

# The Place-based Landscape Analysis & Community Engagement (PLACE) Program

New Haven, Vermont

2015



Prepared for:

The New Haven Conservation Commission

and

The Field Naturalist Program at the University of Vermont

By:

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*Dedicated to all the people who support the PLACE Program — who  
directly and indirectly serve towns and  
communities across Vermont and around the world.*

*With heartfelt thanks to the New Haven Conservation Commission,  
Addison County Regional Planning, Nancy Bell, Shelburne Farms,  
my UVM advisors (Walt Poleman, Jeff Hughes, Ryan Morra, and Deane Wang),  
the Field Naturalist and Ecological Planning Program Team AF,  
my parents, and Andy.*



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# Introduction to the PLACE Program

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Written by Christopher Nytch and Walter Poleman

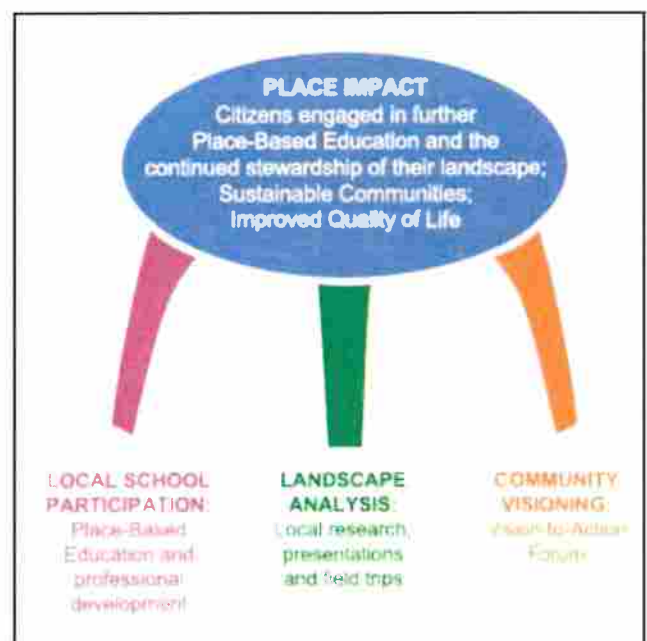
We believe that solutions to social, economic, and environmental challenges start with local initiatives that grow from a mutual understanding of and respect for the natural resources that sustain us. With this in mind, the University of Vermont and Shelburne Farms, a nonprofit organization that focuses on sustainability education, created the Place-Based Landscape Analysis & Community Engagement (PLACE) Program. The PLACE Program promotes sustainable relationships between people and their local landscapes. It accomplishes this by engaging community residents in exploring, understanding, honoring, and celebrating the natural and cultural features that contribute to their town's character.

Since 2001, PLACE has worked with more than 15 communities in the state of Vermont, guiding them through a process of landscape analysis and community engagement. PLACE has spearheaded public presentations, field trips, workshops, and community visioning forums. The PLACE Program helps tell the stories of the landscape over time, emphasizing the fundamental relationships between natural and cultural heritage.

The goals of the PLACE Program are to:

- Encourage exploration and understanding of the local landscape by providing an engaging and accessible framework for residents to learn more about their town's natural and cultural heritage
- Showcase local knowledge and the efforts of individuals and organizations involved in local landscape stewardship and interpretation
- Facilitate the integration of place-based learning into schools by providing local educators with information, resources, and curriculum development support
- Support an informed and participatory community visioning process that builds upon an integrated interpretation of town landscapes and their transformation through time
- Provide meaningful service-learning opportunities for graduate students involved in landscape analysis
- Strengthen the sense of community identity and the connection between the past, the present, and a sustainable future

There are three core parts of the program that hold up these goals: integrating place-based education into local schools, landscape analysis, and community visioning. These core components of the PLACE program are the legs of the stool; each part is distinct and crucial to the program.



# How to Use this Document

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Many people worked together to make this project, and this document, possible. Here are some tips for understanding who did what and where to start in your exploration of the 2015 PLACE (Place-based Landscape Analysis and Community Engagement) Program in New Haven:

- Start by reading the overview below, which is a summary of the entire project. Then, use the table of contents to find the written deliverables that accompany some sections.
- Contributing authors' names are listed beneath the section headings. If no author is indicated, Emma Stuhl wrote the piece.

## Overview: The New Haven PLACE Program

This section describes the six elements of the 2015 PLACE Program in New Haven, Vermont.

The PLACE Program in New Haven is a collaboration between many parties, including:

- the New Haven Conservation Commission
- Beeman Elementary School, the K-6 public elementary school in New Haven
- the New Haven Selectboard
- the University of Vermont, including professors, support staff, and graduate students in the Field Naturalist and Ecological Planning Program. Emma Stuhl, one of the graduate students, worked on the program throughout the summer and for part of the fall.
- Shelburne Farms

## Wildlife Survey:

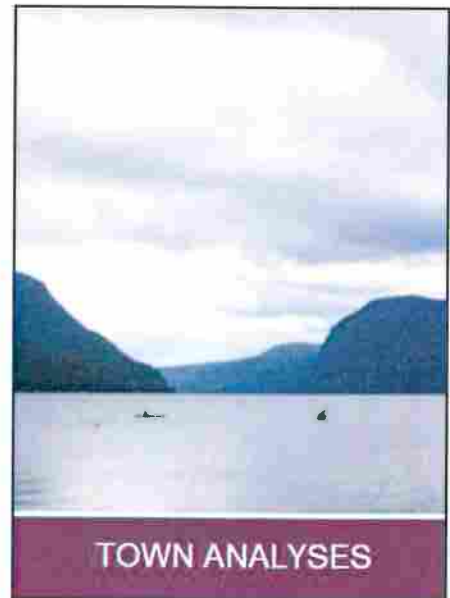
In the spring of 2015, UVM Field Naturalist and Ecological Planning Program graduate students conducted a wildlife survey in New Haven, Bristol, and Lincoln. Students mapped habitat blocks, gathered data on mammal species, investigated how wildlife might move through the landscape, and highlighted areas where amphibians might cross roads en masse in the springtime. They focused their research on sites that connect major habitat blocks, all of which were along the New Haven River. The students shared their results with the Conservation Commission, and this research informed Emma's summer research and helped her create educational materials. The summary report can be found on page 10.

## Research and Interpretive Website Materials:

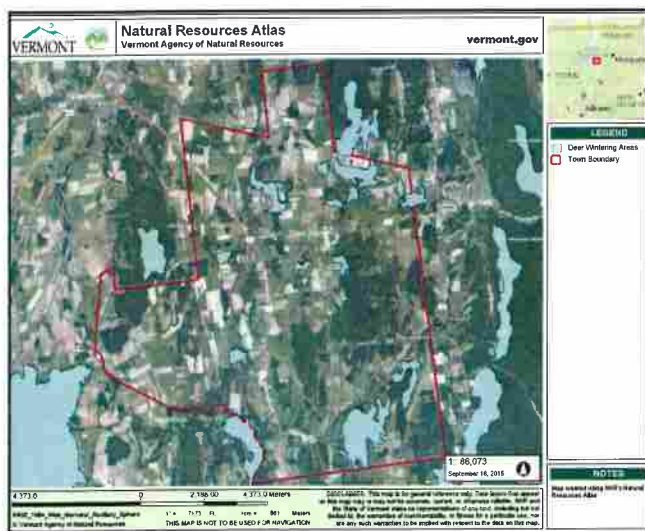
As part of her summer 2015 work, Emma researched New Haven in myriad ways. She interviewed residents, read historical accounts, analyzed maps, and explored the landscape by car and on foot. From this, Emma wrote stories and compiled images that introduce New Haven, from bedrock to humans to bats. To make this content widely available, Emma worked with



*A UVM graduate student tracking on the New Haven River.*



*Anyone can explore the town analyses on the PLACE Program website.*



*Map of New Haven from the VT ANR Atlas.*



*Residents share what they love about New Haven at the Community Forum.*



Inès Berrizbeitia, a PLACE Program partner, to publish the information on the “town analyses” section of the PLACE Program website. The written and visual materials on the website will be available for years to come. Whether people seek out the website on purpose, or find it while they research a New Haven topic, the website aims to help residents better understand the landscape and history that shaped the town and made it how it is today. A hard-copy version of the website content, without all the accompanying images, can be viewed on page 14, or find the complete product online at <http://www.uvm.edu/place/>.

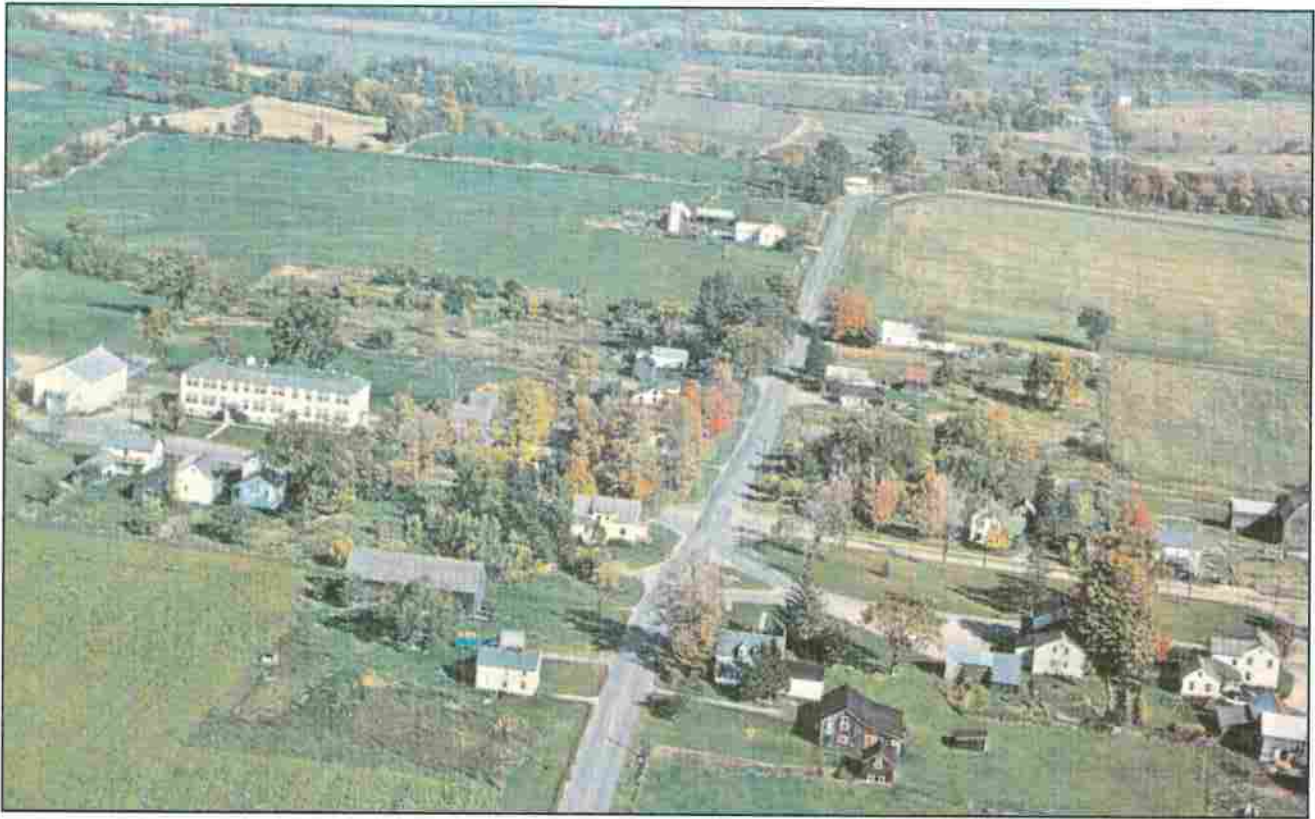
## Mapping:

As part of her research, Emma compiled many maps of New Haven, all of which highlight different town features. She incorporated the maps into the educational materials on the PLACE website, and used them during outreach and education events. The maps can be viewed on page 26 or online at <http://www.uvm.edu/place/>.

## Community Forum:

Emma partnered with Nancy Bell from the Conservation Fund to plan a Community Forum. The forum aimed to gather residents’ thoughts and feelings about New Haven and to launch the PLACE Program’s town events. By starting her work in New Haven with listening to and learning about residents’ values and knowledge, she publically honored the importance of residents’ experiences with the landscape and the community. The responses informed Emma’s research, how she allocated her time, and her understanding of town interests and priorities. Finally, the forum influenced her suggestions for the Conservation Commission’s next steps.

The Community Forum took place the evening of Tuesday, June 30th, 2015 and about 20 people attended. Nancy facilitated the event, and graduate students and other volunteers acted as “scribes,” recording community members’ responses to the prompts. Leah Mital-Skiff compiled the written responses from the forum, and the Conservation Commission plans to make the results publically available. The Conservation Commission provided critical logistical support. The results can be found on page 42.



*"Aerial view of New Haven village, probably taken in the 1980s." The large white building is Beeman Elementary. Image and caption courtesy of the New Haven Library.*

## **Education for Sustainability:**

Two of the Beeman Elementary School teachers, who teach 4-6 grade, attended Shelburne Farms' 2015 Summer Institute on Education for Sustainability (EFS). The five-day institute introduced EFS and a wide variety of workshops demonstrated methods and tools for bringing EFS into the classroom.

Annette Carter and Arnell Paquette, the two Beeman teachers, Shelburne Farms staff, and Emma worked together during the institute to develop a plan for the 4-6 grade curriculum, and to figure out the best ways for Emma to support these efforts. Annette and Arnell decided to implement Shelburne Farms' Healthy Neighborhoods/Healthy Kids curriculum in their classroom, and to use one of the "Big Ideas of Sustainability" as the theme for each of their trimesters. They decided to focus on community, diversity, and interdependence. The Healthy Neighborhoods/Healthy Kids curriculum works to "engage students in meaningful exploration of their community, and to provide teachers, students, and communities with opportunities for student-led community change" ([http://store.shelburnefarms.org/product/82/education\\_resources](http://store.shelburnefarms.org/product/82/education_resources)).

As part of this effort, Emma taught an outreach program for the 4-6 grade classes in September. She shared some of the work she'd done in town and, through this, introduced different types of maps and a variety of ways people use maps to understand a place. The students explored this topic through an outdoor game and role-playing, and made their own maps of the school and surrounding land. The program nicely complemented the Healthy Neighborhoods/Healthy Kids curriculum, which begins with a number of mapping exercises that explore the students' sense of place.

Emma also attended and created a display for the school's open house in October, in order to connect with parents, to explain what the students had been working on, and to publicize other town resources and events. Finally, she tailored and re-wrote 15 classroom and schoolyard activities to meet the goals of the teachers—five activities for each trimester's "Big Ideas of Sustainability" theme. An overview of the curriculum can be found on page 52, and the activities begin on page 54.

## Fall 2015 Field Trips and Evening Talks:

Throughout the summer and into the fall, Emma, with the support of the Conservation Commission and the town office, organized a series of five public educational events. Emma booked the speakers and scheduled and supported most of the events, and the Conservation Commission publicized them and provided logistical support. The public announcement from each event is shared below.

### Farm Tour at the Smiley Farm:

"We'll walk the 150 acres of woods, pastures, and croplands of this 1805 dairy farm and talk about the Smiley Farm's history and how the family is thinking about using the land in the future. The tour includes the old Cape farm house with its center chimney and beehive oven."



### Treleven Farm Field Walk

"Besides being home to a commercial flock of sheep, Treleven Farm includes approximately 70 acres of forested land, managed primarily for overall forest health and biodiversity. Much effort has gone into optimizing wildlife habitat--particularly for endangered bats--and controlling invasives such as buckthorn and garlic mustard. An extensive network of trails allow hikers to explore fine examples of several of the designated Vermont Natural Communities, including:

- Transition Hardwoods Limestone Forest
- Dry Oak-Hickory-Hophornbeam Forest
- Valley Clayplain Forest
- Shallow Emergent Marsh
- Red Cedar Woodland
- Temperate Calcareous Outcrop

Our hike will include a moderately steep climb to a rocky outcrop that overlooks much of the farm as well as the surrounding Champlain Valley, so hiking shoes are recommended. And, of course, dress for the weather since this is a rain-or-shine event."



### Explore the Watershed Center

"The Watershed Center provides access to four parcels of healthy, beautiful, productive land – the 664-acre Waterworks Property, the 94-acre Lost Pond Forest, the 194-acre Middle Forest, and the four-acre Norton Property in Bristol Village. Explore mushrooms, birds, and some other highlights of the Watershed Center's public trails with Craig Zondag, a local naturalist."



*Painting by Claire Dacey.*

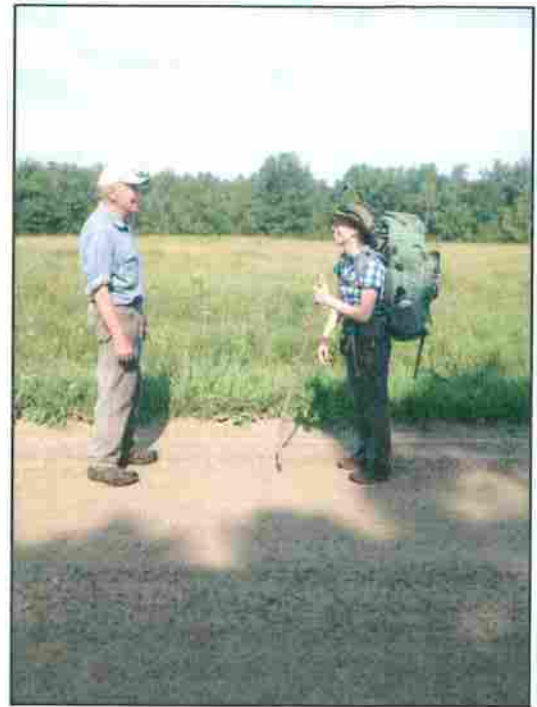


## Across Time and Space: the Changing New Haven Landscape

"From the formation of New Haven's soil to the arrowheads that farmers dug up over the years, Emma Stuhl's research in New Haven this summer unearthed loads of good dirt on the natural and cultural history of the town. Join us as the UVM Field Naturalist shares an integrated story of the New Haven landscape, discussing topics ranging from ancient rock formations to current-day wildlife habitat. Come learn more about New Haven and practice looking at the world through a new lens."

## Tales from the New Haven River-Walker

"In July, Sonia DeYoung, a University of Vermont Field Naturalist, walked the length of the New Haven River from headwaters to confluence—about 25 miles. Over six days she met watershed residents of all ages and professions. They told her about their lives along the river, invited her into their homes, and opened her eyes to the many ways a river can move us. She'll share her stories from the experience and how it has influenced her graduate work at UVM and her approach to life."



*Sonia DeYoung, the River-Walker, speaking with a riverside resident.*

## Conclusion:

The PLACE Program in New Haven built connections between residents with similar interests and helped guide New Haven residents as they built on their sense of place. Whether people are new to town or their family has lived in New Haven for generations, the events and materials that the PLACE Program provided had something new for everyone. The networks formed throughout this project will continue to grow as the Conservation Commission carries on their outreach work in town. As the official PLACE Program winds down, the connections, educational resources, and momentum of the many projects will carry forward, hopefully for years to come.

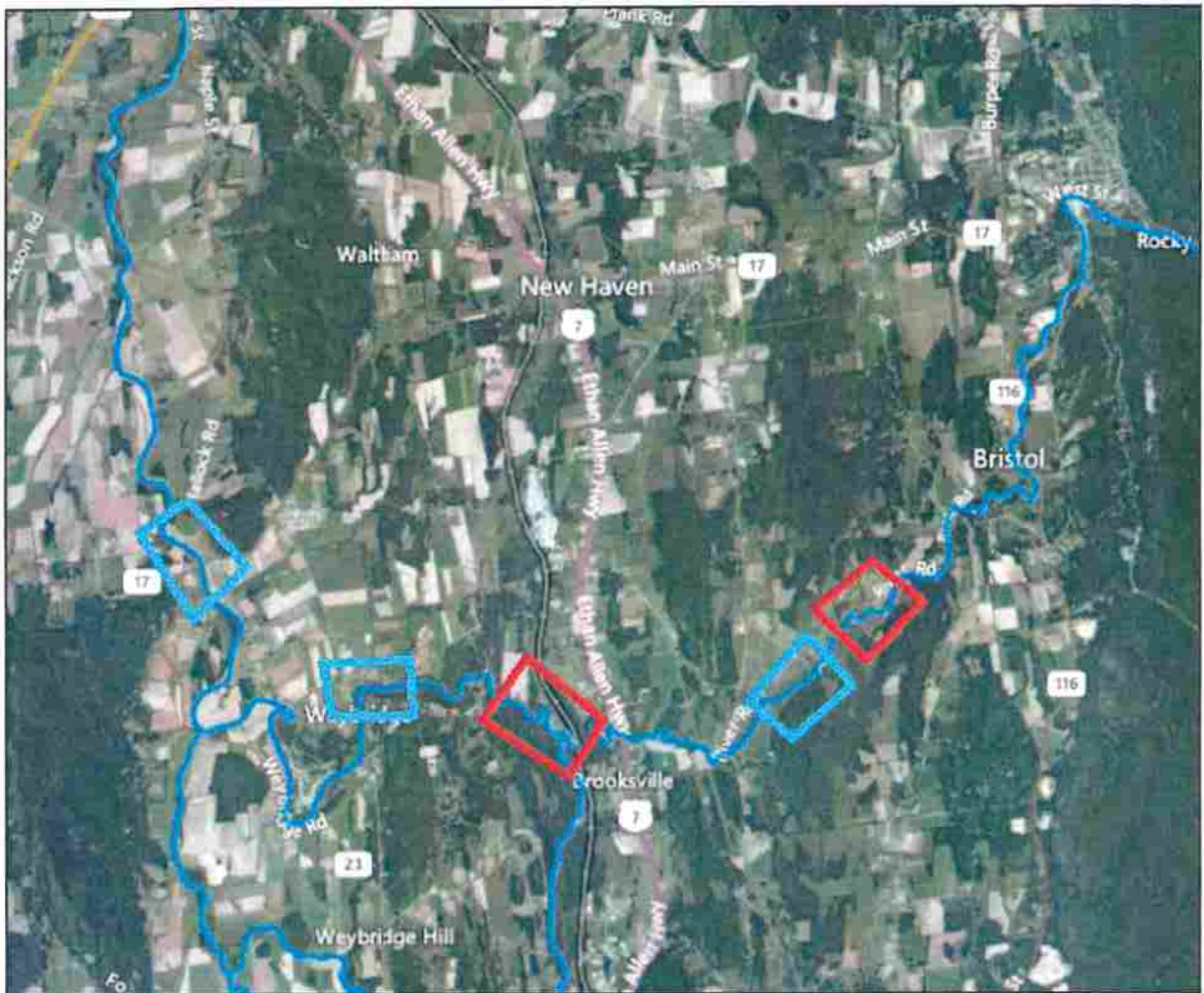


# Wildlife and the New Haven River

By Glenn Etter, Ben Lemmond, and Sonia DeYoung

From February to April, we conducted field surveys to characterize the use of the New Haven River by wildlife. Our surveys were certainly not exhaustive, but they provide some initial data on the presence of mammal species as well as characterize some of the ways that wildlife are moving through the landscape. We used field tracking as well as game cameras to record wildlife presence.

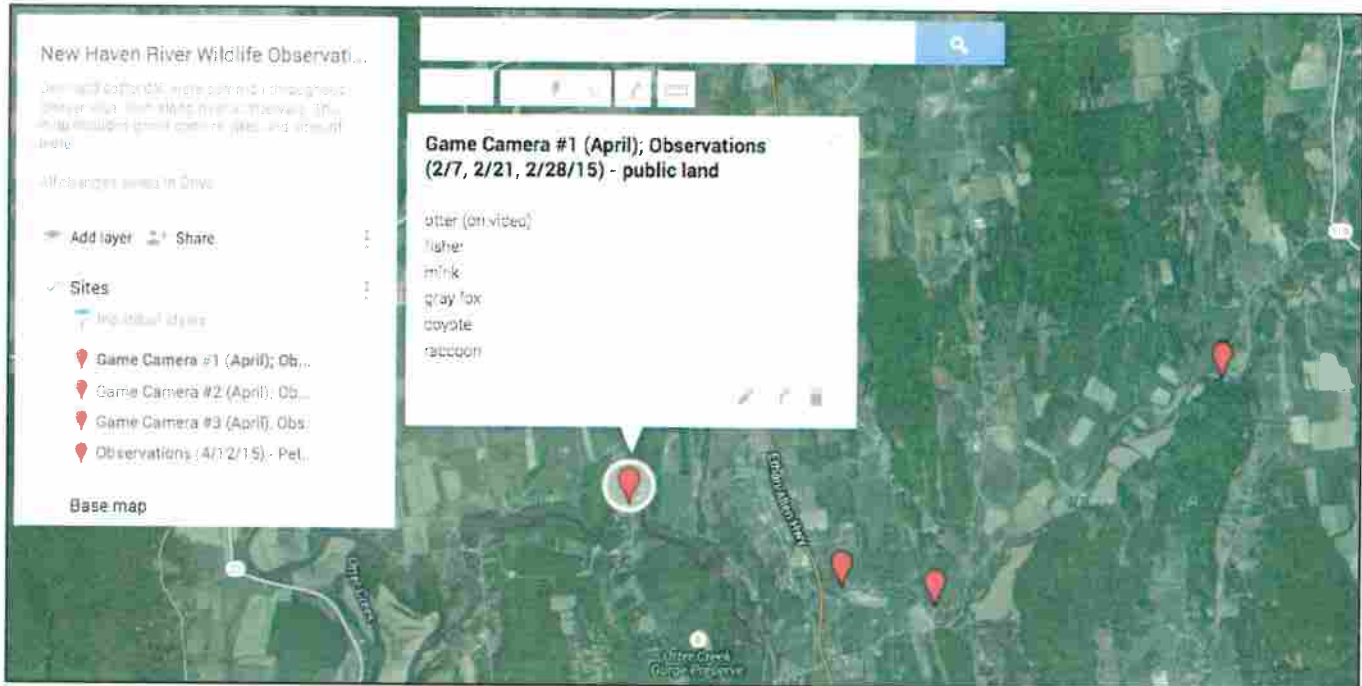
Initial mapping and site selection was determined through remote mapping of habitat blocks and wildlife corridors, using data sets obtained from the Vermont Center for Geographic Information (<http://vcgi.vermont.gov/.opendata>). Using these data layers (habitat blocks, biodiversity index, land cover type), we selected sites along the river that appeared to offer the most strategic value for habitat connectivity. On the map below, high priority sites are indicated in red, medium priority indicated in blue.



*Strategic sites for wildlife connectivity. Red sites are higher priority than blue sites. This data analysis informed where we conducted field surveys.*

Sites were then chosen within these areas by contacting landowners and getting permission to access their land. In Google Maps, we made a map of our four main sites of observation, at three of which we set up game cameras in April, 2015. The map, which lists notable species we saw at each site, can be found here: <https://www.google.com/maps/d/edit?mid=zXAPKb6pRiAq.kvyia4OO-VgA>

Below is a screenshot showing how the online map is formatted.



## Species List (Mammals only)

### Reservoir at Huntington Falls

fisher, mink, gray fox, coyote, raccoon, otter (on video)

### Dean & Lisa Percival (289 Willow Lane)

muskrat, coyote, fox (gray/red), long-tailed weasel

### George Crane (3757 River Road)

coyote, gray fox, weasel (long-tailed/ermine), bobcat (on video)

### Peter Carothers (1089 River Road)

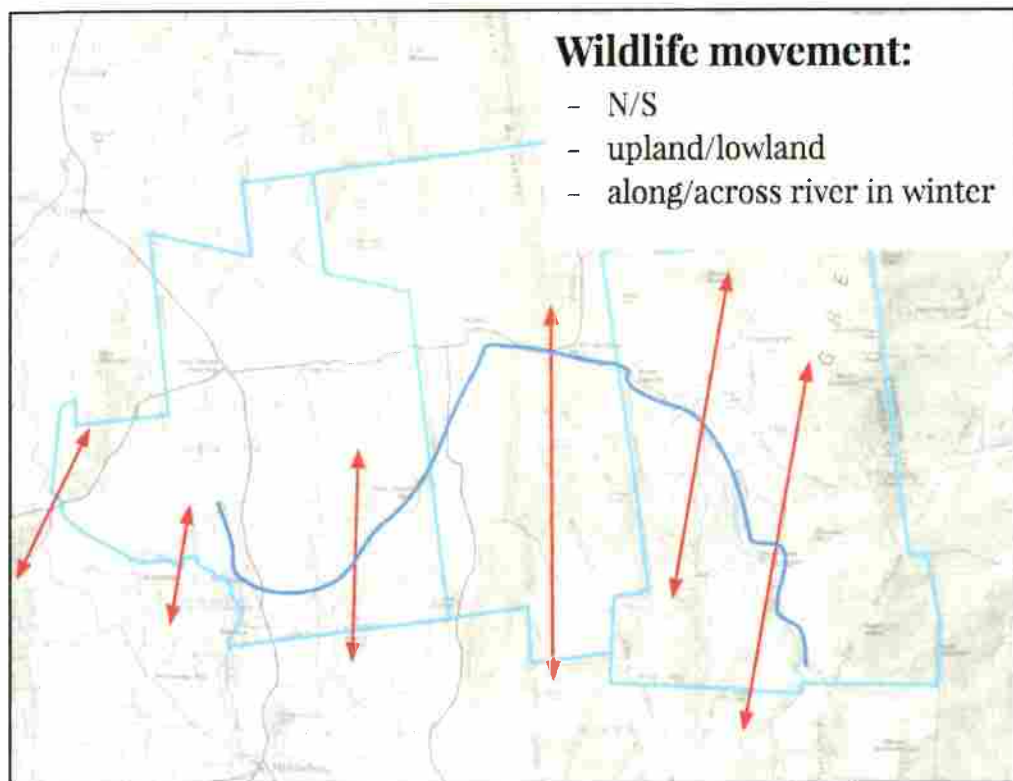
opossum, raccoon

### Widely distributed

deer, cottontail, beaver (sign along river), squirrel, and other small rodents

## Wildlife Use of the New Haven River

Generally speaking, the major habitat blocks in the New Haven River area are oriented north-south. This is true for major features such as the Green Mountains and the Hogback Mountains to the east as well as for smaller ridges and hills that also follow N/S patterns. When the river is frozen, these habitat blocks become more continuous and accessible for many wildlife groups. In our field surveys, we observed many tracks of species such as coyote and deer crossing the frozen river. The map below shows these movement patterns between larger habitat blocks – notice that many involve crossing the river, which wildlife can do either by roads, swimming (only some species), or over the river when it is frozen.



*The arrows show likely wildlife movement patterns between larger habitat blocks. Many of these paths involve crossing the New Haven River.*

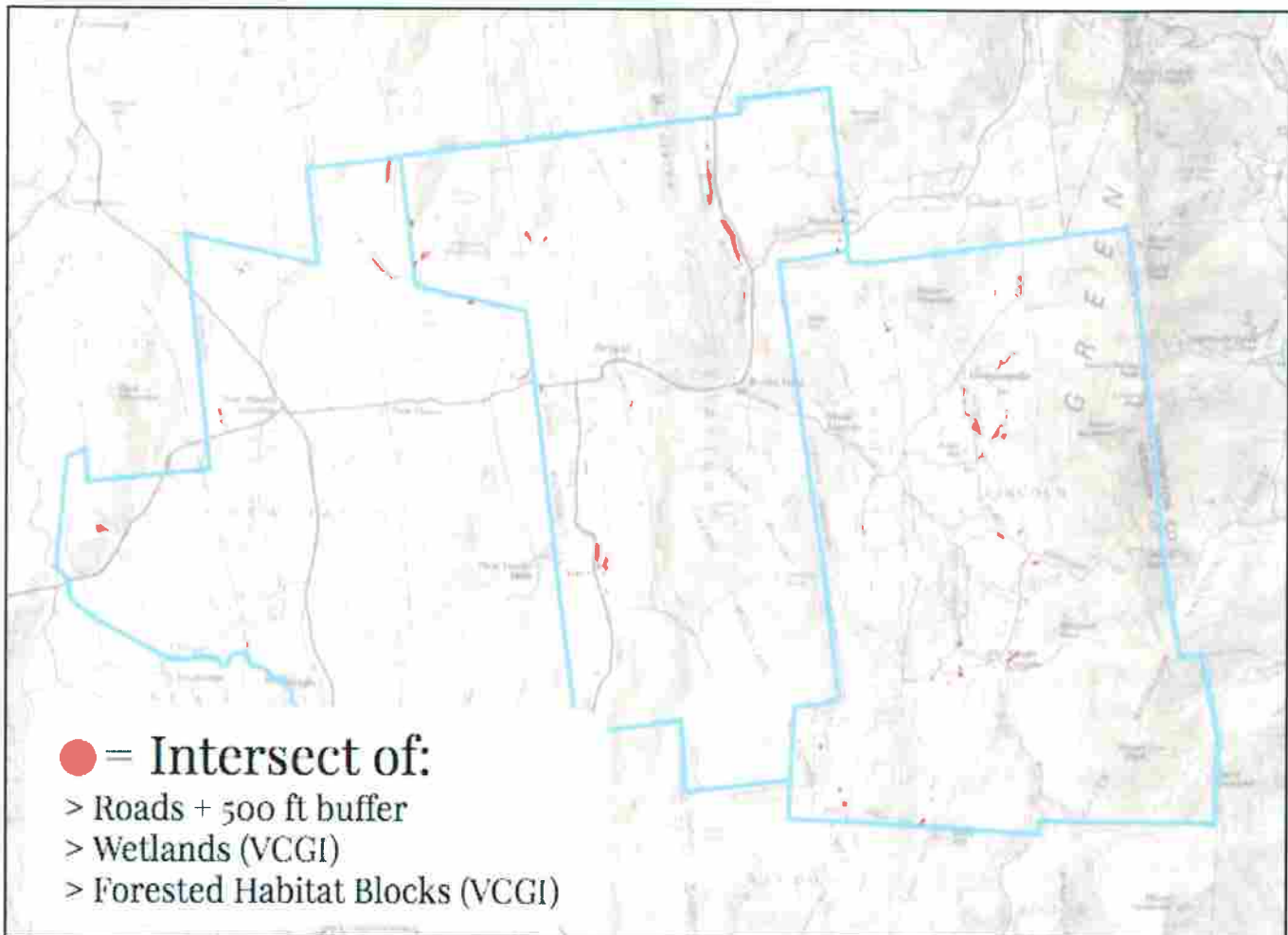
## Notable encounters

According to two of our local contacts, bobcat signs had not been seen lately in the New Haven area. It was a surprise, then, when we glimpsed a bobcat feeding on a deer carcass in our game camera placed on River Road. It's a bit hard to see, but note the ears on the lower right side of the image. A second video captured the bobcat returning to the carcass.



## Amphibians in the New Haven River Watershed

Amphibian movement from upland to lowland areas after the spring snowmelt is a critical piece of the wildlife story in this region. We used GIS to determine areas where mapped wetlands, forested uplands, and a buffered area of roads all intersected in the town of New Haven (shown in red on the map below). This gives at least a coarse-filter analysis of what areas to field-check for potential herp crossing activity. One of the road crossings on North Street that is identified in our map is listed by the Vermont Herp Atlas as a place to observe amphibians such as wood frog, spring peepers, and numerous salamanders during their annual spring migration. For more information on these species and other amphibian crossing sites, visit [vtherpatlas.org](http://vtherpatlas.org).



*It is likely that amphibians cross these red areas each spring as they migrate between forests and wetlands to breed.*

## Moving Forward

We hope that the results of our project will be helpful to the New Haven Conservation Commission in understanding the diversity of mammals using the town's landscape and in deciding what sections of road and adjacent habitat might be most valuable to protect. Hopefully, the connections we made and the relationships we built with residents along the New Haven River, in addition to the preliminary wildlife surveys and mapping exercises, will be a useful foundation for future projects.

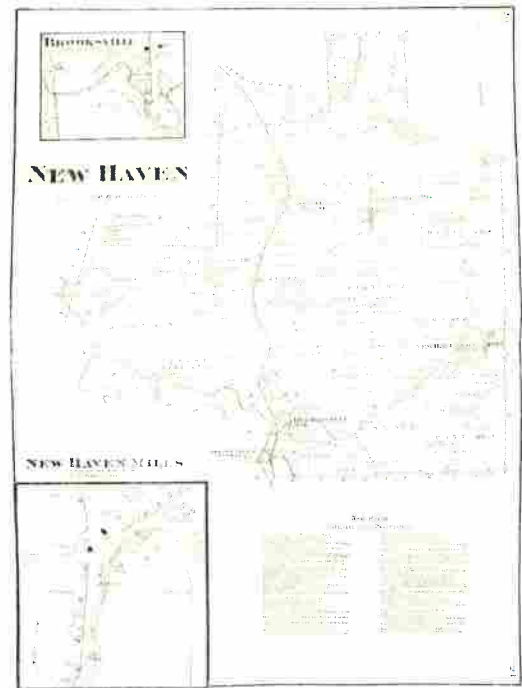
## Interpretive Website Materials

This section of the report is available online on the PLACE Program website, in the "Town Analyses" section. Find it at <https://www.uvm.edu/place/towns/newhaven/index.php>.

### Introduction:

The small town of New Haven, Vermont, greets residents and visitors with expansive views of fields and forests, rolling hills, and the rising mountains of Green Mountain National Forest. Directly north of Middlebury, New Haven is home to the beloved Addison County Fair and Field Days, the largest agricultural fair in Vermont. With a population of approximately 1,700, the town is small enough that many residents say they feel neighborly camaraderie even with those who live on the other side of town.

This web page begins to explore the physical, cultural, and ecological landscapes of New Haven, and considers how the natural world and human culture have impacted each other and will continue to do so. From the New Haven Mills' commercial use of the river to the lime kiln that provided fertilizer and plaster for people near and far, New Haven's cultural history is intimately tied to the land.



*New Haven Town Map. From the F.W. Beers Atlas of Addison County. Image courtesy of University of Vermont Special Collections.*

### Physical Landscape:

#### Bedrock Geology:

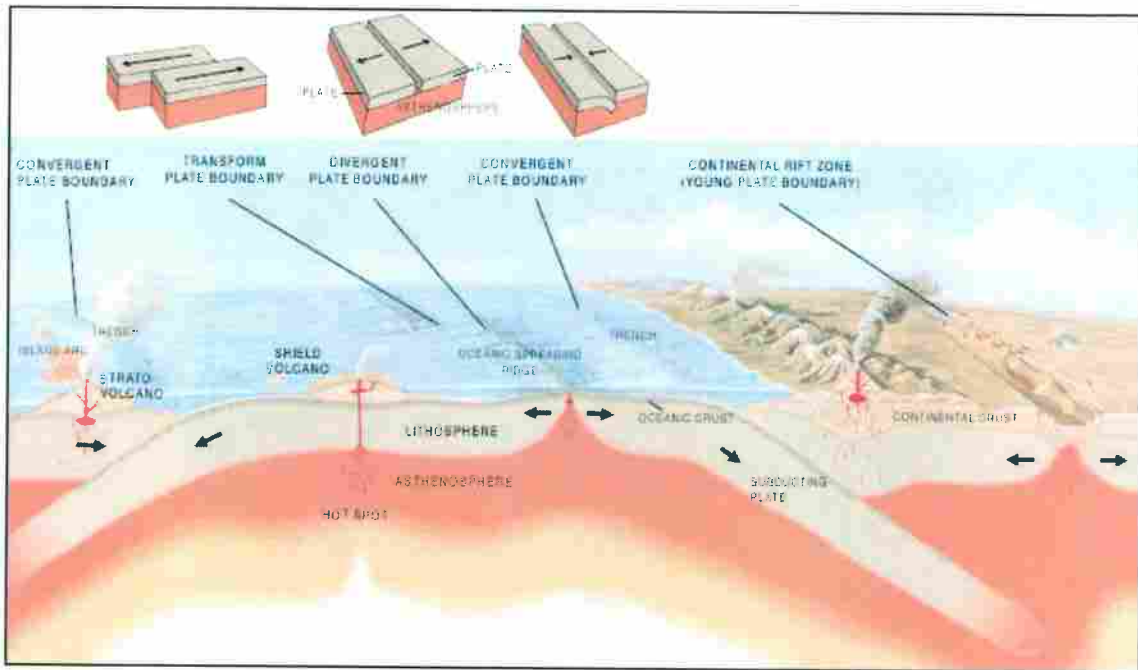
Imagine Vermont 540 million years ago. The Green Mountains had not yet risen to define the "Green Mountain State." In fact, time travelers to this era would find New Haven underwater, and much closer to the equator. There they could lounge, enjoying the shallow, tropical lapetus Ocean that covered much of modern-day Vermont. They would take in the views of another era, and enjoy the grand vista of the coastal Grenville Mountains, which we can still see parts of today in the Adirondacks. The massive Grenville Mountains stretched from Newfoundland to Mexico and stood higher than today's Himalayas. One might wish that Vermont were still a tropical destination, and that this sort of mountaineering opportunity still existed in New England. Alas, rocks are always changing, and over the following 540 million years, the landscape transformed in astounding ways.

Continents, which seem so stable, are actually sitting on huge plates of rock. These blocks of rock, or tectonic plates, float on a layer of hot, liquid rock called magma. As the magma flows, the plates of rock drift slowly, with extensive consequences. When these plates bump, slide, and scrape, earthquakes shake the land. When the plates collide, mountains rise. When the plates separate, they can form deep trenches where liquid rock solidifies as it is exposed to the cooling ocean.

In Vermont, 540 million years ago, separating tectonic plates steadily expanded the land under the sea. As Vermont lay under the lapetus Ocean, the nearby Grenville Mountains began to erode. Water, wind, and ice cracked and fragmented the solid bedrock into fine particles, which washed and blew downhill. These sediments traveled down streams and into the ocean, where they settled out, along with the shells and dead

bodies of small marine creatures. Over the ages, the loose sand and mud cemented into the stone that makes up the modern Green Mountains, and the calcium-rich shells and other bodily remains turned into the limestone and dolostone rocks that underlie much of New Haven. Today, these rocks provide ample calcium, an important plant nutrient, to the soils that cover them and to nearby plant roots.

In a dramatic turn of events, the separating plates under the ocean reversed direction and began to creep towards each other. Where the plates met, a ring of volcanoes spewed liquid rock from the depths of the earth. This arc of explosive mountains eventually crashed into the seashore, and lifted the Green Mountains upwards in what is known as the Taconic Orogeny. In the midst of the upheaval, eastern New England, which was then a separate continent, smashed into Vermont. The collision uplifted the mountains even further. This action-packed story, which took place incrementally over 300 million years, explains the formation of most of the bedrock in Vermont.



*This drawing shows three types of tectonic plate interactions and some of the resulting geologic formations. Image courtesy of the U.S. Geological Survey.*

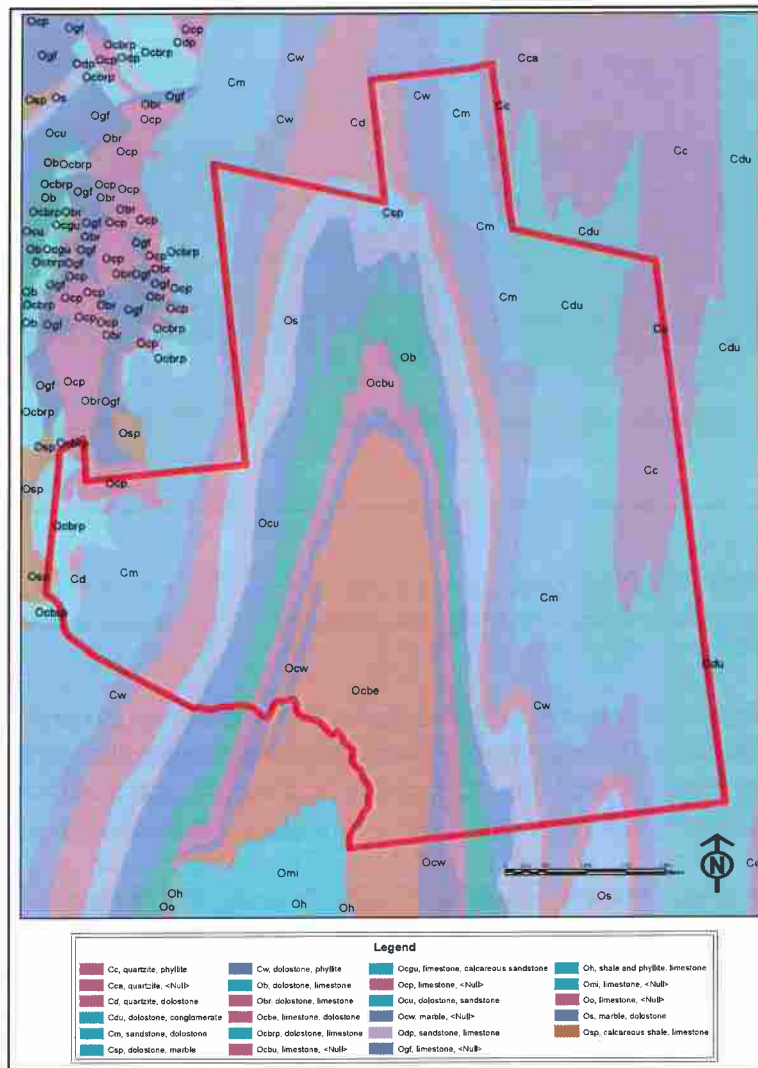
In New Haven, the calcium-rich limestones and dolostones that underlie much of the town were warped in these massive geologic collisions. The extreme heat and pressure of these collisions folded the layers of bedrock and even metamorphosed some of the rocks, changing their physical and chemical structure. A layer of the calcium-rich bedrock recrystallized into marble, which arcs through town in a thin stripe. Some of the bedrock in town started as sand, rather than as the shells of marine organisms; this rock metamorphosed into the quartzite that now lines the eastern edge of town. Over the following millions of years, wind, rain, and ice scoured away the surface of the bedrock that New Haven sits upon, leaving behind the bedrock pattern we see today, a beautiful arc of different rock formations (see map below). In the map below, each color and three-letter code corresponds to a different rock type, which is explained in the legend at the bottom of the page. While there are many types of rock in New Haven, the majority are variants of limestone and dolostone.

This limestone bedrock was and is an economically important resource. In the 1800 and 1900's, limestone was mined from the quarry and heated in the kiln on Lime Kiln Road to break it apart into lime for farmer's fields and for plaster and masonry. The calcium in the bedrock also enriches the surficial materials and the soils that lie above it, slowly fertilizing the landscape.



*Quarry Reflections photograph by Don Shall. New Haven, Vermont USA • Dennis Sparling Studio. <http://sparlingstudio.com/>.*

## New Haven Bedrock



*Much of New Haven's bedrock is limestone. This calcium-rich rock slowly adds nutrients to the overlying soil every year.*



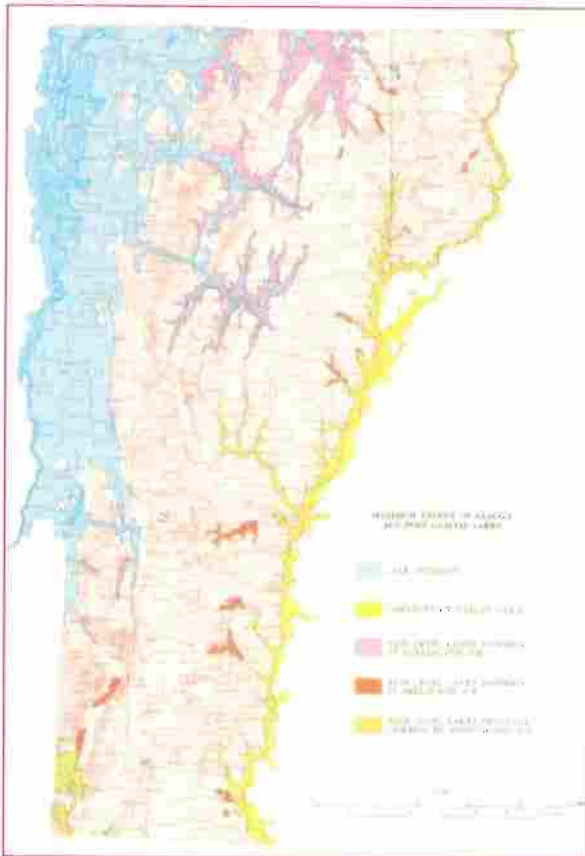
## Surficial Geology:

Surficial geology describes the layers of sediments that lie over the bedrock, but under the living soil where plant roots, fungi, and invertebrates live and grow. While much of the land in Vermont has at least one layer of surficial deposits, some living soil lies directly upon bedrock.

At the peak of the last great ice age about 18,000 years ago, New Haven and the rest of Vermont were covered by a sheet of ice more than a mile thick. This glacier spanned the width of the continent, running from central Canada south to present day Long Island, New York. As it flowed, the glacier scoured everything in its path, moving massive quantities of dirt and bedrock, and dumping them elsewhere in a jumble of materials known as glacial till. This mixed-up glacial till was packed down under the immense weight of the ice, and is known colloquially as 'hardpan'. Glacial till underlies the soil at many of the higher elevations in New Haven.



An artist's rendition of the last glacial maximum. "IceAgeEarth" by Ittiz - Own work. Licensed under CC BY-SA 3.0 via Commons.



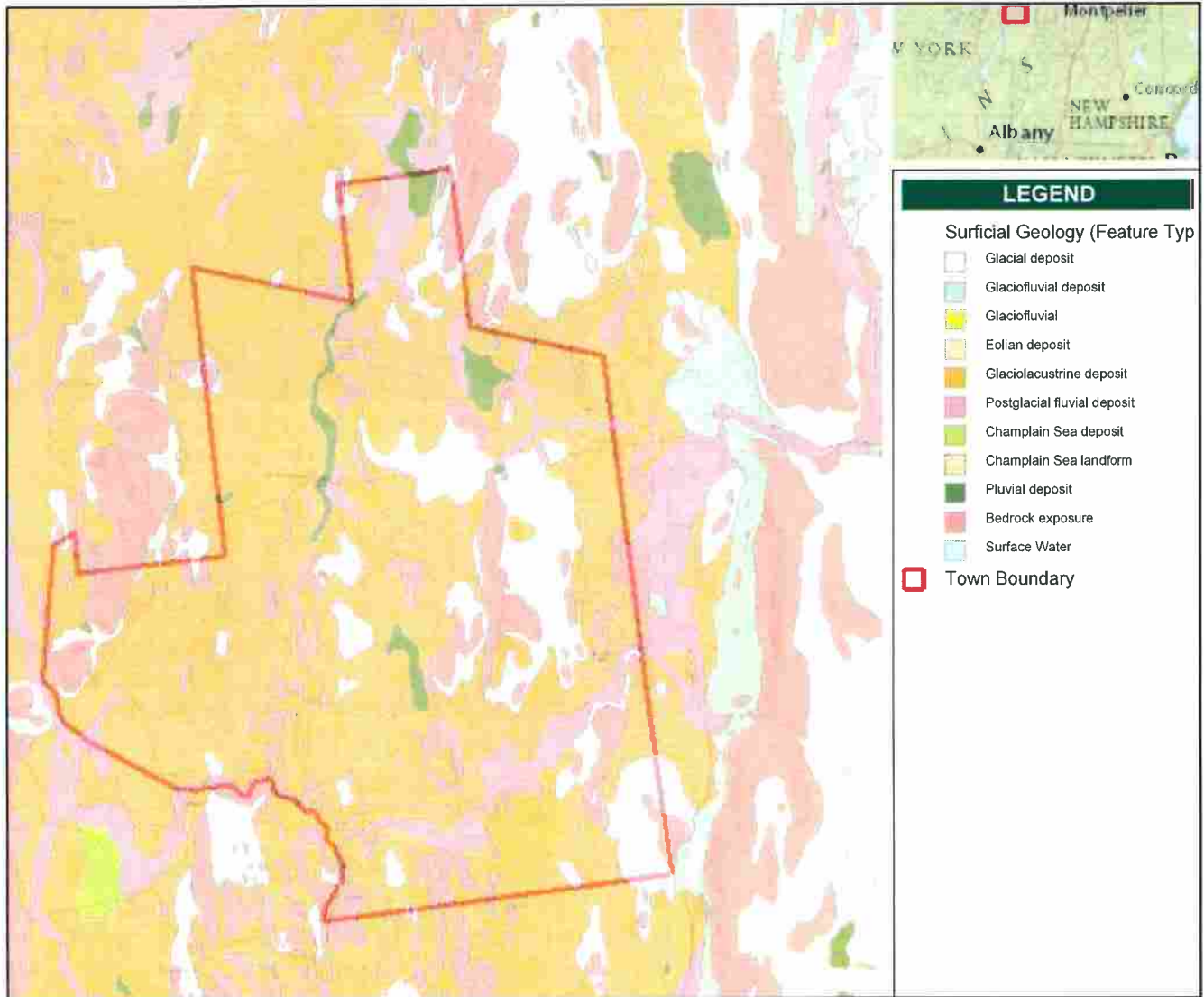
Author: Vermont Geological Survey

In the Champlain Valley, as the glacier melted and retreated, the solid ice blocked the northern outlet for the valley's water. Since the melting ice sheet released enormous quantities of water, the dammed valley filled with water to a much higher level than current day Lake Champlain, creating what geologists call Lake Vermont (see Vermont Geological Survey image below). The surface of Lake Vermont was 500 feet higher than Lake Champlain today, and covered much of modern-day New Haven.

Lake Vermont was a murky lake, as the rivers that flowed into the lake carried lots of loose sediment from the scoured hillsides and from the glacier itself. At the river mouths, as the water slowed, the relatively heavy sand particles fell out of the water column and formed sandy delta deposits and beaches at the water's edge. As the water flowed into the lake, finer silt and clay sediments settled to the bottom of the lake. Glacial Lake Vermont covered the Champlain Valley for over a thousand years, collecting substantial clay deposits that later gave rise to the clay and loam soils that are common in New Haven today.

About 12,000 years ago, the ice dam broke. Lake Vermont abruptly drained, reducing the water level by 300 feet in hours or days. This rapid change in water level exposed the clay that had settled to the bottom of Lake Vermont in New Haven, paving the way for the vegetation that eventually colonized the post-glacial landscape.

# New Haven Surficial Geology



*All the orange areas in this map of New Haven, VT, were once covered by Glacial Lake Vermont. Today, there are lake deposits lying on top of the bedrock in these areas. Data and imagery from the VT ANR Atlas.*

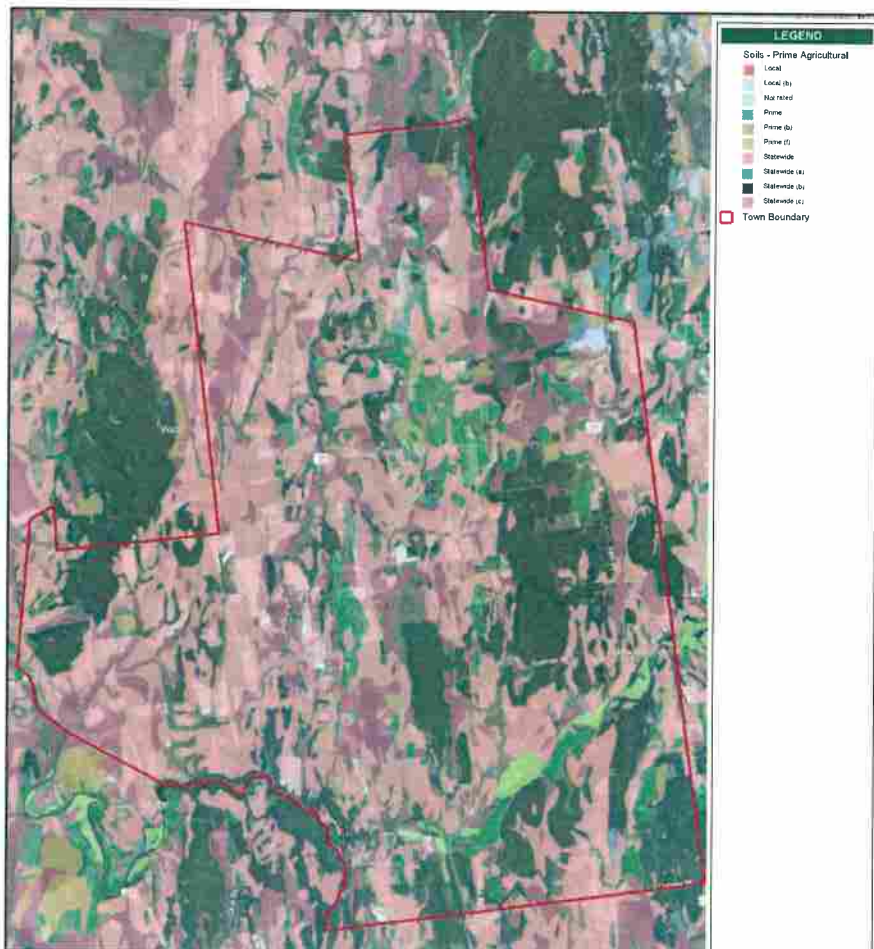
## Soils:

Soil is the foundation for much of life, physically and metaphorically. It is the medium in which we grow our food, the base upon which we build our homes and businesses, and the holder of many of the nutrients that feed us and the plants and animals we consume. The soils of New Haven are integral to the town's rich agricultural history and will continue to shape the way people use the land in the future.

New Haven's soils tend to be fairly nutrient-rich, and many areas are classified as prime agricultural land and continue to be used for agriculture. Some of this richness comes from the clay deposits and limestone bedrock that underlie much of New Haven's clay and loam topsoil. Clays hold onto nutrients well, and thus help prevent them from washing out in rainstorms. The calcium that leaches out of the bedrock makes the soil less acidic, which makes it easier for many plants to grow. It is also one of the key nutrients that plants need to absorb. This fertility supports crops and favors some valued species, like sugar maples.

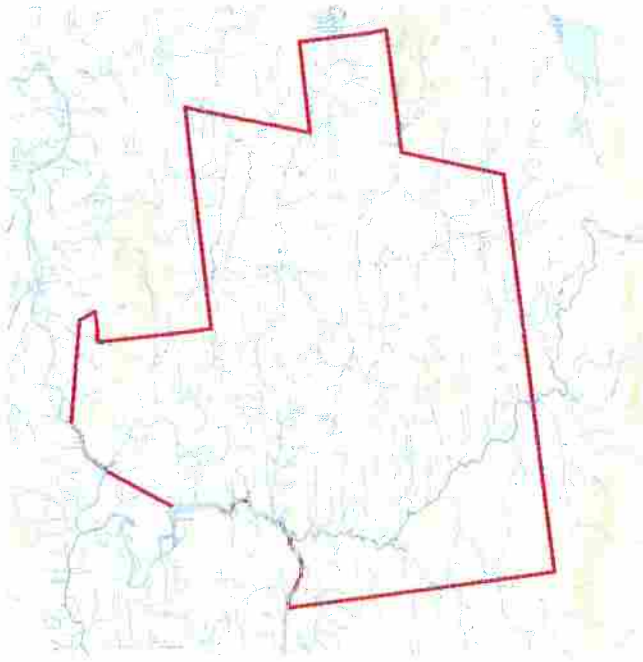


*The confluence of New Haven River and Otter Creek.  
Photo by Sonia DeYoung.*



The forces of erosion continue to shape the soils of New Haven today, as particles slowly change shape and size, and sediment moves from one place to another. Wind blows dust through the air. People move dirt during construction and farming, and expose soil to wind and water. Water trapped in the cracks of rocks expands when it freezes; this widens the crevices and eventually splits the rocks into smaller pieces. Water also moves sediment and deposits it in floodplains, streambanks, and lakes. This soil fertilizes the land or water where it settles downstream.

*Left: New Haven prime agricultural soils. Data and imagery from the VT ANR Atlas.*



## Hydrology:

In 2011, the precipitation from Tropical Storm Irene washed away bridges and flooded streambanks and neighborhoods, even tearing some homes from their foundations. The storm, which garnered national media attention, demonstrated the extent to which water can shape the landscape and the lives of Vermonters. Whether thinking about how water gradually erodes a hill, or how it carves new river channels during massive flooding events, water has shaped the topography of New Haven. Water also played a key role in the formation of New Haven's hidden physical features, like the bedrock and surficial deposits, which were formed, respectively, in an ancient tropical sea and in glacially dammed Lake Vermont.

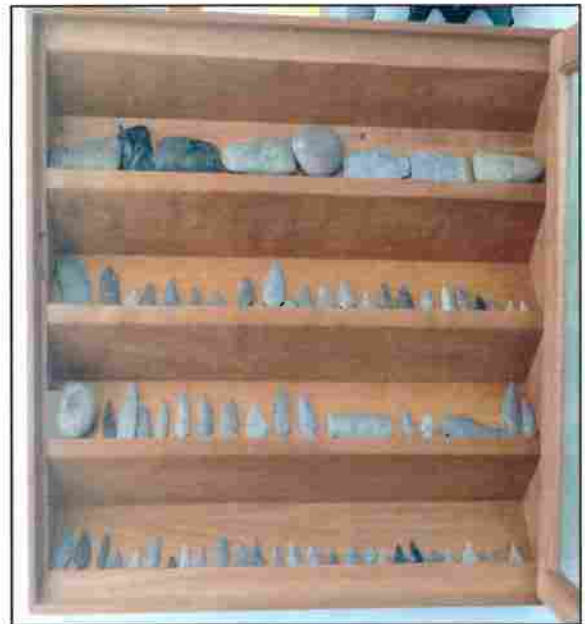
One large river runs through New Haven, the aptly named New Haven River. It flows west from Lincoln and Bristol across the southern part of town and into Otter Creek, which acts as part of the western border for the town. The New Haven River is a popular fishing and kayaking location. A smaller river, Little Otter Creek, flows from the center of town north into the nearby towns of Monkton and Ferrisburgh. New Haven is peppered with other small streams throughout the town, all of which eventually drain into a larger river and then into Lake Champlain.

There are four sizable wetlands in New Haven, including a cedar swamp in the northeast corner of town. Several vernal pools, which fill with water during the spring snow melt and then dry up in the summer, provide breeding habitat for some amphibians, such as wood frogs and spotted salamanders. These amphibians rely on seasonal vernal pools because there are no hungry fish in them that would eat the eggs and tadpoles. New Haven's diverse wetlands are important ecosystems as they mitigate floods, filter water, and are home to countless species.

## Cultural Landscape:

### Prehistory:

Over 10,000 years ago, humans migrated northwards in the wake of the melting glacier. Primarily nomadic hunters and gatherers, these Paleoindians may have lived in or traveled through New Haven. Evidence of these ancient people is scarce, but exists in New Haven. A resident found a Paleoindian arrowhead on his farm that archaeologists believe is about 10,000 years old. There is no way to know, however, whether the arrowhead was dropped by a Paleoindian or whether ancient people passed the arrowhead from generation to generation and then abandoned or lost it in more recent times. Artifacts like this arrowhead remind us of the connections between past and present cultures.



*Tools and arrowheads on display in the New Haven town office. Photo by Susan Smiley.*

As the climate continued warming after the ice age, people settled into defined territories along rivers and streams. This era, known as the Archaic period, lasted from 9,500 to 3,000 years ago. In the following Woodland period, people began farming and created permanent villages. The descendants of the Woodland people in Northern New England make up several distinct tribal groups, collectively called the Abenakis, a name given to them by French traders in Quebec.

Residents of New Haven and visiting archeologists have found numerous American Indian artifacts, including arrowheads, knives, scrapers, hatchets, and a round grinding stone. A display of artifacts is open to the public at the town hall.

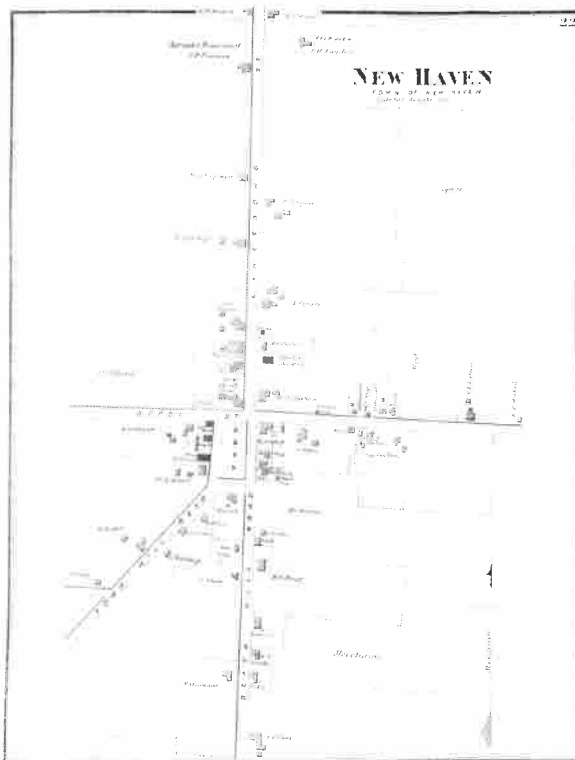
### **Early European Settlement:**

In November of 1761, Governor Wentworth of New Hampshire created the charter for New Haven and granted land to John Evarts and 61 other Connecticut residents. Governor Wentworth did not actually have the authority to give away the land, and he eventually resigned in disgrace after an extended conflict with the New York State authorities who were giving away the same land.

Despite Wentworth's questionable authority, the settlers moved to present-day Vermont and began to clear the land. John Griswold, his five sons, and probably a few men from the Barton and Evarts families, were the first settlers to make the move in the summer of 1769. They worked that summer and in following summers to prepare the homesteads where their families eventually moved. During those preparatory years, the men spent the winters and springs in Connecticut with their families, helping to plant the fields before heading north to clear more land in Vermont.

Early settlers were largely self-sufficient. They farmed, hunted, and made most of what they needed. Over time, people developed small industries in town. For example, in the mid-1800s, there were four small sawmills, a quarry, an axe factory, and several tanneries in New Haven. In the 1820s, many farmers began to raise sheep commercially, as there was a sizable demand for wool. This demand fluctuated over the following decades, and eventually Vermont farmers couldn't compete with cheaper wool from the western United States and Australia. By the end of the civil war, many people had turned to dairy farming, which became a long-lasting staple of the town's economy. Over the next century and a half, dairy farmers shifted from selling butter and cheese to selling liquid milk. Farms grew in size, the number of farmers decreased, and farmers bred cattle to be more productive. Today, a sizable portion of the New Haven landscape is devoted to dairy farming.

To learn more about the cultural history of New Haven, read *New Haven in Vermont: 1761-1983* by Harold Farnsworth and Robert Rodgers and *Wandering the Corners of Elgin Spring Farm: 2014* by Earl W. Bessette and others. Both books are available for sale at the New Haven town office.



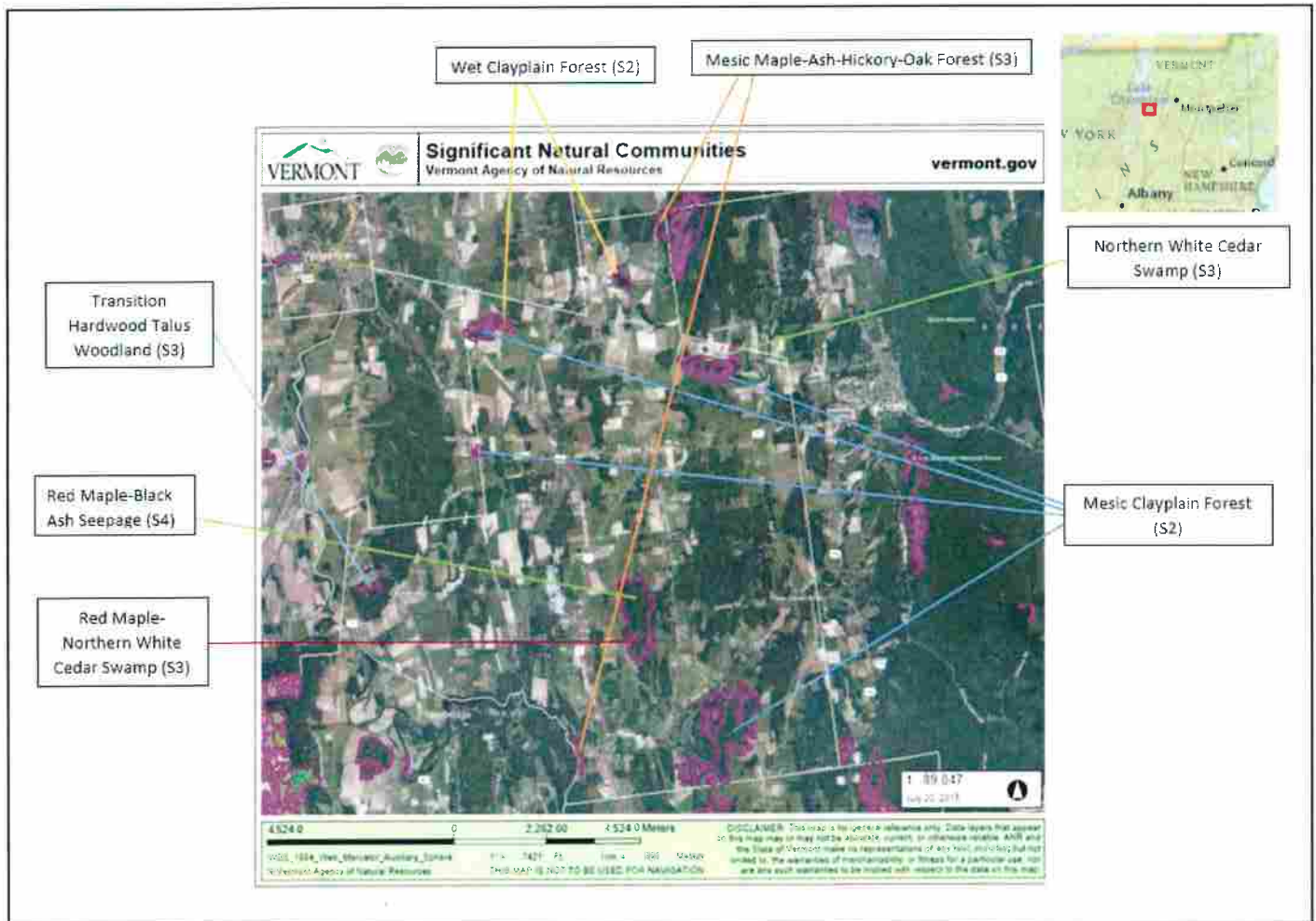
*New Haven Town Center 1871. From the F.W. Beers Atlas of Addison County. Image courtesy of University of Vermont Special Collections.*

# Ecological Landscape:

## Natural Communities:

Have you ever noticed how blueberries grow in places with similar characteristics? Most organisms have biological preferences, needs, and competitive abilities that shape where they are able to survive and thrive. Scientists call groupings of plants, animals, and other organisms that occur repeatedly in certain physical environments “natural communities.” Armed with a bit of know-how, you can head out into wild landscapes and predict some of what you will find based on soil type, water, climate, and more.

While much of the land in New Haven is used for agriculture or homes, New Haven is still home to several significant natural communities, including the rare Clayplain Forest. Clayplain Forests grow in the dense, clay soils that developed from the sediments that settled out of glacial Lake Vermont. The watertable is often high in these forests, so the trees’ roots tend to be shallow. As a result, wind storms easily blow trees over, and leave toppled trees scattered throughout the forest. When people comment on the Champlain Valley’s fertile agricultural land, they are often referring to these clayplain soils. Since this land is so productive, it is now mostly used for agriculture and the Clayplain Forest natural community which grows on these soils is extremely rare. There are several scattered wetlands in New Haven, such as the Red Maple-Northern White Cedar Swamp, a natural community that occurs over calcareous bedrock in Vermont. These swamps flood seasonally, and stay



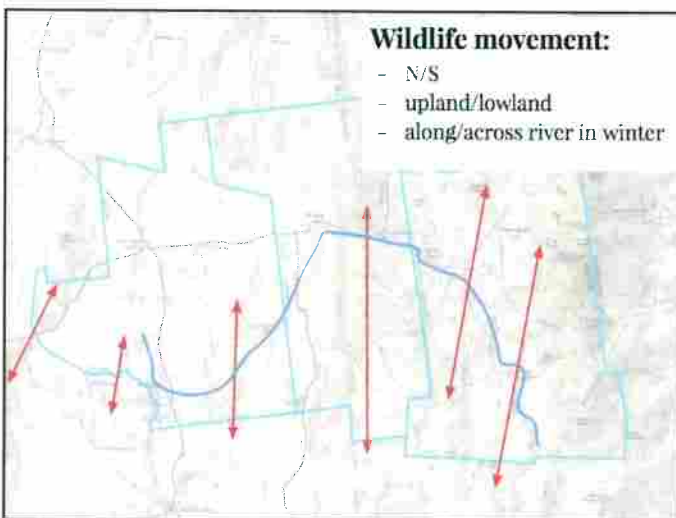
Rare and unusual natural community types in New Haven, VT. While this map only refers to part of New Haven, it gives a sense of the types of forests that New Haven could and does support. Data and imagery from the VT ANR Atlas.

wet year round. Similar to the wet soils of the Clayplain Forest, the wind frequently blows over the shallow-rooted trees. This creates small hummocks and hollows. Some residents of New Haven recall stories of how every land owner in town was also given a piece of distant swamp land where they could harvest the rot-resistant cedars to build fences.

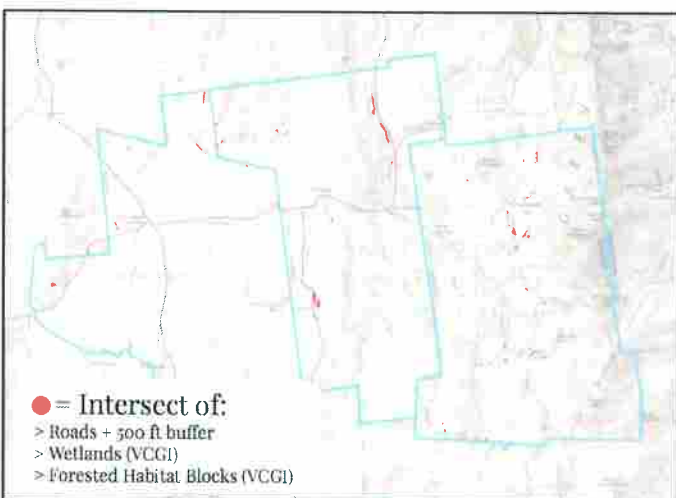
The undeveloped areas in town provide important ecosystem services to the surrounding areas. From supporting pollinators, to cleaning water and mitigating floods, the vegetation of New Haven supports the lives of all town residents.

## Wildlife Habitat:

New Haven's fields and forests are home to many animals besides humans. Small animals that live in New Haven year-round, larger wildlife that travels through town, and migrating songbirds all rely on the landscape they share with humans.



*Wildlife corridors connect habitat blocks in the New Haven River watershed.*



*Potential amphibian road crossings in the New Haven River watershed.*

Many of the large, intact habitat blocks in the New Haven area are oriented north-south, such as the Green Mountains, Hogback Mountains, and the handful of other smaller ridges and hills (see map below). The New Haven River, especially when it is frozen in the winter, is an important east-west connector between these scattered forested patches. The river can also act as an obstacle for some animals. Thus, when waterways are not frozen, some animals may use roads and bridges to cross the water. Others are able to walk or swim to the far bank. Providing water, food, and a travel corridor for many species, the rivers are a great place to look for wildlife tracks. Tracks are especially clear a few days after a snowfall or in the mud after the spring melt has scoured the banks.

The spring-time frog chorus reminds people of all the amphibians that live in their neighborhoods, rarely seen. New Haven is home to many amphibians and reptiles. In the spring, amphibians such as wood frogs, spring peepers, and numerous salamanders migrate to their breeding grounds. These small creatures often have to cross roads, which is a perilous task for an amphibian. Citizen scientists and community volunteers in many communities, including New Haven, monitor the nocturnal amphibian migrations and help the amphibians cross roads safely. The red sections on the map below of New Haven, Bristol, and Lincoln show where roads separate wetlands and forested areas and thus where amphibians might cross roads en masse. To learn more about the amphibians that live in New Haven, explore the Vermont Herp Atlas at [vtherpatlas.org](http://vtherpatlas.org).

## Connections:

Human history is intimately tied to the history of the land in New Haven. The physical and ecological landscapes have determined where people have found or grown food and other life necessities, where people have settled, and what challenges communities have faced. Today, with goods coming into people's lives from around the world, we are connected to a much larger area of land. Yet, we find that our connections to our homes are as strong as ever when we take the time to discover how the land and the surrounding ecosystems support us.

Let's explore a remarkable story that highlights these connections in New Haven today. It all begins with the shagbark hickory, *Carya ovata*, a deciduous tree that grows in the warmer parts of Vermont and that stands out because of its shaggy, peeling bark. Since the shagbark hickory is at the edge of its range in Vermont, it thrives best on relatively nutrient-rich soils. These factors come together nicely in New Haven, where much of the soil is quite fertile and where Lake Champlain holds the summer's heat into the depths of winter and thus moderates the region's temperatures. New Haven's south-facing hills also create warmer microclimates where shagbarks grow well, and calcium-rich bedrock feeds some of the town's soils from below.



*Shagbark hickory. Photo by Dcrjsr (own work).  
Image licensed under creative commons by  
wikimedia.*



*An endangered Indiana bat. USFWS Photo.*

We introduce our second character, the Indiana bat, *Myotis sodalis*, a tiny mammal that weighs one quarter of an ounce, the same weight as three pennies. This federally endangered bat winters in caves in huge numbers, so if something goes wrong in one cave, it has an enormous impact on the population. Since 2007, bats, in general, have been dying in large numbers from White Nose syndrome. White Nose syndrome is an invasive fungus that grows into the bats' noses and digests the nose tissue while the bats hibernate through the winter. When the fungus infects the bats, they often wake from their hibernation and fly out of the cave, into wintery conditions that are too extreme for them to survive.



Breeding female Indiana bats spend the summers in small colonies, raising one baby each. They roost beneath the peeling bark of trees. This bark might be on a dead tree, on a really old tree, or on a shagbark hickory, which peels a lot once trees are mid-sized.

It turns out that Indiana bat mothers raise their young in shagbark hickories in New Haven. In fact, there are landowners in town that work with state wildlife biologists to improve the Indiana bat habitat on their property.

Indiana bats, and other bats, provide important ecosystem services in Vermont. Indiana bats can eat up to half their body weight in mosquitoes, moths, beetles, and midges each night. In tropical and desert ecosystems, bats are also important pollinators. It may be time for New Haven to celebrate this special resident by adopting a new mascot.

This story is just one example of how the diverse features of the New Haven landscape come together in wild areas, but also in residents' backyards. Whether through soil nutrients feeding crops, wetlands purifying the water we drink and swim in, or bats eating bothersome insects, our lives are intimately connected to the landscapes in which we live.

To learn more about Indiana bat habitat in New Haven, check out this PBS podcast which features a New Haven resident: <http://loe.org/shows/segments.html?programID=15-P13-00044&segmentID=2>

"Indiana Bat (*Myotis Sodalis*)." 2015. U.S. Fish and Wildlife. <http://www.fws.gov/midwest/Endangered/mammals/inba/index.html>.



# New Haven Community Forum Map

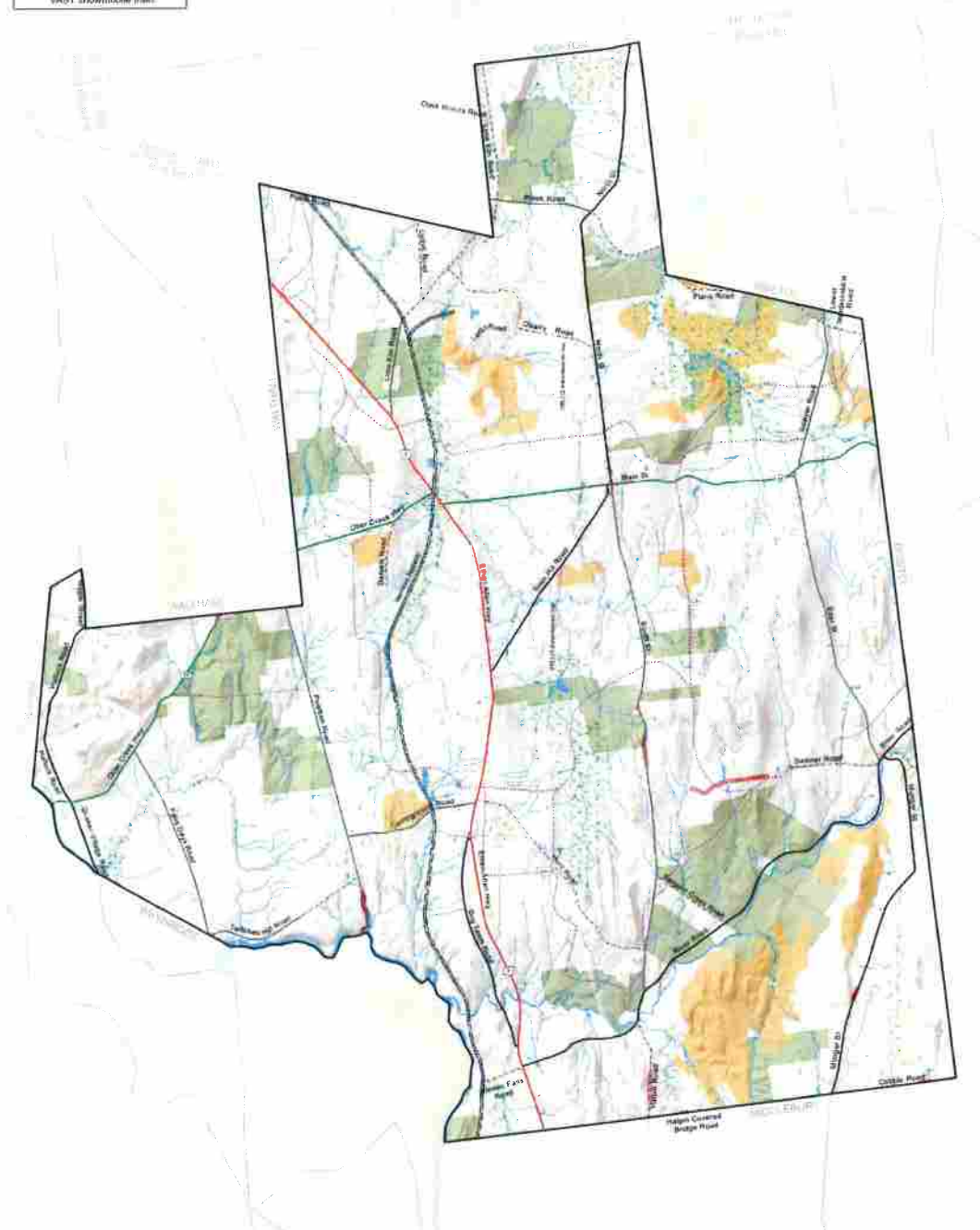
**Legend**

- Conserved lands
- Vermont significant wetlands
- Deer wintering areas
- Wildlife road crossings
- Dwelling or structure
- Electric transmission corridors
- Vermont Rail
- VAST snowmobile trails

New Haven  
Vermont

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THE  
CONSERVATION FUND



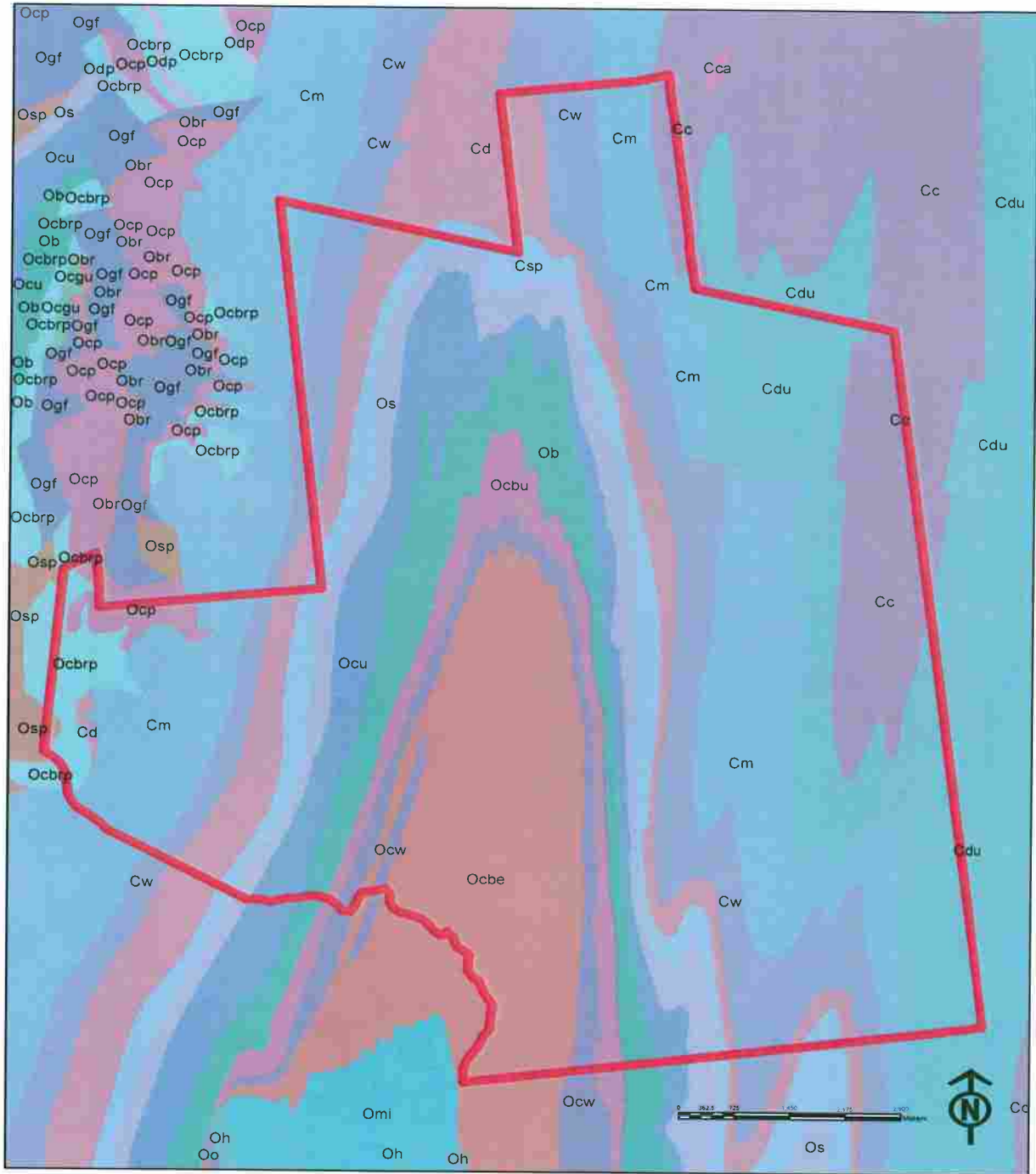
Scale: 1 in = 0.4 miles  
Contours at 20 foot intervals  
2 Miles

**Data sources**

- Conserved lands - VT Land Trust 2013
- Wetlands - Vermont ADE 2011
- Deer Wintering Areas - VT Dept Fish and Wildlife 2011
- Wildlife Road Crossings - VT Dept Resources 2012
- Dwelling and structure - Vermont GIS 2011
- VAST Trails - Vermont 2012
- Roads - VT AIST 2013
- Utility lines - VT AIST 2013 and BNG aerial photos
- Railroads - VT Agency of Transportation 2014

Map by  
1. Taylor June 20, 2014

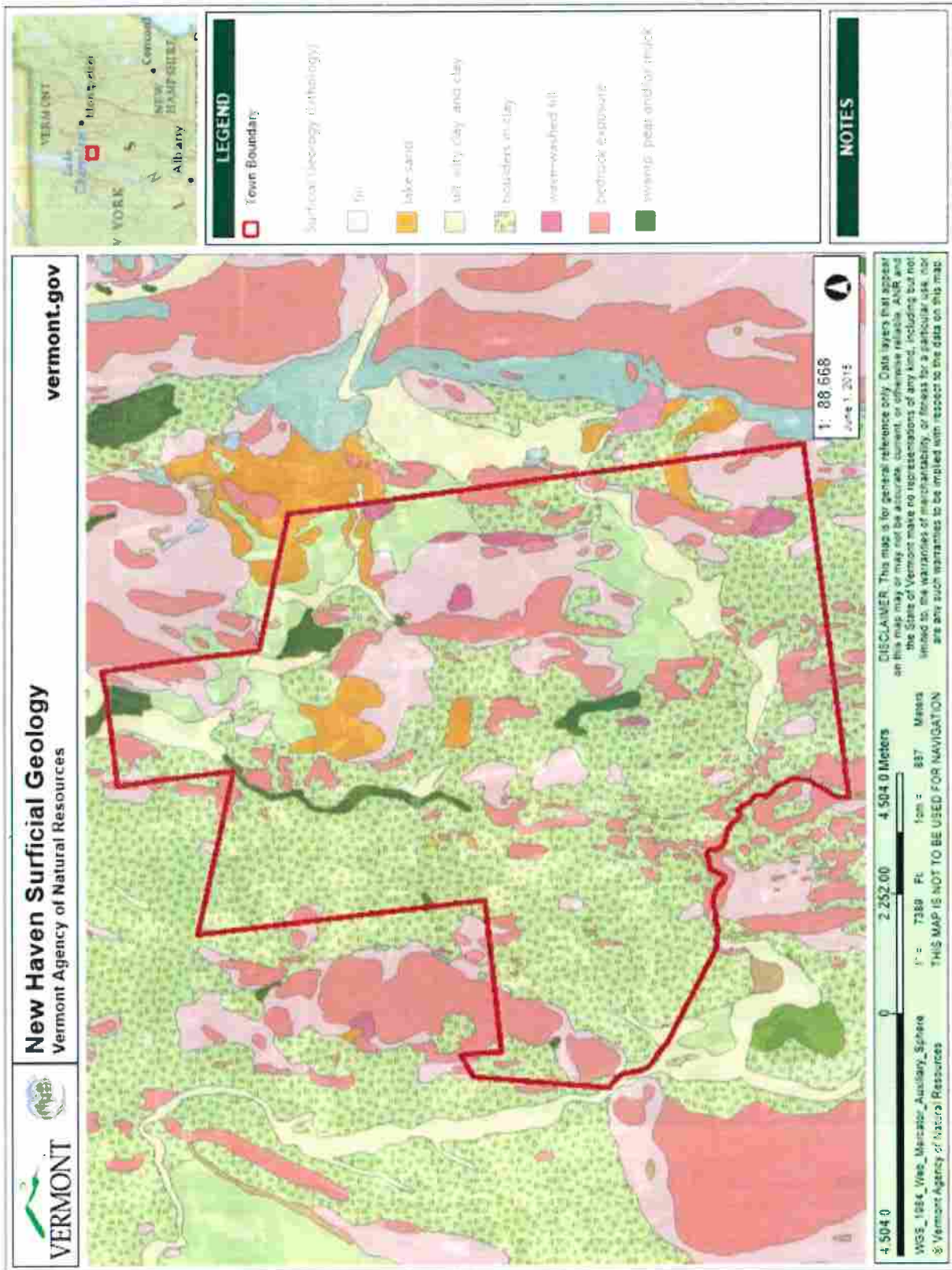
# New Haven Bedrock



Legend			
Cc, quartzite, phyllite	Cw, dolostone, phyllite	Ocgu, limestone, calcareous sandstone	Oh, shale and phyllite, limestone
Cca, quartzite, <Null>	Ob, dolostone, limestone	Ocp, limestone, <Null>	Omi, limestone, <Null>
Cd, quartzite, dolostone	Obr, dolostone, limestone	Ocu, dolostone, sandstone	Oo, limestone, <Null>
Cdu, dolostone, conglomerate	Ocbe, limestone, dolostone	Ocw, marble, <Null>	Os, marble, dolostone
Cm, sandstone, dolostone	Ocbrp, dolostone, limestone	Odp, sandstone, limestone	Osp, calcareous shale, limestone
Csp, dolostone, marble	Ocbu, limestone, <Null>	Ogf, limestone, <Null>	

Much of New Haven's bedrock is limestone. This calcium-rich rock slowly adds nutrients to the overlying soil every year. Data from VCGI.

# New Haven Surficial Geology



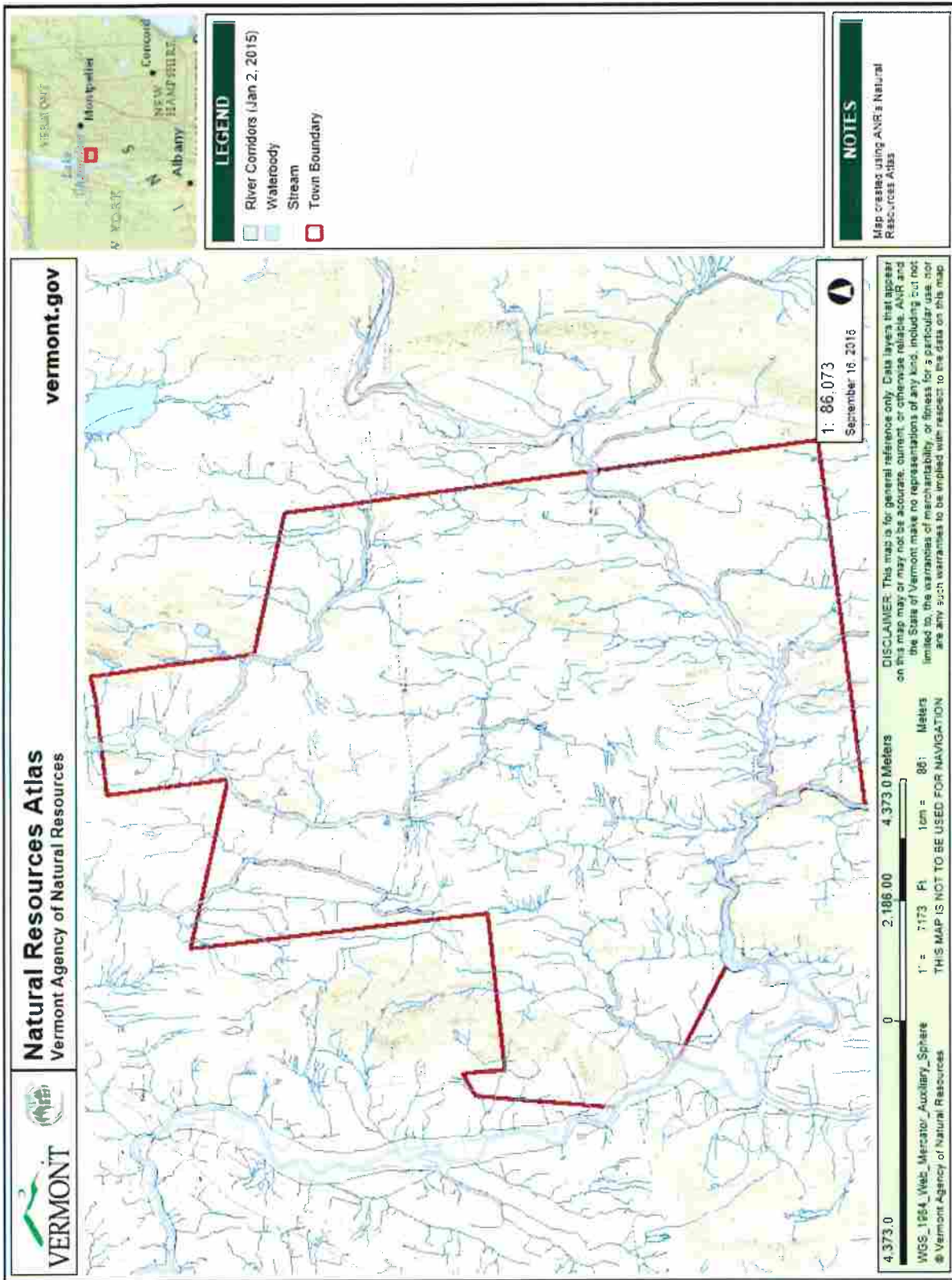
The "boulders in clay" surficial deposit that covers much of the bedrock in New Haven accumulated when clay settled out of Glacial Lake Vermont and covered many of the jumbled rocks and boulders that the glacier had left behind.

# New Haven Agricultural Soils



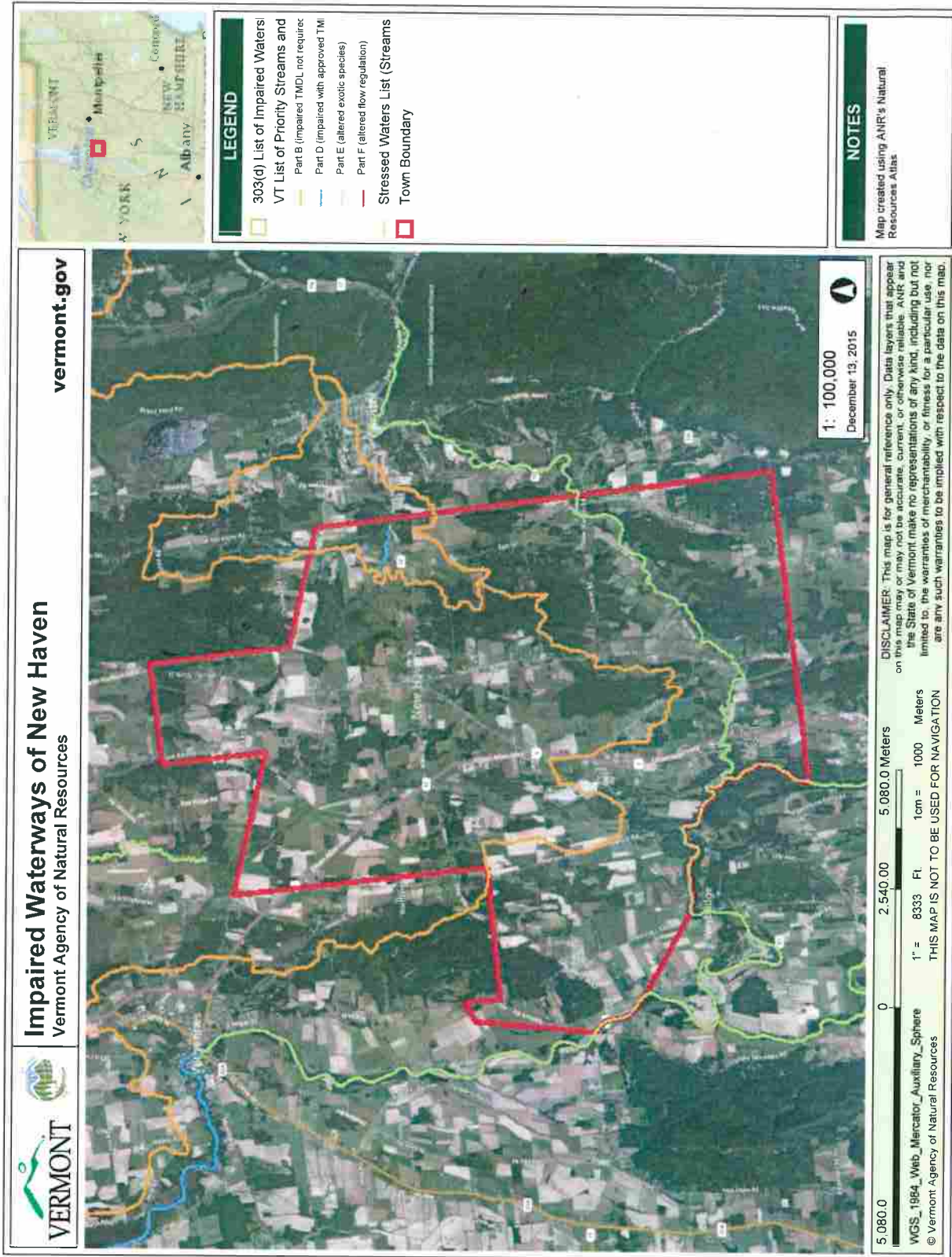
Much of New Haven is classified as prime agricultural land or statewide prime agricultural land. The soils played an important part in New Haven's long agricultural history.

# New Haven Rivers and Streams



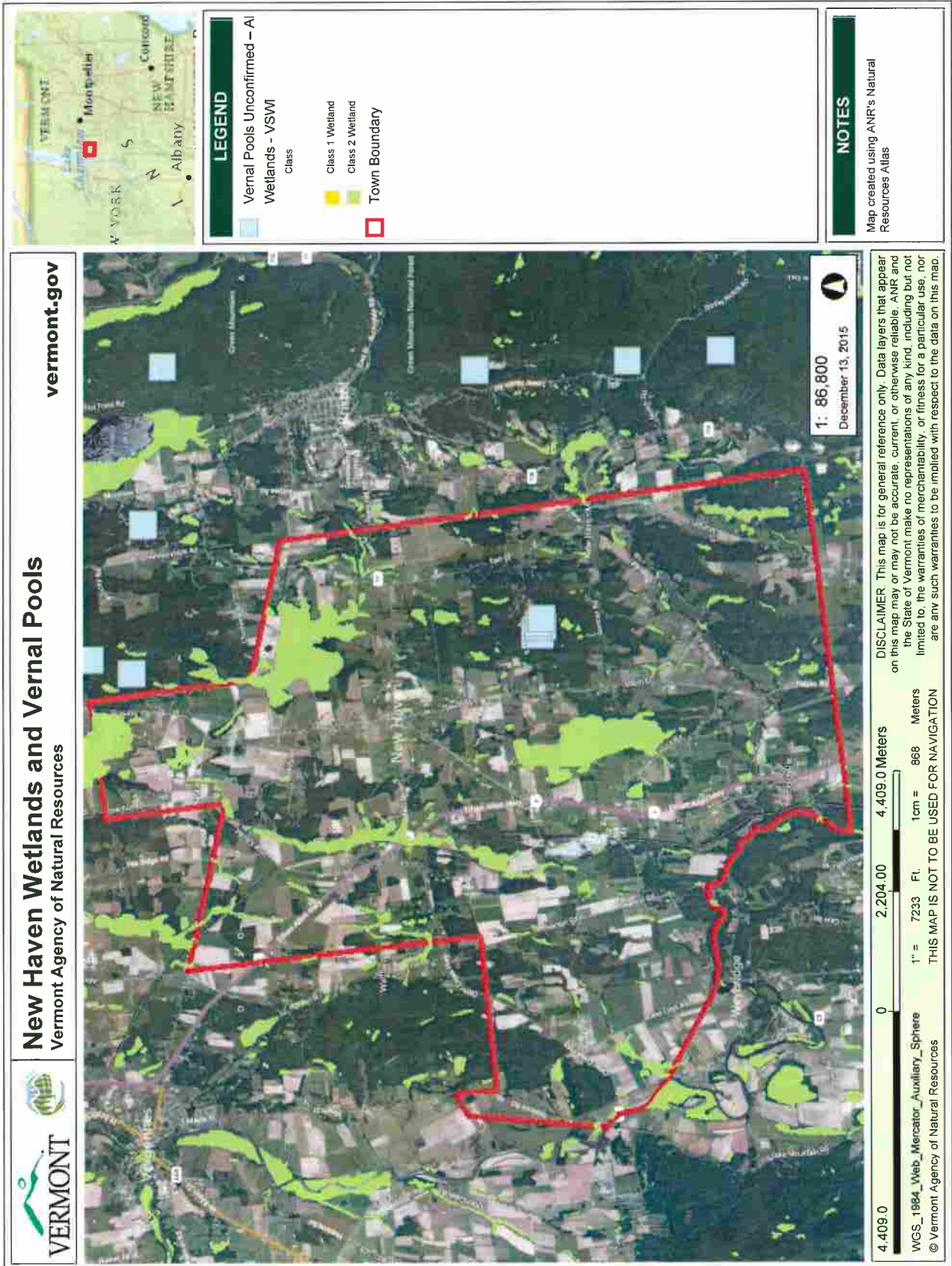
Vermont DEC mapped river corridors across the state to help communities understand where waterways are likely to move, and where there is a risk of flooding. Learn more at [floodready.vermont.gov/](http://floodready.vermont.gov/).

# New Haven Impaired Waterways



This map shows the waterways of New Haven that are impaired by one or more pollutants.

# New Haven Wetlands and Vernal Pools





## Natural Communities of New Haven

Have you ever noticed how blueberries grow in places with similar characteristics? Most organisms have biological preferences, needs, and competitive abilities that shape where they are able to survive and thrive. Scientists call groupings of plants, animals, and other organisms that occur repeatedly in certain physical environments “natural communities.” Armed with a bit of know-how, you can head out into wild landscapes and predict some of what you will find based on soil type, water, climate, and more.

In Vermont, the book *Wetland, Woodland, Wildland*, by Elizabeth Thompson and Eric Sorenson holds the keys to this knowledge. The book describes the physical environments and natural processes that occur across the Vermont landscape. It also details the official natural community types of Vermont, which summarize “the characteristics of all known examples of that type.” The Nature Conservancy and Vermont Department of Fish and Wildlife published this book so everyone in Vermont can have the same vocabulary when talking about natural communities.

### State-Significant Natural Communities:

This section lists state-significant natural communities that the Agency of Natural Resources has mapped in New Haven.

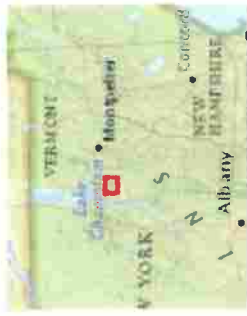
- Transition Hardwood Talus Woodland (S3)
- Mesic Clayplain Forest (S2)
- Wet Clayplain Forest (S2)
- Mesic Maple-Ash-Hickory-Oak Forest (S3)
- Red Maple-Northern White Cedar Swamp (S3)
- Red Maple-Black Ash Seepage (S4)
- Northern White Cedar Swamp (S3)

This list may not be complete. Charlie Hohn, who does natural community mapping for the Vermont Agency of Natural Resources believes there may be a state-significant floodplain forest with lots of sycamores along the New Haven River. He would need to visit the natural community, or have someone else with the appropriate training visit it, to confirm or deny the classification. (Charlie.Hohn@vermont.gov)

### Natural Communities that Landowners Mapped:

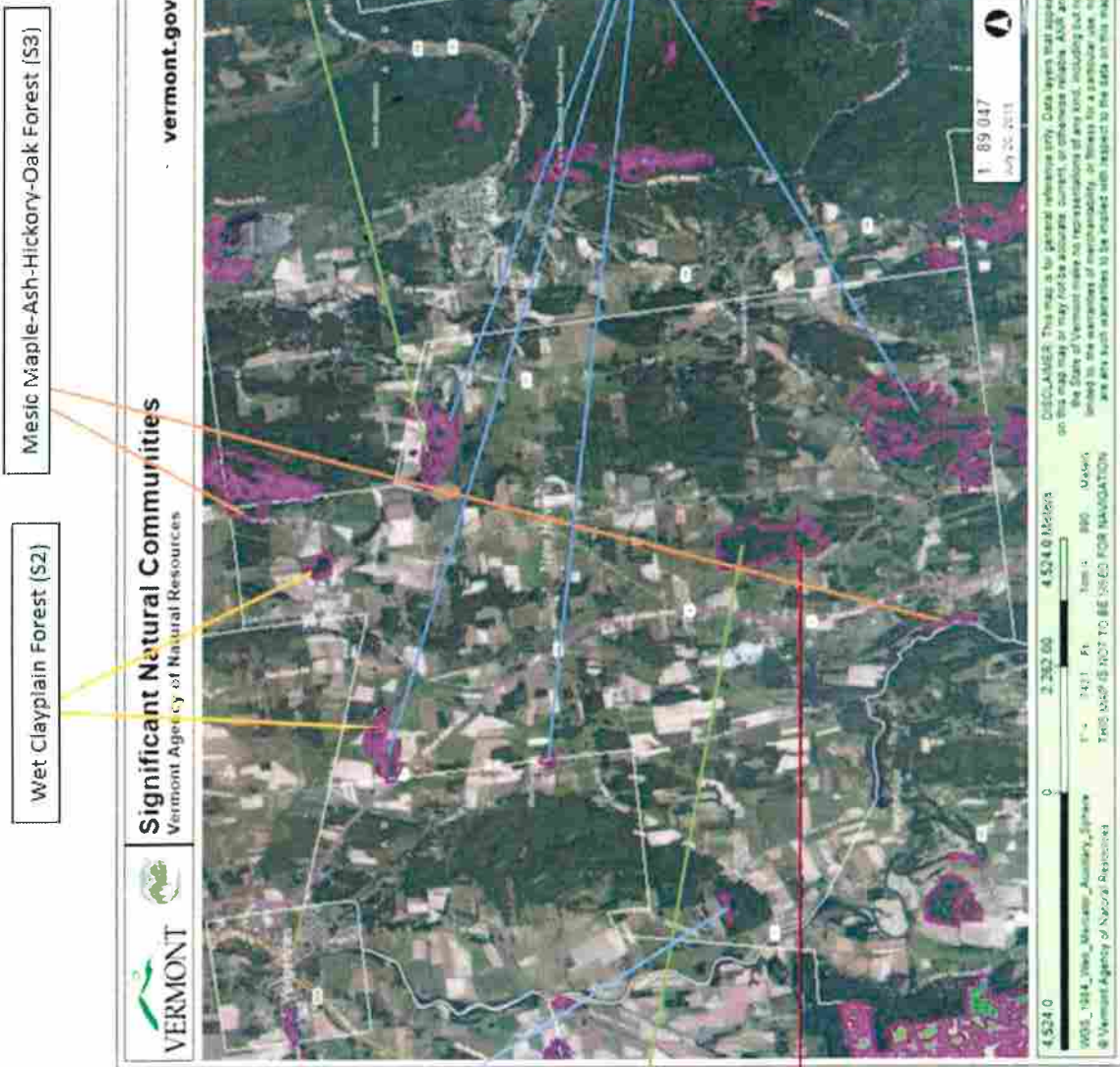
This section lists natural communities that Don and Cheryl Mitchell mapped on their property in New Haven. This list probably does not include all the remaining natural communities in New Haven.

- Transition Hardwoods Limestone Forest
- Dry Oak-Hickory-Hophornbeam Forest
- Valley Clayplain Forest
- Shallow Emergent Marsh
- Red Cedar Woodland
- Temperate Calcareous Outcrop



Northern White Cedar Swamp (S3)

Mesic Clayplain Forest (S2)



Mesic Maple-Ash-Hickory-Oak Forest (S3)

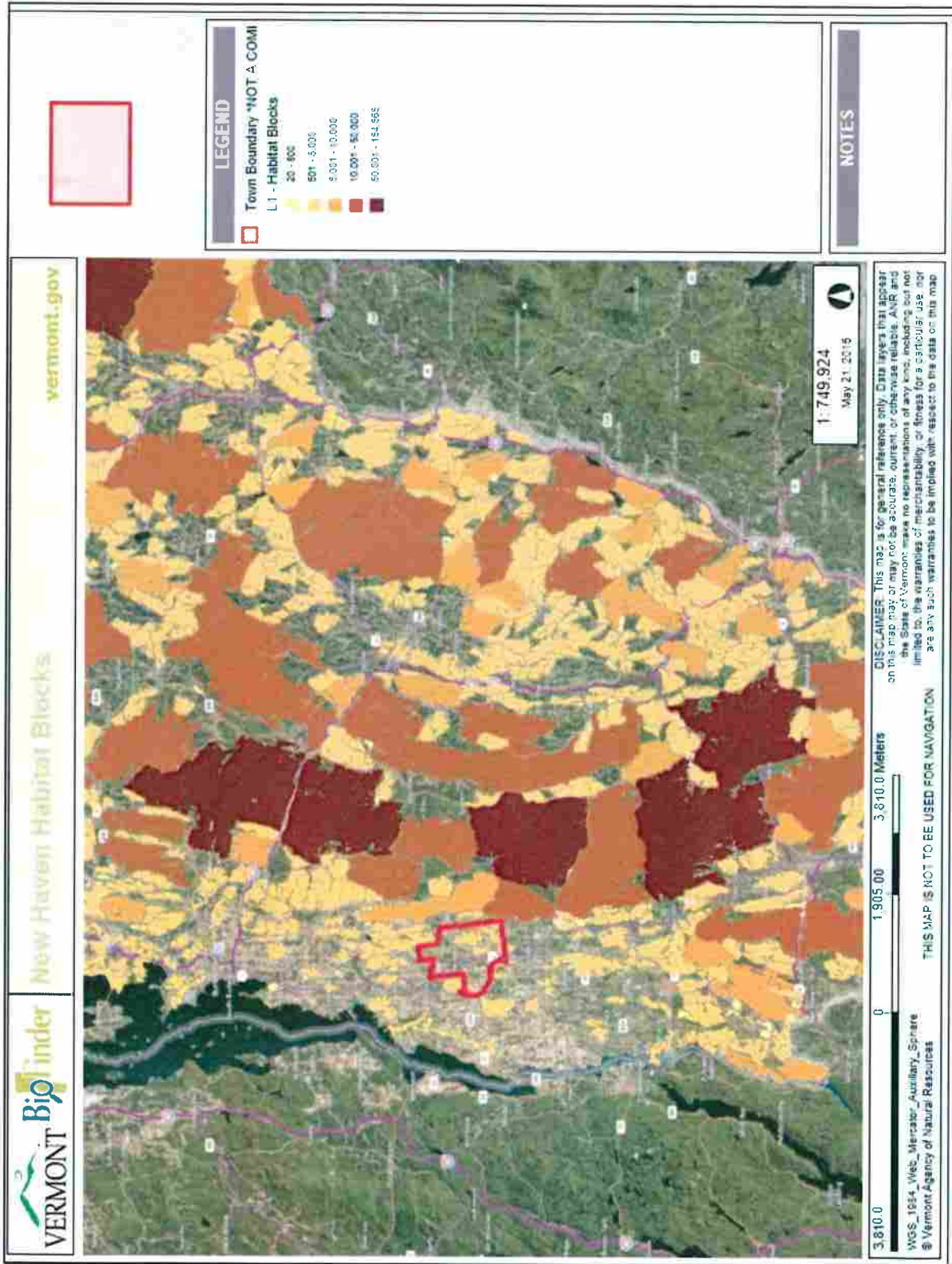
Wet Clayplain Forest (S2)

Transition Hardwood Talus Woodland (S3)

Red Maple-Black Ash Seepage (S4)

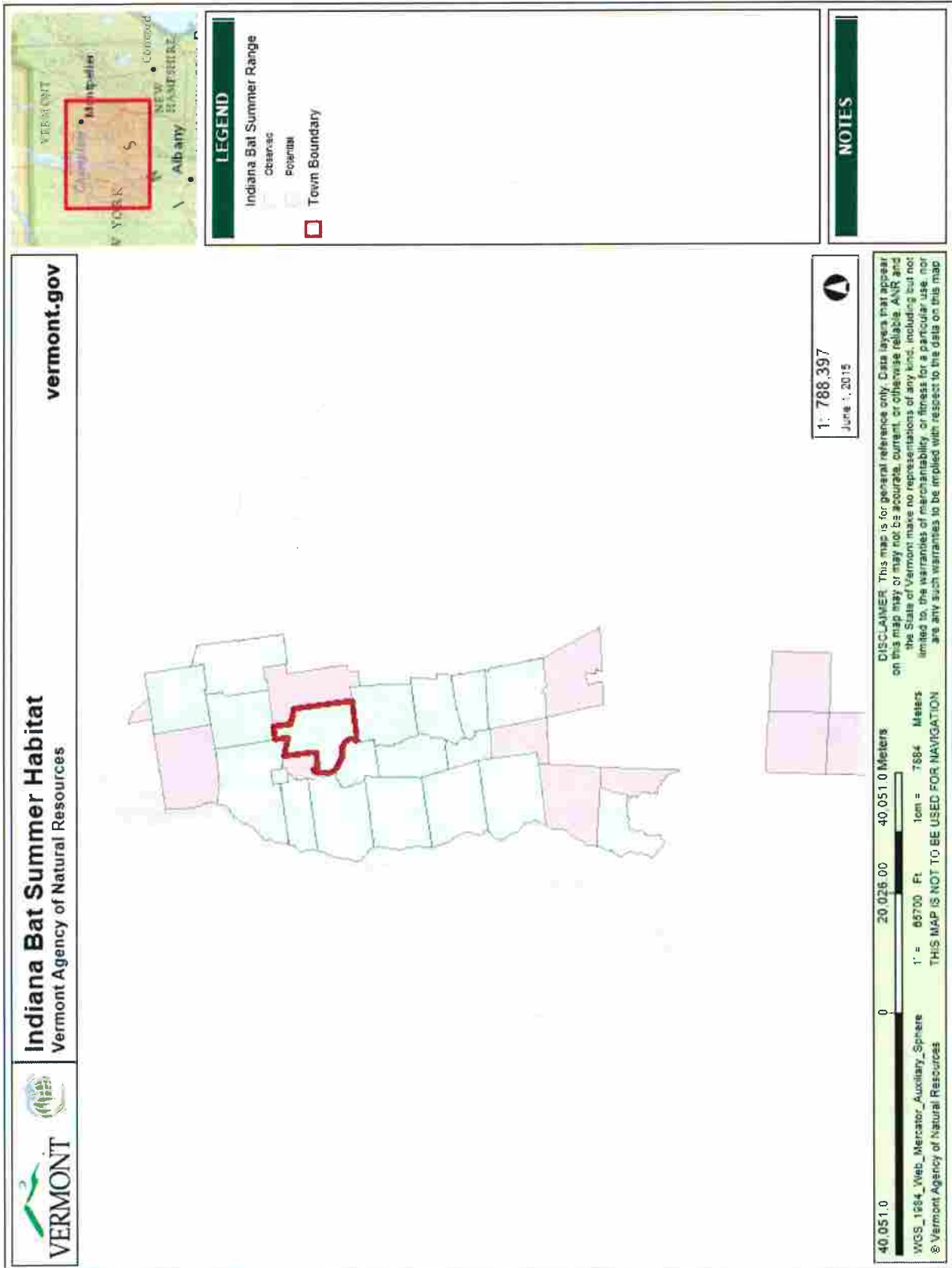
Red Maple-Northern White Cedar Swamp (S3)

# New Haven Habitat Blocks



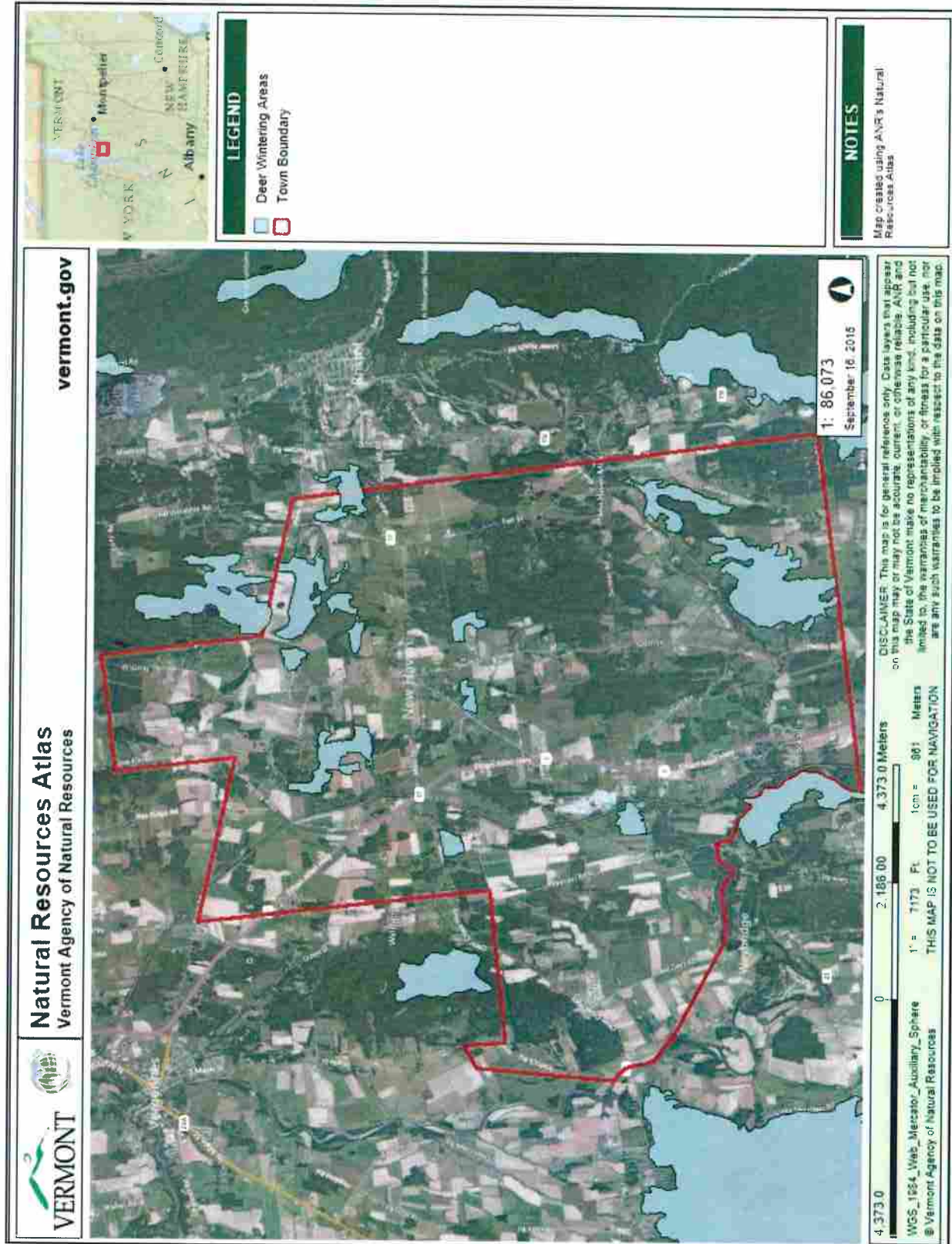
This map shows how New Haven fits into the state's existing wildlife habitat. This is especially important for larger or migratory animals, which need sizeable, connected areas of land to meet their yearly needs.

# Indiana Bat Summer Habitat



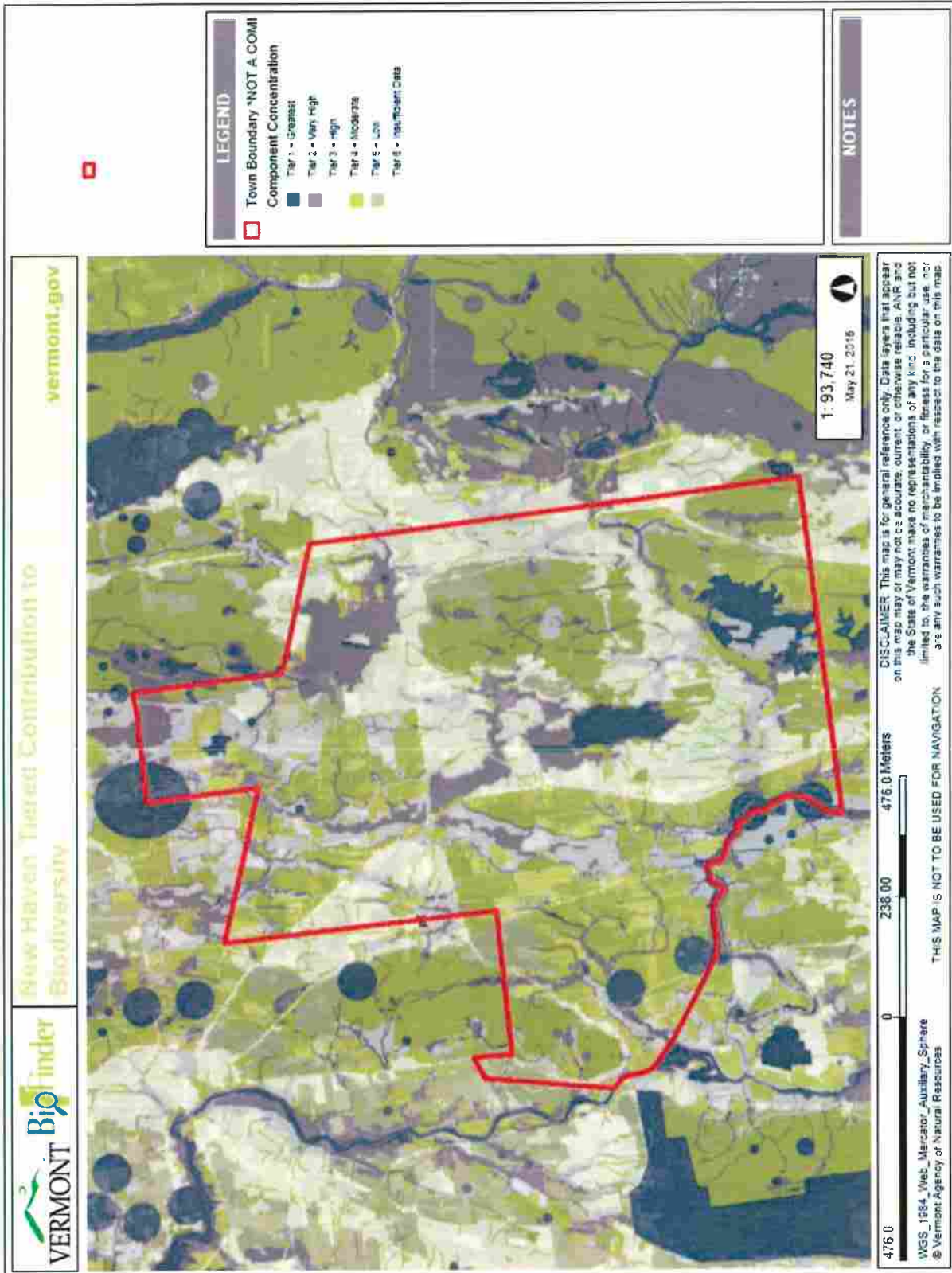
*This map shows summer habitat for the Indiana bat, a federally-listed endangered species. New Haven is home to Indiana bats in the summer.*

# New Haven Deer Wintering Areas



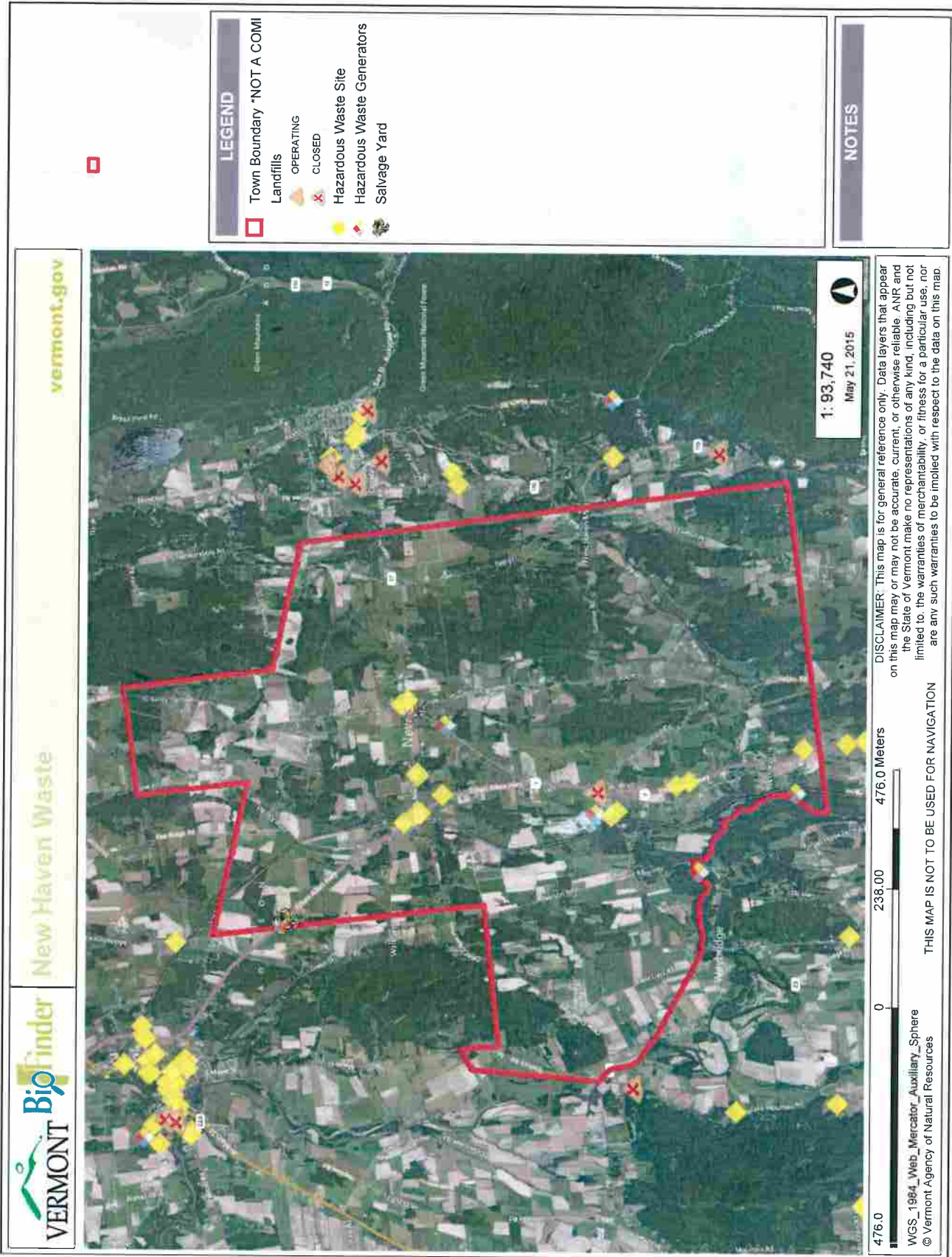
*Deer seek shelter in stands of conifers in the winter, which block the snow and wind. These important stands of evergreen trees help the deer survive the long Vermont winters. This map shows areas that are classified as important deer wintering areas by the Vermont Fish and Wildlife Department.*

# Biodiversity Model in New Haven

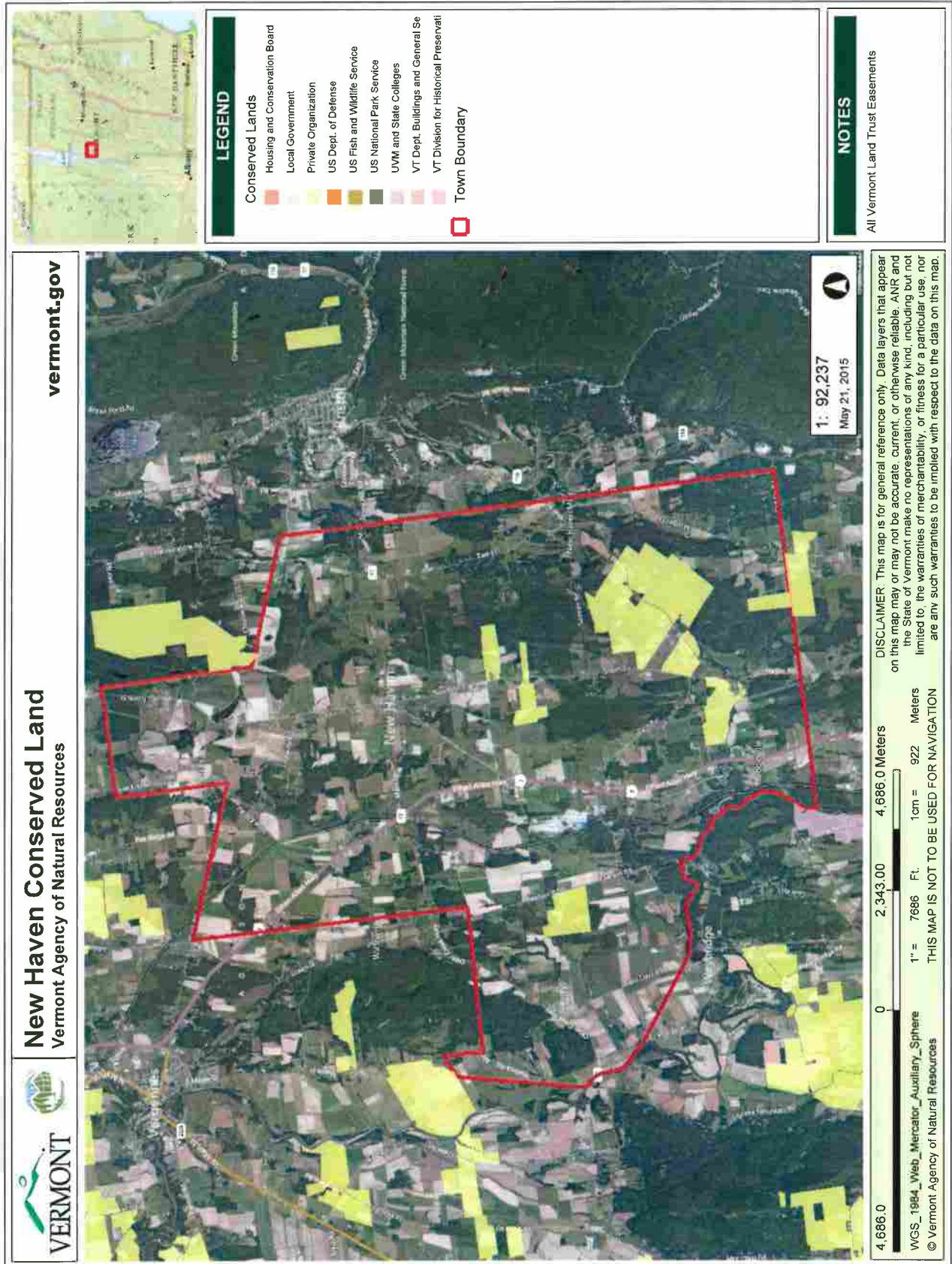


Based on the Agency of Natural Resources' computer modeling, this map shows which parts of New Haven are likely to be most biodiverse. This model's calculations are based on 21 features that contribute to biological diversity. Tiers 1 and 5 have the highest and lowest concentrations of these features, respectively.

# Waste in New Haven



# Vermont Land Trust Conserved Land in New Haven





# Community Forum Results

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The New Haven PLACE Program Community Forum  
Combined Results  
June 30, 2015  
Compiled and Submitted to the Town of New Haven  
By The Conservation Fund and the New Haven Conservation Commission

## Overview

### **Purpose:**

The purpose of the New Haven Community Forum was to hear the community's thoughts and feelings about their town in advance of its participation in the *Place-Based Landscape Analysis and Community Engagement* (PLACE) program. PLACE is a community education program for Vermont towns that is conducted as a collaboration between the town, the University of Vermont, and Shelburne Farms. Its mission is to promote a sustainable relationship between people and their local landscapes by engaging community residents in exploring, understanding, honoring and celebrating the natural and cultural features that contribute to their town's character.

### **Hosting Organization:**

The Conservation Commission of New Haven

### **Facilitator:**

This meeting was facilitated by Nancy Bell of The Conservation Fund. The responses were compiled by Leah Mital-Skiff.

### **Notice:**

All New Haven residents were invited via postings on front porch forum and flyers that were posted in public locations in town and in surrounding towns.

### **Venue:**

The meeting was held on Tuesday, June 30th from 6-9pm at the New Haven Congregational Church in New Haven, VT. A light meal and beverages were served midway through the evening. Approximately 20 people attended.

### **Meeting Structure:**

Participants broke into working groups at tables. There were 4 tables of 4-6 residents each. Each table answered 6 questions and marked areas or information of note on maps of the town. Scribes were directed to write what participants said, using their exact words. Every effort was made to copy details of what was said word for word from the meeting flip charts into this document. This document summarizes the textual responses to 6 questions.

### **Overview of process of summarizing results:**

The compilation of responses has been grouped into general themes. The numbers in parentheses by an item in the results, such as *Open Public Access (3)*, represent the number of tables at which the specific item or topic was mentioned. Individual comments and additional details are noted to preserve the actual individual statements made. The following pages are the compiled responses of New Haven residents to six questions as follows:

## Question 1: What do you love about where you live/this place we call New Haven?

### Character of the town, specific places and features

- Visible history (2)
  - Native American – 2 indigenous camps at river confluence – 5000 yrs old
  - Manufacturing
  - Floods
  - New Haven-Bristol Railroad
  - North-South Highway
  - Mills – remnants if you know where to find them
  - An old quarry by Beldon Falls, near the dam
  - Brooksville – old settlement and axe factory
  - The town doctor's grave in the town hill cemetery with a bell so that he couldn't be buried alive
  - New people coming in have used older buildings for business – i.e Olivia's Croutons using old bank, cabinet making in old barns – buildings look better now than when in agriculture
- Our public spaces (2) – beautiful, inviting
  - The library (2)– many towns in VT have given up their library and we are strengthening ours
  - The park
  - Public offices
  - Beeman Elementary School (2)– an asset
  - Our cemeteries – they hold our past and room enough to hold our future
- The downtown village, a real village
- Train station at New Haven junction – in private hands but well taken care of
- State police barracks in town – we are fortunate to have it, feels secure, they are coming and going all the time
- Volunteer fire department
- New Haven Mills – Old Schoolhouse
- Plan Road Area – along the New Haven, agricultural treasure
- Covered bridge
- Solar panels – positive and negative
- 2 hydro plants on Otter Creek – one is not visible, great way to generate power
- Centrally located – best location of anywhere, 40 minutes to skiing, close to Middlebury College
- Almost no traffic

### Community-oriented, events

- The people (4) –
  - Economic and professional diversity – plumbers, lawyers, etc,
  - The people are nice
  - Knowing your neighbors – small population, someone from across town feels like a neighbor, neighbors helping neighbors – anyone within a few miles helps, great sense of community, appreciation and respect for neighbors – positive interactions even if we don't see them a lot
  - People still stop for runaway animals and try to help
  - Living in a place where the people are collectively engaged in the landscape
- Great group of volunteers – for library, park

- Great elected officials
- The way America was 100 years ago – a full spectrum of working society living in one place
- Feels like Charlotte was when I was a kid – you can still afford to buy a house and raise a family here as a local
- 1 of 3 states in union where 1 person can have an impact and know your representatives
- Family
- Town Management keeps things affordable – i.e. snowplows don't put in overtime, they wait and start in morning to save \$\$, town does great job running budgets
- New Haven Town Meeting –
  - Most items by Australian Ballot
  - Don't have to show i.d., everyone knows you
  - It's okay to disagree and still be friends
- Addison County Field Days – largest agricultural fair in state
- Town-wide activities for all generations

### **Character/features of the land**

- The wide open vistas and space (4) – views of the Greens and wide open fields, bucolic, animals in the fields, views from 2<sup>nd</sup> floor at Beeman – mountains, sunsets
- The working landscape (4) – making a living off the land – using the natural resource rather than just looking at it – logging, farming – diversity of agriculture and other farm types, to watch the corn grow
- Swimming holes (3) – The New Haven Quarries, Dog Team, the entire New Haven River
- Watershed Center – shared with Bristol, beautiful area, trails, programs, geology, birds, wildflowers
- Ecological diversity and the ability to see wildlife in their natural habitat (3)
  - Swamps, open, wooded
  - Diversity of wildlife – mammal, birds (2), mink, bobcat, turkey etc. (unique for me, coming from Boston area)
- The gorge
- Rainbows
- I find the swamps mysterious
- Lack of biting insects compared to rest of state
- Water in the landscape - The New Haven River and Otter Creek
- Amphibian road crossing corridor

### **Recreation**

- Access to our natural landscapes
- Fishing, hunting
- Birding
- TAM trail, especially the gorge

## Question #2: What is your vision for its future?

### Infrastructure, Economic

- School related (4)
  - Maintain an elementary school in the location of Beeman – it helps to define the village in the village
  - A better school or send kids somewhere else – low test scores, school is not a source of civic pride, parents are withdrawing kids and leaving
  - Attract families by working on education, work with state, (2)
  - Have a critical mass to support French, Chemistry, etc
  - Put kids and their education first
- Affordability (4)
  - Better pay to get young people to stay here (2)
  - Home businesses (2)- An expansion of home businesses where 2-3 people work without creating sprawl, keep people here
  - Affordable for all – families, young people, elders
- Housing related (3)
  - Housing within the town for elderly residents (2)
  - Maintain affordability and accessibility of housing and living (2)
  - More housing in the village and therefore some commerce
- Better Internet speed (2), better fiber optics and communications
- Multi-modal transportation
- Repurpose of agricultural buildings – salvage barns and small farms so they preserve identity of town and don't fall into disrepair
- Retain a village center *in* the village center
- Continue to have a vibrant library
- A little bit more business as well as infrastructure that is kept up with
- More employment without turning into an industrial zone
- Surrounding towns to allow for jobs, arts, restaurants – ensure the relationship with these towns for access to the diverse needs of the community, not every town can have everything
- Better use of the railroad – maybe could be industrial at the junction
- Possible passenger station for the train
- Good road infrastructure

### Community-oriented, Events

- To have a vibrant town meeting
- For residents to be involved and more connected in town government, competing for Select board seats
- More involvement by town residents
- Elder care
- Maintain population base
- Have an objective to bring bright young people to town to work and start families
- To maintain or increase socio-economic and cultural diversity and not have “exclusive” towns
- Education and raising awareness of town identity/cultural resources
- More town/community events to bring people together - like Field Days

- “Old timers” who can explain the history and why things are the way they are

### **Land Use (other than recreation) - Development, Management**

- To continue to have farms and an agricultural working landscape (4)
  - Healthy and functioning small farms
  - Better distribution while maintaining customer relationships
  - Farmland not going to waste of being underutilized
  - Diversified agriculture
- More support from town and residents for agriculture (3)
  - Beeman to buy locally
  - A place for residents to buy locally
  - Laws and regulations that allow people to start a 5 or 10 acre farm
  - Conservation/agriculture fund
  - Town to assist in agricultural land transitions between generations
  - Continued support for changing dairy industry
- To continue to keep industrial/commercial development down
- Growth would be in respect to the land, balanced with open space, agriculture, forestry
- No future commercial development on Route 7 – “if we lose Route 7 to commercial development, we lose our town.”
- Not to be an energy corridor
- Homes and structures not to be built in dangerous locations – floodplains, wildlife corridors
- Underground power lines – viewshed
- Good planning - maintain all areas – whole town should be conscious, not set aside some areas and neglect others, balance good habitat with working landscape

### **Conservation, Ecology-oriented**

- Maintain views, viewsheds (3) – maintain open area of town, maintain designated viewsheds that are already in place
- Healthy waterways (3) – New Haven River, Muddy Brook, in terms of run-off, retention ponds, town-wide septic?, clean-up of waterways
- New Haven to take initiative on invasive plants (2) - especially poison parsnip (2), Japanese knotweed
- Connected wildlife habitat (2)
  - More bald eagles in New Haven
- Conserve land along Route 7
- Maintain swampland
- Plant more trees on my land
- Tax on sale of every house to support a conservation fund

### **General**

- Nothing to change, preserve what we have (2)
- Keep New Haven small and affordable and send people to Middlebury to work

### Question #3: What do you see as threats to that vision?

#### **Infrastructure, Economic, Governmental**

- Loss of local control (3) – increasing state control
  - State or Federal regulations that are averse to what we want – poorly sited solar, New Haven becoming a cookie cutter, loss of local control
  - Super-majority single-party state government – doesn't provide balance, becomes too theoretical and less real
  - Small town self-governance w.r.t. tax, education, landscape protection, utilities
- Traffic (2) - Increased population in surrounding areas, more lanes on Rte 7
- Poor school system (2)
- Too few students for adequate class size (2)
- School consolidation (and resulting loss of Beeman)
- Loss of agricultural economy (2) – inability to work the land and make a living, runoff and stormwater control bills making farming unaffordable, GMO labeling and limits, political correctness
- Changes to Current Use program
- Loss of control of regional farming economy – i.e. price of milk, or sheep 100 years ago
- The “need” for economic opportunity within New Haven
- Economic decay – at national and state level
- Lack of affordability and good paying jobs
- Becoming a bedroom community
- Maintaining tax base - Not creating good jobs to attract people – aging population would not be able to sustain tax burden
- Taxation – carbon taxes, income taxes – thin tax base already carrying a huge load, spending based on demographics
- Healthcare costs
- If church were to close
- Ability to maintain town infrastructure
- Closing of village store
- Large-scale, low-price businesses that threaten small local business

#### **Community-oriented, events**

- Inability to change
- Inability of town residents to pull together on a single vision, inability to compromise
- Inability to communicate via computers about these kinds of issues
- Apathy
- Falling population – fewer school-age kids
- Industry and technology threatening respect and etiquette

#### **Land Use, Development, Management**

- Use of New Haven for wind energy or energy corridor (4) –
  - Solar panels threaten open land and New Haven seems to be epicenter of it in Champlain Valley
  - It can be done well – rooftops; too often disregards surroundings
  - “Muddies landscape from tourist perspective who are looking for pastures, animals”

- Commercial and industrial zoning and development (2)
- Out of staters from cities moving in (2) - - they want stop signs, street lights, a country metropolitan feel
- Development in general
- Dairy farming – on an industrial scale – traffic, manure pits, farming exemptions
- Lack of understanding by non-agricultural sector of what it takes to keep land open and in agricultural use

### **Conservation-oriented, Ecological**

- Invasive species (2) – poison parsnip
- MBTE leak from Irving Station on Rte. 7
- Unmanaged runoff
- Reduction in the availability of potable water

### **Question #4: What do you see as solutions to those threats?**

### **Infrastructure, Economic, Governmental, Industry**

- Economic development to bring jobs and education (2)
- Support legislation that does not conflict with what we want
- More local control – i.e. on rules on solar taxation and taxation of gas pipeline, Act 60
- If Beeman Elementary did close, keep the building in education –
  - UVM satellite learning to reduce commuter traffic
  - Apprenticeship opportunities
  - Alternatives to 4-year college or traditional schooling
- Consolidation of school district - improve education quality in the process
- Better use of community resources
  - Train station at New Haven Jct
  - Church at New Haven Mills hasn't had a congregation in 60 years
  - At least 3 unused mills at New Haven Mills
- Keep costs under control
- Emphasis on Vermont products and Vermont brand which carries a 20% premium – copyright, patent, and defend
- Emphasize ski industry
- NY slogan – bring your business here and we'll give you lower taxes
- Commercial marijuana farming
- Craft distilleries

### **Community-oriented, events**

- More community engagement/involvement (3)
  - Connect them to their town and community – this builds respect and willingness to act
  - More programs that focus on family values and involvement
  - More events that bring people together – seminars, concerts, grade school level events
  - Have a majority of residents and their voices heard
  - Recognize that lack of involvement is a universal problem, but don't give up

- Push for what you think is important, the opportunity is there in a small town and state
- Next generation needs to get involved in town – planning commission, fire department
- “Being on the PTA is not enough”, if you are not part of the solution you are part of the problem
- Engage the schools (3)
  - In developing and teaching stewardship
  - Extra credit for students to attend town meeting?
  - More involvement in the school by parents and community – tie cultural history into schooling, engage retired population
  - Teach the value and etiquette of technology in the education system
- Town meeting (2) –
  - Figure out how to be more effective
  - Conduct financial decisions on the floor
  - Ask how to maintain slow growth, how we want to grow, what do we want to preserve
- PLACE program
- Communication – have better forums - front porch forum, side of street, coffee shop, read town newsletter, town website, overcome difficulty of getting the word out
- Cultural interpretive center – at Beeman or New Haven Jct Train Station – New Haven has a rich history
- Guided tours/bicycle tour of interpretive sites

#### **Land Use, Development, Management**

- Sensible zoning
- Identification of agricultural lands to remain in agriculture

#### **Conservation-oriented, Ecological**

- Identification of wetlands, vernal pools, wildlife habitat for protection

#### **Question #5: Who do you need to BE to fulfill the vision?**

##### **Personal**

- Active volunteer/participant who is less burnt-out – go door to door, tireless (3)
- Empathetic (3)
- More open (2), Listen (2), Able to see all options
- Leader (2) and role model, Beat the drum
- Visionary (2), innovative, driven, forward-thinking
- Well-connected, respected, and respectful (2)
- Passionate (2), invested
- Community minded
- Reaching out
- Embody a commitment to the vision
- Desire change, able to accept change
- Happy
- Work with more students
- Knowledgeable



- Resilient
- Flexible
- Patient
- Humble
- Honest
- Realistic
- Team player – share credit
- Charismatic, sweet-talking, articulate
- Organized and willing to organize people
- Able to make decisions
- Smart, educated
- Youthful and wise
- To have more time – work less at paid job

### **Professional**

- Educators
- An environmental economist
- Steve Jobs
- Bill Gates – innovative, entrepreneurial
- Bloomberg

**Question #6: What are some actions you can take now to fulfill the vision? (Note: Number in parenthesis corresponds to the number of residents who repeated a certain answer rather than the number of tables)**

### **Serve on a board or committee, research, organize**

- Recruiting
- Put up posters if someone runs a campaign
- Go to more meetings, find out what's going on in town
- Make food for another community forum – Donna Smith 877-2712
- Commit to making New Haven a better place to live (2)

### **Recreation, Education, events**

- Commit to spreading the word and support PLACE program
- Over the next 2-3 years, I will commit energy and info to the school – Mark Krawczyk 999-2768 (with volunteers Susan, Mark, Ammy)
- Work with others on cultural heritage projects – Susan Smiley 388-6601, Mark K.
- Do a cultural educational program on the North-South highway - Doug Tolles 545-2020
- Agricultural education, farm visits – Harvey Smith 877-2712
- Go to more chicken bbq's
- Teach a dance class – Ammy Martinez 201-293-2334
- Promote and attend a birding event

**Stewardship, inventory**

- Commit to doing what I can to protect wildlife habitat
- Be on Audubon bird count – Lauren LaBerge-Taddeo [letaddeo@gmail.com](mailto:letaddeo@gmail.com)

**Other**

- I'm doing what I want to be doing – on selectboard (2)

# Education for Sustainability: Overview

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The Beeman Elementary 4-6 grade teachers and I attended the Summer Institute on Education for Sustainability (EFS) at Shelburne Farms. During the week-long Institute, we discussed how I could best support their place-based education and EFS efforts, both of which aim to increase students' connections to and care for their landscapes and communities. I shared my strengths and experiences with the teachers, and they shared their ideas and constraints. Our biggest priority was to maximize the benefits of the partnership while being realistic about the time I had to offer and their capacity to integrate curriculum into their classrooms.

From these conversations, and with the guidance of Ryan Morra, the EFS Partnerships Coordinator and Educator at Shelburne Farms, our plan emerged. The two 4-6 grade teachers decided to implement Shelburne Farms' Healthy Neighborhoods/ Healthy Kids curriculum as an extended social studies unit. The unit uses service-learning and project-based learning to explore the New Haven town center, and to develop and implement a neighborhood improvement project. The teachers also decided to use one of the twelve "Big Ideas of Sustainability" as their classes' guiding theme for each trimester. The "Big Ideas" they chose to focus on are: community, diversity, and interdependence.

Since the "Big Ideas of Sustainability" are somewhat abstract ideas, the teachers requested that I compile five activities that explore each theme in a concrete, hands-on way. They also requested that the activities be simple enough that the students can do them at stations, independently, and in small groups. Each group will do a different activity, and the teachers will rotate to answer questions and provide guidance. Each station will last about 30 minutes. The teachers encouraged me to use curriculum sources that I have used before. I re-wrote the activities to meet these specifications, and created directions that the teachers can print for the students. Below, I outline the primary activity and goal for each station.

## COMMUNITY

**Basement Windows:** Discover what lives in the forest, out of sight. Find cool creatures like insects, worms, and amphibians, and learn how our community is made up of all sorts of living things.

**Insect National Park:** Practice sharing the perspective of a very different community member—an insect! Explore what the world is like from their perspective.

**Producer-Consumer-Decomposer Scavenger Hunt:** Learn how different community members get their energy. See which organisms live near the school.

**Wetlands Hopscotch:** See what it's like to be a very different community member — a migrating bird! Many migrating birds need to rest and eat in wetlands as they travel across continents. Learn how humans impact birds' lives as they migrate.

**Schoolyard Field Guide:** Plants are an important part of our ecosystem, which is a type of community. Get to know a new plant—draw it, research it, and learn what makes it cool.

## DIVERSITY

**Soil Smudge:** Explore the soil from several places near the school and figure out which one has the most organic matter. See whether different plants communities correspond to differences in the soil.

**Create a Cold Weather Creature:** Discover how organisms look and act so differently partly because they have varied adaptations that help them survive. Pick three adaptations out of the "bag of fate" and invent a creature with those adaptations.

**Stop, Drop, and Count:** Some ecosystems are more diverse than others. Sample the number of different plant species in different habitats around the school. Then, reflect on the data and think about why certain patterns may exist.

**Shrub Shake:** Shake shrubs and trees and see what you find! Look close, and enjoy how cool and diverse bugs are. Learn how important these community members are for our planet, even if they may seem weird, scary, or different.

**Chatting with a Caterpillar:** Research a species of wildlife and make a skit in which a human interviews the wild animal. Learn how animals are different from people, explore an animal's perspective, and gain an appreciation for all sorts of creatures.

## INTERDEPENDENCE

**Camouflage:** Play a fun game that shows how predator and prey populations depend on each other.

**Meet a Tree:** Play a fun game where each student gets to "meet" a mystery tree, blindfolded. Explore the ways that humans depend on trees and that some trees depend on humans.

**Water Use and Misuse:** Do a group activity to see how all living things are interdependent through their shared use of water. Explore how different organisms use water.

**Diverse Dinner:** Discover how people are connected to many other living things through food chains. Learn about some of the creatures and plants that humans depend upon.

**Seed Spreaders:** Wear a sock on the outside of one shoe and collect seeds from different parts of the schoolyard. Explore one way that plants and animals depend on each other while comparing seeds from different habitats.

**BIG IDEAS OF SUSTAINABILITY  
CURRICULUM GUIDE: COMMUNITY, DIVERSITY, AND  
INTERDEPENDENCE**

Compiled by Emma Stuhl for the Beeman Elementary MegaTeam  
New Haven PLACE Program  
Fall 2015

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# COMMUNITY

## Basement Windows:

Did you know there are windows into the forest's "basement"? The forest's "basement" is not like the one you might have in your house. It is the soil, logs, roots, and rocks that lie on and under the ground. This "basement" is an important home for everything that lives underground in the woods.

Activity:

In the forest, spread out to look into the "basement windows" by flipping over logs and rocks, and looking for holes in stumps and near the bases of trees. Look closely! Many of the fascinating creatures that live underground are small, and are camouflaged to blend in and be safe from predators.

Important! Be careful when you flip logs and rocks over to make sure you don't crush any fingers or creatures. When you are done, gently flip the log or rock back over. If you don't, the surface will dry out and you will have destroyed the habitat. Many underground creatures cannot survive without a wet, dark habitat.

If you find cool animals or insects:

1. Be gentle.
2. Let everyone know so that they can see too!
3. When you are done, put them back where you found them and gently flip the rock or log back over.

Now, explore for 10 minutes!

Insects and fungi have an important role in the forest. Insects and fungi decompose dead things, turning them into soil. This means that the world is not full of dead things forever and that the nutrients are returned to the soil for plants to use again. Insects and fungi are an important part of our community.

Next, discuss with a partner and then write answers to these questions:

1. What living creatures did you find? Where were they living? (Draw too, if you'd like)
2. Why do some creatures live in the "basement windows"? Why don't they live out in the open?
3. Where else could we find creatures that we don't normally see, but that live nearby?

Materials: notebooks, pencils, timer

Vocabulary: community, habitat, decompose/decomposition, nutrients, insect, fungi

Adapted from: Schutsky, Kim, Sashi Kaufman, and Steve Signell. *The ABCs of Ecology: An Educator's Guide to Learning Outside*. Saco, Maine: Ecology Education, Inc., 2006.

## **Insect National Park:**

We share the land with many tiny and even invisible creatures, like insects, fungi, and bacteria. They are very important community members because many of them decompose dead material, turning the dead stuff into healthy soil. We can see this happening anywhere wood is decomposing, like in an old stump.

In this activity, we will explore what our school yard looks like from the perspective of a tiny community member.

In small groups or working alone, choose a special spot to build your insect national park. Find somewhere that would be interesting and beautiful from an insect's point of view. Use yarn to lay out trails in the park, and use toothpick flags to mark points of interest for the insects that will use the trails. You have 15 minutes to work on your park.

After the 15 minutes are up, draw your park, so you'll be able to remember what it looks like after cleaning up.

In writing, answer these questions:

1. What did you notice about the forest or field that you had never noticed before?
2. Did you see any evidence of decomposers in your insect national park? What did you see?

Finally, clean up your park. Put the materials away neatly for the next group to use.

Materials: yarn, toothpicks and tape (to make little flags), notebooks, pencils, timer

Vocabulary: decomposer, fungus, bacteria, insect

Adapted from: Schutsky, Kim, Sashi Kaufman, and Steve Signell. *The ABCs of Ecology: An Educator's Guide to Learning Outside*. Saco, Maine: Ecology Education, Inc., 2006.



### **Producer-Consumer-Decomposer Scavenger Hunt:**

Producers are plants; they produce their own food from the sun. Consumers eat other things. They consume food that already exists. Decomposers eat dead material, breaking it into small pieces and turning it into soil. All of these players are important parts of the food web.

Make groups of 2-3. Make sure everyone is included. Each group gets a container and a scavenger hunt card. This activity is for the field edge and the forest. As a group, clarify what the school boundaries are.

During the scavenger hunt, only collect things that are small, and don't collect live animals. Even if you can't collect something, you can count it for the hunt. If you have time, see if you can find extras for some categories. You have 15 minutes to explore!

Next, in your notebook draw or write about the coolest things you found, and explain what makes the things cool or interesting. For each item you draw, label it as a producer, consumer, or decomposer. If there is time, see what items the other groups collected.

Materials: scavenger hunt cards, collection containers, notebooks, pencils, timer

Vocabulary: producer, consumer, decomposer, food web

Adapted from: Schutsky, Kim, Sashi Kaufman, and Steve Signell. *The ABCs of Ecology: An Educator's Guide to Learning Outside*. Saco, Maine: Ecology Education, Inc., 2006.

## Wetlands Hopscotch:

Different community members have different needs. Migrating birds, for example, need habitat in their summer and winter homes, and also need places where they can rest and eat as they migrate. Since these birds depend on so many places, they connect our New Haven community to communities around the world.

Every year, many birds migrate along the Atlantic coast, visiting wetlands along the way to get food and rest. Our hopscotch court is going to represent the many wetlands along the coast. Each of you will be a migrating bird. Decide whether you are a hermit thrush (a songbird), a rough-legged hawk, or a ring-billed duck.



By William H. Majoros (own work). Creative Commons.



By dfaulder. Creative Commons via wikimedia



By dfaulder. Creative Commons via wikimedia.

It's time to migrate south for the winter. Everyone take one turn at hopscotch. Did everyone make it through without missing a box?

Now, imagine that some people along the way fill in some wetlands to build malls or homes. Put big "X"s through two of the boxes. Now, no one can step in these boxes when migrating.

Everyone go through the hopscotch again-- it's time to head north for the summer. If you land on an "X" or outside of a box, you didn't survive the migration, and you are out. Watch to see what happens.

Now, imagine that people fill in three more wetlands. Put Xs through three boxes. Everyone take another turn on the hopscotch. How many birds/students made it through the migration this time?

Now, imagine that people fill in 2 more wetlands. Take another turn on the hopscotch. Did any birds survive migration? Were there enough wetland rest-stops?

While people have filled in wetlands in the past, luckily, people have also protected and cleaned up wetlands.

Answer these questions in your notebook:

1. What are the effects of filling in or polluting wetlands?
2. What are some ways to protect and clean up wetlands?

Materials: chalk, hopscotch court (or draw one), notebooks, pencils

Vocabulary: wetland, migration, pollution, habitat

Adapted from: Schutsky, Kim, Sashi Kaufman, and Steve Signell. *The ABCs of Ecology: An Educator's Guide to Learning Outside*. Saco, Maine: Ecology Education, Inc., 2006.

## **Schoolyard Field Guide:**

Plants are an important part of our ecosystem. They release the oxygen we breathe and are the foundation of the food chain.

Take 5 minutes to pick out an interesting plant or tree in the schoolyard. It can be a favorite, or one that is particularly weird or beautiful.

Now, draw and research your plant. In your drawing, include the traits that make the plant look different from other plants, so people will know which plant you are writing about.

Use the reference materials to try to find out the plant's name, or what family of plants it is in. Where the worksheet says "Behavior", write how you think the plant changes as it gets colder outside. Where the worksheets says "Ecological coolness," write what makes the plant interesting to you.

We'll compile the class' pages to make a field guide for the plants of our schoolyard.

Materials: Schoolyard Field Guide worksheet, plant field guides, pencils, coloring supplies

Vocabulary: field guide, plant, ecosystem

Adapted from: Schutsky, Kim, Sashi Kaufman, and Steve Signell. *The ABCs of Ecology: An Educator's Guide to Learning Outside*. Saco, Maine: Ecology Education, Inc., 2006.

DIVERSITY

**Soil Smudge:**

Has anyone ever told you to eat your vegetables? Humans get many of the nutrients they need to survive and grow from vegetables and other food. Plants need nutrients too.

Soils have different amounts of nutrients in them. Different soils support the growth of different plants above ground. The diversity of soils across Vermont allows for the diversity of living things in the state.

Use the soil smudge worksheet to make soil smudges from four different soils in the school yard. Through this, you will be able to see which soil has the darkest smudge and probably the most nutrients.

Materials: Soil Smudge worksheet, pencils, something small to dig with

Vocabulary: nutrient, soil, diversity

## **Create a Cold Weather Creature:**

Adaptations are part of what make the world so diverse. Adaptations help creatures survive.

Directions:

When you finish reading these instructions, pass around the “bags of fate,” and pick one card from each. The cards will tell you what adaptations your creature will have to survive the winter outdoors in Vermont.

When you have three cards, make up a creature that has all the traits you picked from the bag, and draw it in the big box on the worksheet. It can be creative and silly. You can make up other adaptations for it, but it has to have the three adaptations you picked.

Make sure your creature will be able to survive! It needs a way to:

1. Get food and water
2. Breathe
3. Stay warm

When you finish drawing, answer the questions. If you have time, color in your creature!

Leave 10 minutes at the end to go around the group to share your critters.

Materials: 3 opaque bags with cards sorted by number into the bags, and bags labeled with category names (see attached scans), Create a Cold Weather Creature worksheets, pencils, coloring supplies, timer

Vocabulary: adaptation, diverse

Adapted from: Schutsky, Kim, Sashi Kaufman, and Steve Signell. *The ABCs of Ecology: An Educator’s Guide to Learning Outside*. Saco, Maine: Ecology Education, Inc., 2006.

## **Stop, Drop, and Count:**

Some ecosystems are more diverse than others. This means that some ecosystems have more types of living things than others. The more diverse an ecosystem is, the better it is at recovering from a disturbance, like a windstorm, flood, or disease.

Let's try to find out which of our schoolyard ecosystems is the most diverse! Since we can't count every living thing that is in the schoolyard at any time of day, we'll measure the living things in plots. We'll measure 2 plots per ecosystem (forest, field, garden) with our "diversity loop".

Choose someone to throw the diversity loop somewhere in the ecosystem. Spread it out so it is a full circle, and gather around it. As a group, count the number of different species in the circle. Species means one type of living thing, like dogs or oak trees. Repeat this somewhere different in the ecosystem and then sample the next location. Record your data on the worksheet.

When you finish sampling, answer these questions in your notebook:

1. In which ecosystem did you find the most plant diversity?
2. What disturbances affect this ecosystem? (Example disturbances are: wind, snow, lightning, getting mowed, getting trampled, hail, etc.)
3. In which ecosystem did you find the least plant diversity?
4. What disturbances affect this ecosystem?
5. Why do you think the ecosystem from question one had more plant species than the ecosystem in question three?

Materials: a loop of rope about the size of a hula hoop (or a bit bigger) (or a hula hoop), Plant Diversity Data Sheet, notebooks, pencils

Vocabulary: ecosystem, disturbance, species, data

## **Shrub Shake:**

Where in the forest do you think we can find the most different types of creatures? What kinds of things live in the forest? Discuss these questions as a group. Make sure everyone gets a chance to say something if they want to.

In this station, you will investigate the shrub layer in groups of 3 or 4 students.

A few students will hold a sheet taut under or in front of a shrub or small tree. The remaining person will tap the shrub or small tree with a stick. When something interesting falls onto the sheet, put it in a container so everyone can look at it more closely.

Try different shrubs and see if certain areas have more creatures than others. After 10 minutes, take a tour of the creatures in the other bug boxes.

Reflection: Bugs play an important role in our ecosystem. They are food for lots of animals, like some birds and bats, and they eat other things themselves. Humans depend on bugs too! They might be pollinators, or decompose rotting food. Some wasps eat the bugs that eat our food crops, like wheat. We need them to help protect our food from pests.

Choose one creature to draw in detail. Zoom in so that your drawing is much bigger than the bug in real life.

Write answers to these questions:

1. What is the weirdest thing about your creature?
2. What other living things might depend on this creature? What might eat it? What does it eat?

Materials for each group: a sheet (cloth or a huge pieces of paper), small containers, notebooks, pencils, coloring supplies, (Magnifying glasses), timer

Vocabulary: pollinator, decompose, diversity, (food web)



# INTERDEPENDENCE

## Camouflage:

Rabbits depend on vegetation for camouflage. It is a critical part of their habitat. When there is not the right kind of vegetation in their habitat, or when the vegetation is removed, the rabbits are more likely to be seen and eaten.

Foxes depend on rabbits for food. If there were no foxes to eat the rabbits, more rabbits would survive each year, and the rabbits would eat too much of the food in their habitat. Then, they might run out of food and starve. In this way, rabbits depend on foxes too.

Play the game in the forest first:

1. Choose one person to be the fox. If lots of people want to be fox, start with the person whose birthday is soonest. Everyone else will be rabbits.
2. The fox chooses a spot to stand. They are not allowed to move from that spot until the round is over. The fox can turn in a circle, but it cannot take any steps.
3. The fox closes their eyes and yells "Fox!" Then the fox counts out loud, down from 20. During this time, the rabbits all hide, as best they can, as close to the fox as possible.
4. When the fox reaches zero, the fox opens their eyes and looks around. If they see a rabbit, they call out the rabbit's name or the color of the clothing they see. The rabbit is then out.
5. When the fox can't see any more rabbits, the fox yells "Carrots!" and the remaining rabbits come out. The rabbit who is still in and was hidden the closest to the fox wins. This rabbit can be the next fox if they want to be.
6. You can play this game for 10 minutes in the forest. Then, play twice in the playing field.

Answer these questions in your notebook:

1. How was it different to play in the field and the forest?
2. Where would it be easier for a fox to catch a rabbit in real life? Why? Where would it be easier for a rabbit to hide from a fox in real life? Why?
3. What other animals depend on each other? Name two pairs of animals.

Materials: a blindfold for the fox, notebooks, pencils, timer

Vocabulary: camouflage, predator, prey, vegetation, habitat

## Meet a Tree:

We depend on trees for many reasons. With the entire group, make a list of at least five ways that humans use trees and wood. See if your group can come up with the longest list of all the groups!

Activity: Find a partner who is in a different grade from you. Listen to all of the instructions before beginning the activity.

Blindfold one partner and slowly and carefully lead them to a mystery tree. The partner who can see is responsible for the safety of the blindfolded student. If someone is not being careful enough with their partner, they will have to sit out of this fun activity.

At the mystery tree, the blindfolded student should try to observe everything they can about the tree. They should use as many senses as they can, except seeing, of course.

The seeing partner will then carefully walk the blindfolded partner away from the tree, in a way that might make it hard for the blindfolded student to remember which way they've gone.

Finally, take off the blindfold, and the student who was blindfolded will try to figure out which tree they "met". They can guess until they figure it out.

Switch jobs with your partner, so the other student gets to "meet a mystery tree."

Written reflection:

1. Working with your partner, brainstorm a list of ways that trees sometimes depend on humans. How do humans help some trees survive and thrive?
2. Starting with waking up in the morning and going through right now, explain the ways that trees have benefitted you today.

Materials: blindfolds, notebooks, pencils

Vocabulary: interdependence

Adapted from: Schutsky, Kim, Sashi Kaufman, and Steve Signell. *The ABCs of Ecology: An Educator's Guide to Learning Outside*. Saco, Maine: Ecology Education, Inc., 2006.

## Water Use and Misuse:

97% of the water on the planet is salt water, which humans and many animals and plants cannot use. Of the remaining 3%, most (2.4%) of the freshwater is locked up in glaciers on mountains and in the arctic, or is deep underground. Fresh water is a very limited resource that living things must share.

As a group, brainstorm all the ways that humans use water. Write down your ideas and see if you can come up with the longest list of all the groups!

Now categorize the list. Circle the idea with a blue marker if it is about how water is **necessary** for survival, like having water to drink. Circle the idea with green if it is **important**, like using water to make toilets flush. Circle the idea with orange if it is **nice, but not necessary**, like using water to make lawns greener.

Next, discuss these questions with a classmate or two. Then write your answers:

1. How do humans take water for granted in their everyday lives?
2. What other living things in New Haven depend on freshwater? What are some creatures that need lots of water, and what are some that need a little water?
3. What are some ways that humans can use less water?

Materials: big paper; blue, green, yellow, and black markers; notebooks; pencils

Vocabulary: freshwater, salt water, resource, glacier

Adapted from: Schutsky, Kim, Sashi Kaufman, and Steve Signell. *The ABCs of Ecology: An Educator's Guide to Learning Outside*. Saco, Maine: Ecology Education, Inc., 2006.

# WORKSHEETS

Name: \_\_\_\_\_

Date: \_\_\_\_\_

### Schoolyard Plant Diversity: Data Sheet

**Forest:** When sampling in the forest, look above the circle too to see if there are tree branches overhead. If so, include these species in the diversity count.

Plot Number	Number of different species counted
1	
2	

#### Field:

Plot Number	Number of different species counted
1	
2	

#### Garden:

Plot Number	Number of different species counted
1	
2	

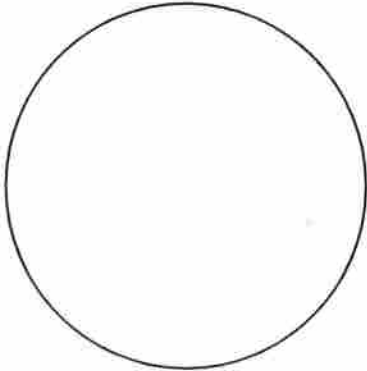
Name: \_\_\_\_\_

Date: \_\_\_\_\_

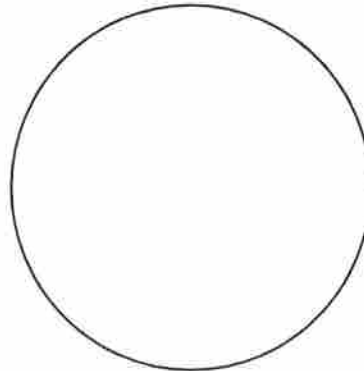
### Schoolyard Soil Smudges

Directions: Make a soil smudge in the circle for each location listed below. To make the smudge, rub a pinch of soil into the paper so some color appears. Press hard when you rub, but not so hard that the paper tears.

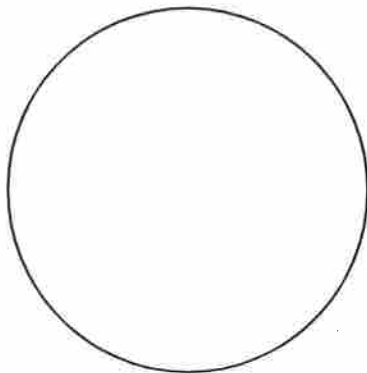
Forest



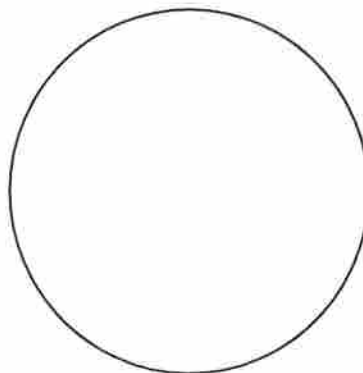
Field



Playground



Gaga Pit



Darker soils have more organic matter, which holds nutrients and helps certain plants grow. Different plants do well in different kinds of soils.

1. Which location has the most organic matter? \_\_\_\_\_
2. What kinds of plants are growing there? \_\_\_\_\_
3. What location has the least organic matter? \_\_\_\_\_
4. What kinds of plants are growing there? \_\_\_\_\_

Organic matter in the soil often come from decomposed dead things, like leaves or roots.

Why do you think the different soils have different amounts of organic matter, even though they are so close to each other?



*This project is dedicated to all the people who support the PLACE Program — who directly and indirectly serve towns and communities across Vermont and around the world.*