

Community Forest Plan for the Barre Town Forest

A municipal forest for the Town of Barre made possible with significant funding from the federal Community Forest Program, the Vermont Housing and Conservation Board and the Open Space Institute.

*Barre Town
Washington County, Vermont
February 2013*



**Submitted by:
Barre Town Selectboard**

Prepared by:
The Barre Town Forest Management Plan Committee
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and
Kate Wanner, The Trust for Public Land

**THIS COMMUNITY FOREST PLAN MUST BE UPDATED
AND APPROVED BY FEBRUARY 2023**

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Special Thanks to

Russ Barrett, Washington County Forester

Carl Rogers, Barre Town Manager

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and the Barre Town Forest Management Plan Committee:

Cate Cattier, Marc Bernier, John Hameline,

Thomas Koch, Cynthia Fitzgerald (Chair),

Stephan Mayr and Lionel Cyr

I. OWNERSHIP and CONTACT INFORMATION

Easement Names: Barre Town Forest Conservation Easement

Location: Barre Town
Washington County, Vermont

Roads: Websterville Road, Violette Street, Littlejohn Road, Church Hill Road,
Casanova St, Barclay Quarry Road, Donahue Road, Brook Street

Landowner: Town of Barre
Address: Town of Barre Town Offices
149 Websterville Rd
Websterville, VT 05678
Contact: Carl Rogers
Phone: 802-479-9331
Email: crogers@barretown.org

Easement Co-Holder: Vermont Land Trust
Address: 8 Bailey Avenue
Montpelier, VT 05602
Contact: Dan Kilborn
Phone: (802) 478-6089
Email: dan@vlt.org

Easement Co-Holder: Vermont Housing and Conservation Board
Address: 58 East State Street
Montpelier, VT 05602
Contact: Kris Hammer, Conservation Stewardship Coordinator
Phone: (802) 828-5068
Email: khammer@vhcb.org

II. PROJECT BACKGROUND

Introduction

This Community Forest Plan for the Barre Town Forest is submitted on behalf of the Town of Barre, Vermont. The Trust for Public Land (TPL) helped the Town of Barre obtain 5 forested properties totaling 355 acres, to be combined with 25.7 acres owned by the Town, to become a new municipal forest (hereafter “the Property”) in Graniteville and Websterville, Vermont. This project was completed as part of the Trust for Public Land’s Community Forest Program and the Vermont Town Forest Project. Funding was provided by the Town of Barre, the Vermont Housing and Conservation Board, the Vermont Recreation Trails Grant Program, the Open Space Institute, the federal Community Forest Program, the Millstone Trails Association, and many other foundations and private individual donors. A conservation easement over 355 acres was conveyed to Vermont Land Trust and Vermont Housing and Conservation Board to protect the Property from development and ensure it is open for public use in perpetuity. The 25.7 acres previously owned by the Town (see Map B: Topographic Map) are part of the Town Forest, and included in this Community Forest Plan, but are not restricted by the easement.

The scenic vistas, recreational opportunities, timber production, wildlife habitat and water protection that this Town Forest provides are important assets to the Town (Barre Town Plan, 2008.) Section 10.4 of the Town Plan states that “The Town should acquire property when it is in the public interest for such things as: strips for highway connectors, parcels abutting Town owned property, parcels along significant water resources, recreational uses, and preservation of natural resources.” The Property contains four out of the five values noted for acquisition.

The Town of Barre will manage the Property as a municipal forest for wildlife habitat, timber harvesting and management, public recreation, education, and water quality protection. Protection of the land as a conserved Town Forest also ensures public access, safeguards drinking water resources, supports the local timber, recreation, and tourism economies, provides occasional timber revenue to the Town, and restores and protects connectivity by assembling parcels with fragmented ownership. The property’s extensive network of trails is a regional destination for mountain biking and other human-powered recreation, providing unique economic and health-related values to the people of Barre Town and surrounding communities.

The purpose of this Community Forest Plan is to identify known information relative to the Property, present the goals of the Town of Barre, and put forth prescriptions for management and conservation activities for the next ten (10) years. Completion of a Community Forest Plan is a requirement of the federal Community Forest Program and the Vermont Housing and Conservation Board. This plan shall be updated at least every ten years.

History

The historic quarry area of Millstone Hill was once the heart of Barre’s boomtown economy and played an important role in shaping this area with a cross section of cultural and ethnical backgrounds not found anywhere else in Vermont. What was a virtual industrial wasteland was reclaimed by nature and is today a unique landscape that highlights Barre’s history. The 7 parcels

that make up the Barre Town Forest were home to some of the first granite quarries in Barre, established in 1790. The parcels were purchased from the Rock of Ages Corporation, the Graniteville Fire District, and 3 private owners. Two abutting parcels (26 acres) owned by the Town of Barre will also become part of the Town Forest.

The properties have not been quarried for over a hundred years. Since then, the forest has grown back to stands of sugar maple, mixed hardwoods, spruce and fir. Portions of the Property have been managed with selective timber harvests, under the supervision of a forester and in compliance with Use-Value standards. The Property has also been used for pedestrian recreation and hunting, and recently for mountain biking and cross country skiing on trails created by the Millstone Trails Association. Two parcels (33 acres) are managed for source water protection, as they contain the water supply for the Village of Websterville.

Effective July 1, 2003, the Town of Barre and the East Barre Fire District #1 merged per action by the Vermont Legislature and signed by the Governor. The Town of Barre is the surviving entity, and it acquired all the East Barre Fire District's assets, including two parcels of land along Littlejohn Road. One parcel is on the south side of the road; the other parcel is on the north side of the road. There is one old quarry hole, filled with water, on each lot. One parcel is 15 acres; the other is 11 acres. Since the town assumed ownership, no timber management has been done on the parcels, and there is no physical evidence the fire district had the lots logged in the recent past. The Barre Town Selectboard has committed these two parcels to become part of the Town Forest, managed according to this Plan but not subject to the Conservation Easement.

In 2008, the non-profit Millstone Trails Association (MTA) was contacted by Rock of Ages and informed that a substantial part of the old quarry lands would soon be put on the market. As it was one of the goals of the MTA to preserve this unique property, the Board of Directors approved a motion to work to find a way to purchase the property for preservation through recreation. It was at this time that the MTA connected with The Trust for Public Land, and together with the Town of Barre they have worked to secure the funding and create the Town Forest.

In August 2010, the Selectboard appointed a Barre Town Forest Study Committee, which included representatives from the Selectboard, MTA, Barre Town Recreation Committee, and a member of the community. For three months, the Committee studied the benefits and costs of a potential town forest, which resulted in a strong recommendation to the Selectboard and town citizens that the town take advantage of this special opportunity to own and manage such a unique recreational and cultural resource. The citizens of the Town of Barre showed support for this acquisition on election day, 2010, when they voted 63% in favor of acquiring the property and contributing \$100,000 towards the acquisition. MTA also committed \$100,000 to the acquisition. The Trust for Public Land and the Town of Barre successfully secured a \$400,000 grant from the new federal Community Forest Program, one of the first ten grants in the country from this fledgling program.

After approval by the Selectboard and the voters, a Barre Town Forest Management Plan Committee was created in April of 2011 to work with citizens, town staff, the county forester, the easement holders, and elected officials to create a management plan and make decisions

about the new town forest. The Committee drafted a Community Forest Plan in the summer of 2011 and finalized this plan for submission to the Selectboard in fall 2012.

Local and Regional Significance

The most direct beneficiaries of the Barre Town Forest will be the 8,000 citizens of Barre Town, who treasure this property for its historic quarries and recreation offerings.

Protection of the Property as a Town Forest will contribute to the overall health of local residents by providing a close-to-home destination for outdoor recreation. Less than 2% of Barre Town is conserved land with public access, compared to 15.2% of the State. Residents of nearby towns and cities will also benefit from the open space and healthy recreation opportunities.

Spaulding High School cross-country team practices and holds meets on the Property. Because of the interconnected trail network, it is one of the few cross-country courses in the region that does not have to cross any roads or worry about safety or delays related to traffic. Websterville Baptist School uses the forest for biology classes, trail walks and other educational purposes.

Proper management of the proposed Barre Town Forest will also help to ensure the water quality and safety of two drinking water supplies:

- 179 acres (69%) of the Source Water Protection Area for the Websterville Fire District #3, that supplies drinking water to 420 people in Websterville; and
- 27 acres (39%) of the Source Water Protection Area for Barre Town Water System that supplies drinking water for 1,210 people.

Master Plan of the Town of Barre

One of the policies in The Barre Town Master Plan (2008) states, “*Ground and surface waters (for drinking and recreation), open lands, forests, farms, natural recreational areas, archaeologically sensitive areas and wildlife habitats should be recognized as valued resources; and their preservation should be balanced with other considerations in making planning decisions.*” It also states “*The Town supports the preservation of rare and irreplaceable natural areas, scenic and historic features and resources.*” The Town Plan also includes, “*Scenic vistas, recreational opportunities, timber production, wildlife habitat, and water protection are important assets that forest lands provide. The Town encourages careful and long-term management for the multiple uses of our forest resources.*” The Proposed Barre Town Forest will provide all of these important assets to the Town and citizens of Vermont. Lastly, the Town Plan states, “*The Town should promote the development and preservation of public scenic areas such as trails, ponds, swimming areas, picnic areas and railroad beds for continued public use. The Town may wish to acquire these properties if a change of use is contemplated in the future.*”

Regional Significance

The Barre Town Forest is rich in recreational and tourism opportunities, important wildlife habitat, productive forestland, and historic and cultural value. The numerous lookouts on the property offer scenic views of the surrounding region, including views of Camel’s Hump and a significant stretch of the northern Green Mountains.

The benefits of the Barre Town Forest go far beyond the town limits. Thousands of visitors from Vermont, New England, Quebec, and beyond have come to Barre Town to experience the unique trail network on the Property and the surrounding area. The area is extensively used by educators, hikers, bikers, skiers, hunters, and other recreational users; all of these uses would have been lost if the land were sold and developed. Permanent protection of the land in Town ownership will not only attract new businesses and homeowners to Barre Town but also ensure that the land remains in active forest management, supporting local resource-based jobs and providing occasional timber revenues to the Town. A recent study of the economic benefits of the proposed Barre Town Forest by the Gund Institute at the University of Vermont estimates there will be 10,500 visitors by 2015, spending \$640,000 annually in the Barre area, and supporting 20 jobs¹.

Within five miles of the property is a landscape-scale block of conserved land that includes the 28,000-acre Groton State Forest and 4,500 acres of private conservation land. (See Map A: Locus Map.) The property itself provides important habitat for a variety of fish and wildlife, and also acts as a “stepping stone” of habitat between the 43,000-acre core forest and protected land around Groton State Forest and an 8,000-acre biodiversity hotspot in Williamstown and Brookfield (identified by the Vermont Biodiversity Project).

Regional Trail Network

The Barre Town Forest is located in the center of the 70-mile Millstone Hill Trail Network, which provides a place for year-round recreation and cultural education. The Millstone Trail Network, 20 miles of which are on the Town Forest, extends onto adjacent private land and connects to the Central Vermont Regional Bike Path, a 14.5-mile path being built that will connect Montpelier to Barre Town. The Path currently goes by the Rock of Ages Craftsman’s Center and connects to the Barre Town School Forest and adjacent Barre Town Middle and Elementary School. This provides children a safe transportation corridor from Graniteville to the Barre Town School and also provides recreational opportunities to more than 900 students. By connecting to the Central Vermont Regional Path, the trail network on the proposed Barre Town Forest is also connected to the Cross-Vermont Trail, a 30-mile multi-use, four-season path that is proposed to be expanded to 90 miles across the width of Vermont.

The local non-profit snowmobiling club, the Barre Town Thunder Chickens, have used and maintained three snowmobile trails through the Property since 1971. These trails are part of the statewide Vermont Association of Snow Travelers (VAST) trail network and are essential linkages between snowmobile trail networks in Washington, Groton and Williamstown.

Central Vermont Regional Plan

The Central Vermont Regional Plan (2008) also recognizes the importance of conserving scenic areas, ecological systems, wildlife habitats, recreational opportunities, and Source Water Protection Areas.

Vermont State Wildlife Action Plan Priorities

Conservation of the majority of this Property will address multiple threats to Species of Greatest Conservation Need, as outlined in the Vermont Wildlife Action Plan (2005).

¹ Source: Posner, Steve, and Marta Ceroni. *Potential Economic Impact of Outdoor Recreation in the Barre Town Forest, Vermont*. Gund Institute for Ecological Economics, University of Vermont. Burlington, Vermont. Prepared for The Trust for Public Land. February 2012.

- *Habitat Loss:* The 355 acres of this Property protected by the easement will never be converted for development, and will remain as habitat for forest-dwelling species in perpetuity. As a stepping stone between Groton State Forest and forestland in Williamstown, Brookfield and the Northfield Range, it serves as a wildlife linkage and additional habitat to species that travel widely through Washington and Caledonia County.
- *Impacts of Roads:* By conserving and consolidating ownership of 5 separately owned properties, further fragmentation and development of these parcels are prevented. Excluding temporary logging roads, no additional permanent roads will be created on the property.
- *Pollutants and Sedimentation:* The creation of a sustainable forestry plan for the Property, which will include appropriate buffers around streams and wetlands and will mandate best management practices, will protect water quality and decrease sedimentation in streams. The restrictions put in place by these Easements will restrict or control recreational off-road vehicle use on the property, which could cause erosion and sedimentation at stream crossings.

Conservation of the Property supports the following Conservation Strategies outlined in the Vermont Wildlife Action Plan:

Strategies for conserving Vermont's Birds of Greatest Conservation Need

- Slow the rate of fragmentation and development and maintain blocks of contiguous forest, grasslands, and early and late-successional habitats. (Chapter 4, page 14)
- (Encouraging) forestry practices that can enhance habitat suitability such as maintaining or increasing aspen stands or the retention of coarse woody debris and snags. (Chapter 4, page 14)
- Identify, prioritize and maintain existing contiguous forest blocks and associated linkages that allow for upward and northward movement in response to climate change (Chapter 4, page 14)

Strategies for conserving Vermont's Mammals of Greatest Conservation Need

- Maintain large blocks of undeveloped forests linked together by habitat corridors in order to provide a network of interconnected habitats throughout northeastern New England (Chapter 4, page 28)
- Maintain riparian buffers along streams (Chapter 4, page 28)
- Maintain and restore habitat connectivity and minimize fragmentation of forest blocks. (Chapter 4, page 28)

Strategies for conserving Vermont's Reptiles and Amphibians of Greatest Conservation Need

- Maintain habitat through appropriate management, direct habitat disturbance and site roadways away from sensitive sites such as breeding pools (Chapter 4, page 33)
- Work cooperatively with landowners, habitat management agencies, towns and communities to protect habitat and maintain connectivity. (Chapter 4, page 33)

Vermont Town Forest Project

In 2004, the Northern Forest Alliance and a wide ranging team of twenty public and private partners, including the Vermont Department of Forests, Parks and Recreation, The Trust for Public Land, and the University of Vermont, launched the Vermont Town Forest Project designed to create new town forests and improve stewardship of existing town forests. The Barre Town Forest will be another successful example of land conservation through local control and ownership.

The Trust for Public Land's Community Forest Program

The Barre Town Forest project is an important component of TPL's Community Forest Program, and could serve as a model for other "assemblage/defragmentation" projects that will become more and more important as large parcels of land become scarcer throughout New England.

Summary of the Conservation Easement

Please see appendix A for the full recorded copy of the Conservation Easement

355 acres of the 381-acre Barre Town Forest is protected by a Conservation Easement co-held by Vermont Land Trust and Vermont Housing and Conservation Board. The Barre Town Selectboard chose to leave the two parcels originally owned by the Town unrestricted, but still part of the Town Forest with regards to management. The Easement seeks to conserve managed forest, wildlife habitat, and scenic beauty, protect water quality, encourage sustainable management of soil resources, and provide recreational opportunities to the public. This protection will serve the natural communities of the forest, the forest industry, wildlife, and the people of Vermont.

The following is a summary of the terms of the Conservation Easement. Note that "Protected Property" in the summary below refers only to the 355 acres shown as conserved on Map B, not the entire Barre Town Forest.

I. Purposes

1. As primary purposes, to conserve and provide perpetual public access to the Protected Property for noncommercial recreational purposes, including but not limited to, bicycling, bird watching, cross-country skiing, fishing, hiking, hunting and trapping, snowmobiling, snowshoeing, walking and wildlife observation and other recreational uses which are compatible with the foregoing uses and with the other Purposes of the Easement. . Dispersed pedestrian public access will be provided throughout the Property while some recreational activities may be confined to mapped recreation corridors.
2. As secondary purposes:
 - a) To conserve forestry values, wildlife habitats, biological diversity, natural communities, riparian buffers, aquatic habitats, wetlands, soil productivity, water quality, and native flora and fauna on the Protected Property;
 - b) To conserve the ecological processes that sustain these natural resource values; and

- c) To conserve complementary, non-commercial recreational opportunities, open space values, and scenic resources associated with the Protected Property for present and future generations.

II. Restricted Uses

1. The Property shall be used only for the following purposes: forestry, education, non-motorized, non-commercial recreation, habitat conservation, natural area and open space purposes only, except as otherwise specifically permitted under the easement. No residential, commercial, industrial, or mining activities shall be permitted, and no structure or improvement shall be constructed or placed on the Property except as permitted under Permitted Uses;
2. Except as specifically permitted, 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 Property without prior written permission of the Grantees;
3. No outdoor advertising structures such as signs and billboards shall be displayed on the Property except reasonable signs indicating the name of the Property and its ownership, boundary markers, directional signs, memorial plaques, informational and interpretive signs, and signs limiting access or use;
4. No placement, collection, or storage of trash, human waste, or any unsightly or offensive material shall be allowed, except the temporary storage of trash in receptacles for periodic off-site disposal, or as otherwise permitted in the Community Forest Plan;
5. There shall be no disturbance of the surface (including filling, excavation, and removal of topsoil, sand, gravel, rocks or minerals) or change of the topography of the land in any manner, nor any surface mining of subsurface oil, gas, or other minerals, except as reasonably necessary to carry out the uses permitted on the Property;
6. The Property shall not be subdivided, transferred, mortgaged, pledged, leased or otherwise encumbered without prior written permission of the Grantee;
7. There shall be no operation of motor vehicles except for uses reserved in Section III, such as for recreation, agriculture, wildlife and forest management, trail grooming, maintenance, handicap access, and safety or emergency purposes. Snowmobiling may be permitted. Except as allowed below, there shall be no all-terrain vehicle use except for emergency or management purposes. All-terrain vehicles include, but are not limited to, motorized four-wheeled, three-wheeled and two-wheeled or tracked vehicles. Motorized personal assistive mobility devices may be permitted for use by persons with a mobility disability.
8. Recreational all-terrain vehicle use and maintenance and repair of an ATV trail that connects to an existing, legal network of ATV trails may be allowed, provided that the ATV connecting trail and network have no significant negative impact on the conservation or public recreation values of the Protected Property. Prior written approval of the Grantees is required. The standards under which ATV use may be allowed are described in a Memorandum of Understanding. (See Appendix J)
9. There shall be no manipulation of natural watercourses, marshes, or other water bodies, nor activities conducted on the Property which would be detrimental to water purity or which could alter natural water level or flow, except as reasonably necessary to carry out the uses permitted on the Property;

10. No use or activity shall be allowed that is inconsistent with the Purposes of the Conservation Easement.

III. Permitted Uses

Recreation

The Town of Barre has the right to:

1. Use the Property for all types of non-motorized, non-commercial recreational purposes including, but not limited to, birdwatching, cross-country skiing, fishing, hiking, hunting and trapping, snowshoeing, walking and wildlife observation consistent with the Purposes of the Grant.
2. Use the Property for snowmobiling, and for non-motorized, mechanized recreation, such as mountain biking and by animals capable of transporting humans (including horses), if such uses are regulated in the Community Forest Plan and are consistent with the Purposes of the Grant.
3. 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 the Grant and are provided for in the Community Forest Plan.
4. Conduct periodic, temporary, community and public entertainment events on the Property, including concerts, fairs, and celebrations, together with the right to erect tents and other temporary structures for such events.
5. Charge members of the public reasonable fees for admission to and use of the Property, provided (a) that such fees are collected only for community and public recreation, education or entertainment events on the Property or (b) such fees are reasonably necessary to support management of the Property. Fees shall not be based on place of residency. All fees charged for admission to or use of the Property shall be consistent with the Purposes of the Grant and shall be provided for in the Community Forest Plan. Membership or use costs shall not be required for pedestrian access to the Property.
6. Charge organizations reasonable fees for recreational use of a portion of the Property provided that such use does not unreasonably interfere with the access of the general public to the Property.
7. Issue temporary special use permits or licenses authorizing the commercial or non-commercial use of the Property for recreational, community entertainment, competitive athletic events, or educational, agricultural, forestry, or research purposes, provided that any such permit or license (i) does not unreasonably interfere with the access of the general public to the Property, (ii) is for uses consistent with the Purposes of the Grant, and (iii) authorizes only uses of or actions on the Property consistent with the Grant.

Forest Management Activities

The town of Barre has the right to conduct the following activities, provided they are in accordance with the Community Forest Plan and supervised by a professional forester:

1. Forest management activities, including harvesting timber, firewood, other wood products and non-timber forest products and conducting maple-sugaring operations.

2. Establishment, maintenance and use of fields, orchards and pastures for agricultural purposes, recreational, scenic or open space purposes, and for the purpose of maintaining or enhancing wildlife habitat on the Property, provided that the initial forest clearing activity required to establish such fields, orchards, and pastures is a component of the Community Forest Plan.

Structures and Improvements

The Town of Barre has the right to:

1. Construct and maintain roads necessary for forest management in accordance with the Community Forest Plan, employing the applicable practices in the publication "Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont" (1987).
2. Construct, maintain, repair, and replace forest management roads and associated bridges, culverts and gates to control motorized access, and construct new forest management roads and associated improvements if consistent with Conservation Easement and if additional road improvements are necessary to provide reasonable forest management access to the Property.
3. Construct, maintain, repair and replace three (3) permeable surfaced parking areas, said parking areas not to exceed a parking capacity of 105 passenger automobiles, at the locations generally depicted as "Parking Area" on Map C. Said parking areas shall be used only in connection with uses permitted under the Grant. Additional parking for additional capacity may be allowed with prior written approval.
4. Construct, maintain, repair, replace, and use permanent or temporary minor structures of a rustic design reasonably necessary to support the public, outdoor, non-commercial, recreational and educational uses permitted by the Grant on the Property
5. Construct, maintain, repair, replace and use sugaring buildings, with access drives and utilities exclusively for agricultural, silvicultural and educational uses normally associated with a sugaring operation, with prior written approval.

IV. Surface Water Buffer Zones

Areas within fifty feet of perennial streams, rivers, ponds and other wetlands are designated as Surface Water Buffer Zones (SWBZ). The principal goal for management within the SWBZ is the establishment and maintenance of a high quality buffer that provides ecological benefits such as:

1. buffering aquatic and wetland plants and animals from disturbance;
2. preventing wetland and water-quality degradation;
3. providing important plant and animal habitat;
4. providing organic matter, nutrients, and structure to aquatic systems; and
5. accumulation of snags and coarse woody debris over time.

Within the SWBZ, operation of machinery shall be done to minimize soil compaction, erosion or rutting. The number and width of stream crossings shall be minimized and AMPs for roads and stream crossings shall be employed.

V. Public Access

Property shall be available to the general public for all types of non-commercial, dispersed recreational and educational purposes (including, but not limited to, bicycling, birdwatching,

cross-country skiing, fishing, hiking, hunting and trapping, snowshoeing, walking, ATV use as described in Section II(8) and wildlife observation) consistent with the Purposes of the Grant.

Public access may be limited or restricted to assure compliance with the Conservation Easement, to protect natural habitats, or to protect the public health or safety (including the right to permit, regulate or prohibit hunting or trapping).

VI. Vernal Pool Special Treatment Area

The Vernal Pool Special Treatment Area (STA) consists of three vernal pools and the area around them. The purpose and goal of the STA is to provide and maintain high quality amphibian habitat, including critical breeding habitat, by promoting and maintaining high levels of shade and coarse woody debris.

The STA Primary Zone is the area within 100 feet of the edges of the vernal pool. Within the STA Primary Zone there shall be no agricultural activity except for collection of maple sap for sugaring, nor any new structures, land disturbance or improvements with the exception of pedestrian trails and existing mountain bike trails. No timber or downed wood or disturbance of the pool's hydrology shall be permitted, except for the control of exotic species and activities that enhance amphibian habitat. .

The STA Secondary Zone is the area within an additional 500 feet radius around the STA Primary Zone. Maple sap and firewood may be harvested within the Secondary Zone but the Community Forest Plan should explicitly state what prescriptions have been imposed to protect and enhance amphibian habitat.

VII. Enforcement of the Restrictions

The Grantees shall have reasonable access to the Property and make reasonable efforts to assure compliance by the Town of Barre with the terms of Conservation Easement by making periodic inspections. In the event that the Grantees become aware of an event or circumstance of non-compliance, the Grantees shall give notice to the Town of Barre via Certified Mail, return receipt requested, and demand corrective action.

III. TOWN OBJECTIVES

The creation of the Barre Town Forest is an effort by the Town to protect this land from development, put it into open public ownership, and manage it for timber, wildlife habitat, and public recreation and education. The Town of Barre values the complex suite of both monetary and non-monetary benefits that forests provide including timber revenues, non-timber forest product revenues, tourism and recreation, water supply and water quality protection, carbon sequestration, open space protection, education, wildlife habitat protection, and a sense of community and increased civic pride.

Administration of the Barre Town Forest

The Barre Town Recreation Board will take the lead role in managing the Property and the implementation of the goals established by this Community Forest Plan. The Barre Town Selectboard will have ultimate decision-making authority over the Property after receiving recommendations from the Recreation Board. The Selectboard may appoint a separate Town Forest Management Committee if deemed necessary in the future. The Recreation Board will handle all day-to-day management decisions and will submit annual action plans and budgets to the Selectboard for approval. Washington County Forester Russ Barrett (or successor Washington County Forester), who prepared the Timber Management section of this document, will provide assistance and advice pertaining to forest treatments. The Town plans to hire a private forester to plan, mark and manage timber harvests. Overall management will be done in accordance with the Easement and this Community Forest Plan approved by the Vermont Land Trust and the Vermont Housing and Conservation Board.

General Purposes

- Preserve and conserve 381 acres of forested land and scenic and historic vistas, in perpetuity under Town ownership, for the enjoyment and education of the general public.
- Provide for the continuation of traditional forest uses including sustainable forest management and outdoor recreation.
- Protect and enhance wildlife habitats, rare and exemplary plants and natural communities, and the ecological processes that sustain the natural heritage of the Property.
- Preserve cultural resources, including historic granite quarry sites.
- Provide public pedestrian access on the Property which will allow the general public to hike, hunt, snowshoe, observe wildlife and participate in other low impact outdoor recreational activities.
- Provide for mountain biking and snowmobiling on designated trails of the property.

Wildlife Habitat and Natural Resource Goals:

- Maintain and protect native biodiversity and ecological integrity.
- Conserve rare and exemplary natural communities.
- Preserve and conserve the quality and quantity of ground water and surface water.
- Protect or enhance water quality, forested and non-forested wetlands, vernal pools, and aquatic habitats.
- Protect and enhance a variety of habitats for native species through timber management.
- Provide a healthy mix of natural communities throughout the Property.
- Protect existing and potential deer wintering areas.
- To the extent possible, prevent the introduction or spread of invasive plant and animal species.
- Manage to each of the wildlife habitat and natural resources goals by following established current best practices as defined by pertinent State, Federal, and private entities.

Recreation, Educational and Cultural Goals:

- Promote and encourage traditional forest uses including low-impact outdoor recreation from novice to expert for residents and visitors.
- Maintain the tradition of public forested land available for low-impact recreation.
- Maintain public access to hunting and fishing, within State regulations.
- Educate the citizens of the Barre Town region about natural communities, biodiversity, the working forest, and good stewardship practices.
- Preserve the unique cultural and historical legacy of the quarries.
- Develop and maintain parking facilities for access to the Barre Town Forest.
- Manage any recreational uses in accord with the wildlife and natural resource goals of the Community Forest Plan.

Timber Management Goals

- Establish or maintain a tall, continuous canopy.
- Maintain a closed overstory canopy with a dense understory.
- Minimize disturbance.
- Create new openings in the forest.
- Allow visual access
- Leave many big trees.
- Promote vegetation that displays colorful foliage or fruit in autumn.
- Promote vegetation that displays attractive flowers.
- Promote vegetation that maximizes a variety of foliage.
- Generate periodic income from timber production.
- Increase the richness of wildlife species.
- Maintain existing water yields.
- Protect water resources, wetlands, and riparian zones.
- Enhance biological diversity on a local level.

- Promote a variety of forest types.
- Restore native ecosystem elements.
- Discourage or eliminate exotic elements.
- Maintain the existing trail network during forest management operations.

IV. INFRASTRUCTURE

(see also Baseline Documentation Report)

General Topographic Description

The overall project area consists of hilly to moderate terrain with some areas of ledge and steep slopes and several ravines. Elevation ranges from 1180 to 1640 feet. The proposed Barre Town Forest is greatly impacted by the human history of use on the site; mining of granite resulted in ponds, removal of soils and bedrock, and the formation of impressive talus piles. The intensive extraction of granite from the Property stopped over 100 years ago. In that time, natural communities have established on the human-altered landscape. The majority of the Property is forested, except for 25 abandoned quarries and a few cleared area totaling 4.5 acres as shown on Map C: Aerial map. One headwater stream, one wetland, and three vernal pools are also on the Property.

Scenic Values

The Barre Town Forest has numerous lookouts which provide terrific views of the Green Mountain Range, Camel's Hump, Barre City, and the forested hills to the east. The maples and birch on the property provide a stunning colorful display in the fall.

Roads

There are a limited number of forest roads and abandoned rail beds that are also used as snowmobile and mountain bike trails on the Property (see Map C: Access and Recreation Map and Appendix B: Survey). A private road off Violette Street that accesses the Websterville water plant crosses the Property.

Pedestrian access to the Property can be gained through frontage along the following town roads:

- Littlejohn Road
- Church Hill Road
- Violette Street
- Casanova Street
- Graniteville Road
- Barclay Quarry Road
- Donahue Road
- Park Street

Two access points/parking areas are planned. See the Proposed Action Schedule section and Map C: Access and Recreation Map for potential parking and access areas.

Road maintenance objectives for interior forest roads include:

- ensuring safe conditions for a variety of uses, including logging and passive recreation;
- minimizing erosion and runoff;
- preventing illegal trespass by unauthorized motor vehicles;
- preventing the spread of invasive plants along trails and roads;
- minimizing increased avian predation and nest parasitism by minimizing the width, number, and extent of new access and skid roads; and
- minimizing disruption of wildlife habitat and recreation trails.

For information pertaining to trails, please see the Recreation Section of this Community Forest Plan.

Boundary Lines

Town roads bound a significant portion of the Barre Town Forest. Portions of the Property are bounded to the southwest by Graniteville Road, to the south by Barclay Quarry Road, to the northwest by Church Hill Road, to the northeast by Donahue Road, and to the west by Violette Street. A portion is also bisected by Littlejohn Road. The Barre Town Forest boundaries have been marked with “Leaving Town Forest” signs to help keep forest users from entering adjoining private property. The Town should replace the signs as needed.

V. GEOLOGY AND SOILS

Bedrock Geology

The bedrock and surficial geology help determine the location of aquifers, wetlands, and forests. Bedrock constituents have the potential to impact water quality, types and depth of soils, topography, vegetation, and potential for various uses. The materials that comprise bedrock vary in density and permeability. Water “pools” in some areas, while running quickly through other areas, creating aquifers (water-saturated areas underground) and wetlands. Fractures in the bedrock also provide sources for water supplies.

The Property lies in the Vermont Northern Piedmont bioregion, which is predominantly made up of limestone, schist and granite. The Property sits over a large intrusion of igneous rocks and their metamorphosed equivalents, including the granitic rock for which the Barre area has become famous. The Property also contains a category of bedrock described as calcareous clastic and metamorphosed rocks. This bedrock category leads to richer soils, characteristic of the Northern Vermont Piedmont biophysical region.

Soils

Soil types are important in managing timber due to differences in productivity and management limitations. Some soils are more fertile than others and thus, more productive. Productivity standards define which species will compete best on any given soil type and are useful when developing silvicultural prescriptions for specific stands. Also, certain soil types have management limitations that must be considered. Limitations are typically defined by a soil’s

characteristics, such as wetness and erodibility. For instance, an area with wet soils should be harvested in the winter when the ground is frozen to avoid damage. Conversely, drier soils can usually be safely harvested in the summer without negative disturbances. These considerations are also important in defining management and silvicultural decisions.

There are 12 soil types on the Property, most of which are characterized as stony, very stony, very rocky, or bouldery. Soil types of the Barre Town Forest are shown in Map F: Barre Town Forest Soils. The majority of the site is mapped as pits, quarry dumps, and mine complex. The bedrock and soil types, as well as the human history of the site, influence the vegetation found here. Important forest soils are those soil map units with a relative value of 74 or higher according to the Soil Potential Study and Forest Land Value Groups for Vermont Soils. These forest soils consist of map units in Forest Value Groups 1, 2 and 3 (out of a total of 7). Statewide, soils in Forest Value Groups 1, 2 and 3 cover approximately 40% of Vermont's total land area. Detailed information on all of the soil types found on the Property can be found in Appendix H: Vermont Soil Fact Sheets from NRCS.

Table 1. Soil Types of the Barre Town Forest

Map Symbol	Map Unit Name	Forest Soils Group	Prime Agricultural Soil	Area (acres)
92C	Buckland silt loam, 8-15% slopes	3	Statewide	11.4
93C	Buckland silt loam, 8-15% slopes, very stony		Statewide	11.7
66D	Vershire-Dummerston complex, 15-25% slopes, rocky		~	4.6
67C	Glover-Vershire complex, 8-15% slopes, very rocky	4	~	53.7
72C	Tunbridge-Lyman complex, 8-15% slopes, very rocky		~	33.7
18B	Cabot silt loam, 0-8% slopes, very stony	5	~	8.0
18C	Cabot silt loam, 8-15% slopes, very stony		~	8.2
78E	Peru gravelly fine sandy loam, 35-60% slopes, very stony		~	7.1
72D	Tunbridge-Lyman complex, 15-35% slopes, very rocky		~	5.6
67D	Glover-Vershire complex, 15-35% slopes, very rocky		~	100.9
67E	Glover-Vershire complex, 35-60% slopes, very rocky		~	5.2
102	Pits, quarry-dumps, mine complex		7	~
W	Water	~		10.6

VI. TIMBER MANAGEMENT

The overarching goal is to manage the Barre Town as “healthy forest,” which is defined as “resilient forest ecosystems that possess the long-term capacity for self-renewal of their ecological productivity, diversity, and complexity” (Sustainable Forestry Task Force, Field Staff Report, October 2007). Management activities will promote a forest that reflects a diversity of stand ages and naturally occurring forest types in the majority of the forest. Special attention will be given to the conservation of rare and exemplary natural communities, and the conservation and enhancement of native plant and animal species and their habitats, including the establishment and retention of a range of sizes and types of downed woody debris, snag trees, cavity trees, occasional very large or old trees, and a small amount of early successional habitats.

In order to improve and manage wildlife habitat, at least 80% of the landscape will be maintained as mid-late successional forest, while also promoting early-successional (scrub/shrub or regenerating forest) conditions where opportunities exist. Combined, these areas of early successional habitat should comprise approximately 5% of the overall property acreage at any given time. These openings will provide browse, dense cover, edge, and the quickly-changing stand dynamics of young forest that benefit and encourage some species of wildlife. Clearing will be conducted between September and November, once the majority of migrant birds have departed and the fruiting season has ended. Large clumps of mature residual trees will be left to serve as perch sites.

In general, uneven-aged silvicultural methods will be used, through single-tree and group selections of less than 5 acres. Harvesting during frozen ground conditions is preferred, but if summer harvesting is required, it will be scheduled before the start of the bird breeding season or after the second week of July. As a general rule, all dead snags and current “biological legacies” (old pasture trees, so-called wolf pines, old growth trees that have been spared in the past) will be retained for the benefit of wildlife and stand diversity, as well as for their educational and aesthetic value. The recommended goal will be to retain a minimum of six snags per acre, with one exceeding 18-inch dbh and three exceeding 16-inch dbh, with a priority of retaining hardwood snags. New “biological legacies” will also be encouraged by setting aside four trees per acre that are representative of the stand. This will add to the structural complexity of the stand and will also eventually create larger pieces of coarse woody material, providing shelter and food for numerous wildlife species. Where possible, slash will also be left on site to contribute to vertical structure and protect seedlings from being browsed by deer.

All activities on the Property shall be performed in accordance with then current, generally accepted best management practices for the sites, soils and terrain of the Property as described in “Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont”, a Vermont Department of Forests, Parks and Recreation publication dated August 15, 1987 (hereafter “AMPs”) and successor documents. Timber harvests will be focused in areas that can be managed easily, with simple access and few impediments due to site or topography. Areas with steep slopes, difficult access, or ecological sensitivity such as riparian or wetland ecosystems, will be managed in order to protect their ecological qualities and to limit any and all environmental impacts from timber harvesting. To accommodate market and climatic (and related soil) conditions, changes may be necessary over the lifetime of this Community Forest

Plan. Any changes to this Timber Management section of the Barre Town Forest Community Forest Plan will occur in accordance with the Easement and in consultation with the Washington County Forester.

Avoiding Conflicts with Recreation

If timber management is to take place near trails, care will be taken to avoid affecting or blocking the trail. In situations where impeding the trail is unavoidable, trails will be temporarily closed or rerouted. The location of the rerouted trails will be at the discretion of the Town of Barre in coordination with the Designated Trail Corridor Manager, reflecting relevant site conditions at the time of harvest, and will be routed to avoid impacts on wetlands, springs, vernal pools, riparian areas, and other sensitive natural or cultural features.

- Trails will be adequately marked and signed to assist both loggers and trail users in locating the affected path.
- Use of forest harvesting machinery should be minimized on and near existing trails.
- Any accumulation of woody debris and slash on existing trails should be minimized.

When actively logging, the Town of Barre will post affected trails within the immediate vicinity of logging activity with one or more signs prohibiting pedestrian access for safety reasons. The prohibition will end at the conclusion of logging activity, and the landowner will remove these signs.

Vernal Pools

The upland forest surrounding vernal pools supports amphibians the majority of the year. Some salamanders and wood frogs are especially sensitive to desiccation and temperature extremes so they need areas of uncompacted, deep litter, coarse woody debris, and patches of canopy shade. There are three vernal pools identified on the Property, as shown on Map J: Natural Communities Map. These vernal pools are given special management consideration through the establishment of Primary and Secondary Special Treatment Areas (STAs) around the pools, as outlined in the Conservation Easement. The purpose and goal of the STA is to provide and maintain high quality amphibian habitat, including critical breeding habitat, by promoting and maintaining high levels of shade and coarse woody debris.

The STA Primary Zone includes the vernal pool itself and the area within a 100-foot radius from the pool's edges. Within this area there shall be:

- No agricultural activity other than the collection of maple sap for maple sugaring operations.
- No new structures, land disturbance or improvements, with the exception of pedestrian trails. The existing mountain bike trail located between Pool 1 and Pool 2 as depicted on the Barre Town Forest Conservation Plan (Map I) may remain but only in its current location and shall not be altered, expanded or improved beyond its current condition, but relocation may be permitted. Trails shall be maintained in a manner so as to avoid any negative impacts on the Goals and to the maximum extent practical such maintenance activities shall be conducted at times other than the spring amphibian breeding season.
- No removal of standing timber or downed wood or disturbance to the pool's hydrology. The only forest management activities shall be the control of exotic species and activities that enhance amphibian habitat. New roads for timber harvest may be approved within the

Primary Zone if Grantees determine that there is no other location that can practically meet the same purpose.

The STA Secondary Zone is the forested area lying within an additional 500-foot zone outward from each Primary Zone, as depicted on the Barre Town Forest Conservation Plan. Within the Secondary Zone:

- Maple sap and firewood may be harvested if included within this Community Forest Plan.
- Other timber harvesting is permitted but amphibian habitat needs, such as coarse woody debris and shade, shall be addressed in the Forestry Plan which shall explicitly state what prescriptions have been imposed to protect and enhance amphibian habitat.

Forest Management Areas – Prepared by Russ Barrett, Washington County Forester

This is a forest management plan developed under current Federal and State forest stewardship guidelines.

Landowner Assessment

Description of resources and level of interest from the landowner: There should be good amount of interest, time and energy that will be available from Barre Town citizens and cooperating recreation users. The existing trail network on the property was built and is now managed by the Millstone Trail Association. Town officials and citizens have the expertise to raise funds and successfully write grants to achieve their management goals and complete planned projects.

Landowner's goals for the property:

- Establish/maintain a tall continuous canopy
- Maintain a closed overstory canopy with a dense understory
- Minimize disturbance
- Create new openings in the forest
- Allow visual access
- Leave many big trees
- Promote vegetation that displays colorful foliage or fruit in autumn
- Promote vegetation that displays attractive flowers
- Promote vegetation that maximizes a variety of foliage
- Generate periodic income from timber production
- Increase the richness of wildlife species
- Maintain existing water yields
- Protect water resources, wetlands, and riparian zones
- Enhance biological diversity on a local level
- Promote a variety of forest types
- Restore native ecosystem elements
- Discourage or eliminate exotic elements
- Maintain existing trail network

General Property Information

Total land area:	296.0 Acres
Total number of stands/mgmt units:	8
Region/subsection or ecosystem type:	Northern Vermont Piedmont
General property description:	The Town Forest will consist of approximately 380 acres of forest land, and numerous remnants from the parcel's industrial granite history. These remnants include road and railroad infrastructure, water filled quarry holes, and grout piles. Northern hardwood and sugar maple forests are the predominant natural communities along with a lesser amount of hemlock/ hardwood and yellow birch /hardwood forests. Three vernal pools and one wetland have also been identified. The water filled quarries and associated grout piles cover approximately 87 acres of the property.
Description of surrounding properties:	Adjacent properties include industrial land owned by the Rock of Ages Corporation and relatively small residential ownerships. To the south and west, larger farm and forest parcels connect to a more rural landscape. Rock of Ages Corporation has traditionally kept their land open for recreational use by employees and Barre Town residents.
Soils information:	Soils maps and information are attached and can be found in appendix H and Map F and Map G.
Management access:	Management access will likely be via old granite network roads and railbeds. An area located near the center of the property was used to store explosives and would be ideal for forest management access in the future.
Presence of threatened and endangered species:	There have been no threatened or endangered species mapped or identified on the property
Cultural importance:	Over 100 years ago, Millstone Hill was the site of more than 75 small independent quarry operations that fostered the town of Barre's growth and prosperity in the 19 th century. Virtually every square foot of Millstone Hill was cleared and quarried. During the 20 th century, as quarry operations consolidated, these small independents closed down. Gradually the quarries filled with water, and forests returned, reclaiming a virtual industrial wasteland and turning it into a cultural, historical and recreational treasure for the central Vermont region.
Map information:	A GIS map is included in the plan (See Map D). Items with an asterisk are shown on the map: * North arrow (required) * Scale bar (required) * Legend (required) * Locator map * Stand boundaries

EXISTING CONDITIONS FOR '1'

Land area:	Land area: 7 Acres	
Landuse history:	This stand probably developed on abandoned pasture land - there was no sign of recent cutting.	
Forest Type:		
- Existing	Hemlock-Hardwoods	
- Potential	Hemlock-Hardwoods	
Successional trend:	This is a hemlock/hardwood stand with the following species distribution by basal area: hemlock (24%), sugar maple (18%), yellow birch (18%), red spruce (18%), balsam fir (12%), white ash (6%) and red maple (6%).	
Forest health:	No problems noted	
Site quality:	Site index is 58 for sugar maple. fair to good	
Approximate age:	66	Size class: Small Sawlogs (11.5 - 17.5")
Trees per acre:	148	Mean Stand Diameter: 11.6 in.
Basal Area (BA):	106	Acceptable BA: 93
Growth Rate:	3 %	Timber Quality: medium
Stocking:	Stand 1 is adequately stocked - just about b-line on mixedwood stocking guide. The overall stand density is 57.7 and the Q-factor is 1.21	
Stand Volume:	4,256 bd. ft./ac.	
Habitat and wildlife use:	This area probably serves as winter cover for white tailed deer, although it is not mapped presently as such by the Vermont Fish and Wildlife Department.	
Recreational opportunities:	The seasonally wet site conditions will limit recreational activities. This area would be best suited to extensive recreation uses such as off trail snowshoeing, bird watching, and hunting.	
Potential for timber production:	This stand has seasonally wet soils with limited drainage. The potential for growing timber production is fair to good. The site is best suited to growing softwoods and white pine.	
Potential for other uses:		
Water quality issues:	Soils are seasonally wet and somewhat poorly drained, but otherwise no water quality issues were noted.	
Important natural features:	None noted	

MANAGEMENT PLANS FOR '1'

Landowner's objectives for this stand:	Manage for multiple uses, including water quality, timber, wildlife habitat, and extensive recreation.
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Silvicultural Prescription

Recommended silvicultural system: Uneven-aged management, favoring hemlock, white pine, yellow birch, and red spruce. Target maximum diameter is 22 inches. The desired cutting cycle is 23 years.

Details of the silvicultural prescription: No management activities scheduled for this planning period

Planned Activities

There are no activities for this stand.

EXISTING CONDITIONS FOR '2'

Land area:	Land area: 8Acres	
Landuse history:	Former farm and quarry land with no recent forest management activity.	
Forest Type:		
- Existing	White pine/hardwoods	
- Potential	Northern Hardwoods	
Successional trend:	This is a stand of large, scattered, white pine sawlogs over smaller sized northern hardwoods. The pine are generally straight and tall, ranging from 12" to over 30" in diameter. The hardwood is of average quality and pole to small sawlog in size. Species distribution by basal area is: white pine 44%, white ash 22%, yellow birch, red maple 6%, paper birch 6% and black cherry 6%.	
Forest health:	No problems noted	
Site quality:	Site index is 57 for sugar maple. Site ranges from fair to very good - quite variable because of industrial mining history.	
Approximate age:	60	Size class: Medium Sawlogs (17.5 - 23.5")
Trees per acre:	127	Mean Stand Diameter: 11.98 in.
Basal Area (BA):	100	Acceptable BA: 73
Growth Rate:	3 %	Timber Quality: medium
Stocking:	Stand 2 is adequately stocked - just about b-line on the mixedwood stocking guide. The overall stand relative density is 57.9 and the Q-factor is 1.14	
Stand Volume:	10,901 bd. ft./ac.	
Habitat and wildlife use:	No critical habitat noted, but this area provides usable habitat for deer, turkey, small mammals, and song birds.	
Recreational opportunities:	Recreation opportunities limited because of rough, rocky terrain. "Empire lookout" is adjacent to this stand.	
Potential for timber	Fair to good. Excellent for white pine and average for northern	

production: hardwoods.
Potential for other uses:
Water quality issues: A stream cuts through the northeast corner of this stand. This entire stand is within the Barre Town Water System source water protection area.
Important natural features: Remnants of past industrial mining history

MANAGEMENT PLANS FOR '2'

Landowner's objectives for this stand: Manage for multiple uses, including water quality, timber, wildlife habitat, and extensive recreation.

Silvicultural Prescription

Recommended silvicultural system: Uneven-aged management, favoring yellow birch, white pine and white ash. Target maximum diameter is 24 inches. The desired cutting cycle is 25 years.

Details of the silvicultural prescription: No management activities scheduled for this planning period.

Planned Activities

2013: Evaluate trails for sustainability and schedule required maintenance
Priority: 1

EXISTING CONDITIONS FOR '3'

Land area: Land area: 25 Acres
Landuse history: Former farm and quarry land with no recent management history
Forest Type:
 - Existing Northern Hardwoods
 - Potential Northern Hardwoods
Successional trend: This is a small sawlog size stand of northern hardwoods with a minor amount of mixed softwoods. Species distribution by basal area is: sugar maple (41%), white ash (16%), yellow birch (10%) red maple (6%), and associated species in lesser amounts.
Forest health: No health problems noted
Site quality: Site index is 62 for sugar maple. Fair to good for timber production, depending on impact from granite mining history

Approximate age: 60 **Size class:** Small Sawlogs (11.5 - 17.5")
Trees per acre: 235 **Mean Stand Diameter:** 9 in.
Basal Area (BA): 112 **Acceptable BA:** 80
Growth Rate: 3 % **Timber Quality:** medium

Stocking:	Stand 3 is adequately stocked - a little over halfway between the a and b-lines on the hardwood stocking guide. The overall relative density is 82.7 and the Q-factor is 1.25
Stand Volume:	3200 bd. ft./ac.
Habitat and wildlife use:	No critical habitat noted, but stand 3 would provide seasonal habitat for deer, turkey, fox, coyote, and song birds
Recreational opportunities:	Excellent terrain for mountain biking, hiking, x-country skiing. Present trails range from easiest to advanced. Stand 3 provides access to the "Empire lookout"
Potential for timber production:	Fair to good - depending on former granite mining history
Potential for other uses:	
Water quality issues:	There is an unnamed stream that flows through the eastern portion of stand 3, paralleling Waterman St.
Important natural features:	Stand 3 borders three water filled quarries with associated grout piles. Empire lookout is accessed through this stand.

MANAGEMENT PLANS FOR '3'

Landowner's objectives for this stand:	Manage for multiple uses, including water quality, timber, wildlife habitat, and intensive, trail-related recreation.
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Silvicultural Prescription

Recommended silvicultural system:	Uneven-aged management, favoring sugar maple, yellow birch, and red spruce. Target maximum diameter is 22 inches. The desired cutting cycle is 22 years.
Details of the silvicultural prescription:	Conduct a single tree and group selection harvest in the year 2014. Groups will be chosen by the marking forester, will be less than 0.5 acre in size and not cover more than 5% of the stand area. 80 sq. ft. of basal area should be left between groups. Present Q is 1.25, with a goal of 1.3n improvement thinning to reduce the amount of unacceptable growing stock and increase proportion of desired tree species. Consider both single tree and group selection. Primary product would be fuelwood. (Prescription D - NE-603)

Planned Activities

2013	Evaluate trails for sustainability and schedule required maintenance
Priority:	1
2014:	Uneven-aged thinning
Priority:	2

EXISTING CONDITIONS FOR '4'

Land area:	Land area: 23 Acres	
Landuse history:	Former farm and quarry land with little recent management history	
Forest Type:		
- Existing	Northern Hardwoods	
- Potential	Northern Hardwoods	
Successional trend:	Stand 4 is a polesize stand of northern hardwoods dominated by sugar maple. Species distribution by basal area is: sugar maple (52%), white ash (21%), eastern hophornbeam (12%), american beech (6%), red maple (3%) and red spruce (3%)	
Forest health:	No problems noted	
Site quality:	Site index is 62 for sugar maple. Good site for growing northern hardwood	
Approximate age:	60	Size class: Poles (5.5 - 11.5")
Trees per acre:	278	Mean Stand Diameter: 8.52 in.
Basal Area (BA):	110	Acceptable BA: 87
Growth Rate:	3 %	Timber Quality: high
Stocking:	Adequately stocked on the northern hardwood stocking guide - a little over halfway between b-line and a-line. Overall relative density 81.8 and Q-factor is 1.48	
Stand Volume:	2,371 bd. ft./ac.	
Habitat and wildlife use:	No critical wildlife habitat was noted, but this area would receive seasonal use by deer, bear, coyote, turkey, fox, and song birds	
Recreational opportunities:	Gradual slopes and generally well drained soils make this area ideal for biking, hiking, skiing, snowshoeing, and bird watching	
Potential for timber production:	Excellent potential for growing high quality hardwoods	
Potential for other uses:		
Water quality issues:	There are no water quality issues in stand 4. A little over 50% of stand 4 lies within the Barre Town Water System source water protection area.	
Important natural features:	Stand 4 is adjacent to the Barre Medium quarry and grout piles; otherwise no notable natural features were identified.	

MANAGEMENT PLANS FOR '4'

Landowner's objectives for this stand:	Manage for multiple uses including water quality, timber, wildlife habitat, and mixed recreation.
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Silvicultural Prescription

Recommended silvicultural system:	Uneven-aged management, favoring sugar maple, white ash and yellow birch. Target maximum diameter is 24 inches. The desired cutting cycle is 22 years.
Details of the silvicultural prescription:	Conduct an all-aged harvest in year 2015. Use single tree and group selection to decrease the percentage of undesirable growing stock and increase the percentage of desired species. Groups will be opportunistic, chosen by the marking forester, and will be less than 0.5 acre in size and not cover more than 5% of the stand area. 80 sq. ft. of basal area should be left between groups. Present Q is 1.44, with a goal Q of 1.3. Fuelwood would be the primary product. (prescription D - NE-603)

Planned Activities

2013	Evaluate trails for sustainability and schedule required maintenance
Priority:	1
2015:	Improvement thinning to produce firewood
Priority:	2

EXISTING CONDITIONS FOR '5'

Land area:	Land area: 34 Acres	
Landuse history:	There are signs of past logging in area 5. It looks like some spruce and fir was removed 15 to 20 years ago.	
Forest Type:		
- Existing	Hemlock-Hardwoods	
- Potential	Hemlock-Hardwoods	
Successional trend:	This is a small sawlog size hemlock/hardwood stand. Species distribution by basal area is: eastern hemlock (39%), balsam fir (14%), sugar maple (10%), white ash (10%), red spruce (9%), aspen (6%), yellow birch (4%); with lesser amounts of white birch, American beech, elm, and black ash.	
Forest health:	No health problems were noted	
Site quality:	Site index is 52 for eastern hemlock. Site quality is fair to good. There is a wet swale down the middle of the stand that accounts for variable site conditions.	
Approximate age:	75	Size class: Small Sawlogs (11.5 - 17.5")
Trees per acre:	281	Mean Stand Diameter: 9.55 in.
Basal Area (BA):	140	Acceptable BA: 90
Growth Rate:	3 %	Timber Quality: medium

Stocking:	Adequately stocked - about halfway between the a and b-lines on the mixedwood stocking guide. Overall relative density is 77.3 and Q-factor is 1.35.
Stand Volume:	2,541 bd. ft./ac.
Habitat and wildlife use:	With a heavy softwood component, stand 5 probably serves as a travel corridor for deer, coyote, fox, and other wildlife with a relative large home range.
Recreational opportunities:	Trails cross through this area rather than meander due to wetness. Hiking snowshoeing, skiing, and bird watching would be compatible uses.
Potential for timber production:	Fair to good for timber production - the better drained portions of the stand will be the better for growing and harvesting timber
Potential for other uses:	
Water quality issues:	Seasonally wet soils will require buffering and require winter harvesting
Important natural features:	Seasonally wet soil may provide for some amphibian breeding activity.

MANAGEMENT PLANS FOR '5'

Landowner's objectives for this stand:	Manage for multiple uses including water quality, timber, wildlife habitat, and recreation.
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Silvicultural Prescription

Recommended silvicultural system:	Uneven-aged management, favoring hemlock, red spruce, and yellow birch. Target maximum diameter is 20 inches. The desired cutting cycle is 22 years.
Details of the silvicultural prescription:	Conduct an all-age harvest in 2016. Use single tree and group selection to reduce the percentage of unacceptable growing stock and increase the percentage of desirable species. Groups will be opportunistic, chosen by the marking forester, will not be larger than 0.5 acre in size and will not cover more than 5% of the stand area. 120 sq. ft of basal area will be left between the groups. Present Q is 1.35, with a goal Q of 1.3. The sale will be cut under frozen winter conditions only. (prescription D, NE-603)

Planned Activities

2013:	Evaluate trails for sustainability and schedule required maintenance
Priority:	1
2016:	Uneven-aged harvest
Priority:	2

EXISTING CONDITIONS FOR '6'

Land area:	Land area: 119 Acres	
Landuse history:	Most of the stand appears to have grown up from pasture or other open conditions associated with mining. There has been some supervised harvesting over the last 10 years in the south eastern section of stand 6.	
Forest Type:		
- Existing	Northern Hardwoods	
- Potential	Northern Hardwoods	
Successional trend:	Stand 6 is a small saw-log size stand of northern hardwoods. Species distribution by basal area is: sugar maple (31%), white ash (17%), red maple (16%), american beech (11%), hemlock (5%); with lesser amounts of yellow birch, red spruce, aspen, cottonwood and eastern hophornbeam.	
Forest health:	No health problems noted	
Site quality:	Site index is 70 for sugar maple. Fair to excellent depending on impact of past granite mining history	
Approximate age:	70	Size class: Small Sawlogs (11.5 - 17.5")
Trees per acre:	167	Mean Stand Diameter: 10.17 in.
Basal Area (BA):	94	Acceptable BA: 67
Growth Rate:	4 %	Timber Quality: medium
Stocking:	Stand 6 is adequately stocked - just about halfway between the a and b-lines on the northern hardwood stocking guide. The overall stand relative density is 64.4 and the Q-factor is 1.33.	
Stand Volume:	3489 bd. ft./ac.	
Habitat and wildlife use:	There are three vernal pools in stand 6 which may serve as amphibian breeding sites.	
Recreational opportunities:	Bike and ski trails abound in all but the southeast corner of this stand. Hiking biking, skiing, snowshoeing, bird watching, snowmobiling, and hunting are all potential opportunities in this stand.	
Potential for timber production:	Stand 6 has very good potential for future timber potential. A portion of the stand received an intermediate thinning within the last 10 years and looks good.	
Potential for other uses:	There are some open areas with scattered buildings and industrial level roads within this area which are presently leased to a company from Maine and used to store explosives. This area has great potential to center future timber harvesting operations.	
Water quality issues:	There are numerous water-filled quarries, and approximately 60% of stand is considered a "source water protection area."	
Important natural	Stand 6 has three vernal pools, two scenic vistas, and one "cold spot"	

features: and contains numerous water filled quarries and grout piles.

MANAGEMENT PLANS FOR '6'

Landowner's objectives for this stand: Manage for multiple uses, including water quality, timber, wildlife habitat and recreation

Silvicultural Prescription

Recommended silvicultural system: Uneven-aged management, favoring sugar maple, white ash, and yellow birch. Target maximum diameter is 24 inches. The desired cutting cycle is 22 years.

Details of the silvicultural prescription: None scheduled for this planning period; however, if the opportunity arises, some improvement cutting to produce fuelwood could be done in the western portion of this stand.

Planned Activities

2013 Priority: Evaluate trails for sustainability and schedule required maintenance
1

EXISTING CONDITIONS FOR '7'

Land area: Land area: 64 Acres

Landuse history: Little sign of past management on this former industrial mining site

Forest Type:
 - Existing Northern Hardwoods/Aspen
 - Potential Northern Hardwoods

Successional trend: This is a small saw-log size northern hardwood stand with a considerable component of aspen and paper birch. Species distribution by basal area is: sugar maple (27%), white ash (20%), aspen (19%), paper birch (14%), with lesser amounts of hophornbeam, yellow birch, balsam fir, basswood and black cherry.

Forest health: No specific health problems noted; however, the aspen component is maturing and shows some signs of decline.

Site quality: Site index is 70 for sugar maple. Good site, well suited for growing northern hardwood

Approximate age:	70	Size class: Small Sawlogs (11.5 - 17.5")
Trees per acre:	210	Mean Stand Diameter: 9.83 in.
Basal Area (BA):	110	Acceptable BA: 73
Growth Rate:	3 %	Timber Quality: high

Stocking: Stand 7 is adequately stocked - above to halfway level between the a and b-lines on the northern hardwood stocking guide. Overall stand

Stand Volume: relative density is 77.8 and the Q-factor is 1.35
3286 bd. ft. /ac.

Habitat and wildlife use: No critical wildlife was noted, but deer, turkey, bear, fox, coyotes, and song birds would all make seasonal use of this stand.

Recreational opportunities: Stand 7 has existing trails for biking, skiing, snowshoeing and snowmobiling. There are 3 "cold spots" and 1 scenic vista in this area.

Potential for timber production: Similar to stand 6, stand 7 has very good potential to grow northern hardwoods.

Potential for other uses:

Water quality issues: About 60% of this stand lies within the Websterville Fire District source water protection area.

Important natural features: Water filled quarries and grout piles are common in this stand, which also has three "cold spots" and one scenic vista

MANAGEMENT PLANS FOR '7'

Landowner's objectives for this stand: Manage for multiple uses, including water quality, timber, wildlife habitat, and recreation

Silvicultural Prescription

Recommended silvicultural system: Uneven-aged management, favoring sugar maple, white ash, and yellow birch. Target maximum diameter is 24 inches. The desired cutting cycle is 22 years.

Details of the silvicultural prescription: Conduct an all-aged harvest in 2018. Use single tree and group selection to reduce the percentage of undesirable growing stock and increase the percentage of desirable species. The groups will be opportunistic, chosen by the marking forester and will not cover more than 10% of the stand area. 80 sq. ft. of basal area will be left between the groups. Present Q is 1.35, with a goal Q of 1.3. Primary products will be aspen pulp and fuelwood. (Prescription D, NE-603)

Planned Activities

2013: Evaluate trails for sustainability and schedule required maintenance
Priority: 1

2018: Uneven-aged harvest
Priority: 2

EXISTING CONDITIONS FOR '8'

Land area: Land area: 16 Acres
Landuse history: This stand grew in from pasture within the last 40 years.

Forest Type:
 - Existing Aspen-Birch
 - Potential Northern Hardwoods

Successional trend: Stand 8 is a pole-size stand of aspen and birch. Species distribution by basal area is: aspen (57%), yellow birch (29%) and gray birch (14%).

Forest health: No health problems noted

Site quality: Site index is 62 for sugar maple. The site quality is variable in that a few areas seem to have had some soil disturbance that will affect site productivity.

Approximate age: 30 **Size class:** Poles (5.5 - 11.5")
Trees per acre: 92 **Mean Stand Diameter:** 9.65 in.
Basal Area (BA): 47 **Acceptable BA:** 20
Growth Rate: 2 % **Timber Quality:** low

Stocking: This stand is understocked - below c-line on the northern hardwood stocking guide.

Stand Volume: 1,177 bd. ft./ac.

Habitat and wildlife use: No critical habitat noted; however, this stand has some early successional stage vegetation, and more could be created. There are numerous wild apple trees that should be pruned and kept free of the encroaching forest.

Recreational opportunities: Stand 8 is adjacent to an active hay field owned by Pierre Couture. Some of the main trails enter the forest through the stand, as it lies just across the field from a Millstone Trail Assoc. parking lot.

Potential for timber production: Fair to good potential for timber production. In the short term, timber production will be only fair because of low value species now occupying the site. The long term timber potential will be good as higher value species eventually occupy the site.

Potential for other uses:

Water quality issues: This entire stand lies within the Water Source Protection Area for the Websterville Fire District

Important natural features: Stand 8 has many apple trees that could be enhanced for wildlife as well as the potential to serve as early successional habitat.

MANAGEMENT PLANS FOR '8'

Landowner's objectives for this stand: Manage for multiple uses, including water quality, timber, wildlife habitat, and recreation

Silvicultural Prescription

Recommended Even-aged management, favoring aspen and birch. Desired rotation

silvicultural system: age is 60 years.
Details of the silvicultural prescription: Maintain apple trees for wildlife as needed. Use patch cuts to create and enhance early successional habitat. Two patch cuts between 0.5 and 1 acre each.

Planned Activities

2013 Evaluate trails for sustainability and schedule required maintenance
Priority: 1
2014 Prune apple trees in northern section of stand.
Priority: 2
2015 Patch cuts to maintain early successional habitat
Priority: 2

SUMMARY TABLES

Overview of Planned Activities

Unit	2013	2014	2015	2016	2017	2018	2019	2020	2021
2	X								
3	X	X							
4	X		X						
5	X			X					
6	X								
7	X					X			
8	X	X	X						

Detailed plans by year**- 2013 -**

Trails will be evaluated in terms of their ability to hold soil and prevent erosion and soil displacement, based upon guidelines and best practices of the International Mountain Biking Association (www.imba.com). This may involve adding waterbars to steep sections of trail, armoring the trail with pallets or rocks for better drainage, rerouting trails, or putting in small culverts to reduce impact on wetter areas, among other techniques.

UNIT	PRIORITY	ACTIVITY
2	1	evaluate trails for sustainability and schedule required maintenance
3	1	evaluate trails for sustainability and schedule required maintenance
4	1	evaluate trails for sustainability and schedule required maintenance
5	1	evaluate trails for sustainability and schedule required maintenance
6	1	evaluate trails for sustainability and schedule required maintenance
7	1	evaluate trails for sustainability and schedule required maintenance
8	1	evaluate trails for sustainability and schedule required maintenance

- 2014 -

UNIT	PRIORITY	ACTIVITY
3	2	Uneven-aged thinning
8	2	Prune apple trees in northern section of stand

- 2015 -

UNIT	PRIORITY	ACTIVITY
4	2	Improvement thinning to produce firewood
8	2	Patch cuts to maintain early successional habitat

- 2016 -

UNIT	PRIORITY	ACTIVITY
5	2	Uneven-aged harvest

- 2018 -

UNIT	PRIORITY	ACTIVITY
7	2	Uneven-aged harvest

Comparison of management units on the property

UNIT	ACRES	COVER TYPE	STAND DIAMETER	BASAL AREA	SILVICULTURAL SYSTEM
1	7	Hemlock-Hardwoods	11.6 in.	106	Unevenaged mgmt. Maximum diameter 22 inches. Cutting cycle of 23 years.
2	8	White pine/hardwoods	11.98 in.	100	Unevenaged mgmt. Maximum diameter 24 inches. Cutting cycle of 25 years.
3	25	Northern Hardwoods	9 in.	112	Unevenaged mgmt. Maximum diameter 22 inches. Cutting cycle of 22 years.
4	23	Northern Hardwoods	8.52 in.	110	Unevenaged mgmt. Maximum diameter 24 inches. Cutting cycle of 22 years.
5	34	Hemlock-Hardwoods	9.55 in.	140	Unevenaged mgmt. Maximum diameter 20 inches. Cutting cycle of 22 years.
6	119	Northern Hardwoods	10.17 in.	94	Unevenaged mgmt. Maximum diameter 24 inches. Cutting cycle of 22 years.
7	64	Northern Hardwoods/Aspen	9.83 in.	110	Unevenaged mgmt. Maximum diameter 24 inches. Cutting cycle of 22 years.
8	16	Aspen-Birch	9.65 in.	47	Evenaged mgmt. Rotation age is 60 years.

VII. WILDLIFE

According to Rose Graves, who completed a rapid ecological assessment, the Barre Town Forest has high wildlife habitat value. Contiguous forest habitat supports native plants and animals, including those species like bobcats and black bears that require large areas to survive. Such habitat, together with other important habitats such as wetlands and vernal pools, also supports natural ecological processes such as predator/prey interactions and natural disturbance. It also serves to buffer species against the negative consequences of fragmentation. For instance, many of Vermont's native migratory songbirds, including the hermit thrush (Vermont's state bird), generally require larger patches of relatively unfragmented forest habitat to ensure successful reproduction. In the absence of such habitat, these birds are greatly affected by increased rates of nest predation from raccoons, skunks, squirrels, and chipmunks, as well as nest parasitism from brown-headed cowbirds. Many of the native migratory songbird populations are now in decline due, in part, to the loss of contiguous forest habitat. The intense human use of the recreational trails in the summer may preclude some species from using this property during those months, but it provides valuable spring, fall, and winter habitat.

Conservation of this property helps protect landscape connectivity and wildlife movement for this part of Washington County. Through its protection, the Barre Town Forest contributes to landscape connectivity in the Northern Vermont Piedmont and into the Northern Highlands biophysical regions of Vermont. This property is not the highest value linkage area within Barre, but its size and proximity to other large blocks of core habitat indicate that it could serve as a valuable stepping stone in east-west and north-south movement between the 43,000-acre core forest and protected land around Groton State Forest and an 8,000-acre biodiversity hotspot in Williamstown and Brookfield (identified by the Vermont Biodiversity Project). (See attached locus map.). Movement of animals from one habitat patch to another is the most common function associated with connecting habitat. This function is particularly important for wide-ranging animals, such as bobcats and black bears, or for animals that require a great deal of space to meet their daily life needs, such as barred owls or otter. Although connecting habitat is often associated with wide-ranging mammals, it is equally important for animals with relatively small ranges. Spotted salamanders, for example, use connecting habitat in spring to move from their hibernation sites to breeding pools.

The value of connecting habitat is a function of both seasonal and spatial patterns of wildlife behavior. For example, connecting habitat may allow black bears to access important food resources during a specific time of year (seasonal), or it may prevent isolation of bear populations by allowing free exchange of breeding adults (spatial). Ultimately, connecting habitat can ensure that the habitat, movement, migration, and behavior requirements of most native plants and animals are conserved across a broad landscape.

The broader ecological value of connecting habitat is to join fragmented pieces of habitat, thereby reducing the deleterious effects of habitat fragmentation and population isolation. Linking small or otherwise isolated habitat patches may reduce the risk of local population extinctions by ensuring immigration, recolonization, reproduction, and exchange of genes for some plant and animal species.

According to a rapid ecological assessment by Rose Graves (see Appendix D), the Property contains six distinct natural communities, including a streamside wetland complex near the southeast corner, hemlock-northern hardwood forest in colder pockets and along a stream on the eastern boundary, and occasional vernal pools. The majority of the forest is the matrix forest common in the Northern Vermont Piedmont: northern hardwood forest and its variants. The large blocks of northern hardwood forest are dominated by yellow birch, sugar maple, and white ash. Along the southern and western portions of the site, aspens are a major component of the canopy but will likely be replaced by mid- and late-successional maples, beech, and birches.

Bear, deer, moose, and coyotes are known to use the site for foraging and winter habitat. A number of woodpecker species currently use this forest and will continue to have abundant habitat as the early successional tree species senesce. The mixture of hemlock-northern hardwoods and abundant rock piles provides ample habitat for porcupine, and possibly its major predator, the fisher.

Important habitat features at this property include wetlands and ponds which can serve as important spring foraging sites, breeding sites for amphibians and birds, and water catchment. The vernal pools and quarries provide breeding habitat for amphibians, and may provide habitat for fish, beavers, and waterfowl as well.

Large rock piles, cast off from the granite quarry operations, provide den sites for porcupines and could also provide cover and den sites for small rodents, weasels, bobcats, black bear and fox

The northern hardwood forest provides habitat for a range of species. Deer frequently find food resources in the herbs, shrubs, and new growth of trees in these forests. Hophornbeam, a common tree at this site, is used by black bear as a spring food source, and beech trees provide important fall food for black bear. Occasional black cherry and wild apple trees are valuable food resources for black bear, deer, wild turkeys, and a host of other mammals and birds. The large blocks of relatively intact habitat provide nest sites for forest birds. The aspen provide early spring forage in its buds for bear and other wildlife and, as it begins to senesce, will provide an abundance of snags which are used by many woodpeckers. At least four species of woodpeckers have been observed on the Property. The hemlock-northern hardwood forest provides winter cover for deer and food for porcupine.

The following is a summary from the Forest Bird Habitat Assessment and Management Recommendations, by Steve Hagenbuch at Audubon Vermont. Please see Appendix C for the full report.

The Barre Town Forest provides a block of interior forest habitat (forest >300 ft from a forest/non-forest edge) within a greater landscape that is fragmented by agriculture and residential and commercial development. Maintaining the Barre Town Forest as a closed canopy (>80% closure) forest (on average), with minimal fragmenting features such as roads and trails >20 ft wide and permanent openings > 2 acres will help to protect high quality nesting habitat for interior forest bird species such as black-throated blue warbler, wood thrush, and scarlet tanager.

General Habitat Types: Primarily mid-successional (mature) northern hardwood forest, mixed forest, and softwood forest with a minor amount of early-successional (young forest/old field)

conditions. The ponds and talus associated with past quarrying are not likely to contribute significantly to overall bird habitat although a portion of the early-successional habitat may be provided along some of the edges.

Features to protect or maintain

- Interior forest – lack of significant fragmenting features provides valuable habitat for a variety of bird species, including black-throated blue warbler, wood thrush, scarlet tanager, blackburnian warbler, and black-throated green warbler.
- Native species composition – good site match with currently only minor amounts of non-native invasive plants (Japanese barberry was noted).
- Larger diameter aspen spp. and white birch – retain as potential snags and cavity trees.
- Early-successional habitat – maintain areas where it currently exists.

Features to enhance

- Horizontal and vertical structure – especially 0-5' understory layer where lacking.
- Woody material – coarse and fine – where lacking.
- Snags – especially larger-diameter trees.
- Possible – create an additional (1-2 acre) patch of early-successional habitat with open canopy (<30% closure) where silviculturally appropriate to create conditions for species such as chestnut-sided warbler.

1. Northern Hardwood and Mixed Forest Habitat – Stands #1-4 and 6-8

Birds Observed: eastern wood-pewee, black-throated green warbler, ovenbird, red-eyed vireo, black and white warbler, hermit thrush, wood thrush, black-throated blue warbler, yellow-bellied sapsucker, winter wren.

Current Habitat Condition

Generally closed canopy, even-aged, and structurally simple. Understory (0-5 ft) and midstory (6-30 ft) layers of the forest are generally lacking. Large diameter snags and both coarse (> 4 in diameter) and fine (<4 in diameter) woody material are found in minimal abundance.

Management Considerations

Main priorities for forest songbird habitat enhancement are to continue enhancing 0-5' and 6-30' layers, woody debris, and snags and cavity trees. Silvicultural treatments for regeneration, such as single-tree and group selection harvests, that creates canopy openings with a diameter twice the height of dominant canopy trees will help release advanced regeneration, promote shrub development, and enhance nesting site opportunities for black-throated blue warbler and wood thrush. Intermediate treatments (e.g. canopy thinning, crop tree release) would likely have a similar effect, depending upon their intensity. Research in tolerant northern hardwood stands has shown that, where silviculturally appropriate, minimum residual basal area outside of groups of at least 85-90 sq. ft./acre, with at least 30- 35 sq. ft. /acre composed of sawtimber >14 in. dbh, should maintain suitable conditions for interior forest bird species sensitive to disturbance, including ovenbird.

2. Softwood Forest Habitat – Stand #5

Birds Observed: scarlet tanager, yellow-bellied sapsucker, eastern wood-pewee, black-throated green warbler

Current Habitat Condition

Similar to that of the northern hardwood/mixed forest, although recent harvesting has resulted in patches of higher understory development. Of moderate concern, however, is the abundance of hayscented fern that has regenerated in these openings.

Management Considerations

Main priorities for forest songbird habitat enhancement are to continue enhancing 0-5' and 6-30' layers, woody debris, and snags and cavity trees. Silvicultural treatments for regeneration, such as single-tree and group selection harvests, that creates canopy openings with a diameter \leq 1x the height of dominant canopy trees will help release advanced regeneration, promote shrub development, and enhance nesting site opportunities for magnolia warbler and white-throated sparrow. Intermediate treatments (e.g. canopy thinning) would likely have a similar effect, depending upon their intensity. Research in softwood dominated stands has shown that densities of blue-headed vireo, blackburnian warbler, and northern parula may decline when canopy cover $<62\%$ and there are fewer than 28 trees/acre $<12''$ dbh.

3. Early-Successional Habitat – Embedded in Stand #8

Birds Observed: common yellowthroat

Current Habitat Condition

Appears to be an old field that is slowly reverting to forest. Dense sapling patches of birch and aspen with scattered apple trees.

Management Considerations

Main priorities for forest songbird habitat enhancement are to maintain the current old field area in an early-successional condition and possibly increase it through timber harvesting in the forest immediately adjacent to or within close proximity. Among the desired features for this condition are high densities of seedlings and saplings up to 20' tall and the presence of fruit producing trees and shrubs such as *Rubus* and cherry spp. Silvicultural options for creating this condition include shelterwood systems (e.g. expanding gap, continuous cover) and group selections/patch cuts of \geq 1 acre. If possible early-successional habitat should be created in areas close to roads or other human disturbances; larger openings in the forest interior are discouraged. This is one of the reasons this area is an excellent site for early-successional habitat creation. Circular or square harvest areas are preferable to long, narrow ones.

VIII. RARE SPECIES AND EXEMPLARY NATURAL COMMUNITIES

As maintenance and protection of biological diversity and integrity is a main stewardship goal for this Property, management activities will promote a forest that reflects a diversity of stand ages and naturally occurring forest types in a majority of the forest. Special attention will be given to the conservation of rare and exemplary natural communities, and the conservation and enhancement of native plant and animal species and their habitats, including the establishment and retention of a range of sizes and types of downed woody debris, snag trees, cavity trees, occasional very large or old trees, and early successional habitats.

No rare or unusual natural communities are known to exist on the Barre Town Forest. The abandoned quarries may provide habitat for rare or unusual amphibians and reptiles and should be surveyed during the appropriate season.

IX. WATER RESOURCES

Rivers and Streams

The Barre Town Forest is situated in the Winooski River watershed. The Property contains 1,838 feet of first order streams, according to GIS analysis of the state hydrology data. The northern portion of the Property contains the headwaters of Jail Branch, which drains into Stevens Branch, the Winooski River, and eventually, Lake Champlain.

Wetlands

There is a small wetland surrounded by hemlock-northern hardwood forest in the southeastern portion of the Property. The wetland is a mix of forested wetland, shrub-swamp, and emergent streamside vegetation. Wetlands are protected by the State of Vermont and all management activities will be designed to preserve their integrity.

Vernal Pools

There are three vernal pools identified on the Property, as shown on Map J: Natural Communities Map. These vernal pools are given special management consideration through the establishment of Primary and Secondary Special Treatment Areas (STAs) around the pools, as outlined in the Conservation Easement, and as described in the Timber Management section on page 22.

Abandoned Quarries

There are 25 abandoned quarries on the Property, providing 14.9 acres of open water habitat for fish, waterfowl and amphibians.

X. RECREATION AND EDUCATION

Outdoor recreation is very important to the quality of life of Barre Town's residents and to the region's tourist economy (Barre Town Plan, 2008). Section 6.1 of the Barre Town Plan calls for the maintenance, preservation, development, and upgrade of recreational opportunities including skiing, fishing, hiking, hunting, snowshoeing, bicycle/pedestrian paths, and snowmobiling. In multiple public meetings in 2010 and 2011, Barre Town's residents have identified recreation as a long-term management priority for the Barre Town Forest.

Trails throughout the Barre Town Forest connect people to the landscape, to the local history of Barre, and to each other, by providing a place for year-round recreation and cultural education. Due to its proximity to residential areas, the Wilson Industrial Park, the Barre Town School, the Barre Town Forest is easily accessible to a large number of residents for recreation and draws visitors from around central Vermont, New England, and beyond.

Recreation and recreation management must be guided by the permitted and restricted uses set forth in the conservation easement (Appendix B) and also should adhere to several other guiding principles. Through the terms of the Easement, passive, non-commercial public access is granted to the Property, provided it does not conflict with the other purposes of the Easement. Public access will benefit the local and regional tourist economy, provide educational and cultural opportunities, and provide health benefits for residents and visitors alike.

Passive Pedestrian Recreation

In accordance with the Easement, the Property shall be available to the public for all types of non-commercial, non-motorized, non-mechanized, non-equestrian, dispersed recreational purposes, including hiking, hunting, trapping, fishing, wildlife viewing, skiing, snowshoeing, and environmental education.

Equestrian, Mechanical, and Motorized Recreation

The following activities will be permitted provided that user groups can maintain trails consistent with the objectives of the Easement and the goals of this Community Forest Plan. Recreational uses such as snowmobiling, mountain biking, horseback riding, and ATV use are permitted only on designated trails and only at the discretion of the Town of Barre in accordance with the Easement. The current status of these forms of recreation is listed below.

Three snowmobile trails, operated by the Vermont Association of Snow Travelers (VAST), and currently locally managed by the Barre Town Thunder Chickens, cross the Property (see map C: Access and Recreation Map). Snowmobile trails can provide access to the Property to those who are disabled, elderly, or otherwise physically challenged. Snowmobiling will be limited to designated trails. The Town Recreation Board will work with the Barre Town Thunder Chickens (and VAST) on any maintenance or management issues relating to these trails or future snowmobile trails. As required by State Law, snowmobiles must be registered with the State. The Town of Barre does not intend to create any additional snowmobile trails at this time.

Mountain biking is allowed on designated trails only (see Map C). Mountain biking trails have been created for three abilities: beginners, intermediate and expert. Expert trails may contain

bridges, steep descents, and challenging terrain (See Appendix E for an inventory of Structures on the trails). Bikers are required to wear a helmet, ride in control and yield to other trail users. To minimize trail erosion, riding in muddy conditions is prohibited.

Currently there are no designated horseback riding trails but the Town Recreation Board will consider any proposals for the creation of such trails and will coordinate with designated Trail Corridor Managers, the Vermont Land Trust, and VHCB on the creation and location of any new designated trails for these uses. Single-track trails used by mountain bikers will not be considered suitable for horseback riding; horseback riding trails will be considered only on wider multi-use trails. Occasional riding on multi-use trails will be permitted until horseback riding trails are designated as use increases.

The Conservation Easement allows recreational use of ATVs and motorbikes only at the discretion of the Town and only on a designated connector trail that connects existing, legal networks of ATV trails. Such a connector trail will need to be reviewed and approved by Easement holders and may not have a significant, negative impact on the conservation values of the property. A local ATV club would need to be responsible for management and enforcing responsible use. Currently there are no designated trails for this use. See Appendix J for more details on the standards under which ATV use may be allowed.

Other motor vehicles may not be operated on the property except for uses specifically permitted under the Easement such as wildlife and habitat management, timber management, trail grooming, maintenance, handicap access, safety, or emergency purposes.

Trails

Historically, old logging roads and quarry roads were used by hikers, skiers, hunters and mountain bikers. The current single-track trail network was built by the Millstone Trail Association over the past 7 years. Trails have been located to minimize effects on streams and ponds (i.e. water-filled quarries). No additional trails are planned at this time. Any new trail construction will need to be approved by the Selectboard, Barre Town Recreation Board, and the Vermont Land Trust. Trails may be rerouted from their current location to decrease erosion and avoid hazards, wetlands, riparian areas or other sensitive natural features, or to create a larger buffer between trails and adjacent private land.

Multi-use trails: Allowable uses are hiking, snowmobiling, horseback riding, snowshoeing, cross-country skiing, and mountain biking, or other such approved use.

Single track trails: Allowable uses are hiking, snowshoeing, cross country skiing, and mountain biking.

Dogs are allowed on the Property in compliance with the Town ordinance (Town of Barre Animal Nuisance Control Ordinance, effective March 7, 2007). Dog owners or handlers must remove their dogs' waste from the Barre Town Forest.

Out of respect for abutting landowners, trails will be a minimum of 10 feet from property lines, or 25 feet if requested by abutting landowner. With landowner permission, trails may be closer than the minimum distance and also connect and continue on to private land.

The Town will coordinate with the Websterville Fire District regarding the use and maintenance of the private road that leads to the Websterville Water Plant in the interior of the Property.

All users of the Forest are required to abide by the Leave No Trace ethic (See Appendix F). Users must confine their activities to durable ground, carry out all trash, respect other users, respect wildlife and wildlife habitats, avoid protected areas, and minimize impact on natural resources.

Trail Corridor Managers

Designated Trail Corridor Managers (TCMs) will be required to obtain written permission from the Selectboard prior to using any existing trails within the boundaries of the Town Forest. Corridor Management Agreements will be created between the town and Trail Corridor Managers (see Appendix G for example Agreement.) These will be renewed annually after evaluation by the Recreation Board and Selectboard to ensure TCMs are fulfilling the responsibilities outlined in the Agreement. TCMs will be required to monitor trail use to ensure users abide by the rules outlined in this Community Forest Plan. TCMs will reference the Barre Town Forest in marketing and publicity materials for events that take place on the Barre Town Forest.

Trail Corridor Managers will be responsible for overseeing any repairs or improvements to existing trails and coordinating with other TCMs or other interest groups as necessary. Trails will be routed to avoid any adverse impact on wetlands, springs, riparian areas, vernal pools and other sensitive natural features. To prevent increased predation of birds and nest parasitism, trails will be less than 25 feet in width and, if possible, a forest canopy closure of greater than 70% will be maintained. Bridges, culverts, and other trail amenities will be installed and maintained as needed to minimize impacts on soil, water, and other resources, with approval by Barre Town Recreation Board. The Easement prohibits manipulation of natural water courses or other water bodies. All trails will be maintained in a manner to minimize environmental impact, be compatible with other uses in the forest, and be in accordance with the Easements, the VT Trails and Greenways Manual (2007), and other appropriate trail standards established by recognized recreational groups.

Organized user groups of a particular activity can petition the Barre Town Selectboard to consider additional recreational activities, if they are consistent with the purposes of the Easement. However, activities more suitable to open, non-forested land and with recreation facilities that currently exist elsewhere in Barre town (such as volleyball courts or community gardens) are not considered appropriate in the Town Forest.

If there is an interest in developing other uses, enthusiasts of a particular activity could request a license from the Town to develop this activity, assuming it is consistent with the Conservation Easement. The cost of establishing these activities and the responsibility of maintaining them rests squarely on the groups interested in these activities and not on the town taxpayers. User

groups must provide proof of insurance which names the Town as additional insured. If the Selectboard or Recreation Board is not satisfied with the way these activities are being managed, they could withdraw the license.

The Recreation Board will annually monitor the forest, particularly the trails, for evidence of abuse or damage to natural systems due to recreational activities and will modify management recommendations and actions appropriately.

Trail Signage

Trail Corridor Managers are required to clearly mark designated trails in coordination with the Barre Town Recreation Board. Trails that continue onto private property will have signs that indicate a user is leaving the Town Forest. All signs are subject to approval by the Recreation Board. Trail maps of the Barre Town Forest can be obtained at the Town office and the Town of Barre's website.

Trail Fees

Trail Corridor Managers who wish to charge a fee for use of any trail located within the Barre Town Forest must get Town approval. The TCM applicant will apply for fee schedule approval from the Barre Town Recreation Board, which will make a recommendation to the Selectboard. The applicant will seek final approval from the Selectboard. See Appendix I for more details.

All trails on the Town Forest will be open to all hikers, snowshoers and dogwalkers, without cost.

Hunting, Trapping, Fishing and Collecting

Hunting is permitted in the Town Forest in compliance with the laws of the Vermont Fish and Wildlife Department. A valid state hunting license is required. Hunting and other recreational and educational uses of this property do not need to conflict. Prudence dictates that precautions are exercised both by hunters and by non-hunting users, especially during rifle season for deer. Except for pedestrian use, trails will be closed from the beginning of rifle season until the end of muzzle loader season for deer. All tree stands are prohibited. Carry in-carry out ground blinds may be permitted within the Town Forest, but must be dismantled after use, following the Leave No Trace Guidelines, and requires written permission from the Barre Town Recreation Board. No live growth shall be cut or damaged to construct blinds or to create shooting lanes.

Trapping is allowed, as permitted and as directed by the Selectboard. (State law requires all trappers to get landowner permission.)

The killing of non-game animals or permanent removal of nests or plants, including wildflowers, is prohibited. Activities such as the limited collection of tree leaves, fern fronds, berries, fungi, fruits, algae, and lichen specimens are permitted for non-commercial, educational, and individual use. The Town may require a special use permit if there is concern for depletion of the resource, or if uncontrolled harvesting may have an adverse impact on the health of the forest.

Camping

There are currently no campgrounds or camping areas located on the Property and camping is not allowed without permission from the Town of Barre. The Town may designate a camping area in the future. Permission from the Town will be required; all authorized camping must follow the Leave No Trace guidelines (see Appendix F).

Due to the risk of wildfires, campfires are prohibited. If camping is allowed in the future, small campfires may be allowed under ideal conditions and in designated confined areas. Permission from the Fire Warden would also be required.

Other Activities

Individuals may choose to engage in other lawful activities which have minimal impact on the natural condition of the land, such as swimming, fishing, and ice skating, at their own risk. The Town may designate a particular quarry for swimming after conferring with the town's insurance provider and after potential sites have been examined by underwater divers. All users should follow Leave No Trace Guidelines by packing out all trash including cigarette butts, and keep noise to a respectful level.

Prohibited

Alcoholic beverages are prohibited within the Barre Town Forest. Notice should be given at parking areas. Littering and dumping is prohibited. No dumping signs should be posted at parking areas and along Littlejohn Road where it bisects the Town Forest.

Enforcement

Town Forest visitors will be expected to respect and obey the Town of Barre Conduct Ordinance (Chapter 3.5 of the Barre Town Code of Ordinances) as it may apply to the Town Forest.

Public Events

The Town or a user group may conduct periodic, temporary, non-commercial, community, and public gatherings and events on the Barre Town Forest, assuring that there is adequate provision for parking and septic disposal, and that there will be no lasting harm to natural systems. Such events require advance written permission from the Recreation Board. The Town may charge user groups a reasonable event fee if police services or traffic control are needed or other costs to the town are incurred. User groups must provide proof of insurance that names the Town as additional insured. Trails may be closed during races or events to ensure public safety. Fires may be allowed during special events with permission of the Fire Warden and the Recreation Board.

Structures

The Property contains a 2-car garage, off Brook Street, as shown on the Conservation Plan. It will be used for storage of equipment used in the management of the Town Forest. If provided for in a Trail Corridor Manager Agreement, TCMs may store trail management equipment here. Rent or an annual fee may be charged for use of the garage by TCMs. The garage may be expanded to include a small shed for storage of lumber, and modified to install electricity, with prior approval of the Town and Easement Holders. If a Trail Corridor Management Agreement is not renewed, all equipment owned by that Trail Corridor Manager must be removed within 30 days. The town is not liable for damage or theft of equipment stored in the garage.

The Property also contains a one story cement block building as shown on the Conservation Plan. This will be used for storage of items related to the management of Barre Town Forest and may, someday, be converted to a picnic shelter or similar recreational structure. The playground equipment (2 swing sets, carousel, slide and jungle gym) at the Town's Upper Graniteville Playground encroaches on the Property and is considered a minor structure.

No new structures are planned at this time.

Managing Public Access

The Town of Barre will monitor public access to and use of areas that are ecologically fragile to ensure that the current ecological conditions and the purposes of the Easements are not diminished or degraded by the public. Access to the property may be closed or restricted by either the Town of Barre or Vermont Land Trust for public health and safety reasons or to protect the Property's natural resources and ensure compliance with the terms of the Easement. Concentrated public use causing erosion or degradation of the landscape, hunting out of season, threat of fire, or danger from active timber harvesting operations are all examples of issues that may require either the Town of Barre or the Vermont Land Trust to restrict public access. Both the Town of Barre and the Vermont Land Trust will work in good faith to manage and maintain public access to the Property according to the terms of the Easements.

The Town of Barre will notify VLT and VHCB if restriction of public access is deemed necessary. The Town of Barre will alert the public using temporary signs regarding any active timber harvesting operations on the Property. The Town of Barre will exercise care during timber harvesting operations to avoid affecting or blocking public trails as much as possible.

Parking and Access

The Town may construct, maintain, and replace three permeable surfaced parking areas, not to exceed 0.3 acres each, at the location depicted as "Parking Area" on the Recreation Map (Map C). These parking areas shall be used for such uses as are permitted in the Easement.

Subject to adequate funding, kiosks will display a trail map, and appropriate cautions, rules and expectations of those using the Property.

The Town of Barre will coordinate the creation of any parking areas with VLT and VHCB. Parking areas will be clearly marked. The Town will be responsible for coordinating annual maintenance, mowing, plowing, or grading as necessary. Parking areas will be open from dawn until dusk and be policed in accordance with other municipal parking facilities. A seasonal 24-hour parking may be considered upon request to the Recreation Board.
(see Map C: Access and Recreation Map).

There are also multiple pedestrian access points to the Town Forest (see map C):

- Littlejohn Road
- Church Hill Road
- Violette Street
- Casanova Street

- Graniteville Road
- Barclay Quarry Road
- Donahue Road
- Waterman Road
- Park Street
- Brook Street

Education

The intent of the Town is to make the Town Forest fully available to all schools and students and to encourage educational field trips. Some ways the Forest can be used as an educational resource include:

- Teaching residents about trail maintenance and stewardship through annual work days;
- Posting interpretive information about forest ecology and management;
- Encouraging teachers to use the Forest as an outdoor classroom; and
- Erecting interpretive signs throughout the Property giving information about the history of the quarries.
- Local naturalists or high school biology classes could add to the biological knowledge about the Property by:
 - i. Performing an inventory of amphibians and reptiles using the vernal pools and quarries;
 - ii. Inventorying fish in the quarries; and
 - iii. Tracking surveys to look at animal activity in the winter throughout different areas and habitats on the Property.

Other Guiding Principles

As a result of its on-site investigations, discussions with experts, and public input, the Management Committee developed the following additional principles to guide the management of recreation within the Barre Town Forest.

1. Encourage recreational use that
 - is consistent with protection and enhancement of natural systems;
 - adheres to the terms of the Easement;
 - minimizes conflict between recreational uses; and
 - respects the rights and privacy of adjoining landowners.
2. Temporarily restrict or curtail recreational activities when needed to allow for other management activities provided for by this plan (e.g. timber management) or when conditions are not suitable (too muddy or wet). Trail closures will be posted on the town website, at the kiosks, and on any TCM's website.
3. Update recreation recommendations as needed to reflect changes in recreational demand and changes in natural systems within the Barre Town Forest.
4. Recognize and take advantage of the educational opportunities created by recreational use of the Barre Town Forest.

5. Concentrate recreational use on existing trails, and prohibit the creation of new trails except to replace unsuitable trails.
6. Adhere to relevant trail and recreational standards and the best available professional judgment to protect soils, water quality, and other natural resources.

XI. HISTORIC AND CULTURAL RESOURCES

The history of the Town Forest land goes back to pre-European settlement. Littlejohn Road, which bisects the Property, was built over the Coos Indian Trail, one of the few East/West Indian trails known to have existed in Vermont. It became the pathway that the original settlers of Barre followed to get to lands they had purchased sight unseen. Two of the original settlers of what is today Littlejohn Road were neighbors, Abijah Abbott and Gardner Wheeler. Abbott is recognized as the first person in Barre to use the granite deposits found on his land for commercial purposes, producing valuable millstones. As early as 1796, this resulted in the hill on his property being given the name Millstone Hill, which it still retains today.

Granite is integral to the history and early growth of Barre, known as the “Granite Capital of the World.” During the first few decades of Barre’s existence, granite production by Abbott and others was a part-time occupation, used to supplement farming. By the 1830s, Abbott’s son Richard Flagg Abbott had turned his father’s Millstone Hill granite works into a full-time occupation, producing a variety of functional granite products, such as paving and cobble stones, doorsteps, lintels, and fence posts. The first significant order for granite from Millstone Hill was for building the State House in Montpelier during the 1830s. This contract was evidence of the superior quality and beauty of Barre granite, but also made clear the difficulty and cost in transporting the stone off The Hill.

Until the 1870s, the primary activity on the Town Forest property was farming, as it was throughout Barre. After many years of actively seeking a railroad connection for Barre, the railroad finally reached the center of town in 1876. Barre and Millstone Hill would never be the same. Between 1876 and the completion of the “Sky Route” railroad to the quarries on The Hill in 1888, Barre began the dramatic growth that would make it the fastest growing town in Vermont ever. At the same time, land speculators moved into Millstone Hill, purchasing the Abbott and Wheeler farms as well as most of the farms of the early settlers. By 1900 these properties had been subdivided into ever-smaller parcels, with the number of active quarries exploding from the two that existed in 1850 into almost seventy independent quarry operations, with virtually every square foot of Millstone Hill transformed from bucolic farmland into a beehive of industrial activity. During this period, virtually every tree had been removed from the Town Forest property, yet tourists flocked by the thousands to see this virtual industrial wasteland, amazed by the engineering wonders of the railroad and granite works. There was another dramatic shift during the beginning of the 20th century, as the technologies being developed in granite quarrying made the granite business ever more profitable, but required greater capitalization and thus drove most of the smaller operators out of business. The land that makes up the Town Forest was gradually reconsolidated into one large parcel, as the five major players absorbed the dozens of smaller quarry operations. By 1990 Rock of Ages had

purchased all the other quarries on Millstone Hill, and they remain today the only active quarry operation and owners of the majority of land on The Hill. Rock of Ages maintains the world's largest "deep hole" granite quarry, attracting tourists and providing hundreds of jobs.

The Property contains twenty-five abandoned quarries, each with its own story, which are explained by interpretive signs created through grant funding from the Vermont Recreation Trails Grant Program. There are also various stone walls throughout the property. All management activities on the Property will ensure protection of these unique historic elements.

The Barre Town Plan states, "The history of Barre Town cannot be presented without honoring the old quarry-related sites. In particular, the Wheaton Quarry, the home of the State House's granite; the ancient Blondin in Graniteville and the grout piles in Graniteville and Websterville that are in themselves monuments to the quarry industry. It is in the best interest of Barre Town to preserve and promote its significant historic resources, architecture and sites as an important record of our heritage."

XII. PROPOSED ACTION SCHEDULE

THE FOLLOWING SCHEDULE IS ONLY A PLAN AND MAY CHANGE DUE TO CHANGING CIRCUMSTANCES.

Year 2013:

- Apply for grant funds to pay for construction of parking areas and kiosks
- Create trail map
- Develop Trail Corridor Management Agreements with Trail Corridor Managers
- Evaluate trails for sustainability and schedule required maintenance
- Town will mark boundary with signs at regular intervals and where trails leave the Property.
- Plan for and design Parking Areas and kiosks
- Post trail information on Town website

Year 2014

- Construct Parking Areas and build kiosks if adequate funding secured
- Update trail information on Town website
- Maintain Parking Areas, Trails, and Signs, as necessary.
- Uneven-aged thinning of Unit 3

Year 2015

- Improvement thinning in Unit 4 to produce firewood
- Patch cuts in Unit 8 to maintain early successional habitat
- Maintain Parking Areas, Trails, and Signs, as necessary.
- Update trail information on Town website

Year 2016

- Uneven-aged harvest in Unit 5
- Maintain Parking Areas, Trails, and Signs, as necessary.
- Update trail information on Town website

Year 2017

- Maintain Parking Areas, Trails, and Signs, as necessary.
- Update trail information on Town website

Year 2018

- Uneven-aged harvest in Unit 7
- Maintain Parking Areas, Trails, and Signs, as necessary.
- Update trail information on Town website

Year 2019

- Maintain Parking Areas, Trails, and Signs, as necessary.
- Update trail information on Town website

Year 2020

- Maintain Parking Areas, Trails, and Signs, as necessary.
- Update trail information on Town website

Year 2021

- Reevaluate Conditions and Management of Property
- Begin Community Forest Plan Revision
- Maintain Parking Areas, Trails, and Signs, as necessary.
- Update trail information on Town website

Year 2022

- Complete Community Forest Plan Revision
- Maintain Parking Areas, Trails, and Signs, as necessary.
- Update trail information on Town website

XIII. LITERATURE CITED

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Vermont Natural Heritage Program

XIV. SIGNATURE PAGE

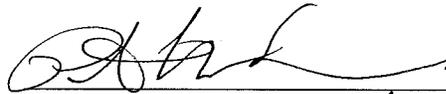
Stewardship is an ethic recognizing that the land and its natural inhabitants have an inherent worth and that we have a responsibility to manage our actions as part of that. It guides us to manage our activities to the utmost of our abilities, to insure the future health, productivity, and well being of the land and its natural communities and species, and to allow our successors opportunities at least equal to ours to use the land and its resources. This Community Forest Plan will help to guide the Town of Barre in actively protecting and managing their forestland and related resources.

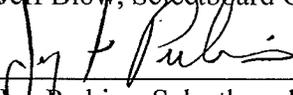
The signatures below indicate the approval and certification of this Community Forest Plan by the following parties.

FEE OWNER
Town of Barre
Selectboard

EASEMENT CO-HOLDER
Vermont Land Trust

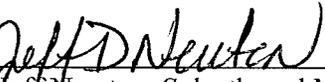

By: Jeff Blow, Selectboard Chair

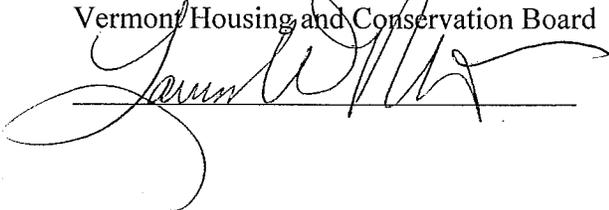

Dan Kilborn Pieter van Loon

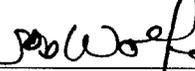

By: Jay Perkins, Selectboard Member


By: Greg Donahue, Selectboard Member

EASEMENT CO-HOLDER
Vermont Housing and Conservation Board


By: Jeff Newton, Selectboard Member




By: William Wolfe, Selectboard Member

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

KNOW ALL PERSONS BY THESE PRESENTS that **PIERRE COUTURE**, an individual of the Town of Barre, State of Vermont, **PHILIP KETCHAM**, an individual of the Town of Washington, State of Vermont, **ALFRED SALDI**, a married man, and **ROBERT SALDI**, a single individual, each of the Town of Barre, State of Vermont, **GRANITEVILLE FIRE DISTRICT NO. 4**, a body politic and corporate, organized and existing under the laws of the State of Vermont with its principal office in the Town of Barre, State of Vermont, and **THE TRUST FOR PUBLIC LAND** doing business in Vermont as The Trust for Public Land, Inc. with a place of business at 3 Shipman Place, Montpelier, Vermont, on behalf of themselves and their heirs, administrators, executors, successors and assigns (hereinafter "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 its full satisfaction, does 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 offices in Montpelier, Vermont, and the **VERMONT HOUSING AND CONSERVATION BOARD**, an independent board of the State of Vermont with its offices in Montpelier, Vermont, and their respective successors and assigns (hereinafter "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 Barre, Washington County, State of Vermont, the Protected Property being more particularly described in Schedule A attached hereto and incorporated herein, but this conveyance shall only become effective upon the conveyance by Grantors of the underlying fee interest to the Town of Barre, 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. 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 Barre, Vermont. In the event that the Protected Property is not conveyed to the Town of Barre, this instrument shall not burden the Protected Property.

I. Purposes of this Grant and Community Forest Plan.

A. Statement of Purposes.

Grantors and Grantees acknowledge that the purposes of this grant are as follows:

1. As primary purposes, to conserve and to provide perpetual public access to the Protected Property for noncommercial recreational purposes, including but not limited to, bicycling, bird watching, cross-country skiing, fishing, hiking, hunting and trapping, snowmobiling, snowshoeing, walking and wildlife observation and other recreational uses which are compatible with the foregoing uses and with the other Purposes of the Easement. Dispersed pedestrian public access will be provided on the Protected Property as a whole while some recreational activities may be confined to mapped recreation corridors.

2. As secondary purposes, to conserve forestry values, wildlife habitats, biological diversity, natural communities, riparian buffers, aquatic habitats, 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 these values exist on the date of this instrument and as they may evolve in the future, and complementary, non-commercial, recreational opportunities, open space values, and scenic resources associated with the Protected Property for present and future generations.

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

- a. includes 350 acres of forest available for long-term sustainable management for the production of forest products;
- b. contains 3.7 miles of undeveloped frontage on historic quarries;
- c. contains 202 acres of the Websterville Water District Source Water Protection Area and 27 acres of the Source Water Protection Area for the Barre Town Water System;
- d. contains 6,700 feet of frontage on Waterman St (TH 55), Littlejohn Road (TH 116), Graniteville Rd (TH 1), Donahue Rd (TH 55), Barclay Quarry Rd (TH 68), Brook St (TH 80) and Church Hill Rd. (TH 3), all public roads with scenic vistas;
- e. contains over 3,700 feet of the Vermont Association of Snow Travelers Route 25

- Corridor trail, and 4,700 feet of a secondary corridor trail, parts of Vermont's popular statewide snowmobile trail network;
- f. contains a diverse array of natural communities that provide habitat for a broad spectrum of flora and fauna, including a number of quarry holes that are important for spring breeding habitat for reptiles and amphibians; other wetlands; and upland natural communities, some of which provide important winter deer habitat;
 - g. is considered by Barre Town residents to be an important property for recreational use in town, because it provides exceptional opportunities for a wide variety of recreational uses like biking, skiing, hiking, and bird watching on its established trail network;
 - h. has the ability to provide environmental, recreational, and historical educational opportunities for local schools; and
 - i. contains old stone foundations, cellar holes, and stone walls from rural early American history.

Grantors and Grantees recognize the Purposes of this Grant and share the common goal of conserving these values of the Protected Property by the conveyance of conservation restrictions, and development rights, 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 such conservation restrictions, development rights and public access easement in order to conserve these values for present and future generations. The purposes set forth above in this Section I are hereafter collectively referred to as the "Purposes of this Grant".

B. Community Forest Plan.

Grantors will, from time-to-time develop a comprehensive Community Forest Plan, including updates, revisions and amendments, for the Protected Property (hereinafter "Community Forest Plan"). The Community Forest Plan 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; and,
2. At a minimum, the Community Forest Plan shall identify actions necessary to accomplish the following and shall appropriately balance all the resource attributes of and human uses for the Protected Property:
 - a. identify the objectives for the community forest;
 - b. identify and address the management needs of the recreational uses that may need special or more intensive management focus;
 - c. provide for meaningful recreational links to private and public lands;
 - d. allow for sustainable forest management activities pursuant to the Forestry Plans in C. below;
 - e. provide a plan for road, sign, trail and sanitary facility use that has minimal impact on water quality and plant, wildlife and aquatic habitat;
 - f. provide for the sustainable use of fish and wildlife resources;
 - g. provide for the identification and protection of natural communities, plant, wildlife and aquatic habitat and other ecologically sensitive or important areas;
 - h. provide for parking areas; and,
 - i. provide for the construction and use of any minor recreational structures and any other structures permitted under this Grant.
3. Otherwise be consistent with this Grant and any applicable rules promulgated to implement the U. S. Forest Service Community Forest and Open Space Conservation Program (the "CFP").

Prior to the final adoption of each Community Forest Plan, including updates, revisions and amendments, Grantors shall: (a) secure appropriate public input from the Town of Barre and from the general public, (b) develop the Community Forest Plan in a timely and responsive manner, and (c) provide Grantees with a copy of each such Community Forest Plan as well as a copy of each final adopted Community Forest Plan.

C. Forestry Plans.

Grantors shall not harvest timber or other wood products (except for maple sugar production and the cutting of firewood for use on the Protected Property) without first developing in consultation with the Vermont Department of Forests, Parks and Recreation and the Vermont Department of Fish and Wildlife, and submitting to Grantees for its approval, the Forest Management

Plan component of the Community Forest Plan for the Protected Property (hereinafter the "Forestry Plan"). All updates, amendments or other changes to the Forestry Plan shall be submitted to Grantee for its approval prior to any harvesting. Grantees' approval of the Forestry Plan and any update, amendment or change to the Forestry Plan (collectively "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, and in particular, the Purposes set forth in Section I. 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 would be detrimental to the values identified in Section I(A). The Forestry Plan and any Amended Forestry Plan shall be consistent with the Purposes of this Grant and shall include at least the following elements and notices (except that those elements of the Forestry Plan which do not change need not be re-submitted in updates, amendments or changes to the Forestry Plan):

- a) Grantors' forest management objectives;
- b) An appropriately scaled, accurate map indicating such items as forest stands, streams and wetlands, and major access routes (truck roads, landings and major skid trails);
- c) Forest stand ("treatment unit") descriptions (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);
- d) Plant and wildlife considerations (identification of known significant habitats and management recommendations);
- e) Aesthetic and recreational considerations (impact on viewsheds from public roads, trails and places);
- f) Historic and cultural resource considerations (identification of known resources and associated management recommendations); and
- g) Management practices to be applied within Surface Water Buffer Zones, established in Section IV below and within the Vernal Pool Special Treatment Area established in Section VI below, 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 Amended Forestry Plan in its discretion if consistent with the Purposes of this Grant, including the following purposes:

- a) To release an established understory,
- b) To permit the planting of different species of trees or the establishment or re-establishment of a field, orchard or pasture,
- c) For wildlife management purposes, or
- d) 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.

I. Restricted Uses of Protected Property.

1. The Protected Property shall be used for forestry, educational, 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. No building or structures shall be constructed, created, erected or moved onto the Protected Property, including, but not limited to, telecommunication towers, except as specifically permitted in both Section III below and the Community Forest Plan.

2. No rights-of-way, easements of ingress or egress, driveways, roads, utility lines, other easements or use restrictions shall be constructed, developed, granted or maintained into, on, over,

under, or across the Protected Property without the prior written permission of Grantees, which permission shall not be unreasonably withheld or conditioned if the proposed right-of-way, easement of ingress or egress, driveway, road, utility line, other easement or use restriction is consistent with the Purposes of this Grant.

3. 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 V, 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.

4. The placement, collection or storage of trash, human waste, or any other unsightly or offensive material on the Protected Property shall not be permitted except at locations, if any, and in a manner which is consistent with this Grant and permitted by the Community Forest Plan. The temporary storage of trash in receptacles for periodic off-site disposal shall be permitted.

5. 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.

6. Grantors shall not give, grant, sell, convey, subdivide, 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.

7. There shall be no operation of motorized vehicles on the Protected Property except as necessary or customary for uses specifically reserved in Section III below, such as recreation and wildlife management, logging, trail grooming and/or maintenance, and for safety or emergency purposes. Snowmobiling may be permitted as provided for in the Community Forest Plan. Except as allowed in paragraph II (8), below, there shall be no all-terrain vehicle use permitted on the Protected Property except for emergency or management purposes. For purposes of this Grant, all-terrain vehicles include, but are not limited to, motorized four-wheeled, three-wheeled and two-wheeled or tracked vehicles. However, Grantors may permit motorized personal assistive mobility devices for use on the Protected Property by persons with a mobility disability if consistent with the Purposes of this Grant.

8. Notwithstanding paragraph II(7), Grantors may allow recreational all-terrain vehicle ("ATV") use and maintenance and repair of an ATV trail across the Protected Property that connects to an existing, legal network of ATV trails, provided that the ATV connecting trail and network have no significant negative impact on the conservation or public recreation values of the Protected Property, as stated in the Purposes of this Grant, and Grantors have received the prior written approval of the Grantees for such use, which approval shall not be unreasonably withheld, conditioned or denied. Reference is here made to a Memorandum of Understanding, of even date herewith, as the same may be amended from time to time, setting forth the standards under which ATV use may be allowed on the Protected Property.

9. 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 purity, 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.

10. 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. Following consultation with Grantors, 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:

1. The right to use the Protected Property for all types of non-motorized, non-commercial recreational purposes including, but not limited to, birdwatching, cross-country skiing, fishing, hiking, hunting and trapping, snowshoeing, walking and wildlife observation consistent with the Purposes of this Grant. 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) shall be permitted if such uses are regulated in the Community Forest Plan and are consistent with the Purposes of this Grant and Sections IV and VI, below. Use of the Protected Property for ATVs shall be permitted as set forth in Section II(8) hereinabove.

2. The right to use the Protected Property to conduct all activities allowed by the Community Forest Plan, provided that such activities are reasonably necessary to carry out the Purposes of this Grant and are consistent with the Purposes of this Grant, and provided further that such activities are provided for in the Community Forest Plan. Such activities may include, but shall not be limited to the management of vegetation and wildlife, and the use and management of the Protected Property for non-commercial dispersed recreation. This Section III (2) shall not be construed to authorize the construction of new structures not otherwise specifically permitted by this Grant.

3. The right to establish, maintain and use fields or orchards for dispersed recreational, scenic or open space purposes and/or for the purpose of maintaining or enhancing wildlife habitat on the Protected Property, provided that the initial forest clearing activity required to establish such fields and orchards is a component of a forest management plan which is an element of the Community Forest Plan and is consistent with the Purposes of this Grant and Sections IV and VI, below.

4. The right to conduct maple sugaring operations using maple sap collected on the Protected Property. Further, the right to harvest timber and other forest products, together with the right to construct and maintain roads necessary for such activities, installing all erosion control devices and employing all applicable recommended practices set forth in the regulations entitled "Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont", a Vermont Department of Forests, Parks, and Recreation regulation promulgated on August 15, 1987 (or such successor amended regulation) (the "AMP's") and in accordance with a forest management plan which is a component of the Community Forest Plan (see Section I B and C).

5. 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 and Sections IV and VI, below, and are provided for in the Community Forest Plan.

6. 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 Community Forest Plan.

7. 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. 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. Membership or use costs shall not be required for pedestrian access to the Property. 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 Sections IV and VI, below, and shall be provided for in the Community Forest Plan.

8. The right to issue temporary special use permits or licenses authorizing the commercial or non-commercial use of the Protected Property for recreational, community entertainment, competitive athletic events, educational, forestry, or research purposes, provided that any such permit or license (i) does not unreasonably interfere with the access of the general public to the Protected Property; (ii) is for uses consistent with the Purposes of this Grant; and, (iii) authorizes only uses of or actions on the Protected Property consistent with this Grant.

9. The right to construct, maintain, repair and replace three (3) permeable surfaced parking areas, said parking areas not to exceed a parking capacity of one hundred and five (105) passenger automobiles as follows: existing location on Barclay Quarry Road of ten (10) spaces; Littlejohn Road estimated twenty-five (25) spaces; Brook Street estimated seventy (70) spaces; said locations generally depicted as "Parking Area" on the Barre Town Forest Conservation Plan described

in Schedule A attached hereto and incorporated herein, or at such other location or providing for such parking capacity as mutually agreed upon in writing by Grantors and Grantees; provided, that the location, size, construction, maintenance, repair and use of such parking areas shall be consistent with the Purposes of this Grant, Sections IV and VI below and the Community Forest Plan. Said parking areas shall be used only in connection with uses permitted under this Grant.

10. The right to construct, maintain, repair and replace permanent or temporary minor structures of rustic design, drives and utilities reasonably necessary to support the uses permitted by this Grant (including such structures and facilities as deer stands, gazebos, hunting blinds, lean-tos, Adirondack shelters, tent platforms, tree houses, privies, informational kiosks about the Protected Property and/or features thereon, outdoor fireplaces); provided, however, that any such structures and improvements shall be consistent with the Purposes of this Grant, Sections IV and VI below, and the Community Forest Plan.

11. 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 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.

IV. Surface Water Buffer Zones.

Those areas, in forest cover or in other natural vegetation, lying within fifty feet (50') of each bank or shore of the perennial streams, rivers, ponds, and other wetlands, or within wetlands themselves, on the Protected Property depicted as "SWBZ" on the Barre Town Conservation Plan, described in Schedule A attached hereto and incorporated herein, or any successor maps approved by Grantors and Grantees depicting the Protected Property, as those waters may move from time to time, shall be designated as Surface Water Buffer Zones (hereinafter "SWBZ").

Within the SWBZ described herein, the goals and restrictions of this Section IV are in addition to the provisions of Sections II, III and V, and where inconsistent, the provisions of this Section IV shall supersede the provisions of Sections II, III and V.

The principal goal for management within the SWBZ is the establishment and maintenance of a high quality buffer that provides an array of ecological benefits including but not limited to:

- 1) buffering aquatic and wetland plants and animals from disturbance;
- 2) preventing wetland and water-quality degradation;
- 3) providing important plant and animal habitat;
- 4) providing organic matter, nutrients, and structure to aquatic systems; and
- 5) accumulation of snags and coarse woody debris over time within the SWBZ .

Existing and subsequently approved roads and landings, where relocation is not feasible or where negative impacts would be increased by relocating, may exist within the SWBZ. Any machinery operation within the SWBZ as depicted on the Barre Town Conservation Plan must be done in a manner that results in a minimum of soil compaction, erosion or rutting. Stream crossings, for the purpose of constructing roads for transporting machinery and harvested timber, are exempt from this restriction, but the number and width of such crossings shall be kept to a minimum and said crossings shall include the installation of all erosion control devices and employ all recommended practices described in the AMPs for such roads and stream crossings.

V. Public Access.

Grantors covenant and agrees that the Protected Property shall be available to the general public for all types of non-commercial, dispersed recreational and educational purposes (including, but not limited to, bicycling, bird watching, cross-country skiing, fishing, hiking, hunting and trapping, snowmobiling, snowshoeing, ATV use as allowed in Section II(8) of this Grant, walking and wildlife observation) consistent with the Purposes of this Grant. 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).

VI. Vernal Pool Special Treatment Area.

The Vernal Pool Special Treatment Area consists of three (3) vernal pools and the area around

them which is described below and generally depicted as "STA Primary Zone" and "STA Secondary Zone" on the Barre Town Forest Conservation Plan (together hereinafter referred to as "the STA"). The purpose and goal of the STA 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 VI all or a portion of the STA 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 STA Primary Zone shall be subject to the following limitations and restrictions which shall supersede the provisions of Sections II, III, IV and V of this Grant to the extent these limitations and restrictions are inconsistent with those Sections:

STA 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 STA. There shall be no agricultural activity within the 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(5) above, shall be permitted within the Primary Zone. The existing mountain bike trail located between Pool 1 and Pool 2 as depicted on the Barre Town Forest Conservation Plan may remain but only in its current location and shall not be altered, expanded or improved beyond its 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. Any trails permitted hereunder shall be maintained in a manner so as to avoid any negative impacts on the Goals and to the maximum extent practical such maintenance activities shall be conducted at times other than the spring amphibian breeding season.

Within the Primary Zone there shall be no removal of standing timber or downed wood or disturbance to the pool's hydrology; provided, however, that Grantors may remove a downed tree within the Primary Zone that obstructs one of the existing trails located within the Primary Zone as depicted on the Barre Town Forest Conservation Plan. The only forest management activities which may take place within the 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. New roads for timber harvest may be approved within the 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.

The STA Secondary Zone shall be subject to the following additional element of the Forestry Plan required under Section I of this Grant:

The Secondary Zone of the STA is the forested area lying within an additional 500-foot zone outward from each Primary Zone, as depicted on the Barre Town Forest Conservation Plan. Within the Secondary Zone maple sap and firewood may be harvested as permitted pursuant to an approved Forestry Plan. Other timber harvesting is permitted but amphibian habitat needs, such as coarse woody debris and shade, shall be addressed in the preparation of the Forestry Plan which shall explicitly state what prescriptions have been imposed to protect and enhance amphibian habitat.

VII. 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. 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 by Grantors 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 extraordinary costs, including staff time, in investigating the non-compliance and securing its correction, Grantors shall at Grantees' request reimburse Grantees all such costs incurred in investigating the non-compliance and in securing its correction.

Failure by Grantors to cause discontinuance, abatement or such other corrective action as may be demanded by Grantees within a reasonable time after 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,

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 Grantees initiate litigation and the court determines that Grantors have not failed to comply with this Grant then Grantees shall reimburse Grantors for any reasonable costs of defending such action, including court costs and reasonable attorneys' fees, in addition to any other payments ordered by such court; provided, however, that in the event that Grantor is not the Town of Barre, then Grantees shall reimburse Grantors for any reasonable costs of defending such action, including court costs and reasonable attorney's fees, only in the event that Grantees have initiated litigation without reasonable cause or in bad faith. The parties to this Grant specifically acknowledge that events and circumstances of non-compliance could 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 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.

VIII. Miscellaneous Provisions.

1. 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.

2. 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.

3. 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 Barre and the State of Vermont.

4. 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.

5. In the event the development rights or conservation restrictions conveyed to Grantees herein are extinguished by eminent domain or other legal 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 performed at the direction of either Grantors or Grantees in the year of this conveyance. 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.

6. 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.

7. Grantees shall be entitled to rerecord this Grant, or to record a notice making reference to the existence of this Grant, in the Town of Barre Land Records as may be necessary to satisfy the requirements of the Record Marketable Title Act, 27 V.S.A., Chapter 5, Subchapter 7, including 27 V.S.A. §§603 and 605.

8. The term "Grantors" shall include the administrators, executors, heirs, successors and assigns of the original Grantors Pierre Couture, Philip Ketcham, Alfred Saldi, Robert Saldi, Graniteville Fire District No. 4, and The Trust for Public Land. The term "Grantees" shall include the respective successors and assigns of the original Grantees, Vermont Land Trust, Inc. and Vermont Housing and Conservation Board.

9. Any signs erected on the Protected Property which mention funding sources shall include the U.S. Forest Service Community Forest and Open Space Conservation Program, the Vermont Housing and Conservation Board and the Vermont Land Trust, Inc.

10. As used herein, "non-commercial" use of the property may include the use of the property, in accordance with the Community Forest Plan and consistent with the Purposes of this Grant, by groups or organizations which charge its members a membership fee, including by way of example and not as a limitation, the Vermont Association of Snow Travelers and its local affiliate and Corridor Managers with which Grantors may contract.

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

12. Grantors, unless Grantor is the Town of Barre, 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 said Grantors as owner or operator of the premises, or those of said Grantors' agents. Grantors shall maintain adequate liability insurance covering the Protected Property and the uses thereof, and shall name Grantees as additional insureds thereunder.

13. 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.

14. Whenever notice is required hereunder to be given to a party, it shall be given to the following addresses:

GRANTORS:

Pierre Couture
P.O. Box 44
Websterville, VT 05678

Philip Ketcham
463 Tilton Road
Washington, VT 05675

Alfred Saldi and Robert Saldi
29 Skylark Terrace
Barre, VT 05641

Graniteville Fire District No. 4
P.O. Box 206
Graniteville, VT 05654

The Trust for Public Land
3 Shipman Place
Montpelier, VT 05602

If Grantor becomes the Town of Barre, Vermont, the notice shall be provided to:

Town of Barre
Attn: Town Manager
149 Websterville Road
P.O. Box 116
Websterville, VT 05678

GRANTEES

VLT:
Vermont Land Trust, Inc.
Attn: Vice President for Stewardship
8 Bailey Ave.
Montpelier, VT 05602

and to

VHCB:
Vermont Housing and Conservation Board
Attn: Executive Director
58 East State Street
Montpelier, VT 05602

Or to such other address as Grantors or any Grantees may provide from time to time to the other parties in writing. Notwithstanding the foregoing, notice shall be effective if given as required by Vermont law.

15. Notwithstanding the terms and conditions hereof, reference is here made to the Notice of Grant Requirements of even date herewith and to be recorded in the Land Records of the Town of Barre, which provides, in part, that in the event that the Protected Property is conveyed to the Town of Barre and the Town of Barre sells or converts the Protected Property to non-forest uses or a use inconsistent with the purpose of the CFP, the Town of Barre shall: (1) pay the United States an amount equal to the greater of the current sale price or the current appraised value of the Protected Property; and (2) not be eligible for additional grants under the CFP.

16. Alfred Saldi hereby certifies that none of the conveyed property is his homestead and that his wife, Cynthia Saldi, has no homestead or 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 behoof forever, and the said Grantors, PIERRE COUTURE, PHILIP KETCHAM, ALFRED SALDI, ROBERT SALDI, GRANITEVILLE FIRE DISTRICT NO. 4, and THE TRUST FOR PUBLIC LAND, on behalf of themselves and their administrators, executors, heirs, successors and assigns, do covenant with the said Grantees, their successors and assigns, that until the ensealing 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, and they hereby engage to warrant and defend the same against all lawful claims whatever.

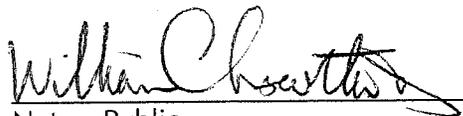
GRANTORS have executed this Grant on this 29 day of March, 2013.



Pierre Couture

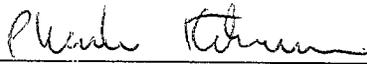
STATE OF VERMONT
COUNTY OF WASHINGTON, SS

At WESTERVILLE, this 27th day of March, 2013, Pierre Couture personally appeared and he/she acknowledged this instrument, by him/her sealed and subscribed, to be his/her free act and deed, before me.



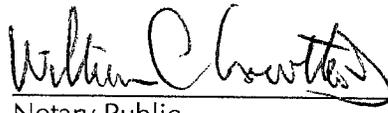
Notary Public

My Commission Expires: 02/10/2015


Philip Ketcham

STATE OF VERMONT
COUNTY OF WASHINGTON, SS

At Websterville, this 28th day of MARCH, 2013, Philip Ketcham, personally appeared and he acknowledged this instrument, by him/her sealed and subscribed, to be his free act and deed, before me.


Notary Public
My Commission Expires: 02/10/2015

Alfred Saldi
Alfred Saldi

Robert Saldi
Robert Saldi

STATE OF VERMONT
COUNTY OF WASHINGTON, SS

At Town of Barre, this 27th day of March, 2013, Alfred Saldi and Robert Saldi personally appeared and they acknowledged this instrument, by them sealed and subscribed, to be their free act and deed, before me.

Alice W. Bartlett
Notary Public Alice W. Bartlett
My Commission Expires: 02/10/2015

GRANITEVILLE FIRE DISTRICT NO. 4

By: David Lafleche
Its Duly Authorized Agent

STATE OF VERMONT
COUNTY OF WASHINGTON, SS

At WEBSTERVILLE, this 28th day of MARCH, 2013, DAVID LAFLECHE,
duly authorized agent of the Graniteville Fire District No. 4, personally appeared 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 Graniteville Fire District No. 4, before me.

William C. Crowther

Notary Public

My Commission Expires: 2/10/15

THE TRUST FOR PUBLIC LAND

By: Kathleen Wanner
Its Duly Authorized Agent

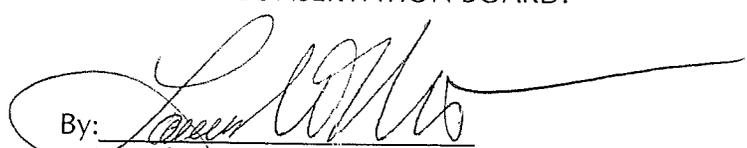
STATE OF VERMONT
COUNTY OF WASHINGTON, SS

At Barre, this 29th day of March, 2013, Kathleen Wanner, duly authorized agent of The Trust for Public Land, personally appeared 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 Trust for Public Land, before me.

Judith Morse
Notary Public
My Commission Expires: 2/10/15

Accepted and approved by the VERMONT HOUSING AND CONSERVATION BOARD:

Date 3/25/13

By: 
Its Duly Authorized Agent

**SCHEDULE A
PROTECTED PROPERTY**

Being all and the same lands and premises situated in the Town of Barre, conveyed to **PIERRE COUTURE, PHILIP KETCHAM, ALFRED SALDI and ROBERT SALDI, GRANITEVILLE FIRE DISTRICT NO. 4, and THE TRUST FOR PUBLIC LAND**, all of whom are referred to as Grantors herein and each party's interest is more particularly described as follows:

Couture Parcels:

Parcel I (for information only tax parcels 02-031.00 and 02-034.01)

Being a part of all and the same lands and premises as conveyed by Rock of Ages Corporation to Millstone Hill, a Vermont Limited Partnership by instrument dated September 5, 1985 and recorded on September 5, 1985 in Volume 97, Page 312 of the Barre Town Land Records.

Further described as being Parcel 1 in the aforementioned deed except for the conveyance of four parcels by Millstone Hill as follows: (1) Conveyance of 1.84 acres to Steven Blondin by instrument dated June 29, 1994 and recorded on July 5, 1994 in Volume 138, Page 232 of the Barre Town Land Records. (2) Conveyance of 1.84 acres to David Wilder by Warranty Deed of Millstone Hill by instrument dated August 3, 1994 and recorded on August 5, 1994 in Volume 138, Page 681 of the Barre Town Land Records and (3) Conveyance of 1.84 acres to James Terrill by deed dated August 4, 2003, and recorded on August 7, 2003 in Volume 189, Page 943 in the Barre Town Land Records and (4) Conveyance of 2.4 acres by Warranty Deed of Millstone Hill to Edith Fontana and Jacque Couture by instrument dated August 10, 2007 and recorded on August 14, 2007 in Volume 227, Page 390 of the Barre Town Land Records.

Further described as being all of Parcel II from the Rock of Ages Corporation to Millstone Hill deed except for a 1.83 acre parcel conveyed by Millstone Hill to Rock of Ages Corporation by a Corrective Quitclaim Deed dated January 21, 1988 and recorded on February 2, 1988 in Volume 112, Page 146 of the Barre Town Land Records.

Reference is made to a Warranty Deed dated October 30, 2012 from Millstone Hill, a Vermont Limited Partnership to Pierre Couture recorded in Volume 264, Page 320 of the Barre Town Land Records.

Parcel II (for information only tax parcel 02-032.00):

Being all and the same lands and premises as conveyed by Leonard A. McCarthy to Pierre Couture by Warranty Deed dated October 30, 2012, recorded in Volume 264, Page 325 of the Barre Town Land Records located off Littlejohn Road containing 1.0 +/- acres.

Being further described as all and the same lands and premises decreed to Leonard McCarthy by Decree of Distribution of the Vermont Superior Court, Washington Probate Division in RE: the Estate of Lucie McCarthy, Docket No. 127-03ET, dated October 9, 2008 and recorded in Book 235 at Page 303 of the Barre Town Land Records, and by an Amended Decree of Distribution dated August 13, 2012 and recorded in Book 262, Page 808 of the Barre Town Land Records.

The same being all and the same lands and premises conveyed by Quitclaim Deed of George T. McCarthy to George T. McCarthy and Lucie C. McCarthy, husband and wife, by instrument dated July 27, 1990 and recorded in Volume 123, Page 1004 of the Barre Town Land Records.

Ketcham Parcel (for information only tax parcel 23-064.00):

The land situated off Brook Street, in the Town of Barre, Washington County, State of Vermont, containing 4.5 acres, more or less, and being all and the same lands and premises as conveyed to Grantor by the following three deeds (i) by Frank W. Harmon, (his undivided 1/3 interest) dated May 7, 2012 and recorded in Book 261 at Page 214 of the Barre Town Land Records, (ii) by Carl Welch, (his undivided 1/3 interest) dated May 7, 2012 and recorded in Book 261 at Page 216 of the Barre Town Land Records, and by Doreen Welch, Administrator of the Estate of Gene L. Welch, (his undivided 1/3 interest) dated June 14, 2012 and recorded in Book 261 at Page 212 of the Barre Town Land Records. Reference is made to the above-noted deeds and their records and to all former deeds and their records for a more particular description of the land and premises being conveyed herein

Saldi Parcel (for information only tax parcel 02-010.00):

That certain land situated off Church Hill Road in the Town of Barre, Washington County, State of Vermont, containing 2.0 acres, more or less, and being all and the same lands and premises as

conveyed from the Town of Barre to Fernando Saldi, Robert Saldi and Alfred Saldi by Warranty Deed dated September 18, 1962 and recorded in Book 40 at Page 374 of the Barre Town Land Records and by a Decree of Distribution of the Vermont Superior Court, Washington Probate Division in RE: the Estate of Fernando Saldi, Docket No. 22286, and the Estate of Doris F. Saldi, Docket No. 26349, dated November 28, 2011 and recorded on April 13, 2012 in Book 259 at Page 762 of the Barre Town Land Records. Reference is made to the above-noted deeds and documents and their records and to all former deeds and their records for a more particular description of the land and premises being conveyed herein

Graniteville Fire District No. 4 (for information only tax parcel 14-008.00):

That certain land situated off Barclay Quarry Road, in the Town of Barre, Washington County, State of Vermont, containing 4.2 acres, more or less, and being the same lands and premises conveyed by Quitclaim Deed of Rock of Ages Corporation to Graniteville Fire District No. 4 by deed dated March 30, 1962 and recorded in Book 40, Page 260 of the Barre Town Land Records as affected by quitclaim deed dated December 6, 2012 and recorded in Book 265, Page 377 of the Barre Town Land Records. Reference is made to the above-noted deeds and their records and to all former deeds and their records for a more particular description of the land and premises being conveyed herein

The Trust for Public Land.

Those certain parcels of land containing 272 +/- acres being more particularly described in a Warranty Deed of even or nearly even date hereto from The Rock of Ages Corporation and recorded herewith at the Barre Town Land Records.

Parcel I (for information only tax parcel 02-034.00)

Being part of the lands and premises conveyed to Rock of Ages Corporation by the following deeds:
1. Deed of Wetmore & Morse Granite Company dated March 24, 1945 and recorded in Book 27, Page 352 of the Barre Town Land Records; and
2. Deed of E.L. Smith Company dated March 24, 1945 and recorded in Book 27 at Page 360 of the Barre Town Land Records.

Rock of Ages Corporation conveyed out the following land which is excepted from the above description: those lands and premises conveyed to Millstone Hill, A Vermont Limited Partnership by deed dated September 5, 1985 and recorded in Book 97 at Page 312 of the Barre Town Land Records. In said conveyance the Rock of Ages Corporation reserved for itself, its successors and assigns a certain Perpetual Easement for "...Ingress and Egress to property belonging to the Grantors (Rock of Ages)... the location of the easement is over a strip of land running along the westerly edge of the above-described land and premises" and is more particularly described under that portion of the above referenced deed from Rock of Ages Corporation to Millstone Hill under the section entitled "parcel III". This would appear to be the same easement previously conveyed by Rock of Ages Corporation to Green Mountain Power Corporation in Book 42 at Page 31 of the Barre Town Land Records.

In aid of this description reference is made to a certain survey entitled "Survey Plat of Property in the Town of Barre, Vermont for Rock of Ages Corporation" prepared by American Survey Company, dated September 10, 1984 and filed at Slide #122 of the Barre Town Clerk's Office.

Parcel II (for information only tax parcel 02-012.00 and 02-013.00):

Being the same lands and premises conveyed to Rock of Ages Corporation by Executor's Deed from Amancio Penna Estate by deed dated November 19, 1984 and recorded in Book 94 at Page 253 of the Barre Town Land Records.

In aid of the description reference is made to a plan entitled "Survey Plat of Property in the Town of Barre, Vermont, for Rock of Ages Corporation" prepared by American Survey Company, dated September 10, 1984 and filed at Slide #122 in the Barre Town Clerk's Office for a partial description of the said two parcels.

Parcel III (for information only tax parcel 02-008.01):

Being part of the lands and premises conveyed to Rock of Ages Corporation by deed of Wetmore & Morse Granite Company dated March 24, 1945 and recorded in Book 27 at Page 352 of the Barre Town Land Records. This is a 3.3 +/- parcel and reference is made to a certain plan entitled "Survey Plat of Property in the Town of Barre, Vermont for Rock of Ages Corporation" prepared by American Survey Company, dated May 31, 1984 and filed at Slide #122 in the Barre Town Clerk's Office.

Parcel IV (for information only tax parcel 02-009.00):

Being part of the lands and premises conveyed to Rock of Ages Corporation by:

1. Deed of Boutwell, Milne and Varnum Company dated June 30, 1925 and recorded in Book 18 at Page 464 of the Barre Town Land Records.
2. Deed of Wetmore & Morse Granite Company dated March 24, 1945 and recorded in Book 27 at Page 352 of the Barre Town Land Records.
3. Deed of E.L. Smith Company dated March 24, 1945 and recorded in Book 27 at Page 360 of the Barre Town Land Records; and
4. Deed of Clyde S. Thompson and Katherine E. Thompson dated November 17, 1948 and recorded in Book 30 at Page 101 of the Barre Town Land Records.

Meaning and intending to convey a parcel consisting of 100 +/- acres. As a further aid to the description of said parcel, reference is made to a plan entitled "SURVEY PLAT OF PROPERTY IN THE TOWN OF BARRE, VERMONT FOR ROCK OF AGES CORPORATION" prepared by American Survey Company dated September 27, 1984 and filed at Slide #120 in the Barre Town Clerk's Office.

There is excepted and reserved from said parcel 02-009.00 two (2) parcels conveyed to: (I) Jeffrey Bennett and Suzanne Bennett by deed dated October 12, 1994 and recorded in Book 139 at Page 209 of the Barre Town Land Records; and (II) Alfred H. Longchamp and Shirley A. Longchamp by deed dated July 15, 2002 and recorded in Book 175 at Page 450 of the Barre Town Land Records.

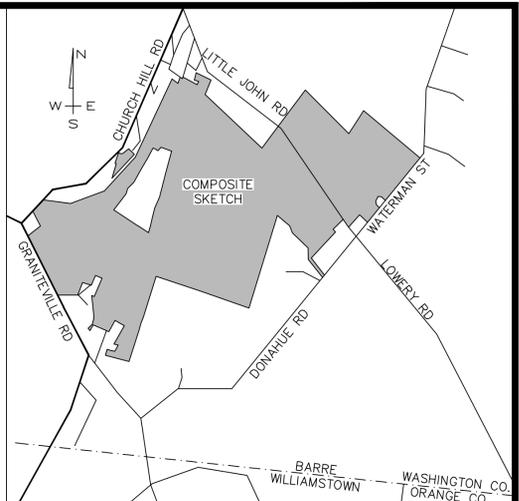
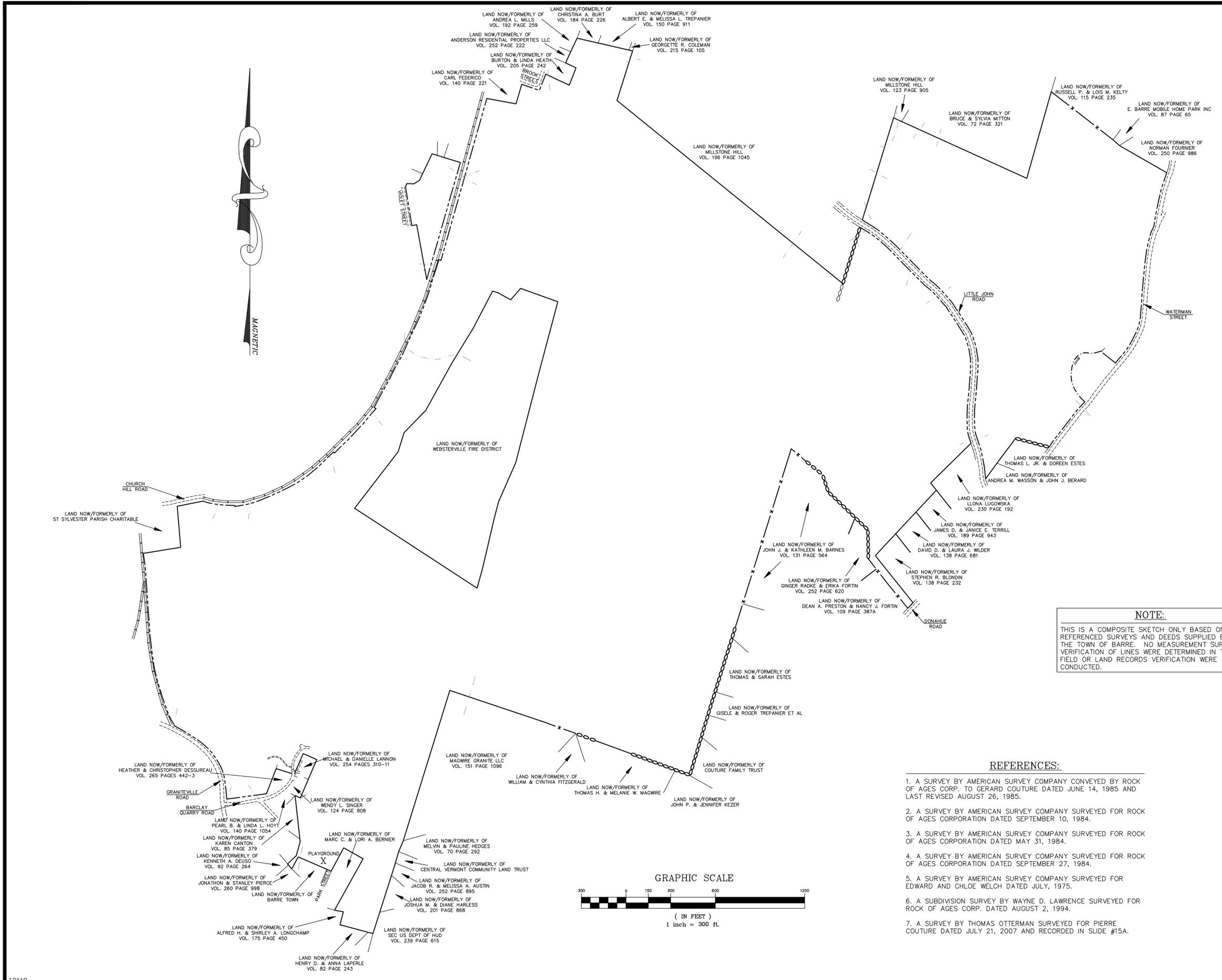
The premises is conveyed with the benefit of that certain 50 foot right of way dated December 5, 2012 and recorded in Book 265, Page 92 of the Barre Town Land Records.

Meaning and intending to include in this description of the Protected Property all of the land with the buildings and improvements thereon and generally described as containing 355 acres, more or less, lying northerly of Town Highway #1 (also known as Graniteville Road), in the Town of Barre, Vermont.

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 - Barre Town Forest Property, Town of Barre, Washington Co., VT, March, 2013" signed by the Grantors (as to their respective parcel) and VLT (referred to throughout this Grant and its Schedules as "Barre Town Forest Conservation Plan"). The Barre Town Forest 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 Barre Town Forest 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 Barre Town Forest Conservation Plan is kept by VLT in its Stewardship Office. **The Barre Town Forest 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 deeds, surveys and record, and to the deeds and records referred to therein, in further aid of this description.



LOCATION MAP
(NOT TO SCALE)

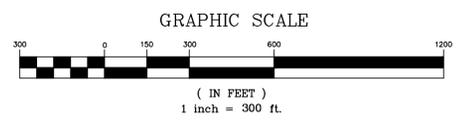
LEGEND

TRAIL CROSSING	---
EDGE OF TRAVEL	----
RIGHT OF WAY	-----
FENCE REMNANTS	---x---
STONEWALL REMNANTS	○○○○○○
CENTERLINE OF BROOK	---≡---
RAILROAD TRACKS	====

NOTE:
THIS IS A COMPOSITE SKETCH ONLY BASED ON REFERENCED SURVEYS AND DEEDS SUPPLIED BY THE TOWN OF BARRE. NO MEASUREMENT SURVEY VERIFICATION OF LINES WERE DETERMINED IN THE FIELD OR LAND RECORDS VERIFICATION WERE CONDUCTED.

REFERENCES:

1. A SURVEY BY AMERICAN SURVEY COMPANY CONVEYED BY ROCK OF AGES CORP. TO GERARD COUTURE DATED JUNE 14, 1985 AND LAST REVISED AUGUST 26, 1985.
2. A SURVEY BY AMERICAN SURVEY COMPANY SURVEYED FOR ROCK OF AGES CORPORATION DATED SEPTEMBER 10, 1984.
3. A SURVEY BY AMERICAN SURVEY COMPANY SURVEYED FOR ROCK OF AGES CORPORATION DATED MAY 31, 1984.
4. A SURVEY BY AMERICAN SURVEY COMPANY SURVEYED FOR ROCK OF AGES CORPORATION DATED SEPTEMBER 27, 1984.
5. A SURVEY BY AMERICAN SURVEY COMPANY SURVEYED FOR EDWARD AND CHLOE WELCH DATED JULY, 1975.
6. A SUBDIVISION SURVEY BY WAYNE D. LAWRENCE SURVEYED FOR ROCK OF AGES CORP. DATED AUGUST 2, 1994.
7. A SURVEY BY THOMAS OTTERMAN SURVEYED FOR PIERRE COUTURE DATED JULY 21, 2007 AND RECORDED IN SLIDE #15A.



REVISED 3/29/13: REVISED VIOLET STREET AREA - LGB
REVISED 3/22/13: REVISED LONGCHAMP AREA - LGB
REVISED 3/11/13: SURVEYED AROUND BARCLAY QUARRY ROAD - LGB

A COMPOSITE SKETCH IN
BARRE, VERMONT FOR
BARRE TOWN FOREST

★ ★ ⊕ ★ ★

AMERICAN SURVEY COMPANY
"SURVEYING, MONUMENTING, AND MAPPING
THE LANDS OF AMERICA"

VERMONT OFFICE	WILLIAMSTOWN, VT
CHIEF OF PARTY	L. BARNABY
COMPILED	NOVEMBER 13, 2012
APPROVED	REVISED: MARCH 29, 2013

Robert J. Townsend

Forest Bird Habitat Assessment



Properties of:

Proposed Barre Town Forest

Located in:
Barre, VT

Prepared by: Steve Hagenbuch
Conservation Biologist
shagenbuch@audubon.org
February 15, 2012

Property Information

Landowner's Name: Barre Town, VT (proposed), currently multiple private owners

Town: Barre, VT

Priority Block: N/A

Acres: 380 (GIS)

Assessment Date: July 6, 2011

Forest Management Plan: yes, for various currently private ownerships

Forester: Russ Barrett, on behalf of town; private consultants for currently private ownerships

Landowner Objectives: TBD

Introduction

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.** Audubon Vermont's Forest Bird Initiative focuses its conservation efforts on 40 of these forest bird species, known as *responsibility species* (Appendix 1). 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.

Since roughly 80% of our region's forests are privately-owned, even the smallest properties can be critical parts of large forest blocks that provide high-quality habitat for breeding birds. **Small actions by individual forest landowners can have a global impact.** Audubon Vermont is partnering with foresters and other stewardship and conservation organizations to provide technical assistance to and educational opportunities for landowners who want to make a difference for birds in their forests. Habitat assessments and reports are provided to landowners free of charge due to generous support from grant funding and individual donations.



Meet some of the responsibility species that may be nesting your forest (left to right): chestnut-sided warbler, Canada warbler, scarlet tanager, blackburnian warbler.

How to use this report

This assessment was conducted by an Audubon biologist in order to (1) describe current forest bird habitat conditions on the property, (2) identify specific opportunities for protecting and/or enhancing habitat, and (3) suggest management options and/or considerations for improving bird habitat over a 10 year period. Here are some suggestions for what to do with this report after you look it over:

Learn more about birds and habitat on the property(s). Whether you are a seasoned birder or only recognize a couple of songs, we hope that this report will show you something new about your property and leave you wanting to learn more. You can add to the information about birds on your land by learning to identify the *Birder's Dozen* if you don't know them already and noting when and where you hear birds in your woods. If you are interested in doing some simple monitoring on your property, let us know and we can help get you started. We'll also keep you posted about workshops and other learning opportunities at the Green Mountain Audubon Center in Huntington, Vermont or elsewhere in the region.

Share and discuss this report with your forester. Tell your consulting and/or county forester that birds are important to you and that you want to prioritize protection of their habitat on your property. Ask your forester if s/he is already working with Audubon through the *Foresters for the Birds* project. If not, suggest that s/he join.

Include information and recommendations in this report in your forest management plan or attach the report as an appendix. This report is designed to supplement and inform a full forest management plan created by your forester in order to maximize positive impacts on breeding forest birds. If you request it, we hope that much of the information in this report could easily be inserted into a new plan or update.

List protection and enhancement of forest bird habit as a management objective in your forest management plan. Make your interest in birds clear and state it right up front. Example: *Protect and enhance habitat for breeding birds of conservation concern.*

Share this report with other town committees and boards as well as neighboring landowners. You can help spread the word about the importance of our forests for responsibility species and let others know about the services that Audubon provides for landowners interested in making a difference for birds on their properties. When landowners keep in touch about planning management activities across property boundaries they can maximize the benefits of their actions for birds and forest health.

Contact us and/or your county forester with any questions or when you're planning management activities. We'll be happy to follow up with you and provide additional assistance if and when you implement any of our recommendations.

Landscape Context

The proposed Barre Town Forest provides a block of interior forest habitat (forest >300 ft from a forest/non-forest edge) within a greater landscape that is fragmented by agriculture, residential and commercial development, and associated road networks (Map 1). This interior forest is an extremely valuable aspect of the property and increases the bird habitat value. A number of forest nesting songbird species, including ovenbird, blackburnian warbler, and black-throated blue warbler have been shown to increase in both abundance and nesting success as the area of forest away from a forest/non-forest edge increases.

The landscape context lends itself to further promoting and/or maintaining structurally complex mature closed canopy (>80%) forest on the proposed Barre Town Forest. Minimizing the development of roads and trails >20 ft wide as well as permanent openings >2 acres will help to protect high quality nesting habitat for interior forest bird species such as black-throated blue warbler, wood thrush, and scarlet tanager. Maintaining current and/or creating additional small areas of early-successional habitat conditions (young forest and/or old field) would complement the predominance of mature forest on the properties in question.

Property Descriptions

In their current condition the properties that make up the proposed Barre Town Forest primarily provide breeding habitat for bird species that nest and forage in closed canopy, mature, interior forest. Variation in forest structure among the parcels does make some areas higher quality habitat conducive to a greater number of bird species. Although forest composition is primarily hardwood, stands with a heavier softwood component help to provide horizontal diversity. This in turn also helps to diversify the breeding bird community. In addition to the mature forest that makes up >75% of the proposed Town Forest is a very small component of young forest/old field and a powerline corridor embedded within the mature forest near the northern boundary. The early-successional habitat provided by these areas, although small in size, is an extremely valuable condition to have. The remainder of the land is listed as “non-productive” from a forestry perspective. This includes the ponds associated with the past quarrying. The edges of some of these ponds and the surrounding talus slopes also support vegetation that may be providing an additional small amount of early-successional habitat.

Habitat Units

Summary of Habitat Units

Habitat Unit	Habitat Type	Stand(s)	Approx. Acres	% of Ownership	Description and Notes
1	Mature Hardwood/Mixed Forest	2,3,4,6,7,8	256	67%	Primarily northern hardwoods and hemlock/hardwood; red spruce locally abundant
2	Mature Softwood Forest	1,5	39	10%	Stands with a greater hemlock component
3	Early-Successional	N/A	2	< 1%	Old field or possibly landing reverting to forest; powerline corridor; edges of some quarry ponds and on associated talus slopes
4	Non-Productive	9	83	22%	Primarily quarry ponds and rock piles

Habitat Unit 1: Mature Hardwood/Mixed Forest - 256 acres

Current Habitat Conditions

Overall the mature forests of this habitat unit are comprised of pole and small sawtimber sized trees, maintain a high (>60 ft) closed canopy (>80% cover), are even-aged, and exhibit varying levels of structural complexity. The understory (0-5 ft) layer is generally lacking although there are patches where these features are well-developed, particularly in areas that were most recently harvested. The midstory (6-30 ft) shows better development than the understory as the result of the sapling layer. Bird species potentially benefitting from greater overall vertical structure include *black-throated blue warbler* (understory), *wood thrush* (midstory), and *scarlet tanager* (canopy). Each of these species was observed on the proposed TF.

Large diameter snags and both coarse (> 4 in diameter) and fine (<4 in diameter) woody material exist but are found in lower than desirable abundance. These may reduce habitat quality for *yellow-bellied sapsucker*, *white-throated sparrow*, and *ruffed grouse*. There is good future potential for cavity trees as the health of the locally abundant aspen component declines. This tree species are heavily utilized as a site nesting cavity excavation.

The diversity of tree species is desirable in that it has the potential to increase overall habitat suitability for a wider range of bird species. Birds such as *ovenbird*, *eastern wood-pewee*, and *American redstart* show a preference for hardwoods while *black-throated green warbler*, *blue-headed vireo*, and *blackburnian warbler* are more strongly associated with mixed and/or softwood dominated stands.

Non-native Japanese barberry was noted in this habitat unit. Although some bird species are known to nest in and feed on berries of this and other invasive plants they are of lower quality and not actually beneficial.

This habitat unit offers excellent opportunities to enhance structure of mature forest as well as develop an area(s) of early-successional habitat conditions.



Structurally simple stand = lower habitat quality



Well-developed understory and midstory layers = higher habitat

Desired Habitat Conditions – Mature Forest (Primary)

Desired Condition	Potentially Benefiting Bird Species *denotes species observed
Closed canopy conditions or at least 80% cover on average.	Ovenbird* Black-throated green warbler* Eastern wood-pewee* Blue-headed vireo Blackburnian warbler
Interior forest conditions	Scarlet tanager* Black-throated green warbler* Black-throated blue warbler* Wood thrush* Veery Ovenbird* Canada Warbler Northern parula Blue-headed vireo Blackburnian warbler
Enhanced understory and midstory vegetation layers	Black-throated blue warbler* Veery Canada warbler White-throated sparrow Wood thrush* American redstart Black-throated green warbler* Blue-headed vireo
Large aspen trees are retained, especially when declining, as potential cavity trees.	Northern flicker Yellow-bellied sapsucker*
Large-diameter snags and cavity trees	Northern flicker Yellow-bellied sapsucker*
Large logs on the ground	Ruffed grouse Canada warbler Ovenbird*
Fine woody material is present and aggregated into piles.	Veery White-throated sparrow
Tree species diversity	All birds/general forest health
Invasive plants monitored and controlled	All birds/general forest health
Deep layer of moist deciduous leaf litter	Ovenbird* Wood thrush* Veery

Desired Habitat Conditions – Early-Successional (Secondary)

Desired Condition	Potentially Benefiting Bird Species *denotes species observed
Open canopy conditions (<30%) with high densities of regenerating seedlings, saplings, and shrubs	Chestnut-sided warbler Mourning warbler Nashville warbler Ruffed grouse American woodcock White-throated sparrow
Presence of soft mast producing trees and shrubs (e.g. raspberry, blackberry, cherry spp., elderberry, etc.)	Ovenbird American redstart Eastern wood-pewee Scarlet tanager Wood thrush Veery
Tree species diversity	All birds/general forest health
Invasive plants monitored and controlled	All birds/general forest health

****Special Note on Early-Successional Habitat** – if the development of early-successional conditions is desired it is recommended to create this condition on ≤ 7 acres ($\leq 2\%$) of the total proposed TF property. Ideal locations for development of early-successional habitat conditions are near the north-east - north-central property boundary, adjacent or near to the existing powerline and/or old field (habitat unit 3). See Habitat Unit 3 for further discussion on early-successional habitat.

Management Options and Considerations

A variety of silvicultural treatments could be used to achieve the desired habitat conditions described in the previous sections. The following options are from *Silviculture with Birds in Mind: Options for Integrating Timber and Songbird Habitat Management in Northern Hardwood Stands in Vermont* (Appendix 4).

Mature Forest

Option 1A – Crop Tree Release with Canopy Gap Formation

Option 1B – Variable-Retention Thinning

Option 2A – Expanding-Gap Group Shelterwood

Option 2B – Small Group and Single-Tree Selection – groups $\leq \frac{1}{2}$ acre preferable

Option 3B – Mixed Intermediate Treatments

Early-Successional

Option 2B – Small Group and Single-Tree Selection – groups > 1 acre preferable

Option 3A – Shelterwood with Reserves

Additional Management Considerations

Retain yellow birch - The branches and foliage of yellow birch are preferentially chosen foraging substrates for insect eating responsibility bird species, including blackburnian warbler, black-

throated green warbler, and scarlet tanager. This preference may be due to higher densities of potential prey and the ability of these bird species to forage effectively among the branching and foliage structure of this tree species. Retain as many individuals, across all size classes, as possible.

Minimize harvesting during the bird breeding season - The forest bird breeding season roughly extends from May-August with the most critical time period running through the second or third week of July. Although it may not be desirable or possible to refrain from harvesting during this time frame, consider less intensive silviculture such as single-tree and small group selection. Shelterwoods and patch cut harvests during the breeding season are likely to have greater impact on bird communities. Harvesting during frozen ground conditions is preferable as it has no direct negative impact on the breeding bird community. Winter harvesting can also help protect advanced regeneration and understory shrubs from damage.

Minimize extent of wide forest access roads and recreational trails - Forest access roads can serve as pathways for increased nest predation and parasitism, particularly in forests within an agricultural matrix. Maintain < 15 percent of a property in roads and access trails and utilize the current trail system as much as possible. Minimize long, straight stretches of access roads into the forest interior. Road/trail widths <20 ft. are preferred.

Habitat Unit 2: Mature Softwood Forest - 39 acres

Current Habitat Conditions

In many ways the conditions of this habitat unit are similar to the mature hardwood/mixed forest of habitat unit 1. Among the similar features are relatively simple structure, although there are some exceptions, and lower than desirable amounts of large diameter standing snags and cavity trees and both coarse and fine woody debris. One of the main attributes that make this habitat unit different from unit 1 is tree species composition. Although softwoods, predominantly hemlock, are found in the hardwood and mixed forest stands it is more abundant in this habitat unit. Balsam fir and red spruce are also a softwood component of this unit. This in turn provides higher quality habitat for softwood preferring bird species such as *blackburnian warbler*, *blue-headed vireo*, and *black-throated green warbler*. Black-throated green warbler have been shown to reach their highest abundance in hemlock dominated stands. Additionally canopy gaps created through a timber harvest approximately 5 years ago have resulted in a nicely developing understory.

This habitat unit offers excellent opportunities to enhance structure of mature forest.



Developing understory as a result of canopy gap created through timber harvesting

Desired Habitat Conditions

Desired Condition	Potentially Benefiting Bird Species
Closed canopy conditions or at least 80% cover on average.	Ovenbird Black-throated green warbler Eastern wood-pewee Blue-headed vireo Blackburnian warbler
Interior forest conditions	Scarlet tanager Black-throated green warbler Ovenbird Canada Warbler Northern parula Blue-headed vireo Blackburnian warbler
Enhanced understory and midstory vegetation layers	Black-throated blue warbler Canada warbler Magnolia warbler White-throated sparrow Black-throated green warbler Blue-headed vireo
Large-diameter snags and cavity trees	Yellow-bellied sapsucker
Large logs on the ground	Ruffed grouse Canada warbler Ovenbird
Fine woody material is present and aggregated into piles.	White-throated sparrow
Tree species diversity	All birds/general forest health
Invasive plants monitored and controlled	All birds/general forest health

Management Options and Considerations

A variety of silvicultural treatments could be used to achieve the desired habitat conditions described in the previous sections. The following options are from *Silviculture with Birds in Mind: Options for Integrating Timber and Songbird Habitat Management in Northern Hardwood Stands in Vermont* (Appendix 4).

**Note – although hemlock stands are not specifically covered in the Silviculture with Birds in Mind document, the two options below may be used in accordance with appropriate hemlock silvicultural guides, such as “Managing Eastern Hemlock-A Preliminary Guide (NA-FR-30).*

Option 1B – Variable-Retention Thinning

Option 2B – Small Group and Single-Tree Selection – groups \leq .25 acre preferable

Additional Management Considerations

Retain yellow birch - The branches and foliage of yellow birch are preferentially chosen foraging substrates for insect eating responsibility bird species, including blackburnian warbler, black-throated green warbler, and scarlet tanager. This preference may be due to higher densities of potential prey and the ability of these bird species to forage effectively among the branching and foliage structure of this tree species. Retain as many individuals, across all size classes, as possible.

Minimize harvesting during the bird breeding season - The forest bird breeding season roughly extends from May-August with the most critical time period running through the second or third week of July. Although it may not be desirable or possible to refrain from harvesting during this time frame, consider less intensive silviculture such as single-tree and small group selection. Shelterwoods and patch cut harvests during the breeding season are likely to have greater impact on bird communities. Harvesting during frozen ground conditions is preferable as it has no direct negative impact on the breeding bird community. Winter harvesting can also help protect advanced regeneration and understory shrubs from damage.

Minimize extent of wide forest access roads and recreational trails - Forest access roads can serve as pathways for increased nest predation and parasitism, particularly in forests within an agricultural matrix. Maintain < 15 percent of a property in roads and access trails and utilize the current trail system as much as possible. Minimize long, straight stretches of access roads into the forest interior. Road/trail widths <20 ft. are preferred.

Habitat Unit 3: Early-Successional - 2 acres

Current Habitat Conditions

The primary locations of this habitat unit are both near the northern boundary of the proposed town forest; one area is an approximately ½ acre old field reverting to forest and the other is the powerline corridor that comprises approximately 1.8 acres. Both areas contain good densities of seedlings, saplings, and shrubs ≤20 ft in height with an open canopy (<30% closure). Presently the powerline corridor offers higher quality early-successional habitat due to higher densities of vegetation. Additional minor amounts of early-successional habitat may be found along the edges of the quarry ponds and associated talus slopes.

These areas provide the type of structure necessary for birds that nest in young forest such as *chestnut-sided warbler*, *mourning warbler*, and *Nashville warbler* to find suitable habitat. The presence of aspen in the old field is a valuable food source for *ruffed grouse* which are likely to feed on the buds, particularly during the winter.

In addition to the breeding habitat provided to young forest nesting birds the abundance of fruit producing trees and shrubs in the powerline corridor may offer an important post-breeding/pre-migration food source for many bird species, including those that nested in the mature forest.

Given the current vegetative condition of the powerline it is likely that it will continue to provide early-successional habitat for another 6-10 years, or until 2018-2022, if nothing were done to it. The old field early-successional conditions may last longer, perhaps 10-15 more years, due to the slower growth of vegetation on what are likely compacted soils.



Powerline early-successional habitat showing higher densities of saplings and shrubs



Old field habitat showing mix of saplings and herbaceous vegetation

Desired Habitat Conditions

Desired Condition	Potentially Benefiting Bird Species <small>*denotes species observed</small>
Open canopy conditions (<30%) with high densities of regenerating seedlings, saplings, and shrubs	Chestnut-sided warbler Mourning warbler Nashville warbler Ruffed grouse American woodcock White-throated sparrow
Presence of soft mast producing trees and shrubs (e.g. raspberry, blackberry, cherry spp., elderberry, etc.)	Ovenbird American redstart Eastern wood-pewee Scarlet tanager Wood thrush Veery
Tree species diversity	All birds/general forest health
Invasive plants monitored and controlled	All birds/general forest health

Management Options and Considerations

If possible work with the power company that maintains the powerline corridor to conduct vegetation management during the fall or winter seasons. This will have no direct impact on the breeding bird community.

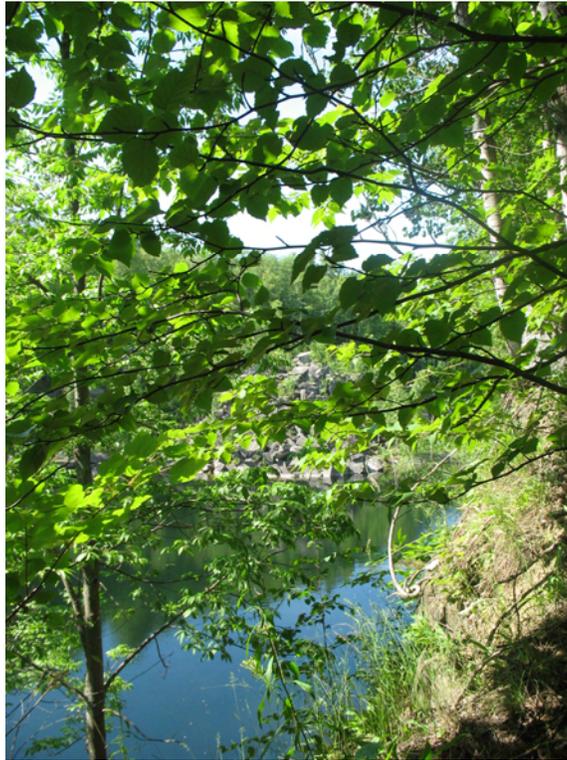
Due to the current conditions of the old field no active management to maintain early-successional habitat conditions should be required over the next 10 year period. Between 2020 and 2022 vegetative conditions should once again be assessed at both the property and landscape level to determine if early-successional habitat management is warranted in the next planning cycle.

One consideration during the upcoming 10 year planning period is to monitor for non-native, invasive plant species such as honeysuckle spp. The Nature Conservancy is a great resource for developing a plan. For more information go to <http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/vermont/volunteer/wise-on-weeds.xml>.

Habitat Unit 4: Non-Productive - 83 acres

Current Habitat Conditions

Although characterized as non-productive from a timber management standpoint, the areas that make up this habitat unit offer interesting and valuable wildlife habitat to the proposed town forest. The quarry ponds and associated talus slopes, along with other talus piles, are very unique within the landscape. It is likely that some of the vegetation growing in and around the talus provides a very minimal amount of early-successional habitat. Some species of waterfowl are also likely to use the quarry ponds. Beyond birdlife these areas may provide habitat for a variety of mammals, reptiles, and amphibians.



A view through the trees at a quarry pond and talus

Management Options and Considerations

No active management is recommended for this habitat unit.

Appendix 1: Responsibility Bird Species

Appendix I



Responsibility Bird Species

The Atlantic Northern Forest of Vermont, New Hampshire, Maine and New York provide breeding habitat to dozens of bird species. For some species, as much as 90% of their global population is breeding in this region. Many of these birds are seeing long-term declines that may be indicating larger ecosystem problems. The North American Bird Conservation Initiative (NABCI) defines birds like these as responsibility birds. A responsibility bird has a high proportion of its global population breeding in the region, and therefore species conservation efforts should be focused in this area. The following are birds Audubon Vermont has recognized as responsibility species in our region based on the work by NABCI.



- | | |
|------------------------------|---------------------------|
| Alder Flycatcher | Magnolia Warbler |
| American Redstart | Mourning Warbler |
| American Woodcock | Nashville Warbler |
| Bay-breasted Warbler | Northern Flicker |
| Bicknell's Thrush | Northern Parula |
| Black-backed Woodpecker | Olive-sided Flycatcher |
| Blackburnian Warbler | Ovenbird |
| Blackpoll Warbler | Palm Warbler |
| Black-throated Blue Warbler | Purple Finch |
| Black-throated Green Warbler | Ruffed Grouse |
| Blue-headed Vireo | Rusty Blackbird |
| Boreal Chickadee | Scarlet Tanager |
| Canada Warbler | Spruce Grouse |
| Cape May Warbler | Swamp Sparrow |
| Chestnut-sided Warbler | Tennessee Warbler |
| Chimney Swift | Veery |
| Eastern Wood-Pewee | White-throated Sparrow |
| Gray Jay | Wood Thrush |
| Lincoln's Sparrow | Yellow-bellied Flycatcher |
| Louisiana Waterthrush | Yellow-bellied Sapsucker |

Photos from top to bottom: Magnolia Warbler, Blackburnian Warbler, Bicknell's Thrush, Scarlet Tanager. Bicknell's Thrush photo provided by the Vermont Institute of Natural Science, Blackburnian Warbler and Scarlet Tanager by Charlie Eiseman, Magnolia Warbler by Powdermill Banding Station in PA.

Appendix 2: Habitat Terms and Explanations

Area-sensitive Bird Species: A bird species such as the wood thrush and scarlet tanager that increases in abundance and/or achieves higher nesting success with increasing forest patch size.

Canopy: The combined cover of individual tree crowns.

Importance for Forest Birds: Canopy height influences nesting site potential for responsibility birds in both young and mature forest habitats. For birds that nest in young forest habitats – such as chestnut-sided and mourning warbler – once the regeneration attains a height of approximately 20 feet, overall conditions are no longer suitable as nesting habitat. For mature forest nesting birds, including wood thrush and blackburnian warbler, nest site selection is strongly associated with increasing canopy height. Forest stands ≥ 1 acre in size with an open canopy (<30% closure) are likely to provide young forest habitat conditions. An intermediate canopy (30-80% closure) often promotes advance regeneration and shrub development suitable for understory and midstory-nesting birds. Canopy closure tends to be inversely proportional to understory development.

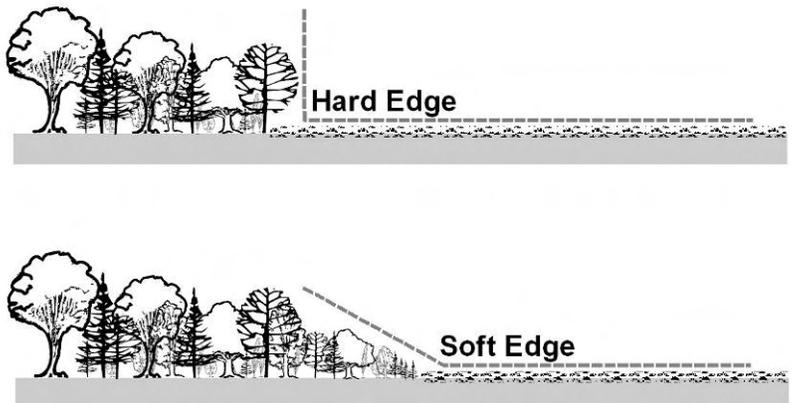
Coarse and Fine Woody Material: Coarse woody material (CWM) is downed logs and branches >4 inches diameter. Fine woody material (FWM) is limbs and branches <4 inches diameter including slash.

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.

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 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.

Mixedwood Forest: A forest made up of hardwood and 25-75% softwood tree species.

Importance for Forest Birds: Some breeding birds are associated with mixedwood forests, such as black-throated blue warbler, Canada warbler, and white-throated sparrow.

National Audubon Society WatchList: An analysis by the National Audubon Society and American Bird Conservancy which uses the latest available research from the bird conservation community along with citizen science data to identify bird species in the continental U.S. and Hawaii that are in need of immediate conservation help. It is a call to action to save species fighting for survival amid a convergence of environmental challenges, including habitat loss, invasive species and global warming. Wood thrush and Canada warbler are Audubon WatchList species.

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.

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.

Appendix 3: Additional Forestry Terms

Source: Vermont Land Trust Forestry Glossary

Acre: A standard unit of area measure. One acre equals: 43,560 square feet; 4840 square yards; 10 square chains.

Advance regeneration: Natural regeneration that is established prior to a timber harvest.

Age Class: One of the intervals, commonly 10-20 years, into which the age range of trees are divided for classification.

Browse: Buds, leaves, and twigs of seedling and sapling regeneration that are utilized as a food resource by wildlife.

Clearcut: A silvicultural method which removes all trees from a designated area at one time for the purpose of creating a new, even-aged stand. This management system is usually used to regenerate shade-intolerant tree species. Variations include patch and strip clearcutting.

Crop Trees: Trees to be grown to the end of the rotation in even-aged management or trees to be favored for future growth in uneven-aged management.

Crown: The branches and twigs of the upper part of a tree.

Diameter at Breast Height (DBH): The diameter of a standing tree measured at 4.5 feet above the ground and expressed in inches.

Even-aged: An age class description of a stand in which the age of the trees is relatively close, usually within 20 years. Stands with two distinct age classes can also be referred to as even-aged.

Forest Management Plan (FMP): A long range plan designed to identify a landowner's goals and objectives and the silvicultural methods that will be employed to achieve those goals. FMP's in Vermont are typically written for a 15 year period and updated every 10 years.

Forest Type: A natural group or association of different species of trees which commonly occur together over a large area. Forest types are defined by one or more of the dominant species of trees in the type.

Forestry: The art and science of growing and managing forests and forest lands for the continuing use of their resources.

Girdle: To destroy the conductive tissue of a tree in a ring around the bole or trunk. A technique often used to create snags.

Harvest: A silvicultural treatment that is intended to establish regeneration. A harvest is generally a higher level of cutting intensity than a thinning.

High-grading: A liquidation cut in which only the best quality, highest value trees are removed. Cuts of this nature are short sighted and exploitative and result in the degradation of the forest ecosystem.

Individual Tree Selection: An uneven-aged harvesting method designed to favor tolerant species. Trees are removed individually to maintain a continuous and uniform crown cover. Also referred to as single tree selection.

Intermediate Treatments: The removal of trees from a stand between the time of establishment and the final harvest with the purpose of improving stand growth and/or species composition and/or health.

Intolerant Species: Trees unable to grow and develop in the shade of other species. Intolerant commercial species in Vermont include: paper birch and aspen.

Landing: Any place where logs are assembled for further transport.

Mast: Nuts, berries, and seeds utilized by wildlife as a food resource.

Overstory: Those trees making up the main canopy. The overstory is usually referenced as the larger trees in the stand.

Pole or Pole Timber: A tree or trees greater than 4.0 inches DBH and less than 10.0 inches DBH.

Prescription: A course of action to effect change in a forest stand (e.g. harvest, thinning, or planting).

Regeneration: Renewal of a tree crop by natural or artificial means.

Release: The freeing of well-established seedlings or saplings from surrounding growth.

Residual: Trees that are left to grow in a stand after a silvicultural treatment.

Rotation: The length of time required to grow an even-aged crop of trees to a desired age.

Rotation Age: The age at which an even-aged stand is considered ready for harvest.

Salvage Cut: The removal of dead, dying, and damaged trees after a natural disaster or insect or disease infestation to utilize the wood before it loses all of its commercial value.

Sapling: Trees taller than 4.5 feet but less than 5.0 inches DBH.

Sawlog: A log considered suitable in size and quality for producing lumber. Regional standards apply for diameter, length and freedom from defect. Sawlog is also used to refer to a tree that has

reached sufficient size to produce a sawlog. Small sawlog trees are 12-16 inches DBH, medium sawlog trees are 17-20 inches DBH, and large sawlog trees are 22 inches DBH or greater.

Sawtimber: Trees that have obtained a minimum diameter at breast height that can be felled and processed into sawlogs. Typical minimum size limits for commercial species in Vermont are 8 inches DBH for softwoods and 12 inches DBH for hardwoods.

Seedlings: Trees that are less than 4.5 feet tall.

Shade tolerance: The ability of trees to reproduce and grow in the shade of other trees. Tolerance ratings are very tolerant, tolerant, intermediate, intolerant, and very intolerant.

Silviculture: Manipulation of the forest ecosystem to achieve specific goals and objectives.

Skid Trail: Any path in the woods over which multiple loads of logs are hauled, usually by a skidder or tractor. Primary skid trails are the main pathways that enter the landing.

Stand: A community of trees possessing sufficient uniformity in regards to composition, constitution, age, spatial arrangement or condition to be distinguishable from adjacent communities.

Stocking: An indication of the number of trees in a stand as compared to the optimum number of trees required to achieve some management objective, usually improved growth rates or increased timber values.

Tolerant Species: Trees that can grow satisfactorily in the shade of other trees. Tolerant species of commercial importance in Vermont include sugar maple, beech, red spruce, and hemlock.

Uneven-aged: An age class description of a stand of trees that contains more than two distinct age classes and a variety of size classes.

Blowdown: A tree or trees that have been toppled by high winds. A common phenomenon along the edge of strip cuts and clearcuts.

Natural Communities of the proposed Barre Town Forest, Barre VT

Rose Graves

April 28, 2011



University of Vermont Ecological Planning Program

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Note to the Reader

This report summarizes the results of a two-day rapid assessment of natural communities and wildlife resources found at the proposed Barre Town Forest. It is not meant to be an exhaustive inventory of all the flora and fauna. The results herein can be used for discussion and increased understanding of the opportunities provided by the conservation of this property.

Executive Summary

The proposed Barre Town Forest, 370 acres of former quarry land, is located in central Vermont, east of Barre City and within the Northern Piedmont bioregion. The lands are being protected by the Town of Barre in conjunction with the Trust for Public Lands and the Millstone Trails Association. The property has a long history of granite quarrying, with 28 abandoned quarries throughout. Some infrastructure remains from the granite operation, including pipes and metal cables near the quarries, as well as some larger scrap metal pieces. The quarries have not been actively mined for the last 100 years, allowing the lands surrounding them to reforest. The property has been managed for timber, wildlife habitat, and recreational values and, though some early successional species are present, is primarily in the intermediate successional forest stages.

The property has at least six distinct natural communities, including **a streamside wetland complex** near the southeast corner, **hemlock-northern hardwood forest** in colder pockets and along a stream on the eastern boundary, and occasional **vernal pools**. The majority of the forest is the matrix forest common in the Northern Vermont Piedmont: **northern hardwood forest** and its variants. The large blocks of northern hardwood forest on this site can be further identified by their dominant trees into stands of northern hardwood variants such as **yellow birch northern hardwood forest** and **sugar maple – white ash northern hardwood forest**. Along the south and western portions of the site, aspens are a major component of the canopy but will likely be replaced by mid- and late-successional maples, beech, and birches. No rare or unusual communities were observed. The abandoned quarries may provide habitat for rare or unusual amphibians and reptiles and should be surveyed during the appropriate season.

Overall, the proposed Barre Town Forest has high wildlife habitat value. A number of common species occur frequently in northern hardwood forest types. The occasional high value food trees, such as black cherry or wild apples, increases the value particularly for species such as black bear. Additionally, aspen, which are prevalent on the site, provide important spring food for bear and other wildlife. The vernal pools and quarries provide breeding habitat for amphibians, and may provide habitat for fish, beavers, and waterfowl as well. Bear, deer, moose, and coyotes are known to use the site for foraging and winter habitat. A number of woodpecker species currently use this forest and will continue to have abundant habitat as the early successional tree species senesce. The mixture of hemlock-northern hardwoods and abundant rock piles provides ample habitat for porcupine, and possibly its major predator, the fisher. The large rock piles, cast off from the granite quarry operations, could also provide denning habitat for small mammals, black bear, and bobcat.

Through its protection, the proposed Barre Town Forest would contribute to landscape connectivity in the Northern Vermont Piedmont and into the Northern Highlands biophysical regions of Vermont. This property is not the highest value linkage area within Barre, but its size and proximity to other large blocks of core habitat indicate that it could serve as a valuable stepping stone in east-west and north-south movement. The intense human use of the recreational trails in the summer may preclude some species from using this property during those months, but it provides valuable spring, fall, and winter habitat.

Introduction

The potential Barre Town Forest comprises 370 acres with frontage on Church Hill Road, Waterman St, Donahue Road, Graniteville Road and Littlejohn Road. The majority is owned by the Rock of Ages Corporation (ROA), with other parcels owned by Websterville Fire District, Graniteville Fire District and up to 4 private landowners. These forested hills contain 28 abandoned granite quarries, and include an extensive trail system built by the volunteers of the Millstone Trails Association.

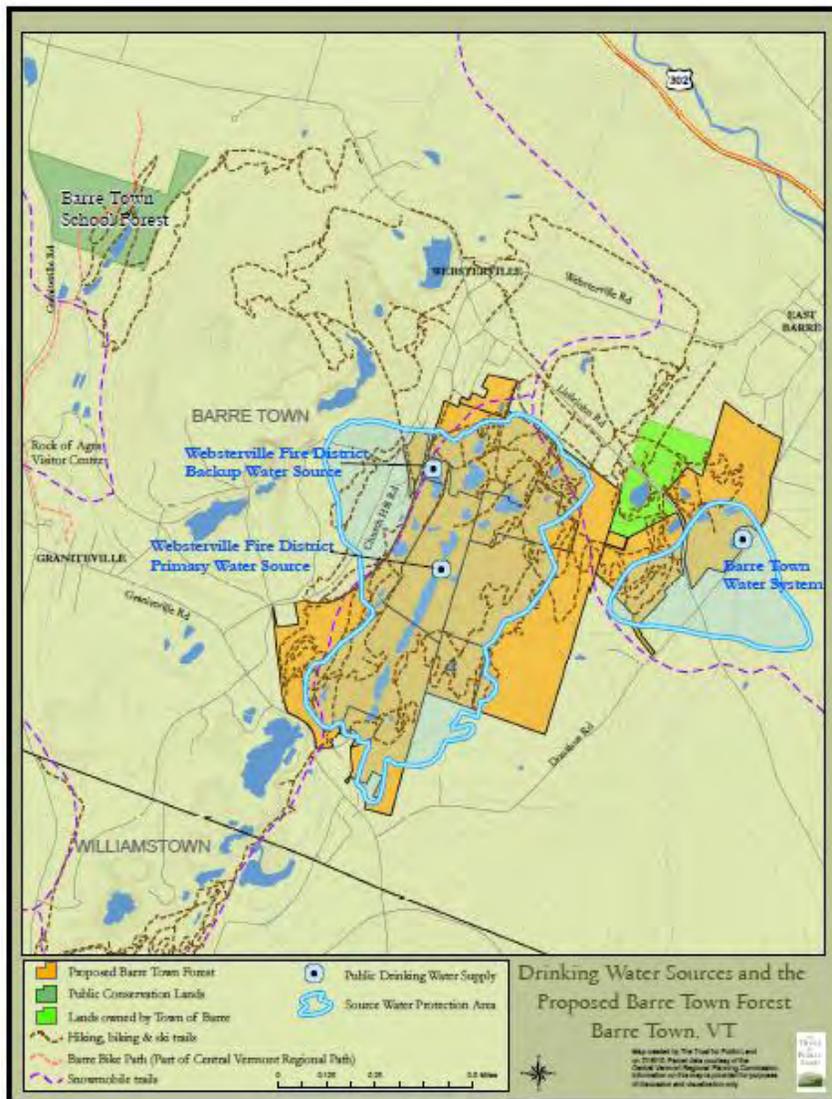


Figure 1. Location of the proposed Barre Town Forest

Since 2005, Millstone Trails Association has provided opportunities for non-motorized recreation with the mission of promoting local economic benefits in the Town of Barre. Specifically, they maintain a trail network of over 70 miles that connects lands surrounding East Barre, Graniteville, and Websterville. When ROA decided to sell a portion of their land, which included a number of the trails, Millstone Trails Association approached the Trust for Public Land (TPL) to explore the option of purchasing the land and transferring it to the Town of Barre to be held as a town forest with conservation easements held by third

party land trusts. In the fall of 2010, the citizens of Barre voted to move forward on acquiring the land for the proposed Town Forest. TPL will take the lead on fundraising and securing the lands. As part of understanding the proposed town forest and its ecological importance, as well as provide information to potential funders, TPL has asked for an assessment of the natural communities and wildlife habitat resources on the site. Additionally, TPL has asked for a brief description of how the proposed Barre Town Forest will aid in landscape connectivity for wildlife, serving as a stepping stone between larger core habitats.

Site Description

The most prevalent features within the Barre Town Forest are the abandoned quarries and piles of waste granite. These, while giving insight into the history of the site, also provide a quick summary of the bedrock: it is primarily granite. In a bedrock classification map, produced by the Vermont Biodiversity Project, the proposed Forest sits over a large intrusion of igneous rocks and their metamorphosed equivalents including the granitic rock for which the Barre area has become famous. Additionally, the property also contains a category of bedrock described as calcareous clastic and metamorphosed rocks. This bedrock category leads to richer soils, characteristic of the Northern Vermont Piedmont biophysical region.

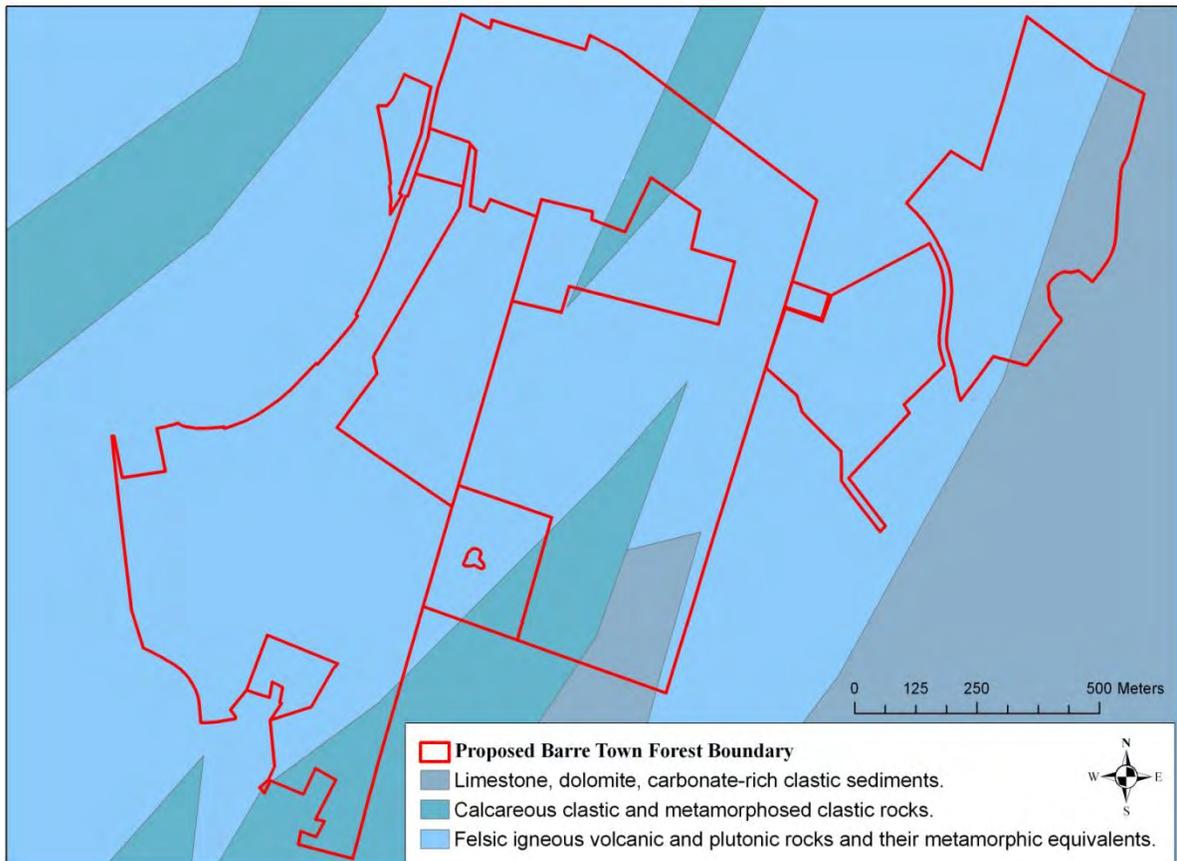


Figure 2. VT Biodiversity Project bedrock classifications for the site.

There are at least 10 soil types present at this site, most of which are characterized as stony, very stony, very rocky, or bouldery. The majority of the site is mapped as pits, quarry dumps, and mine complex. The bedrock and soil types, as well as the human history of this site, influence the vegetation found here.

Natural Communities

Before describing the natural communities present at the proposed Barre Town Forest, I'd like to first acknowledge the definition of natural community presented by Liz Thompson and Eric Sorenson, "*a natural community is an interacting assemblage of organisms, their physical environment, and the natural processes that affect them.*" The emphasis in this definition is on natural—implying that the ecological community present at a site influenced by humans may be different than the actual natural community that the site would tend towards. The proposed Barre Town Forest is greatly impacted by the human history of use on the site; mining of granite resulted in ponds, removal of soils and bedrock, and the formation of impressive "talus" piles. The intensive extraction of granite from the site stopped over 100 years ago. In that time, natural communities have established on the human altered landscape; the current state of natural communities at this site is described herein.

There are at least six natural community types present on this site. The majority of the site is classified as Northern Hardwood Forest or one of its variants. Other communities include: Northern Hardwood Talus Woodland, Hemlock – Northern Hardwood Forest, Streamside Wetland Complex, and occasional Vernal Pools. The abandoned quarries have not been classified as a natural community type in this report, but will be discussed for their habitat and water resource values.

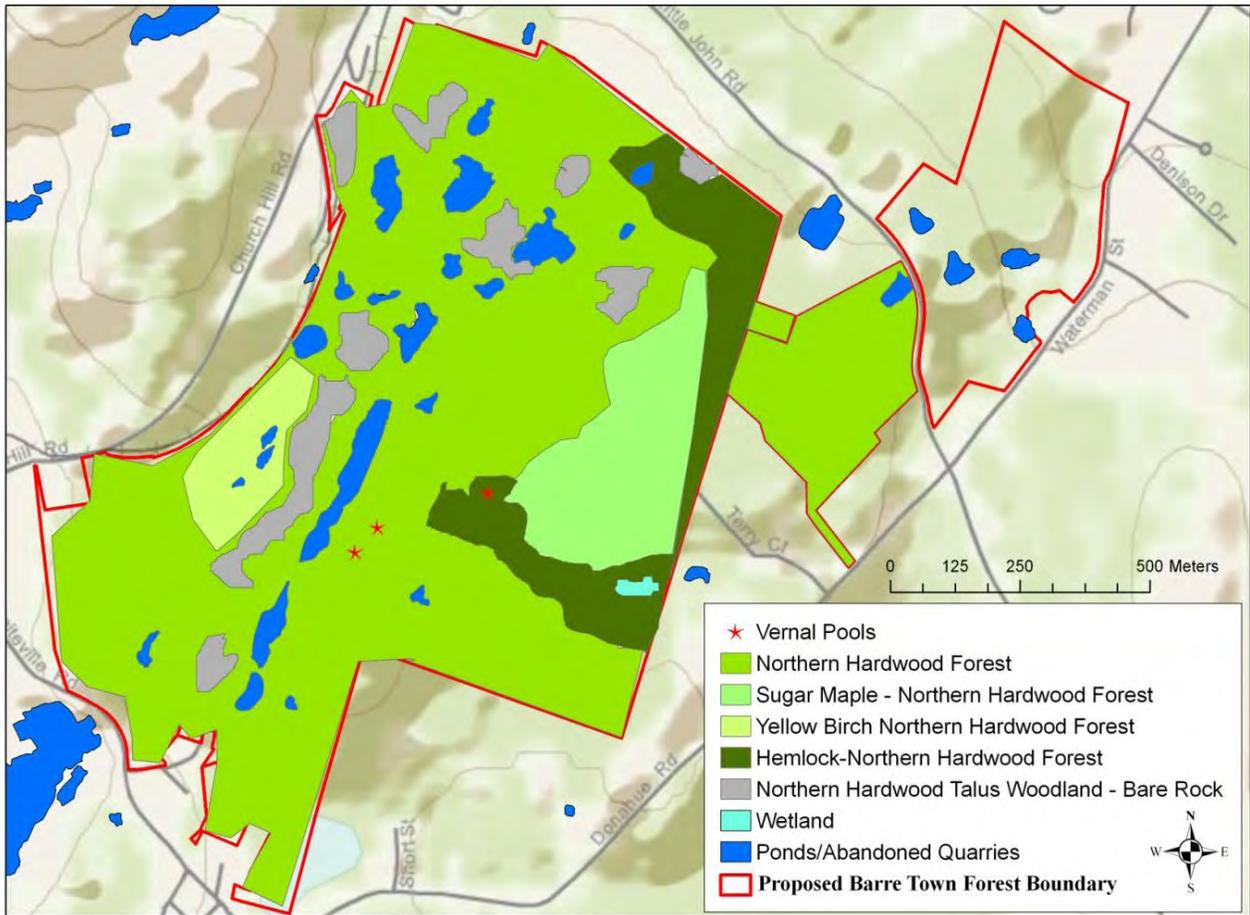


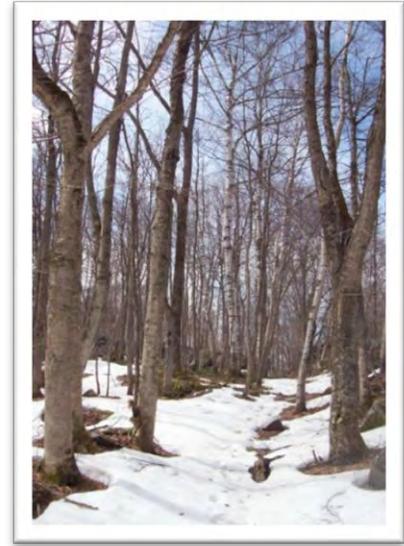
Figure 3. Natural communities of the proposed Barre Town Forest.

Northern Harwood Forest

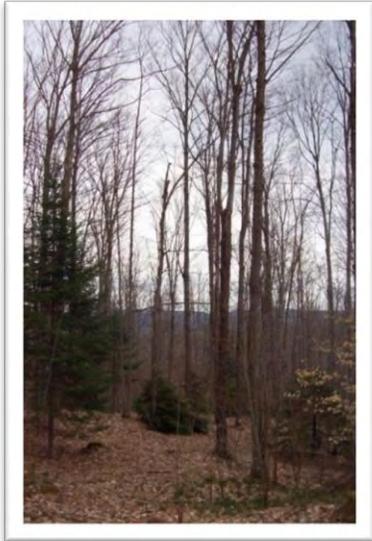
The Northern Hardwood Forest natural community type is one of the most common in Vermont. It is a variable natural community, with canopy trees changing dominance over short distances. Characteristic overstory trees include sugar maple, beech, and yellow birch. At the proposed Barre Town Forest, the Northern Hardwood Forest includes the characteristic canopy trees but also aspen, white birch, red maple, hophornbeam, white ash, eastern hemlock and black cherry. Scattered white pines are found, but do not make up a significant component of this forest. Regeneration includes red maple, sugar maple, beech, striped maple, and Some areas were classified as variants of the Northern Hardwood Forest based on the dominance of one or two canopy species over the others. These variants include: Sugar Maple – White Ash Northern Hardwood Forest and the Yellow Birch Northern Hardwood Forest. Both of these variants indicate differences in surficial geology, soils, and land use over the site. The Northern Hardwood Forest is used by many wildlife species. Wildlife observed included a variety of forest birds and deer, as well as sign of bear and coyote.

Yellow Birch Northern Hardwood Forest

Yellow birch, normally an early- to mid-successional tree, tends to gain dominance in Northern Hardwood communities that have a continuous supply of mineral soil sites for yellow birch to germinate. The exposed rocks and boulders close to and above the surface that are scattered throughout this property provide good sites for yellow birch to grow. The yellow birch were particularly dominate on the southwestern portion of the site. Also, big-tooth aspen made up a good portion of the canopy in this area. Aspen, also an early successional tree, was not present in the understory, suggesting that it is being replaced by the later successional trees including



the yellow birch and maples. Bear sign was observed within this area, on beech, white birch, and aspen trees.



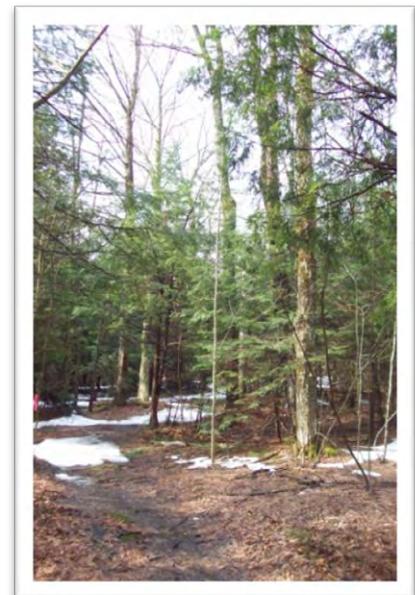
Sugar Maple – White Ash Northern Hardwood Forest

The second variant of the Northern Hardwood Forest that can be distinguished at this site indicates slight enrichment of the soil. Often, the presence of Jack-in-the-Pulpit further indicates enrichment (none were seen during this survey, as it was too early in spring). The large stand on the eastern side of the property has been managed for continued growth of sugar maple. However, the abundance of sugar maple trees and regeneration as well as white ash, beech, yellow birch, and occasional black cherry

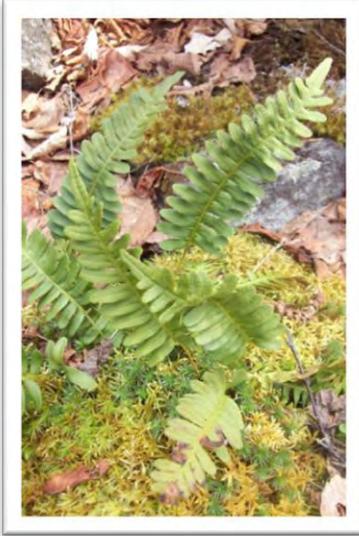
indicate that these would likely persist as the mid- to late-successional trees on this site.

Hemlock – Northern Hardwood Forest

This natural community is common throughout the state of Vermont. It is a mixed community characterized by eastern hemlock, mixed hardwoods, and white pine. It differs from a pure hemlock forest in that hemlock shares the canopy with at least one other species. On this property, hemlock shares the canopy with red maple, beech, and red spruce. The red maple and beech are more common in the higher, more western portions of this community. At the proposed Barre Town Forest, the hemlock – northern hardwood forest follows a small ravine down an eastern slope and then follows a stream



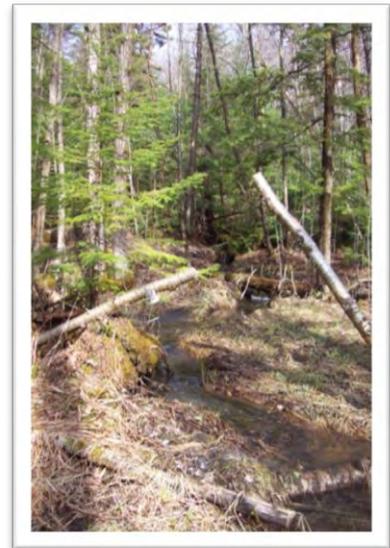
flowing along the eastern boundary. Along the stream and in the lower sites, spruce and some balsam fir are co-dominant with the hemlock. There is ample evidence of porcupine and deer in this natural community.



Northern Hardwood Talus Woodland

Discarded piles of granite boulders are common throughout the property. These towering rock piles, in addition to providing great viewpoints, provide growing sites for a distinct natural community. The Northern Hardwood Talus Woodland normally occurs as a small, isolated community associated with open talus. Trees growing on these sites include yellow birch, white birch, and white ash. There were also occasional aspen and striped maple. Mountain maple was common. Appalachian polypody commonly grows on the rocks.

The rocks were also densely covered in spots by lichens and mosses. The trees, shrubs, and plants growing in this community are sparse. The areas mapped as Northern Hardwood Talus Woodland also contain a lot of bare rock. These areas are important for porcupine and may also be used for cover by other animals including black bear, bobcat, small mammals, and some birds.



Streamside Wetland Complex

There is a small wetland on the southeastern side of the property. This wetland was very flooded during early spring and has a permanent stream running through it. The edges are likely intermittently flooded but permanently saturated. The wetland complex is surrounded by hemlock-northern hardwood forest. The wetland itself is a mix of forested wetland, primarily spruce and fir, shrub – swamp, and emergent streamside vegetation. The wetland is used by snowshoe hare, deer, and spring peepers. Other species, such as small weasels, mammals, and birds, though not observed, likely use this habitat as well.



Vernal Pools

At least three vernal pools were located on this site. Vernal pools are small, temporary wetlands that usually occur in depressions where an impermeable layer is close to the surface. At the proposed Barre Town Forest bedrock close to the surface can act as this impermeable surface. Surveys of the property were done in early

spring, coinciding with snowmelt and extensive spring showers. There was ponding water in many depressions throughout the property. The three mapped vernal pools (locations are approximate) were identified as such by size and presence of calling wood frogs. Wood frogs and other amphibians are obligate vernal pool breeders.

Abandoned Quarries

There are up to 28 abandoned quarries in the proposed Barre Town Forest. These quarries have filled with water and provide valuable water resources to wildlife, as well as to the surrounding towns. Two villages use these quarries for their fire districts. The plants and animals directly surrounding each quarry vary. In some cases, the matrix northern hardwood forest continues to the edge of the quarry. In others, the edge of the quarry contains northern white cedar and speckled alder. Wood frogs were observed in two of the quarries. Most of the other quarries still had ice covering them, so an in depth assessment of their use by amphibians, reptiles, fish, and other wildlife was not possible. At the edge of the southernmost quarry, there is evidence of beaver activity. Mallard ducks were also observed in this quarry.

Wildlife Resources in the proposed Barre Town Forest

The proposed Barre Town Forest provides abundant resources for wildlife. A full list of wildlife observed during surveys can be found in Table 1. A brief summary of habitat features follows; it is not an exhaustive inventory of wildlife resources. Important habitat features at this property include wetlands and ponds which can serve as important spring foraging sites, breeding sites for amphibians and birds,



and water catchment. Large rock piles provide den sites for porcupines and could also provide cover and den sites for small rodents, weasels, bobcats, and black bear. The northern hardwood forest provides habitat for a range of species. Deer frequently find food resources in the herbs, shrubs, and new growth of trees in these forests. Hophornbeam, a common tree at this site, is used by black bear as a spring food source and beech trees provide important fall food for black bear. Occasional black cherry and wild apple trees are valuable food resources for black bear, deer, wild turkeys, and a host of other mammals and birds. The large blocks of relatively intact habitat provide nest sites for forest birds. The aspen at the proposed Barre Town Forest provides early spring forage in its buds and, as it begins to senesce, will provide an abundance of snags which are used by many woodpeckers. At least four species of woodpeckers were observed during this survey. The hemlock-northern hardwood forest provides winter cover for deer and food for porcupine.

Table 1. Wildlife observed at the proposed Barre Town Forest during two field visits in April 2011. * denotes species identified by tracks or other sign, not direct observation.

Birds		Mammals	Amphibians
American Crow (<i>Corvus brachyrhynchos</i>)	Hairy Woodpecker (<i>Picoides villosus</i>)	Black Bear (<i>Ursus americanus</i>)*	Spring Peeper (<i>Pseudacris crucifer</i>)
American Robin (<i>Turdus migratorius</i>)	Hermit thrush (<i>Catharus guttatus</i>)	Coyote (<i>Canis latrans</i>)*	Wood Frog (<i>Rana sylvatica</i>)
Barred Owl (<i>Strix varia</i>)	Mallard (<i>Anas platyrhynchos</i>)	Moose (<i>Alces alces</i>)*	
Black-capped Chickadee (<i>Poecile atricapillus</i>)	Northern Flicker (<i>Colaptes auratus</i>)	Porcupine (<i>Erethizon dorsatum</i>)*	
Blue Jay (<i>Cyanocitta cristata</i>)	Pileated Woodpecker (<i>Colaptes auratus</i>)	White-tailed Deer (<i>Odocoileus virginianus</i>)	
Brown Creeper (<i>Certhia americana</i>)	Ruffed Grouse (<i>Bonasa umbellus</i>)		
Common Raven (<i>Corvus corax</i>)	White-throated Sparrow (<i>Zonotrichia albicollis</i>)		
Dark-eyed Junco (<i>Junco hyemalis</i>)	Winter Wren (<i>Troglodytes troglodytes</i>)		
Downy Woodpecker (<i>Picoides pubescens</i>)	Yellow bellied Sapsucker (<i>Sphyrapicus varius</i>)		

Proposed Barre Town Forest and Landscape Connectivity

The potential of the proposed Barre Town Forest to serve as a stepping stone between large conserved lands is hard to assess in a short field survey. The observed sign of mobile mammal species, including moose and black bear, which are likely not using the area year round, suggests that it is being used for portions of their life requisites. During the other seasons, these animals could be moving out to the larger core habitats of the Groton State Forest to the northeast or large contiguous blocks of forested habitat to the southeast and southwest.

The State of Vermont Agency of Transportation (VTrans) and Vermont Fish and Wildlife (VFW) have conducted large-scale assessments of wildlife linkage habitat and wildlife core habitat throughout the state. As can be seen below, the proposed Town Forest sits between two large blocks of high value linkage habitat, and on the edge of medium value linkage habitat.

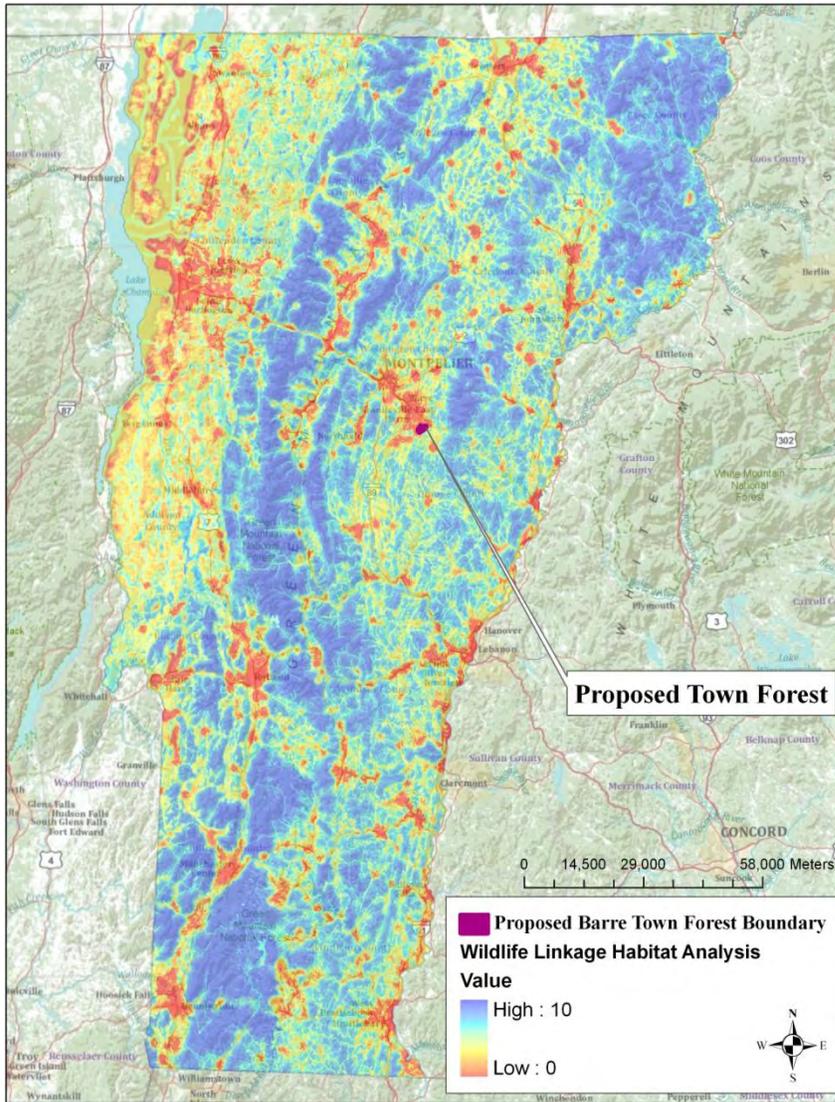


Figure 4. Wildlife Linkage Habitat in the State of Vermont.

The proposed Town Forest contains habitat blocks identified as core habitat due to their size, land cover, and surroundings. However, we can see that there may be significant barriers due to roads and development surrounding the site which could inhibit its ability to serve as a stepping stone. Specifically, moving southwest toward Williamstown could be difficult for animals.

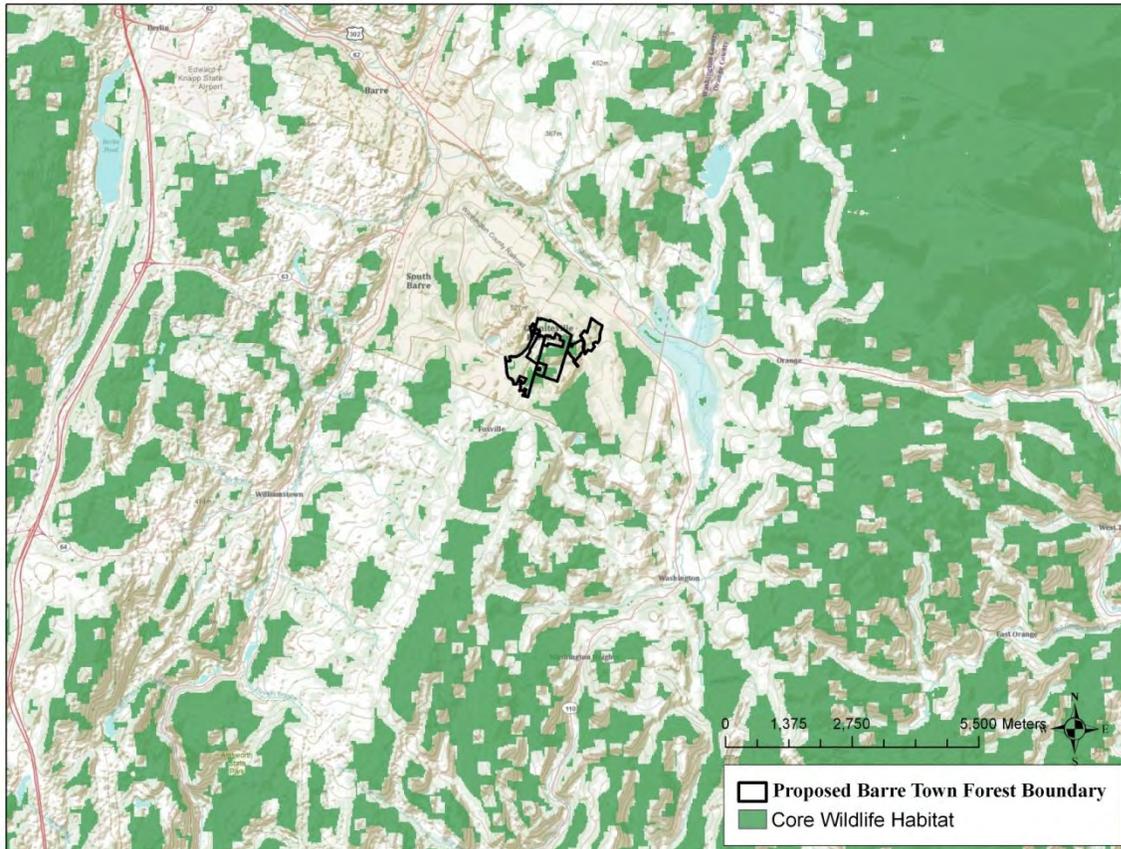


Figure 5. Core Wildlife Habitat blocks, as mapped by VTrans and VFW, surrounding the proposed Barre Town Forest.

Despite this potential difficulty, the presence of core habitat and proximity to other core habitats directly south and the large blocks to the north and east increases the value of this land as a stepping stone. It should be noted that the Barre Town Forest alone will not provide connectivity between these blocks, but in conjunction with other conserved lands in the area could allow for greater movement of wildlife. Specifically, the higher ranked linkage areas to the immediate south and east should be targeted conservation priorities to increase the utility of this parcel as a stepping stone.

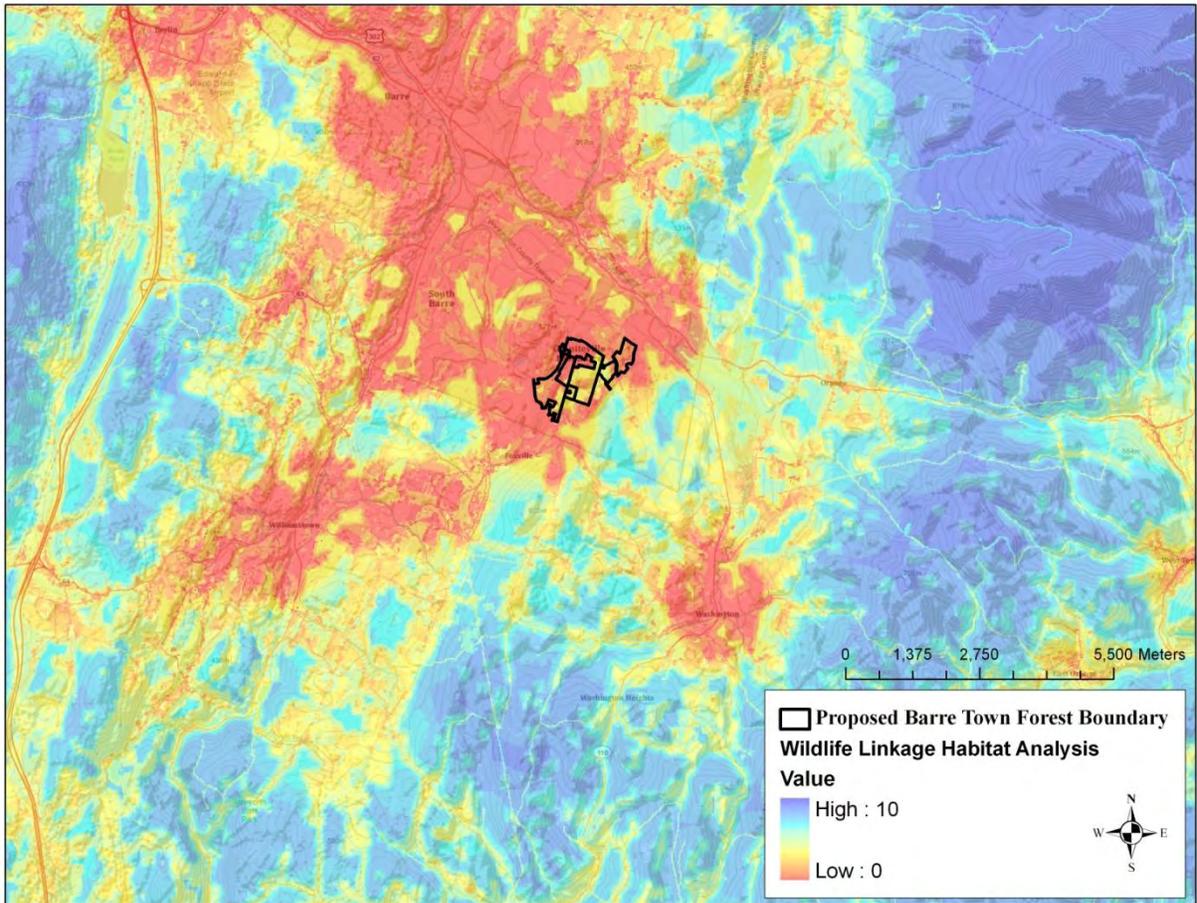


Figure 6. Wildlife habitat linkage value of the proposed Barre Town Forest and the surrounding area.

Further information regarding the specific animals that use this property and their seasonal patterns should be collected using VT state biologist knowledge, finer scale GIS data on habitats, and field surveys throughout multiple seasons. The data currently available suggests that this property will serve connectivity in the Northern Vermont Piedmont.

Final Summary

The proposed Barre Town Forest provides an opportunity for protection of wildlife habitat and conservation of natural communities representative of the Northern Vermont Piedmont. In addition, it will continue to serve as a valuable site for recreation, forest management, tourism, and water quality protection.

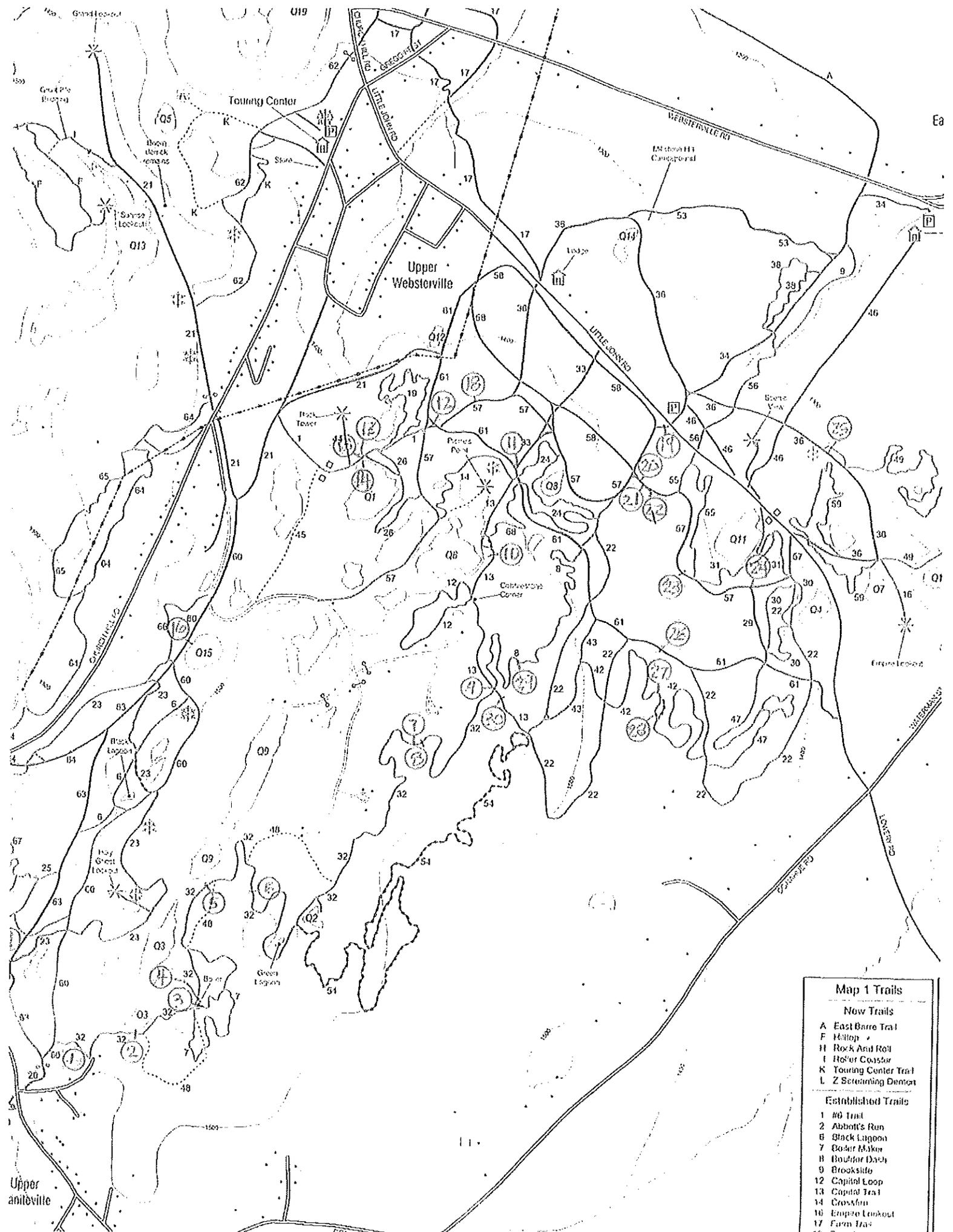
References

Austin, J., K. Viani, F. Hammond. 2006. Vermont Wildlife Linkage Habitat Analysis: A GIS-Based, Landscape-level Identification of Potentially Significant Wildlife Linkage Habitats Associated with State of Vermont Roadways. Vermont Fish and Wildlife in accordance with Vermont Agency of Transportation. VTrans Research Advisory Council No. RSCH008-967.

Thompson, E.H. and E.R. Sorenson. 2000. Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont. University Press of New England, Hanover, NH.

Vermont Center for Geographic Information. Available online: www.vcgi.org

**INVENTORY OF STRUCTURES
ON THE MILLSTONE TRAILS
FOR THE
BARRE TOWN FOREST**



Map 1 Trails	
Now Trails	
A	East Barre Trail
F	Hilltop
H	Rock And Roll
I	Ho'er Coaster
K	Touring Center Trail
L	Seating Denton
Established Trails	
1	#0 Trail
2	Abbott's Run
6	Black Lagoon
7	Boiler Maker
8	Boulder Dash
9	Brookside
12	Capital Loop
13	Capital Trail
14	Crossfin
16	Empire Lookout
17	Farm Trail



①

On Locomotion
below Barclay
Quarry Road



② Culvert next to Barclay Quarry



③ The Boiler at the intersection of Locomotion and Boilermaker

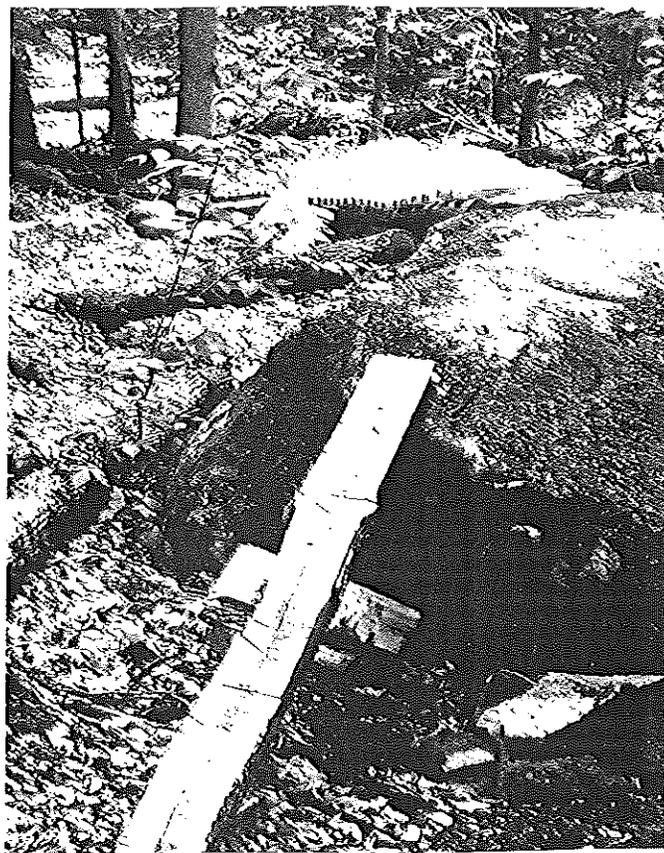
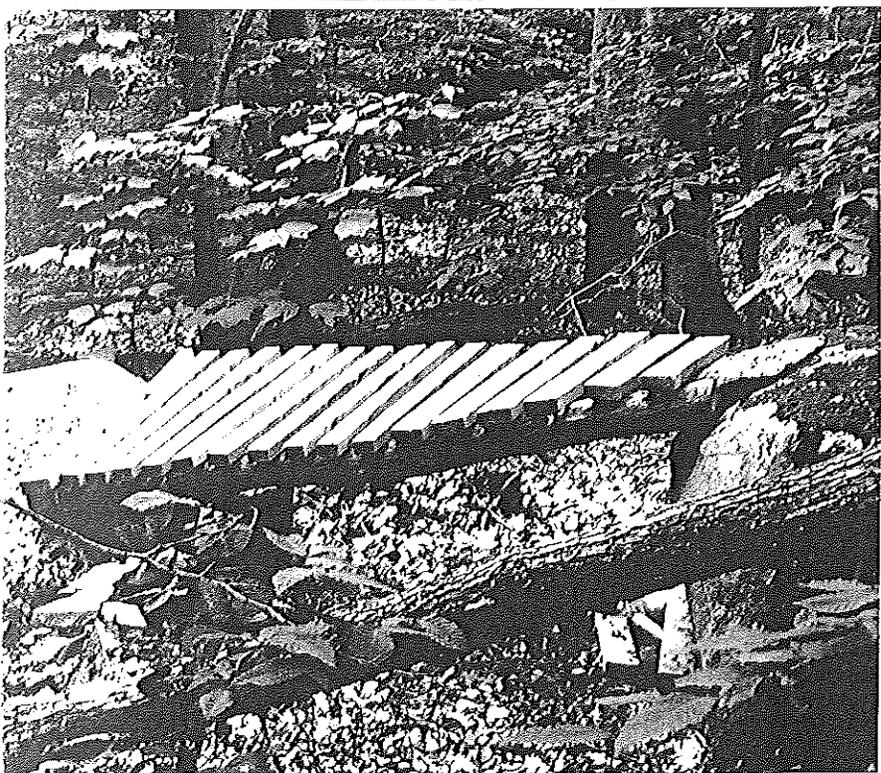


④

On Locomotion less than 100 feet from the Boiler



⑤ On locomotion near Jones Brothers Quarry



⑥ On locomotion (short side trail)



⑦ On locomotion near
the dynamite buildings

⑧ On locomotion near
the dynamite buildings

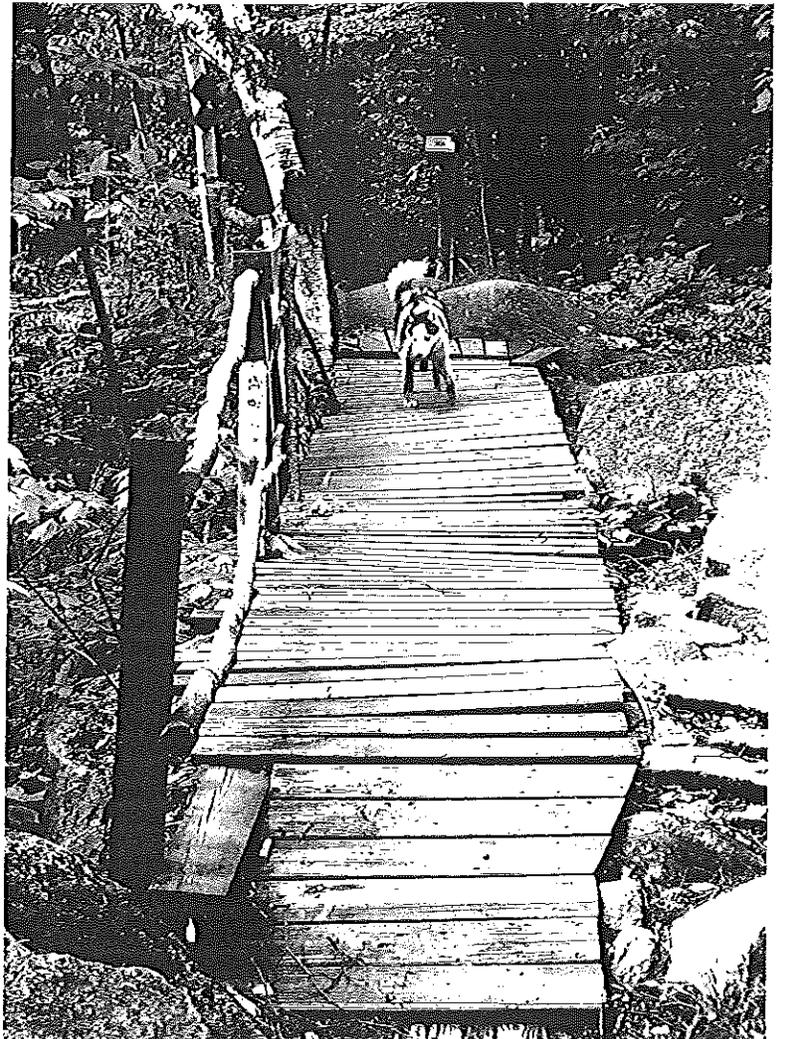




9

Kiosk at jctn.
of locomotion
and Capital

10 Next to Capital Quarry





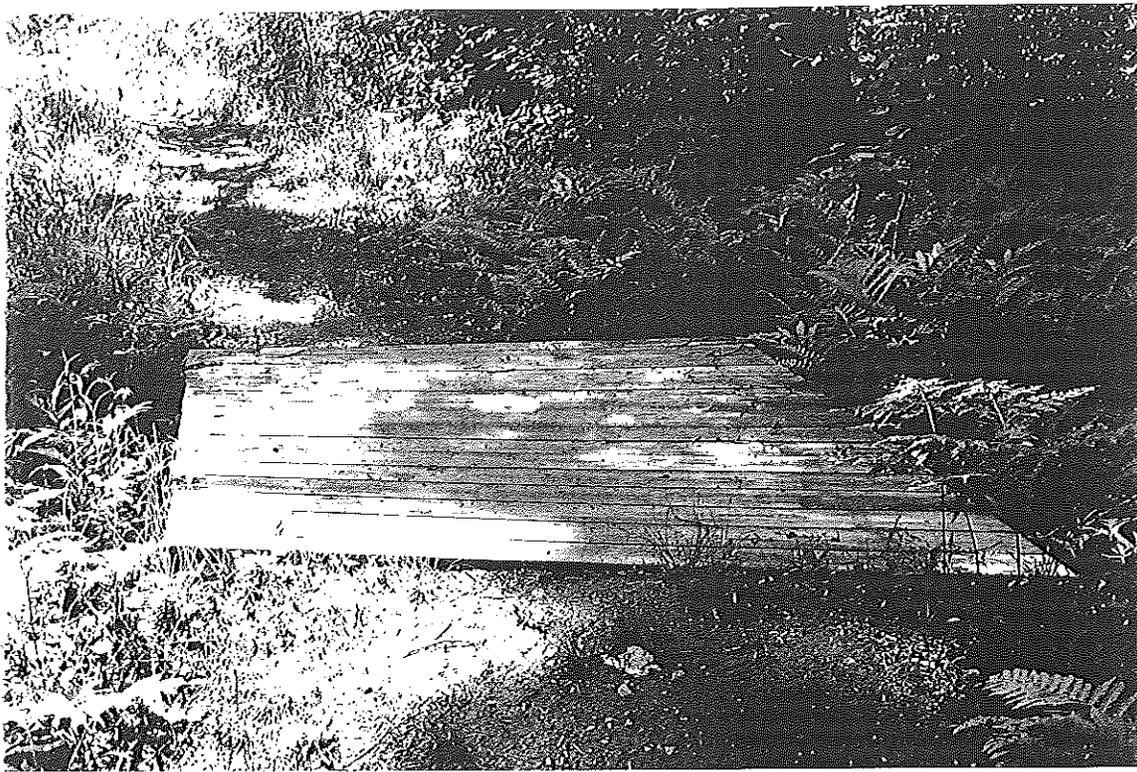
11

Kiosk at intersection of
VAST and Lodge Trails

12

Kiosk at intersection of
VAST, Upper Mainline and
6 Trails

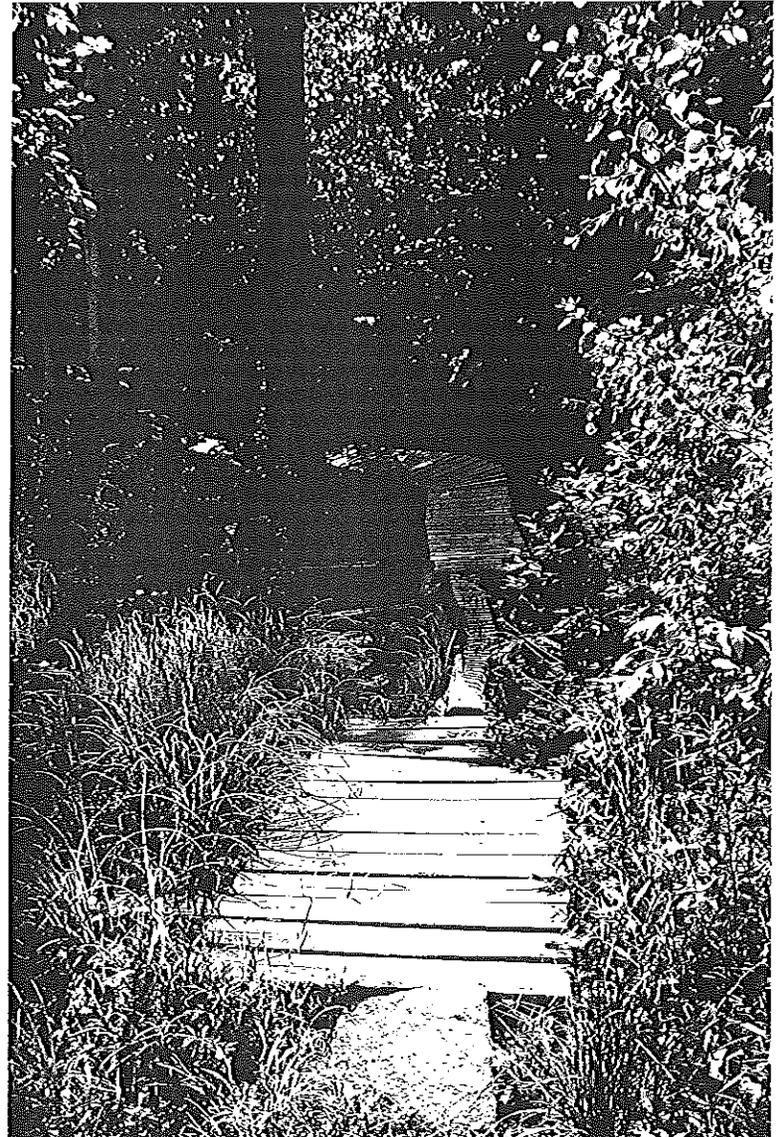


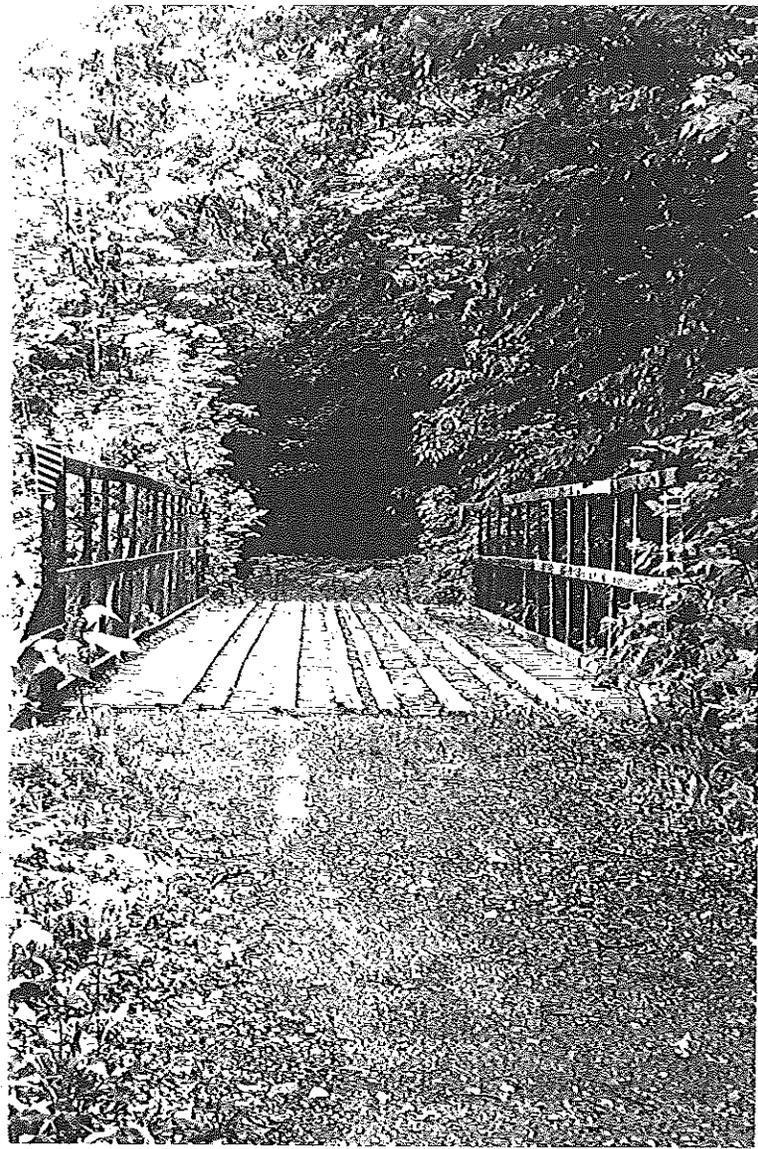


13

Near #6 Quarry

14 Beginner Bridge Next To #6 Quarry 15 Expert Bridge Next To #6 Quarry





16

Upper Vast Trail next
to Murphy Quarry

17

Kiosk at intersection of
Last Light and Switchback
Trails





18

Upper Mainline between
the field and # 6 Trail

19

Littlejohn Road near
Upper Parking lot, entrance
to the field.





②0 and ②1

Upper Mainline near
Upper corner of field

②2

Upper Mainline



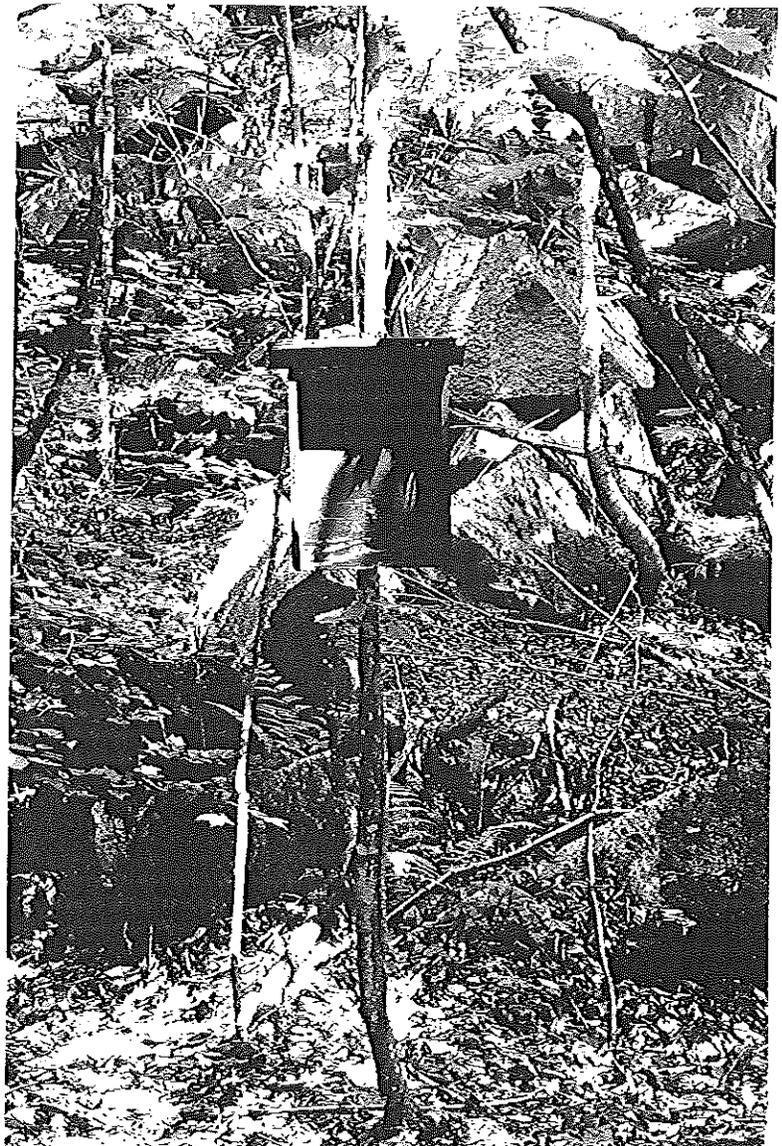


23

Upper Mainline

24

Kiosk at intersection of
Link and Upper Mainline





25 Main line near end of Sidewinder



26 VAST Trail near Heifer Pasture

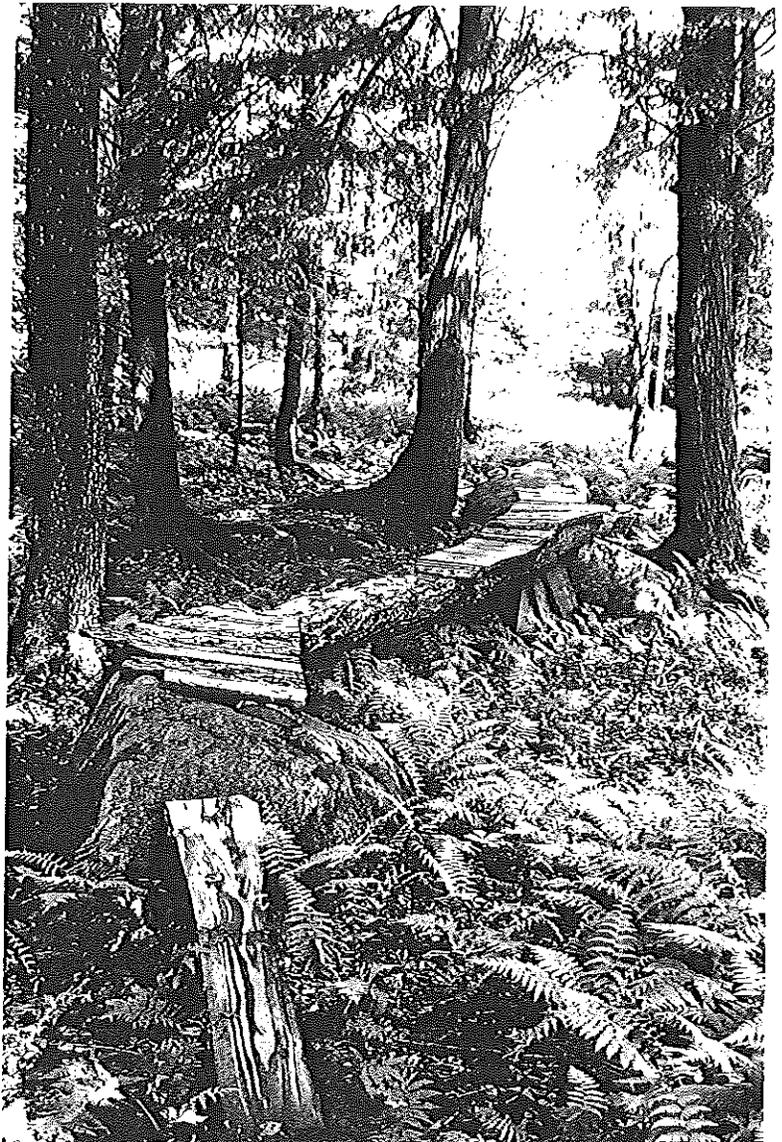


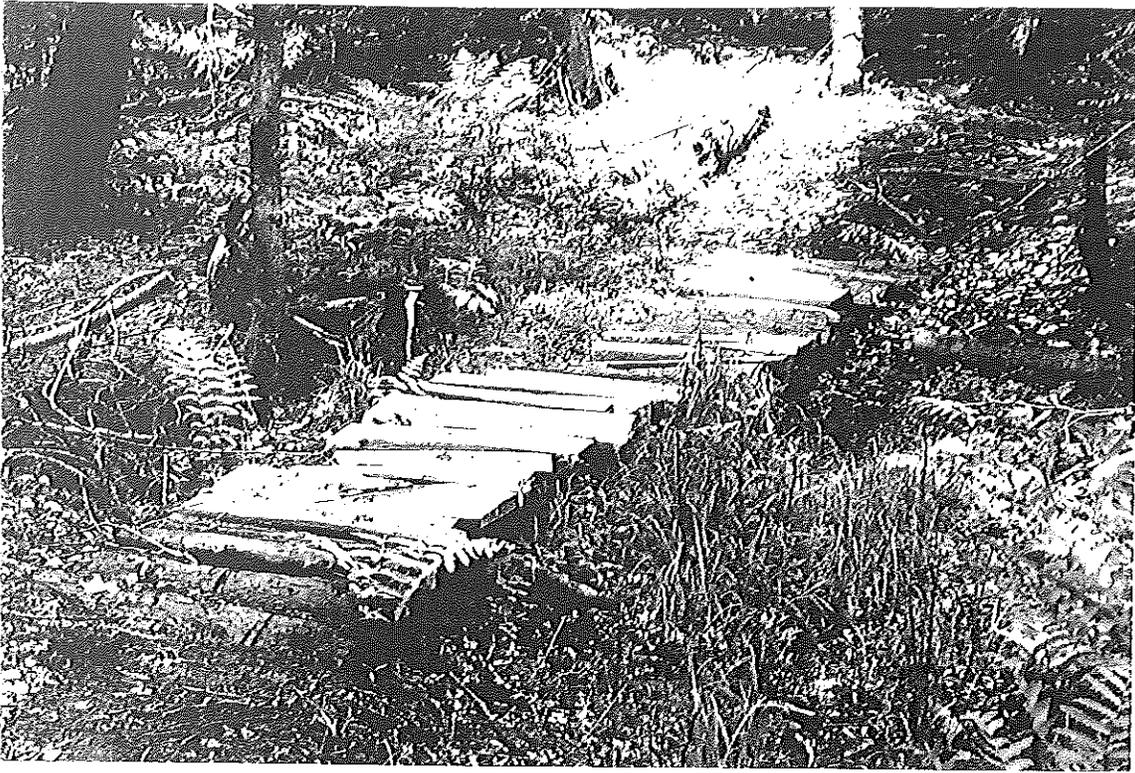
(27)

Rambler

(28)

short sidetrail off from Rambler





(29) Boulder Dash



(30)

Capital near intersection
of Locomotion

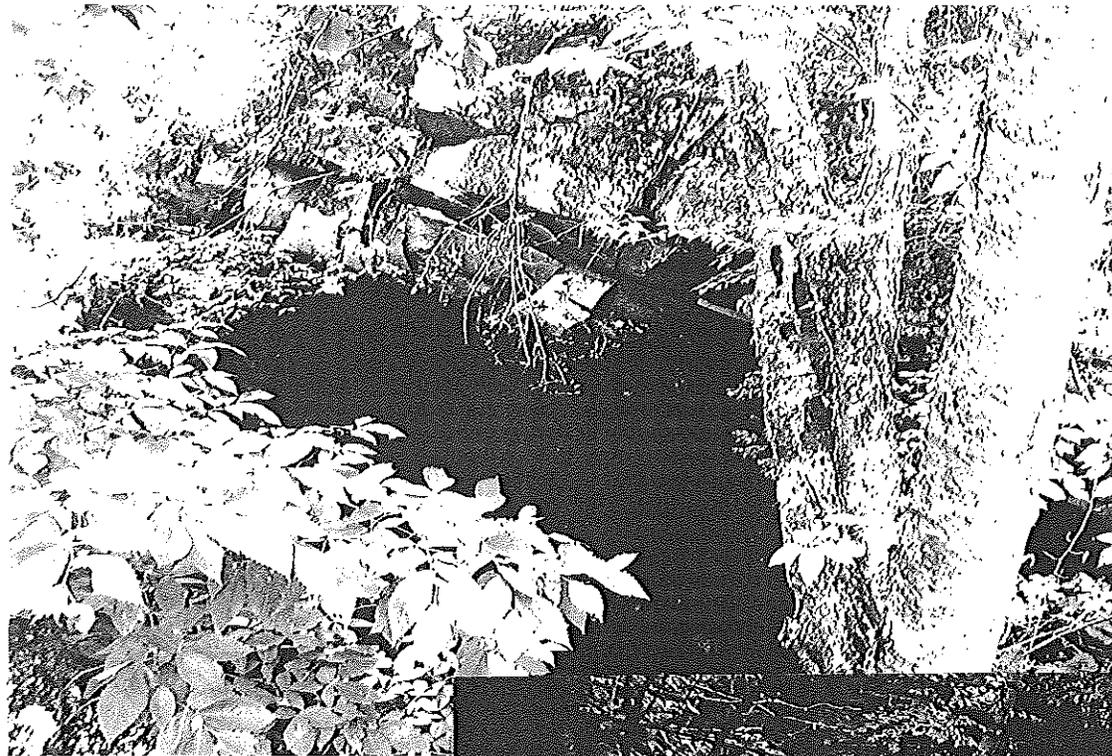


Q1
#6 Quarry

Q2 Anderson Quarry

Q15 Murphy Quarry





The Black
Lagoon



The Green
Lagoon



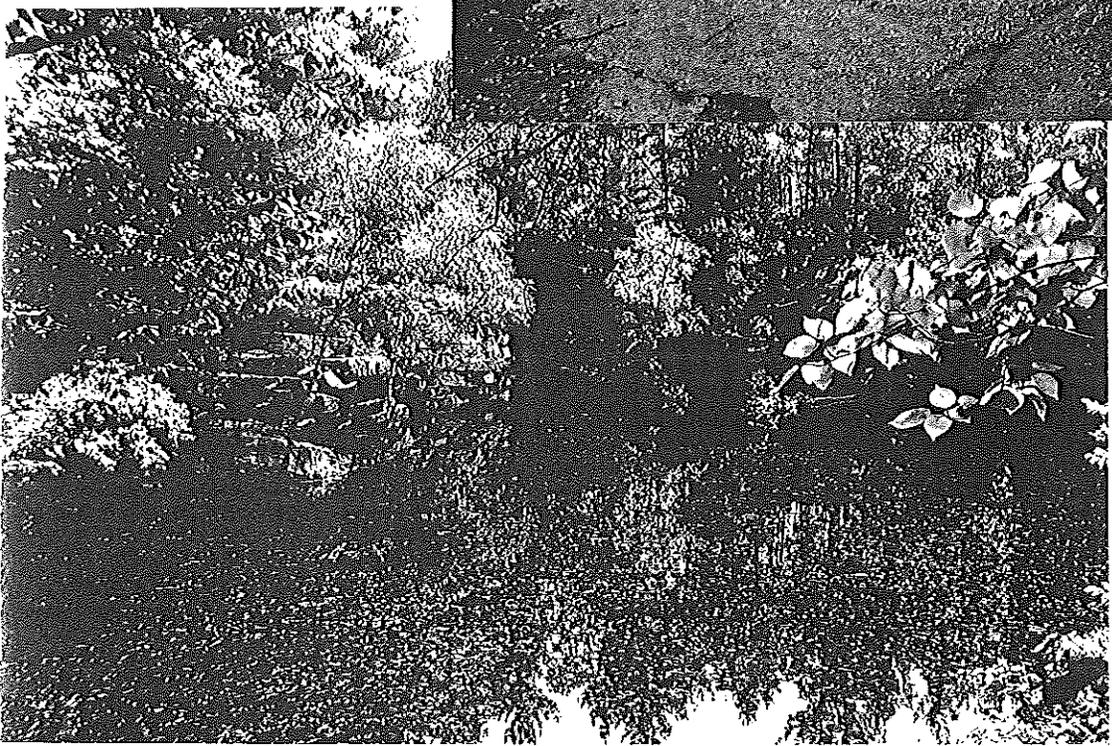
Q3
Barclay Quarry



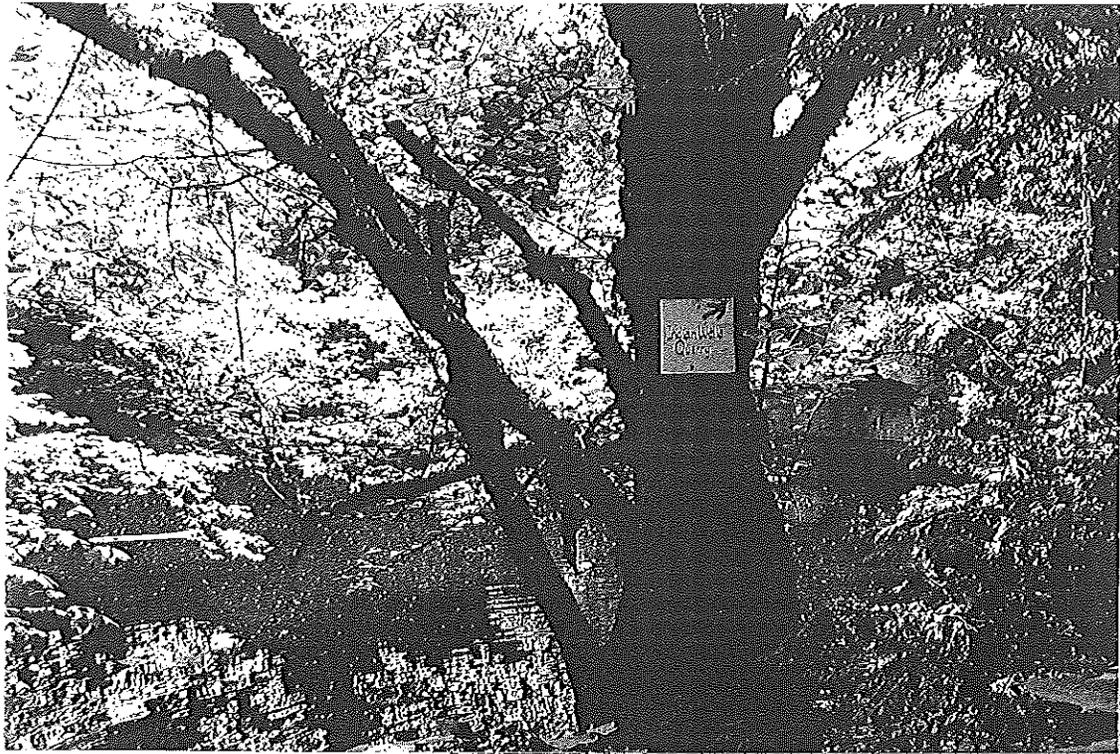
Q6
Capital Quarry



Q6
Capital Quarry



Q7
Empire Quarry



Q8
Indian Wells
Quarry



Q11
Littlejohn
and Milne



Quarry near
Froot Loops Trail



Q 9 Jone Brothers Quarry

Appendix F

Leave No Trace Principles

Meant to be viewed as guidelines for those who care about the land, Leave No Trace principles were developed in cooperation with the U.S. Forest Service, National Park Service, Bureau of Land Management, and U.S. Fish and Wildlife Service. For more information about the Leave No Trace principles and the national Leave No Trace program, visit www.lnt.org.

The Seven Principles are:

1. **Plan Ahead and Prepare.** Know the terrain and any regulations applicable to the area you're planning to visit, and be prepared for extreme weather or other emergencies. This will enhance your enjoyment and ensure that you've chosen an appropriate destination. Small groups have less impact on resources and the experience of other backcountry visitors.
2. **Travel and Camp on Durable Surfaces.** Travel and camp on established trails and campsites, rock, gravel, dry grasses, or snow. Good campsites are found, not made. Camp at least 200 feet from lakes and streams, and focus activities on areas where vegetation is absent. In pristine areas, disperse use to prevent the creation of campsites and trails.
3. **Dispose of Waste Properly.** Pack it in, pack it out. Inspect your camp for trash or food scraps. Deposit solid human waste in catholes dug six to eight inches, at least 200 feet from water, camp and trails. Pack out toilet paper and hygiene products. To wash yourself or your dishes, carry water 200 feet away from streams or lakes and use small amounts of biodegradable soap. Scatter strained dishwater.
4. **Leave What You Find.** Cultural or historic artifacts, as well as natural objects such as plants or rocks, should be left as found.
5. **Minimize Campfire Impacts.** Cook on a stove. Use established fire rings, fire pans, or mound fires. If a campfire is built, keep it small and use dead sticks found on the ground.
6. **Respect Wildlife.** Observe wildlife from a distance. Feeding wildlife alters their natural behavior. Protect wildlife from your food by storing rations and trash securely.
7. **Be Considerate of Other Visitors.** Be courteous, respect the quality of other visitors' backcountry experience, and let nature's sounds prevail.

Corridor Management Agreement

between the Town of Barre and _____

THIS AGREEMENT made and entered into this ____ day of _____, 20__ by and between the Town of Barre and _____.

WHEREAS: on _____, 2013, the Town of Barre created a Barre Town Forest Management Plan for the Barre Town Forest which requires Corridor Managers to enter into Corridor Management Agreements,

WHEREAS: ____ is a non-profit organization (describe mission)

WHEREAS: The Barre Town Forest contains _____ opportunities that complement and enhance the other uses of the Forest;

WHEREAS: the Conservation Easement on the Barre Town Forest allows _____ if managed in accordance with the restrictions in the Conservation Easement and in accordance with the Town Forest Management Plan;

WHEREAS: the Town of Barre and _____ consider it mutually advantageous to cooperate with the development and maintenance of _____ trails on the Barre Town Forest.

NOW THEREFORE:

A. The TOWN OF BARRE HEREBY AGREES TO:

1. Grant permission for the building, maintenance, and use of _____ trails (designated on the attached map) on the Barre Town Forest.
2. Work with and provide pertinent information to aid _____ in locating, developing, maintaining and encouraging appropriate use of the designated trails, provided that the Town shall not be obligated to provide assistance beyond that allocated in its budget.
3. Notify _____ when it is determined that trails are in need of repair or maintenance that should be addressed, provided, however, that the Town shall not be obligated to inspect the trails, and shall not be liable except for its own actions.
4. Notify _____ when timber harvest, events, or other activities may necessitate temporary closure of some trails.
5. The Town of Barre shall from time to time amend the existing Management Plan. Said plan shall provide for the recreational access, use and management of the Barre Town Forest. The Town of Barre shall provide _____ with a copy of these plans and shall inform _____ of any proposed changes to the Plan.

B. _____ HEREBY AGREES TO:

1. Act in an independent capacity and not as officers or employees of the Town of Barre. The _____ shall indemnify, defend and hold harmless the Town of Barre from all claims, suits, or demands for payment for all members, affiliates, or agents of _____ and any other users of the trails. Further, _____ shall annually provide the Town of Barre a Certificate of Insurance showing liability insurance coverage of at least two million dollars (\$2,000,000), and that such coverage shall name the Town of Barre as an additional insured.

2. Obtain and maintain, at its own expense, all permits or licenses required to construct, install, maintain, and manage the _____ trails and shall not violate the terms or conditions of any of those permits, licenses or regulations.
3. Be responsible for the construction of the _____ at its own expense. Excavation, filling, grading and the reestablishment of vegetation will be done to the Town of Barre's satisfaction. No excavation, filling or grading on the Barre Town Forest will be done unless it is approved in writing, in advance, by the Recreation Board or other agent of the Town of Barre.
4. Conduct all maintenance and construction projects using the best available management techniques and practices such as those described in _____. Trails will be maintained in a condition satisfactory to the Recreation Board or other designated agent of the Town of Barre.
5. _____ shall not use herbicides, pesticides, growth inhibitors, or other toxic chemicals on the property.
6. Submit an annual (month) trail conditions report and proposed yearly work plans to the Town of Barre.
7. Educate trail users about personal safety, sustainable usage and above all, discourage illegal trail building.
8. Give the Town of Barre a current trail map with appropriate user information, when available.
9. Acknowledges that any trail development on adjoining parcels of private forest land are at the sole discretion of those property owners. Development and management of trails located outside of the Barre Town Forest is the sole responsibility of _____ and is conducted with permission of the landowners.
10. Notify the Town of Barre Recreation Board 45 days in advance of any events or activities that it proposes within the Town Forest for approval by the Recreation Board. A seasonal schedule of events can be submitted and approved.
11. Use the following standard language when promoting or publicizing an event or service centered at the Town Forest, "The (event name or service) will be held in the Town of Barre Forest in Websterville, VT."
12. Ensure that all of their activities are in compliance with the Conservation Easement. _____ shall hold the Town of Barre harmless from any failure to comply with the Conservation Easement, and take such action as shall be requested by the Easement Holders to maintain or restore compliance, except to the extent that such noncompliance was caused by the Town of Barre. Nothing contained in this Corridor Management Agreement shall create any liability on behalf of the Fee Owner or the Easement Holder to any third party or create any right, claim or cause of action on behalf of any party other than the obligations to each other set forth herein.

C. IT IS MUTUALLY AGREED THAT:

1. Permission to perform work on the Town's Property under the terms of the agreement and any authorization supplemental hereto does not in any way convey to _____, its members, officials, or persons volunteering work with _____ in the performance of said work, employee status or any other status that would extend to them the benefits of Town employees.
2. Any improvements constructed under the terms of this Agreement on Town property will be the property of the Town. Nothing contained herein or in the said Management Plan shall grant _____ any leasehold or other interest in the Barre Town Forest property.
3. Nothing in this Agreement shall be construed as obligating the Town of Barre to expend labor and funds in excess of allotments or appropriations authorized or available.
4. The Barre Town Forest will be closed to _____ from _____ to _____ of each year. Any request to keep the trails open beyond _____ or to open the trails prior to _____

shall require prior written approval from the Town of Barre.

5. The Town of Barre maintains the right to close the trails to _____ use when any of the following are true:
 - Weather conditions make the trails unsuitable for _____ use.
 - Use of the trails is resulting in degradation of surface waters.
 - Damage to the trails may occur due to heavy rain, mud, or other conditions.
 - Use of the trails is resulting in unauthorized _____ use on the remaining property.
 - Use of the trails has resulted in conditions that violate the Conservation Easement or Community Forest Plan.
 - Any other reason, which in the sole discretion of the Town of Barre would cause public safety or environmental concerns sufficient enough to close the trails to _____ use.
 - The TCM does not abide by this Agreement.
6. _____ and the Town of Barre will give adequate and appropriate recognition to each other in publications or news releases regarding the Barre Town Forest trails.
7. All new trail development must be pre-approved by the Town of Barre and the Vermont Land Trust.
8. Any fee schedule must first be approved by the Barre Town Selectboard and attached to this agreement. _____ shall not harass, berate, lecture, or eject individuals or groups from the Forest or trails for failure to pay fees.
9. This agreement does not grant exclusive rights and privileges to _____. The Town of Barre reserves the right to use or allow others to use any part of the trail system.
10. This agreement may be terminated at any time by any party by giving sixty days written notice to the other parties or by mutual agreement.
11. This agreement is between the Town of Barre and _____ herein named, and is not assignable or transferable unless mutually agreed upon by all parties. Nor shall _____ subcontract to any individual or organization to fulfill any of _____'s management responsibilities without the advance written permission of the Town of Barre, which may be withheld at the sole discretion of the Town of Barre.
12. This Agreement shall commence on the date of signing for an initial period of one year. It will be reviewed annually and renewed for additional terms of one to five years provided that _____ has fulfilled its duties as the _____ Trail Corridor Manager in accordance with this Agreement, the Barre Town Forest Conservation Easement, and the Management Plan for the Barre Town Forest. The CMA may be renewed by mutual written consent of the Parties, sixty days prior to the expiration date.
13. Termination of this Agreement shall not relieve _____ of its duties hereunder, including but not limited to Sections B.1 and B.10, above.
14. There shall be no manipulation of natural watercourses, wetlands, or other water bodies, nor shall there be activities conducted on the property which would be detrimental to water quality, or which could alter natural water level or flow, except as is minimally necessary to carry out the uses permitted on these lands under this Agreement and the Conservation Easement.
15. The Town of Barre and _____ further agree that:
 - a.
 - b.
 - c.

IN WITNESS WHEREOF, the parties hereto have executed this agreement.

Town of Barre

Chair of Select Board

Date

Witness

Date

Authorized representative

Date

Witness

Date

17B: Cabot silt loam, 3 to 8 percent slopes

CABOT SOILS formed in loamy, compact glacial till on uplands. They are very deep to bedrock, shallow or moderately deep to dense basal till and poorly drained. These soils have a perched water table at depths of 0 to 1.5 feet below the surface from late Fall through late Spring. Permeability is moderate in the solum and slow or very slow in the substratum.

This map unit is poorly suited to cultivated crops, hay and pasture. The seasonal high water table is a concern during periods of high rainfall. Tillage in the spring may be delayed because of the seasonal high water table. Where suitable outlets are available, subsurface drainage can be used to lower the seasonal high water table. Proper stocking rates and rotational grazing during wet periods will help to maintain a good stand of pasture plants. Planting water tolerant plants helps to overcome the wetness caused by the seasonal high water table.

<u>Important farmland classification:</u> Statewide (b)	<u>Land capability:</u> 3 w	<u>Vermont Agricultural Value Group:</u> 6d
---	-----------------------------	---

Vermont Residential Wastewater Disposal - Group and Subgroup:

Iva.- This unit is generally not suited as a site for soil-based residential wastewater disposal systems, based on a review by the Natural Resources Conservation Service of criteria set forth in the Vermont 2007 Environmental Protection Rules. Excessive soil wetness in association with the minimal slope is the limiting condition. Prolonged periods of saturation at or near the soil surface do not allow for the proper functioning of septic systems.

PHYSICAL and CHEMICAL PROPERTIES							EROSION FACTORS		
Soil name	Depth (In)	Typical texture	Clay (Pct)	Soil reaction (pH)	Permeability (In/Hr)	Organic matter (Pct)			
							Kw	Kf	T
Cabot	0-4	SIL	1-15	5.1 - 7.3	0.6-2	4.0-12	.32	.32	2
	4-11	CN-VFSL	1-15	5.1 - 7.3	0.6-2	0.5-4.0	.28	.32	
	11-60	CN-SIL	1-15	5.6 - 7.3	0.001-0.2	0.0-1.0	.28	.37	

WATER FEATURES					SOIL FEATURES			
Soil name	Hydrologic group	Depth to seasonal high water table (Feet)	Flooding		Ponding		Hydric soil?	Depth to bedrock (range in inches)
			Frequency	Duration	Frequency	Duration		
Cabot	D	0.0-1.5	None		None		Yes	---

LAND USE LIMITATIONS				AGRICULTURAL YIELD DATA	
Soil name	Land use	Rating	Reason **	Crop name	Yield / acre
Cabot	Dwellings with basements:	Very limited	Depth to saturated zone	Grass-legume hay	3.5 Tons
Cabot	Pond reservoir areas:	Somewhat limited	Slope	Corn silage	15 Tons
				Grass hay	4 Tons
				Grass-clover	5.6 AUM

WOODLAND MANAGEMENT				
Soil name	Management concern	Rating	Reason	Vermont natural communities
Cabot	Harvest equip operability:	Moderately suited	Wetness	Red Maple-Black Ash Swamp, Spruce-Fir-Tamarack Swamp, Lowland Spruce-Fir Forest, Alder Swamp, Northern White Cedar Swamp, Calcareous Red Maple-Tamarack Swamp
Cabot	Road suitability:	Poorly suited	Wetness	
Cabot	Erosion hazard (off-road):	Slight		

92D: Buckland silt loam, 15 to 25 percent slopes

BUCKLAND SOILS formed in loamy, compact glacial till on uplands. They are very deep to bedrock, shallow to moderately deep to dense basal till and moderately well drained. These soils have a perched water table at depths of 1.0 to 2.0 feet below the surface from Mid-Winter through late Spring. Permeability is moderate in the solum and slow in the substratum.

This map unit is poorly suited to cultivated crops and is suited to hay and pasture. Slope causes a hazard of erosion and severely limits the use of this map unit for cultivated crops. Equipment use is limited by slope. The seasonal high water table is a concern during periods of high rainfall. Subsurface drainage can be used to lower the seasonal high water table. Proper stocking rates and rotational grazing during wet periods will help to maintain a good stand of pasture plants and help to control erosion. Planting water tolerant plants helps to overcome the wetness caused by the seasonal high water table.

<u>Important farmland classification:</u> NPSL	<u>Land capability:</u> 4 e	<u>Vermont Agricultural Value Group:</u> 8
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Vermont Residential Wastewater Disposal - Group and Subgroup:

IIIe.- This unit is marginally suited as a site for soil-based residential wastewater disposal systems, based on a review by the Natural Resources Conservation Service of criteria set forth in the Vermont 2007 Environmental Protection Rules. The depth to the seasonal high water table and slopes greater than 20 percent in some areas are the major limitations. A detailed, site-specific analysis is generally required. On-site groundwater level monitoring and determination of induced groundwater mounding is often necessary to establish the suitability of this unit. Curtain drains may help lower the water table to an acceptable level. There may be less-sloping areas within the unit that are suitable for siting a septic system, or, if feasible, cut and fill site modifications may produce an acceptable area within the unit. An erosion prevention and sediment control plan is required by the State for construction on sites over 20 percent slope.

PHYSICAL and CHEMICAL PROPERTIES							EROSION FACTORS		
Soil name	Depth (In)	Typical texture	Clay (Pct)	Soil reaction (pH)	Permeability (In/Hr)	Organic matter (Pct)			
							Kw	Kf	T
Buckland	0-5	SIL	5-10	5.6 - 7.3	0.6-2	3.0-8.0	.32	.32	3
	5-20	CN-SIL	5-10	5.6 - 7.3	0.6-2	0.5-2.0	.37	.43	
	20-65	CN-SIL	7-14	5.6 - 7.3	0.06-0.2	0.0-1.0	.28	.32	

WATER FEATURES					SOIL FEATURES			
Soil name	Hydrologic group	Depth to seasonal high water table (Feet)	Flooding		Ponding		Hydric soil?	Depth to bedrock (range in inches)
			Frequency	Duration	Frequency	Duration		
Buckland	C	1.0-2.0	None		None		No	---

LAND USE LIMITATIONS				AGRICULTURAL YIELD DATA	
Soil name	Land use	Rating	Reason **	Crop name	Yield / acre
Buckland	Dwellings with basements:	Very limited	Slope	Grass-legume hay	2.5 Tons
Buckland	Pond reservoir areas:	Very limited	Slope	Alfalfa hay	3 Tons
				Grass hay	3.5 Tons
				Grass-clover	4 AUM

WOODLAND MANAGEMENT				
Soil name	Management concern	Rating	Reason	Vermont natural communities
Buckland	Harvest equip operability:	Moderately suited	Wetness	Northern Hardwood Forest, Rich Northern Hardwood Forest, Sugar Maple-White Ash Northern Hardwood Forest Variant
Buckland	Road suitability:	Poorly suited	Slope	
Buckland	Erosion hazard (off-road):	Moderate	Slope/erodibility	

90C: Dummerston fine sandy loam, 8 to 15 percent slopes

DUMMERSTON SOILS formed in loamy glacial till on uplands. They are very deep to bedrock and well drained. Permeability is moderate.

This map unit is suited to cultivated crops and well suited to hay and pasture. Slope causes a hazard of erosion. Crop rotation, cover cropping, contour farming and conservation tillage are practices that can be used to help control erosion. The installation of diversion ditches to divert surface runoff can also be used to help control erosion. Proper stocking rates and rotational grazing will help to maintain a good stand of pasture plants and help to control erosion.

Important farmland classification: Statewide	Land capability: 3 e	Vermont Agricultural Value Group: 5
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Vermont Residential Wastewater Disposal - Group and Subgroup:

Ic.- This unit is well suited as a site for soil-based residential wastewater disposal systems, based on a review by the Natural Resources Conservation Service of criteria set forth in the Vermont 2007 Environmental Protection Rules. With moderate permeability and slopes less than 20 percent, there are few limitations.

PHYSICAL and CHEMICAL PROPERTIES							EROSION FACTORS		
Soil name	Depth (In)	Typical texture	Clay (Pct)	Soil reaction (pH)	Permeability (In/Hr)	Organic matter (Pct)	Kw	Kf	T
	4-26	GR-FSL	2-10	4.5 - 6.0	0.6-2	0.5-3.0	.28	.28	
	26-65	GR-FSL	2-10	4.5 - 6.0	0.6-2	0.0-1.0	.28	.32	

WATER FEATURES						SOIL FEATURES		
Soil name	Hydrologic group	Depth to seasonal high water table (Feet)	Flooding		Ponding		Hydric soil?	Depth to bedrock (range in inches)
			Frequency	Duration	Frequency	Duration		
Dummerston	B	---	None		None		No	---

LAND USE LIMITATIONS				AGRICULTURAL YIELD DATA	
Soil name	Land use	Rating	Reason **	Crop name	Yield / acre
Dummerston	Dwellings with basements:	Somewhat limited	Slope	Grass-clover	5.6 AUM
Dummerston	Pond reservoir areas:	Very limited	Slope	Alfalfa hay	4 Tons
				Grass-legume hay	3.5 Tons
				Corn silage	19 Tons
				Grass hay	3.5 Tons

WOODLAND MANAGEMENT				
Soil name	Management concern	Rating	Reason	Vermont natural communities
Dummerston	Harvest equip operability:	Well suited		Northern Hardwood Forest, Mesic Red Oak-Northern Hardwood Forest, Mesic Maple-Ash-Hickory-Oak Forest, Rich Northern Hardwood Forest
Dummerston	Road suitability:	Moderately suited	Slope	
Dummerston	Erosion hazard (off-road):	Slight		

98B: Cabot silt loam, 3 to 8 percent slopes, extremely bouldery

CABOT SOILS formed in loamy, compact glacial till on uplands. They are very deep to bedrock, shallow or moderately deep to dense basal till and poorly drained. These soils have a perched water table at depths of 0 to 1.5 feet below the surface from late Fall through late Spring. Permeability is moderate in the solum and slow or very slow in the substratum.

This map unit is poorly suited to cultivated crops, hay and pasture because of boulders on the surface and the seasonal high water table.

Important farmland classification: NPSL	Land capability: 7 s	Vermont Agricultural Value Group: 11
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Vermont Residential Wastewater Disposal - Group and Subgroup:

IVa.- This unit is generally not suited as a site for soil-based residential wastewater disposal systems, based on a review by the Natural Resources Conservation Service of criteria set forth in the Vermont 2007 Environmental Protection Rules. Excessive soil wetness in association with the minimal slope is the limiting condition. Prolonged periods of saturation at or near the soil surface do not allow for the proper functioning of septic systems.

PHYSICAL and CHEMICAL PROPERTIES							EROSION FACTORS		
Soil name	Depth (In)	Typical texture	Clay (Pct)	Soil reaction (pH)	Permeability (In/Hr)	Organic matter (Pct)			
							Kw	Kf	T
Cabot	0-1	SPM	---	3.2 - 5.7	2-6	25-95	---	---	2
	1-9	SIL	1-15	5.1 - 7.3	0.6-2	4.0-12	.15	.32	
	9-17	CN-SIL, SIL	1-15	5.1 - 7.3	0.6-2	0.5-4.0	.28	.32	
	17-61	CN-SIL	1-15	5.6 - 7.3	0.001-0.2	0.0-1.0	.28	.32	

WATER FEATURES						SOIL FEATURES		
Soil name	Hydrologic group	Depth to seasonal high water table (Feet)	Flooding		Ponding		Hydric soil?	Depth to bedrock (range in inches)
			Frequency	Duration	Frequency	Duration		
Cabot	D	0.0-1.5	None		None		Yes	--

LAND USE LIMITATIONS				AGRICULTURAL YIELD DATA	
Soil name	Land use	Rating	Reason **	Crop name	Yield / acre
Cabot	Dwellings with basements:	Very limited	Depth to saturated zone		
Cabot	Pond reservoir areas:	Somewhat limited	Slope		

WOODLAND MANAGEMENT				
Soil name	Management concern	Rating	Reason	Vermont natural communities
Cabot	Harvest equip operability:	Poorly suited	Too bouldery	Red Maple-Black Ash Swamp, Spruce-Fir-Tamarack Swamp, Lowland Spruce-Fir Forest, Alder Swamp, Northern White Cedar Swamp, Calcareous Red Maple-Tamarack Swamp
Cabot	Road suitability:	Poorly suited	Wetness	
Cabot	Erosion hazard (off-road):	Slight		

92C: Buckland silt loam, 8 to 15 percent slopes

BUCKLAND SOILS formed in loamy, compact glacial till on uplands. They are very deep to bedrock, shallow to moderately deep to dense basal till and moderately well drained. These soils have a perched water table at depths of 1.0 to 2.0 feet below the surface from Mid-Winter through late Spring. Permeability is moderate in the solum and slow in the substratum.

This map unit is suited to cultivated crops and well suited to hay and pasture. Slope causes a hazard of erosion. The seasonal high water table is a concern during periods of high rainfall. Crop rotation, cover cropping, contour farming and conservation tillage are practices that can be used to help control erosion. The installation of diversion ditches to divert surface runoff can also be used to help control erosion. Tillage in the spring may be delayed because of the seasonal high water table. Subsurface drainage can be used to lower the seasonal high water table. Proper stocking rates and rotational grazing during wet periods will help to maintain a good stand of pasture plants and help to control erosion. Planting water tolerant plants helps to overcome the wetness caused by the seasonal high water table.

Important farmland classification: Statewide	Land capability: 3 e	Vermont Agricultural Value Group: 7
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Vermont Residential Wastewater Disposal - Group and Subgroup:

III d.- This unit is marginally suited as a site for soil-based residential wastewater disposal systems, based on a review by the Natural Resources Conservation Service of criteria set forth in the Vermont 2007 Environmental Protection Rules. The depth to the seasonal high water table is the major limitation. A detailed, site-specific analysis is generally required. On-site groundwater level monitoring and determination of induced groundwater mounding is often necessary to establish the suitability of this unit. Curtain drains may help lower the water table to an acceptable level.

PHYSICAL and CHEMICAL PROPERTIES							EROSION FACTORS		
Soil name	Depth (In)	Typical texture	Clay (Pct)	Soil reaction (pH)	Permeability (In/Hr)	Organic matter (Pct)			
							Kw	Kf	T
Buckland	0-5	SIL	5-10	5.6 - 7.3	0.6-2	3.0-8.0	.32	.32	3
	5-20	CN-SIL	5-10	5.6 - 7.3	0.6-2	0.5-2.0	.37	.43	
	20-65	CN-SIL	7-14	5.6 - 7.3	0.06-0.2	0.0-1.0	.28	.32	

WATER FEATURES					SOIL FEATURES			
Soil name	Hydrologic group	Depth to seasonal high water table (Feet)	Flooding		Ponding		Hydric soil?	Depth to bedrock (range in inches)
			Frequency	Duration	Frequency	Duration		
Buckland	C	1.0-2.0	None		None		No	---

LAND USE LIMITATIONS				AGRICULTURAL YIELD DATA	
Soil name	Land use	Rating	Reason **	Crop name	Yield / acre
Buckland	Dwellings with basements:	Very limited	Depth to saturated zone	Alfalfa hay	3.5 Tons
Buckland	Pond reservoir areas:	Very limited	Slope	Grass-legume hay	3 Tons
				Corn silage	20 Tons
				Grass hay	3.5 Tons
				Grass-clover	4.8 AUM

WOODLAND MANAGEMENT				
Soil name	Management concern	Rating	Reason	Vermont natural communities
Buckland	Harvest equip operability:	Moderately suited	Wetness	Northern Hardwood Forest, Rich Northern Hardwood Forest, Sugar Maple-White Ash Northern Hardwood Forest Variant
Buckland	Road suitability:	Moderately suited	Wetness	
Buckland	Erosion hazard (off-road):	Slight		

66D: Vershire-Dummerston complex, 15 to 25 percent slopes, rocky

These soils formed in loamy glacial till on bedrock controlled uplands. VERSHIRE SOILS are moderately deep to bedrock and well drained. Permeability is moderate. DUMMERSTON SOILS are very deep to bedrock and well drained. Permeability is moderate.

This map unit is poorly suited to cultivated crops and suited to hay and pasture. Slope causes a hazard of erosion and severely limits the use of this map unit for cultivated crops. Equipment use is limited by slope. Areas of exposed bedrock sometimes interfere with the operation of farming equipment. Proper stocking rates and rotational grazing will help to maintain a good stand of pasture plants and help to control erosion.

Important farmland classification: NPSL	Land capability: 4 e	Vermont Agricultural Value Group: 8
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Vermont Residential Wastewater Disposal - Group and Subgroup:

IId.- This unit is moderately suited as a site for soil-based residential wastewater disposal systems, based on a review by the Natural Resources Conservation Service of criteria set forth in the Vermont 2007 Environmental Protection Rules. The depth to bedrock and slopes greater than 20 percent in some areas are the primary concerns. A significant percentage of this map unit has sufficient soil depth over bedrock to accept a range of designs. On-site investigations can help avoid areas with limited depth to bedrock. Additional fill material may be needed in some areas in order to meet the separation distance requirement between the bottom of the leachfield and bedrock. There may be less-sloping areas within the unit that are suitable for siting a septic system, or, if feasible, cut and fill site modifications may produce an acceptable area within the unit. An erosion prevention and sediment control plan is required by the State for construction on sites over 20 percent slope.

PHYSICAL and CHEMICAL PROPERTIES							EROSION FACTORS		
Soil name	Depth (In)	Typical texture	Clay (Pct)	Soil reaction (pH)	Permeability (In/Hr)	Organic matter (Pct)	Kw	Kf	T
	9-17	VFSL	4-18	4.5 - 6.5	0.6-2	0.5-3.0	.24	.28	
	17-36	FSL	4-18	4.5 - 6.5	0.6-2	0.5-3.0	.24	.28	
	36-40	UWB	---	---	0.01-20	---	---	---	
Dummerston	0-4	FSL	2-10	4.5 - 6.0	0.6-2	2.0-4.0	.32	.32	5
	4-26	GR-FSL	2-10	4.5 - 6.0	0.6-2	0.5-3.0	.28	.28	
	26-65	GR-FSL	2-10	4.5 - 6.0	0.6-2	0.0-1.0	.28	.32	

WATER FEATURES					SOIL FEATURES			
Soil name	Hydrologic group	Depth to seasonal high water table (Feet)	Flooding		Ponding		Hydric soil?	Depth to bedrock (range in inches)
			Frequency	Duration	Frequency	Duration		
Vershire	C	---	None		None		No	20-40
Dummerston	B	---	None		None		No	---

LAND USE LIMITATIONS				AGRICULTURAL YIELD DATA	
Soil name	Land use	Rating	Reason **	Crop name	Yield / acre
Vershire	Dwellings with basements:	Very limited	Slope	Grass-clover	4.8 AUM
Dummerston	Dwellings with basements:	Very limited	Slope	Alfalfa hay	3.5 Tons
Vershire	Pond reservoir areas:	Very limited	Slope	Grass-legume hay	3 Tons
Dummerston	Pond reservoir areas:	Very limited	Slope	Corn silage	12 Tons
				Grass hay	3 Tons

WOODLAND MANAGEMENT				
Soil name	Management concern	Rating	Reason	Vermont natural communities
Vershire	Harvest equip operability:	Moderately suited	Slope	Northern Hardwood Forest, Mesic Red Oak-Northern Hardwood Forest, Rich Northern Hardwood Forest, Hemlock Forest, Temperate Acidic Outcrop, Temperate Calcareous Outcrop
Dummerston	Harvest equip operability:	Moderately suited	Slope	
Vershire	Road suitability:	Poorly suited	Slope	
Dummerston	Road suitability:	Poorly suited	Slope	
Vershire	Erosion hazard (off-road):	Moderate	Slope/erodibility	
Dummerston	Erosion hazard (off-road):	Moderate	Slope/erodibility	

67E: Glover-Vershire complex, 35 to 60 percent slopes, very rocky

These soils formed in loamy glacial till on uplands. GLOVER SOILS are shallow to bedrock and somewhat excessively drained. Permeability is moderate. VERSHIRE SOILS are moderately deep to bedrock and well drained. Permeability is moderate.

This map unit is poorly suited to cultivated crops, hay and pasture because of very steep slopes, stones on the surface and bedrock outcrops.

Important farmland classification: NPSL	Land capability: 7 s	Vermont Agricultural Value Group: 11
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Vermont Residential Wastewater Disposal - Group and Subgroup:

IVb.- This unit is generally not suited as a site for soil-based residential wastewater disposal systems, based on a review by the Natural Resources Conservation Service of criteria set forth in the Vermont 2007 Environmental Protection Rules. Steep slopes in association with the depth to bedrock is the limiting condition. Cut and fill site modifications that reduce the slope gradient are difficult to achieve due to the depth to bedrock.

PHYSICAL and CHEMICAL PROPERTIES							EROSION FACTORS		
Soil name	Depth (In)	Typical texture	Clay (Pct)	Soil reaction (pH)	Permeability (In/Hr)	Organic matter (Pct)			
							Kw	Kf	T
Glover	0-2	HPM, SPM	---	3.2 - 5.7	2-6	25-95	---	---	1
	2-4	SIL	4-18	4.5 - 6.0	0.6-2	2.0-8.0	.32	.37	
	4-17	SIL	4-18	4.5 - 6.0	0.6-2	0.5-3.0	.20	.24	
	17-21	UWB	---	---	0.01-20	---	---	---	
Vershire	0-2	HPM, SPM	---	3.2 - 5.7	2-6	25-95	---	---	2
	2-4	VFSL	4-18	4.5 - 6.5	0.6-2	1.0-4.0	.32	.37	
	4-26	VFSL	4-18	4.5 - 6.5	0.6-2	0.5-3.0	.24	.28	
	26-30	UWB	---	---	0.01-20	---	---	---	

WATER FEATURES					SOIL FEATURES			
Soil name	Hydrologic group	Depth to seasonal high water table (Feet)	Flooding		Ponding		Hydric soil?	Depth to bedrock (range in inches)
			Frequency	Duration	Frequency	Duration		
Glover	D	---	None		None		No	10-20
Vershire	C	---	None		None		No	20-40

LAND USE LIMITATIONS				AGRICULTURAL YIELD DATA	
Soil name	Land use	Rating	Reason **	Crop name	Yield / acre
Glover	Dwellings with basements:	Very limited	Slope	Pasture	2.6 AUM
Vershire	Dwellings with basements:	Very limited	Slope		
Glover	Pond reservoir areas:	Very limited	Slope		
Vershire	Pond reservoir areas:	Very limited	Slope		

WOODLAND MANAGEMENT				Vermont natural communities
Soil name	Management concern	Rating	Reason	
Glover	Harvest equip operability:	Poorly suited	Slope	Northern Hardwood Forest, Mesic Red Oak-Northern Hardwood Forest, Dry Oak-Hickory-Hophornbeam Forest, Hemlock Forest, Temperate Acidic Outcrop, Temperate Acidic Cliff, Temperate Calcareous Outcrop, Temperate Calcareous Cliff
Vershire	Harvest equip operability:	Poorly suited	Slope	
Glover	Road suitability:	Poorly suited	Slope	
Vershire	Road suitability:	Poorly suited	Slope	
Glover	Erosion hazard (off-road):	Severe	Slope/erodibility	
Vershire	Erosion hazard (off-road):	Severe	Slope/erodibility	

72D: Tunbridge-Lyman complex, 15 to 35 percent slopes, very rocky

These soils formed in loamy glacial till on uplands. TUNBRIDGE SOILS are moderately deep to bedrock and well drained. Permeability is moderate or moderately rapid. LYMAN SOILS are shallow to bedrock and somewhat excessively drained. Permeability is moderately rapid.

This map unit is poorly suited to cultivated crops, hay and pasture because of stones on the surface, bedrock outcrops and steep slopes.

Important farmland classification: NPSL	Land capability: 7 s	Vermont Agricultural Value Group: 10
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Vermont Residential Wastewater Disposal - Group and Subgroup:

IId.- This unit is moderately suited as a site for soil-based residential wastewater disposal systems, based on a review by the Natural Resources Conservation Service of criteria set forth in the Vermont 2007 Environmental Protection Rules. The depth to bedrock and slopes greater than 20 percent in some areas are the primary concerns. A significant percentage of this map unit has sufficient soil depth over bedrock to accept a range of designs. On-site investigations can help avoid areas with limited depth to bedrock. Additional fill material may be needed in some areas in order to meet the separation distance requirement between the bottom of the leachfield and bedrock. There may be less-sloping areas within the unit that are suitable for siting a septic system, or, if feasible, cut and fill site modifications may produce an acceptable area within the unit. An erosion prevention and sediment control plan is required by the State for construction on sites over 20 percent slope.

PHYSICAL and CHEMICAL PROPERTIES							EROSION FACTORS		
Soil name	Depth (In)	Typical texture	Clay (Pct)	Soil reaction (pH)	Permeability (In/Hr)	Organic matter (Pct)	Kw	Kf	T
	3-4	VFSL	5-9	3.6 - 6.0	0.6-6	2.0-8.0	.20	.24	
	4-17	FSL, VFSL	3-9	3.6 - 6.0	0.6-6	0.5-4.5	.20	.24	
	17-25	CN-FSL	3-7	5.1 - 6.5	0.6-6	0.0-1.0	.20	.24	
	25-29	UWB	---	---	0.01-20	---	---	---	
Lyman	0-1	HPM, SPM	---	3.2 - 5.7	2-6	25-95	---	---	1
	1-2	FSL	2-10	3.6 - 6.0	2-6	2.0-8.0	.20	.28	
	2-15	GR-FSL	2-10	3.6 - 6.0	2-6	2.0-8.0	.32	.37	
	15-19	UWB	---	---	0.01-20	---	---	---	

WATER FEATURES					SOIL FEATURES			
Soil name	Hydrologic group	Depth to seasonal high water table (Feet)	Flooding		Ponding		Hydric soil?	Depth to bedrock (range in inches)
			Frequency	Duration	Frequency	Duration		
Tunbridge	C	---	None		None		No	20-40
Lyman	D	---	None		None		No	10-20

LAND USE LIMITATIONS				AGRICULTURAL YIELD DATA	
Soil name	Land use	Rating	Reason **	Crop name	Yield / acre
Tunbridge	Dwellings with basements:	Very limited	Slope		
Lyman	Dwellings with basements:	Very limited	Slope		
Tunbridge	Pond reservoir areas:	Very limited	Slope		
Lyman	Pond reservoir areas:	Very limited	Slope		

WOODLAND MANAGEMENT				
Soil name	Management concern	Rating	Reason	Vermont natural communities
Tunbridge	Harvest equip operability:	Moderately suited	Slope	Northern Hardwood Forest, Hemlock-Northern Hardwood Forest, Mesic Red Oak-Northern Hardwood Forest, Beech-Red Maple-Hemlock-Northern Hardwood Forest Variant, Hemlock Forest
Lyman	Harvest equip operability:	Moderately suited	Slope	
Tunbridge	Road suitability:	Poorly suited	Slope	
Lyman	Road suitability:	Poorly suited	Slope	
Tunbridge	Erosion hazard (off-road):	Moderate	Slope/erodibility	
Lyman	Erosion hazard (off-road):	Moderate	Slope/erodibility	

78E: Peru gravelly fine sandy loam, 35 to 60 percent slopes, very stony

PERU SOILS formed in loamy, compact glacial till on uplands. They are very deep to bedrock, shallow to moderately deep to dense basal till and moderately well drained. These soils have a perched water table at depths of 1.5 to 2.5 feet below the surface from late Fall through late Spring. Permeability is moderate in the solum and moderately slow to slow in the substratum.

This map unit is poorly suited to cultivated crops, hay and pasture because of slope and the stones and boulders on the surface.

Important farmland classification: NPSL	Land capability: 7 s	Vermont Agricultural Value Group: 11
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Vermont Residential Wastewater Disposal - Group and Subgroup:

IVd. - This unit is generally not suited as a site for soil-based residential wastewater disposal systems, based on a review by the Natural Resources Conservation Service of criteria set forth in the Vermont 2007 Environmental Protection Rules. Steep slopes in association with the slowly permeable substratum is the limiting condition. Cut and fill site modifications that reduce the slope gradient are not generally effective due to the slowly permeable substratum.

PHYSICAL and CHEMICAL PROPERTIES							EROSION FACTORS		
Soil name	Depth (In)	Typical texture	Clay (Pct)	Soil reaction (pH)	Permeability (In/Hr)	Organic matter (Pct)			
							Kw	Kf	T
Peru	0-3	HPM, SPM	---	3.2 - 5.7	2-6	25-95	---	---	3
	3-4	GR-FSL	3-10	4.5 - 6.0	0.6-2	2.0-6.0	.20	.24	
	4-32	CN-FSL, GR-FSL	3-10	4.5 - 6.0	0.6-2	0.5-4.5	.32	.37	
	32-67	CN-FSL	3-10	4.5 - 6.0	0.06-0.6	0.0-1.0	.24	.28	

WATER FEATURES					SOIL FEATURES			
Soil name	Hydrologic group	Depth to seasonal high water table (Feet)	Flooding		Ponding		Hydric soil?	Depth to bedrock (range in inches)
			Frequency	Duration	Frequency	Duration		
Peru	C	1.5-2.5	None		None		No	---

LAND USE LIMITATIONS				AGRICULTURAL YIELD DATA	
Soil name	Land use	Rating	Reason **	Crop name	Yield / acre
Peru	Dwellings with basements:	Very limited	Slope		
Peru	Pond reservoir areas:	Very limited	Slope		

WOODLAND MANAGEMENT				
Soil name	Management concern	Rating	Reason	Vermont natural communities
Peru	Harvest equip operability:	Poorly suited	Slope	Northern Hardwood Forest, Red Spruce-Northern Hardwood Forest, Hemlock Forest
Peru	Road suitability:	Poorly suited	Slope	
Peru	Erosion hazard (off-road):	Severe	Slope/erodibility	

18B: Cabot silt loam, 0 to 8 percent slopes, very stony

CABOT SOILS formed in loamy, compact glacial till on uplands. They are very deep to bedrock, shallow or moderately deep to dense basal till and poorly drained. These soils have a perched water table at depths of 0 to 1.5 feet below the surface from late Fall through late Spring. Permeability is moderate in the solum and slow or very slow in the substratum.

This map unit is poorly suited to cultivated crops, hay and pasture because of stones on the surface and the seasonal high water table.

Important farmland classification: NPSL	Land capability: 6 s	Vermont Agricultural Value Group: 10
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Vermont Residential Wastewater Disposal - Group and Subgroup:

Iva.- This unit is generally not suited as a site for soil-based residential wastewater disposal systems, based on a review by the Natural Resources Conservation Service of criteria set forth in the Vermont 2007 Environmental Protection Rules. Excessive soil wetness in association with the minimal slope is the limiting condition. Prolonged periods of saturation at or near the soil surface do not allow for the proper functioning of septic systems.

PHYSICAL and CHEMICAL PROPERTIES							EROSION FACTORS		
Soil name	Depth (In)	Typical texture	Clay (Pct)	Soil reaction (pH)	Permeability (In/Hr)	Organic matter (Pct)			
							Kw	Kf	T
Cabot	0-1	SPM	---	3.2 - 5.7	2-6	25-95	---	---	2
	1-9	SIL	1-15	5.1 - 7.3	0.6-2	4.0-12	.28	.32	
	9-17	CN-SIL, SIL	1-15	5.1 - 7.3	0.6-2	0.5-4.0	.28	.32	
	17-61	CN-SIL	1-15	5.6 - 7.3	0.001-0.2	0.0-1.0	.28	.32	

WATER FEATURES						SOIL FEATURES		
Soil name	Hydrologic group	Depth to seasonal high water table (Feet)	Flooding		Ponding		Hydric soil?	Depth to bedrock (range in inches)
			Frequency	Duration	Frequency	Duration		
Cabot	D	0.0-1.5	None		None		Yes	---

LAND USE LIMITATIONS				AGRICULTURAL YIELD DATA	
Soil name	Land use	Rating	Reason **	Crop name	Yield / acre
Cabot	Dwellings with basements:	Very limited	Depth to saturated zone	Pasture	2.6 AUM
Cabot	Pond reservoir areas:	Somewhat limited	Slope		

WOODLAND MANAGEMENT				
Soil name	Management concern	Rating	Reason	Vermont natural communities
Cabot	Harvest equip operability:	Moderately suited	Wetness	Red Maple-Black Ash Swamp, Spruce-Fir-Tamarack Swamp, Lowland Spruce-Fir Forest, Alder Swamp, Northern White Cedar Swamp, Calcareous Red Maple-Tamarack Swamp
Cabot	Road suitability:	Poorly suited	Wetness	
Cabot	Erosion hazard (off-road):	Slight		

18C: Cabot silt loam, 8 to 15 percent slopes, very stony

CABOT SOILS formed in loamy, compact glacial till on uplands. They are very deep to bedrock, shallow or moderately deep to dense basal till and poorly drained. These soils have a perched water table at depths of 0 to 1.5 feet below the surface from late Fall through late Spring. Permeability is moderate in the solum and slow or very slow in the substratum.

This map unit is poorly suited to cultivated crops, hay and pasture because of stones on the surface and the seasonal high water table.

Important farmland classification: NPSL	Land capability: 6 s	Vermont Agricultural Value Group: 10
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Vermont Residential Wastewater Disposal - Group and Subgroup:

III d.- This unit is marginally suited as a site for soil-based residential wastewater disposal systems, based on a review by the Natural Resources Conservation Service of criteria set forth in the Vermont 2007 Environmental Protection Rules. The depth to the seasonal high water table is the major limitation. A detailed, site-specific analysis is generally required. On-site groundwater level monitoring and determination of induced groundwater mounding is often necessary to establish the suitability of this unit. Curtain drains may help lower the water table to an acceptable level.

PHYSICAL and CHEMICAL PROPERTIES

Soil name	Depth (In)	Typical texture	Clay (Pct)	Soil reaction (pH)	Permeability (In/Hr)	Organic matter (Pct)	EROSION FACTORS		
							Kw	Kf	T
Cabot	0-1	SPM	---	3.2 - 5.7	2-6	25-95	---	---	2
	1-9	SIL	1-15	5.1 - 7.3	0.6-2	4.0-12	.28	.32	
	9-17	CN-SIL, SIL	1-15	5.1 - 7.3	0.6-2	0.5-4.0	.28	.32	
	17-61	CN-SIL	1-15	5.6 - 7.3	0.001-0.2	0.0-1.0	.28	.32	

WATER FEATURES

SOIL FEATURES

Soil name	Hydrologic group	Depth to seasonal high water table (Feet)	Flooding		Ponding		Hydric soil?	Depth to bedrock (range in inches)
			Frequency	Duration	Frequency	Duration		
Cabot	D	0.0-1.5	None		None		Yes	---

LAND USE LIMITATIONS

AGRICULTURAL YIELD DATA

Soil name	Land use	Rating	Reason **	Crop name	Yield / acre
Cabot	Dwellings with basements:	Very limited	Depth to saturated zone	Pasture	2.6 AUM
Cabot	Pond reservoir areas:	Very limited	Slope		

WOODLAND MANAGEMENT

Soil name	Management concern	Rating	Reason	Vermont natural communities
Cabot	Harvest equip operability:	Moderately suited	Wetness	Red Maple-Black Ash Swamp, Spruce-Fir-Tamarack Swamp, Lowland Spruce-Fir Forest, Alder Swamp, Northern White Cedar Swamp, Calcareous Red Maple-Tamarack Swamp
Cabot	Road suitability:	Poorly suited	Wetness	
Cabot	Erosion hazard (off-road):	Slight		

W: Water

These areas consist of open bodies of water. These waters do not support bottom rooting plants.

This map unit consists of open water and is not suited to cultivated crops, hay or pasture.

Important farmland classification: NPSL	Land capability:	Vermont Agricultural Value Group: 11
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Vermont Residential Wastewater Disposal - Group and Subgroup:

V.- This unit is not rated as a site for soil-based residential wastewater disposal systems.

PHYSICAL and CHEMICAL PROPERTIES							EROSION FACTORS		
Soil name	Depth (In)	Typical texture	Clay (Pct)	Soil reaction (pH)	Permeability (In/Hr)	Organic matter (Pct)	Kw	Kf	T

WATER FEATURES						SOIL FEATURES		
Soil name	Hydrologic group	Depth to seasonal high water table (Feet)	Flooding		Ponding		Hydric soil?	Depth to bedrock (range in inches)
			Frequency	Duration	Frequency	Duration		
Water	---	---					Unranked	---

LAND USE LIMITATIONS				AGRICULTURAL YIELD DATA	
Soil name	Land use	Rating	Reason **	Crop name	Yield / acre
Water	Dwellings with basements:	Not rated			
Water	Pond reservoir areas:	Not rated			

WOODLAND MANAGEMENT				
Soil name	Management concern	Rating	Reason	Vermont natural communities
Water	Harvest equip operability:	Not rated		
Water	Road suitability:	Not rated		
Water	Erosion hazard (off-road):	Not rated		

93C: Buckland silt loam, 8 to 15 percent slopes, very stony

BUCKLAND SOILS formed in loamy, compact glacial till on uplands. They are very deep to bedrock, shallow to moderately deep to dense basal till and moderately well drained. These soils have a perched water table at depths of 1.0 to 2.0 feet below the surface from Mid-Winter through late Spring. Permeability is moderate in the solum and slow in the substratum.

This map unit is poorly suited to cultivated crops, hay and pasture because of stones on the surface.

Important farmland classification: NPSL	Land capability: 6 s	Vermont Agricultural Value Group: 10
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Vermont Residential Wastewater Disposal - Group and Subgroup:

IIId.- This unit is marginally suited as a site for soil-based residential wastewater disposal systems, based on a review by the Natural Resources Conservation Service of criteria set forth in the Vermont 2007 Environmental Protection Rules. The depth to the seasonal high water table is the major limitation. A detailed, site-specific analysis is generally required. On-site groundwater level monitoring and determination of induced groundwater mounding is often necessary to establish the suitability of this unit. Curtain drains may help lower the water table to an acceptable level.

PHYSICAL and CHEMICAL PROPERTIES							EROSION FACTORS		
Soil name	Depth (In)	Typical texture	Clay (Pct)	Soil reaction (pH)	Permeability (In/Hr)	Organic matter (Pct)	Kw	Kf	T
	1-5	SIL	5-10	5.6 - 7.3	0.6-2	3.0-8.0	.28	.32	
	5-28	SIL	5-10	5.6 - 7.3	0.6-2	0.5-2.0	.37	.43	
	28-61	VFSL	7-14	5.6 - 7.3	0.06-0.2	0.5-2.0	.28	.32	

WATER FEATURES					SOIL FEATURES			
Soil name	Hydrologic group	Depth to seasonal high water table (Feet)	Flooding		Ponding		Hydric soil?	Depth to bedrock (range in inches)
			Frequency	Duration	Frequency	Duration		
Buckland	C	1.0-2.0	None		None		No	---

LAND USE LIMITATIONS				AGRICULTURAL YIELD DATA	
Soil name	Land use	Rating	Reason **	Crop name	Yield / acre
Buckland	Dwellings with basements:	Very limited	Depth to saturated zone	Pasture	2.6 AUM
Buckland	Pond reservoir areas:	Very limited	Slope		

WOODLAND MANAGEMENT				
Soil name	Management concern	Rating	Reason	Vermont natural communities
Buckland	Harvest equip operability:	Moderately suited	Wetness	Northern Hardwood Forest, Rich Northern Hardwood Forest, Sugar Maple-White Ash Northern Hardwood Forest Variant
Buckland	Road suitability:	Moderately suited	Wetness	
Buckland	Erosion hazard (off-road):	Slight		

72C: Tunbridge-Lyman complex, 8 to 15 percent slopes, very rocky

These soils formed in loamy glacial till on uplands. TUNBRIDGE SOILS are moderately deep to bedrock and well drained. Permeability is moderate or moderately rapid. LYMAN SOILS are shallow to bedrock and somewhat excessively drained. Permeability is moderately rapid.

This map unit is poorly suited to cultivated crops, hay and pasture because of stones on the surface and the bedrock outcrops.

Important farmland classification: NPSL	Land capability: 6 s	Vermont Agricultural Value Group: 9
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Vermont Residential Wastewater Disposal - Group and Subgroup:

IIc.- This unit is moderately suited as a site for soil-based residential wastewater disposal systems, based on a review by the Natural Resources Conservation Service of criteria set forth in the Vermont 2007 Environmental Protection Rules. The depth to bedrock in some areas is the primary concern. A significant percentage of this map unit has sufficient soil depth over bedrock to accept a range of designs. On-site investigations can help avoid areas with limited depth to bedrock. Additional fill material may be needed in some areas in order to meet the separation distance requirement between the bottom of the leachfield and bedrock.

PHYSICAL and CHEMICAL PROPERTIES							EROSION FACTORS		
Soil name	Depth (In)	Typical texture	Clay (Pct)	Soil reaction (pH)	Permeability (In/Hr)	Organic matter (Pct)	Kw	Kf	T
	3-4	VFSL	5-9	3.6 - 6.0	0.6-6	2.0-8.0	.20	.24	
	4-17	FSL, VFSL	3-9	3.6 - 6.0	0.6-6	0.5-4.5	.20	.24	
	17-25	CN-FSL	3-7	5.1 - 6.5	0.6-6	0.0-1.0	.20	.24	
	25-29	UWB	---	---	0.01-20	---	---	---	
Lyman	0-1	HPM, SPM	---	3.2 - 5.7	2-6	25-95	---	---	1
	1-2	FSL	2-10	3.6 - 6.0	2-6	2.0-8.0	.20	.28	
	2-15	GR-FSL	2-10	3.6 - 6.0	2-6	2.0-8.0	.32	.37	
	15-19	UWB	---	---	0.01-20	---	---	---	

WATER FEATURES					SOIL FEATURES			
Soil name	Hydrologic group	Depth to seasonal high water table (Feet)	Flooding		Ponding		Hydric soil?	Depth to bedrock (range in inches)
			Frequency	Duration	Frequency	Duration		
Tunbridge	C	---	None		None		No	20-40
Lyman	D	---	None		None		No	10-20

LAND USE LIMITATIONS				AGRICULTURAL YIELD DATA	
Soil name	Land use	Rating	Reason **	Crop name	Yield / acre
Tunbridge	Dwellings with basements:	Very limited	Depth to hard bedrock	Pasture	3.1 AUM
Lyman	Dwellings with basements:	Very limited	Depth to hard bedrock		
Tunbridge	Pond reservoir areas:	Very limited	Slope		
Lyman	Pond reservoir areas:	Very limited	Slope		

WOODLAND MANAGEMENT				
Soil name	Management concern	Rating	Reason	Vermont natural communities
Tunbridge	Harvest equip operability:	Well suited		Northern Hardwood Forest, Hemlock-Northern Hardwood Forest, Mesic Red Oak-Northern Hardwood Forest, Beech-Red Maple-Hemlock-Northern Hardwood Forest Variant, Hemlock Forest
Lyman	Harvest equip operability:	Well suited		
Tunbridge	Road suitability:	Moderately suited	Slope	
Lyman	Road suitability:	Moderately suited	Slope	
Tunbridge	Erosion hazard (off-road):	Slight		
Lyman	Erosion hazard (off-road):	Slight		

67C: Glover-Vershire complex, 8 to 15 percent slopes, very rocky

These soils formed in loamy glacial till on uplands. GLOVER SOILS are shallow to bedrock and somewhat excessively drained. Permeability is moderate. VERSHIRE SOILS are moderately deep to bedrock and well drained. Permeability is moderate.

This map unit is poorly suited to cultivated crops, hay and pasture because of stones on the surface and the bedrock outcrops.

Important farmland classification: NPSL	Land capability: 6 s	Vermont Agricultural Value Group: 10
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Vermont Residential Wastewater Disposal - Group and Subgroup:

IIIa.- This unit is marginally suited as a site for soil-based residential wastewater disposal systems, based on a review by the Natural Resources Conservation Service of criteria set forth in the Vermont 2007 Environmental Protection Rules. The depth to bedrock is the major limitation. On-site investigations are needed to locate areas with sufficient soil depth. A significant percentage of the soils in this unit are less than 18 inches to bedrock and are not suitable as a site. However, there may be deeper areas that are suitable. Additional fill material may be needed in some areas in order to meet the separation distance requirement between the bottom of the leachfield and bedrock.

PHYSICAL and CHEMICAL PROPERTIES							EROSION FACTORS		
Soil name	Depth (In)	Typical texture	Clay (Pct)	Soil reaction (pH)	Permeability (In/Hr)	Organic matter (Pct)	Kw	Kf	T
	2-4	SIL	4-18	4.5 - 6.0	0.6-2	2.0-8.0	.32	.37	
	4-17	SIL	4-18	4.5 - 6.0	0.6-2	0.5-3.0	.20	.24	
	17-21	UWB	---	---	0.01-20	---	---	---	
Vershire	0-2	HPM, SPM	---	3.2 - 5.7	2-6	25-95	---	---	2
	2-4	VFSL	4-18	4.5 - 6.5	0.6-2	1.0-4.0	.32	.37	
	4-26	VFSL	4-18	4.5 - 6.5	0.6-2	0.5-3.0	.24	.28	
	26-30	UWB	---	---	0.01-20	---	---	---	

WATER FEATURES					SOIL FEATURES			
Soil name	Hydrologic group	Depth to seasonal high water table (Feet)	Flooding		Ponding		Hydric soil?	Depth to bedrock (range in inches)
			Frequency	Duration	Frequency	Duration		
Glover	D	---	None		None		No	10-20
Vershire	C	---	None		None		No	20-40

LAND USE LIMITATIONS				AGRICULTURAL YIELD DATA	
Soil name	Land use	Rating	Reason **	Crop name	Yield / acre
Glover	Dwellings with basements:	Very limited	Depth to hard bedrock	Pasture	2.6 AUM
Vershire	Dwellings with basements:	Very limited	Depth to hard bedrock		
Glover	Pond reservoir areas:	Very limited	Slope		
Vershire	Pond reservoir areas:	Very limited	Slope		

WOODLAND MANAGEMENT				
Soil name	Management concern	Rating	Reason	Vermont natural communities
Glover	Harvest equip operability:	Well suited		Northern Hardwood Forest, Mesic Red Oak-Northern Hardwood Forest, Dry Oak-Hickory-Hophornbeam Forest, Hemlock Forest, Temperate Acidic Outcrop, Temperate Calcareous Outcrop
Vershire	Harvest equip operability:	Well suited		
Glover	Road suitability:	Moderately suited	Slope	
Vershire	Road suitability:	Moderately suited	Slope	
Glover	Erosion hazard (off-road):	Slight		
Vershire	Erosion hazard (off-road):	Slight		

67D: Glover-Vershire complex, 15 to 35 percent slopes, very rocky

These soils formed in loamy glacial till on uplands. GLOVER SOILS are shallow to bedrock and somewhat excessively drained. Permeability is moderate. VERSHIRE SOILS are moderately deep to bedrock and well drained. Permeability is moderate.

This map unit is poorly suited to cultivated crops, hay and pasture because of stones on the surface, bedrock outcrops and steep slopes.

Important farmland classification: NPSL	Land capability: 7 s	Vermont Agricultural Value Group: 10
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Vermont Residential Wastewater Disposal - Group and Subgroup:

IIIa.- This unit is marginally suited as a site for soil-based residential wastewater disposal systems, based on a review by the Natural Resources Conservation Service of criteria set forth in the Vermont 2007 Environmental Protection Rules. The depth to bedrock is the major limitation. On-site investigations are needed to locate areas with sufficient soil depth. A significant percentage of the soils in this unit are less than 18 inches to bedrock and are not suitable as a site. However, there may be deeper areas that are suitable. Additional fill material may be needed in some areas in order to meet the separation distance requirement between the bottom of the leachfield and bedrock.

PHYSICAL and CHEMICAL PROPERTIES							EROSION FACTORS		
Soil name	Depth (In)	Typical texture	Clay (Pct)	Soil reaction (pH)	Permeability (In/Hr)	Organic matter (Pct)			
							Kw	Kf	T
Glover	0-2	HPM, SPM	---	3.2 - 5.7	2-6	25-95	---	---	1
	2-4	SIL	4-18	4.5 - 6.0	0.6-2	2.0-8.0	.32	.37	
	4-17	SIL	4-18	4.5 - 6.0	0.6-2	0.5-3.0	.20	.24	
	17-21	UWB	---	---	0.01-20	---	---	---	
Vershire	0-2	HPM, SPM	---	3.2 - 5.7	2-6	25-95	---	---	2
	2-4	VFSL	4-18	4.5 - 6.5	0.6-2	1.0-4.0	.32	.37	
	4-26	VFSL	4-18	4.5 - 6.5	0.6-2	0.5-3.0	.24	.28	
	26-30	UWB	---	---	0.01-20	---	---	---	

WATER FEATURES					SOIL FEATURES			
Soil name	Hydrologic group	Depth to seasonal high water table (Feet)	Flooding		Ponding		Hydric soil?	Depth to bedrock (range in inches)
			Frequency	Duration	Frequency	Duration		
Glover	D	---	None		None		No	10-20
Vershire	C	---	None		None		No	20-40

LAND USE LIMITATIONS				AGRICULTURAL YIELD DATA	
Soil name	Land use	Rating	Reason **	Crop name	Yield / acre
Glover	Dwellings with basements:	Very limited	Slope	Pasture	2.6 AUM
Vershire	Dwellings with basements:	Very limited	Slope		
Glover	Pond reservoir areas:	Very limited	Slope		
Vershire	Pond reservoir areas:	Very limited	Slope		

WOODLAND MANAGEMENT				
Soil name	Management concern	Rating	Reason	Vermont natural communities
Glover	Harvest equip operability:	Moderately suited	Slope	Northern Hardwood Forest, Mesic Red Oak-Northern Hardwood Forest, Dry Oak-Hickory-Hophornbeam Forest, Hemlock Forest, Temperate Acidic Outcrop, Temperate Calcareous Outcrop
Vershire	Harvest equip operability:	Moderately suited	Slope	
Glover	Road suitability:	Poorly suited	Slope	
Vershire	Road suitability:	Poorly suited	Slope	
Glover	Erosion hazard (off-road):	Moderate	Slope/erodibility	
Vershire	Erosion hazard (off-road):	Moderate	Slope/erodibility	

102: Pits, quarry-Dumps, mine complex

This map unit consists of open excavations from which soil material and some of the underlying bedrock has been removed, exposing the rock. Mounds of waste rock and soil material are associated with the quarries. The excavated bedrock is used for road construction, buildings, ground lime and other industrial and agricultural uses depending upon the kind of bedrock. Little or no vegetation grows in the quarries and there is water in the bottom of many pits. On-site investigation is needed to identify the soil properties and to determine the hazards and limitations for specific uses.

The soil in this map unit has been altered or removed. This map unit is not suited to cultivated crops, hay or pasture.

<u>Important farmland classification:</u> NPSL	<u>Land capability:</u> 8 s	<u>Vermont Agricultural Value Group:</u> 11
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Vermont Residential Wastewater Disposal - Group and Subgroup:

V.- This unit is not rated as a site for soil-based residential wastewater disposal systems. Due to the variable nature of the soils, on-site investigations are needed to determine their suitability.

PHYSICAL and CHEMICAL PROPERTIES

Soil name	Depth (In)	Typical texture	Clay (Pct)	Soil reaction (pH)	Permeability (In/Hr)	Organic matter (Pct)	EROSION FACTORS		
							Kw	Kf	T
Dumps	0-60	VAR	---	---	0.001-0.06	0.0-0.1	---	---	---
Pits	0-60	UWB	---	---	0.01-20	0.0-0.1	---	---	---

WATER FEATURES

SOIL FEATURES

Soil name	Hydrologic group	Depth to seasonal high water table (Feet)	Flooding		Ponding		Hydric soil?	Depth to bedrock (range in inches)
			Frequency	Duration	Frequency	Duration		
Dumps	---	---	None				Unranked	---
Pits	---	---	None				Unranked	0

LAND USE LIMITATIONS

AGRICULTURAL YIELD DATA

Soil name	Land use	Rating	Reason **	Crop name	Yield / acre
Pits	Dwellings with basements:	Not rated			
Dumps	Dwellings with basements:	Not rated			
Pits	Pond reservoir areas:	Not rated			
Dumps	Pond reservoir areas:	Not rated			

WOODLAND MANAGEMENT

Soil name	Management concern	Rating	Reason	Vermont natural communities
Pits	Harvest equip operability:	Not rated		
Dumps	Harvest equip operability:	Not rated		
Pits	Road suitability:	Not rated		
Dumps	Road suitability:	Not rated		
Pits	Erosion hazard (off-road):	Not rated		
Dumps	Erosion hazard (off-road):	Not rated		

Appendix I

TRAIL FEE PROCESS

In some cases it is appropriate for approved Trail Corridor Managers (TCM) to charge fees for use of managed trail networks. Approved TCMs, therefore, may charge fees for use of their trail networks in compliance with their Corridor Management Agreement (CMA). User fees may be approved when the TCM has expenses: for maintenance such as regular removal of debris from trails, repair or replacement of trail bridges, repairing eroded trail beds and rerouting trails, for insurance, for equipment, materials, and supplies needed for trail maintenance, for producing maps and for trail signs.

TCMs shall submit their proposed fee schedule, if any, with their CMA application to the Barre Town Recreation Board. The fee schedule must be validated by the TCM documentation of cost and must result in a neutral financial outcome. Charging fees to produce a profit from use of trails on public land is inappropriate. The Barre Town Recreation Board will forward a recommendation regarding the fee schedule, with the CMA, to the Selectboard for final approval.

Pedestrian use of the Town of Barre Forest, whether on trails or dispersed, shall be free to all users. Pedestrian use includes hiking, walking, running, snowshoeing, and dog walking. Use of groomed cross country ski trails and guided tours are not necessarily free.

Trail CMAs shall provide that approved TCMs shall not harass, berate, or lecture individuals or eject them from the Town of Barre Forest or the trail corridors for failure to pay trail fees. TCMs and/or the Town of Barre may provide information at kiosks within the Town Forest to educate the public of the value added to the forest by the maintenance of trails supported by fees.

A TCM's CMA may be revoked for failure to abide by the CMA. The Town Selectboard should meet and confer with a TCM before a revocation decision is made.

MEMORANDUM OF UNDERSTANDING:
ATV STANDARDS – BARRE TOWN FOREST

This MEMORANDUM OF UNDERSTANDING ("MOU") is entered into this 29th day of March, 2013, among the TOWN OF BARRE, a Vermont municipality located in Washington County ("Grantor"), the VERMONT LAND TRUST, INC., a non-profit corporation organized under the laws of the State of Vermont, with its principal offices in Montpelier, Vermont ("VLT") and the VERMONT HOUSING AND CONSERVATION BOARD, an independent board of the State of Vermont with its offices in Montpelier, Vermont (together with VLT, "Grantees").

I. BACKGROUND

On _____, 2013 PHILIP KETCHAM, PIERRE COUTURE, GRANITEVILLE FIRE DISTRICT NO. 4, THE TRUST FOR PUBLIC LAND, ALFRED SALDI and ROBERT SALDI, conveyed to Grantees that certain Grant of Development Rights, Conservation Restrictions and Public Access Easement (the "Grant") recorded in Book _____, Page _____ of the land records of the Town of Barre for the purposes of protecting the recreational and natural values of the Protected Property¹ (as described therein).

Section II(8) of the Grant provides in part as follows:

Notwithstanding paragraph II(7), Grantor may allow recreational all-terrain vehicle ("ATV") use and maintenance and repair of an ATV trail across the Protected Property that connects to an existing, legal network of ATV trails, provided that the ATV connecting trail and network have no significant negative impact on the conservation or public recreation values of the Protected Property, as stated in the Purposes of this Grant, and Grantor has received the prior written approval of the Grantees for such use, which approval shall not be unreasonable withheld, conditioned or denied.

Grantor and Grantees desire to set forth herein the criteria by which Grantees will grant their approval to an ATV trail pursuant to Section II(8) of the Grant.

II. ATV STANDARDS

Grantor and Grantee hereby agree that Grantees shall not be obligated to provide their approval for an ATV trail pursuant to Section II(8) of the Grant unless Grantor demonstrates, to Grantees' reasonable satisfaction, that all of the following criteria have been met:

1. It must be shown that the proposed non-commercial recreational ATV use of the Protected Property will be limited to a defined trail (the "ATV Trail") which is part of a larger, meaningful, non-commercial recreational ATV trail network linking the Protected Property to other contiguous properties in an officially designated trail system that is actively managed by the Maintaining Entity (as defined herein) and that such uses are regulated in the Management Plan and are consistent with the Purposes of the

¹ All terms with initial capital letters not defined herein shall have the meaning given to them in the Grant.

Received for Record
March 29, A.D. 2013
at 4 o'clock 05 minutes P. M.
and recorded in Book 267, Pages 465-469
of Land Records.
Attest
[Signature]
Alice W. Barrelet
Town Clerk ASST.

Grant.

2. It must be shown that the proposed creation and maintenance of the ATV Trail, and management of its use and users, will be under the oversight and maintenance of a Maintaining Entity. As used herein, the term "Maintaining Entity" shall mean an entity that has demonstrated capacity to manage the ATV Trail as required herein, that executes a written commitment to maintain and oversee the ATV Trail and that meets all of the following criteria: (i) it is an entity that exists for the purpose of overseeing ATV trail use and management; (ii) it provides a written indemnification reasonably acceptable to Grantor and the Grantees for any claims, suits, liabilities or causes of action with respect to any and all property damage, injuries, loss of life and/or damage arising from the ATV Trail and the use thereof; (iii) provides satisfactory evidence of liability insurance naming the Grantor and Grantees as co-insureds; and (iv) provides the name, address and other contact information for a representative for the Maintaining Entity with respect to the ATV Trail.
3. The ATV Trail shall be marked by appropriate signs and the Maintaining Entity shall maintain the signs and otherwise take all actions necessary to ensure that all ATV traffic remains on the ATV Trail only.
4. The Maintaining Entity shall ensure that the ATV Trail is used only at such times that the trail surface is sufficiently dry or frozen to support the weight of machinery and shall post the trail usage guidelines and, if necessary, close the trail during seasons or periods that the ATV Trail does not meet these criteria.
5. The Maintaining Entity shall immediately repair any damage to the Protected Property resulting from ATV use.
6. Only ATVs shall be permitted on the ATV Trail and the Maintaining Entity shall ensure that no trucks, 4x4s, land rovers, motorcycles or any other motorized vehicle other than traditional ATVs use the ATV Trail or trespass onto the Protected Property in the vicinity of the ATV Trail.
7. Grantees may require that the Maintaining Entity close the ATV Trail if the Maintaining Entity has failed to abide by these ATV use standards or the use of the ATV Trail has created an undue adverse impact on the Protected Property, as determined by the Grantees in light of the Purposes of the Grant, within 48 hours of Grantees' delivery of notice to the Maintaining Entity and to the Grantor; provided, however, that no such notice shall be required to close the ATV Trail in the event that Grantees determine that the Protected Property is in imminent danger of damage. The ATV Trail shall remain closed until the Grantor and Grantees reach agreement that the violation has been resolved, which agreement shall not be unreasonably withheld or conditioned in light of the Purposes of the Grant.
8. The Grantor, Grantees and the Maintaining Entity shall locate the ATV Trail and any spur trails connecting such trail to designated parking areas supporting the Protected Property, on the ground together and flag the ATV Trail route prior to any construction, vegetation clearing or site work.
9. By way of example, and not by way of limitation, the existing VAST snowmobile trail on the Protected Property, as depicted on the map attached hereto as Exhibit A, which enters the Protected Property from the southwest and exits the Protected Property

to the east, would be considered one trail with a spur exiting the Protected Property to the north. Provided however, that before the VAST trail, or any other trail, could be used by ATVs it would have to meet all of the terms and conditions listed herein.

III. Miscellaneous.

1. The parties agree to consult from time to time in an effort to facilitate achievement of the goals embodied in this MOU.
2. This MOU may be amended only by written agreement signed by all the parties hereto.

GRANTOR
TOWN OF BARRE

By: Carl Rogers
Carl Rogers, Town Manager

GRANTEE
VERMONT LAND TRUST, INC.

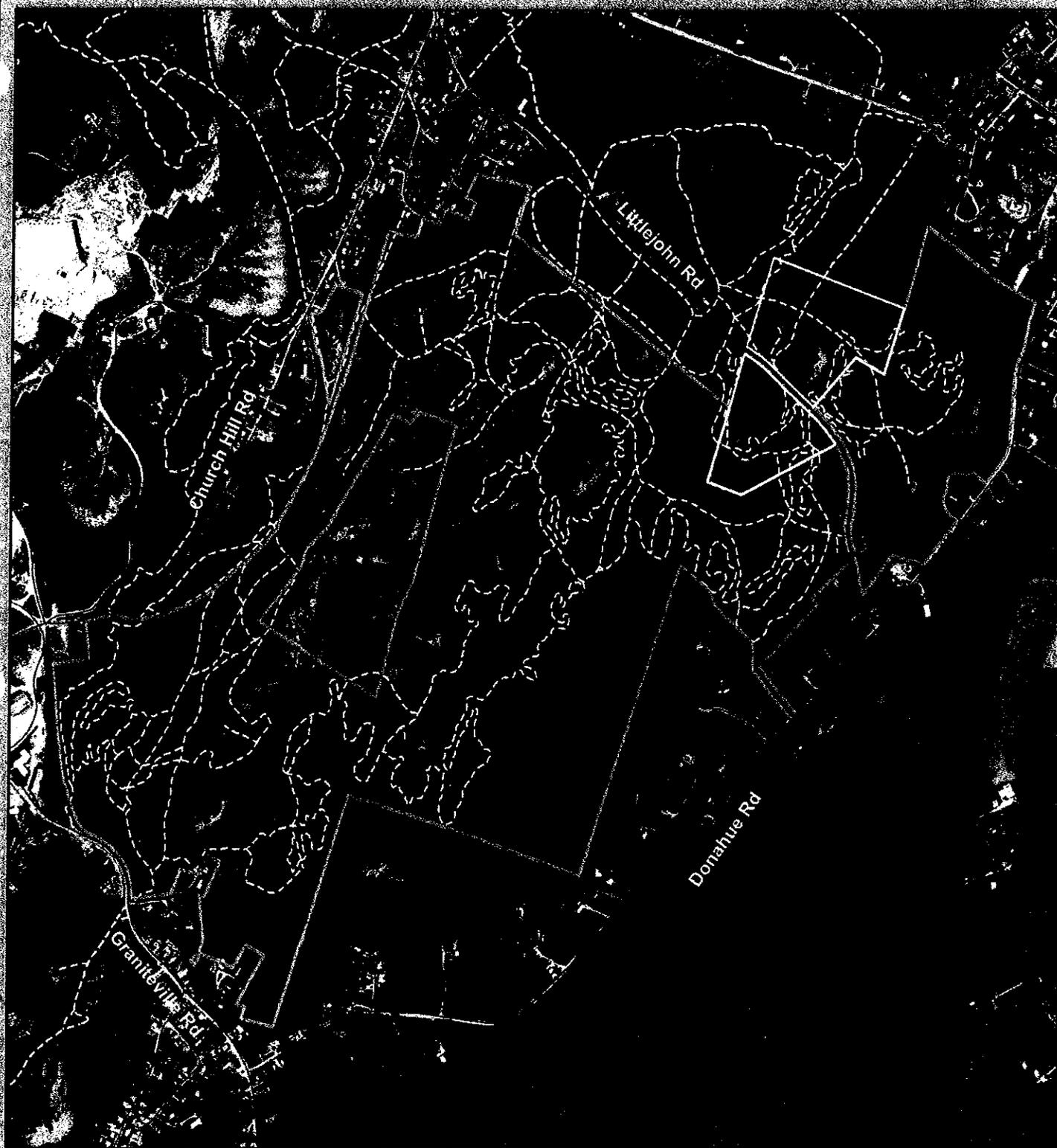
By: J. F. Co.
Its duly authorized agent

GRANTEE
VERMONT HOUSING AND CONSERVATION
BOARD

By: [Signature]
Its duly authorized agent

EXHIBIT A
Barre Town Forest Trail Map

[see attached]

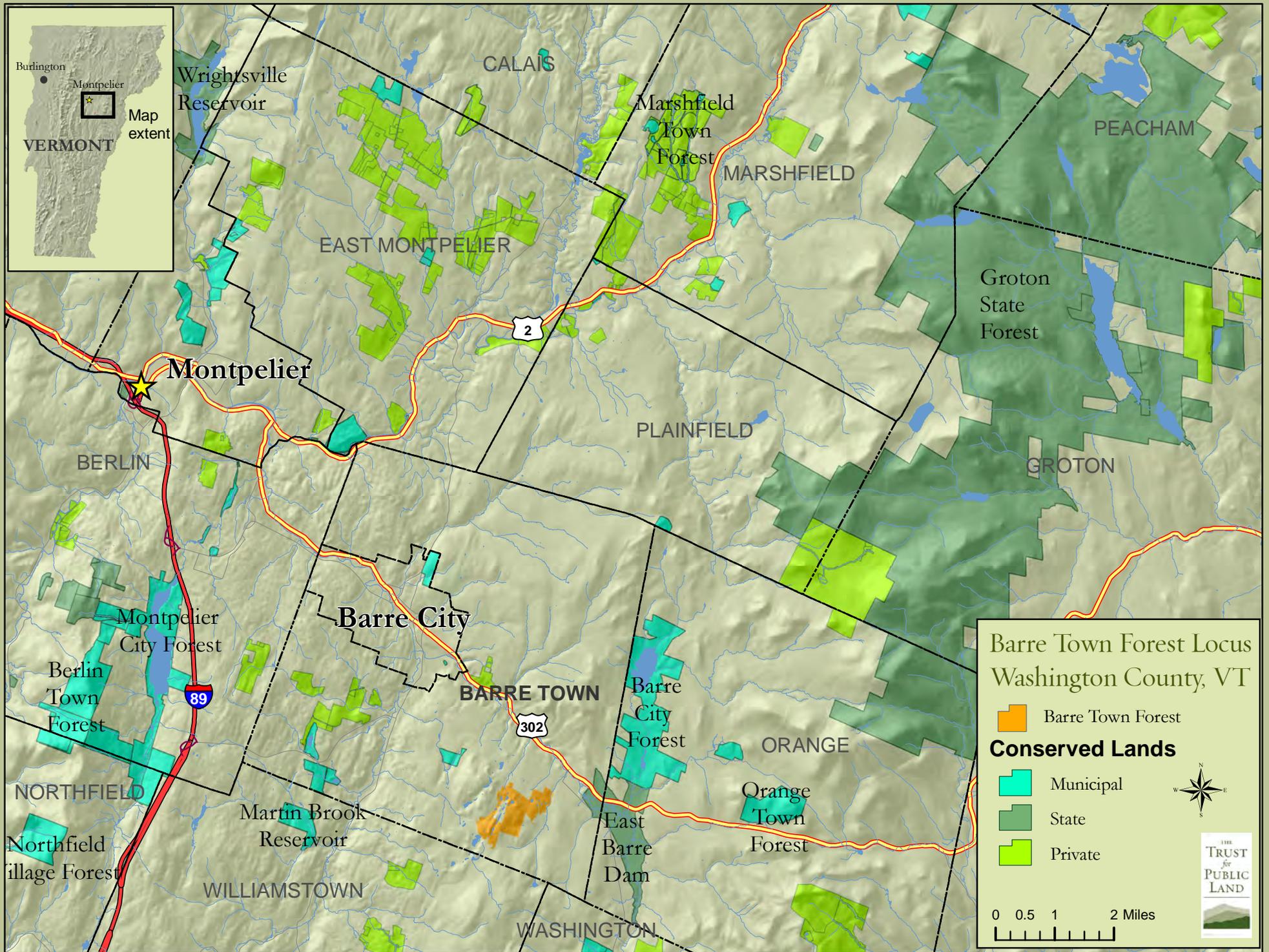


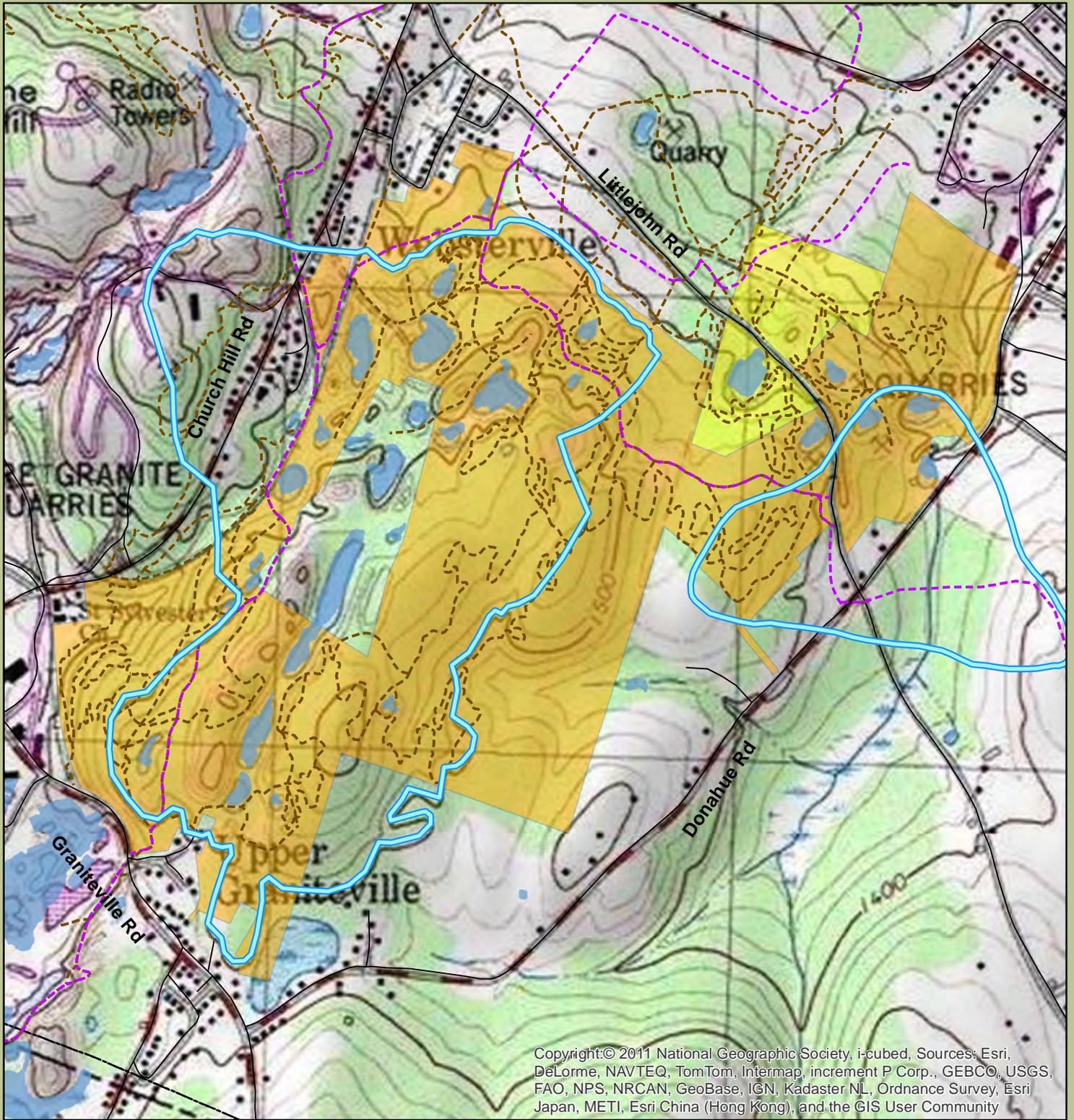
-  Barre Town Forest- with Conservation Easement, 355 acres
-  Barre Town Forest- Unrestricted, 25.7 acres
-  Proposed Parking Areas
-  Hiking, biking & ski trails
-  Snowmobile trails, most also open to hiking, biking, skiing

Barre Town Forest
 Access and Recreation
 Barre Town, VT

Map created by TRU's Trust for Public Land on 5/28/13. Boundaries from 2012 Composite Sketch by American Survey Company. Trails courtesy of Millstone Trail Association. Information on this map is provided for purposes of discussion and visualization only.



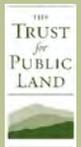




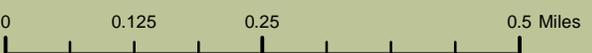
Copyright:© 2011 National Geographic Society, i-cubed, Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community

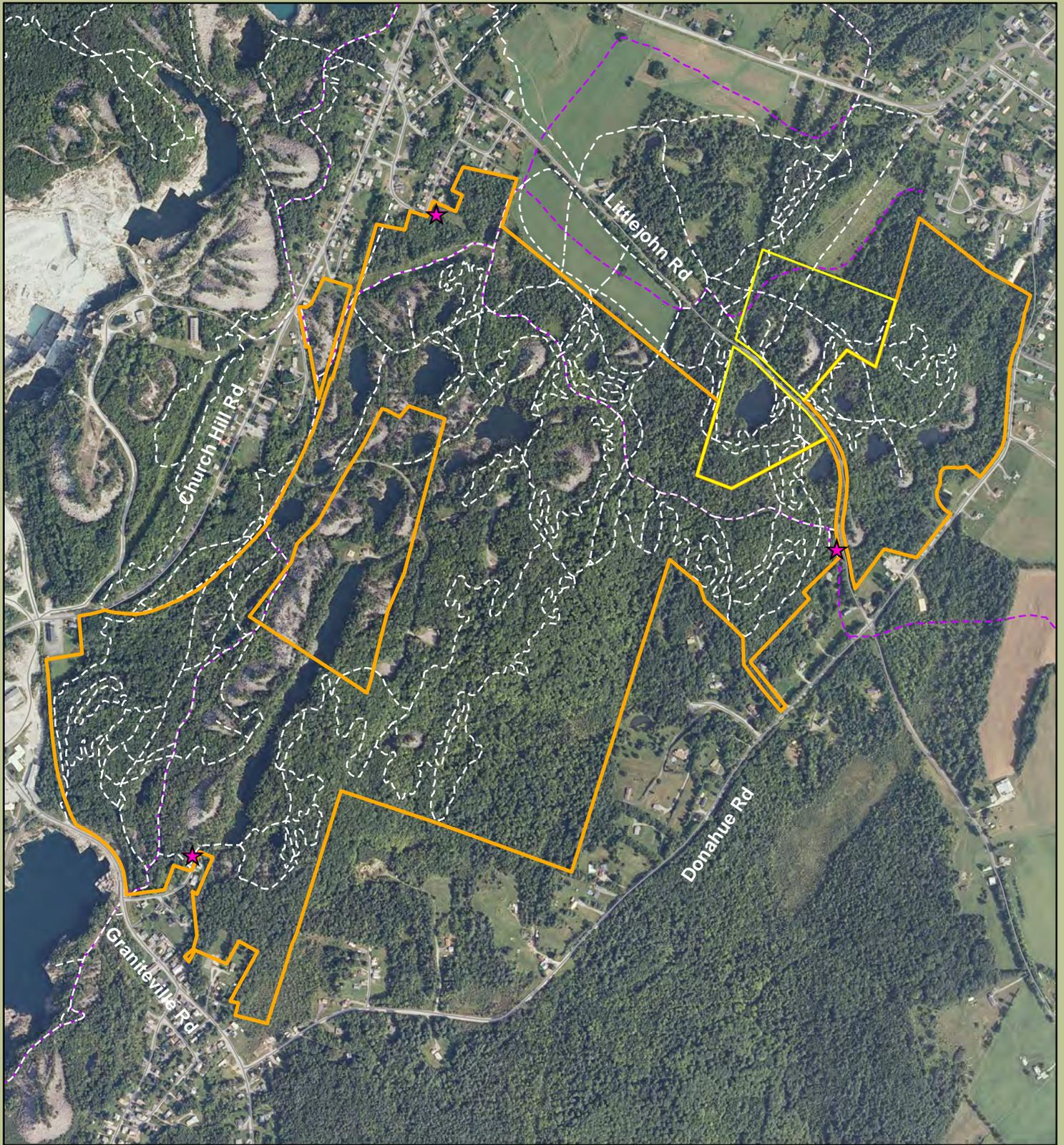
-  Barre Town Forest- with Conservation Easement, 355 acres
-  Barre Town Forest- Unrestricted, 25.7 acres
-  Source Water Protection Area
-  Ponds/Abandoned Quarries
-  Existing hiking, biking & ski trails
-  Existing snowmobile trails, also open to hiking, biking, skiing

Barre Town Forest Topographic Map Barre Town, VT



Map created by The Trust for Public Land on 3/25/13. Boundaries from 2013 Composite Sketch by American Survey Company. Information on this map is provided for purposes of discussion and visualization only.





-  Barre Town Forest- with Conservation Easement, 355 acres
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Barre Town Forest Access and Recreation Barre Town, VT



Map created by The Trust for Public Land on 3/25/13. Boundaries from 2013 Composite Sketch by American Survey Company. Trails courtesy of Millstone Trail Association. Information on this map is provided for purposes of discussion and visualization only.



Barre Town Forest

Forest Stand Map

1:6,000

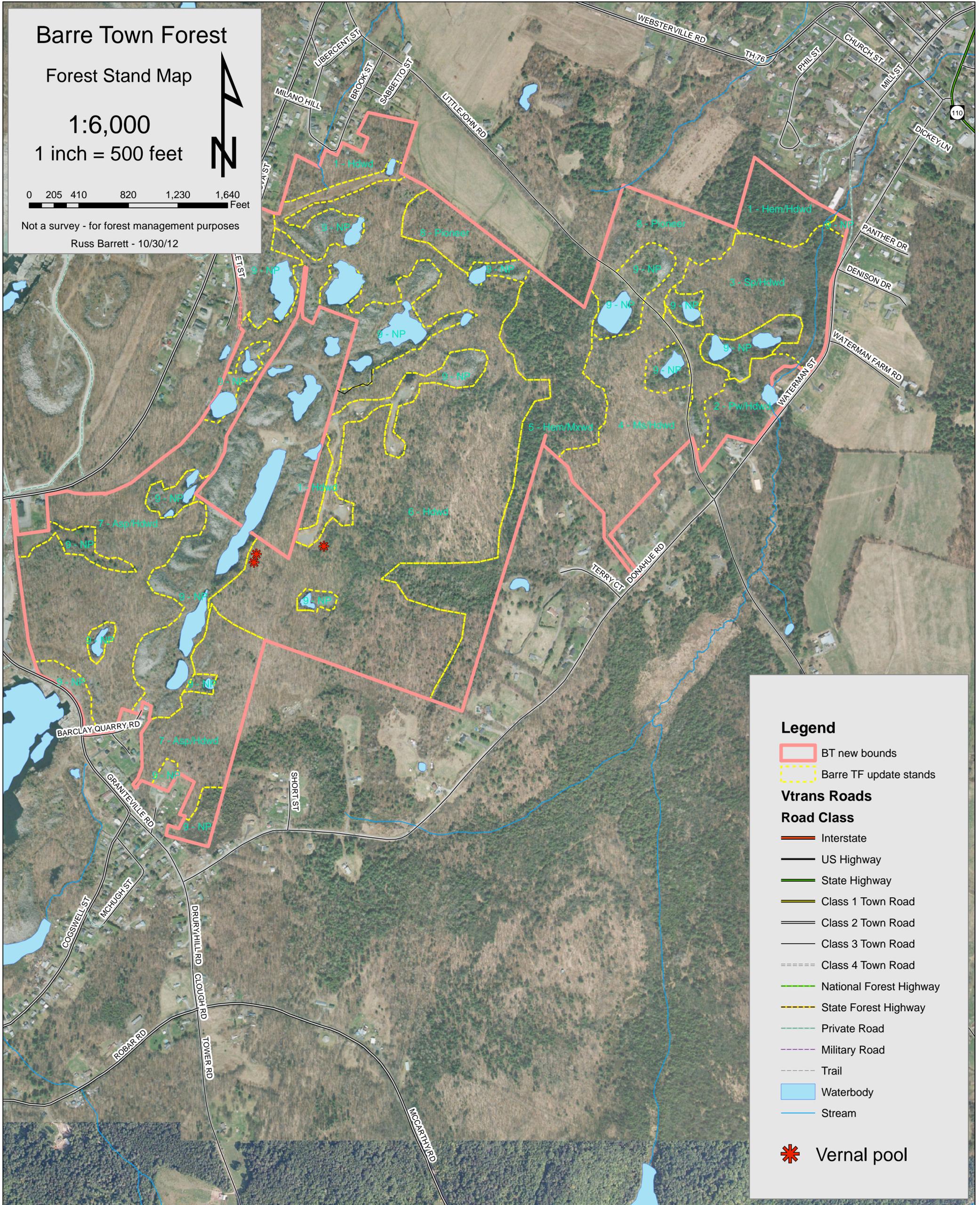
1 inch = 500 feet



0 205 410 820 1,230 1,640 Feet

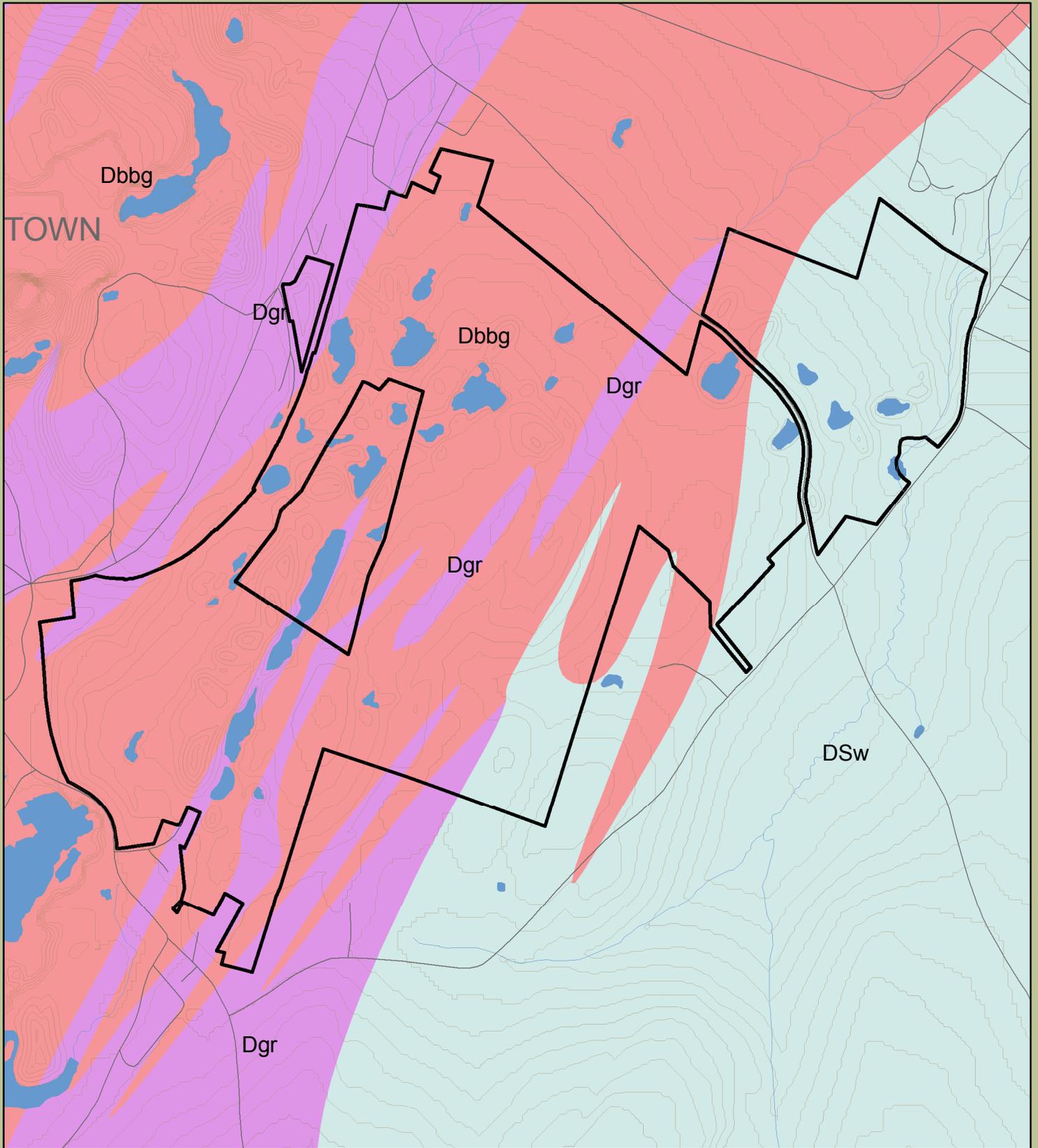
Not a survey - for forest management purposes

Russ Barrett - 10/30/12



Legend

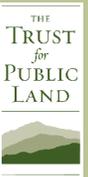
- BT new bounds
- Barre TF update stands
- Vtrans Roads**
- Road Class**
- Interstate
- US Highway
- State Highway
- Class 1 Town Road
- Class 2 Town Road
- Class 3 Town Road
- Class 4 Town Road
- National Forest Highway
- State Forest Highway
- Private Road
- Military Road
- Trail
- Waterbody
- Stream
- Vernal pool

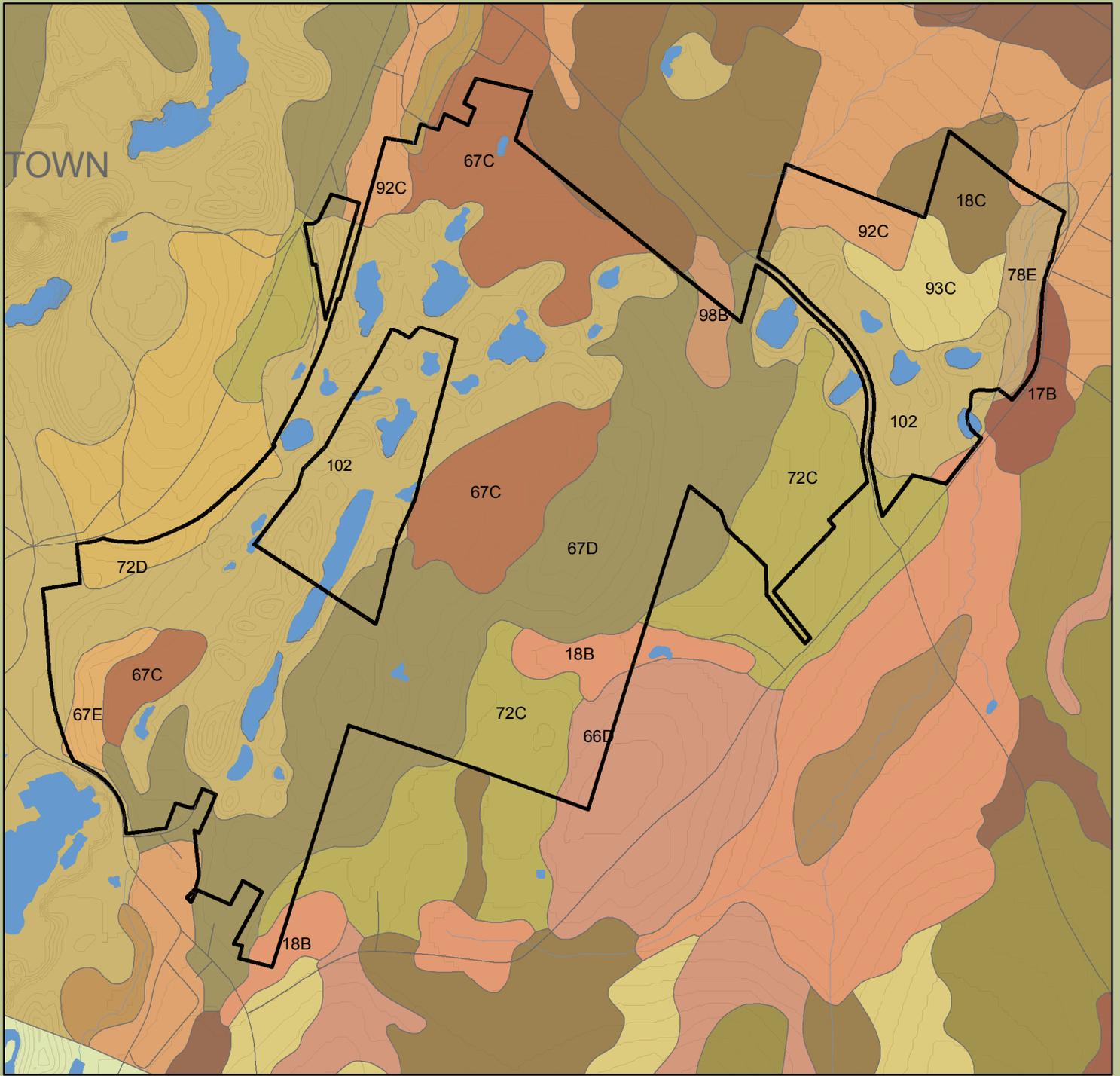


	Barre Town Forest		Water
Bedrock Geology			
	DSw: Metalmestone phyllite		
	Dbbg: Granite		
	Dgr: Quartzite schist		

Geology of Barre Town Forest Barre Town, VT

Map created by The Trust for Public Land on 3/25/13. Boundaries from 2013 Composite Sketch by American Survey Company. Information on this map is provided for purposes of discussion and visualization only.

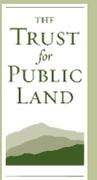




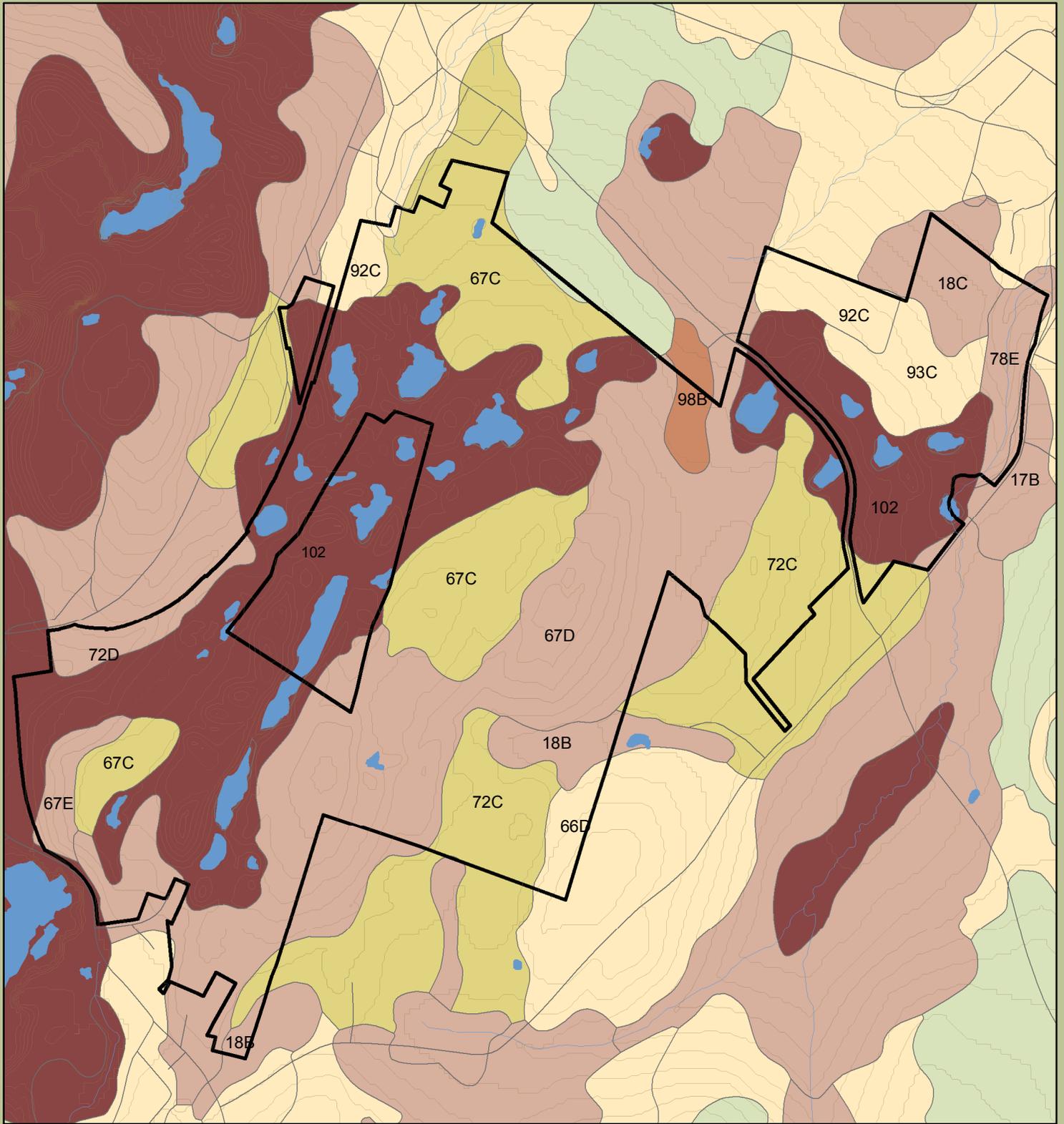
-  Barre Town Forest
 -  Water
- Soil Types**
-  102- Pits, quarry-dumps, mine complex
 -  17B- Cabot silt loam, 3-8% slopes
 -  18B- Cabot silt loam, 0-8% slopes, very stony
 -  18C- Cabot silt loam, 8-15% slopes, very stony
 -  66D- Vershire-Dummerston complex, 15-25% slopes, rocky
 -  67C- Glover-Vershire complex, 8-15% slopes, very rocky
 -  67D- Glover-Vershire complex, 15-35% slopes, very rocky
 -  67E- Glover-Vershire complex, 35-60% slopes, very rocky

Soil Types of Barre Town Forest Barre Town, VT

Map created by The Trust for Public Land on 3/25/13. Boundaries from 2013 Composite Sketch by American Survey Company. Information on this map is provided for purposes of discussion and visualization only.



-  72C- Tunbridge-Lyman complex, 8-15% slopes, very rocky
-  78E- Peru gravelly fine sandy loam, 35-60% slopes, very stony
-  92C- Buckland silt loam, 8-15% slopes
-  98B- Cabot silt loam, 3-8% slopes, extremely bouldery



Forest Soil Groups of Barre Town Forest Barre Town, VT

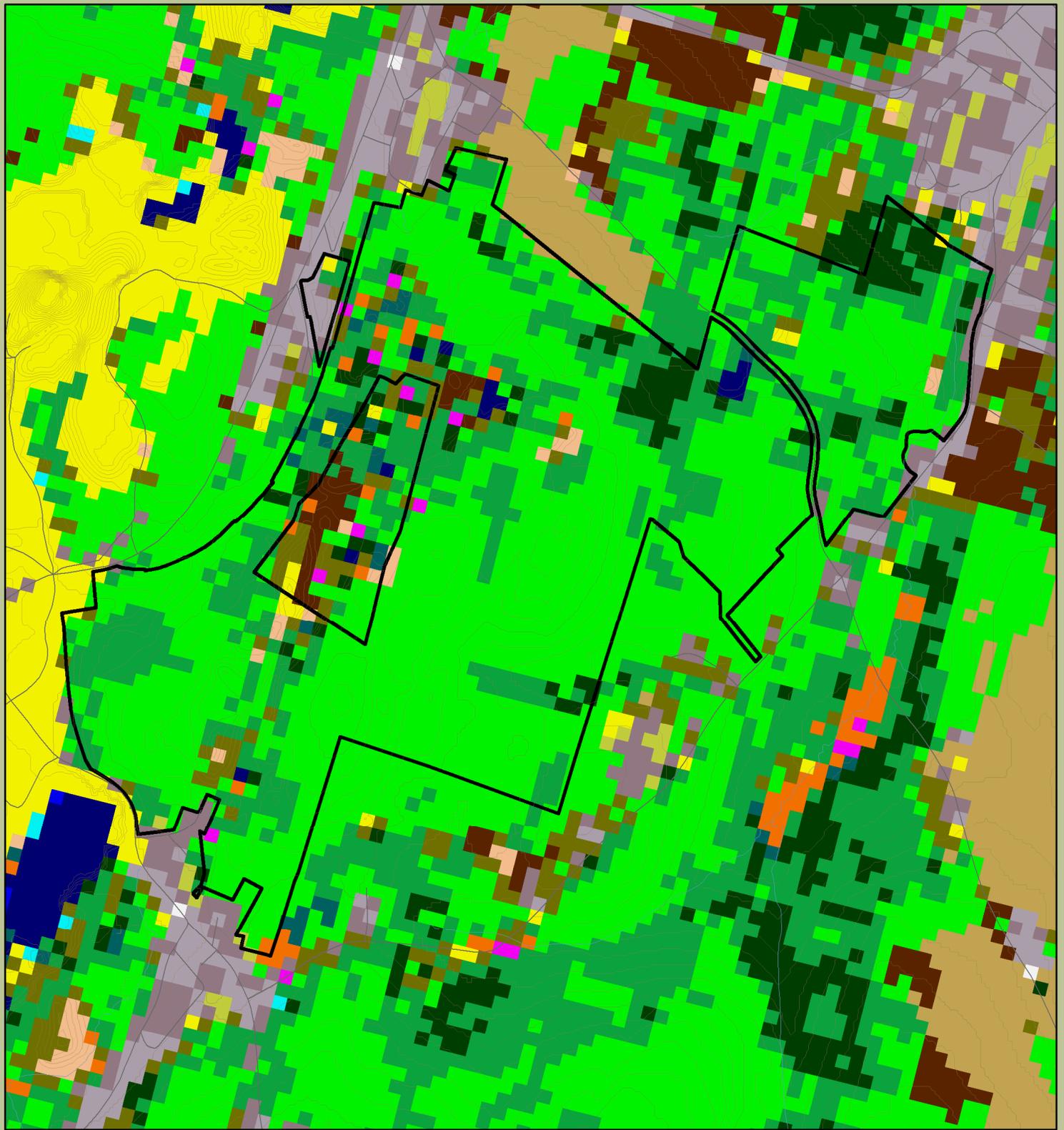
 Barre Town Forest

Forest Soil Group



Map created by The Trust for Public Land on 3/25/13.
Boundaries from 2013 Composite Sketch by American
Survey Company. Information on this map is provided
for purposes of discussion and visualization only.





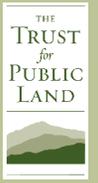
 Barre Town Forest

Landcover (2006)

- | | | |
|--|---|--|
|  Developed, High Intensity |  Grassland/Herbaceous |  Palustrine Scrub/Shrub Wetland |
|  Developed, Medium Intensity |  Deciduous Forest |  Palustrine Emergent Wetland |
|  Developed, Low Intensity |  Evergreen Forest |  Bare Land |
|  Developed, Open Space |  Mixed Forest |  Open Water |
|  Cultivated Crops |  Scrub/Shrub |  Palustrine Aquatic Bed |
|  Pasture/Hay |  Palustrine Forested Wetland | |

Land Cover of Barre Town Forest
Barre, VT

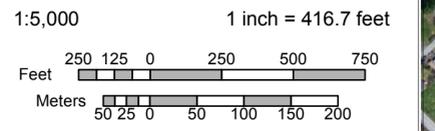
Map created by The Trust for Public Land on 3/25/13. Boundaries from 2013 Composite Sketch by American Survey Company. Information on this map is provided for purposes of discussion and visualization only.



Vermont Land Trust
Barre Town Forest Property
Town of Barre
Washington Co., VT
March 2013

VLT Project #131006 VHC# 2011-085-001

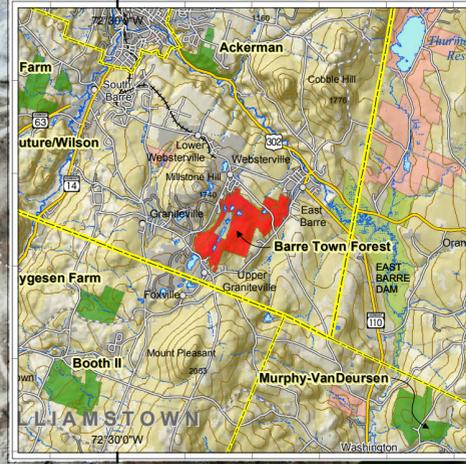
The Barre Town Forest Property Conservation Plan is based on 2011 Digital Globe-Microsoft orthophotos.



- Protected Property
- STA Primary Zone
- STA Secondary Zone
- Surface Water Buffer Zone (SWBZ)
- Existing Trail in Primary Zone

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

Woods	323 acres
Talus/Bare Rock	18 acres
Open Water/Wetland	14 acres
Total Protected Property	± 355 acres

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

Reviewed and Accepted by:

Pierre Couture Date

Philip Ketcham Date

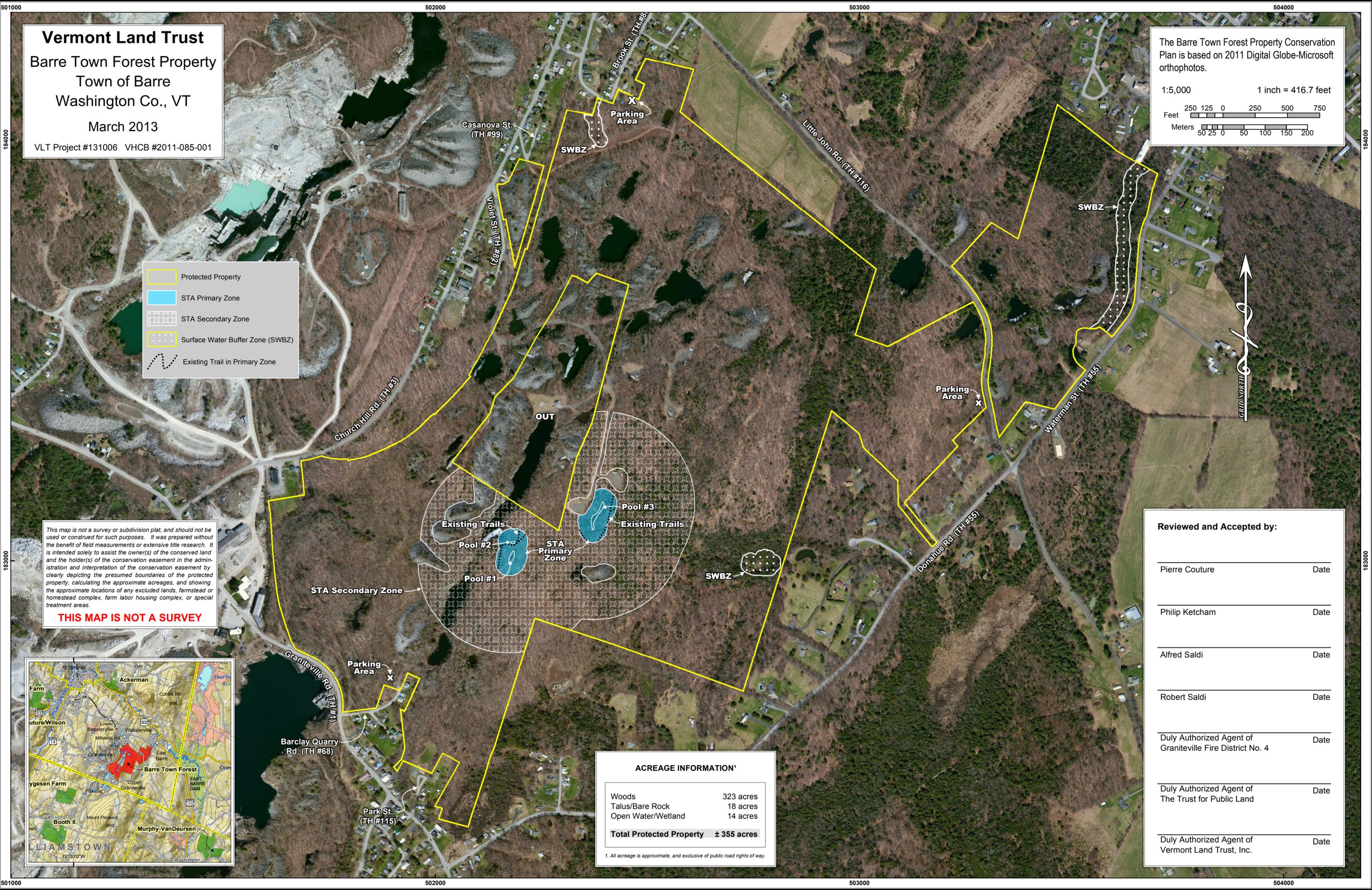
Alfred Saldi Date

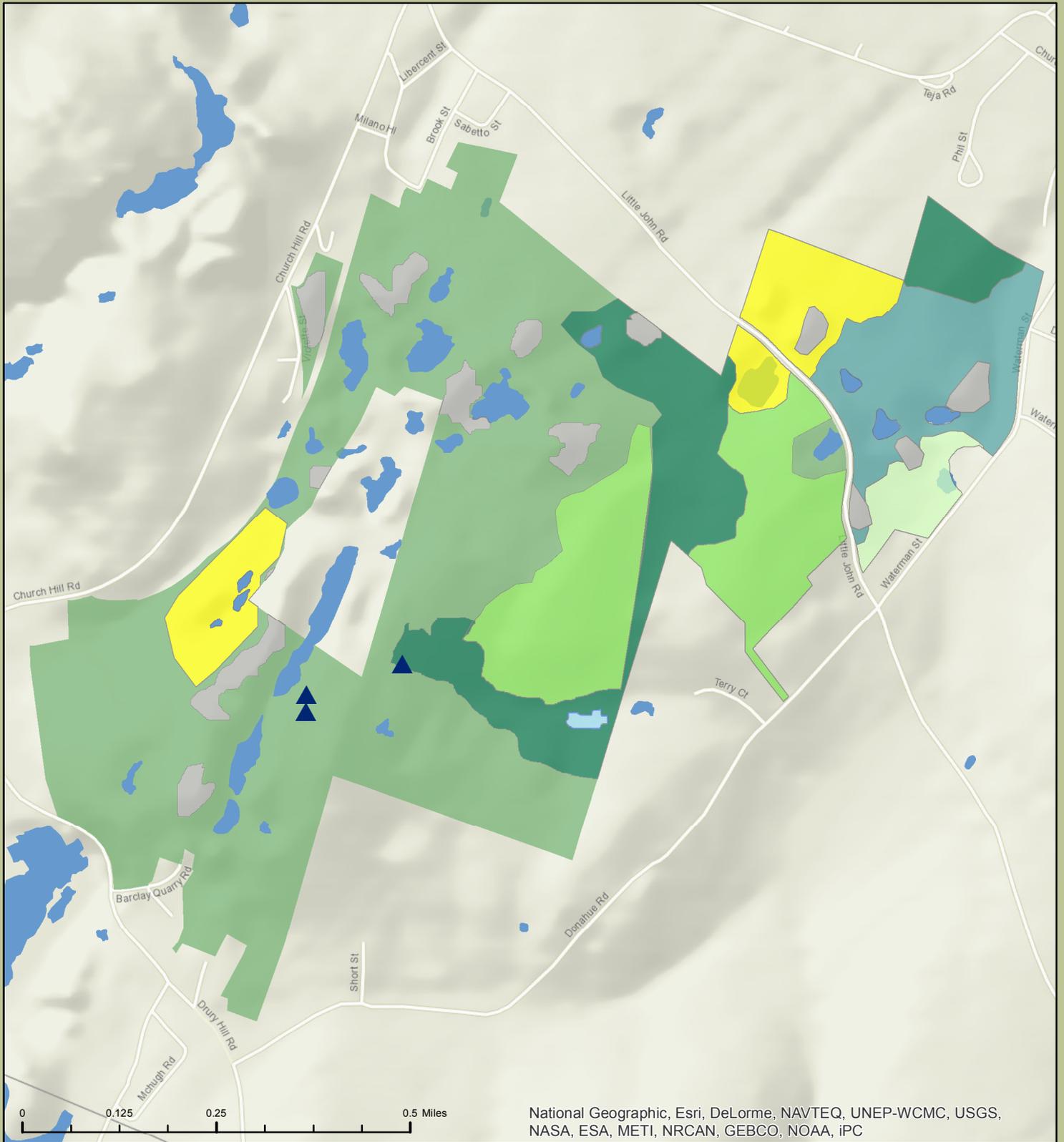
Robert Saldi Date

Duly Authorized Agent of
Graniteville Fire District No. 4 Date

Duly Authorized Agent of
The Trust for Public Land Date

Duly Authorized Agent of
Vermont Land Trust, Inc. Date



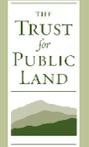


National Geographic, Esri, DeLorme, NAVTEQ, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, IPC

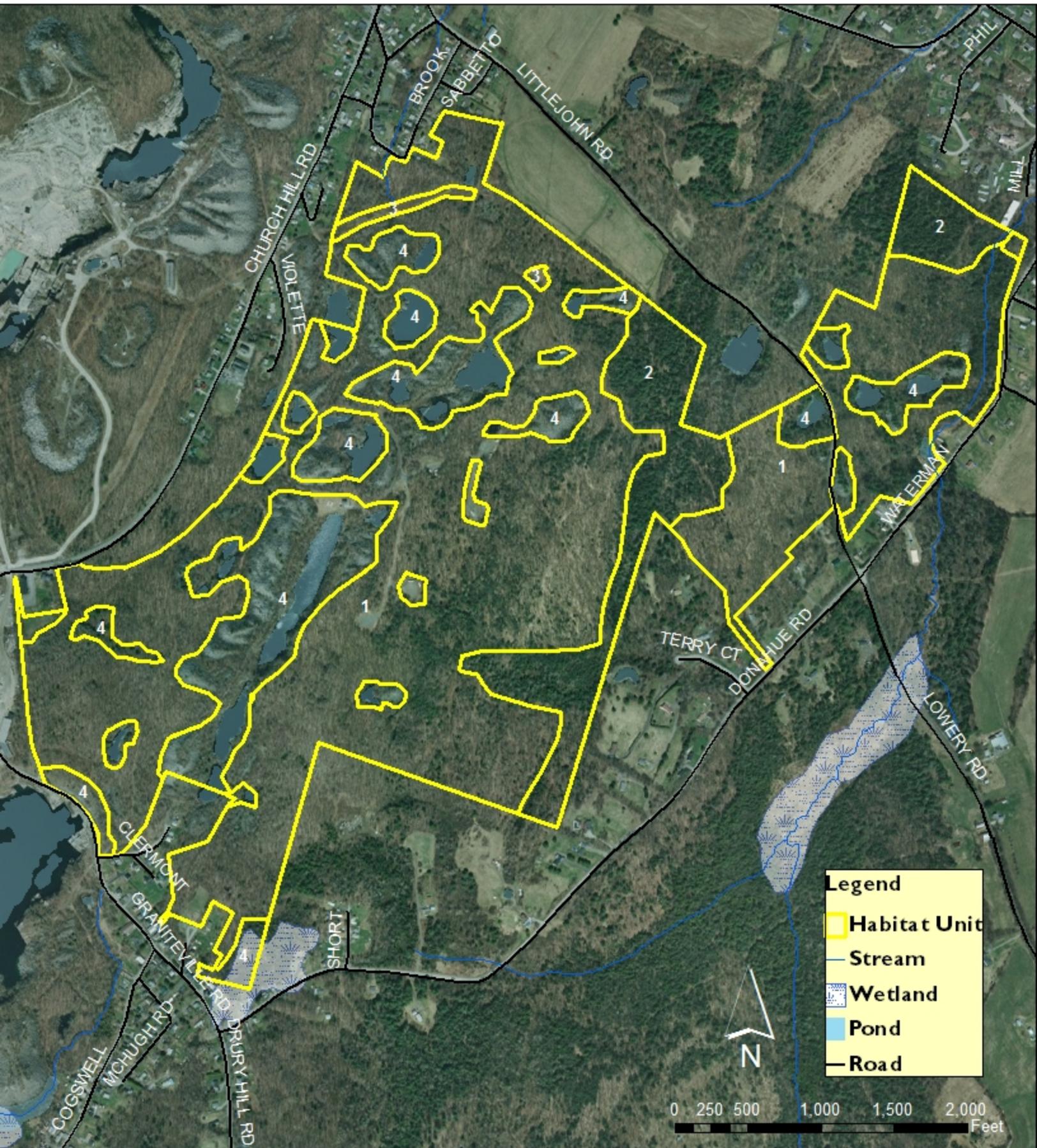
Natural Communities

-  Northern Hardwood Forest
-  Yellow Birch-Northern Hardwood Forest
-  White Pine-Northern Hardwood Forest
-  Sugar Maple-Northern Hardwood Forest
-  Northern Hardwood Talus Woodland-Bare Rock
-  Spruce-Northern Hardwood Forest
-  Hemlock-Northern Hardwood Forest
-  Wetland
-  Ponds/Abandoned Quarries
-  Vernal Pools

Natural Resources
of Barre Town Forest
Barre Town, VT



Map created by The Trust for Public Land on 3/25/13. Natural Community Types determined by Rose Graves and Russ Barrett. Information on this map is provided for purposes of discussion and visualization only.



Forest Bird Habitat Assessment
 Proposed Barre Town Forest
 Barre, VT
 Map 2. Habitat Units

Habitat Units	
1. Mature Hardwood/Mixed Forest	- 256 acres
2. Mature Softwood Forest	- 39 acres
3. Early-Successional	- 2 acres
4. Non-Productive	- 83 acres

 **Audubon** VERMONT
 Prepared 02-06-12, SH
 Not a survey. All boundaries approximate.
 Data Sources: ESRI, VCGI
 NAD1983, VT State Plane
 Scale: 1:10,000