**Hinesburg, Vermont**

**LAPLATTE HEADWATERS TOWN FOREST MANAGEMENT PLAN**

**Revision 3**

Adopted by the Town of Hinesburg:



Selectboard chair \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_

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# Document History

### Adopted December, 2009

The original LHTF management planning committee authors and contributors included:

* Kristen Sharpless, Chair
* Lenore Budd (Trails Committee)
* Timothy Clancy (Planning Commission)
* Lisa Godfrey (LaPlatte Watershed Partnership)
* Jean Isham (Planning Commission)
* Andrea Morgante (Hinesburg Land Trust)
* Stewart Pierson (Trails Committee)
* Matthew Probasco (Conservation Commission)
* Paul Wieczoreck (Hinesburg Land Trust)
* Susan Mead (Trails Committee)
* With special assistance from Michael Snyder, Chittenden County Forester

### Revision 2 April 2017

* Added restrictions: mountain biking and horse riding on the trails is not permitted
* Added emphasis to the need to take immediate action regarding invasive species

### Revision 3 ?? 2019

* Removed redundancy and reorganized, removed information that can be found in the appendices, adding appendix G, Owl’s Knoll Field Guide, updated completed actions section, added a Monitoring Plan section and created Appendix H for Detailed Monitoring Plans, condensed sections when deemed appropriate without sacrificing content.

# Executive Summary

The LaPlatte Headwaters Town Forest (LHTF) is a 301-acre parcel in the western part of Hinesburg. It was granted to the Town from the Vermont Land Trust and Vermont Housing and Conservation Board, which co-hold a conservation easement on the land as part of a larger project in cooperation with other local, state, and federal organizations and agencies.

The LHTF is particularly well-suited to being town-owned public land because it:

* Is representative of the western part of Hinesburg’s rich and unique natural heritage in the Champlain Valley, which includes its geology, ecology, and cultural history.
* Contains a diverse mix of open and forested land that is home to a wide variety of plant communities and organisms - some of which are rare or endangered within Hinesburg, Vermont, and even North America.
* Includes the headwaters of the LaPlatte River. This creates an opportunity for restoring flood storage capacity of the riparian area, which is important to improving and maintaining the water quality of Lake Champlain.
* Has an established network of trails and history of use by the public for walking, snowshoeing, skiing, hunting, and education.
* Is less than a half-mile from the Hinesburg Village and Hinesburg Community School (HCS) at its northernmost boundary.

This management plan was developed by the Town of Hinesburg in order to guide the future use and management of the LHTF.

In the spring of 2008, the Hinesburg Selectboard appointed members from the Hinesburg Planning Commission, Conservation Commission, Trails Committee, Hinesburg Land Trust, LaPlatte Watershed Partnership, and interested residents to serve on a planning committee. This planning committee was charged with the responsibility of creating the LHTF management plan (hereafter referred to as the plan). The original plan was created over a period of 21 months through a collaborative process that included research, input from experts, input from the public, meetings with recreation user groups, and several public educational walks through the property. A final draft was completed in December of 2009. The plan represents a sincere effort to outline a philosophy and guidelines that go a long way toward implementing the purposes of the conservation easement.

The plan provides an introduction to the LHTF and includes the following broad sections:

* + Vision and goals
	+ Permitted and restricted uses
	+ Site history and biophysical characteristics
	+ Goals, Management objectives, guidelines, and actions

The plan is to be implemented by the Town Forest Committee in collaboration with Conservation Partners and other Town committees. Its intended use is as a sustainable management guidance document and a reference for those interested in the LHTF or involved in its management. The plan will be updated and submitted for approval by the Hinesburg Selectboard at least every ten years.

The plan was last updated in 2019 by a subcommittee of the Town Forest Committee. The draft was reviewed by the relevant stakeholders including those listed below, the Hinesburg Trails CommitteeHinesburg Land Trust and the general public. Recommendations were considered, and where appropriate included in a final draft that was submitted to the Selectboard for approval.

# Introduction

## Why Plan?

In any situation, good planning facilitates informed decisions. In the case of the LHTF the absence of a good plan could result in compromised ecological function and health. The LHTF is a designated multi-use resource and as such the lack of a well thought out plan would also likely lead to conflicts between different uses, interests of users may go unaddressed, legal and financial issues could arise, and short-term gain could potentially be chosen over long-term investment.

### One Forest, many stakeholders (landowners, partners, and land managers)

The LHTF is collectively-owned by all of Hinesburg’s residents. Everyone must be given the opportunity to express and discuss his/her ideas and opinions, which must be balanced against those of others the long term health of the forest and the needs and interests of the community as a whole. Planning provides constructive opportunities for these discussions resulting in a management plan that can be supported by the majority of residents and management partners.

Although the LHTF is town-owned, in accordance with the conservation easement on the property, its management must be planned in consultation with, and approved by, the easement holders (see Appendix A for contact information):

* Vermont Land Trust
* Vermont Housing and Conservation Board

Its management must also be planned in consultation with, and approved by, three departments of the Vermont Agency of Natural Resources (see Appendix A for contact information):

* Vermont Fish and Wildlife Department
* Vermont Department of Forests, Parks, and Recreation
* Vermont Department of Environmental Conservation

A good plan that clearly articulates and documents how the LHTF will be used and managed is essential. This is of particular importance given the involvement of so many stakeholders and partners including but not limited to land managers, including foresters, wetland specialists, wildlife biologists, trail maintainers, and farmers who are collaborating with the Town to achieve the sustainable management of the LHTF. The plan provides important coordinated guidance for each of these stakeholders in their area of interest and expertise. The more people involved in the management and use of the LHTF, the more important it is to have a clear and comprehensive plan.

## Management Authority

Overseeing the management of the LHTF is ultimately the responsibility of the Hinesburg Selectboard. This plan is an official document that is approved by the Selectboard, as well as required partners, and will direct the decisions that this governing body makes regarding the future of the LHTF.

## Acquisition of the LaPlatte Headwaters Town Forest

The acquisition and conservation of the 301 acres of forestland, fields, wetlands, and riparian areas along the LaPlatte River that is now the LHTF was part of the LaPlatte Headwaters Initiative on the Bissonette Farm led by the Hinesburg Land Trust (HLT) and Trust for Public Land (TPL). Encompassing 627 acres south of Hinesburg Village, the LaPlatte Headwaters Initiative conserved a classic Vermont landscape of prime farmland, rolling wooded hills, open meadows, and rich wetlands. The size and diversity of the farm offered the opportunity to achieve multiple conservation and community goals.

The initiative commenced in 2004 when the HLT began discussions with Wayne and Barbara Bissonette about possibilities for conserving one of the largest undeveloped tracts remaining in Hinesburg. Over the following three years, the HLT developed partnerships with the Vermont Land Trust (VLT) and TPL in order to find funding to purchase the 627- acre farm. The acquisition of the LHTF (with an appraised value in 2007 of $1,210,000) was funded with major grants from the Vermont Housing and Conservation Board, US Fish and Wildlife Service Recovery Land Acquisition Fund, Vermont Clean and Clear Action Plan, and Wayne and Barbara Bissonette. The Town of Hinesburg also contributed directly to the funding of the project with a $100,000 appropriation voted at the 2007 town meeting, which helped leverage both public funding and additional private donations.

The LHTF was officially granted to the Town of Hinesburg from the VLT and Vermont Housing and Conservation Board in 2007. (Appendix B found in the Hinesburg land records).

## Recent Management History

Much of the management work at the LHTF has centered around the restoration of the 130+ acre Riparian STA in the north of the property. In 2008 the Town of Hinesburg entered into an agreement with the US Natural Resources Conservation Service (NRCS), and work began during the summer of 2009 on this contract, which included riparian plantings and the plugging of several ditches in this area. Planting of the Riparian STA continued in 2017 with funding from Vermont Youth Conservation Corp (VYCC)’s Watershed Program, which covered the majority of the trees planted in addition to the time of the VYCC crew. Planting in 2018 utilized funding from the Trees for Streams program, which was secured with help from the Winooski Natural Resource Conservation District, and using a VYCC crew for planting.

The only extensive forest management work that has been done was a salvage operation, capturing blowdown from a large wind event in 2012. This operation was supervised by Chittenden County Forester Keith Thompson and harvested by logger William “Bill” Torrey. This forest management activity covered only a small area in the far southern portion of the LHTF.

## Conservation Easement

VLT and VT Housing and Conservation Board hold a conservation easement on the LHTF (see Appendix B). This easement states that the Town of Hinesburg is responsible for the management of the Town Forest, which includes creating this management plan. The permitted and restricted uses outlined in the conservation easement are described within the *Permitted and Restricted Uses* in Section II of this plan.

## Access

Parking at the LHTF will be allowed at two places (Main Map). The first on the northern River Parcel will be at a parking area on the west side of Gilman Road, approximately one-half mile south of its intersection with Route 116. This area, via a packed earth and culvert crossing of the LaPlatte River, serves as access for the Wilson property. Except for permitted management activities, vehicles must not cross over that culvert, and care must be taken not to block that access.

A second parking area was created just east of the Owl’s Knoll boundary, on the west side of Gilman Road, approximately 1.3 miles south of its intersection with Route 116 (Main Map). Access to the trail system of the LHTF and adjoining conserved Fish and Wildlife managed property crosses a field that is part of a six-acre parcel that is currently owned by Amy and Mathew Sayer. The field crossing is a Town owned deeded Right of Way (ROW).

The LHTF is also accessible by trails on adjacent public and conserved properties that connect to those on the LHTF as found on the HART maps on the Town website.

## Liability

Like any town owned land in Vermont, the LHTF is afforded some protection from liability under the doctrine of sovereign immunity, as well as case law. In addition, the Town has an insurance policy for all public land and facilities. In general, the Town’s insurance provider feels that a town forest creates only a low exposure to risk. Since the land is open to the public and recreational trail use is encouraged, there will be some expectation that the trails are maintained to a certain level, and this increases the liability exposure. To limit expectations, and thus liability exposure, signs at all entry points should say, "use at your own risk."

# SECTION I: Vision and Goals

## Vision Statement

The following statement is the vision of the residents of Hinesburg for the future of the LaPlatte Headwaters Town Forest (LHTF):

*The LHTF is a special place:*

* *To enjoy, learn from, and care for the land, its forests, streams, wetlands, and inhabitants.*
* *To observe natural processes at work and model management activities to reflect those processes.*
* *To monitor changes and adapt future management in response to those changes.*
* *To explore unique and diverse natural systems and our place within them.*

## Goals

The following are Hinesburg residents’ goals for the management of the LHTF:

* + Promote educational and community uses of the LHTF that are compatible with other management goals.
	+ Maintain and enhance ecological connections between the LHTF and the larger landscape.
	+ Allow natural processes to govern the LHTF’s ecosystems and model any active management on these processes to the extent possible.
	+ Protect and enhance habitat for the endangered Indiana Bat and a diversity of other native species.
	+ Allow the LaPlatte River and its tributaries to create and adjust their natural channels and floodplains over time.
	+ Protect the water quality of the LaPlatte River and its tributaries.
	+ Restore and conserve wetlands.
	+ Promote and manage recreational uses that are compatible with other management goals for the LHTF.
	+ Demonstrate sustainable forestry practices that protect and enhance ecosystem function and health.
	+ Allow agricultural uses that are compatible with other management goals in designated areas of the LHTF.
	+ Monitor and respond to ecological changes per the monitoring plans in Appendix H.

# SECTION II: Summary of Permitted and Restricted Uses

(Refer to Appendix B, Conservation Easement, for addition detail)

Use and management of the LaPlatte Headwaters Town Forest must conform to the terms of a conservation easement granted by the Bissonette’s to Vermont Land Trust (VLT) and the Vermont Housing and Conservation Board (VHCB) in October 2007. The Town of Hinesburg, as the new owner of the property, is bound by the terms of the conservation easement (or grant of development rights) because the easement runs with the land in perpetuity. The full text of the conservation easement, Appendix B, can be found in the Town of Hinesburg’s land records.

## Permitted Uses

These uses are fully described in the Conservation Easement (Appendix B) and should be considered when any management is being planned.

1. **Recreation:** The Town has the right to use the property for all types of non-motorized, non-commercial recreation including bird-watching, cross-country skiing, fishing, hiking, hunting, snowshoeing, trapping, walking and wildlife observation. Snowmobiling, and non-motorized, mechanized recreation may be permitted if such activities are regulated in the Management Plan. Recreational uses may be more restricted within the Riparian Corridor Special Treatment Area, than on the rest of the property.
2. **Management plan Activities**: The Town may conduct activities that are reasonably necessary to carry out the purposes of the conservation easement and are permitted in this management plan. These activities may include management of vegetation and wildlife.
3. **Fields:** The Town has the right to use and maintain fields and pastures for agricultural and/or horticultural purposes, recreational, scenic or open space purposes and/or for the purpose of maintaining or enhancing wildlife habitat, unless such use conflicts with management for Indiana Bats.
4. **Forest Management:** The Town may harvest timber and conduct maple sugaring operations by tapping a minimal number of trees, but vegetation management to create a sugarbush is not permitted. The Town has the right to construct and maintain logging roads. All timber management must be in accordance with Forest and Wildlife Habitat Management Guidelines (Section II) and a project plan.
5. **Trails:** The Town may maintain trails for non-motorized, non-commercial recreational activities and may clear and construct new trails as described in this management plan. Although the easement does not exclude bicycle or horse riding from the trails, in 2017, the Town Forest Committee determined that such use shall not be permitted because the nature of the soils does not support those activities.
6. **Public Events:** The Town may conduct periodic, temporary, non-commercial, community, and public gatherings and events on the unforested portion of the LHTF depicted as “Public Events Area” on the Bissonette Parcels 1 and 3 in the Baseline Documentation Report (Appendix C). Such Events Area must be provided for in this Management Plan.
7. **Parking Areas:** The Town may construct, maintain, and replace a permeable surfaced parking area, not to exceed 0.3 acres, at the location depicted as “Parking Area” on the Bissonette Parcels 1 and 3 in the Baseline Documentation Report (Appendix C). This parking area shall be used for such uses as are permitted in the easement. Prior written approval from VLT is required for the construction of the access drive and parking area.
8. **Septic Disposal System:** The easement allows for the construction, maintenance, repair, replacement, and use of a septic disposal system on the protected property for one single- family residence to be located on the most northerly portion of Parcel 3A as “Septic Easement to benefit Lot 3A,” on the survey entitled “Survey and Subdivision of Parcel 3 of the Lands of Wayne R. Bissonette Revocable Trust and Barbara B. Bissonette Revocable Trust, Gilman Road, Hinesburg, Vermont” by McCain Consulting, Inc., dated October 11, 2007, revised 10/18/07. The system will be constructed and maintained in the area of the protected property depicted as “Septic Easement to benefit Lot 3A” on the Survey, and as depicted on the Bissonette Parcels 1 and 3 in the Baseline Documentation Report (Appendix C). VLT must be notified and all requisite permits and approvals must be obtained prior to construction of the septic disposal system.

## Restricted Uses

These and other limitations are fully described in the Conservation Easement (Appendix B) and should be considered when any management is being planned.

1. **General:** The LHTF shall be used for habitat conservation, wetland and river restoration, education, non-motorized and non-commercial recreation, natural area, open space, agricultural and forestry purposes only. Unless specified in the easement no residential, commercial, industrial or mining activities are permitted. No building or structures may be constructed, created, erected or moved onto the property, unless specifically permitted in both the easement and this management plan.
2. **Rights of Way and Easements:** Unless specifically permitted in the easement, or unless written approval for new easements is obtained from VLT, no rights-of-way, access easements, driveways, roads, or utility lines are permitted. Existing rights of way and easements are unaffected.
3. **Signs:** No signs, billboards, or outdoor advertising of any kind may be erected or displayed on the property. However, the landowner may erect and maintain reasonable signs indicating the name and ownership of the property, boundary markers, directional signs, memorial plaques, informational and interpretive signs, and signs limiting access or use. VLT and VHCB may erect and maintain signs designating the property as land under their protection, with the prior written permission of the Town.
4. **Trash:** The storage of trash, human waste, or unsightly material is prohibited unless VLT approves such storage in advance. No permission is required for the temporary storage of trash that is generated on the LHTF. The use of fertilizers and pesticides is allowed only with prior written approval of VLT and is to be regulated in this management plan.
5. **Excavation:** The easement prohibits filling, excavation, removal of topsoil, sand, gravel, rocks, or minerals or any change to topography unless the change is necessary to carry out the uses otherwise permitted by the easement and the uses required by the *LaPlatte River Corridor and Wetland Management Plan* (Appendix E). Surface mining is expressly prohibited.
6. **Subdivision or Sale:** The Town may not give, grant, sell, convey, subdivide, convey in separate parcels, transfer, mortgage, pledge, lease, or otherwise encumber the property without the prior written approval of VLT and VHCB.
7. **Motor Vehicles:** Motor vehicles may not be operated on the property except for uses specifically permitted under the easement such as wildlife and habitat management, trail grooming, maintenance, handicap access, safety or emergency purposes, and such agricultural and forestry uses as may be compatible with the primary purposes of the easement.
8. **Water Resources:** There shall be no placement, repair, removal or modification of structural elements such as revetments, levees, or fill encroachments. Nor shall there be removal or depositing of sand, gravel, or rock, or other, manipulation of natural water courses, marshes, wetlands, or other water bodies. No activities that would be detrimental to water purity, or that could alter the natural water level or flow are permitted except as reasonably necessary to carry out the uses permitted in the easement and as may be more specifically permitted or limited under the *LaPlatte River Corridor and Wetland Management Plan* (Appendix E).
9. **General Clause:** No use may be made of the LHTF that is inconsistent with the purposes of the easement. Proposed uses not addressed in the easement, or changes in existing uses, may be approved by VLT if they are consistent with the purposes of the easement.

## Restricted Uses, Woodland Special Treatment Areas (STAs)

1. **Management Goals:** Any activities planned and conducted in the Woodland STAs will focus on:
	* Conserving and improving maternal roosting habitat for the Indiana Bat and
	* Protecting the integrity and natural species composition of the natural communities in the areas.
2. **Machinery:** No machinery will be operated within the Woodland STAs, with the exception of existing or subsequently approved roads and landings, where relocation is not feasible, or where negative impacts would be increased by relocating such roads and landings.
3. **Forest Management:** Forest management activities not required for improving maternal roosting habitat for the Indiana Bat or for control of exotic species are prohibited in the Woodland STAs.
4. **Agricultural Activity:** No agricultural activity shall be conducted within the Woodland STAs.

## Restricted Uses, Riparian Corridor Special Treatment Area (STA)

1. **Management Goals:** Any activities planned and conducted in the Riparian Corridor STA will focus on:
* Restoring and preserving the natural values of the Riparian Corridor STA and
* Improving the natural functions of the STA.
1. **Consulting with Experts:** The Town must consult with the conservation partners (or their successors) when planning and implementing management activities in the Riparian Corridor STA.
2. **LaPlatte River Corridor and Wetland Management Plan:** This plan (Appendix E) addresses the planning, maintenance and cutting of vegetation, and other activities related to maintaining and improving ecological processes and must be a component of this management plan. It may be amended or altered in response to changes in conditions in the STA or the state of scientific knowledge.
3. **Agriculture:** No agricultural use (except what is provided for in the *LaPlatte River Corridor and Wetland Management Plan* – Appendix E) is permitted.
4. **Recreational and Educational Use:** The Town has the right to use the STA for all types of non-motorized, dispersed recreational and educational purposes that are consistent with the purposes of the easement and this management plan’s vision and goals. Non-commercial snowmobiling trails are permitted only as outlined in this management plan. Trails are permitted to be cleared for non-commercial skiing, walking, and snowmobiling as specified within this management plan or other project plans. Footpaths must appear natural and be a compact earthen surface only. Water bars may be built as needed. Boardwalks and other trail-related structures are permitted except as excluded by the conservation easement.

# SECTION III: Site History and Biophysical Characteristics

## Landscape Context

The 301-acre LaPlatte Headwaters Town Forest (LHTF) is a rich and diverse area of forests, streams, wetlands, and agricultural fields, with trails and woods roads connecting to adjacent properties, lying west of Route 116 and Gilman Road and beginning one-half mile south of the village of Hinesburg. Orthophoto and topographic maps depicting the property are attached to this Management Plan.

LHTF is unusual in the Champlain Valley as it is quite rugged in places and has large areas of forest, some of which may never have been cleared. The woods on the LHTF and the adjacent lands are vitally important as wildlife habitat and travel corridors, and they also harbor many interesting natural communities and species that are generally not found just a few miles to the east in the Green Mountains.

The LHTF also forms the headwaters of the LaPlatte River and includes some small tributaries and wetlands, as well as a longer stretch of the main body of the River where it flows through and along the northern part of the property.

## Land Use History

### Pre-European Settlement

It is very likely that Native American groups, such as the Abenaki, used the land at the LHTF for hunting and possibly for other purposes, such as seasonal camps. Although no direct evidence of Abenaki presence has been found at the LHTF, it does not mean that it is not there. This is an area that warrants further exploration.

### Colonization and Early Agriculture (1762 - 1860)

The land in Hinesburg was originally divided into 50- and 100-acre lots after Governor Wentworth of New Hampshire signed the charter for the Town in 1762. Settlers began purchasing these lots, moving to Hinesburg, and clearing the land for farming. Over the years, farms were bought and sold, rented, divided, and consolidated. Historical documents, such as diaries, deeds, agricultural censuses, photos and maps help us piece together the stories of previous inhabitants by providing information about who was living on the land and how they were managing it. This research can be easier to do for some pieces of land than others. Some farms stayed in the same family for generations with few changes in property boundaries. Others, such as the LHTF, have more complicated histories.

No one has yet traced the ownership of the land at the LHTF back to it its original owners. However, because it is in the valley and not far from the village, it is likely that the land was settled and cleared early in the Town’s history. Whereas a large portion of the LHTF is currently forested, for much of the past 200 years, it was probably open fields and pasture. It is likely that during the early and mid1800s, its owners raised sheep for wool, which they processed at the carding mill and later sold to the woolen mill in Mechanicsville. After the region-wide decline in the woolen industry and closing of the woolen mill in Mechanicsville in the latter part of the nineteenth century, farmers in Hinesburg probably followed the regional trend of converting from raising sheep for wool to raising dairy cows.

###  Growth and Emergence of Modern Vermont (1860 - 1930)

The most detailed and accessible historical information for land ownership and use in Hinesburg exists for the period during the late 1800s. For this time period, it is relatively easy to reconstruct the stories of who was living on the land and what they were doing at the time by using a combination of historical records, such as deeds in the town hall and U.S. agricultural censuses, and maps, such as the 1869 *Atlas of Chittenden County*, by F.W. Beers (referred to as ‘the Beers *Atlas*’). Based on information from these sources, and remnants of old roads and stone walls found on the property, it is likely that the Owl’s Knoll falls in parts of the original Lots 16, 18, 115 and 117 as they are shown on the Beers *Atlas*.

According to the deed records at the Hinesburg Town Clerk’s Office, in the late 1800s and into the early 1900s, Michael and Margaret Gaffney farmed Lot 16. The deeds also show that during this time, the Gaffney farm was bordered by the Charles H. Weed farm to the south and west, the Noble. L. Partch farm to the west, and the O. Cogan farm to the north. The Gaffney farm probably included what is currently the hay field east of Owl’s Knoll, as well as part of Owl’s Knoll’s eastern forest. The Tenth U.S. Agricultural Census shows that, in 1879, the Gaffneys were only farming 36 acres of land. This was a relatively small farm, especially compared to their neighbors, the Weeds and the Nobles, who each owned more than 200 acres of land. The Census also shows that, in 1879, the Gaffneys, like many Vermont farmers at the time, kept dairy cows and made butter on their farm to sell in town or to ship to cities. They also grew corn, oats and potatoes for their own use, had a small orchard, and cut firewood for cooking and heating off of a woodlot on their land.

The western part of Owl’s Knoll, including the two rocky hills, could have been part of the Noble L. Partch Farm in the late 1800s. With a much larger farm than the Gaffneys, the Tenth U.S. Agricultural Census show that the Partches employed farm laborers and had enough dairy cows to sell milk to the creamery in town in addition to making butter on their own farm. The Partches also produced a small amount of maple sugar in 1879 (50 pounds), which would have been produced from a sugarbush somewhere on their property. It is possible that the sugarbush was located on the rich, steep slopes of the hills on the LHTF where there are currently many sugar maples.

We do not know what happened on the land at the LHTF in the early part of the twentieth century. One guess is that its owners continued to farm it and slowly abandoned pieces of it over time as farming generally declined throughout the state. As they were abandoned, fields and pastures would have slowly returned to forest and eventually been logged as they matured. A tree core taken from a white cedar growing on the top of one of the knolls estimated the tree to be about 90 years old. White cedars only establish in sunny, open sites. Therefore, it is possible that dairy cows were still grazing on even the steepest, rockiest part of the LHTF in the early 1900s. However, it is also possible that the hilly pasture at the LHTF was abandoned earlier and that the cedars established after a major disturbance, such as a fire, wind storm, or logging event, all of which could have created enough light on the site for the cedars to grow.

### The Modern Era (1930-present)

An aerial photo taken in 1942 shows that, by the mid-twentieth century, much of the LHTF had reverted to forest, except for the pastures and hay fields along the LaPlatte River in the northern part of the property. The land on either side of the road that is currently the trail through Owl’s Knoll was still open in 1942 as well, although the aerial photo contains a few dark patches of trees or shrubs which indicate that the land was probably abandoned shortly before that time. In the photo, there is also a building on the site, the remains of which are still visible today. This structure may have been a sugarhouse at one time as there is still a rusting evaporator pan on the site, but it also could have been used as a seasonal camp.

The 1942 aerial photo also indicates that Roy Hines had a farm on Gilman Road at this time. Although much of the Hines farm was in the fields on the east side of Gilman Road, his farm also included the eastern part of Owl’s Knoll. Deeds show that Roy’s neighbors Wayne and Barbara Bissonette bought the Hines farm in 2001, which included this part of Owl’s Knoll.

Although we can see that Owl’s Knoll had mostly returned to forest by the mid-1900s, humans have continued to play a role in its history. Based on the many stumps that are evident throughout the forest, it is apparent that all parts of the forest at Owl’s Knoll have probably been logged at least once within the past century. This cutting has impacted the current forest composition and structure through the preferred removal of or management for certain species of trees.

## Physical Site

### Biophysical Region and Climate

The LHTF lies on the eastern edge of the Champlain Valley. Therefore, the climate and weather it experiences can be very different on a seasonal and even daily basis from that in the higher foothills of the Green Mountains on the eastern side of town. On average, places such as the LHTF in the Champlain Valley experience warmer temperatures, more growing days and less precipitation than places in the higher elevations of the Green Mountains. As a result, there are several plant and animal species in Vermont that are restricted to the milder climate of the Champlain Valley. For example, bitternut hickory (*Carya cordiformis*) and white oak (*Quercus alba*) grow at the LHTF, but are uncommon in forests at higher elevations on the eastern side of Hinesburg.

### Topography

Topographically, Hinesburg is divided almost evenly in half. The Champlain Valley makes up the western side of town and the foothills of the Green Mountains make up the eastern half. A major geologic feature, the Hinesburg thrust fault, runs in a north-south line through the middle of the town marking the boundary between the western valley and the eastern hills. This fault was formed about 350 million years ago during the closing of Iapetus Sea.

The Iapetus Sea closed due to the convergence of tectonic plates. The movement of the plates created enough force to break the bedrock at the bottom of the sea and push it westwards, thrusting older rock up over younger rock. In Hinesburg, the bedrock on the eastern and western sides of the thrust fault is very different; the eastern valley, where Owl’s Knoll is located, is generally underlain by softer sedimentary rocks, such as sandstones, dolostones and limestones, and the western hills are generally made of harder metamorphic rocks, such as schists and phyllites. The movement of tectonic plates created the tremendous force necessary to break, move, and, in some cases, metamorphose the bedrock.

Even though the LHTF is part of the Champlain Valley, it is not flat. The landforms on the property were formed by the same forces that created the Green Mountains and the Hinesburg thrust fault. The three main oblong, north-to-south-running hills, or knolls, at the LHTF are smaller scale versions of Mount Philo and Snake Mountain, which were formed as the bedrock in the region was thrust upward and westward.

In general, the landforms at the LHTF are defined by the underlying bedrock. There are three rocky knolls, or hills, where the bedrock is at or just below the surface on the western side of Owl’s Knoll (Parcel 3) and another on the River Parcel. The topography, or shape of the land, on the eastern side of Owl’s Knoll and the fields and meadows of The River Parcel is less hilly because most of the bedrock is buried deep under thick layers of mineral deposits, such as sand and clay. In this part of Owl’s Knoll, the bedrock occasionally juts out as small knolls or outcrops. There are several impressive cliffs throughout the LHTF that are good places to get a closer look at the bedrock.

### Bedrock Geology

The bedrock at Owl’s Knoll is primarily Winooski dolostone, with some Monkton quartzite in the western part of Owl’s Knoll (Parcel 3). Dolostones are relatively soft sedimentary rocks that form when shallow-sea marine creatures or bacteria deposit calcium carbonate, often in the form of shells or exoskeletons, on the seafloor as they die. The calcium carbonate layers build up over time and are eventually cemented into limestone or dolostone. Dolostone can also form from limestone as some of the calcium in the limestone is replaced by magnesium over time. The dolostone at Owl’s Knoll was deposited about 540 million years ago off the shore of the ancient continent, Laurentia, in a tropical sea called the Iapetus. Monkton quartzite is a slightly older rock formation containing layers of different sedimentary rocks, including dolostone, sandstone and mudstones. If you look closely at the lighter bands of sandstone that are exposed at the south facing cliff on the western knoll, you can see the individual grains of sand that make up the rock!

### Surficial Geology

As described earlier, there are many places at the LHTF, where the bedrock is covered by layers of loose mineral deposits, or sediments. These sediment deposits, which were laid down by the forces of water, wind or glaciers, make up the surficial geology of the site. The low spots between the knolls in the western part of the property and the majority of the northern part of the property are covered by layers of fine clays and silts which are overlain in some spots by coarser sands.

Where did these sediment deposits at the LHTF come from? As in the rest of New England, glaciers have played an important and relatively recent role in defining the surficial geology at the LHTF. During the last ice age that lasted from about 2.5 million years ago to 14,000 years ago, at least a mile of ice covered the LHTF and all other places in Vermont. As the ice sheet moved south, it helped to grind down the mountains and carve out the valleys of Vermont and picked up huge amounts of different-sized sediments along the way. When the climate began to warm, the glaciers started to melt, leaving behind the sediment they had collected on the bare, rocky landscape. This mix of sediments, from boulders to clays, is called glacial till. Glacial till makes up the surficial geology of the Green Mountains and is the source of stone that people used to build the miles of stone walls that still criss- cross the hills of Vermont today.

Glacial till was deposited in the valleys too, but it was quickly covered with other sediments. In addition to till, the glaciers released tremendous amounts of water as they melted. This water filled the valleys of Vermont creating large glacial lakes. 15,000-14,000 years ago, the Champlain Valley was flooded by Glacial Lake Vermont up to 600 feet in elevation. The highest point at the LHTF is only about 540 feet. Therefore, all of the land at the LHTF was submerged under the waters of Lake Vermont. As the glaciers continued to melt, sediments were carried into the lake by runoff and rivers. Heavier particles, such as sand, settled out close to shore and smaller, lighter particles, such as clay and silt stayed suspended in the water column until they reached calmer, deeper water, further from shore. The clay sediment layers at the LHTF indicate that the area was under relatively deep water at one time. The sandy layers over the clay were deposited in shallower water closer to shore, much like a beach (Figure 8). This pattern indicates that the water levels of Lake Vermont periodically dropped as different drainages opened up for the lake.

Perhaps you can imagine sitting on the recently-exposed rocky tops of the hills at the LHTF with the waters of Glacial Lake Vermont extending to the west. Once the lake waters receded, the clays, silts and sands that were deposited on these knolls when they were under water, probably quickly eroded off the hills’ steep slopes, leaving behind larger pieces of till and exposing the bedrock. If you climb up any of the knolls on the property, you will probably find some loose pieces of rock that are not dolostone or quartzite. These pieces of stone are probably till that was eroded from another place and carried here by the glaciers.

### Soils

Because of the diverse topography and geology of the LHTF, there are also many different soils on the site (Soils Map). The following table summarizes the characteristics of the main soil types shown on the Soils Map of Owl’s Knoll. For more information on each of these types, please refer to the Chittenden County Soil Survey.

***Table 1.*** *The soil types at Owl’s Knoll and their associated characteristics*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Soil Type** | **Textures/ Layers** | **Depth (inches)** | **Drainage** | **pH** | **Slope** | **Parent Material** | **Soil Survey name and code** |
| Stony Loam | Extremely rocky mixed with loam | Shallow 7+ | Excessively drained | 5.5-8 | Gently sloped to steep | Quartzite or Dolostone bedrock | Farmington Series (FaC and FaE) |
| Fine Sandy Loam | Thick layer of fine sand over silt/clay | Somewhat shallow <40 to silt/clay | Well drained | 5.5 | Flat to steep | Glacial Lake sediments | Hinesburg Series (HnB and HnD) |
| Silt Loam | Fine silty or sandy loam over clay layer | Somewhat shallow<40 | Poorly drained | 5.5 | Flat | Glacial Lake sediments | Munson Series (MyB) and Scantic Series (ScB) |
| Silt or sandy loam over clay | Silty layer over clay layer | Somewhat deep 40+ | Poorly drained | 4-4.5 | Steep (25-60%) |  | Terrace Escarpment, silty and clayey (TeE) |
| Gravelly fine sandy loam | Loam over sand with gravel mixed throughout | Deep 72+ | Excessively drained | 4-4.5 | Moderately sloped (12-20%) | Unsorted sediments from glacial runoff | Stetson Series (StC) |

## Water and Wetlands

Water has been, and continues to be, a defining force at the LHTF. In addition to being directly essential for the survival for all living things, water is a major transport system, carrying sediments, nutrients, seeds and animals, such as aquatic invertebrates. Because the LHTF is part of the headwaters of the LaPlatte River, the water here is only beginning its long journey downstream. The water drains down its low hills into a network of small streams and gullies that join the main stem of the LaPlatte on The River Parcel eventually flowing into Shelburne Bay 14 miles to the west. The waters in Shelburne Bay provide drinking water for more than 68,000 people in Chittenden County (Trust for Public Lands, 2006).

The LHTF’s long history of agricultural use has had a significant impact on the flow of water and on wetland communities on the property. Prior to agricultural use, The River Parcel in particular looked very different. It is likely that most of The River Parcel was, at one time, a mixture of forested, shrub, and open wetlands. However, the main stem of the LaPlatte River that flows through The River Parcel was ditched and the channel was straightened in order to drain the land for use as fields, pastures, and hay meadows. The LaPlatte River in this area was also regularly dredged to prevent flooding of the site. The result of this past activity is a series of straightened streams, a straightened and deeply incised river, and a near monoculture of reed canary grass on the property. A review of historic aerial photographs taken in 1942 indicates that at one time meandering streams crisscrossed the property. These streams likely flooded the fields on a regular basis and the LaPlatte River likely had access to its floodplain.

### LaPlatte River Geomorphology

Steam geomorphic assessments were conducted on the section, or reach, of the LaPlatte River that runs through The River Parcel. The following paragraphs summarize the results of these studies, which are presented in more detail in the LaPlatte River Corridor and Wetland Management Plan written by Arrowwood Consulting in 2006 (Appendix E).

On the LHTF, the LaPlatte River is a low gradient stream running through a very broad, unconfined valley setting. This reach of the LaPlatte River appears to have been entirely straightened. There are several berms along the left bank in some areas, which were part of the effort to drain the surrounding land to create arable fields and pastures. As of 2008 , channel sinuosity is low due to extensive straightening, although the upstream most section has some bends. The riparian buffer for this reach is in poor condition, being only 5-25 feet wide with mostly shrubs and saplings.

The straightening and resulting shortening of the river’s path acted to increase the speed of the water flowing through the riverbed since the water could not disperse into its floodplain. Faster moving water has a greater erosion force. Therefore, fast-moving flood waters

eroded the river bed deeper and deeper over time. The deepening of these channels led to the speeding-up of the flow of water through the upstream channels on the LHTF at Owl’s Knoll as well, which is probably part of the cause of the ongoing erosion of the stream heads at the site. This continuing erosion is particularly noticeable at the point where the trail crosses the head of the main stream at Owl’s Knoll. Just downstream of the crossing, the streambed has been filled with a large number of tires. These tires were probably put into the streambed by previous landowners to slow the flow of water and reduce the rate of erosion. However, since the time that the tires were added, the streambed has continued to erode from underneath and upstream of the tires. This same erosion process is also deepening and lengthening the gullies in the forest on the eastern side of Owl’s Knoll.

Currently, there is evidence that the river channel is now starting to grow wider, rather than deeper, which is part of the natural change in the channel’s morphology as it evolves toward a more stable dimension, pattern and, profile where new floodplains will develop. The actions in the *LaPlatte River Corridor and Wetland Management Plan* (Appendix E) are designed to allow this evolution process so that the river channel can return to pre-straightening equilibrium conditions more rapidly.

Since the implementation of the LHTF management plan, as of this 2019 update of the plan, several activities have been completed in an attempt to facilitate the return of the LaPlatte river to it natural geomorphic condition. Those activities include the excavation of shallow depressions (ponds) in the floodplain, installation of ditch plugs in tributary channels, and the planting of hundreds of native trees and shrubs in the riparian corridor. The degree of success of these actions may not be apparent for many years, although some of the plantings have reached significant size and some beaver activity is apparent.

### Wetlands

Currently, there are only a few small examples of wetlands on the LHTF: a cattail marsh at Owl’s Knoll and part of a Red Maple (*Acer rubrum*) -Green Ash (*Fraxinus pennsylvanica*) Swamp on The River Parcel that extends onto an adjacent property. However, the soils in the fields and meadows of The River Parcel indicate that most of these areas were once wetlands before they were drained for agricultural use.

The soils present on The River Parcel suggest that a combination of natural community types was likely present prior to agricultural activity. The areas of Limerick soils (historic floodplain of the LaPlatte River) were likely dominated by riverine floodplain forests (such as the silver maple (*Acer saccharinum*)/sensitive fern (*Onoclea sensibilis*) forest type) and secondarily alluvial shrub swamps and alder (*Alnus*) swamps. Anecdotally, the previous landowner suggested that there were extensive alder swamps present on the property prior to hydrologic manipulations. The areas with Scantic silt loams may have been characterized by red maple/black ash (*Fraxinus nigra*) swamp or possible conifer (*Pinophyta*) swamp. Adjacent undisturbed wetland areas are dominated by white cedar (*Thuja occidentalis*), supporting the proposal that the disturbed property may well have contained areas of conifer vegetation too.

The small area of upland soils on The River Parcel (Winooski fine sandy loam), was most likely characterized by riverine floodplain forest (such as silver maple/ sensitive fern).

It is likely that this large parcel had a combination of community types: riverine floodplain forest along the LaPlatte, alluvial and alder swamps along the meandering streams, and pockets of sedge meadow or emergent marsh in wetter depressional areas.

## Forests

### Natural Communities

Plant communities on a particular site change over time through the processes of succession and disturbance; this is especially true in places like the LHTF where humans have had major impacts on the forest by clearing land for agriculture and altering the forest’s composition through practices such as logging. With or without human management and use, most of the forest stands that we see today will look very different in 50 or 100 years. For example, the pines (*Pinus*) in the pine plantation will die eventually and a new suite of tree species will likely establish and take over, changing structure and composition of that part of the forest.

Because conditions are ever-changing, sites are classified into natural communities based on what exists at the time of the inventory and also on the potential of the site. Classifying the forests at the LHTF into natural communities is a process that evaluates the current vegetation and physical site and makes a prediction of the type of plant community that will persist on the site over time in the absence of human disturbances, such as logging. Each natural community has its characteristic place on the landscape, such as on a hilltop or on a steep, east-facing slope.

As documented in site visits and reports by Liz Thompson, VLT Director of Conservation Biology, and UVM Field Naturalist Kristen Sharpless, in 2006 several different forested natural communities are found on the LaPlatte Headwaters Town Forest. Kristine Sharpless documented the natural community of the forest in the STA that includes the Owl’s Knoll in the 2007 publication A Local Educator’s Field Guide to Owl’s Knoll, Since this document is an inventory of the natural community of the forest as of 2006 in the area of the Owl’s Knoll it is included as Appendix G of this document

### Natural Communities of Statewide Significance and STAs

Two natural community types on the LHTF are of statewide significance: the Transition Hardwood Limestone Talus Woodlands and a portion of a Red or Silver Maple (*Acer Saccharinum*)-Green Ash Swamp. These communities are significant because they are rare in the state of Vermont and they are sizable examples in good condition. Because of their significance, the swamp and several patches of the Transition Hardwood Limestone Talus Woodland are worthy of the highest level of protection possible and, as such, are protected by a Woodland Special Treatment Area clause in the conservation easement (Appendix B).

##### Transition Hardwood Limestone Talus Woodland

This natural community is found on the steepest slopes at the LHTF, sometimes below a cliff, sometimes not. Many of these steep slopes are very rocky where calcium-rich talus is at or just below the surface. The soils on these steep, talus hillsides are unstable with frequent local slides. Where the soil is very thin and the talus and the site is regularly disturbed, the trees are large and widely scattered and in some places there are few shrubs, which results in an open, glade-like feeling. On the slopes where the soils are deeper and more stable, the trees grow tall, straight, and closer together. Depending on how much soil has accumulated, the vegetation is sparse to quite dense in places. Refer to Owl’s Knoll Stand 7, and parts of stands 1, 2, 4, 5, 6, 8, 9 and 14 in Appendix G

##### Red or Silver Maple-Green Ash Swamp

A portion of a Red or Silver Maple-Green Ash Swamp occurs on The River Parcel and continues onto an adjacent property. This natural community occurs in a wet depression near the meadows where its soils are flooded during the spring and remain saturated during the rest of the growing season. It is also of statewide significance and warrants special protection. The health of this natural community is highly threatened by the presence of invasive exotic plants on this site.

### Other Natural Communities

##### Northern Hardwood Forest

The northern hardwood forest, dominated by maple, birch and beech trees, is by far, the most common natural community throughout Vermont, especially in cooler, moister, poorer sites, such as the eastern hills of Hinesburg. However, this natural community becomes less common in the Champlain Valley where yellow birch (*Betula alleganiensis*) and American beech (*Fagus grandifolia*) are often outcompeted by southern tree species, such as hickory (*Carya*) and oak (*Quercus*) that are better adapted to milder climates and tree species that are well-adapted to rich sites, such as basswood (*Tilia*). Refer to Owl’s Knoll Stand 3 in Appendix G.

##### Mesic Maple – Oak – Ash - Hickory

The mesic maple-oak-ash-hickory forest is more common in the milder Champlain Valley than in the colder hills and mountains of Vermont. On these valley sites, beech and birch, which are common in Northern Hardwood Forest natural communities, tend to be out- competed by more southern species, such as hickory and oak. Refer to Owl’s Knoll stands 4 and 5 in Appendix G.

##### Clayplain Forest

This natural community probably dominated the forests of the Champlain Valley before extensive land-clearing. However, because this natural community grows on fertile, clay soils, the sites it would grow on have continued to be used as farmland in the Champlain

Valley, making clay plain forests very rare in Vermont today. The silty-clayey soils that the pine plantation is currently growing on would support a variety of oak species, as well as hickories and hemlock (*Conium maculatum*). However, because the pine plantation is so different from what probably grew on the site before the land was cleared and then re-planted and no oaks currently grow on the site, it is difficult to know what plant community would eventually establish on the site after many years. However, based on the soil type, topography and climate, the clayplain forest is a reasonable guess. Refer to Owl’s Knoll stand 16 in Appendix G.

##### Hemlock - White Pine (*Pinus Strobus*) – Northern Hardwood

The fine sandy, well-drained soils make it likely that white pine will persist in these forests along with northern hardwood species such as red maple and birch that can tolerate less-rich soils. Hemlock also seems to do well on the site and can persist for long periods of time in the shade of other trees. Because these sites are all north-west facing, they may be slightly cooler than other places on the property, which favors hemlock. Refer to Owl’s Knoll stands 10, 12, 13, and 15 in Appendix G.

##### Hemlock – Northern Hardwood

This variant of the northern hardwood forest is similar to the one listed above, but does not include white pine. Because this site contains numerous shaded gullies, hemlock is likely to be favored over pine. In addition, these gullies have exposed deeper silt and clay layers below the sandy soils that are mapped in these areas. Hemlock tolerates these heavy, poorly- drained soils much better than pine. Refer to Owl’s Knoll stand 14 in Appendix G

## Invasive Species

Non-native invasive plant species are a concern for the future health and function of the forested and wetland communities at the LHTF. These plant species, such as European honeysuckle (*Lonicera periclymenum*) and reed canary grass (*Phalaris arundinacea*), establish quickly on disturbed sites, out compete native species, and often degrade the quality of habitat for many native wildlife species. They also often spread quickly and can be very difficult to manage and remove once established.

In 2016 a group of UVM students from the Rubenstein School of Environment and Natural Resources NR 206 course inventoried the LHTF for invasive exotic plants. In forested areas they found pockets of common buckthorn (*Rhamnus cathartica*) and shrub honeysuckle (*Lonicera* spp.) in the southeastern portion of the southern parcel and around the Bissonette meadow, in some areas the populations of these species were dense, and representing a serious threat to the continued health and viability of the forests in these areas.

In the Riparian STA area referred to here as the “River Parcel,” this 2016 report, and a subsequent report created by an NR 206 group and The Nature Conservancy (TNC), detailed extensive interference from reed canary grass and a more minor amount of poison parsnip (*Pastinaca sativa*). Of these, reed canary grass is causing extensive interference to the revegetation of historic floodplains at the LHTF, making it nearly impossible for infested areas to revegetate naturally.

## Wildlife and Habitat

### Indiana Bat: An Endangered Species

*The following text is adapted from the* Indiana Bat Management Guidelines *the full text of which can be found in Appendix D.*

This Indiana Bat was found by Vermont Fish and Wildlife Biologists on the LHTF property during the summer of 2006. The Indiana bat (*Myotis sodalis)* is a state and federally endangered bat the size of one’s thumb and weighing less than three pennies (~ 7 grams).

Like most bats in Vermont, Indiana bats are long-lived (> 20 years) and produce only a single pup each summer. Indiana bats are found throughout the central and northeastern United States.

Throughout its range, the Indiana bat occupies a patchy landscape of forest woodlots and agriculture, like those on the LHTF. The bat roosts and forages within the forested portions of its range.

##### Population Abundance and Distribution in Vermont

Research since 2001 indicates that the Champlain Valley of Vermont provides important summer range for Indiana bats. Female Indiana bats have been tracked from a New York hibernaculum containing 9000 Indiana bats to several sites in the Champlain Valley, ranging from Orwell to Hinesburg. By 2007, a total of 10 maternity colonies (some with more than 300 individuals/colony) have been identified in Vermont. These colonies make up New England’s only known summer maternity range, and include one of the largest known maternity colonies across the species’ range.

Ensuing surveys have also captured male Indiana bats as far south as West Haven. Surveys conducted outside of the known distribution, yet still within the Lake Champlain Valley and Valley of Vermont Biophysical Regions have not located any Indiana bat maternity colonies.

A small number of Indiana bats have historically been found in Vermont hibernation sites, while the majority of Vermont's summer population overwinters across the lake in New York state

Since 2008 White-Nose Syndrome (WNS) has caused significant decline in Indiana Bat populations in the Northeast. Recovery of the species requires diligence in the conservation and enhancement of Indiana Bat habitat. In particular, habitat on the LHTF will be critical to restoring the species to its recent distribution.

##### Endangered Species Status

The Indiana bat was first officially listed as federally endangered in 1967 (the bat was officially listed as one of Vermont’s first endangered species in 1972), several years prior to the establishment of the federal Endangered Species Act (ESA). Since that time, Indiana bat populations have continued to decline from an estimated 600,000 to now less than 350,000 animals. It is notable that populations continue to decline in the southeastern United States, but have been stable or slightly increasing here in the Northeast. Furthermore, the Indiana bats found in the Northeast may be very important to the species recovery given two facts –

1. Vermont is at the species’ northeastern-most edge of its range.
2. Indiana bats in the Northeast appear to be genetically distinct from other portions of the species’ range.

The bat is protected from taking (i.e., harming, killing, harassing) both at the federal and state levels. Although the Vermont endangered species law specifically exempts normal silviculture practices, the US Endangered Species Act does not. (Note: the Public Service Board Order regarding chip harvesting for energy does require endangered species takings and habitat to be addressed). The forest management activity most vulnerable to killing Indiana bats is the cutting of trees within which bats are currently roosting. There are numerous reports of northern long-eared bats found within felled trees.

##### Habitats

The Vermont Fish and Wildlife Department recognizes two specific critical habitats that are important to the survival and productivity of Indiana bats: hibernaculum habitat and maternity colony habitat. Maternity colony habitat is the only habitat located on or near the LHTF and is described below.

###### Maternity Colony Habitat

Until recently, little has been known about the summer habitat of Indiana bats. Female Indiana bats emerge from hibernation and travel, potentially great distances, to their summer range. Bats emerge with stored sperm, and quickly become pregnant. The females appear to migrate to their maternity habitats, although they are initially more dispersed, and gather into larger maternity colonies as parturition approaches. In Vermont, maternity colony habitat appears to be focused in the southern portions of the Champlain Valley, where the lower elevations provide for warmer, drier summer seasons. The forests at the LHTF provide the northernmost know maternal colony habitat in Vermont.

Maternity colonies congregate in primary and secondary (the latter often termed “alternate”) roost trees. The primary roost trees are generally occupied by many bats (as many as 200+ in some cases). Research from Vermont and elsewhere on the characteristics of primary and secondary roost trees indicate that they are:

* + Live shagbark hickory (C*arya ovarta*) or black locust (*Robinia pseudoacacia*) trees, or dead or dying trees (in the earlier stages of decay) of any species
	+ Possess exfoliating bark under which bats roost
	+ Greater than 8-10 inches dbh
	+ Dominant or co-dominant in the forest stand
	+ Receive some level of direct solar radiation
	+ Generally within 20 feet of forested cover

On the LHTF, Indiana bats have been captured using mist nets in the pine plantation area of Owl’s Knoll in 2006 and 2008, and a roost tree was documented in another part of the forest near the plantation (Indiana Bat Survey Report, July 2007). In 2008, Vermont Fish and Wildlife Department biologists documented a colony of 300+ bats in a roost tree near the LHTF.

Research from other areas also indicates that the roost trees are often clustered on the landscape, and may exist in areas having a good supply of snags. It is also noteworthy that directly after emergence, female bats have been found to roost in trees as small as 8 inches diameter breast height (dbh).

One element of maternity colony habitat is suitable foraging areas where bats feed on insects. Radio telemetry work in Vermont suggests bats forage within approximately 2.5 –

2.75 miles of their roost trees. There is little published information on the importance and characteristics of quality foraging habitat in and around the maternity roost trees. However, research does indicate that Indiana bats prefer to forage and travel in forested stands and along forest edges/hedgerows. Open fields are generally avoided during foraging activity.

General forest bat research suggests that high quality foraging habitat is a relatively open stand condition below a main canopy of small sawtimber and larger size classes. Mature and over-mature uneven-aged stands that exhibit structural diversity and occasional gap openings can provide similarly high quality roosting and foraging habitat. In contrast, stand-wide sapling to pole size classes are less favorable as these limit bat flight and foraging to the stand edge or above the canopy. While it is not necessary for the entire Town Forest to be dedicated to suitable roosting and foraging habitat, it is important that these habitats are available in an interconnected network of forest patches and riparian areas.

## Other Wildlife Species

Although a systematic wildlife inventory of the entire LHTF has not yet been undertaken it is known to be the home of a diversity of other wildlife species including mammals, birds, amphibians, reptiles, insects, and other invertebrates. A list of potential and confirmed wildlife species was generated by Kristen Sharpless in 2006 during her fieldwork on Owl’s Knoll and is recorded in Appendix F of *A Local Educator’s Field Guide to Owl’s Knoll*.

Audubon Vermont conservation biologists Steve Hagenbuch and Mark LaBarr also conducted a forest, grassland, and shrubland bird habitat assessment of the LHTF during 2008 (Appendix F). This assessment summarizes the importance of Vermont’s habitats for breeding birds, identifies some key responsibility species that should be the focus of conservation and habitat enhancement efforts, lists species identified at the LHTF, and makes some management recommendations for how to enhance habitat on the LHTF.

## Landscape Context and Connectivity

Since wildlife do not observe property boundaries, in general, it will be important to consider the LHTF’s place within the larger landscape and how it connects to other habitats within the area and region when thinking about wildlife habitat management. Many of the wildlife species documented on the LHTF only spend part of their lives on the property and must travel to other areas during seasonal migrations, to forage for food, to mate, and/or to disperse.

## Stand-Level Habitat Features and Attributes

A comprehensive inventory and assessment of wildlife habitat has not yet been conducted at the LHTF. When designing a wildlife habitat inventory and assessment or proposing forest management activities the following habitat features and attributes should be considered:

### Horizontal and Vertical Forest Structure

A healthy forest ecosystem typically consists of both horizontal and vertical stand or forest structure. Vertical forest structure refers to the presence of different forest layers including litter layer, ground or herb layer, shrub layer, understory, midstory, and canopy. Horizontal forest structure refers to the presence of patches of forests simultaneously occurring in different successional stages across the landscape (i.e. regenerating forest patches adjacent to mature forest patches). Wildlife species use and often require different layers of the forest and a variety of age classes for foraging, nesting, and denning. Therefore, a forest that exhibits structural diversity is likely to support a wide array of wildlife species.

### Early Successional Habitat

Early-successional habitat has a canopy closure of <30% and is primarily comprised of shrubs and saplings. It provides nesting and foraging habitat and cover for a diversity of wildlife species, including forest song birds and bats. A small patch of early-successional habitat was created by recent logging near the small wetland at Owl’s Knoll and the blowdown area salvaged in 2012. A chestnut- sided warbler, which breeds in early-successional forest, was heard singing in this area during the summer of 2008 (Audubon Habitat Assessment, Appendix F).

Regenerating floodplain forest in the River Parcel will likely provide more early-successional and shrubland habitat over time.

### Mature Forest Habitat

Most of the existing forest at the LHTF is currently closed-canopy in the “stem exclusion” successional stage where there is little understory or regeneration. As forests develop and are subject to natural disturbances (or active management) it is likely that their structural diversity will increase. Forests featuring mature trees but also a dense understory and midstory are particularly important for several breeding forest birds that are common within our region, but whose populations are declining globally (i.e. black- throated blue warbler, which has been documented at the LHTF, Audubon Habitat Assessment, Appendix F). Other bird species, such as the scarlet tanager, nest and forage in the forest canopy. The transition of these closed-canopy forests towards a more late-successional-type structure can occur naturally (with invasive species control) or be facilitated by active forest management

## Native Plant Species Composition

Wildlife species rely directly and indirectly on native plants for food and shelter. For example, yellow birch supports a diversity of native insects and is the preferred foraging tree species for many songbirds in the northern forest. Diverse, healthy, native forest communities are most resilient to disease and pest outbreaks, and as a result provide the best habitats for wildlife species. See the *Forest Stand* and *Natural Communities* sections for descriptions of the forest types and communities at the LHTF.

### Downed Woody Material, Snags, and Cavity Trees

##### Downed Woody Material

Downed woody material includes logs, large limbs, stumps, upturned roots, and smaller branches that have fallen to the forest floor and are in the process of rotting. Leaves, small branches and limbs quickly recycle nutrients back into the soil and can help improve water quality be trapping sediments and reducing erosion. Larger rotting logs and stumps decay more slowly and are used by wildlife for nesting and cover, thermal and drought refuge, places to find and store food, look out, drumming, preening, and sunning sites, and as natural bridges to cross openings and streams. Woody material that falls into streams can help to create pools and riffles that create habitat for a diversity of aquatic macroinvertebrates and fish. Examples of wildlife species that have been documented at the LHTF that rely on downed woody material include eastern newts (*Notophthalmus*), wood frogs (*Lithobates silvaticus*), and ruffed grouse (*Bonasa umbellus*).

Downed woody material is present at Owl’s Knoll in the greatest abundance in Stands 12, 13, 15, as well as on knoll tops (Stands 2 and 8) where large old trees are in the process of decay. During the course of any active forest management, steps should be taken to leave as much downed woody material on the forest floor as possible, and to take steps to recruit it when appropriate and in line with forest management objectives.

##### Snags and Cavity Trees

Snags are standing dead or dying trees. Cavity trees are standing living, dying or dead trees that have holes in them. Cavity trees are used by many birds and mammals, such as woodpeckers (*Picidae*), owls (*Strigiformes*), porcupines (*Erethizon dorsatum*), and chickadees (*Poecile atricapillus*), as nest and den sites, perches and roosts. Woodpeckers play a significant role in excavating cavities in trees when they foraging for insects within the wood. Large snags provide important perching and nesting habitat for raptors, and bats, such as the Indiana bat, roost beneath the loose bark of dead or dying trees.

At Owl’s Knoll, snags and cavity trees appear to be found in the greatest concentration in the pine plantation (Stand 16), on the knoll tops (Stands 2 and 8), and in the recently logged areas (Stands 12, 13, and 15). Numbers of snags and cavity trees were collected as part of the forest inventory conducted by Field Naturalist, Kristen Sharpless in 2006, but percentages or trees/acre were not calculated from the data.

During the course of any active forest management, steps should be taken to preserve snags and cavity trees, and to take steps to recruit snags through girdling when appropriate and in line with forest management objectives.

## Mast

Mast is nuts, seeds, berries, or fruits produced by trees, shrubs, vines, and flowering herbs. Mast of various plant species is an important food source for many wildlife species, from squirrels (*Sciuridae*) and black bears (*Ursus americanus*) who need to store food and fat for the winter month, and migrating songbirds who feast on fruits and berries in order to make their long migrations south each fall.

Hard mast (nuts) found in the forests at Owl’s Knoll includes red and white oat, bitternut hickory, American beech, and butternut (*Juglans cinerea*). Other species may be present elsewhere on the LHTF. These species are found in the highest concentration on the knoll tops at Owl’s Knoll (Stands 2 and 8).

Soft mast species (fruits and berries) found include black cherry (*Prunus serotina*), apple, red raspberry (*Rubus idaeus*), blackberry (*Rubus*), elderberry (*Sambucus*), false Solomon’s seal (*Maianthemum racemosum*), Canada mayflower (*Maianthemum canadense*), wild grape (*Vitis vinifera*), and red trillium (*Trillium erectum*). Raspberries and blackberries are particularly abundant in the recently logged areas of Stands 12, 13, and 15.

In the course of any forest management, at LHTF the continued growth and regeneration of mast-producing tree species should be encouraged.

## Special Habitats

### Riparian Ecosystems and Wetland

Riparian ecosystems and wetlands provide important breeding, wintering, and migratory habitats for a wide diversity of wildlife species, such as birds, moose (*Alces alces*), black bear, macroinvertebrates, and amphibians.

On the River Parcel, both of these habitats are present, but the riparian forests are currently very narrow and in poor condition. The only wetland on this part of the property is a portion of the Red or Silver Maple – Green Ash Swamp. Part of the *LaPlatte River Corridor and Wetland Restoration Plan* (Appendix E) includes planting many native trees and shrubs along the riparian corridor to create habitats that will be more valuable to wildlife and work to restore the floodplain forest and wetland natural communities that once dominated this area .

The wetlands and floodplains which comprise the River Parcel are highly infested with invasive exotic plant species, primarily reed canary grass, which are inhibiting the growth and regeneration of natural cover types in this area, aided by hydric soil conditions and over-browsing by white-tailed deer (*Odocoileus virginianus*). While some artificial regeneration has been established in southern portions of the River Parcel, a more comprehensive approach is needed. Over the next 10 years, the LHTF should work with TNC and US Fish and Wildlife Partners, among other partners, to implement restoration and revegetation of this area which is innovative and targeted at restoring healthy, native riparian ecosystems.

On the Owl’s Knoll portion of the LHTF, wildlife, such as moose, raccoons, and small mammals, clearly use the riparian areas along the small streams as travel corridors and places to forage for food and access water. The small wetland at Owl’s Knoll also appears to be important foraging habitat for insect-eating animals such as bats and birds and for birds of prey, such as owls.

### Grasslands

Some of the fields on the River Parcel, most notably in the south, have been maintained through annual mowing. The larger fields along Gilman Road have been unmanaged for the last 10 years. These fields have been documented as supporting nesting grassland bird species such as meadowlarks (*Sturnella*) and Boblinks (*Dolichonyx orizivorus*) (Mark LaBarr, Audubon Vermont, personal communication). While most of these areas are being managed to revert to forest and wetland habitat , several acres in the south of the River Parcel (*LaPlatte River Corridor and Wetland Management* Plan map, Appendix E) will continue to be mowed up to 100 feet from the river channel until the quality of the hay in the fields declines to the point where plowing and fertilizing would be needed to maintain agricultural value. Only the Bissonette Meadow will be kept open through mowing.

### Deer Wintering Areas

Deer (*Cervidae*)wintering areas are stands of dense softwoods that provide cover and food sources for deer populations. Part of the LHTF is designated as a deer wintering area and should be ground-truthed to see how much deer are actually using the area.

# SECTION IV: Goals, Management Guidelines, Objectives, and Actions

## Permanent Management Committee

In 2009, at the request of the Selectboard, the Town Forest Committee accepted responsibility for the permanent management of the LaPlatte Headwaters Town Forest (LHTF) in addition to management of the Town Forest. Combining the management of both of Hinesburg’s Town Forests under the responsibility of one permanent committee allows the management of these different, but related, town properties to be well-coordinated and complementary.

The list below is a summary of the responsibilities of the Town Forest Committee. Detailed goals, objectives, management guidelines and actions are outlined in the sections that follow.

* Oversee implementation of Management Plan and update every ten years.
* Approve specific project plans related to general, forest and wildlife habitat management, and recreation projects.
* Approve public events uses.
* Approve scientific uses, maintain a record of research and monitoring results, and use research to adapt management and update plan.
* Encourage educational uses of the LHTF.
* Coordinate and collaborate with the management of the Hinesburg Town Forest, as well as with other Town committees, such as the Trails Committee, Planning Commission and Conservation Commission.

## Landscape Connections

The management of the LHTF is for the protection of the: wildlife habitat, biological diversity, Indiana Bat, natural communities, natural river processes, aquatic habitat, wetlands, water quality, and native flora and fauna. These protections are made possible and further enhanced by the ownership pattern and known management goals and objectives of adjoining and nearby public and private conserved land. These management goals cannot be met on a single property, like the LHTF; they are met on a landscape scale across multiple properties.

Conservation of land that includes the LHTF (301 acres) and the other conserved parcels (about 345 acres) associated with the LaPlatte Headwaters Conservation Initiative on the Bissonette Farm was guided by an understanding of conservation planning principles recognizing that significant ecosystems and wildlife habitat are generally defined by the quality and quantity of natural features and their potential to insure important ecological functions and biological diversity. These include:

* + Representative landform level ecosystems.
	+ Intact surface and groundwater ecosystems
	+ Undisturbed natural areas
	+ Connectivity and cohesiveness
	+ Priorities species/natural areas
	+ Rare/unique species & natural communities.

Management for the conservation values of the LHTF is also supported by the Hinesburg Town Plan. Several sections of the Town Plan reflect the importance of maintaining ecological complexity and connectivity in the Hinesburg landscape. Management of the LHTF serves to support these broader goals for the whole town.

## Education and Community Uses

### Goal:

* Promote educational and community uses of the LHTF that are compatible with other management goals.

### Management Guidelines:

* Design parking areas to accommodate parking and turn around space for at least one school bus.
* Scientific studies should avoid causing any negative impact on the condition of the ecological communities at the LHTF or leaving any lasting markers whenever possible (eg. flagging, plot markers).
* Teachers and tour leaders should avoid taking their groups into the STAs or other sensitive areas where they could have a collectively damaging impact. Access to these areas should be limited to the perimeter whenever possible (i.e. observing woodland flowers at the base of talus slopes).
* Small groups and individuals should minimize use of STAs and should take care to minimize their negative impact.
* Large groups (20+ participants) should minimize their off-trail access of the LHTF.
* Teachers and group leaders should be aware that hunting on the LHTF is allowed during legal seasons.
* If educational or community uses begin to conflict with each other or other management goals, stakeholders should work together with the Town Forest Committee to devise and implement a solution(s).
* Allow periodic, temporary, non-commercial events in the designated “Public Events Area” (Bissonette Meadow), 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 Town Forest Committee (see Recreation Section).
* Proposed scientific research projects taking place on the LHTF should be submitted to the Town Forest Committee for review and approval.
* Use the Town website to list information about and contacts related to scientific projects happening on the LHTF.
* Publicize community events on the Town website.
* Ask or require researchers to share their findings with the Town Forest Committee and/or the public through a copy of a written publication, a walk, a talk etc.
* Provide educational opportunities for community members and the public to learn about responsible forest management and stewardship, in accordance with activities prescribed in this Management Plan.

### Objectives:

* Teachers and students at Hinesburg Community School (HCS), Champlain Valley Union High School (CVU), the University of Vermont (UVM) and other educational organizations and institutions will use the LHTF as an outdoor classroom.
* Student, academic, and government scientific researchers will use the LHTF as a study site.
* The LHTF will be used as a community education and outreach site for educational demonstrations and tours.
* Community uses will promote awareness of the ecological values of the LHTF.

### Actions:

* + Offer opportunities for teachers to learn about the LHTF at the LHTF.
	+ Seek funds to offer small incentive grants to cover field trip costs for teachers to bring their classes to the LHTF.
	+ Maintain a list of potential service-learning projects that the Town Forest Committee could partner on with teachers and their students at the LHTF (i.e. development of interpretive/informational material at a kiosk or creating and maintaining trail markers).
	+ Make *A Local Educator’s Field Guide to Owl’s Knoll on the Bissonette Farm* available to any educators who might want to use the LHTF as an outdoor classroom.
	+ Expand *A Local Educator’s Field Guide to Owl’s Knoll on the Bissonette Farm* to include information on the northern parcel.
	+ Seek input from local teachers on what resources would be helpful for bringing their students to the LHTF.
	+ Find a way to make Port-a-lets available in the parking areas during the times when teachers are likely to bring their students to the LHTF (fall and spring).
	+ Designate a contact person on the LHTF management committee to act as a liaison with scientists who are using or may want to use the LHTF as a study site. List contact information on Town website and in all relevant documents.
	+ Coordinate with academic and state scientists to accomplish monitoring goals.
	+ Ask or require researchers to share their findings with the LHTF management committee and/or the public through a copy of a written publication, a walk, a talk etc.
	+ Maintain a list of research projects that have been completed at the LHTF.
	+ Designate a contact on the LHTF management committee to act as a liaison between County Foresters, Fish and Wildlife Department Biologists and others who would be likely to want to use the LHTF for education and demonstration purposes.
	+ Develop a flyer that summarizes the vision and goals for the LHTF along with guidelines for public uses (events and recreation) that can be downloaded from the Town website and available at the kiosk at the LHTF.
	+ Seek opportunities to coordinate planned management activities with education and outreach to improve public understanding of forested ecosystems and sustainable forest management and stewardship.

## Forests and Wildlife

All forest and/or wildlife habitat management at the LaPlatte Headwaters Town Forest (LHTF) shall be overseen by the Chittenden County Forester and – due to the presence of the endangered Indiana Bat in the Town Forest – Vermont Fish and Wildlife Department biologists. All forest management activities shall be directed by a Forest Management Plan or a specific project plan approved by the Town Forest Committee working in consultation with the County Forester and Vermont Fish and Wildlife biologists. The specific project plan shall conform to the permitted and restricted uses outlined in the LHTF’s conservation easement and address the following goals, objectives, guidelines and actions within this plan.

### Goals:

* Allow natural processes to govern the LHTF’s ecosystems and model any active management on these processes to the extent possible.
* Demonstrate sustainable forestry practices that protect and enhance ecosystem function and health.
* Monitor and respond to ecological changes in the ecosystems of the LHTF.
* Protect and enhance habitat for the endangered Indiana Bat and a diversity of other native species.
* Demonstrate responsible active management of invasive exotic plant species.

### Management Guidelines

##### General

Until more specific guides are available for Vermont, consult the following publications for more detailed guidelines on protecting and enhancing forest health, function and biodiversity by mimicking natural processes:

* Natural Stand Dynamics Silviculture: A Discussion of Natural Community-Based Forestry Practices published by the Nature Conservancy (2000).
* Natural Disturbance and Stand Development Principles for Ecological Forestry by Jerry F. Franklin, Robert J. Mitchell, and Brian J. Palik, Department of Agriculture Forest Service Northern Research Station General Technical Report NRS-19 (2007)
* Biodiversity in the Forests of Maine by Gro Flatebo et al. (1999)
* Multiaged Silviculture - Managing for Complex Forest Stand Structures by Kevin L. O’Hara (2014)
* Creating a Forestry for the 21st Century - The Science of Ecosystem Management by Kathryn A. Kohm and Jerry F. Franklin (1997)
* New England Wildlife – Habitat, Natural History, and Distribution by Richard M. DeGraaf and Mariko Yamasaki (2001)
* Technical Guide to Forest Wildlife Habitat Management in New England by Richard M. DeGraaf, Mariko Yamasaki, William B. Leak and Anna M. Lester (2006)
* Landowner’s Guide to Wildlife Habitat – Forest Management for the New England Region by Richard M. DeGraaf, Mariko Yamasaki, William B. Leak and Anna M. Lester (2005)

##### Wildlife Habitat

* Follow the Vermont Fish and Wildlife Department’s *Indiana Bat Forest Management Guidelines for Indiana Bat Habitat* for “Lands within Known Indiana Bat Maternity Colony Habitat” for all forests at the LHTF. If conflicts arise between guidelines for management of Indiana Bat habitat and other guidelines in this plan, consult with Vermont Fish and Wildlife Department biologists and the Chittenden County Forester.
* Avoid disturbing roosting and cavity trees, snags, and upturned tree roots from April 1 to November 1 to so as not to disrupt Indiana Bats, nesting birds and denning animals.
* Avoid forest management activities during breeding forest bird and Indiana Bat roosting seasons (April 1 – November 1).
* Consider all management activities within the surrounding landscape context (3000 acres). Work to create and/or maintain a forested landscape capable of supporting viable populations of species associated with a variety of forest types, successional stages, and patch sizes (horizontal diversity). Pay special attention to ensuring habitat for species whose life-history requirements include large areas of contiguous forest.
* Enhance vertical and horizontal structure of forest stands where it is lacking to ensure nesting and foraging habitat for a diversity of breeding forest birds and other wildlife.
* Soften edges along fields to minimize edge effects, such as predation and brood parasitism by cow birds, on breeding birds and other wildlife. Seek advice from Audubon Vermont on how to do this.
* Protect and enhance long-term hard and soft mast production in hardwood stands with significant beech, oak, hickory, cherry (*Prunus*) and/or apple (*Malus*) densities.
* Maintain and regenerate inclusions of softwood cover in predominantly hardwood stands and inclusions of hardwood cover in predominantly softwood stands.
* Manage existing and potential deer wintering areas according to the Vermont Fish and Wildlife Department Guidelines for managing deer wintering areas.
* Retain a high percentage of trees >24” DBH and at least 1 snag/acre >18” DBH where present. Plan for the recruitment of these sizes, types, and densities of trees into the future.
* Manage for coarse woody debris by retaining material that currently exists, allowing its accumulation where it is currently missing, and recruiting it in the course of any active management.
* If any vernal pools are identified at the LHTF, document the location and condition of the pool, and follow VT Fish and Wildlife forest management guidelines for protecting vernal pools (currently being developed).
* Allow beavers (*Castor*) and other native wetland species to recolonize and influence the areas along and around the LaPlatte. If beaver activity comes in conflict with other purposes of the conservation easement, town roads or culverts, or neighbors, consult with Vermont Fish and Wildlife biologists and the Chittenden County Forester. Trapping may be authorized by the Selectboard on a case-by-case basis to resolve conflicts when it is recommended by the Town Forest Committee and Conservation Partners (Appendix A).
* Create, retain and enhance a diversity of wildlife habitats, including riparian forest, wetland and grassland, within The River Parcel in the northern part of the LHTF, with particular focus habitat for the Indiana Bat. See the *LaPlatte River Corridor and Wetland Management Plan* (Appendix E) for more specific guidelines and prescribed management activities.
* Actively treat invasive exotic plant infestations at the LHTF, using measures appropriate to the species and level of infestation present. The judicious use of herbicide should be considered as a means to lower populations of these species to a level at which mechanical control is feasible.

##### Silviculture

* Apply the principles of ecological forestry to protect and enhance biodiversity, ecological health, water quality, and site productivity.
* Uneven-aged silviculture, including single tree and group selection and irregular shelterwood methods should be favored for any forest management activity at the LHTF. Large patch cuts (>2 acres) and clear cuts (>10 acres) will be avoided.
* Grow the largest trees and use the longest rotations possible within site and log quality limitations. For example, for high quality red and sugar maple, yellow birch, beech, and white ash, the diameter objective should be 22 inches or greater. Culmination of mean annual board foot growth for these species occurs at 100 to 120 years. Allow several to many “legacy” trees to grow to their natural lifespan without ever being cut.
* When planting, use only local sources of native species to the maximum practical extent and attempt to match species composition to the known or suspected natural community type. Avoid introductions of non-native and/or potentially invasive species.
* Use natural regeneration to the maximum practical extent.
* Biological legacies of the forest community -- including coarse dead wood, logs, and snags; trees that are large, living, and old; buried seeds; soil organic matter; invertebrates; sprouting plants; and mycorrhizal fungi -- should be retained in any management of the LHTF.
* Promote the seed bearing capacities of poorly represented plant species of the stand.
* Avoid active forest management on slopes exceeding 50%.
* Leave as much woody material on site as possible. In the course of forest management leave brush and tree tops “un-lopped” except to clear recreational trails.
* Promote a vertical stand structure that includes differentiated overstory, understory, and midstory strata, as well as diverse shrub and herbaceous vegetation layers.
* Remove slash from all trails. Retain large specimen trees and trees with unusual shape or interesting character along trails.
* Maintain a closed canopy (75-80%) and prohibit the use of machinery within 25 feet adjacent to streams and the wetland areas. Enforce adherence to Vermont’s Acceptable Management Practices (AMP) for maintaining water quality on logging jobs, and adherence to water quality/riparian area protections specified in the LHTF’s conservation easement at all times.

##### Forestry Operations

* The use of pesticides – including insecticides, fungicides, and herbicides – should be extremely limited. Only those pesticides accepted by the Northeast Organic Farming Association should be used on agricultural lands and only herbicides recommended by The Nature Conservancy should be used in other areas. Herbicide should be used judiciously to control invasive exotic plant infestations, with a goal to lower populations of these species to a level at which manual/mechanical control is feasible.
* All forest management shall be done in accordance with a Forest Management Plan, drafted by a licensed forester and approved by the Town Forest Committee, the LHTF conservation partners, and the Hinesburg Selectboard.
* All forest management activities shall be supervised by a Vermont-licensed forester, in agreement with the Town Forest Committee and the Hinesburg Selectboard.

In the course of forest management:

* Residual stand damage – including basal wounds, broken and/or scraped tops, and exposed roots – should be confined to 10% or fewer of the dominant or codominant trees.
* All trees to be removed should be marked prior to the inception of harvest.
* Average annual harvest volumes should not exceed 75% of the average annual growth.
* Harvest only under frozen winter conditions. Avoid soil disturbance to the extent possible and rutting that extends beyond the A soil horizon.
* Minimize the number and extent of truck roads and skid trails -- particularly in or near sensitive areas such as stream crossings, protective strips, and steep slopes.
* All skid trails, truck roads, and log landings should be carefully designed and flagged or otherwise marked prior to the inception of harvest and should be carefully constructed should not exceed 10% of the land area of the harvest zone.
* Truck roads should be built at grades from 0% to 10% and skid trails from 0% to 15% to the extent possible.
* Truck roads and skid trails should be properly drained during and after use according to the Vermont AMP.
* Log landings should be located on nearly level, stable ground, be kept away from protective strips, have water diversions installed, and be graded to prevent erosion and sedimentation.
* Protective strips -- characterized by minimal soil disturbance, nearly-complete canopy closure, and many large mature trees -- should be maintained between the access network and surface waters according to Vermont AMP and the LHTF’s conservation easement.
* Stream buffer strips should be kept free of logging vehicles and have only little or no tree cutting.
* Areas of exposed soil that occur within the protective strip should be seeded and mulched according to the Vermont AMP.
* Check with Conservation Partners (Appendix A) for current buffer guidance when planning any management around streams.
* Stream crossings should be restored and non-permanent structures should be removed as soon as possible.
* Streams should be crossed with bridges or culverts that are properly sized according to the Vermont AMP and installed at right angles to streams.
* Sediment should be prevented from entering streams by using turn-ups or broad-based dips on truck roads and skid trails prior to all stream crossings.
* Drainage ditches should not feed directly into streams or other surface waters.
* Post-harvest use of the access network should be restricted in order to prevent erosion, compaction, and site disruption.

### Objectives:

* Forest stands will maintain a diversity of vertical structures and degrees of crown closures through small-scale, patch-creating natural disturbance events, such as wind and ice storms, or through single tree and group selection, crop tree management, or irregular shelterwood silvicultural treatments intended to mimic these disturbances.
* Forest stands will likely be replaced on large spatial *(>2 acres*) and temporal scales (100+ years) by natural disturbances, such as hurricanes or micro-bursts, but not through management.
* Native tree-species composition will be maintained in each natural community, as appropriate within successional stages of development. Vermont natural community descriptions will be referenced from the publication *Wetland, Woodland, and Wildland* (Thompson and Sorenson, 2005) or any updated descriptions from the Vermont Nongame and Natural Heritage Program.
* The presence, structure, function and condition of significant natural communities will be maintained or enhanced.
* Active management of vegetation and animal habitats will provide opportunities for demonstration, use of experimental techniques and community involvement.
* Populations of rare, threatened or endangered plants and animals on the LHTF will be viable and healthy enough to be resilient to change and stress over time and to serve as sources for the colonization of nearby habitat patches.
* Wide-ranging wildlife species that require large areas of contiguous and/or connected forest will be present at the LHTF.
* Habitats for the full assemblage of organisms associated with the natural communities at the LHTF will be maintained and/or enhanced wherever possible.
* Wildlife will be able to move freely between the LHTF and the surrounding landscape.

### Actions

* Mark boundaries of Woodland STAs and post signs along trails to let the public know they are entering an STA and significant natural community.
* Have a licensed forester draft a forest management plan for the LHTF, including current data, in 2019 or 2020.
* Conduct an inventory of wildlife and habitats, and create recommendations for protection and enhancement. Create a map of wildlife sightings and signs, and significant habitat features that can be added to and updated periodically.
* Set up monitoring programs including vegetation plots, and birds, bats, and other wildlife. Approach local schools and institutions (HCS, CVU, UVM) to get assistance with monitoring.

## Water and Wetlands

The primary purposes of the Grant of Development Rights, Conservation Restrictions, and Public Access Easement covering the property are to “…conserve, improve and extend maternal roosting and feeding habitat for the Indiana Bat…” and to “…conserve riparian areas and natural river processes and morphology, wetlands, water quality, and aquatic habitats…” Forestry management and recreation activities are secondary and must be compatible with the primary purposes of the easement (Appendix B) and approved by the LaPlatte Headwaters Town Forest (LHTF) Management Committee.

Wetland restoration activities will follow the *LaPlatte River Corridor and Wetland Management Plan* (Appendix E) and must comply with the conservation easement (Appendix B). Any management activity within the LHTF should be created in consultation with and must be reviewed by all the conservation partners in Appendix A.

### Goals

* Allow the LaPlatte River and its tributaries to recreate natural channels and floodplains over time.
* Protect the water quality of the LaPlatte River and its tributaries.
* Restore and revegetate wetlands and floodplains.

### Management Guidelines

##### General

* Consult the Vermont Department of Environmental Conservation River Management Program (RMP) website for more specific guidelines regarding stream buffers, passive restoration, and river corridor management at: <http://www.anr.state.vt.us/dec/waterq/rivers/htm/rv_EducationalResources.htm>
* No agricultural activities will be allowed within the special treatment areas, except what may be necessary to control invasive exotic plants and create opportunities for the reestablishment of native ecosystems.

##### Restoration

* Follow the wetland restoration plan for the northern portion of the LHTF as detailed in the LaPlatte River Corridor and Wetland Management Plan.
* Allow the LaPlatte River and its tributary streams to migrate, create meander bends, erode banks, and complete any other adjustments without intervention, even if such adjustments result in erosion of ditch plugs, depressional areas, or plantings and require the relocation of trails and bridges.
* Woody debris shall remain in stream channels to allow for sediment deposition, pool formation, and habitat creation.
* Allow beavers and other native wetland species to recolonize and influence the areas along and around the LaPlatte. If beaver activity comes in conflict with other purposes of the conservation easement, town roads or culverts, or neighbors, consult with Vermont Fish and Wildlife biologists and the Chittenden County Forester.

##### Riparian Buffers

Along the LaPlatte River, buffers are 100-foot wide planted and naturally regenerating areas along the river channel (see LaPlatte River Corridor and Wetland Management Plan Map, Appendix E)*.* Buffer widths may vary along tributary streams depending on the site. Check with Conservation Partners (Appendix A) for current buffer guidance whenever planning management activities.

* Avoid disturbance of soil within the stream buffers so as not to contribute sediment or excessive runoff or erosion into the streams. Exception: unless done so under the conditions of the LaPlatte River Corridor and Wetland Management Plan for restoration purposes.
* Forest Management and other activities within riparian buffers must be compatible with the easement and reviewed by the LHTF Management Committee.
* Maintain natural vegetation (native plant species) within the riparian buffers to limit erosion and enhance wildlife habitat. Any non-native or invasive plants that are removed should be replaced by native plant species. Native riparian vegetation may be removed for such purposes as treating pest infestations or accomplishing other activities compatible with the easement.
* Plant native vegetation and allow for natural growth within the stream buffers in areas where such vegetation is lacking.
* Take measures to establish native species well suited to the site and diminish the impact of suppressing invasive exotic vegetation which may include site preparation through mowing and plowing, planting, direct seeding and the judicious use of herbicide on non-native species. These activities may take place within river buffers to the extent necessary to establish native ecosystems in the LHTF, but should not contribute to erosion into the LaPlatte River or its tributaries.

##### Trails

River processes take precedence over trails as stated in the easement.

* Protect stream buffers from excessive pedestrian use and manage any trails within the stream buffers to minimize their impact on buffer vegetation and habitat.
* Trails will be designed and built in response to the changing stream profile and wetlands dimensions. Trails will be adapted as necessary when such changes happen so as not to impede stream or wetland processes.
* Trails occurring within buffers or the STAs will be designed and managed to maintain the integrity of the natural plant communities.

##### Stream Crossings

* Stream crossings will be minimized and improved so as not to impede stream function.
* Size crossing structures according to the VT DEC River Management Program guidelines and Guidelines for the Design of Stream/Road Crossings for the Passage of Aquatic Organisms in Vermont (VT DFW) and/or consult with the District Stream Alteration Engineer and District Fisheries Biologist for sizing, placement, and permitting requirements.

##### Aquatic Habitat

* Depressions and open water wetland areas will be created and maintained to provide habitat for waterfowl and amphibians.
* Cattails may be removed if they begin to take over open water areas.
* Woody debris will be allowed to accumulate in the open water habitats and will be allowed to accumulate in the river and streams to create and maintain varied habitat.

##### Invasive Species

* Invasive plant species such as reed canary grass, purple loosestrife (*Lythrum salicaria*), and phragmites (*Phragmites autralis*) shall be removed from wetland areas and replaced with native vegetation to the extent possible and through natural or artificial regeneration.
* Best attempts will be made to monitor wetland sites for invasive plant species and remove them when found before they produce seeds.
* The Town Forest Committee will consult state and other invasive species experts as needed for current guidance on invasive species management.
* The Town of Hinesburg recognizes the threats embodied by the presence of invasive exotic plant species. It is the policy of the Hinesburg Town Forest Committee (HTFC), in their stewardship of the LHTF, to discourage the continued establishment and spread of these species. The methods with which the HTFC will use respond to remove these species will be dictated by the judgment of the HTFC, in consideration of available research on successful invasive species removal strategies. The removal of these species should commence as soon as is feasible, with specific timing dictated by the HTFC.

##### Monitoring and Science

* Evaluate the progress of the wetland restoration and make recommendations for future actions.
* Monitor the progress of the passive restoration of the LaPlatte and its tributaries.

##### Demonstration and Education

* Take advantage of opportunities to involve and educate the public about wetland and river processes and restoration and the importance of aquatic habitats.

### Objectives

* Restore and preserve the natural values of the Special Treatment Areas (STAs) and to maintain and improve the natural functions of the STAs.
* Allow stream channels to continue to adjust (migrate, erode, deposit sediment, etc.) in order to regain equilibrium conditions (slope, channel dimensions) over the long term through a passive restoration approach.
* Improve water quality by allowing streams to regain natural (equilibrium) form and thereby reduce sediment and phosphorus loading.
* Conserve and improve aquatic and wetland wildlife habitats.
* Reduce erosion hazards by allowing streams to regain natural (equilibrium) form and thereby reduce water speeds during high flows.
* Maintain native riparian plant communities, where they exist, along streams and wetlands.
* Act aggressively to control invasive exotic plants where they interfere with the growth of native species and ecosystems.
* Maintain forest connectivity between upland habitats and wetlands and waters.

### Actions

* Implement the *LaPlatte River Corridor and Wetland Management Plan* (Appendix E):
* Plant buffers of native, site-appropriate tree and shrub species adjacent to the LaPlatte River and its tributaries to the extent possible.
* Plant wetland marsh and meadow species in open meadow areas.
* Allow previously ditched tributaries to regain natural channel form and plant buffers with shrub and floodplain forest species.
* Plant the small area of upland soils with valley clay plain forest species.
* Discourage reed canary grass and other invasive exotic plants.
* Consider establishing an area of early successional shrub land to enhance wildlife habitat, particularly for golden-winged warbler.
* Enhance existing intact wetlands through removal of invasive plant species and planting of native vegetation where applicable.
* Plan for a stream crossing or trail relocation where the gully is eroding the main access trail at the intersection of the trail loop at Owl’s Knoll. Monitor this site and relocate the trail or install a structure (bridge) that does not interfere with the natural erosion process, as necessary.
* Monitor the wetland restoration areas following NRCS protocols for the first 15 years (until 2024). The site will be monitored for proper functioning of ditch plugs and depressions, condition of plantings, control of invasive and nuisance plants, and the progress of the restoration. Any further monitoring will be identified in future revisions of the management plan as recommended by initial monitoring results.
* Conduct a habitat assessment for all streams using updated RMP habitat assessment protocols.
* Set up permanent monitoring sites along stream and river channels for cross sections, pebble counts, and photographs and define a monitoring schedule (every 5-10 years) to track channel adjustments. Possibly coordinate with UVM to combine this with education as a student project.

## Recreation

Future recreational activities and management of the LaPlatte Headwaters Town Forest (LHTF) for recreation should be undertaken only with the specific approval of the LHTF Management Committee. 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.

### Goal:

* Promote and manage recreational uses that are compatible with other management goals for the LHTF.

### Management Guidelines

* Encourage recreational use that:
	+ Is consistent with protection and enhancement of natural systems.
	+ Adheres to the terms of the conservation easement.
	+ Minimizes conflict between recreational uses.
	+ Respects the rights and privacy of adjoining landowners.
* 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.
* Update recreation recommendations as needed to reflect changes in recreational demand and changes in natural systems within the LHTF.
* Recognize and take advantage of the educational opportunities created by recreational use of the LHTF.
* Concentrate recreational use on existing trails and prohibit the creation of new trails except to replace unsuitable trails, to complete trail loops, and to connect trails to other parts of the HART network outside the LHTF.
* Adhere to relevant trail and recreational standards and the best available professional judgment to protect soils, water quality, and other LHTF resources.
* Maintain a permanent gate to block unauthorized motorized vehicle access to the woods road on Owl’s Knoll.
* Encourage multi-use trails.
* Prohibit the creation of new trails except as needed to:
	+ Bypass wet, steep, or otherwise unsuitable stretches of existing trails.
	+ Complete the loop around the west knoll when and if the Mead Farm Road Association (MFRA) allows.
	+ To connect to the Village.
* Because radiating trails lead onto adjacent properties and are narrow and wet in places, restrict use to walking, skiing, and snowshoeing where access is permitted until such times as issues of access and erosion can be adequately addressed.
* Unless public trail access is secured on the adjacent private properties discourage trespass by the placement of signs and/or other appropriate means.
* Mark the trails in a manner consistent with the town-wide trail system.
* Collaborate with the Hinesburg Trails Committee to maintain the trail system.
* Coordinate the use and maintenance of the woods road that leads into the “Hidden Meadow” with the Vermont Department of Fish and Wildlife.
* Install signs to designate the allowed uses of each trail, to encourage trail safety and etiquette, and to minimize conflicts between recreational uses.
* Install bridges, culverts, and other trail amenities as needed to minimize impacts on soil, water, and other resources.
* Allow snowmobiling only on the designated VAST trail. For reasons of safety, no other uses of this trail should be allowed in winter.
* To facilitate access, provide and maintain (including snow plowing) two parking areas on Gilman Rd. (Snow plowing and parking in the northern area must not interfere with grooming or use of the snowmobile trail or the use of the private right-of-way.
* Post signs at both parking areas and at other access points to the LHTF that indicate allowed and prohibited uses of the trails and the Forest in general.
* Publicize the trails, and the Forest in general, via the Town website, downloadable maps, and Town reports. Maintain barriers to motorized vehicle access to trails and woods roads (i.e. permanent gate, stones, trail design).
* Close trails to certain uses when conditions warrant.
* Adhere to the trail standards set out in the VT Trails and Greenways Manual (2007) and other appropriate trail standards established by recognized recreational groups.
* Trail creation and maintenance activities involving cutting standing trees should be conducted between November 1 to April 1 to avoid harming roosting Indiana Bats and nesting songbirds.
* Allow overnight use and camping only in conjunction with on-site research activities or educational programs, and only after written permission has been obtained from the LHTF Management Committee.
* Designate areas where campfires may occur and allow campfires only when a permit has been issued by the fire warden.
* Allow dogs under the physical or verbal control of their owners/handlers and in accordance with the Town dog ordinance. Dog owners/handlers must remove their dogs’ droppings from the LHTF.
* Dispersed activities must cause no harm to LHTF resources and must follow Leave No Trace guidelines.
* Flora, fauna, and mineral materials may not be disturbed, picked, collected, or removed from the LHTF except as needed to further the purposes of the conservation easement and objectives of this management plan, the collection of mushrooms or berries and other edible items for non-commercial purposes, legal hunting, educational, or research purposes.
* To promote safety and to minimize conflicts between hunters and other users of the LHTF, post permanent signs at parking areas and trail heads indicating that hunting for deer, bear, turkeys (*Meleagris*), grouse, and other legal game is permitted within the LHTF.
* Allow periodic, temporary, non-commercial events in the designated “Public Events Area” (Bissonette Meadow), 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 Management Committee.
* Annually monitor the forest, particularly the trails, for evidence of abuse or damage to natural systems due to recreational activities and modify management recommendations and actions appropriately.
* Establish and maintain a multi-use trail system.
* Minimize the impact of dispersed (non-trail) recreation on the LHTF resources.
* Allow non-commercial hunting, trapping and fishing in the LHTF in accordance with all state and federal regulations.
* Encourage appropriate public events and group use.
* Adapt recreation management recommendations to reflect changes in resource conditions and changes in the types of intensities of human uses.

### Actions

* Mark property boundaries to facilitate 1) the placement of trail signs, and 2) discussion with adjoining property owners about trail access and development.
* Approach the Hinesburg Trails Committee about taking leadership to work toward the long-term objectives of ( working with the Mead Farm Road Association to complete the trail loop around the western knoll on Owl’s Knoll.

## Agriculture

Most of the LaPlatte Headwaters Town Forest (LHTF) has been used for agricultural production for many years, which has shaped the current condition of the property. Agricultural uses will continue to be allowed in appropriate areas of the LHTF in order to maintain a connection to historical uses of property, to maintain a diversity of wildlife habitats, to enhance scenic values, and to provide recreational opportunities and a community gathering area.

The conservation easement (Appendix B) recognizes the agricultural values of the LHTF and identifies 55 acres of prime and statewide agricultural soils on the property. However, agricultural values are secondary to the primary purposes of protecting water quality and Indiana Bat habitat. The easement permits agricultural use in areas not designated as Special Treatment Areas.

### Goal:

* Allow agricultural uses that are compatible with other management goals in designated areas of the LHTF.

### Management Guidelines

* Consult with Natural Resources Conservation Services (NRCS) to determine current Best Management Practices related to soil cultivation and crop production that is consistent with conservation restrictions.
* Conduct agricultural practices in a manner that recognizes the primary purpose of protecting water quality.
* Agricultural use should be at no or little cost to the Town.
* Allow agricultural use on portions of the property until maintaining productivity requires practices that conflict with the primary purpose of the easement.
* Consult with Conservation Partners (Appendix A) to ensure agricultural practices are consistent with the primary purposes of easement.
* Mowing of areas identified as significant breeding habitat for grassland birds should occur only between July 15th and September 1st.

### Objectives

* Keep the highly productive, eight-acre field located on the River Parcel of the LHTF (known as The Bissonette Meadow - Main Map) open through agricultural use.
* Utilize the 48-acre field shown on the Agricultural Fields Map for hay production in a manner that enhances grassland habitat on the abutting property until maintaining productivity of the field requires practices that conflict with the primary purposes of the easement.
* Maintain the option of using the Bissonette Meadow as a community gathering area by keeping it open through appropriate agricultural use.

### Actions

* Maintain a 10-year contract between the Town and a local farmer that ensures management of designated agricultural fields that is consistent with the purposes of the easement and maintains soil productivity.

# SECTION V: Summary of Actions

## Completed

* Create ditch plugs on the River Parcel in areas designated by the *LaPlatte River Corridor and Wetland Management Plan* (Appendix E) in order to facilitate flooding (September 2009).
* Plant native tree species on the River Parcel in areas designated by the *LaPlatte River Corridor and Wetland Management Plan* (Appendix E) to facilitate the revegetation of riparian buffers (partially completed during 2009-2010 growing season, with additional trees planted in 2017-2018.
* Develop a 10-year contract between the Town and a local farmer that ensures management of designated agricultural fields that is consistent with the purposes of the easement and maintains soil productivity (September 2009).
* Make *A Local Educator’s Field Guide to Owl’s Knoll on the Bissonette Farm* available to any educators who might want to use the LHTF as an outdoor classroom (available on the web and in the HCS library).
* Revitalize the permanent Town Forest management committee. Since Hinesburg has two Town Forests and an existing Town Forest Committee that oversees the management of the older Hinesburg Town Forest, the LHTF Management Planning Committee recommends that the existing Town Forest Committee also be responsible for the management of the LHTF into the future.
* Work with the Hinesburg Town Planner to make improvements to the existing property base map and create additional necessary maps: landscape context, soils, natural communities, stands, and wildlife habitat.
* Write a letter to the Planning Commission stating that public lands should be considered a natural and cultural resource worthy of consideration and protection in the rural zoning changes.
* Designate a contact person on the LHTF management committee to act as a liaison with scientists who are using or may want to use the LHTF as a study site. List contact information on Town website and in all relevant documents. The Forest Committee chairperson is the designated contact.
* Designate a contact on the LHTF management committee to act as a liaison between County Foresters, Fish and Wildlife Department Biologists, and others who would be likely to want to use the LHTF for education and demonstration purposes. The Forest Committee chairperson is the designated contact.
* Create and maintain the two parking areas, including appropriate signs.
* Engineer a solution (bridge, etc.) to maintain access to the main trail loop and Hidden Meadow despite the ongoing erosion that threatens the integrity of the existing farm road. The trail was closed and a new trail created to connect the loop.
* Initiate a conversation with the Vermont Fish and Wildlife Department and farmers about how to maintain access to the Hidden Meadow for mowing, given the deteriorating condition of the current access through Owl’s Knoll.
* Remove tires from the gully. Complete per April 2017 amendment. The trail was re-routed and the tires left in place based on a recommendation resulting from the Milone-and-MacBroom Tire Gully Report.
* Reroute walking trail through the hay field from the parking area to the woods road on Owl’s Knoll around the perimeter of the field and through the woods.

## Highest Priority

***Recommended to be completed by 2022***

* Mark property boundaries.
* Develop a 10-year contract between the Town and a local farmer that ensures management of designated agricultural fields that is consistent with the purposes of the easement and maintains soil productivity (2019).
* Have a licensed forester inventory the forest and produce a Forest Management Plan, including an assessment of the overall health of the forest, and recommendations for management. This Forest Management Plan should be approved by the Town Forest Committee, Selectboard, Vermont Land Trust, and Vermont Fish and Wildlife Department, and included as an appendix to this Management Plan.
* Collaborate with The Nature Conservancy on implementation of their grant project for tree planting in the LaPlatte Riparian Corridor STA beginning in 2020.
* Collaborate with US Fish and Wildlife Partners on approaches to reed canary grass control and the re-establishment of native ecosystems in the north of the River Parcel using mowing, plowing, herbicide application, direct-seeding and planting.
* Relocate the trail in the ravine or install trail structures to eliminate the current muddy, eroded conditions.
* Work with other partners and seek funding for ongoing restoration efforts in the LaPlatte Riparian Corridor STA.
* Create a monitoring protocol that will guide all monitoring activities.
* Clearly define priority monitoring activities for incorporation into this plan.

## High Priority

***Recommended to be completed by 2025***

* Mark boundaries of Woodland STAs and post signs along trails to let the public know they are entering an STA and significant natural community.

## Medium Priority

***Recommended to be completed by 2027***

* Approach adjacent landowners about evaluating and planning for potential beaver conflicts as they arise.

## Ongoing and Long-term (5+ years)

* Develop a flyer that summarizes the vision and goals for the LHTF along with guidelines for public uses (events and recreation) that can be downloaded from the Town website and available at the kiosk at the LHTF.
* Approach the Hinesburg Trails Committee about taking leadership to work toward the long-term objectives of (1) creating a public trail connection between the northern and southern portions of the LHTF that is acceptable to affected landowners and (2) working with the Mead Farm Road Association to complete the trail loop around the western knoll on Owl’s Knoll.
* Meet and coordinate with local town committees such as: Conservation Commission, Planning Commission, Hinesburg Land Trust, and Trails Committee.
* Work with the Hinesburg Town Planner to make improvements to the existing property base map and create additional necessary maps: landscape context, soils, natural communities, stands, and wildlife habitat.
* Communicate with regional conservation organizations such as the Lewis Creek Association, the LaPlatte Watershed Partnership, the Nature Conservancy, and Audubon Vermont.
* Coordinate management of the LHTF with other properties in the area between Silver Street, Gilman Road, Lewis Creek Road, and the Village through the creation of a neighborhood management plan.
* LHTF management committee participates in town plan and zoning regulation updates, and revisions.
* Offer opportunities for teachers to learn about the LHTF at the LHTF.
* Maintain a list of research projects that have been completed at the LHTF.
* Implement the *LaPlatte River Corridor and Wetland Management Plan* (Appendix E):
* Monitor the wetland restoration areas following NRCS protocols for the first 15 years. The site will be monitored for proper functioning of ditch plugs and depressions, condition of plantings, control of invasive and nuisance plants, and the progress of the restoration. Any further monitoring will be identified in future revisions of the management plan as recommended by initial monitoring results.
* Maintain a list of potential service-learning projects that the LHTF Management Committee could partner on with teachers and their students at the LHTF (i.e. development of interpretive/informational material at a kiosk or creating and maintaining trail markers).
* Continue planting native tree species on the River Parcel in areas designated by the *LaPlatte River Corridor and Wetland Management Plan* (Appendix E) to facilitate the revegetation of riparian buffers

## Wish List

*To be completed as resources and opportunities allow. These projects may be particularly well-suited for academic research/projects so this list should be made available to local schools and academic institutions.*

* Monitor wildlife use of travel corridors.
* With the help of neighboring landowners, field visits and orthophotos, map the spatial layout of forest ages and types in the roughly 1000 acres surrounding the LHTF.
* Seek funds to offer small incentive grants to cover field trip costs for teachers to bring their classes to the LHTF.
* Develop an understanding of the habitats found on adjacent lands and identify how plants and animals move between these habitats and habitats on the LHTF.
* Expand *A Local Educator’s Field Guide to Owl’s Knoll on the Bissonette Farm* to include information on the northern parcel.
* Seek input from local teachers on what resources would be helpful for bringing their students to the LHTF.
* Coordinate with academic and state scientists to accomplish monitoring goals.
* Conduct an inventory of wildlife and habitats, and create recommendations for protection and enhancement. Create a map of wildlife sightings and signs, and significant habitat features that can be added to and updated periodically.
* Set up monitoring programs including vegetation plots, and birds, bats, and other wildlife. Approach local schools and institutions (HCS, CVU, UVM) to get assistance with monitoring
* Conduct a habitat assessment for all streams using updated RMP habitat assessment protocols.
* Set up permanent monitoring sites along stream and river channels for cross sections, pebble counts, and photographs and define a monitoring schedule (every 5-10 years) to track channel adjustments. Possibly coordinate with UVM to combine this with education as a student project.

# SECTION VI: Monitoring Plan

## Introduction

Monitoring is a tool that is useful in identifying the presence of specific features, the condition of those features at a point in time, and changes to those features over time. Without monitoring, changes in the condition of various features of the natural community cannot be meaningfully discussed.

The Town Forest Committee or its appointees periodically monitor LHTF to ensure that its management objectives for wildlife, recreation, timber production, and environmental protection are being met. Some items, such as the assessment of river and floodplain health/viability, are conducted periodically. Others, such as monitoring invasive species or project implementation, may be conducted annually or on a weekly basis as operations are ongoing.

All monitoring results shall be compiled in a database (Excel spreadsheet), updated on an annual basis, and made available to the Selectboard and general public.

This is the top level monitoring plan for the LHTF. This plan outlines the general features of the LHTF that will be periodically monitored.

This plan represents a wish list of features to monitor. Neither the Town Forest Committee nor the Town has the resources necessary begin monitoring all of the features in all of the categories represented in the plan. As resources are identified and made available, individual, detailed monitoring plans will be created, implemented, and included in Appendix H of the LHTF Management Plan.

Monitoring Plan

| **What**  | **When**  | **By Whom** | **How**  | **Notes** |
| --- | --- | --- | --- | --- |
| Native tree, shrub, and grass plantings | Annually, late winter (conducted when there is no snow cover. Ideally during the late spring) | HTFC members and volunteers | Check plantings for mortality and health. Follow monitoring protocols for individual plans | Clean up plastic sleeves as needed |
| Invasive Species | Annually, early spring (and ongoing) | HTFC members and volunteers | Site inspections  | Map sightings or record and summarize in the annual report of all monitoring activities.Provide public information about invasive species found in the LHTF. |
| River and floodplain | Every five years | Volunteers and/or students | Set up permanent monitoring sites along stream and river channels for cross sections, pebble counts, and photographs. Define a monitoring schedule to track channel adjustments. | Use NRCS protocols. The site will be monitored for proper functioning of ditch plugs and depressions, condition of plantings, control of invasive and nuisance plants, and the progress of the restoration. |
| Wildlife |  | Approach local schools and institutions to get assistance with monitoring | Set up monitoring programs including vegetation plots, and birds, bats, and other wildlife.  |  |

# References and Resources

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# Glossary of Terms

Downed woody debris – Dead woody branches, limbs, and logs lying on the forest floor.

Co-dominant – Refers to a tree species in the forest canopy that shares the majority of percent species composition with another tree species.

Conservation easement – A legal document that dictates the purposes for which a conserved property can be used or managed. May include specific permitted and restricted uses.

DBH (Diameter at Breast Height) – A measurement of the diameter of a tree 4.5 feet off the ground.

Dominant – Having a very slow or temporarily stopped metabolism, as in the case of an overwintering animal or tree.

Early-successional habitat – Young forest that is characterized by an open canopy (<30% closed) and dense shrub and sapling growth.

Ecosystem – The living (biotic) and non-living (abiotic) pieces of an environment and their interactions.

HLT – Hinesburg Land Trust

HTF – Hinesburg Town Forest located in the eastern foothills of Hinesburg and accessed off of Hayden Hill East and West Roads.

Hardwoods - Deciduous trees that lose their leaves each autumn (e.g. maple, ash).

Herb – An herbaceous plant that dies back and re-grows each year. Most herbs in the woods are perennials; they regrow leaves and stems from an established root system rather than starting from seed each spring (e.g. asters).

Herb layer – the layer of herbs growing on the forest floor.

Hibernacula – Habitats where large numbers of bats congregate to overwinter or hibernate (i.e. caves).

Invasive species – A plant or animal that outcompetes and prevents the establishment or succession of other species.

LHTF – LaPlatte Headwaters Town Forest

Large sawtimber – A tree with a DBH of greater than 23.5 inches.

MFRA – Mead Farm Road Association

Medium sawtimber – A tree with a DBH of 17.5-23.5 inches.

Natural Community – ‘an interacting assemblage of organisms, their physical environment and the processes that affect them.’ (taken from the book *Wetland, Woodland and Wildland*)

Non-native species – A species living in a place where it did not evolve.

NRCS – Natural Resources Conservation Services

Overstory –The layer of trees whose crowns make up the top layer of the forest.

Pole – A tree with a DBH of 5.5-11 inches.

Rich site indicators – Plant species that are restricted to growing on rich sites, indicating a high soil pH (6.5-8.5).

Bat roosting tree – A tree under whose peeling bark forest bats, such as the Indiana Bat, roost and rear their young.

Sapling – A tree with a DBH of 1-5.5 inches.

Seedling – A tree with a “diameter at breast height” (DBH) of less than 1 inch.

Shrub - A woody plant with multiple stems that does not grow to the full size of a tree (e.g. dogwood).

Small sawtimber – A tree with a DBH of 11-17.5 inches.

Snag – A standing dead tree.

Softwoods - Coniferous trees with needles that usually stay green throughout the winter (i.e. white pine, white cedar).

Spring ephemerals – Woodland herbs that grow and flower in the spring before the tree canopy leafs out.

Stand – A sub-unit of the forest defined by a common physical site and/or tree species composition, age, quality or size.

TPL – Trust for Public Land

Understory – The layer of tall shrubs, seedlings, saplings and poles growing in the shade of the dominant trees.

VLT – Vermont Land Trust

Wetland – A plant community characterized by permanently or seasonally wet soils.

# APPENDICES

## Appendix A: Conservation Partners

The Town of Hinesburg owns and has primary responsibility for managing the LHTF, including the LaPlatte River corridor and wetlands. Floodplain forest, river management, & wetland restoration activities and bat habitat management activities will be carried out, in consultation with, approval by, and in some instances participation by (as needed) the Vermont Land Trust and three departments of the Vermont Agency of Natural Resources – the Department of Fish & Wildlife, the Department of Forests, Parks, and Recreation, and the Department of Environmental Conservation. The conservation easement and various components of this Management Plan articulate the required consultation and advice.

The Hinesburg Land Trust will provide ongoing assistance, as needed, to the Town in managing the LHTF and, in particular, its trail system.

Paul Wieczoreck, Hinesburg Land Trust, 2800 Lincoln Hill Road, Hinesburg, VT 05461 Home: 434-4216

E-mail: mgcpw@gmavt.net

Andrea Morgante, Hinesburg Land Trust, 56 Mechanicsville Road, Hinesburg, VT 05461

Home: 802-482-5120

E-mail: morgante@gmavt.net

The Vermont Land Trust will have primary responsibility for stewardship of the conservation easement on the LHTF. As needed, VLT will consult with the Vermont Housing & Conservation Board, co-holder of the conservation easement, and three departments of the Vermont Agency of Natural Resources – the Department of Fish & Wildlife, the Department of Forests, Parks, and Recreation, and the Department of Environmental Conservation. The current primary contacts for the Vermont Land Trust and the Vermont Housing and Conservation Board:

Adam D. Piper, Regional Stewardship Manager, Champlain Valley Office, Vermont Land Trust

PO Box 850, Richmond, Vermont 05477, (226 Bridge Street)

Office: 802-861-6405

Field Cell: 802-371-8613

E-mail: adam@vlt.org

Tyler Miller, Stewardship Director, Vermont Land Trust, Champlain Valley Office, PO Box 850, Richmond, VT 05477;

Office: 802-861-6407

E-mail: tyler@vlt.org

Caitlin Cusack, Stewardship Forester, Vermont Land Trust, Champlain Valley Office, P.O. Box 850, Richmond, VT 05477

Office: 802-861-6504

E-mail: caitlin@vlt.org

Mark Martin, Conservation Stewardship Coordinator, Vermont Housing & Conservation Board, 149 State Street, Montpelier, VT 05602;

Office: 802-828-5068

E-mail: mmartin@vhcb.org bcoster@vhcb.state.vt.us

Current primary contacts for other partners who are required to be involved in and consulted about future management issues and have signed off on this plan:

### Wetlands restoration and management:

Laura.Lapierre@vermont.gov, 802-490-6177 [unfilled position at the writing of this plan]

### River management:

Gretchen Alexander, Fluvial Geomorphologist

Vermont Department of Conservation, Vermont Rivers Program, 111 West Street Essex Junction, VT 05452

Office: 802-490-6950

E-mail: gretchen.alexander@vermont.gov

### All Wildlife Issues and, in particular, Indiana bat habitat management:

Andrea Shortsleeve, Private Lands Habitat Biologist, Vermont Fish and Wildlife Department, 5 Perry Street, Suite 40, Barre, VT 05641

Office: 802-479-4439

Mobile: 802-477-2257

E-mail: andrea.shortsleeve@vermont.gov

Alyssa Bennett

VT Fish and Wildlife, Small Mammals Biologist (bat biologist)

111 West Street

Essex Junction, VT 05452

Mobile: 802-353-4818

E-mail: alyssa.bennett@vermont.gov

John Austin, Lands and Habitat Program Manager, Vermont Fish and Wildlife Department, 5 Perry Street Suite 40, Barre, VT 05641

Office: 802-476-0197

E-mail: john.austin@vermont.gov

Jane Lazorchak, Lands Acquisition and Stewardship Coordinator, Vermont Fish and Wildlife Department, Montpelier, VT

Office: 802-505-0561

E-mail: jane.lazorchak@vermont.gov

### Forest management:

Ethan Tapper

Chittenden County Forester

Department of Forests, Parks, & Recreation, 111 West Street Essex Junction, VT 05452

802-585-9099

Ethan.Tapper@vermont.gov

## Appendix B: Conservation Easement

## Appendix C: Baseline Documentation Report, Vermont Land Trust

## Appendix D: Indiana Bat Management Guidelines

## Appendix E: LaPlatte River Corridor and Wetland Management Plan

## Appendix F: Audubon Vermont Habitat Assessment

## Appendix G: A Field Guide to Owls Knoll

## Appendix H: Monitoring Plans

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