goods and managed as such



Vermont Town Forest

Recreation Planning

- Camp, school, and on-site interpretive educational opportunities should be encouraged.
- Minimize them. Leave the site alone as much as possible. Do education there, then get your table or equipment or whatever and get out. I don't want a permanent installation to tell me about the frogs or whatever.
- I hope the forest is used to expose the youth to nature and to develop a love and passion for recreation and conservation.
- I think having some interpretive signage and kiosks would be appropriate, but I would spot short of a building. Let walks and use by groups would be a great fit.
- Allowing educational and research programs to visit the site would be a nice addition.
- It is open right now for all of the above to any group who want to use it. Audubon, schools, etc.
- Local schools have strong natural science programs, as does, of course, UVM. The Town Forest will make an outstanding outdoor learning laboratory for studies of ecology, wildlife, botany, resource protection and other topics.
- School and community education about ecology, biology, geology
- Field trip site for school!
- I am ambivalent
- Good use, but seems that is not a critical need in town.
- School trips and visits. No need for permanent structures.
- Education opportunities for schools and others
- Educate landowners about habitat, conservation
- It is a great opportunity to educate school age children about the environment and the importance of taking care of our natural resources
- Nice to see the schools use it, but I don't think that is their priority and don't know if they have even made much use of Willis Hill. Not that hear of.
- School children having opportunity for a forest school experience
- Sufficient sites already exist state-wide
- School field trips and educational camp access
- Students should be able to visit for field trips.
- I think that would be great but I also would like to see continued hunting allowed during deer season.
- education for folks of the history and research opportunities
- Any educational opportunities for the school and community should be pursued.
- ditto
- Partnerships with local schools and research orgs around sustainable community forestry and land use
- None
- Make the forest part of the curriculum in surrounding schools. That is to say, don't make the town forest a field trip destination, it is not an amusement park. Instead, create a personal connections between the children of the area and the forest. Show children that these areas are precious, and should be treated with integrity and finesse.
- Fine



Vermont Town Forest

Recreation Planning

- Let's teach the raccoons how to read
- Opportunities for school groups to visit - hike - learn
- My own woods have been used in four different UVM graduate thesis. Make it available for higher education
- Make it available to school and university groups to conduct these activities. I don't see Richmond having the budget for this on the town side but it can be a great resource for schools. It's proximity to colleges might be attractive and hopefully all could benefit from their efforts.
- As I indicated above, low impact visits are good, but not if they stifle wildlife reintroduction.
- Like the Audubon
- Don't have a vision but all for it.
- Yes, similar to Shelburne Farms, where education is tied to the practices of managing the land.
- School reside, community education and activities, family events, senior walks
- Ask local schoolteachers and do what works best for educating youth
- Walking path
- No opinion
- Partnerships with UVM
- There are plenty of other educational forests around. The Huntington Audubon property especially comes to mind, not to mention all the state land. I'd rather see it USED.
- We have so many other educational pieces of property in Richmond how often are they really being used
- No specific vision, but I'd fully support this being used a resource for low-impact research activities.
- Supportive
- I don't have such a vision but am happy if such uses could be made
- None
- Don't have one.
- I would love to learn more about the potential for education and research at the town forest site. (I manage the education program at Shelburne Farms)
- Nature walk for students would be nice.
- Programs that would model habitat protection and biodiversity
- I leave this to others to define.
- The more the better
- Ecological and environmental ed and other classes would be great.
- Keep them live limited and isolated to paths. Rambling groups can be destructive, unwittingly.
- research in natural areas is always welcome and educational opportunities to expand appreciation is as well
- ok
- Letting people know what exists there.



Vermont Town Forest

Recreation Planning

- Don't know potential
- engage MMU, CHMS, Essex Tech and UVM for field trip and natural resource monitoring they get free experience we get free data
- no
- Sugaring demos for novices. Tree identification workshops. Wild bird identification/habitat fostering/reading the forested landscape (see Tom Wessels) Partnerships with UVM forestry research? Bat houses, trapping the emerald Ash borer, etc. Or whatever is showing a way to currently improve or understand our valued forest.
- There could be habitat research about habitat corridors; Educational opportunities could include ecological programs.
- It would be great to incorporate day trips for schools and summer camps with naturalists giving a short tour and pointing out significant features.
- There is a great opportunity for habitat modification for endangered species.
- I support educational initiatives as well.
- none - but if some other group (non-profit, not paid for by the town or tax dollars) wanted to partner with the town to use some of the land I might be open to it
- It would be great to have educational opportunities for adults and kids - orienteering courses, wildlife tracking, etc.
- Schools could make good use of the area for science and just getting kids outdoors to learn and appreciate nature.
- Educating kids on the environment and conservation
- There's not enough space for a full-scale adventure in the town forest, but GMARA would love to put together some short family-friendly navigation challenges on the property, or possibly have racers pass through to reach a point or two during one of our longer summer events.
- K - Grad should be on this land to experience its wildness.
- Forestry and wildlife education for local schools and community. Signs at different sites and educational pamphlets
- ongoing.
- VYCC does great work, and I would be open to hearing their ideas for using some of the land. I would also love to see the public and private schools using the land for ecology field trips and fun hikes. We need to get our kids out into nature!
- I think that this would be a great site to use the VYCC to build trails that protect water quality - and showcase those measures for others who are considering building trails on their property. I think it would be great to interpretive birding trails.
- Having a public school connection with such a site offers enriched, hands on learning opportunities. Whether it be a science unit, creative writing, or a math project, kids can feel more inspired by the project based learning at their doorstep.
- The Audubon, Birds of VT and VYCC all have outdoor education programs so adding another should be low on the list for the forest.
- field trips?
- not my area of expertise so I leave this to the teachers



Vermont Town Forest

Recreation Planning

- None
- I would expect our local schools to involve students in exploration and environmental projects.
- Great access for school groups and other programs to learn about a working landscape
- I can't think of any specifics, but educational programs would be great.
- Farm and forest education
- lots of field trips for kids! and opportunity for land management, forestry, chainsaw, invasive species classes for local land owners
- Possibly a place for school groups to go to learn about various habitats and the flora and fauna within the forest.
- Get involved with Vermont Audubon and UVM.
- not sure
- Green Mountain Audubon already does a great job with this nearby. Could connect with them for ideas or partnering on programs
- None - I do not want any educational, research or demonstration programs AT ALL
- Deeply connecting it with our school system and getting as many kids out there as possible will pay huge dividends in the future as the next generation has fond memories of all that the outdoors offers.
- bird watching programs, fungi identifications, winter animal tracking, wildlife painting, there could be so many opportunities for education for people of all ages and interests.
- All of the above, great
- open to that
- Don't really have a vision
- There are a number of forest -based permaculture educational activities that could benefit citizens
- I don't know if there are excellent educational opportunities associated with this site. In addition, there are many alternative forest educational sites in our area. I do not want to see educational infrastructure developed on the forest parcel. Trails, sugaring, timber management, local floral and fauna observation at all good.
- Learning more about our ecosystem is always important. Our little town is tied into much bigger issues. Teaching about our connection, with visual aids could help more people to understand more about just how big of an affect even the smallest change can have.
- I see it as a great resource for our schools and other community groups.
- Education should focus on the effects of detrimental logging practices for profit versus sustainability. That area experienced a poor forest management plan and was raped of maturing oak all for profit - shameful.
- Continued Hunting usage
- N/A
- This could be a good place for field trips, but I think I'd rather see kids on bicycles enjoying trails and getting exercise.
- Field trips for kids, summer camps? Story walk and educational, accessible to young children story walks would be great.



Vermont Town Forest

Recreation Planning

- see above comment re: college/university
- I do not believe that any research affecting the forest should be done. Observation and non-disturbance based education are okay
- Effect of climate change on forest diversity, wildlife ecosystems. Both education and research
- Local school field trips to study the forest, its inhabitants, ecosystem, and how forestry management works.
- Minimal disruption. I would like educational activities to stress the importance of leaving the land for the wild creatures.
- Connect with CHMS and MMU for field trips and uses students to collect data and perform experiments.
- Nature trails
- Perhaps research plots can be created to help document impacts of other uses on the property. For example trail use impacts.
- Access for schools to visit natural communities and to propose public school projects
- again.. I want wild... rough... .. interpretation is nice.. but just for the first time visitor.. .. I'd love for the lands to be as primitive and unfinished as possible.
- I support educational programming in the forest.
- I would love to see the forest used for educational purposes. Studies have shown that children (and adults) who have experience in the natural world gain an appreciation for it and therefore are more likely to protect it, habitat and animals both.
- No limits, really, except activities that might impact wildlife and environment.
- I believe it would work well for research, and could provide additional educational opportunities, though many are provided at this time on VYCC land.
- I could see research activities related to natural communities and understanding forest functions and changes. (My answer is related to education.)
- Timber/forestry management education would be of interest. There is already a well-established program of this type called Game of Logging, but I'm not aware of any courses done in Richmond. GOL education teaches those with interest, responsible chain saw work (at the most basic) all the way through responsible commercial timber industry practices through multiple levels of formal courses. Information here: <http://www.woodlandtraining.com/NEWT.php>
- Working with the Middle School, High School and UVM and other educational institutions.
- School partner programs Select events to highlight area
- would be wonderful for students of all ages to be invited and encouraged to do both research and enjoyment activities there i think it would be cool to have a natural playground type area where kids are encouraged to come and be wild and playful and where it's ok to go off trail and build structures and collect things and climb trees and all that. something to balance out our nice, well-loved, well-used but rather sterile playground at the VGreen.
- All the above are appropriate and desirable. The only limit is respect for sensitive areas.



Vermont Town Forest

Recreation Planning

- It would be great if there were trails that local school groups could access to learn about nature, the environment, biology, etc. I have fond memories of going out on the "nature trail" in elementary school in Barnet and I learning about plants and habitats and watersheds.
- Hope the schools, town committees, Master Naturalist program, etc. can use the site a lot.
- Not my area of expertise or focus, but it is close to the Elementary and Middle schools and hope they would make use of it as well as any other school groups looking to use the resource to get outdoors, look at the cultural history, etc.
- Sustainable trail building!
- PLEASE DO! the more communities like ours may be exposed to educational programs having to do with forest management, the better informed they will be when projects like this come up.
- teach young children value and need for natural places in their lives
- see 19
- Hands on, long term projects for area schools. Not just one day field trips. Get them invested in the land and habitat
- Work with local schools. Make nature guides
- partnerships with Audubon or colleges/universities, local schools for birds, wildlife, reforestation projects, or organic and sustainable agricultural projects
- All of these uses would be great. I am not exactly sure what this might look like as I am not familiar with the make up of the forest.
- Perhaps a modest pavilion to serve as a resting spot for hikers, educational programs, demonstrations and perhaps even rental opportunities to contribute to revenue toward forest costs
- It would be great if the schools could use the site for outdoor studies.
- I think its a great opportunity to educate people on the importance of our forests. I love mountain biking and have a great appreciation for the outdoors.
- Having Audubon-like education opportunities. Forest school. Co-op maple sugaring paired with a learning/teaching experience.
- Mountain biking education, nature education
- Not big. Many other opportunities around.
- Maple syrup - forest management
- Great opportunity to teach kids and adults. Field trips? Walking tours.
- It is a good resource for biological or ecological education and research. Could be used by MMU, UVM, CHMS and others
- Educating about the need for stewardship
- Could the UVM School of Natural Resources assist in this area?
- Important opportunity to capitalize on by our schools, camps, and others
- I want to be more involved in the preservation and integrity of the forest.
- That it be open to any project or program that follows agreed upon forest protocol (do no harm, etc.) and enlightens people to their place in nature and the importance of



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defragmentation - and looking at the use of permanent, rustic, locally made, unobtrusive, informative kiosks and markers.

- excellent for school trips, college research
- I would support using the town forest for educational purposes - research & field trips - for local schools, programs, and universities.
- Demonstration site modeling/studying restorative ag practices Developmental of environmental, health, and place-based ed opportunities made available to local teachers/schools and other communities groups
- No expertise here, will leave that up those who have it.
- Teach about a healthy forest for wildlife habitat management, teach about invasive woody & herbaceous plants and safe removal, teach about damaging effects from overuse, rogue trails, erosion & compaction.
- All kinds of agricultural and forestry research and demo projects could occur here, including finding answers to problems with pests such as the emerald ash borer, and problems incurred by global climate change.
- Defer to existing eg: Audubon
- orchard. stream restoration.
- Having a shared communal space for a variety of functions. Dedicated space for things like 4-H plus a rental/town owned space. Kitchen for greatest variety of events that could be held and a nature center.
- A place for students (of all ages) to come learn about and experience natural habitats, forest succession, wildlife diversity. Also a good site for research into passive forest restoration. Perhaps study or demo project in small part of forest on medicinal forest plants/mushrooms.
- Approve. Model after Shelburne farms
- I think incorporating educational opportunities would be a great idea.
- Anything to educate the youth and the public on the importance of protecting the land and its wildlife
- None
- This will be a great site to bring members of the community including school kids to look at the resilience of nature, as much of it is regrown farmland.
- To let this place be a good site for having this type of project
- Would not want to create redundant programming. Work with Audubon.
- school use, YCC
- Learning about the forest land ,the proper uses of the site..
- Partner with Audubon.
- It'd be great to have an educational aspect!

Educational Use

When asked for thoughts about the following potential education programs, survey respondents answered:



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Learning Lab/Outdoor Classroom (RES, CHMS, MMU)

- Great
- Should be utilized
- YES
- I'm supportive
- Very much in favor
- Yes to all
- yes all local schools
- Yes, please.
- Nope.
- Yes please!
- Sounds great!
- School classes certainly would benefit from occasional visits, but I don't think that there'd be great interest among teachers for regular visits here.
- perfect place to bring kids. There is plenty of room for bus to park/turn around. Trails are already there
- Absolutely, but include environmental programs at UVM, St. Mikes and other institutions.
- Yes!
- Wonderful!
- Sounds good to me
- If they want it.,,
- Good
- Avoid overuse and frequent disturbance.
- Great
- IN favor
- Great idea, but requires a vision from the school administrators that I believe is sorely lacking.
- Great!
- Use existing UVM sites
- Great!
- thumbs up
- Great idea
- yes
- Absolutely yes!
- Establishment of regular outdoor learning labs, e.g. Forest Fridays
- No
- I would hope to expose as many students to the land as possible.
- It is a great start!
- Fine
- Sounds great
- Positive
- Great location for those.
- Excellent potential for this.
- As above.
- Great - Sandy Fary and Dan Hamilton are two very engaged science teachers at CHMS that use many field trips and outdoor labs to augment their science classes.
- Yes
- Great
- Yes!!!! More kids need to get outside to learn about this. Sandy Fary would be my vote for who could help develop excellent and memorable programs.
- Positive
- Great stuff
- Useful
- That would be cool.
- Yes, the more that kids can experience/learn outdoors the better.
- Approve
- ok fine, but what's wrong with Audubon? You still have to get in a bus to get there.
- Sorry to be the broken drum but all the land that Richmond has



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- acquired is always used for learning Labs Etc and they don't get used enough
- sure
 - Yup
 - Great idea
 - Nice
 - Yes, great
 - Sounds good!
 - Great idea! Will there be structures/ buildings built on the land? Adequate parking? Will there be bathrooms? Having worked in environmental and outdoor education across the country throughout my career, I'd love to learn more about the plans as they move forward. Happy to be involved if I can be of service.
 - Good.
 - All of the above
 - Yes I support
 - YES
 - Great
 - positive
 - great
 - Include community
 - Positive
 - YES!!!
 - I'm small areas yes
 - no
 - In favor
 - Yes! More outdoor classrooms!
 - It would be a great spot for understanding interaction between conservation and recreation.
 - Any activity that encourages appreciation and conservation is desirable.
- Teaching our youth the importance and value of the outdoors is absolutely critical!
 - not interested
 - Great opportunity for schools
 - Absolutely - all schools could use it in almost any subject .
 - Great idea
 - I think outdoor learning is one of the healthiest ways for kids to learn.
 - yes
 - Yes
 - go for it.
 - Yes--strongly in favor for all schools.
 - Would be a great resources for the local kids to be able to learn from it. Habits should be left in place.
 - Yes. Birding, et al.
 - I work at Founders Memorial School in Essex Junction where we have an outdoor classroom. It's a great way to expose kids to what nature can provide, be it scientific wonder, a quiet companion, or inspiration for ideas.
 - RES and CHMS have land trust land adjacent to the schools, and use the above mentioned resources, so this area isn't needed.
 - good
 - Positive, would be great
 - Ok
 - Yes, get them all into the woods!
 - Strongly support
 - That would be great.
 - Sure at certain times
 - Great!



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- Yes!
- Sounds like a great idea.
- support it
- Sounds like a great idea but not sure it's a reality. Requires transportation and that is expensive. RES and CHMS have a bunch of natural areas already around their schools.
- Could also look at UVM's Jericho Research Forest for a model
- No interest at all
- Great, absolutely.
- Fully support as access should be fairly straight forward
- As a current student who has been at RES, CHMS, and MMU, I believe schools would take full advantage of any opportunity for more outdoor learning, and students would probably love to help with any restoration or sustainability projects.
- Yes
- local schools use
- Sounds great
- Fine
- yes
- Yes
- No infrastructure.
- I think this is a fantastic idea. I remember enjoying my own outdoor classroom experiences. The practical applications shown helped me to understand in a more immediate way just how everything was connected.
- Wonderful! I worked at the Charlotte School and saw the benefit there of having forested area nearby which was used by the teachers. I remember Sue Morse taking a fourth grade class tracking .
- VYCC has better accommodations as well as classroom infrastructure indoors and out.
- No
- Great!
- great
- Not desired
- You learn by doing. Highest priority. Why not higher education?
- An opportunity for educating folks - young and old about the essential nature of nature.
- Good idea.
- This is an excellent idea.
- See # 17
- Love the idea of outdoor learning for both main stream students and students needing alternatives to the classroom experience..
- Support
- This is a question for teachers.
- Excellent opportunity for our education community to connect our youth with the outdoors.
- yes!!
- i'm super supportive of using the lands for education. but prefer no augmentation. buildings. instruments, etc
- Important
- Strong support.
- Great - I'll repeat my answer to 18 I would love to see the forest used for educational purposes. Studies have shown that children (and adults) who have experience in the natural world gain an appreciation for it and therefore



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- are more likely to protect it, habitat and animals both.
- Good.
 - Good site, though, again, VYCC could easily partner with local schools for this purpose.
 - Yes, definitely would like to see those activities there.
 - Great!
 - Would be great.
 - great resource for our schools
 - Yes!
 - great
 - All are fine.
 - Sure
 - Would greatly encourage all educational opportunities be given for the school population including teacher education .
 - Sounds good.
 - Great!
 - Highly interested
 - Fantastic, but also don't count UVM out- always looking for areas such as these- currently MMU uses the Jericho Research Forest which is a UVM plot.
 - good idea
 - Awesome!
 - I think this would be a great opportunity and resource!!
 - Love it. Must have!
 - All sound great!
 - like it!
 - It would provide a unique learning experience.
 - Yes - anything to teach our young people to save our planet
 - Great opportunity for all the schools.
 - I think the more young kids, adults can get out and gain an appreciation for the outdoors the better. I'm all for it!
 - Great!
 - Yes, yes!
 - Yes
 - Great
 - They have forest next to schools no need to transport kids there
 - Yes!!! My son is very interested in Forestry & would love this! In general I think kids learn more when they are engaged & participating; outdoor classroom is ideal!
 - Great
 - Excellent
 - Sounds good if the schools are interested
 - Sounds great
 - Great
 - Excellent use
 - Great!
 - Sounds great, I'd love my kids to have the opportunity to spend time in an outdoor classroom, and learning about local natural resources
 - excellent
 - Yes!
 - Sounds good
 - Sounds good...
 - Yes with controlled environment.
 - All area schools should have access for educational purposes.
 - No comment
 - Let's do it. I'll bring students from Saint Michael's College
 - Nice but rather have more of a nature center that is open to public rather than focusing only on school groups. Enrichment



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- happens not only in school but beyond it.
- All sounds good.
- Great
- Absolutely!
- Very useful and I experienced it when I was in school, lots of value
- Sure, great ideas
- All good
- Like.
- yes
- Yes they should be able use the site a learning lab..
- Great idea and the best way for kids to learn

Volunteer Biodiversity Monitoring Program (CHMS, MMU, UVM)

- Fantastic
- Good idea
- Very Important and cool sounding
- I'm supportive
- Very much in favor
- Yes to all
- yes
- Great.
- Yep.
- Yes please
- Love it!
- There's little need for such a monitoring program for this parcel alone and the benefit to biodiversity management would be negligible. Biodiversity at this site is nothing special (e.g., Northern Hardwood, Dry Oak natural communities with a few wetlands and vernal pools). the site's magic is its connection to the Chittenden Upland Project.
- great way to get people out in nature to explore and potentially use on their own
- This will be an excellent way to fill out our understanding of habitat and habitat connectors on the property, and its function among other conserved and unconserved lands in the Chittenden County Uplands Conservation Project, and the Mt. Mansfield Forest Block as a whole. A bonus will be greater public involvement with the property, and deeper appreciation for its beauty, biodiversity and the ecological functions it provides.
- Yes!
- Yes!
- What does this actually mean? Sounds like the Forrest, if left alone can manage and monitor it's own biodiversity
- If they want it...
- Good
- Avoid overuse and frequent disturbance.
- Great
- In favor
- Sounds good, if someone has the time and energy to run that.
- Sounds good
- See #18
- Excellent
- I also think this is a great idea to help keep track of animal and forest health.
- cool



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- ditto
- Mimic Huntington River monitoring network
- No
- Strongly agree with this program!
- Fine
- Good opportunity for hands-on learning
- Positive
- Sounds good if well organized.
- As above.
- Yes
- Great
- Yes.
- Positive
- Great idea
- Meh
- That would be cool.
- No opinion
- Approve
- good
- sure
- Yup
- Also a welcome idea
- Meh
- Yes
- Fantastic- I have established phenology monitoring sites in California and Vermont and would be interested (if desired) in working with folks to set up a plant monitoring trail for the National Phenology Network or other citizen science monitoring opportunity. Great opportunity for students, adult volunteers including retired folks and seniors to get involved in science, possibly use technology, and be outdoors.
- Sure.
- Yes
- Yes I support
- YES
- Great
- positive
- great
- Don't know what that is
- Yes
- YES!!!
- no
- In favor
- Yes! Get the kids outside!
- I'm not sure what this would mean or if the property would be a good fit.
- maybe
- Yes as long as still available for recreational use.
- Would be great volunteer opportunity for citizens as well as children.
- Great idea
- Biodiversity monitoring could complement any outdoor learning program. I don't know how much value it has beyond the learning process (meaning that I actually don't know - maybe it's hugely valuable), but I'm not opposed to it.
- Yes
- Yes
- okay.
- Great idea for all schools. Wonderful learning opportunities.
- yes.
- good
- Good
- Yes, get them all into the woods!
- Strongly support
- Sure
- Sure
- Yes!



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- Sounds great
- Very strongly support it.
- I could see this happening. It already happens in Richmond with CHMS students. They could add this site to their list.
- Yes, great idea. Jim Duncan at Forest Ecosystem Monitoring Cooperative might be interested.
- No interest at all
- Yes, absolutely.
- Excellent idea
- Yes!
- Great
- OK
- Great
- sure
- Yes
- Yes
- I don't know much about this, but it sounds like it would be a beneficial program.
- Yes. Citizen Science.
- The area should be included for Ash Borer monitoring
- No
- Great!
- great
- This would be a good idea
- You learn by doing. Highest priority
- Yes!
- Yes.
- This is an excellent idea.
- See #17
- Yay! involving students in collecting data hits multiple bases.
- Support
- Again, a question for teachers.
- Another excellent opportunity for our community to use the forest as a research lab in order to help preserve Vermont's outdoor heritage
- Yes!!
- I love using this as a basis for citizen science. also .. as long as its done while keeping the land in its most primitive state
- Important
- Strong support.
- Great. Very important for sustaining forest habitat.
- Good.
- There is potential for benefit there.
- Yes, definitely would want those types of monitoring programs there.
- Great!
- Excellent.
- great resource for our schools
- Yes
- great
- Also good stuff.
- Yes!
- If it could be coordinated with the studies in the schools and reinforced to benefit the students.
- Sounds good.
- Sure!
- Yes, look to the field naturalist program at UVM- they do master's projects which could be a wonderful partnership.
- good idea
- Awesome!
- Good. Volunteer is always hard. Work it into a class
- Yes, please!
- like it!
- Excellent opportunity for students.
- YES again
- This would be a great use of the property.



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- Great!
- Great!
- Yes!
- Sure but make the colleges donate for their access
- Great
- No
- Yes!
- Great
- Excellent
- Sure
- Cool
- If there is an interest
- Excellent use
- Yes
- excellent
- Yes!
- Sounds good
- Yes!
- Yes
- Same as #18.
- No comment
- yup
- Nice idea, would like it to expand beyond the learning institutions.
- Excellent.
- Even better!
- Yes!
- Great
- Yes, biodiversity monitoring and other forms of monitoring - could include air quality, haze, meteorological, etc.
- Yes and consider other types of monitoring - air quality, haze, human impact, etc.
- Maybe ANR too?
- yes
- Also a plus

Other Educational Programs

- Why not
- See previous entry
- Resident steward educational classes for volunteers in the town, (mostly regular guided tours so the residents feel connected)
- Absolutely.
- As long as they leave no trace.
- You could use the area to teach sustainable trail building and recreational resource management, as well as sustainable forestry in a multi-use forest. UVM's school of forestry could collaborate with the town on fulfilling these programs.
- Partner with VYCC to demonstrate sustainable trail design/build!
- birding, tracking, wildflower/plant id
- Yes!
- Avoid overuse and frequent disturbance.
- Not sure
- Yes
- We aren't lacking in places to do this in Richmond. Adding the town forest seems to fall in the nice but not really necessary category in terms of additional places for conservation education.
- Not sure
- ditto



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- Partner with Audubon re Forestry for the Birds.
- No
- Reading the forested landscape. Look to work from Tegue O'Connor for examples. He has relatives in town and spends more time outside than all of us combined.
- UVM School of Forestry. Bring out firewood for the needy
- As above for onsite, offsite to be encouraged.
- Yes
- Enjoyment of nature via walking/hiking paths.
- Forest Fridays, per Huntington schools
- Use it
- Sure, why not?
- No opinion
- Can't think of any
- N/A
- For adults: Guided walks, public programs, nature programs and talks, gardening programs, citizen science volunteer training, community classes, art programs. For youth: public programs, field trips, early childhood group visits, art programs.
- Outdoor Rec education
- Programs that would teach gardeners about native plants, native pollinators, and gardening for wildlife.
- Hunter safety courses
- Citizen education programs
- Depends
- positive
- Community field trips 1 year, 2 year , 5 year post timber harvest
- no
- History of agricultural impact on landscape. Are there any culturally significant stoneworks within the forest indicating possible Native American ceremonial uses? (there certainly are elsewhere in Richmond and surrounding towns and throughout Vermont.) Promoting respect and awareness of these sacred or valued places is another facet of utilizing a town forest on many levels.
- Sure, why not!
- Wild plant stewardship is worthwhile. I have harvested a lot of edible plants but the land couldn't support everyone taking from it . It might be a good place to identify natures bounty and harvest elsewhere.
- no
- Keeping track - hunter safety, trail building, erosion control,
- All are good !
- As I mentioned before, I think learning to navigate with a map & compass is worthwhile & would love to set up something to teach kids (or adults) how to find their way in the woods.
- Yes
- General public on SFM
- also okay.
- Maybe seminars on ecologically friendly trail-building?
- Unsure
- Yes, get them all into the woods!
- Depends what they are
- Yes!



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- Not sure what exists for possibilities but am sure that there could be excellent programs developed for the forest
- No interest at all
- Rather than dream up all the potential educational programs, I think we should dream up a system to encourage the development of responsible educational programs. Some type of incentive that can get our educators, parents and other community members thinking of ways to educate our kids and create the next gen of environmental stewards.
- Maybe informal events such as an early morning bird-watching walk lead by a volunteer ornithologist, or a nature art workshop, etc that all community members can partake in
- Adult learning, tree ID , bird ID, etc
- open to
- Potential innovative grant programs to foster forest maintenance and appreciation
- Other volunteering opportunities. Not sure what is a paid job dealing with the forest and what isn't.
- Geological studies
- The area supports a stable population of Piliated Woodpeckers and Turkeys which could benefit from food source management education
- No
- Story walks, accessible informative nature trails, viewing blinds are also cool
- Undesired
- Why is UVM / higher education not included in question 18.
- Community education programs for all ages encompassing all aspects of keeping a healthy forest.
- See #17
- bring everyone.. .. let them enjoy the woods as the move back to being the wild places they once were.
- Rotational grazing? Invasives? Trail building? Erosion control systems. Watershed respect.
- No limits, except as above, or those that might interfere with allowed recreational usage.
- Birding and other field trips for area seniors.
- any and all
- Education in sustainable and responsible forestry and agriculture.
- For use by after school programs and such.
- Wildlife studies, birding education
- learn from local experts like Sue Morse about sustainable forests and wildlife
- Ask the students!
- Not sure what other programs would be appropriate for the site, but I would support them.
- impact of various land uses - and how to minimize them.
- Great
- Sure!
- It is fairly remote for this area, and an important animal movement corridor, so it could be a good



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place to monitor wildlife movement

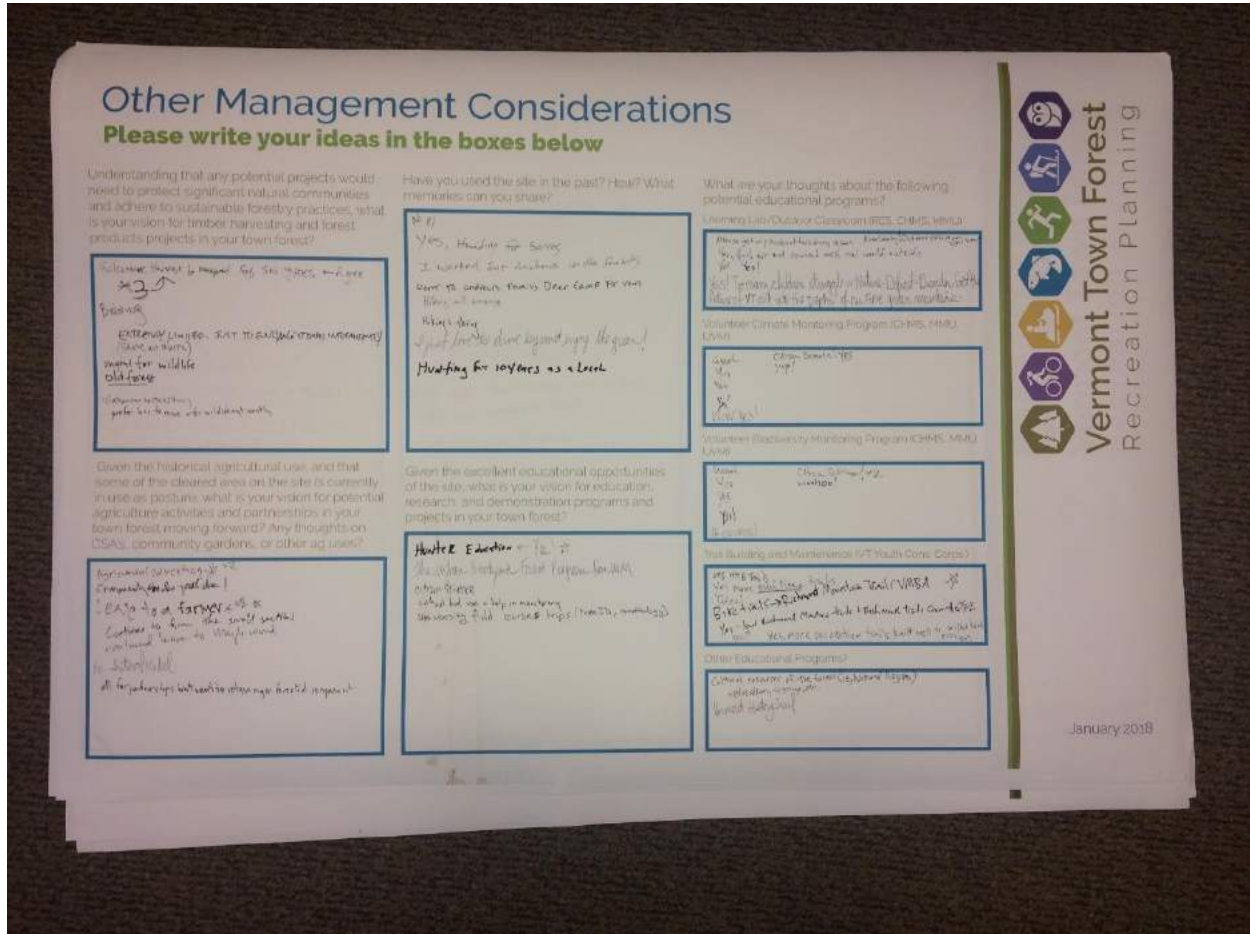
- Great!
- Important
- Anything that can assist kids (and adults) to rediscover connection with nature.
- Preservation of nature as is vs habitat alteration from overuse by pedestrians, dogs, mountain bikes.
- Senior programs such as outdoor exercise, tai chi, etc.
- Outdoor education / forest school
- orchard ed
- This is where I think the town should focus. Instead of limiting it to one or two programs having a multi-use space will turn it into a space owned by the community rather than used by a small

fraction of the community. It would be nice to see it be a place that could be rented out by groups as well as have dedicated space for specific functions. Having a nature center would really help youth develop life long appreciation for nature and differentiate it from just another forest area.

- Allow private schools and after school programs to visit.
- Anything folks want to do that is not particularly destructive
- Anything that is not terribly destructive
- yes
- As a parent to a toddler, it'd be great to have some simple hands on nature exploration options!



Public Workshop



Natural Resources

Present Natural Resources

Survey respondents identified the following 'natural resources of note' in the Town Forest:

- Deer Wintering Areas
- Vernal Pools
- Large Ledges or Cliffs
- Groundwater Seepage Areas
- Forested Swamps

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Open-ended responses include:

- Deer wintering area according to the maps I have
- Great Views
- Wildlife
- Timber and NTFPs, including wildlife
- Unaltered
- Hemlock forest, vernal pools, unfragmented wildlife corridors.
- Old conifer growth area/water ways
- Forest land
- I think all the above, but the cliffs may be outside.
- Woodlands
- open space, forest edge for wildlife,
- Bobcat, and many other species; south facing so probably some white oak worth emphasizing
- Turkey, deer
- Unknown
- Hemlock forest. Oak forest. Creeks
- flora, fauna, abiotic resources
- Vernal pools, streams (per map)
- timber harvest
- Deer wintering
- trees
- trees, but I don't think they should be used for timber
- field and forest
- Bear habitat?
- Deer, birds, fiddleheads all other plants and animals
- Dry Oak forest, seeps and vernal pools
- I am not familiar enough with the land to say.
- unknown
- The resources are being investigated as part of creating a plan for the forest.
- Unsure
- Deer habitat
- Many of the ones listed above
- Leave the forest alone!
- Timber, Water, Wildlife.
- large enough all are there
- Gillett Pond
- Deer
- Unaware
- Go to STA. I have in-depth knowledge of these and do not really have the time to list them all. For starters wetlands vernal pools, rare endangered species, deer winter, bear habitat, significant upland communities, contiguous forest units wildlife connectors ... the list goes on
- Beaver habitat, vernal ponds, amazing trees, streams
- Vernal pool, dry oak stands, wildlife
- Open fields and mature woodlands
- trees, dirt !, leaves, bugs
- Gillet Pond, Huntington Gorge, Winooski River and its buffers/banks, extensive flood plain.
- Many of those listed above and below. I used to live on land similar to and close to the forest so I am familiar with a similar ecosystem.
- Wildlife, flora, riparian buffers
- From what I have heard -- Forests, wildlife, streams, etc.
- The biggest would be protected open land for recreation (and conservation)



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- I have noticed deer wintering areas, some beech, some stage 1 forests, and a few vernal pools.
- Beaver pond, ledges, accessible nature walking
- Likely numerous, but my knowledge of this particular area is limited.
- open areas, water sources, cliffs/ledges
- northern hardwood forest, upland watershed
- Firewood
- Forest/wildlife
- Pine trees
- Vernal pools, beaver pond, mast trees, wildlife corridors contiguous with adjacent lands.
- unknown
- Terrific wildlife habitat...safe, secure, nearby food and shelter. Relatively untouched wetlands. Peace and quiet for all creatures.
- Gravity
- Vernal pools, streams, wildlife, gorges and a lot that we don't know and haven't
- Two vernal pools, at least, and a gorge, and deer yards and a lot that we don't know about or haven't discovered
- Trees
- woods forest land
- habitat

Wildlife

Survey respondents identified the following wildlife using the forest:

- Standard for the area, just one of the few pieces that isn't crawling with people
- Wide variety
- The usual species found in northern VT
- All types - deer, bear
- Bobcat, deer, birds, moose (?), bear
- Deer, bear, mountain cats, etc
- Whitetail deer, Pileated woodpecker, Bobcat sign, mink sign, raccoon sign, red tailed hawk, songbirds, great horned owl, quail.
- Bear, deer, turkey, moose, coyote, partridge
- Bear, turkey, deer, chupacabra
- What kind don't I see? That size plot with adjoining plot should see all Vermont wildlife
- I could see all Vermont woodland wildlife using it including bear and moose.
- Turkeys, other birds, squirrels, mice, chipmunks, deer. Nearby, moose, porcupines, bobcat.
- Local animals
- Lots
- deer, birds of prey
- Hawks, Foxes, forest birds, deer
- Diverse habitat -> Deer and many smaller mammals, birds.
- Deer, turkey, raccoon, bear, Fox, coyote and small mammals.



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- 🐿️ 🦋 birds deer etc.
- Local
- I have not yet been to the town forest
- Deer, small mammals, birds
- Bear, Fisher Cats, lynx, deer, a stray moose or two
- birds, porcupine, moose, deer
- Deer, raptors, coyote, Fox, amphibians and reptiles
- full mix of hardwood dwellers
- Deer moose various birds. Bears
- Birds, Mammals and insects.
- birds, deer, salamanders, red efts, toads,
- squirrels, chipmunks
- songbirds deer, coyotes and a few bears.
- Deer, bears, birds, fish
- Deer, moose, birds, coyote, turkey etc
- What ever is native to vermont
- All the usual ones found there currently
- deer, small mammals, birds, etc. With luck bobcats, moose, etc.
- teenagers
- Deer bear rabbit partridge
- Assume that there are deer, bear, moose along with numerous other small mammals, reptiles, etc.
- warblers, deer, bear, Bobcat, snakes, turtles
- Leave the wildlife alone!
- Deer, Coyote, etc.
- Deer, fox, beaver, etc.
- I know what I see at home. Birds (including cardinals and blue jays), many squirrels and chipmunks.
- I've seen all animals that reside in vermont except Lynx,
- Deer
- Large variety of birds. What do you mean by see. Actually see? Tracks? Signs? Deer, bear, squirrels, coyote, fox
- birds, mammals, reptiles and amphibians
- Birds deer
- moose, deer, bobcat, turkey, grouse, forest birds
- Deer, Moose, Turkey, hawks, fisher, bobcat fox coyote.....
- squiles, birds. dear, foxes, bears, moose
- Deer, moose, black bear, coyote, fox, fisher, rabbit, skunk, beaver, muskrat, squirrel, chipmunk, field mice, shrew, and other small rodents, birds of prey (including red-tailed hawks, owls, other), songbirds, and hopefully one day wolves, to restore the apex predator to the habitat.



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- Bear, moose, bear, bobcat, coyote, fisher and other weasels, fox, small mammals, potentially mountain lion
- deer, birds etc...
- All native species that can thrive in the habitat
- pretty standard for this part of Richmond - mammals from voles, mice and chipmunks up to deer and some reptiles and bugs
- I have really only seen deer, turkey
- Deer, beaver, chipmunks, squirrels.
- Deer, birds, fox
- deer, birds, bear, and smaller wildlife
- All kinds- whatever wildlife has already been living there should have their habitats protected.
- wild cats, deer,
- I have not had access in the past.
- All natural, local wildlife....
- Deer, moose, all the native species
- Deer, raccoon, skunk, opossum, bear, chipmunk, squirrel, snakes, moose...
- Deer, squirrel, birds
- All species found in Vermont
- deer
- Deer, bear, coyote, fox, fisher, beaver, owls, many songbirds, maybe hawks & bobcat.
- Endemic
- bear, deer, porcupine, red and grey fox
- have not been to the town forest
- Upland birds, deer
- Bobcats, bears, reptiles and amphibians, deer, turkeys, coyotes, owls, bunnies, fisher, moose, skunk, grouse
- Bears, fishers, coons, coy dogs, owls raptors
- I don't see any wildlife using the forest - I am sitting at my desk. But I presume that the usual bird, mammalian and herp communities are abounding, including the big mammals.
- deer, bear, bobcat, birds, coyote, etc
- deer, bear and other small creatures

Natural Resource Protection Concerns

When asked “Are there any human activities (existing or planned) that may conflict with these resources?” survey respondents answered:

- The ag isnt used heavily enough now to interfere
- Not sure
- Hunting, logging



Vermont Town Forest

Recreation Planning

- I would like to see hunters still able to hunt the land in season
- Hunting, snowmobiling, powerlines
- Not to be a recreation area
- Potential timber harvest
- Mountain biking
- Atv
- ATV's
- Nope
- Motorized vehicles.
- Mountain biking, ATV use, four wheeling
- Be careful to control mountain bike use (impact on wildlife)
- None
- If we are helping to pay the taxes on yet another piece of property let hunting continue
- Snowmobile trail
- Hunting and trapping, logging, motorized vehicles
- I have not been to the town forest
- Hunting and trapping
- No
- Hunting should be allowed.
- Trapping
- motorized vehicles, hunting, trapping
- Vast trail may conflict with deer wintering?
- Mountain biking
- Trapping. Disruptive outdoor recreation.
- Any human activities can disrupt all the aforementioned resources
- residential building in adjacent lands.
- The VAST trail might be disruptive, but I don't think it would be worth the controversy to change it.
- Clear cutting
- Anything powered, atv, dirt bikes etc should not be allowed
- Too much mtn biking would be a problem.
- Not if done properly



Vermont Town Forest

Recreation Planning

- Snowmobiling, 4-wheeling, major logging operations, major construction, poorly designed trails, illegal camping
- unknown
- Human activities can co-exist with human use as they have for decades
- hunting, trapping
- Snowmobile
- Always a concern with new trails through habitat
- Mountain biking
- Not sure what is planned
- ATVs
- hunting
- not sure
- Timber harvesting, mowing (including impacts to ground nesting birds), recreating
- Yes - all human activities. Leave the forest alone!
- Resource extraction
- un managed land use
- Not that I know of.
- Planned infrastructures, logging, camping, vehicle traffic
- Ripping the farm apart
- Don't know
- Unaware
- There could be many. Development of any kind in the wrong place, same for forestry and related activities, recreational uses including walking, skiing, bike trails that compromise the features described in previous answers.
- Does any human activity conflict with nature?
- I don't know.
- I don't know what's going on at the moment.
- Bicycles could cause erosion
- Would like to keep soils from eroding with trail design and maintenance
- trail use (hiking and biking) that brings lots of people to the north end of the parcel quickly. Best to keep the majority of trails on the south end of the property
- always



Vermont Town Forest

Recreation Planning

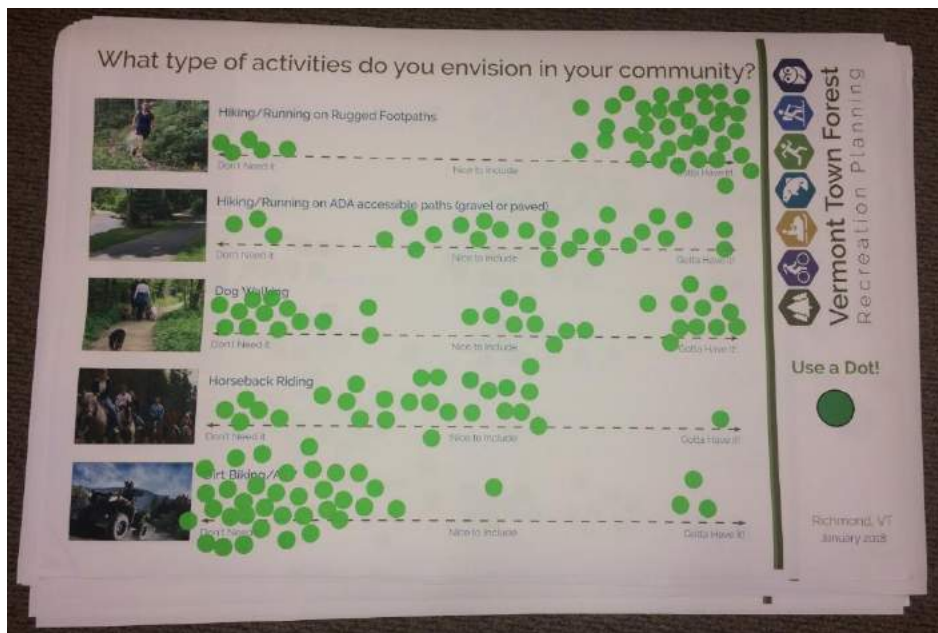
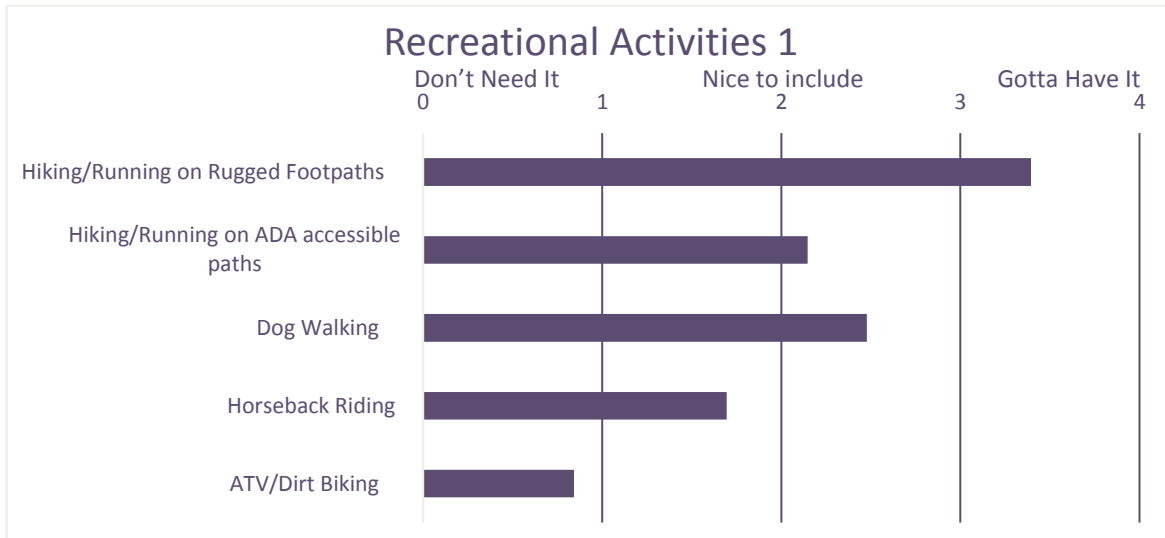
- I wouldn't like to see ATV use in this forest. I do love the idea of walking, hiking, bicycling on labeled areas, horses on labeled areas, hunters during appropriate seasons. A multi use gem for our community.
- Yes. Poorly planned timber management/harvest. Excessive recreation use, especially of motorized vehicles of any sort (ATVs, snowmobiles, motorcycles)
- possibly, if trails are not well managed or motorized recreation is allowed.
- Yes, hiking and especially mountain biking
- Motorized recreation in the summer and mountain biking
- Motorized vehicles, irresponsible hunting and fishing
- I'd like to see limited motorized use, along the lines of current VAST
- Excessive motorized use (dirt bikes, ATVs, snowmobiles)
- I don't know.
- I'd say the powerline is the largest impediment on the property along with historical logging roads and any localized (in time and place) issues related to logging.
- planning any timber practices and trails wisely.
- yes, many: hunting, mountain biking, litter associated with increased humans
- Trapping
- I'm sure snowmobiling would scare of wildlife if allowed. Trapping would be harmful as traps are left out after that season is over and other animals returning to the area for the season are injured or killed unnecessarily.
- Snowmobiles. Too many mountain bikers
- Snowmobiles-please keep all motorized vehicles for recreation off premises
- Mechanized recreational vehicles should be prohibited (e.g. Snowmobiles, dirt bikes and ATVs)
- timber harvest, hunting
- I do not know.
- Don't know
- Not sure what is planned but likely yes
- Not aware
- Utility maintenance
- ATV and snowmobile use (if existing or planned), non-ecological forestry practices.
- Yes, snowmobiling, mountain biking, rogue trails, and allowing dogs.
- unknown



Vermont Town Forest Recreation Planning

Recreation Activities

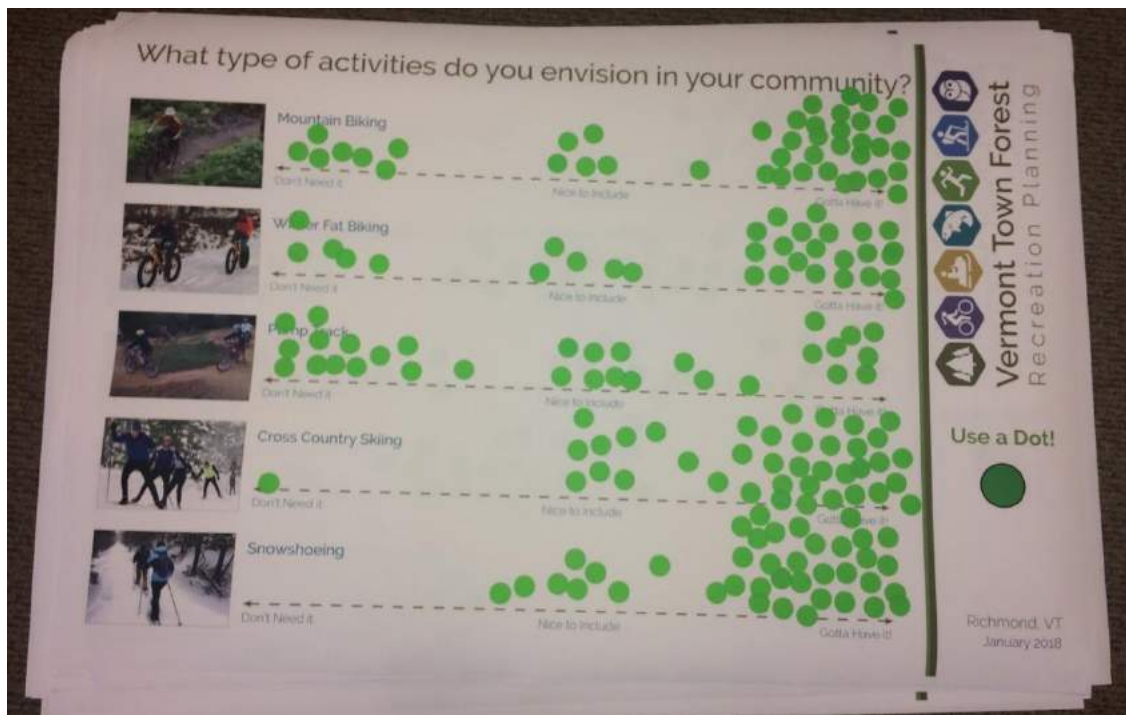
Survey respondents and workshop participants were asked about the recreation activities they envisioned in their town forest by indicating their feelings about a number of activities on a spectrum from “Don’t need it” (0) to “Nice to include” (2) to “Gotta have it” (4).



Both survey respondents and workshop participants were very supportive of hiking/running on rugged footpaths and not very supportive of ATV/dirt biking. Both groups were relatively neutral on the other three activities. Workshop participants were slightly supportive of ADA accessible paths, evenly split on dog walking, and slightly less supportive of horseback riding. Survey respondents were very neutral on ADA accessible paths, slightly supportive of dog walking, and slightly supportive of horseback riding.



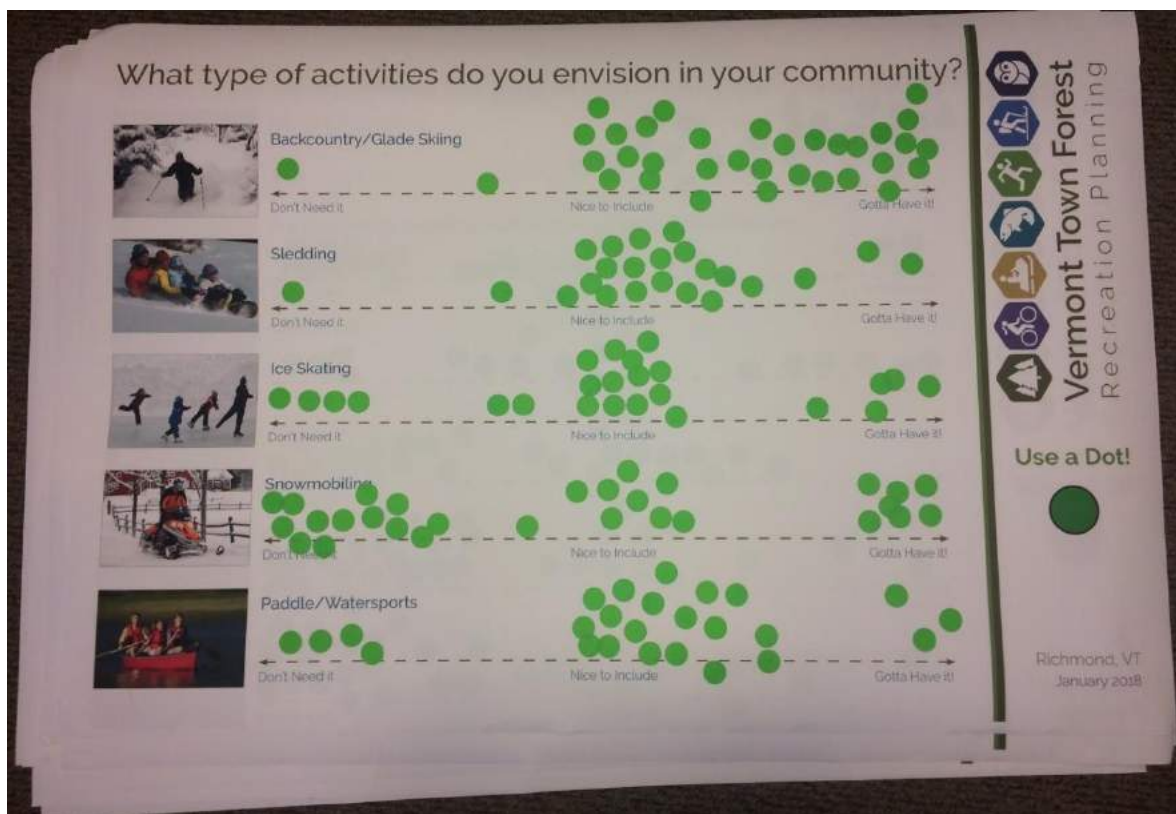
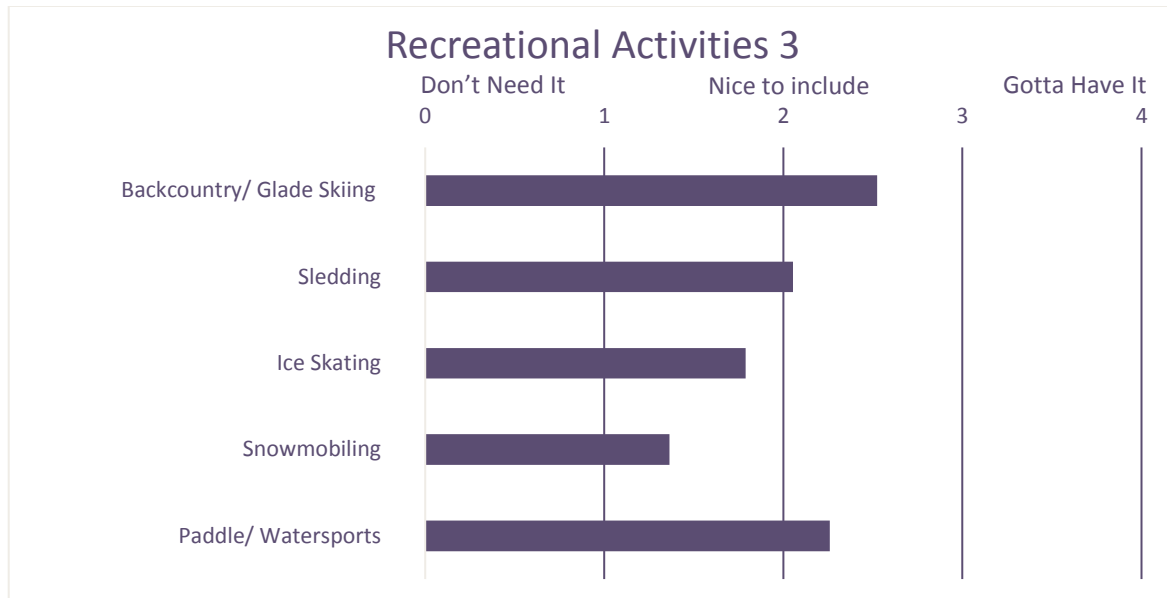
Vermont Town Forest Recreation Planning



Both survey respondents and workshop participants were very supportive of snowshoeing and cross country skiing. Workshop participants nearly equaled that level of support for mountain biking and winter fat biking, but survey respondents were more neutral on those activities. Survey respondents were very neutral on a pump track and workshop participants were very split on a pump track.



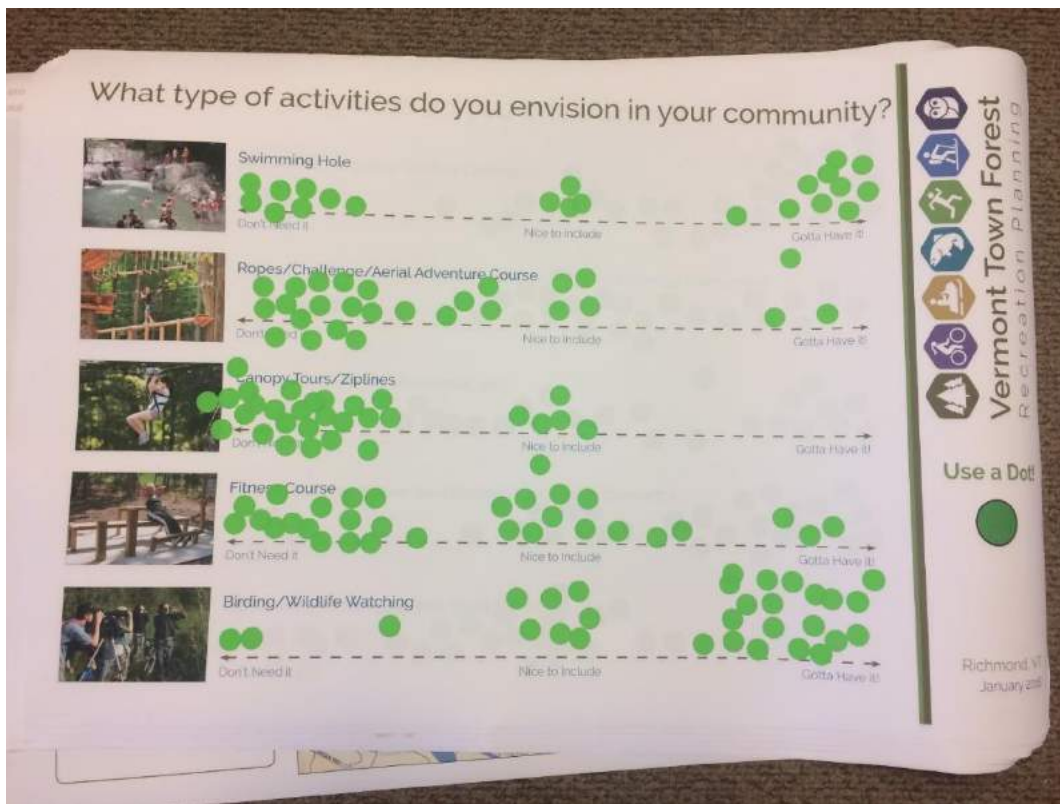
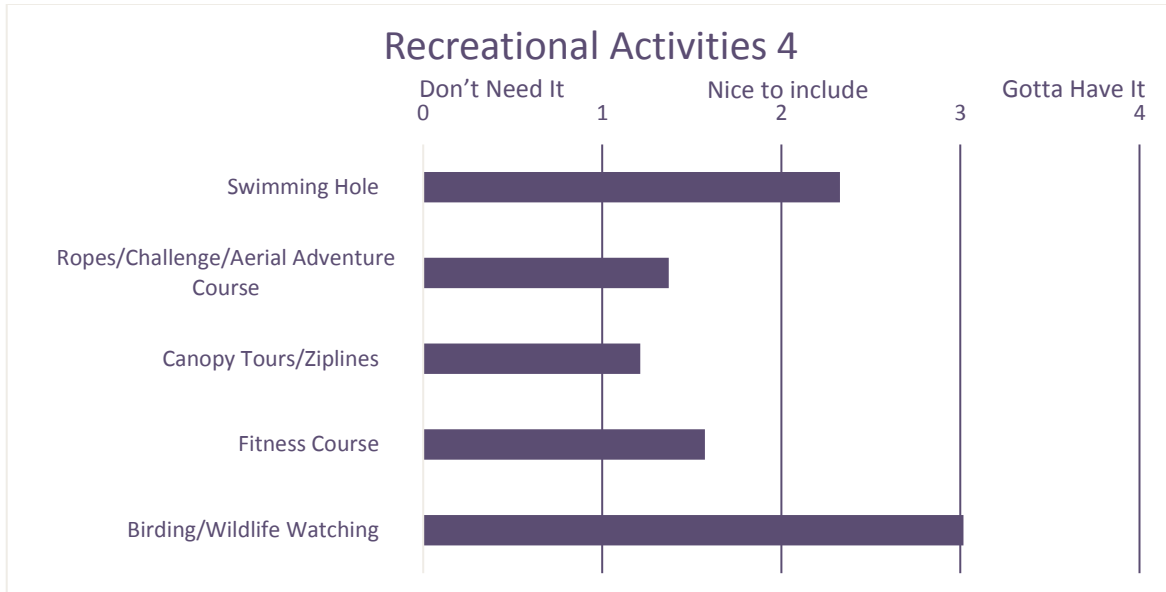
Vermont Town Forest Recreation Planning



Both survey respondents and workshop participants were very neutral towards sledding, slightly less supportive of ice skating, and slightly more supportive of paddle/watersports. Workshop participants were fairly support of backcountry/glade skiing, while the survey respondents were more neutral. The workshop participants were fairly neutral towards snowmobiling, while the survey respondents were less supportive.



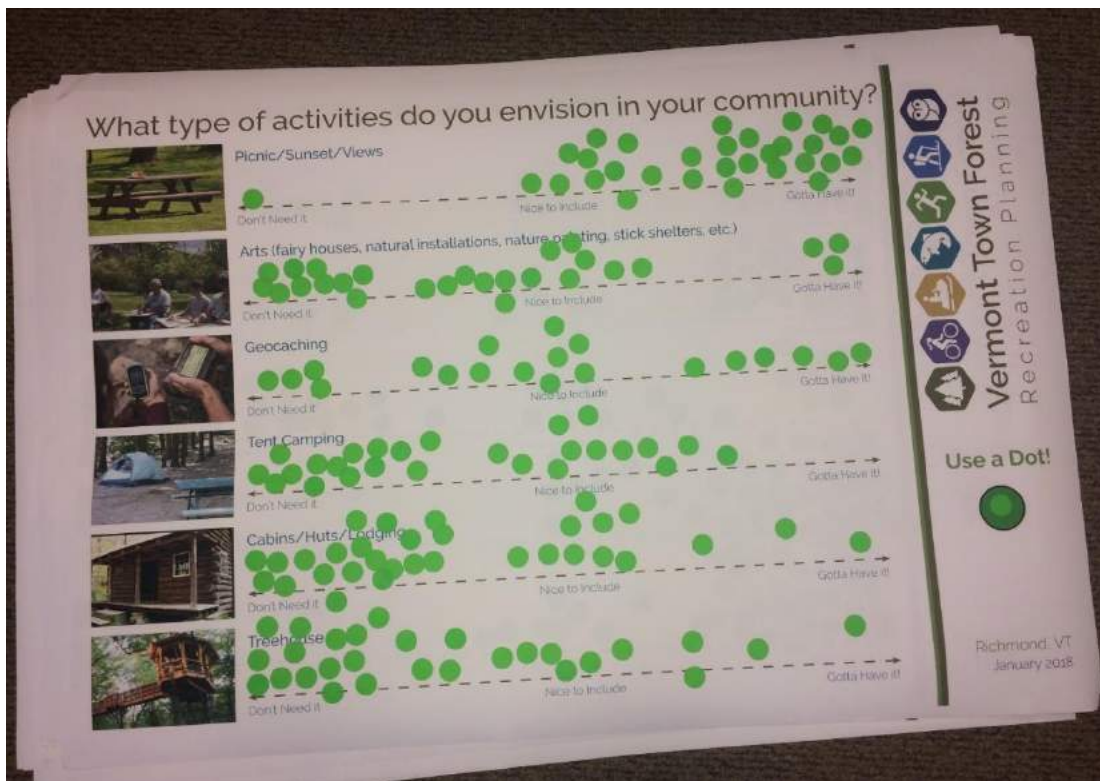
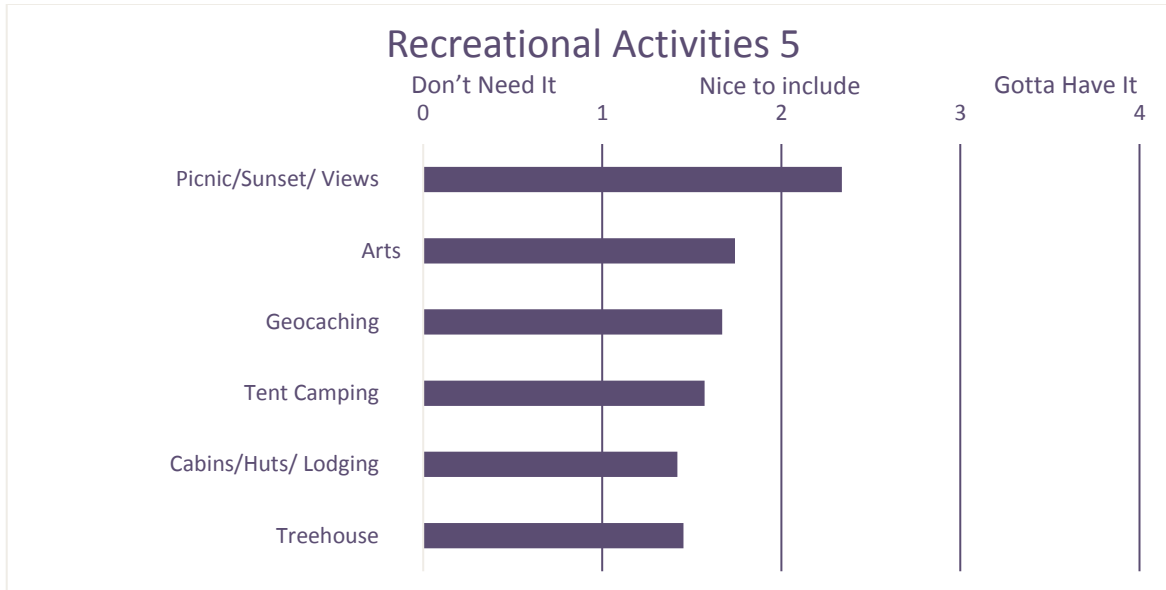
Vermont Town Forest Recreation Planning



Both the survey respondents and the workshop participants were very interested in birding/wildlife watching and had little interest in canopy tours/ziplines. Both groups were slightly more supportive of fitness courses and ropes/challenge/aerial adventure course, with the workshop participants feeling almost neutral towards a fitness course. There was also some support for a swimming hole from both groups.



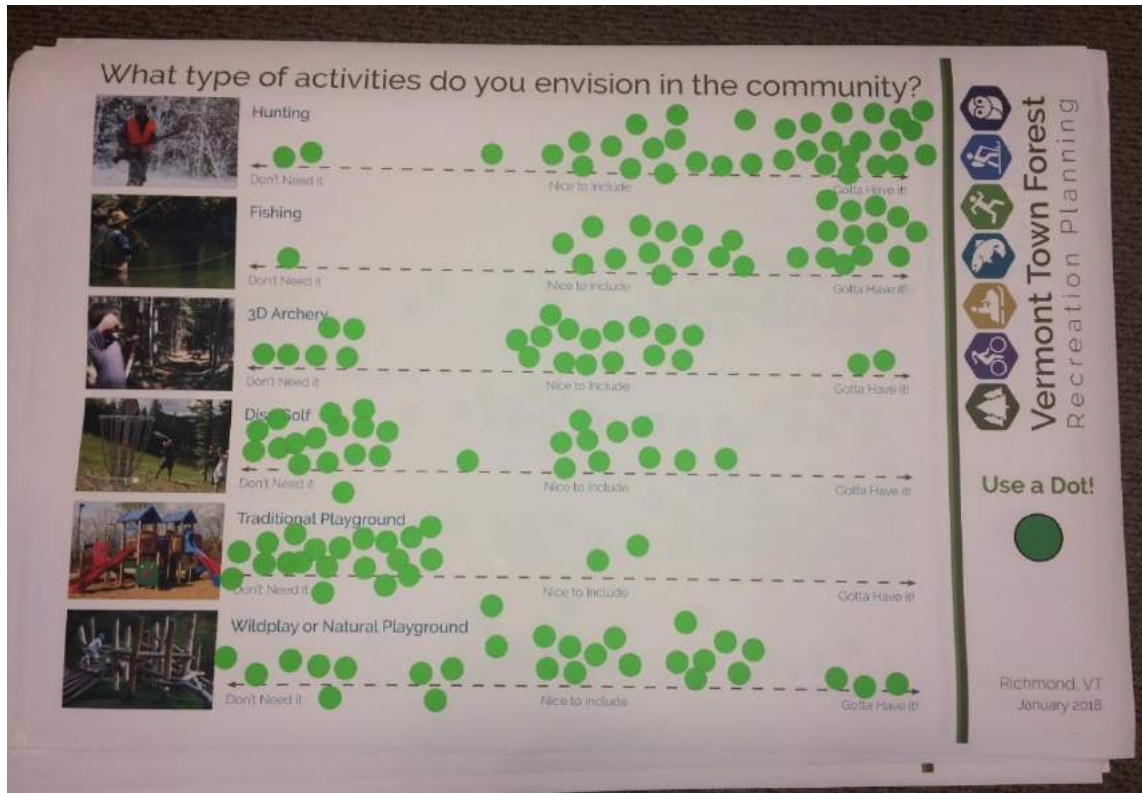
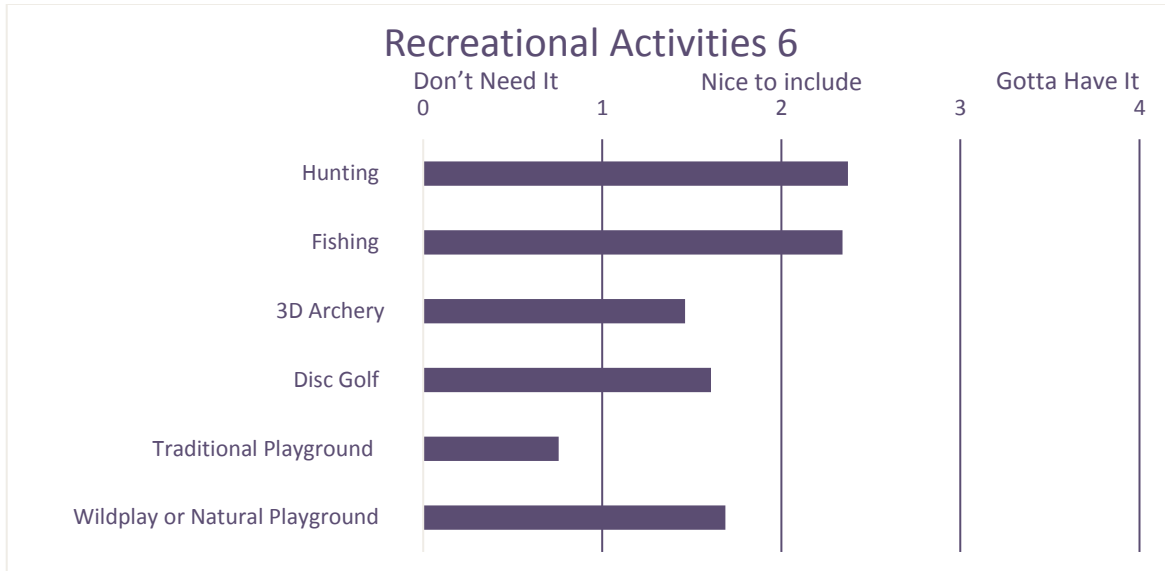
Vermont Town Forest Recreation Planning



Neither set of responses was very supportive of many of the activities and facilities listed here. The workshop participants were fairly supportive of picnic/sunset/views and the survey respondents were more neutral, only slightly supportive. Both survey respondents and workshop participants were slightly less supportive of arts, geocaching, and tent camping, and fairly unsupportive of cabins/huts/lodging and treehouses.



Vermont Town Forest Recreation Planning



The workshop participants and survey respondents were more supportive of hunting and fishing, although the workshop participants significantly more so. The workshop participants were also slightly supportive of 3D archery and wildplay or natural playground, while the survey respondents leaned unsupportive on both those activities. The workshop participants had little support for disc golf, but the survey respondents were more neutral. Neither group was interested in a traditional playground.



Vermont Town Forest

Recreation Planning

Open ended responses to the question “Are there other activities or facilities you would like to see added to our town forest?” included:

- That was quite the list.
- Moto cross course
- Sugaring infrastructure
- Sustainable logging to make it economically sustainable
- Now hunting
- Jeep access
- garden space in agricultural areas; benches along trails and/or stump circles for groups; possibly an amphitheater/ campfire ring; observation platform near a body of water?
- cleared view at high point
- Hiking and hunting or fishing.
- No keep the mechanized vehicles out!!!!
- Restricted use trails: walking only, biking only etc. Or seasonal use specified.
- Elder activities/groups
- I'm in favor of hunting only if it happens in well-defined time periods, so we can all know to keep our kids out of the woods at those points.
- maps and parking
- a bathroom
- More hunting
- composting toilet facilities
- sugaring
- PARKING
- Connectivity to other trail networks
- I would like the land to be as undisturbed as possible.
- The intensity of use needs to be managed more than the type(s) of use.
- as little as possible please !
- Wow, those were a lot of great possible uses!
- the natural playground pictured above is more traditional/sterile than it needs to be--the designated play area could be pretty rustic
- Hiking
- composting toilet?
- Reach the hard to reach demographics in our community. A shuttle? From river view commons or Bolton town
- modest pavilion
- I would like to see minimal facilities there
- This question is not clear. Is this what we would use? Or what we believe is best for the community. Also, it all depends on how the activities are developed. Many of these put together would turn it into too much development but as a stand alone activity/ one playground they would be okay.
- Preservation.




Vermont Town Forest Recreation Planning

- orchard tending
- Nature trail, areas for demonstrations, wilderness preparation courses
- Small shelter for educational and community groups to use for teaching.
- The less the better; wild spaces are good
- Hiking trails with boardwalks and bridges are all that I really hope for!

Other Activities, Programs, and Events
Please write your ideas in the boxes below

What new activity or facility would you like to see added in your community?	What new program would you like to see added in your community?	What new events would you like to see take place in your community?
<p>Learning Lab for Environmental/Climate change. It's what's needed to events we already have.</p> <p>Area of land been developed in earlier in</p> <p>Field sites for field work lessons higher education & continuing higher ed</p> <p>Rec Facility w/ tennis & community pool</p> <p>Outdoor Edge for Children > Support RES & OMS</p> <p>Community education project for Town</p> <p>Plans for bird banding for monitoring tree condition</p> <p>Print 2011</p>	<p>Trails/Multi Programs for youth</p> <p>Rec. Dept</p> <p>Wood for burning from Town Forest</p> <p>ONLINE</p> <p>Urban space</p> <p>Area HOUSED (under house DEPT HORSES)</p> <p>* A trail facilitating long distance non-motorized travel</p> <p>Firewood Coop (community used for firewood)</p>	<p>Outdoor activities in part of open spaces</p> <p>Planned based on seasonal</p> <p>Green Mountain Adventure Fairy House Bikes</p>



Vermont Town Forest
Recreation Planning

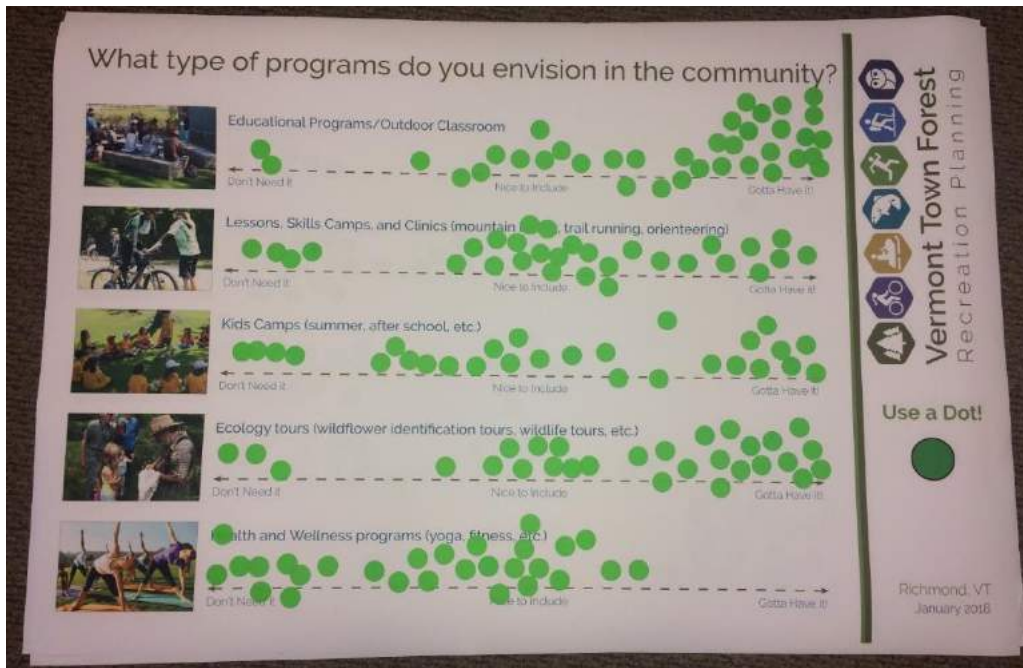
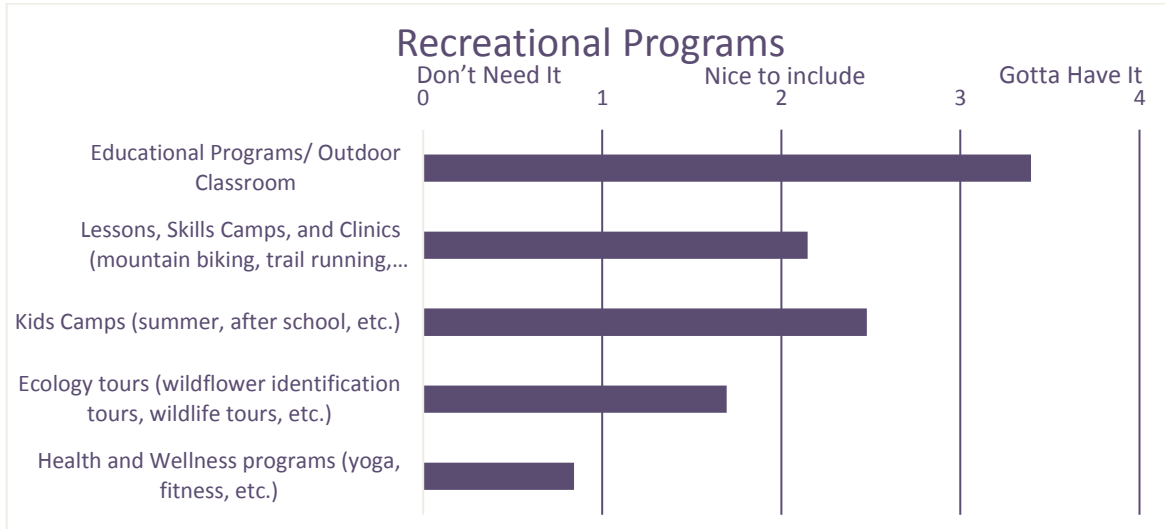
Richmond, VT
January 2018



Vermont Town Forest Recreation Planning

Recreation Programming

Survey respondents and workshop participants were asked about the recreation programs they envisioned in their town forest by indicating their feelings about a number of programs on a spectrum from “Don’t need it” (0) to “Nice to include” (2) to “Gotta have it” (4).



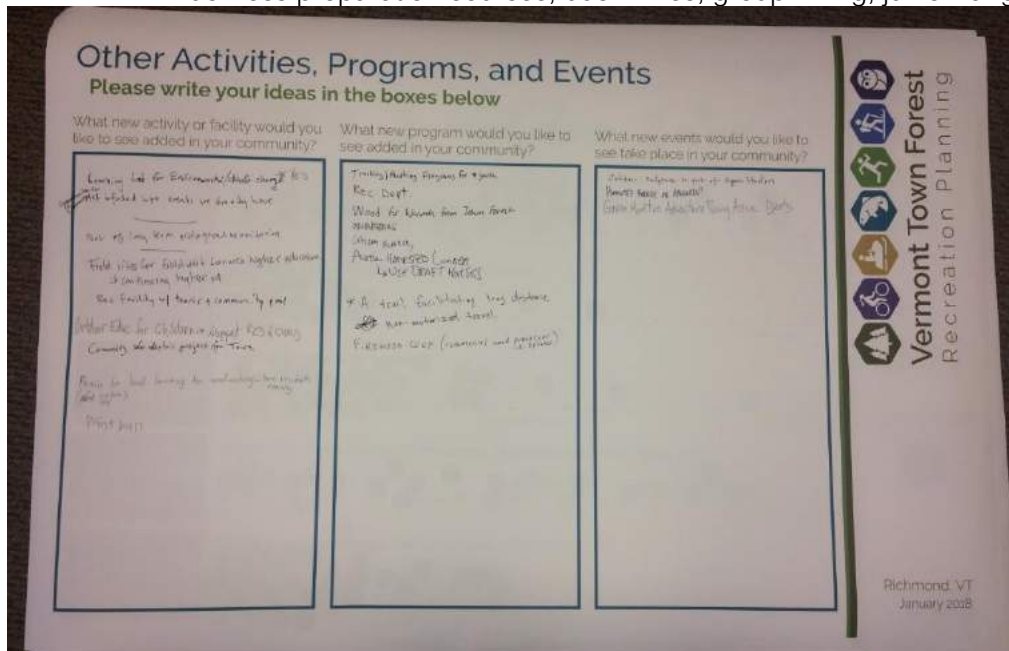
Both survey respondents and workshop participants were very supportive of educational programs/outdoor classroom and slightly supportive of kids camps. The workshop participants were also fairly supportive of ecology tours and lessons, skills camps, and clinics, while the survey respondents were neutral towards lessons and slightly disinterested in ecology tours. Both groups were fairly disinterested in health and wellness programs.



Vermont Town Forest Recreation Planning

Open ended responses to the question “Are there other programs you would like to see added in our Town Forest?” included:

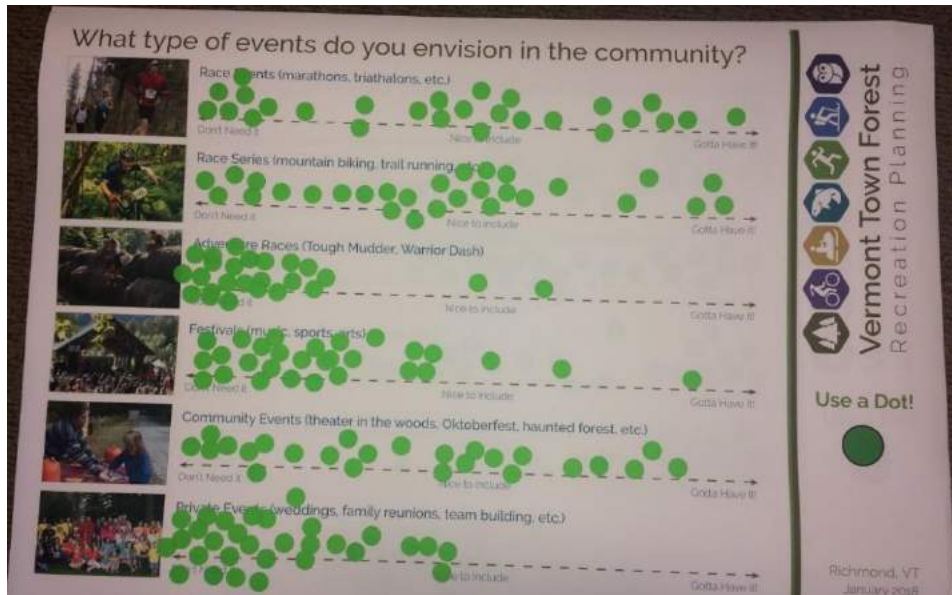
- Landowner forest management
- Leave no Trace, Trail development/maintenance
- Detailed resource mapping project, supervised by a naturalist and involving the public
- Avoid overuse and habitat disturbance.
- I'm open to whatever healthy activities people want to do there, I don't think the town itself has any need to provide "programming."
- Forest mgmt tutorials
- Low impact monitoring climate and biota changes, and concomitant local human activity.
- Group hikes, rides, snowshoes & ski
- Community gardens
- please don't overdo structured activities!
- Moonlight walks or snowshoeing
- Leave the forest alone.
- wildlife ed
- I would like the land to be as undisturbed as possible.
- minerals/geology
- climate awareness
- intro to forest ecology research, rather than just nature walks.
- Teen programs. Geo cache. Mystery adventure. Hunger games (without death) app based adventure. Get teens outside!!!
- Just keep it to things that highlight and maintain the forest's natural beauty
- Preservation.
- Wilderness preparation courses, dusk hikes, group hiking, junior range style programs



Vermont Town Forest Recreation Planning

Events in the Town Forest

Survey respondents and workshop participants were asked about the events they envisioned in their town forest by indicating their feelings about a number of events on a spectrum from “Don’t need it” (0) to “Nice to include” (2) to “Gotta have it” (4).



There was little alignment between the survey respondents and the workshop participants on events. The survey respondents were very supportive of race events and fairly interested in private events as well. Workshop participants were all over the board on race events and expressed little support for private events. They also had little support for adventure races, an event that survey respondents, were somewhat supportive of. The survey respondents expressed little support for community events, while the workshop participants were neutral on the event. There was some alignment over race series and festivals - both groups were roughly neutral on race series and slightly supported festivals.



Vermont Town Forest

Recreation Planning

Open ended responses to the question “Are there other events you would like to see added in our Town Forest?” included:

- No, there is already locals
- Trail work days
- Avoid overuse and habitat disturbance.
- I don't see events as any sort of "need." I'm open to races being held there is someone is going to organize them.
- Forest educational seminars and celebrations
- Make yourself "invisible" training.
- Christmas bird count; Stargazing/Astronomy nights; orienteering course
- No. The events or offerings added should not take away from the public's regular enjoyment of the areas.
- Don't really care for big events. Would rather it stay quite
- I have to use this space to say that "Tough Mudder" and "Warrior Dash" are obstacle races. Adventure racing uses nature as the challenge, not man-made mud pits.
- I don't want any activities or events in the forest!
- I would like the land to be as undisturbed as possible.
- I love events.. but love my forests undisturbed
- No, I would like to see the human activities balanced with preserving undisturbed habitat for wildlife
- I'm not answering most of these b.c they all seem a bit over the top--i'm not really sure i see all this kind of thing in that space--esp w/ the pictures offered....i picture this more like a place to go hiking and birdwatching or something, not big bandshells and things, but I'm open to how it evolves as long as it doesn't impact the value for wildlife and conservation
- Outdoor, family-oriented, picnic, early evening concerts
- Please contact "come alive outside" bring here. Working in Rutland and Addison. No need to reinvent the wheel. Can also work with RiseVT
- Please no races
- Again, depends on what this all looks like.
- Preservation.
- Regular monthly get together style events, non-American holiday celebrations such as Chinese New Year and Day of the Dead celebrations to broaden horizons, seasonal




Vermont Town Forest Recreation Planning

events such as sugar on the snow, star gazing during meteor showers, winter carnival and Richmond Days Celebration

- Possibly weddings if they help raise funds

Other Activities, Programs, and Events
Please write your ideas in the boxes below

What new activity or facility would you like to see added in your community?	What new program would you like to see added in your community?	What new events would you like to see take place in your community?
<p>Learning Lab for Environmental/Climate change 10's of 1000's of people what's added into events we already have</p> <p>Trail of Ten been established in northern</p> <p>Field sites for field work courses higher education & continuing higher ed</p> <p>Rec Facility w/ tennis & community pool</p> <p>Outdoor Educ for children > support RES & OAS Community & electric projects for Town</p> <p>Praxis for local learning for manufacturing & other products (see 2/2/18)</p> <p>Praxis hall</p>	<p>Training/Marketing Programs for youth Rec. Dept</p> <p>Wood for kinderg from Town Forest on-site Urban square</p> <p>Area Housed (Lumber Large DRAFT HORSES)</p> <p>* A trail facilitating long distance non-motorized travel</p> <p>Firewood Coop (community used firewood)</p>	<p>Outdoor activities in part of open spaces Planned (see in manual) Green Mountain Adventure Trail/Access Bikes</p>



Vermont Town Forest
Recreation Planning

Richmond, VT
January 2018



Vermont Town Forest

Recreation Planning

Final Thoughts

Open ended responses to the question “Are there any other thoughts, concerns, or comments you'd like share about our town forest or outdoor recreation in our community?” included:

- The back side (north) of property includes a gorgeously rich and beautiful area that would lose its magic if trails were built here. Best to leave it only for sporadic access.
- this property lends itself to some events while other events are not suitable like weddings, races...There are other places in town which could facilitate these other kind of events.
- We need to remember that our Town Forest is a forest, not a park, and is being protected as a forest through the vision and generosity of the Andrews Family. It's also a functioning part of a larger, miraculously still-intact, and state-recognized forest block. Developing it for high-volume and high-impact human uses will degrade its many natural functions, chip away at the integrity of the forest block of which it is a part, and make it only more difficult for the public to enjoy the ecological, educational and aesthetic benefits we invested in.
- I think the town forest and specifically mountain bike and running trails could make Richmond an amazing destination for New Englanders and a great place for Richmond residents to enjoy life and the outdoors on a daily basis
- This survey contains a lot of great ideas that, while seemingly are a lot of fun, simply do not seem feasible for our small community in Richmond. I would be wary of placing too much stock in positive survey responses like "fairy houses" and ecological tours and stay focused on activities more suited to something like the Hinesburg town Forest. This is a much more cost effective approach.
- Let's not over do it. manage for natural habitat and wildlife preservation with limited public access. Then leave it alone.
- Do not need more commercial activities. Leave land as natural with minimal amenities. Like hinesburg town forest.
- Richmond currently has an abundance of trails, event venues, parks and programs. This land currently provides a valuable backcountry experience and important wildlife habitat. Planners should take a broad view of existing assets in town and surrounding lands, e.g. Cochran trails, river trail, etc before considering additional trail and infrastructure development. Minimally developed and disturbed forests are rapidly shrinking in Chittenden Co., and overuse will affect our children's opportunities to experience the unique qualities of the backcountry.
- I see the town forest as a primarily a recreation asset that will both increase the quality of life for residents but will also attract visitors who will spend money in Richmond and help keep our collection of fancy little bakeries, beer halls, etc, in business. I'm strongly



Vermont Town Forest

Recreation Planning

opposed to motorized use, but have no problem with mountain bikes. I would recommend, even, that some trails be developed only for hikers and runners and some trails be mixed use to prevent conflict. A world class "natural playground" would be really cool as well and would attract a different demographic. I think that conservation and recreation goals are very compatible on this parcel.

- This shouldn't be just for the tree huggers and trust funders! Make sure it's open to ALL citizens.
- Preserve the wildlife, migrating birds, bats and life that needs help to sustain it's offspring in the future.
- Developing, monitoring and constantly updating the mgmt plan should be done with maximum transparency and participation.
- My wish for this forested space is that it is left largely undisturbed. Personally, I think that forests are best left untarnished by human meddling. We already have enough infrastructure and entertainment in every other aspect of our lives, why not let the character of a place shine through, without our chiseled hands.
- No mountain biking
- For the love of God, keep ATVs out
- I believe that the trails for bikes and walker/hikers should be separate, but all should link up with adjoining trail systems.
- Enjoy the forest for what it is not for what you want it to be
- Most recreation should remain in other locations such as Volunteers Green. As a neighbor of the forest, I can jog to and through it, so I appreciate that more distal town residents who support the forest should be able to visit and appreciate it in person. But the fewer the visitors and the lower the impact, the better.
- Love the resource, the intent and the open discussion! Thanks for all your hard work on this
- That it continue to be managed by our town and not an outside source.
- Linking up the forest to Richmond village with a bike path and walking trail off Route 2
- Renewable energy is important to the Town. So Biomass (wood chip) from sustainable logging; also consider solar array on already open land (e.g. old gravel excavation area)
- Maintain the natural state of the forest.
- It needs parking!
- My vision is to leave the forest largely undeveloped - allowing it to be used without building things or changing things significantly, while preserving the natural habitat. I LOVE the idea of cutting some glades for backcountry skiing (assuming the elevation change and pitch would be good for skiing), and that could tie into timber harvesting.



Vermont Town Forest

Recreation Planning

Not interested in it being used much for formal events/programs (though I support it being used for educational opportunities.)

- On a large tract of land there is room for everyone. Section out places for walkers, bikers, and motorized access. With planning, one group may never come into contact with another.
- I'm looking forward to learn more about the town forest and the community's hopes for this use and management of this space into the future.
- More hike/bike trails the better! Grooming for skiing/fat biking!
- Hunting and trapping would seriously limit community use of the forest due to concerns about safety. I feel strongly about banning them.
- Personally, I would like to see the town forest stay as pristine as possible. We have plenty of outdoor recreation opportunities in this area so there is no need to rush in to developing this parcel for things like zip lines and treehouses.
- Hunting access needs to be a priority for any town forest in Vermont.
- Connectedness of trails to the Sunshine and VYCC trails is very important. I see this as a great opportunity to connect some existing adjacent trails into one low-impact network, and still be able to set aside much of the space as habitat that is not directly influenced by humans.
- No trapping at all if there is hunting allowed.
- It should be open to ALL uses as tax payers represent all the outdoor groups. Including hunting. some trails should be multi use including bikes. Some trails foot traffic only. VAST should be welcome. I will not support future taxpayer funding if I feel some are being left out. Timber harvesting with mechanical skidding should be allowed.
- Keep the land natural and don't attract crowds, don't allow mechanized vehicles or guns. NO pets.
- I am wondering what kind of oversight is planned? Also, there are many pie-in-the-sky dreams being floated, but realistically what sort of budget is provided with which to provide these wonderful beneficial offerings? Thank you!
- I would like to see a trail network that is low-impact on the environment and leaves plenty of space for habitat.
- It should be as accessible to the public as possible, however, organized events still need to have some sort of Town permission and we need a mechanism to close part, or all, of the Town Forest on a temporary basis for legitimate reasons
- I would like to see multiple use including habitat improvement and small game hunting as well as deer hunting.
- I envision lots of trails for locals to use. I don't want a lot of lodging or events to attract tourists and it be too crowded or unpleasant for locals to enjoy.



Vermont Town Forest

Recreation Planning

- Forest should be a place for individuals or small groups. Should balance activities against the impact they have on the forest and allow activities that will not exacerbate the decline of the quality of the habitat or landscape.
- Really excited for this, think it should be left as natural as possible. Maybe a few trails but mostly just nature how it is meant to be enjoyed, completely left alone and natural. Should be open to almost all rec activities.
- Seeing "Tough Mudder" listed as an adventure race on the last page of the survey has me worried, because I fear that green mountain adventure racing will be lumped in with that type of "extreme sport" and dismissed out of hand. Our adventures are like a long day outside where people hike/bike/swim/climb/paddle together with friends. There are no mud pits and crawling under barbed wire - it's primarily a day in nature with a map & compass, and we always look for interesting public outdoor spaces that we can explore and share. Hopefully we get a chance to do some of that in the town forest!
- Would love to see active forest management done well so public understands the importance
- Walking trails might be separate from mountain bike trails as bike trails are hard to walk on and bikes appear suddenly. Hunting should be allowed during deer season. Trails for bikes and walking should connect with trails on adjacent properties.
- regarding hunting and trapping: During hunting seasons there is no place in town to safely walk off road. And walking on the roads is dangerous too, especially with children. So if not the Town Forest, I would like to have some forest area in Richmond that prohibits hunting and trapping.
- Please no mountain biking. They make a mess and destroy habitat.
- Thank you
- Why was the list of possible communities I live in include some that are very far away from Richmond? For example, Hartwick was listed - why? Do people in Hartwick really drive to Richmond for a town forest and get a say in how our tax dollars are spent? The Richmond community tax base CAN NOT support investment in forest developing. Our taxes are TOO high and have increased entirely too much in recent years. STOP the nonsense; do not develop the forest; leave it alone! Leave us alone!
- Snow machines in winter OK; otherwise no ongoing mechanized noise. Dirt bike trails need to be separated from walking trails. Avoid commercialization of recreation activities
- be inclusive to all types of outdoor recreation in a timber managed forest
- It would be nice to have a covered area with bathroom facilities that could be reserved (rented?) for special events such as plein air painting, etc.



Vermont Town Forest

Recreation Planning

- Town forests are great. They should not take resources from the rest of the budget as they are capable of generating revenue. Do not treat our town forest as a wilderness as bio diversity is essential. Do not build fixed infrastructure in our town forest.
- Need to carefully consider access and parking availability. This will make or break the ability to use the resource.
- This will be a great asset to our town. Thank you all on the committee for putting in the work for this.
- The forest is a bountiful nature area which I'd like to see remain as a core aspect of the forest. Human intrusion will impact the natural corridor that exists today allowing animals to pass relatively free from Richmond to Bolton to Waterbury and beyond.
- Communication about accessibility will be key. I wouldn't know where to go to access it at this point.
- Designated parking areas - I live near a RLT property now and it's a nightmare - no respect is given to adjacent landowners. Who is going to pay for the recreational facilities should they be voted in? What about Plowing? Trash removal? Occasional police patrols? Enforcement of leash law (yeah, right!) General upkeep? We have a public bike path/trail in place now and people still run and bike on the main roadways - will providing an additional venue for these activities make any difference? Probably not. I can't keep on paying for these pie-in-the-sky ideas through my tax dollars to fund this type of thing. If we at least let a college forestry program do some sustainable logging, it may help off-set the cost of some of this and they'd learn a valuable skill set. It still does not answer the issue of stewardship - or lack thereof - as we have seen in other projects in town. Volunteer's Green/trail is covered in dog poop; the canoe access parking lot has bottles and trash in it; people park dangerously on roadsides or on private land to access RLT holdings ... there is no accountability here, for any of it. It's imperative that a plan is in place to deal with these issues BEFORE a project is in place. If you build it, they will come . . . which includes many who are not vested in Richmond and it will bother them not what they leave behind.
- I believe the forest should be preserved and left natural if at all possible. We don't need more open disturbed spaces, we need ecosystem services provided by forests
- 1. Could have done a good deal better with some of the questions. 2. Where is the should not do as an answer
- We have too much. Need to have more development to bring in tax dollars
- Great to have the forest in our town!
- Provide access with parking.
- I am most interested in preserving the wildlife that lives in the forest.
- Thank you for putting together this project and pulling together this survey. Hope my responses and others will be helpful/



Vermont Town Forest

Recreation Planning

- Make the forest accessible and balance that access with a firm commitment to allowing natural communities to flourish in an undisturbed manner.
- thank you for being good stewards !
- I am excited about our forest and look forward to having this beautiful natural space as a way for people to enjoy nature and each other. I hope it provides a community gathering place where our residents can connect with one another - or find solace alone. Either way, I'd like this forest to provide an even stronger sense of community and support for Richmond residents.
- Yes. I feel passionately that there should not be hunting or trapping (of any animal with any type of weapon) permitted in the town forest. (1.) If top animal predators are allowed to exist there, wildlife populations will take care of themselves, with rises and declines in a natural cycle as has been happening for millennia. (2.) Autumn in Vermont is especially wonderful. I would so love to have an area where I could enjoy the forest (during Fall but all the time) without fear of me or my dog getting accidentally injured by a hunter's weapon. This is extremely important to me, so thank you very much for allowing me to share my thoughts on this matter. Thank you also to all of you who are contributing your time and efforts to so carefully planning the use of this land.
- Maintaining/upgrading existing trails could be all that is needed to make the land more accessible for the time being.
- I know that mountain bicycling is envisioned, however, I think the number of trails should be seriously limited. The focus for the new town forest should be on conservation and some trails for hiking (but even those should be limited.) Parking -- there will need to be enough parking at the entrance to the town forest. I believe the forest will be used extensively (with its proximity to Burlington etc.) and there will need to be parking. Thank you for the opportunity to comment.
- Keep it simple and sustainable. "Quiet" recreation. Logging when needed and educational opportunities for all ages.
- I think a well maintained trail system rugged and possible gravel as well should be a priority I also feel that animals should be on lease on these shared trails- many people let their dogs off lease and there should be a designated area for this but those without dogs should not have to be approached by animals that they are unfamiliar with.
- I know there will be strong pressure for motorized vehicles but they are simply too damaging to the environment and the noise affects wildlife and other human activities. There also should be sensitivity to seasonal conditions, such as mud season, when some activities, such as hiking and biking, should be suspended to avoid damaging habitat and trails.
- This is so exciting!



Vermont Town Forest

Recreation Planning

- Whatever trails are constructed, I'd like to see multi-use (foot, horse, bicycle, limited snowmobile) prioritized. Thanks for the opportunity to weigh in!
- Hope that over the decades, the carbon content of the forest can increase (we should always keep trying to sequester carbon.) I don't hunt but support it as a use: a native American and European traditional use. Thanks!
- This is a key parcel of land for the town, that the town helped fund and it would be great to work to link trails on the property to other existing and proposed trails to create a ring from the village center to the town forest, over through VYCC and over to the Jonesville Bridge and then to the River Trail. I think this would be a great and noteworthy accomplishment which would allow many residents and visitors to hop on at various points and be able to recreate more (and possibly drive less)
- potential conflict(s) between those who want peace, tranquility, and simply a place to enjoy nature within forest and activities such as hunting and fast mountain biking are probably under-rated and will need to be addressed; Also, please make sure that 'exploding targets' are explicitly banned from use in Town Forest
- Please keep the trails and uses simple. Protect its wildness; safeguard the natural habitats for animals and birds while creating trails for walking, running, snowshoeing, skiing. We have a playground with plastic accoutrements, a bandstand, and space to picnic; it would be great to ensure that this town forest is a space free of non natural materials and motorized recreation or "tracks".
- I think any human activities should be carefully planned so as not to interfere with or disturb the vital natural habitats.
- Lets try to keep the motorized vehicles out of the forest - they do not add to peace and tranquility, not support wild life habitat. If we allow mountain and fat bikes, lets keep them separate from hikers - their speed does not pair well with families out to enjoy nature with their children (especially small ones) and dogs
- I am concerned about bikes on the trails. Other town trails that have bikes have serious erosion problems. The steepness of this parcel makes me think that bikes would not be appropriate due to erosion issues.
- The more access people have to the outdoors, the more exercise they will get right here in our town and in my opinion the happier the people of this town will be. Exercise makes you feel great!
- I would strongly prefer NO motorized sports/vehicles. I would strongly prefer NO hunting (thus allowing the community to use it safely year round. There are not many safe options for similar activities during hunting season)
- I think we should promote recreation but not hold any races here; keep the wear and tear to a minimum. People will likely use this spot a lot, we don't need to advertise or push its use. Also, please be wary about mountain bike overuse. I am a mountain biker



Vermont Town Forest

Recreation Planning

so I believe we should put in some trails there. Unfortunately, mountain bikers have often leaned towards higher quantities of trails than quality of trails. Also, biking wears out trails much more quickly, especially those that are not as well built. Mountain bikers have a propensity to build trails first and ask permission later and I can really see this causing tension in the Town Forest. If you want to maintain a good balance between recreational use and environmental conservation, you need to be very careful and thoughtful about how you lay out the trails. I recommend areas with no trails allowed at all and an intentional process of both planning the trails and making sure that more are not built than have been planned.

- I just think it will be a great resource for residents of this community. Let me know how I can help
- Want simple and natural construction, blends in and does not stand out.
- That there is always clear communication of the importance and purpose of, and the criteria to be followed in this precious corridor.
- I have heard several comments about have a walking/bike path connecting the village to the Richmond Town Forest.
- Protecting the natural resources and serenity of the forest, while encouraging appropriate use It's a great resource -- let's honor it!
- Preservation as much as possible with no mountain biking, rogue pedestrian trails, or dogs allowed. I have seen way too much damage/dominance/disrespect in other town/city parks or natural areas from the above activities to the point where other folks refuse to visit anymore. They are completely unable to enjoy nature for itself.
- Firearm use should either not be allowed or only allowed in certain areas at certain times and automatic and semiautomatic weapons should never be allowed. Obviously this would be hard to police, but should be part of a policy to protect town forest users. There are thousands of acres of other land in Richmond open to hunting.
- Gazebo and amphitheater
- Great project! Thanks for doing the work!
- Keep it natural
- Please do not disturb wildlife for our own recreation and enjoyment....they have more rights over the land than we do!!! Not fair for us to barge into their home for our own pleasure.
- I'd like to see this forest used to raise appreciation for wild spaces, and not as a giant outdoor playground.
- I don't think this survey is really appropriate for this town forest. I think we need to keep the forest natural and not be building trails and walkways and structures and buildings. I



Vermont Town Forest

Recreation Planning

like the idea of keeping it more like the Mobbs land in Jericho for hiking and snowshoeing and maybe mountain biking.

- Please keep it open for all to use....
- We would like to see this resource managed as a wild place, as much as possible. No noisy messy human activities, no off-leash dogs. Come peacefully and ready to observe and enjoy nature. No motorized off road vehicles, no building of structures and paved areas. Yes to self-guided tour trails.
- Biggest concern is parking access as that is problematic for other trail heads in Richmond

Notes

Forest Walk

- Lots of old logging roads throughout the property
- Claimed no user group conflicts (including with mountain bikers) in the area
- Very steep topography including large hill as you enter the property from Route 2
- VYCC has an adjacent campus and wants to build trails (probably willing to at a reduced rate to create connections)
- Maplewind farm uses some of the land as cow grazing (not many days a year but would need to accommodate)
- Proposed additional parking area for school buses just a little further east on Route 2 (all hypothetical, sort of in talks about buying it)
- Huge powerline through the area – possible spraying of herbicides
- Concerns the area will become a mountain bike park (too hilly for that)
- Possible connections with other nearby properties (Sunshine) or trails across route 2
- Sense of positive relations with landowners and community spirit (willing to pitch in to help with the property)
- Richmond known as a place for trails – lots of UVM students come down and enjoy
- Conflict over whether to build new trails in the area – one steering committee member sees these logging roads and trails as enough human designs on the landscapes. Others want trails built for recreation, doesn't see those logging roads as trails
- Possible great views from the tops of hills throughout the property
- VAST snowmobile trail through the parcel, access has been lost
- Popular area for deer hunting but not a ton of animals that live there
- Saw this land purchase as an opportunity to own the land, not based on experiences with other town's forests



Vermont Town Forest

Recreation Planning

Steering Committee Meeting

- Larger Questions
 - Want to define recreation – what does it mean? What counts?
 - How do we figure out our role as the steering committee? One vote, one person?
 - How do we insert ourselves to make those decisions?
 - How do we account for the people who do and don't show up to meetings fairly?
 - How do we balance conflicting uses?
- What's on the land
 - Realizing there's a lot they don't know about the land, more studies, drone?
 - Lots of existing logging roads and trails – should inventory, possibly don't need new trails
 - Maplewind farm's use – should look towards long term agreement with them
- What they want on the land
 - Interested in guidance about how to build trails around wildlife
 - Willingness to incorporate trails as long as it is sworn that trails can be moved
 - Potentially interested in cultural history signage but more interested in agricultural history
 - Questions to ponder: Hut or Cabin? Portal? Parking? Multiple Entrances? Sensitive Areas? Balance with agricultural uses? Gates?
 - Discussion about whether they should discuss different types of hunting, biking etc (trapping vs. different types of animal hunting)
 - Minimal educational use of the land (a little bit of agricultural ed) but there are a lot more opportunities
 - VYCC, birdwalks, invasives, school programs
 - School programs as way of fostering attachment to land/nature
- Structure of the Forest Management Plan
 - Want the Forest Management Plan to be a living document, reflect changes in the forest as it grows
 - Interested in separating out descriptions and management through the document
 - Unsure of whether recreation section should be separate from Forest Management Plan but want there to be unity between them and have them able to be revised separately
 - Want to define overall goals/vision at the beginning of the Forest Management Plan
 - The codependence and relations with neighbors needs to be built into the plan
 - Want provisions about e-bikes
 - Conservation section of document as the summary of the easement
 - Should have section on the powerlines, need to work with them too
 - Discussion of overall practices/ethics (i.e. stewardship), some enforcement mechanism
 - Put provisions in management plan for things to exclude beyond easement (Haunted Forest)
 - Town Plan review on 8 year cycle – should place the revision on opposite cycle
 - Drew counseled against putting forest management plan on set time frame



Vermont Town Forest

Recreation Planning

- Other
 - Want evening meetings
 - Have seen a lot of community compliance around trail closures etc.
 - Should be in talks with other forests for ideas
 - Interested in reaching all the various groups – excited about stakeholder interviews

Comment Cards

#1 - I think you will have trouble interpreting the data because of the breadth of questions, eg. How do we answer questions regarding services/features we already have? “Less Important” because they already exist? “Most important” only if we want more or “most important” if we just value what we already have the most? Good luck with it – great turnout and efforts!

#2 - Consider Green Mountain Adventure Racing

#3 -I would like to see the town follow the VLT easement as far as allowing traditional land uses to continue. Hunting, Trapping, Fishing. Keeping this land open to ALL PUBLIC, not just dogwalkers and non-consumptive uses. Trapping is an important management tool. It takes place on ALL state owned land along with the rest of the public use.

#4 - Add X-terra off road triathlon

#5 - (comes with map and image) Possible site for solar array on the property. Old gravel pit as used for I-89 construction. Enclosed area c. 3500 m², 35,000 ft². Track distance to road c. 1350 feet. Could be a problem (cost of cable to Route 2). Probably minimal need to cut trees to get winter sun exposure. Suggested by Ian Stokes istokes@gmavt.net



Richmond Town Forest **Interim Management Plan**



Photo Credit Olivia Wolf

Richmond, Vermont
March, 2018

Prepared by the
Richmond Town Forest Steering Committee

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Goals of the Interim Management Plan

Overview: The Richmond community has decided to purchase a parcel of land from the Andrews Family that will be converted from private ownership to a public town forest. The goal of the Town Forest Steering Committee, in drafting this interim plan, is to allow the planning process to work with as many options as possible to develop a well-informed, well-balanced product. The full Town Forest Management Plan will be the product of considerable effort to gauge public opinion, study the land's natural and social history, and carefully balance the town's expressed interests in conservation, recreation, education, agriculture and forestry.

Preparing for management of the Andrews parcel by the town involves discovering and engaging with the current activities on the land. This Interim Management Plan (IMP) for the Richmond Town Forest property (RTF), outlines the known activities and processes that are of ongoing concern and interest to the town, and provides a set of interim allowances and restrictions to be in effect during the short period of time between purchase of the land and implementation of the full management plan. These allowed activities and restrictions are intended to provide "breathing room" for the development of an effective full management plan.

This and subsequent plans are intended to inform partner organizations, including the Vermont Land Trust and the Vermont Housing & Conservation Board, who will co-hold a Conservation Easement on the property. Town Forest management plans also provide guidance to contractors and volunteers (if any) who will conduct on-the-ground management activities, in accordance with the restrictions in the conservation easement. The final conservation easement and map will be included as Appendix A of this document at the time of closing.

Full Plan Development: As part of a grant through the Vermont Urban and Community Forest Program, the Town will be working with SE Group and Arrowwood Environmental to engage the broad community to create the first full Management Plan. Grant funding through the Federal Community Forest Program requires that a town forest management plan be completed within four months of the Town's purchase of the property. However, Neal Bungard, the regional coordinator for this federal program with the US Fish and Wildlife Service, has indicated that the grant opportunity through the Vermont Urban and Community Forest Program would warrant leniency on that deadline. The plan developed through this facilitated process shall be completed by year end of 2018.

Timeframe: The IMP is to remain in effect only while the full management plan is in development, a six-to nine-month long process expected to be completed by October 2018, though no later than December 31, 2018. This IMP will then sunset as the town transitions to the formal Town Forest Management Plan.

Property Description

The Richmond Town Forest is a 428-acre forested parcel just outside of Richmond Village in Chittenden County. The property itself is a diverse forestland with two small meadows. It has an abundance of hard-mast stands, predominantly oak and beech that are important food sources for a multitude of wildlife. The forest includes several patches of Dry Oak Forest, an uncommon natural community in Vermont. Protection of this community will help benefit biodiversity on a statewide level. With its pockets of dense hemlock, its low elevation and southerly aspect, the property serves as a heavily used winter deer yard. According to the Vermont Department of Fish and Wildlife, the RTF property is located in a larger swath of contiguous forestland that is ranked in the top 3% of Vermont's wildlife habitat blocks.



Hemlock stand on Richmond Town Forest.

The property is one of eight large parcels that inspired the Chittenden County Uplands Conservation Project (CCUCP). The CCUCP is a landscape-scale conservation effort with over a dozen partners working to conserve ecologically and culturally important forest blocks, habitat connectors and other land between and alongside Camel's Hump State Park and Mt. Mansfield State Forest. The property abuts adjacent conserved land totaling more than 5,000 acres that connect to Mt. Mansfield State Forest, itself comprising 44,444 acres, helping to create a critical wildlife corridor on a statewide scale.

There are several headwater streams on the property that flow into the Winooski River and then to Lake Champlain. The property also includes a small beaver pond and wetland and at least two vernal pools. Conservation of the contiguous forestland around these surface waters will protect water quality and avoid any increases in surface-water runoff, degradation of water quality, or flooding risks associated with potential development or poor management. It will also safeguard year-around habitat for species living near and breeding in these water bodies.

The property has a network of existing logging roads and the potential for the development of trails specifically designed for a variety of uses. There is an existing VAST Trail running through the property, and the land has the potential to connect to existing trails on neighboring properties. There are existing hiking trails on the Vermont Youth Conservation Corps (VYCC) property to the east, and a public multi-use trail was recently



Community site walk on the RTF.

developed on privately-owned land abutting the RTF to the northwest that connects to Browns Trace Road and the Old Jericho Road Trail in Richmond's Southview neighborhood.. The Andrews Forestland has been actively managed for timber under professionally-developed forest management plans, and the productive forestland has the potential to provide timber and forest products into the future. The western portion of the property has seen the most recent forest management, with harvests has recently as four years ago.

Town Forest Objectives

The Richmond Town Forest has the potential to benefit the local community for many years to come.

This forested parcel will make many natural contributions to our town:

- Provide outdoor recreational and educational opportunities.
- Protect critical wildlife habitat and natural areas.
- Support the Town's working landscape and land-based economy.
- Maintain the area's scenic and rural character.
- Protect water quality in the Lake Champlain Basin.

In general, the chance to explore the property and be directly involved in its management will strengthen the community's connection to its natural and cultural history.

The Richmond community will continue to work through a public process to finalize the objectives of the RTF. In 2017 Richmond voted to approve a proposal to use some of Richmond's Conservation Reserve Funds towards the purchase of the Andrews Forestland. In 2016 and 2017, prior to that vote, the town's residents were asked how they would like use town forest lands through public meetings and a survey. At that time residents expressed interest in a wide diversity of objectives, including:

- Wildlife habitat protection
- Outdoor recreation and trail connections
- Natural area protection and enjoyment
- Outdoor education
- Water quality protection
- Economic and social benefits
- Sustainable forest management
- Scenic landscape protection

The local community has also articulated a desire for an ongoing balance among these diverse objectives, uses, and community benefits of the RTF.

Management and oversight of the RTF

During the period covered by this Interim Management Plan, management decisions for the RTF will be made by the Richmond Selectboard with guidance and on-the-ground management within the bounds of this Interim Management Plan by the Richmond Conservation Commission in consultation with an interim Town Forest Steering Committee. During the interim period, the Town



Moose sign on the property.

will create a permanent Town Forest Committee to provide ongoing recommendations and on-the-ground management within the bounds of the full Management Plan. Management Plans shall be consistent with the conservation easement and will be reviewed and approved by the Vermont Land Trust stewardship staff and by the Vermont Housing and Conservation Board.

Protection of wildlife habitat and natural areas.

In response to a survey about whether the Town of Richmond should purchase the Andrews Forestland as a town forest, wildlife habitat protection was the most often listed interest of respondents related to the opportunity. Significant information regarding wildlife habitat exists through work completed in the Chittenden County Uplands Conservation Project area and through statewide priority mapping of wildlife blocks. Information on some of the property's natural communities and sensitive features exist from previous work for Vermont's Natural Heritage Program and a four-town, science-to-action, resource inventory completed by Arrowwood Environmental. Allaire Diamond, an ecologist from Vermont Land Trust, has collected and mapped information on uncommon natural communities and sensitive areas on the property in the Ecological Report included here as Appendix B. Audubon Vermont conducted a forest bird habitat assessment on the property in July of 2017 and reported its findings in November, 2017 (Appendix C). The community can draw on this existing information for ongoing management considerations for wildlife habitat and can consult specialists for additional input, such as the Chittenden County Forester, Vermont Fish and Wildlife Department, and Keeping Track.

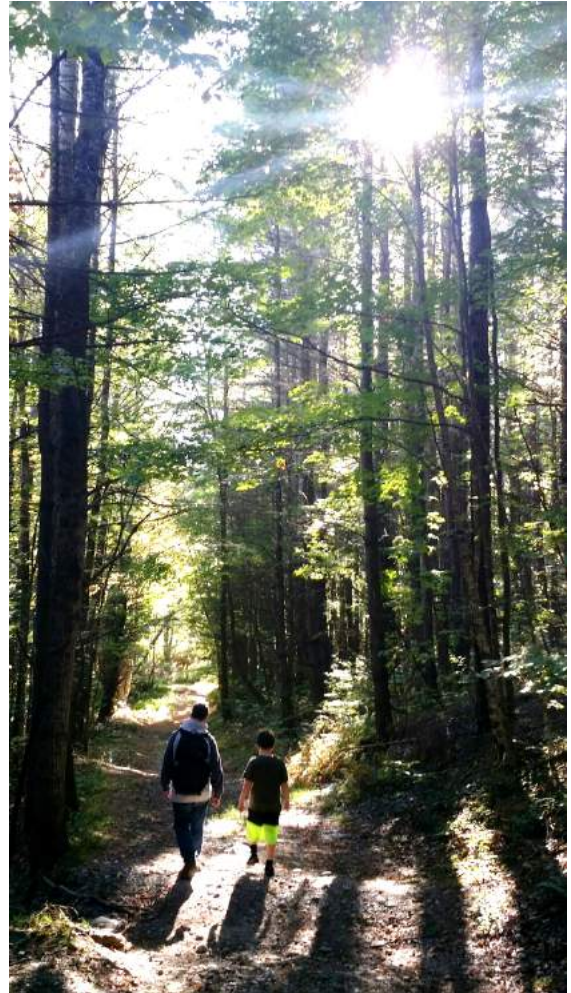
The conservation easement protecting the property describes several areas of the property that are uncommon or particularly sensitive, and therefore require special treatment. Natural communities that are uncommon or rare in Vermont will be managed in a more sensitive manner to allow communities that contribute to statewide biodiversity to persist into the future. Areas around wetlands and streams will also be managed in accordance with the limitations of the conservation easement to protect water quality and aquatic habitat. Further on-the-ground assessments may reveal additional sensitive areas for plants and wildlife.

Outdoor Recreation and Trail Connections.

Interest in trails and outdoor recreational opportunities were also some of the most frequently articulated sentiments by Richmond residents responding to a survey about whether the Town of Richmond should purchase the Andrews Forestland as a town forest. The Town of Richmond has developed a significant trail network around the village, and public trails exist on the western and eastern sides of the new Richmond Town Forest (see map in Appendix A).

A VAST trail crosses the property and has been used for snowmobiling and other winter uses. The VAST trail is not being maintained this winter because of issues of trail connectivity elsewhere, but VAST is interested in continuing to route the trail over the Richmond Town Forest going forward, if possible. The property has a network of old logging roads and one primary farm road, but otherwise the land does not have any other formal, existing trails. The property has also been used by local hunters, and many in the community have voiced an interest in allowing their use to continue in the future.

The property will be assessed for potential new trails and the most appropriate recreational uses. Trail management in Vermont town forests is often done by volunteers, a non-profit trail partner, through funded grant opportunities, or some combination of all these methods. Richmond, and this property in particular, has the unique benefit of being adjacent to VYCC headquarters, providing opportunities for mutually-beneficial partnerships on recreational and educational management. Members of the Town Forest Steering Committee, the Conservation Commission, and the Trails Committee have consulted with VYCC in several meetings, and there will likely be possibilities for collaborative trail planning, design, construction, and maintenance. Richmond Trails Committee, which is a Town committee, would likely take the lead on any trails in the new Richmond Town Forest. The recently formed Richmond Mountain Trails may play a supporting role in trail design and construction.



Forest road on Richmond Town Forest.

The Town will inventory the existing logging road network and evaluate their use as recreational paths. ***During the period covered by this interim plan, the Town may close roads, except to those who have a legal right-of-way on the roads, during mud season and/or if there is evidence or concern of resource impact in particular locations. The Town may mitigate and/or repair stormwater and erosion damage on logging roads, excluding installation of permanent infrastructure, to protect natural resources and water quality.***

Permitted Recreational Uses During Interim Period:

Future allowed uses of the RTF will ultimately be determined by the community in an on-going public process to develop a full management plan. ***During the period covered by this Interim Management Plan, allowed recreational uses will include pedestrian uses, such as hiking, walking, wildlife observation, cross-country skiing, and hunting. Mountain biking, horseback riding, snowmobiling and***

other potentially higher impact uses will not be allowed during the interim period and will only be allowed subsequently with restrictions described in the full management plan.

No new trails will be created during the interim period and until the completion of a full management plan to allow for the development of “best planning practices,” except for the in-progress loop trail around the lower meadow (see attached map in Appendix A).

The Town will explore the creation of a hunting safety zone buffering an adjacent private residence and the parking area during hunting season. The Town will also install signs warning users of the RTF of hunting activity during hunting season.

Water Quality Protection.

Management of the RTF will be conducted in a manner that protects water quality. Surface waters on the property include an inactive beaver pond and wetland, headwater streams, and two vernal pools. These surface waters will be “buffered” by the maintenance of forested cover in proximity to these surface waters to protect water quality and aquatic habitat. The three headwater streams carry water directly into the Winooski River and then on to Lake Champlain. Maintaining forested cover around these headwater streams will contribute toward Vermont’s priority for water quality protection in the Lake Champlain Basin.



Inactive beaver pond and wetland.

Sustainable Forest Management and Agriculture.

The Andrews property has been managed under professionally developed Forest Management Plans for decades. Timber harvests were carried out on the western portion of the property approximately four years ago. Through a public process and in consultation with the Chittenden County Forester, the community will work to create a Forest Management Plan prior to conducting any harvests on the property. ***There will be no timber harvesting except what is required to comply with other allowed uses during the period covered by this interim plan (clearing existing trails, expanding parking, etc).***

Bruce Hennessey and Beth Whiting of Maple Wind Farm (MWF) purchased 187 acres of the former Andrews Farm in 2013. MWF also currently farms eight acres of the Andrews land that will be transferred to the Richmond Town Forest, including the “lower meadow” and a meadow along the powerline right of way. MWF has a right of way to drive up the main farm road on the future RTF to access the upper meadows on their property, and the Town will have a right of way across the northern edge of MWF's upper meadow.

The Town will discuss with the owners of MWF how the Town can maintain a trail along this right of way in a manner that is consistent with the owner's use of their fields.

The lower meadow on the RTF is currently fenced with a high tensile electric fence powered from the garage of the current farmhouse homeowners. MWF

uses the land on the RTF for 10-16 days of grazing per year, and on grazing days there are typically 30 adult bovines and 30 calves. Bruce and Beth are interested in entering into a longer-term lease with the Town, which would encourage MFW to invest more in these fields to increase their utility and productivity.

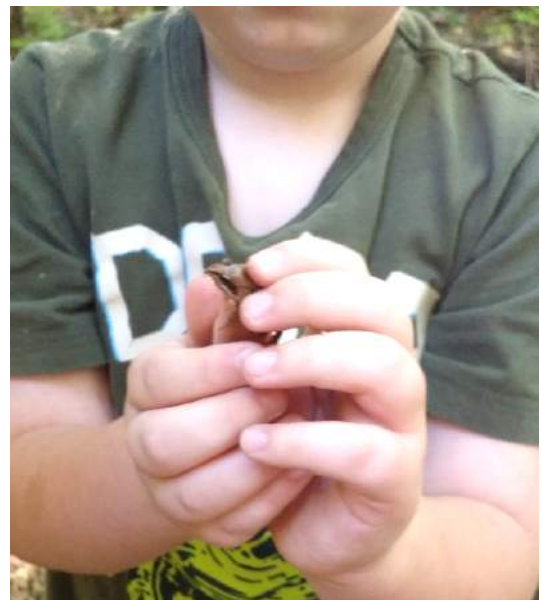
MWF will be permitted to continue to pasture the fields that are now part of the RTF during the interim period. The Town will install signs at key locations indicating the presence of an electric fence.



The “lower meadow,” one of two small meadows on the RTF.

Outdoor Education.

With a very diverse landscape, uncommon natural communities, wetlands and vernal pools, the RTF provides the opportunity for significant environmental educational opportunities. Two old stone foundations, or “cellar holes,” on the property are perfect entry points to add local cultural history to the environmental educational opportunities that abound on the property. The Richmond community will work to ensure that the property is available to provide outdoor education to residents of all ages.



Wood frog on community walk.

Scenic Landscape Protection and Rural Character.

The Richmond Town Forest contributes significantly to the Town of Richmond’s scenic rural character. The entire Andrews “Gray Rocks Farm” is listed on the National Register of Historic Places. The property provides a scenic, forested backdrop to the Monitor Barns, iconic landmarks and landscape features in Richmond that are also listed on the National Register of Historic Places. This scenic landscape is valued by Richmond residents and by thousands of travelers on Route 2 and Interstate 89 in Vermont’s most-travelled corridor. The community will be mindful of how its management and uses of the property can maintain or improve the community’s history, sense of place, and scenic rural setting.



Historic Monitor Barn with RTF in background.

Public Access.

The RTF will be open to the general public for widely dispersed use of the land and for more concentrated use on existing and future trails and forest roads. There is a well-maintained logging road leading into the property that includes an informal parking area for about a dozen cars. With improvement, the parking area may be able to accommodate more. There is need for improvement to the parking area and to delineate the boundary between the abutting property and the appropriate area for parking. ***During the period covered by this Interim Plan, the Town will explore maintaining and making improvements to the parking area for a gravel parking lot for up to 20 cars. While making these improvements, the Town will consider requesting a permit for signage on Route 2 warning travelers to watch for turning vehicles. The Town will also explore the clearing of roadside vegetation along the Route 2 westerly of the parking area to maximize sight distance, as well as plowing the parking area in winter months.***

The conservation easement protecting the property will not allow motorized recreational use, except for the use of snowmobiles along the VAST trail or for those with disabilities, if the community so decides in the final management plan. ***In order to deter unauthorized vehicular use, the Town will consider installing gates at the entrance of the main logging road and the main farm road north of the two-acre farmhouse lot.*** If



Parking area and logging road off Route 2.

a gate is installed at this location, the owners of Maple Wind Farm will require a key to access their right of way to their upper meadows.

An early priority of the community will be to create signage at the main parking lot identifying the Town Forest and communicating acceptable and prohibited uses during the interim period. The Town may install a kiosk for such purposes at the parking area during the interim period. A map of the property will be included with the signs at the main entrance to the Town Forest. The Town will also install signs at key boundary points to discourage community members from wandering onto private property. Key among these locations is the boundary between the Town Forest and the farmhouse property along the main Farm Road where a gate will likely be located. During the interim period the RTF will be open from dawn to dusk.

There are remains of a hunting camp on the property that burned many years ago, including portions of the metal roof and other debris. ***The Town could consider removing debris during the interim period.*** There are no physical improvements on the property, and ***no new physical improvements will be constructed on the property during the interim period.***

Other Rights of Access:

Vermont Electric Power Company (VELCO) retains a deeded right to access their power lines through the Forest property, and intends to cross the property for maintenance following the Town's acquisition. VELCO intends to improve the forest road leading from the highway access to their lines to support the necessary equipment, and may request to lease for a short time some of the "log landing" for a staging area. VELCO may improve a parking area at the highway access and may improve the log landing area for their needs. The Town retains the right to permit non-exclusive access as described provided that it will deliver to the Vermont Land Trust any proposed document permitting such access for its review and approval prior to signing.

Summary of Allowed Uses During Interim Period

- Pedestrian uses, such as hiking, walking, wildlife observation, cross-country skiing, and hunting.
- The Town may close roads during mud season and/or if there is evidence or concern of resource impact in particular locations.
- The Town may mitigate and/or repair stormwater and erosion damage on logging roads, excluding installation of permanent infrastructure, to protect natural resources and water quality.
- The creation of a hunting safety zone buffering an adjacent private residence and the parking area during hunting season.
- Installation of a kiosk and/or signs identifying the Town Forest, communicating acceptable and prohibited uses during the interim period, indicating boundaries, warning users of the RTF of hunting activity during hunting season and the presence of electric fences.
- Installation of gates at the entrance of the main logging road and the main farm road north of the two-acre farmhouse lot.
- Pasturing of fields by Maple Wind Farm.

- Making improvements to the parking area for a gravel parking lot for up to 20 cars, and clearing of roadside vegetation along the Route 2 westerly of the parking area to maximize sight distance.
- Removal of burned hunting camp debris.
- The Town will contact Vermont Land Trust if it proposes activities during the interim period that are outside those represented in this interim management plan to ensure consistency with the conservation easement.

Summary of Prohibited Uses During Interim Period

- Motorized recreational use, except for use by those with physical disabilities and emergency access.
 - Snowmobiling may be permitted only on the VAST trails, should the VAST network be re-established and VAST provides trail maintenance on their through-way.
- “Mechanized” recreation, like mountain biking.
- Horseback riding.
- New trail development, with the potential exception of improvements to a trail along the western side of the lower meadow that is already “roughed-in” and a trail along the lower edge of this meadow to connect to the farm road on the eastern side of the meadow.
- Timber harvests.
- New physical improvements.
- Public use of the RTF before dawn or after dusk, or until 11 p.m. with permission of the Steering Committee chair.

Key Contacts:

- Town Forest Steering Committee, Guy Roberts, Chair guyr@gmavt.net, (802) 825-858
- Chittenden County Forester, Ethan Tapper, ethan.tapper@vermont.state.gov, (802) 585-9099
- Vermont Land Trust, Adam Piper, Regional Stewardship Manager, adam@vlt.org, 802-861-6405

List of Maps and Exhibits

- Property map (Appendix A)
- Conservation easement (Appendix A)
- Vermont Land Trust ecological report (Appendix B)
- Audubon bird habitat assessment (Appendix C)
- Map of surrounding Public trails (Appendix D)
- Chittenden County Uplands Conservation Project Map (Appendix E)

Signed:

Town of Richmond

By: *[Signature]* 3/27/2018
Its Duly Authorized Agent Date

Approved:

Vermont Land Trust

By: *[Signature]* 3/27/18
Its Duly Authorized Agent Date



View from the Richmond Town Forest over high meadows on neighboring farmland.

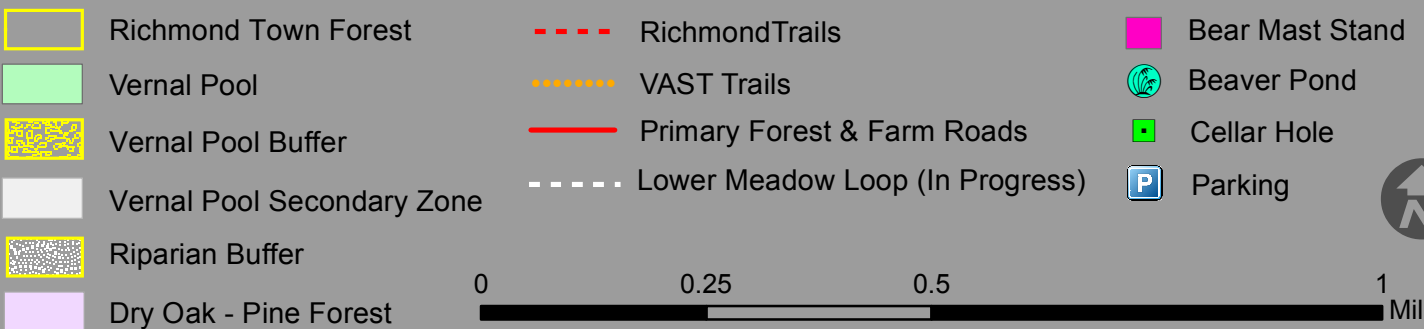
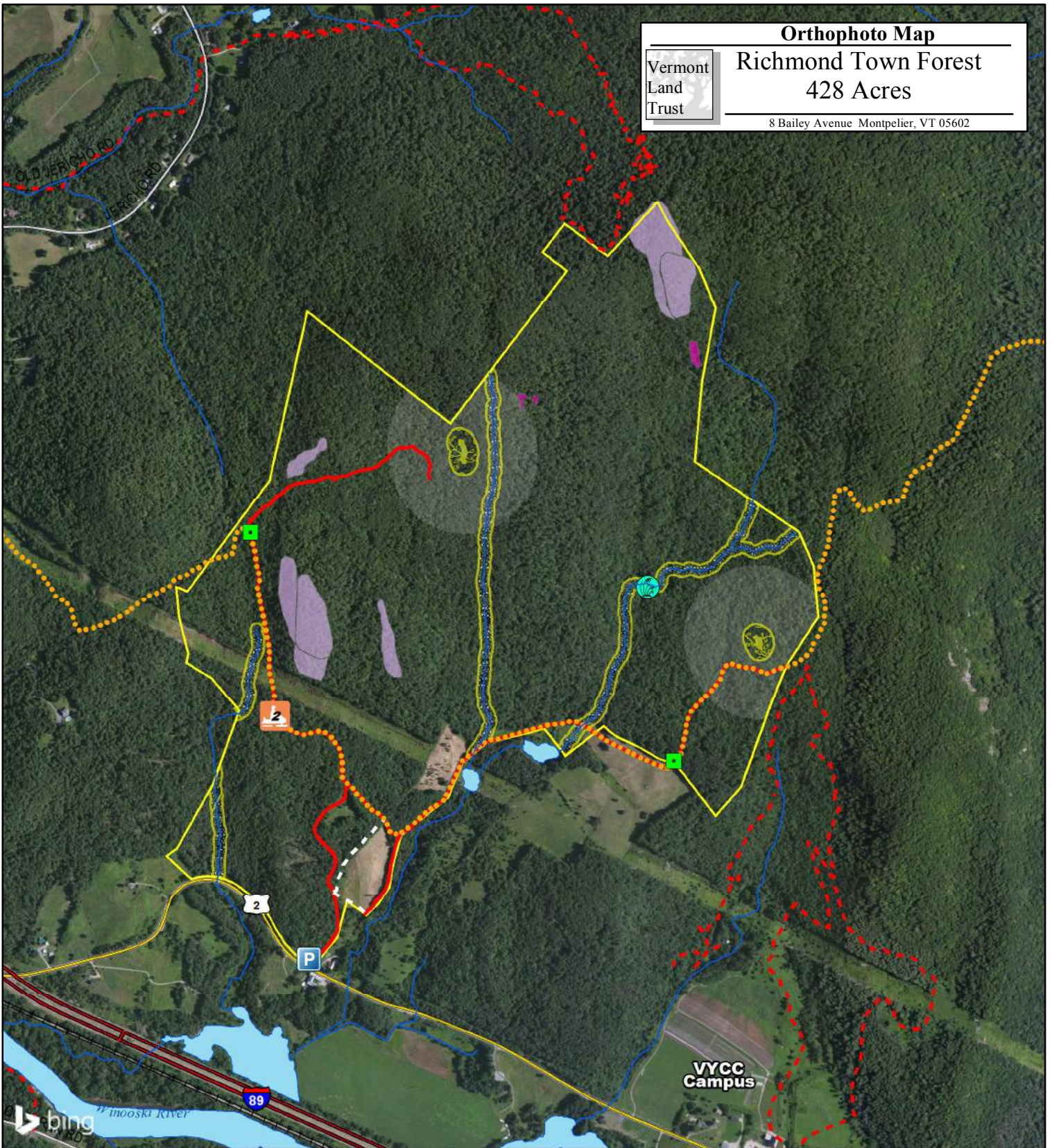
Orthophoto Map

Vermont
Land
Trust

Richmond Town Forest

428 Acres

8 Bailey Avenue Montpelier, VT 05602



- B. Ecological Assessment of the Andrews Forestland (201_), prepared by Alair Diamond, VLT.
- C. Audubon Forest Bird Habitat Assessment: Richmond Town Forest/Andrews Forestland (2017), prepared by Steve Hagenbuch, Audubon Vermont.
- D. Map of surrounding Public trails
- E. Chittenden County Uplands Conservation Project Map