An Educator's Guide to the Russell Family Farm

Hinesburg, Vermont

The PLACE Program
Spring 2006

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I. Background

PLACE—Place-based Landscape Analysis and Community Education—is a program developed in partnership with the University of Vermont and Shelburne Farms. The PLACE Program's mission is to help communities explore, understand, honor, and conserve the natural and cultural features of their landscapes. One of PLACE's primary goals is to provide local educators with information and strategies for creating place-based learning opportunities for their students.

The PLACE Program approach includes showcasing specific locations within town landscapes in order to tell the story of the larger landscape. Hinesburg was selected as a featured town for 2006 PLACE Program opportunities because of its unique and informative landscape and its strong sense of community. An opportunity for the program arose at a place in Hinesburg that serves as a microcosm of these town-wide traits: the Russell Family Farm ("the Farm"). A long-standing centerpiece of the Village, the 105-acre Farm is unique in two significant ways. First, it contains an array of cultural and natural features that make it an exciting place for all ages to explore. Its rocky hilltops, stonewalls, past and present farmland, and traditional maple sugaring operation offer a broad spectrum of material that enhances one's understanding of the larger landscapes of Hinesburg and Vermont. Second, the Farm is a very short walk from Hinesburg Community School (HCS) grounds, making it an ideal destination for short field trips.

This resource guide aims to provide HCS educators and other community members with background information on the landscape features of the Farm. The intent is not to supply a definitive, all-encompassing resource, but rather to create a living document that can be added to and enhanced over time. Our hope is to provoke further study of the Farm's landscape and encourage continued educational opportunities at a very special place in Hinesburg.

II. Exploring Landscapes: The PLACE Approach

The present-day state of any particular landscape is inextricably tied with its natural and cultural histories. Therefore, it is important to explore these histories when looking at the current features of a landscape. This guide provides narratives on the different components, or layers, of the Farm's natural and cultural histories.

Landscapes are complex systems with many parts. The PLACE Program begins looking at landscapes by dividing them into three main focal areas: the **physical landscape**, the **cultural landscape**, and the **ecological landscape**. This intuitive framework will be used in this guide, but it is important to remember that these three landscape layers are very much interconnected. For example, the underlying physical aspects of a landscape greatly influence historical and present agricultural use; in turn, agricultural use impacts plant cover and associated wildlife habitat. In learning about the Farm, a goal should be to look for the stories and processes that demonstrate the connectedness of its layers.

(A note on organization: this guide includes three main sections on the physical, ecological, and cultural landscapes. Within each section, there are several narratives that discuss the different layers of these landscapes.)

III. The Physical Landscape

The physical landscape has a tremendous impact on distributions of plants, animals, and people, and therefore is a logical starting point for exploring the Farm. The layers of the physical landscape have been shaped and influenced by geologic forces over millions of years, and include climate, topography, bedrock, surficial sediments, and soils. These components set the stage for the ecological and cultural layers of the landscape.

Climate

The Farm is situated on the eastern edge of the Champlain Valley biophysical region. This region is characterized by flat-to-rolling topography, occasional calcareous bedrock outcrops and steep slopes, and glacial surficial deposits including clays, silts, and sand (Thompson and Sorenson, 2000). The climate of the Champlain Valley is generally warm and dry relative to the rest of Vermont, mostly due to lower elevations and the temperature regulating effect of Lake Champlain. Its relatively long growing season helps to make the Champlain Valley an important agricultural region in the state.

Topography

The Farm, along with the rest of Hinesburg Village, lies on the boundary of two very different landscapes. To the east of the property lie the foothills of the Green Mountains, while to the west lie flat, rolling agricultural lands that stretch to the shores of Lake Champlain. The Farm is bordered to the south, southwest, and northwest by developed portions of the Village and Route 116, and to the north, east, and south by undeveloped and rural residential areas. The property lies entirely within the LaPlatte River Watershed (see *Map #2: Landscape Context*). This watershed drains an area of approximately 53 square miles in the towns of Shelburne, Charlotte, Richmond, Williston, St. George, and Hinesburg. A tributary of the LaPlatte runs along the northeastern border of the Farm.

The Farm is characterized by a rugged topography that greatly impacts the property's soils, vegetation, and human use. The property includes three hills surrounded by lower areas (see *Map #1: Base Map*). The hills are rocky and forested, with many bedrock outcroppings and sharp elevation changes. Meanwhile, the lower areas are generally cleared for agriculture. *Figure 1* depicts the characteristic topography at the Farm.

Figure 1. A characteristic landscape scene at the Russell Family Farm, as seen from the family's sugarhouse (March 2006).

Bedrock

Bedrock geology refers to the origin and composition of the rocks that underlie the landscape (Austin et al. 2004). Vermont's geologic history is complex, and is rooted in an oceanic past and the movement of continental plates over millions of years. This narrative will discuss the bedrock formations underlying the Farm; for more complete readings on Vermont's geologic history, see Johnson (1998) and Thompson and Sorenson (2000).

There are three bedrock formations mapped beneath the Farm: Clarendon Springs, Danby, and Winooski Dolostone (see *Figure 2*). All three formed between 540 - 443

million years ago during the Cambrian and Ordovician Periods. At this time, Vermont was at the edge of a tropical sea, and calcium-rich sediments from marine organisms

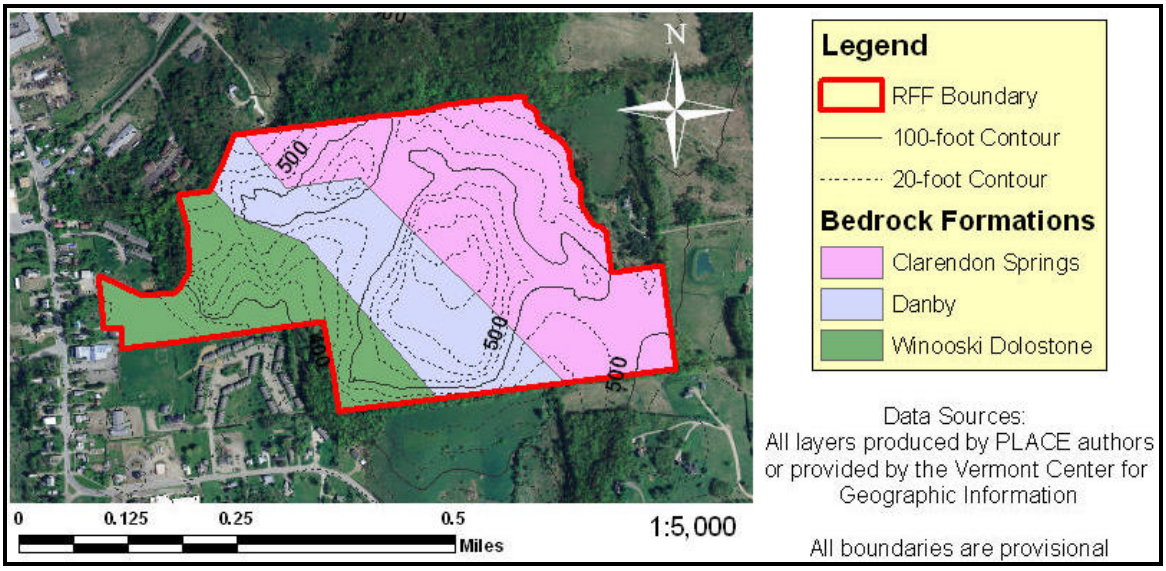

Figure 2. Bedrock formations at the Russell Family Farm, Hinesburg, Vermont.

collected on the sea floor (Thompson and Sorenson, 2000). These sediments were later buried by thick layers of deposits, and formed sedimentary rocks after million of years of intense pressure.

The Clarendon Springs and Winooski Dolostone formations are dolostones, which are slightly metamorphosed rocks that are very close to their original sedimentary composition (Gillepsie 1975; Vermont Geological Survey 2003).

The Danby is a mixture of sandstone and dolostone (Gillepsie 1975; see *Figure 3*). While dolostone is a slightly altered sedimentary rock, sandstone is a pure sedimentary rock that has a high amount of dolomite.

Figure 3. Dolostone. (Photo courtesy of Vermont Geological Survey.)

The bedrock formations at the Farm are

especially important landscape features in the hillier sections of the property. In these areas, there are relatively thin layers of soil and surficial deposits (to be discussed shortly), and the chemical composition of the bedrock therefore can influence soil chemistry. Dolostones are primarily composed of the mineral dolomite, a calcium and magnesium carbonate, which can be weathered from the bedrock (Vermont Geological Survey 2003). This weathering releases calcium and magnesium into the surrounding and overlying soils, therefore raising the fertility (the nutrients available in the soils for uptake by plants) of many parts of the Farm. Furthermore, the carbonates are alkaline in reaction: they buffer acidity in the soil (i.e. raise the pH), which creates favorable conditions for nutrient uptake by plants (Thompson and Sorenson, 2000). This affects which species occur in different parts of the Farm, as will be discussed in **Section V**.

Surficial Deposits

The natural history of the Farm, and the greater Champlain Valley, is inextricably tied to glaciation. Around two million years ago, a changing global climate caused ice to begin spreading over northern North America. This was the first of several successive glacial periods. The most recent wave of glaciation, the Laurentide Ice Sheet, began about 100,000 years ago. At its peak around 20,000 years ago, the ice sheet buried all of Vermont under one to two miles of ice. Then, by 13,500 years ago, the ice sheet had retreated north of the state.

The region's glacial past is evidenced by surficial deposits. As the Laurentide Ice Sheet advanced into Vermont, glaciers scoured and plucked bedrock into blocks and pieces, which were taken up by the moving ice. These sediments ranged in size from large boulders and rocks to fine particles like sand, silt, and clay. Collectively known as **glacial till**, the sediments were eventually exposed on the landscape as the glaciers melted. Most of Vermont is covered in till to varying thicknesses; it is usually deeper in valleys and thinner on hilltops (where it is often only bare bedrock).

As the ice sheet receded, melting ice fed into streams and rivers which flowed into the Champlain basin.[1] Till sediments were picked up by the flowing water, carried downstream, and deposited in accordance with stream speed. First, the larger pieces of till—rocks and cobbles—were dropped out along the streambed. Then, as the streams hit Lake Vermont and slowed down, sand particles were dropped out.[2] Finally, the finest particles—the clays—stayed in the water column, eventually settling out on the lake bottom (what is presently the rich fertile lowlands of the Champlain Valley).

In the past, the Farm was covered by glaciers and Lake Vermont. Therefore, the Farm contains various sediments, including clays, silts, and rocky till. These sediments, along with bedrock and topography, have a large influence on the soils present at the Farm.

Soils

Soils are an extremely important landscape component, and greatly influence the vegetation and human use of a particular area. Soils are complex, with varying proportions of four main ingredients: inorganic rock particles (ranging in size from small to large**: clay, silt, sand**); organic material (insects, bacteria, fungi, and decomposing plant material); air; and water.

Soils are greatly influenced by other layers of the landscape, including topography, surficial deposits, bedrock (where it is not covered by thick layers of surficial deposits), hydrology (the effects of water on the landscape), and cultural history. Because of these influences, soils vary from place to place across a landscape.

[1] The Champlain Basin was originally filled by Glacial Lake Vermont, a large freshwater lake filled with water from the melting ice sheet. The weight of the Laurentide ice sheet, however, had depressed (lowered) the continental plate beneath it to elevations below sea level; therefore, when the ice receded past the St. Lawrence River valley, the North Atlantic Ocean was able to flow into Lake Vermont and create the saltwater Champlain Sea. This sea existed from around 13,500 years ago until 11,000 years ago; as the continental plate rebounded from the weight of the glacier, the Champlain Basin once again flowed out to the sea. The remnants of this marine past include the fossils of marine animals (including the famous Charlotte whale).

[2] Evidence of this is apparent today: due to ice blockage farther to the north, the ancient Winooski River once flowed through Hinesburg Hollow and met with Lake Vermont where, today, there is an extractive operation for sand and gravel.

Soils differ from each other in their proportions of clay, silt, and sand, yielding a range of soil textures. Loamy soils are those with a relatively even mixture of these three particle sizes. Clayey soils, made up of the smallest particles, are thick and dense, and therefore have high capacities for holding water. Sandy soils, on the other hand, are made up of the larger particles, and are generally very porous and well-drained (they do no retain water for very long).

Another way in which soils differ from each other is in their profiles: the sequence of layers, or horizons, which extend from the surface down to the bedrock. Using differences in profiles, soil scientists classify soils into *series*. Then, based on differences of characteristics such as texture, slope, and stoniness, soil series are further classified into *phases*. The Soil Survey of Chittenden County (conducted by the U.S. Natural Resources Conservation Service) depicts six soil types (based on series and phases) at the Farm (see *Map #3: Soils*). These soils can be placed into two groups: **water-deposited soils** and **till-derived soils** (these groups are based upon those described in the original Soil Survey).

Water-deposited soils formed in sediments dropped out from glacial meltwater and Lake Vermont. Their compositions include high amounts of clay, silt, and/or sand, and are generally found on the lower, gentler slopes in the eastern and western portions of the Farm. Generally, areas of the Farm with these soils are better-suited for agriculture.

<u>Water-deposited soils:</u>

- *Hartland very fine sandy loams* are generally deep to bedrock, well-drained, and loamy. They have high natural fertility.

- *Munson and Raynham silt loams* are generally deep to bedrock and somewhat poorly drained. They have high natural fertility.

- *Covington silty clay* is deep to bedrock, poorly drained, and clayey. It has a very high natural fertility.

Till-derived soils formed in the jumble of rocks left behind by receding glaciers. Their compositions are stony or extremely stony, and areas with these soils are characterized by bedrock outcrops. Till-derived soils are found at the center of the Farm, especially on the hillier sections. The bedrock formations that served as the parent material of the till were mostly limestones and other carbonate-bearing rocks. Therefore, in combination with the underlying dolostone bedrock, these soils have relatively high natural fertilities (see *Bedrock* narrative).

Till-derived soils:

- *Farmington extremely rocky loams* are shallow to bedrock, somewhat excessively drained, and loamy with many rocks. They have medium natural fertility.

- *Georgia stony loam* is deep to bedrock, moderately well-drained, and loamy with many stones. It has a high natural fertility.

- *Stockbridge and Nellis extremely stony loams* are deep to bedrock, well drained, and loamy with many rocks and stones. They have high natural fertility.

Soils make up a very important component of the Farm's landscape. Just as surficial sediments, topography, and bedrock have influenced soils, soils influence human uses and plant and wildlife distributions across the landscape. This is readily apparent when looking at the Farm's cultural history.

IV. The Cultural Landscape

Vermont has a rich cultural history. From the time of the earliest Native American inhabitants to the present, this history has left many human features on the landscape. Some of these features are remnants that speak of a long-ago past, and others are evidence of our present influence on the land. The Farm is an excellent place to explore Vermont's agricultural roots following European settlement; it is also an exciting place to learn about present agricultural activities.

The Past

Presettlement: 12,000 Years Before Present – Late 18th Century

In the period between glacial retreat and European settlement, Native American populations in the Champlain Valley concentrated their activities near lakes and rivers. Therefore, any intensive use in the property's vicinity would have coincided with the higher water levels of Lake Vermont and the Champlain Sea. As water levels dropped to present-day elevations, it is likely that the Farm would have been used on a more limited basis. According to members of the Russell family, no one can recall the discovery of evidence of Native American activity at the Farm.

Post-settlement Land-use: Late 18th Century – Present

In 1763, after around sixty-five years of fighting, the British claimed victory over the French in the French and Indian War. This began a dramatic period of settlement in Vermont. From 1763 to 1791 (the year in which Vermont received statehood) Vermont's population grew from about 300 to 85,000. By 1810, the population had reached 218,000 (Johnson 1998).

The U.S. demand for wool was at a peak in 1840, and Vermont's sheep farming was the state's primary agricultural activity. Deforestation reached its peak in the state at this time. In general, steeper and rockier slopes were put into pasture while richer lowlands

were cultivated for crops. Beginning in the 1850s, Vermont's economic growth began to decline due in part to poor farming and logging practices. Agricultural operations decreased, and forests began to reclaim the fields (Johnson 1998).

This history is evident at the Farm. A network of stonewalls runs throughout the property, indicating that the entire area was used as pastureland. The property was most likely a sheep farm through the 1840s, and then became a dairy farm with some sheep from the 1850s and on.

The Russell family traces its Hinesburg roots back to 1795, when Charles Russell bought a 1,500 acre farm. It is said that the Russells were the fifth family to arrive to the town.
The family's livestock operations were supplemented by maple sugaring, and the evidence of this activity is obvious today. The original structure of the family's sugarhouse, which is still in use, is believed to have been built in the 1850s. Furthermore, the species composition of the forest tells much of its use for sugaring. Over the generations, the family has managed for sugar maples by cutting back other species, and therefore maples are extremely abundant throughout the forested parts of the property.

Figure 4. A stonewall (located on the hill to the east of the sugarhouse) at the Russell Family Farm (March 2006).

The current pattern of forests and fields on the Farm is directly connected with its physical features. The higher portions of the property were initially cleared for sheep and cow pastures. However, the thinner soils, bedrock outcrops, and steep terrain of these areas made them poorly-suited for agriculture, and therefore they were the first places

that were allowed to revert to forest. Meanwhile, the lower portions of the Farm, with deeper and more clayey soils, were kept in agriculture.

In 1983, Howard Russell, the patriarch of the family, passed away in a barnyard accident. The dairy operation, which had seen up to 50 milking head, came to an end shortly after his death. Since this time, additional cleared areas of the Farm have begun to revert to forest.

The Present

Through the generations, the Russell's have continued sugaring operations at the Farm. The family gathers sap in the traditional fashion, using buckets, horses, a wagon, and a sled. They have about 1,350 taps, and make about 300 gallons of syrup in a typical season. This involves a tremendous amount of work, and the spring sugaring season brings the extended family and many community members up the hill to help. The original sugarhouse structure is still in place, having been renovated in 2001.

Figure 5. The sugarhouse at the Russell Family Farm, pictured with Joe Donegan (left) and Harry Russell (March 2006).

Since Howard Russell's death, the activity at the Farm was mostly limited to sugaring. In the past year, however, a flurry of activity has descended upon the Farm. The Russell Family Trust is working with the Hinesburg Land Trust and Vermont Land Trust to place a conservation easement on 63 acres of the Farm's forests and fields. This will prevent the land from being developed, and officially open up over two miles of trails for public use. Furthermore, the Trust has purchased an adjacent 15-acre parcel of farmland, increasing the Farm's acreage to approximately 105. The youngest generation of the Russell family—James, Joe, and Kevin Donegan—have used this parcel to restart traditional agricultural operations at the Farm. They have planted organic garden beds, and will be selling vegetables at local farmer's markets and through a community-supported agriculture (CSA) operation. Also, Joe Donegan is bringing dairy back to the Farm with the recent purchase of some cows. He has fenced in some pastures, and the cows are often seen out grazing. Other agricultural efforts include raising poultry and participating in a community compost program.

The Russell family is an integral layer of the Farm's landscape. As such, they are interconnected with the other elements in the landscape. This is perhaps most evident when examining the ecological features of the property, where the relationships between plants, animals, and people are readily seen.

V. The Ecological Landscape

The ecological landscape of the Farm includes the vegetation and wildlife that occur there. In many ways, the ecological landscape serves to connect all of the landscape layers present at the Farm. When reading about the vegetation and wildlife, think about how these elements are inseparable from the geologic features and human activities that occur there.

Pieces, Patterns, and Processes

Ecology is the study of relationships between organisms and their environments. The PLACE program emphasizes a **"pieces, patterns, and processes"** approach to understanding the ecology of a particular landscape. The **"pieces"** of a landscape include the plant and animal species that are present (as well as abiotic landscape components such as bedrock and soils), while **"patterns"** describe the distribution or arrangement of these pieces. **"Processes"** are the forces that dictate these patterns, including natural disturbances (e.g. wind and ice), soil and bedrock chemistry, and human use. This section will first look at the pieces, patterns, and processes involved in the vegetative cover of the Farm; then, it will briefly discuss how the patterns of vegetation impact the wildlife species present at the Farm.

Vegetation

Vegetation is often the most evident landscape component, and can be very important in instilling a community's sense of place. The traditional image of Vermont's landscape involves a matrix of forests filled with trees such as maples, oaks, and pines, intertwined with a patchwork of hay and corn fields. This scene is represented at the Farm; more than half of the property is covered in forest dominated by hardwood species,[3] and the

[3] Hardwood species include maples, oaks, beech, birches, and other most other *deciduous* trees—those that drop their leaves in the fall and grow new ones in the spring. Softwood, or *coniferous*, species mostly include evergreens like pine, hemlock, and spruce.

rest is comprised by fields and wetlands. The vegetation seen at the Farm today reflects both its physical and cultural landscapes.

Plant species vary in their tolerance of environmental conditions such as soils, bedrock, moisture level, slope, and climate (Thompson and Sorenson, 2000). Some species, such as red maple, are tolerant of a range of conditions and can therefore occur in a number of different habitats. Other species, such as maidenhair fern, have narrower tolerances and occur only when specific environmental conditions are present. Furthermore, based on similarities in tolerance levels, plant species tend to occur in natural groupings within a certain area. These groupings, called plant communities, also respond to past human use of the landscape. Therefore, by looking at patterns of plant distributions across a landscape, one can learn a great deal about the natural and cultural history of a particular place.

An important ecological concept to keep in mind when examining plant communities is **succession**: the change, over time, of the plant species that occur at a particular place. Plant communities are not static, but instead are in a slow but constant flux caused by natural and human disturbances, as well as the capacity of plants themselves to alter environmental conditions. With the concept of succession in mind, this narrative will examine the current distribution of plant communities (**current cover types**) at the Farm and also its potential **natural communities types**: the groupings of plants that might occur there if natural processes were allowed to take their course with minimal human alteration.

Current Cover Types

The Farm is currently a mix of hardwood forest, cleared agricultural fields, brush (old fields reverting back to forest), and wetlands. The property is located in a transitional zone between two forest formations: the Northern Hardwood Forest Formation, which is characterized by colder temperatures and dominated by sugar maple, American Beech, and yellow birch; and the Transition Hardwood Forest Formation, which is characterized

by warmer temperatures and the mixing of Northern Hardwood species with more southern species like oaks and hickories. Over the generations, the Farm's forests have been heavily managed for sugar maple, and this is by far the dominant tree species. Other common tree species include northern red oak, American beech, northern white cedar, hophornbeam, and Scotch pine, which occur in plantations in the eastern portion of the property.

It is clear that the calcareous (carbonate-bearing) nature of the bedrock and till found at the Farm influence the species found there. In many of the forested areas of the property, the ground is carpeted in herbaceous species that indicate soil richness (i.e. those that only grow in areas with higher nutrient levels). For example, *Figure 6* shows Dutchman's breeches, an indicator species of rich, fertile sites that is very common at the Farm.

Figure 6. Dutchman's breeches (white flowers) and Stinking Benjamin (purple flower) photographed in the northwestern section of the Russell Family Farm (April 2006).

The non-forested areas of the property consist of cleared agricultural fields, brush, and wetlands (the boundaries between these three cover types are sometimes indistinct). The cleared agricultural fields, such as the "Eight-Acre Field" in the southeastern portion of the property (*Figure 7*), are used primarily for pasture by the Farm's cows.

Figure 7. "Eight-Acre Field" at the Russell Family Farm. (Photo courtesy of Jeannette Armell, Spring 2006).

The Farm also contains many areas of brush, which are old agricultural fields that have only recently (within the last 20 years) been allowed to revert to forest. Depending on the stage of succession, these areas may be dominated by herbaceous grasses and flowering plants, or woody tree and shrub species such as eastern red cedar and common juniper. *Figure 8* depicts an old field that the Russell family calls "Giroux's Pass", which is in an early stage of succession.

Figure 8. An old agricultural field called "Giroux's Pass" near the eastern border of the Russell Family Farm (April 2006).

Finally, there are two main emergent wetland communities located at the Farm. One occurs in the center of the property, just east of the sugarhouse, while the other occurs in the northeast corner. These areas are dominated by herbaceous plants such as grasses, sedges, and common cattail. These plants depend on moist to saturated soils that are seasonally inundated with water.

Natural Community Types

Thompson and Sorenson (2000) define a natural community as "an interacting assemblage of organisms, their physical environment, and the natural processes that affect them" (p. 58). Essentially, natural communities describe patterns of species distribution according to the environmental conditions (e.g. soil and bedrock types) and natural disturbance regimes (e.g. flooding) of particular places. A fundamental objective of the natural community concept is to predict successional pathways in the absence of human alteration; that is, trying to figure out what might naturally occur in a given place.

The Farm is an excellent place to begin thinking about natural communities. It is also a difficult one, in some ways, because it has such a rich cultural history. The property has been used in different ways for hundreds of years, and this affects everything presently seen at the Farm. However, with some knowledge of the physical components and current cover types of the landscape, it is a useful exercise to predict the natural community types of the Farm. (A note: the book Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont, by Thompson and Sorenson (2000), is an excellent resource for studying this topic. The book serves as the source for the Farm's potential natural community types listed below.)

Keeping the physical landscape of the Farm in mind (in particular, the high nutrient levels of the underlying bedrock and till, the shallow soils of the higher sections, and the silt and clay sediments in the deeper soils of the lower sections) the following is a list of potential natural community types of the Farm. The first two are possible dominant

community types, while the rest would probably occur as smaller pockets interspersed throughout the property.

Potential Natural Community Types:

- Northern Hardwood Limestone Forest, a variant of the Rich Northern Hardwood Forest*
- Transition Hardwoods Limestone Forest, a variant of the Mesic Maple-Ash-Hickory-Oak Forest*
- Rich Northern Hardwood Forest
- Sugar Maple-White Ash-Jack-in-the-pulpit Northern Hardwood Forest
- Sugar Maple-Hophornbeam Forest, a variant of Dry Oak-Hickory-Hophornbeam Forest
- Mesic Maple-Ash-Hickory-Oak Forest
- Northern Hardwood Forest
- Mesic Red Oak-Northern Hardwood Forest
- Valley Clayplain Forest
- Temperate Calcareous Outcrop
- Temperate Calcareous Cliff
- Cattail Marsh
- Shallow Emergent Marsh
- Limestone Forest variant of Mesic Maple-Ash-Hickory-Oak Forest

(* Denotes potentially dominant natural community.)

Wildlife

Wildlife species, like plant communities, have varying tolerances for environmental conditions. Most wildlife species have adapted to particular habitats, and therefore different species can be found in different types of places. For example, some bird species are found in older forests, some are found in younger forests, and others are found in open grasslands. As a result of these different habitat needs, many wildlife populations are directly affected by changes in vegetation and human use.

Over time, Vermont's wildlife populations have responded to human impacts on the landscape. In the 1800s, when much of the state was cleared of forests, many species

were extirpated from the state, including white-tailed deer, beaver, wild turkey, and fisher. These species, with some help from conservationists, eventually returned as the forest grew back beginning in the 1850s.

The Farm's wildlife inhabitants have responded to changes in its vegetation and human use over the generations. Today, there is ample habitat present at the farm. There are open fields, brushy areas, rocky outcrops, wetlands, conifer stands, and hardwood forests of varying ages. In all, the Farm is well-suited for a wide-variety of wildlife species. In compiling information for this guide, untrained eyes were able to observe several species either directly or through signs on the land, including white-tailed deer, red fox, gray squirrel, white-footed mouse, and numerous bird species (such as ruffed grouse, wild turkey, American robin, black-capped chickadee, downy and pileated woodpecker, Northern cardinal, red-winged blackbird, cedar waxwing, and red-tailed hawk). For a list of just some of the species occurring at the Farm, please see *Appendix A*.

VI. The Future

All of the landscape layers at the Russell Family Farm are intertwined in a story that reaches far into the past. This exciting story includes fantastical elements like ancient seas and massive ice sheets, and less dramatic—but equally influential—characters such as forests, fields, and farmers.

The Farm's present and future are just as exciting. The recent resurgence of crop and dairy farming, the conservation of a large section of the property, and the traditional sugaring season that marks each spring all help to make the Farm an ideal place to learn about Vermont's cultural heritage. These features also demonstrate some of the forces that are helping to shape Vermont's future landscape. When visiting the Farm, look for clues about its natural and cultural history, but also look for signs of the future.

Appendix A: Preliminary Species List

Mammals

White-tailed deer
Red fox
Deer mouse
White-footed mouse
Woodland jumping mouse
Chipmunk
Gray squirrel
Eastern cottontail
Meadow vole
Striped skunk
Porcupine
Red squirrel

Birds
Northern cardinal
Cedar waxwing
American robin
Black-capped chickadee
Ruffed grouse
Wild turkey
Pileated woodpecker
Downy woodpecker
Red-tailed hawk

Amphibians
Wood frog

Appendix B: Activity Ideas for Educators

The Farm is a terrific destination to learn about a number of topics, including maple sugaring, soils, farming, cultural history, and plants.

Activity ideas (organized by focal group) might include:

The Physical Landscape:

- Dig a soil pit to examine soil horizons and learn about geological processes.
- Explore the Farm's topography, paying particular attention the bedrock outcroppings found throughout the property.

The Ecological Landscape:

- Learn to identify the common plant species present at the Farm, especially trees and spring ephemeral flowers.
- Map natural communities at the Farm.

The Cultural Landscape:

- Make a cultural features map by using GPS units to map specific points.
- Explore the Farm's history by looking for old fields and stonewalls.
- Explore the Farm's present and future by learning about its vegetable gardens, dairy operation, and sugaring season.
- Try a "clue quest" or "scavenger hunt" that integrates history lessons.
- Explore records from the Town of Hinesburg and the Census of Agriculture.

Check out Shelburne Farm's educator activity workbook, Project Seasons, for more great ideas on how to integrate outdoor learning into your classroom!

Sources and Suggested Readings

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And, of course, the PLACE Program website! Available at http://www.uvm.edu/place