

ECOLOGICAL INVENTORY
for
SPRING HILL FARM (CHURCH EASEMENT)
CHESTER, NEW HAMPSHIRE

Prepared for:
Town of Chester Conservation Commission



Respectfully submitted by:
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Cover photos (clockwise from top-left): Red maple, Spotted Salamander eggs, Marsh marigold, and Wood Thrush.

Introduction

At the request of the Town of Chester Conservation Commission, Moosewood Ecological, LLC conducted an ecological inventory on a section of the Spring Hill Farm's Church Easement to better understand the property's biodiversity and current ecological condition, as well as to generate a series of recommendations addressing concerns over the impacts of recreation on sensitive species. These recommendations stemmed from a compilation of data collected on-site and existing data resources found online or elsewhere. Prior to field work, the following datasets and resources helped guide our inventory efforts at Spring Hill Farm:

- United States Geological Survey (USGS) topographic quadrangles
- National Hydrography Dataset
- National Wetlands Inventory (NWI) Plus spatial dataset
- New Hampshire Fish and Game Wildlife Action Plan
- New Hampshire Natural Heritage Bureau rare species and natural communities
- New Hampshire Conservation and Public Lands
- New Hampshire GRANIT aerial and color-infrared imagery
- New Hampshire GRANIT digital parcel dataset for Rockingham County
- New Hampshire GRANIT LiDAR-derived digital elevation model
- Town of Chester Conservation Commission
- Historical property documents
- Current agricultural tenants
- Other individuals using the property for recreation

While this study took place on just part of one of Spring Hill Farm's easements, the report denotes the focus area as 'Spring Hill Farm' for simplicity's sake.

Methodology

Following the establishment of a geographic information system (GIS) database for the Spring Hill Property and an initial synthesis of existing information, Moosewood Ecological designed a series of inventory methods that targeted species of conservation concern, wildlife habitats, natural communities, invasive plants, and forest pathogens. Field surveys occurred between April and December, 2023 to optimize detection of focal species while still experiencing the property in most seasons. Both focal species (sometimes bear, moose, otter, beaver, or mink) and species of conservation concern can act as telling indicators of an area's ecological health, or integrity. Field surveys also sought to corroborate large-scale habitats mapped by the Wildlife Action Plan, as well as identify and map fine-scale wildlife habitats (e.g., vernal pools, den sites, etc.), exemplary/unique natural communities, invasive plants, forest pathogens (e.g., beech bark scale disease), and ecologically sensitive areas.

During each visit, Moosewood Ecological biologists recorded all significant observations of wildlife and plants, sometimes using taxon-specific techniques. Breeding birds were sampled via systematic surveys following standard point-count protocols, whereas mammals were primarily sampled with strategically placed camera traps. Amphibians and reptiles were surveyed

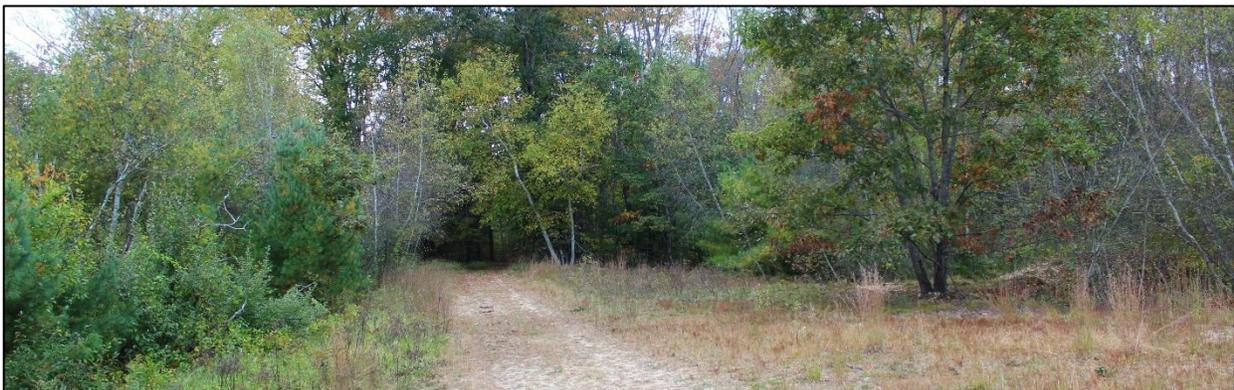
from spring through summer with an emphasis on vernal pools, streams, and wetlands. Plants, natural communities, and forest pathogens were also surveyed from spring through fall. Incidental observations of invertebrates and other organisms were recorded throughout the project's duration. All observations of wildlife, as well as unique, rare, or invasive plants were noted throughout field work, including both visual and auditory observations whenever organisms could be confidently identified. Other signs such as feeding stations, browsing, tracks, scat, and scent stations were also noted. A GPS unit and digital camera were used to record primarily significant findings but also to document the site's rich natural beauty.

Site Description

Spring Hill Farm covers an approximately 161-acre area south of Route 102 between Towle Road and Shepard Home Road in the eastern part of Chester, New Hampshire. The property was donated to the Town of Chester by the former owner, Muriel Church, in 1996. Currently, the property supports a working farm on the far eastern end (Figure 1), as well as recreational activities by the community, from hunting and fishing to hiking, horseback riding, and wildlife viewing. ATVs and snowmobiles are not permitted on the property, except for as-needed maintenance.

The property's topography consists of several small hills, frequent depressions, and occasional steep slopes formed through natural erosion, with more recent alterations made to the landscape by quarrying activities (Figure 2). High-resolution light detection and ranging (LiDAR) data depict Spring Hill Farm's complex microtopography, including a network of wetlands, smoothed-over areas of past agricultural activity, hills, slopes, and drainages of varying size and steepness (Figure 3). The soils of Spring Hill Farm consist mostly of gravel and sand deposits characteristic of a glacial outwash floodplain that once filled the local valley (Figure 4). Combined, the physical features of Spring Hill Farm enable biodiversity to flourish.

Rather than surveying the entire property, the Spring Hill Farm ecological inventory placed an emphasis within a 72.5-acre study area defined by the Conservation Commission and approximately identified in the New Hampshire Natural Heritage Bureau data-check report dated August 30, 2022. This study area included about half of the property's trail network, the site's only open waterbody, multiple wetlands, several open sandy areas, and an active farm, which included gardens, a greenhouse, and a small hayfield.



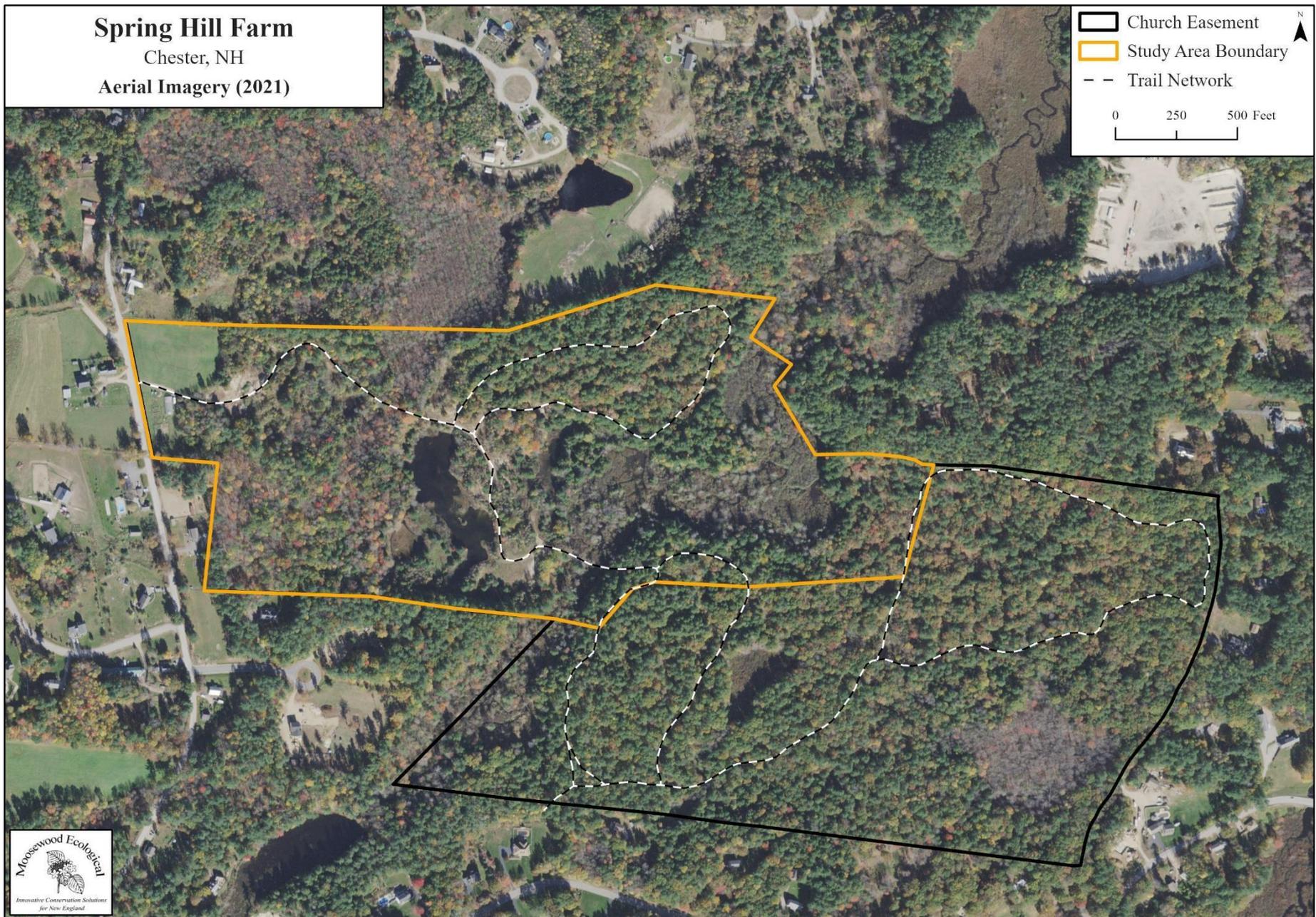


Figure 1. Aerial imagery of Spring Hill Farm from 2021 with the study area outlined in gold.

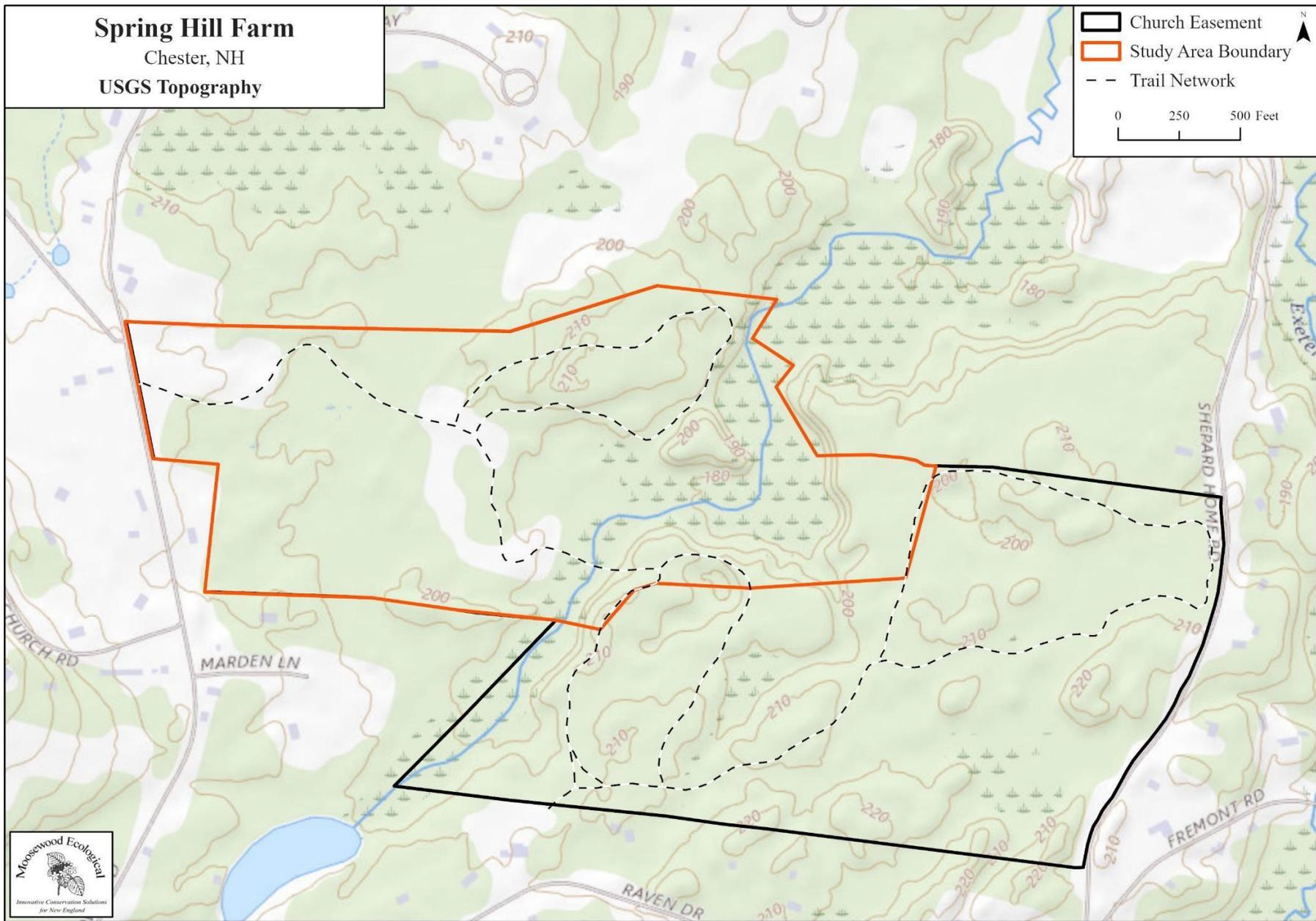


Figure 2. Topographic map of Spring Hill Farm with the study area outlined in orange.

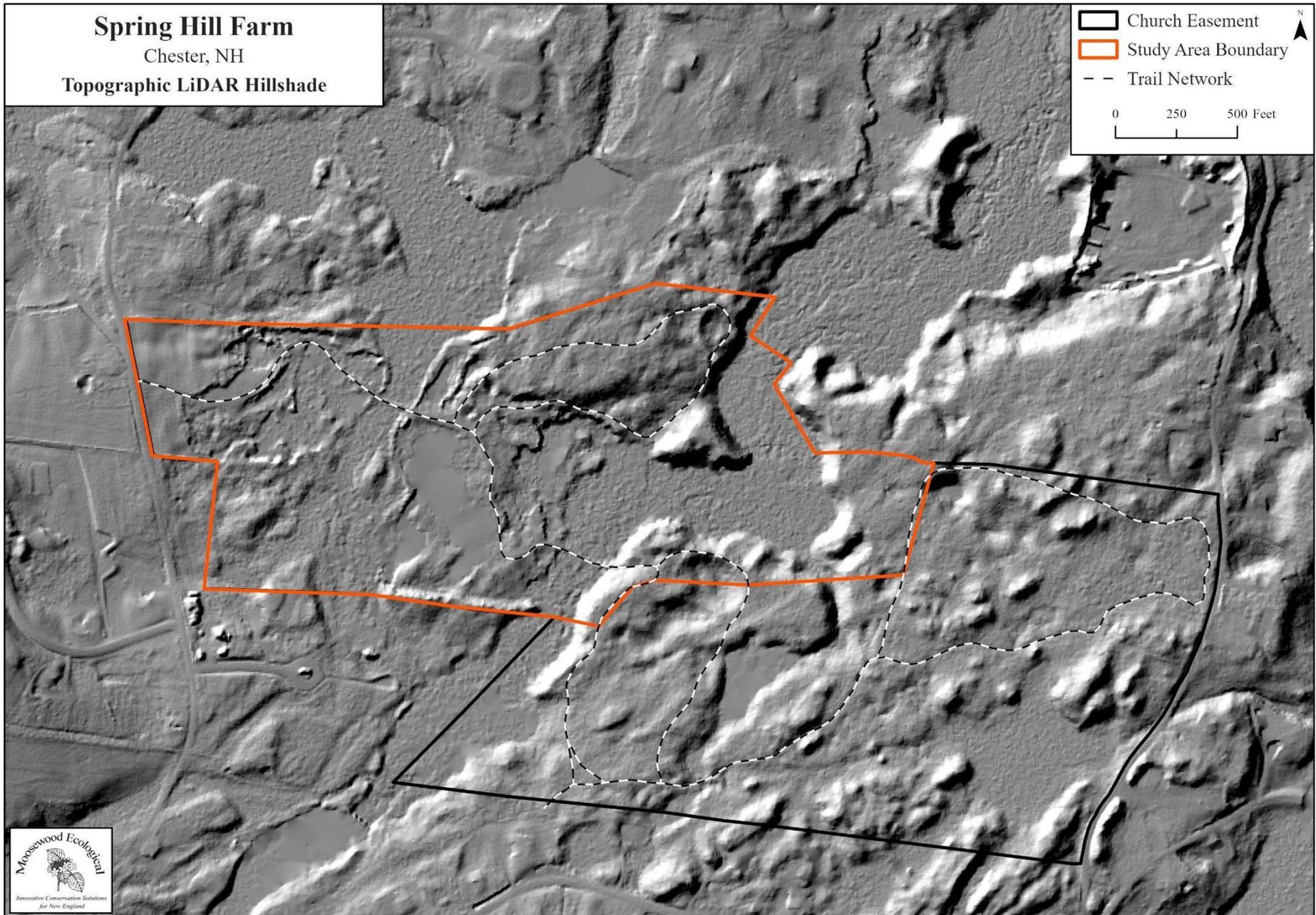


Figure 3. Microtopographic hillshade map generated from LiDAR data for Spring Hill Farm with the study area outlined in orange.

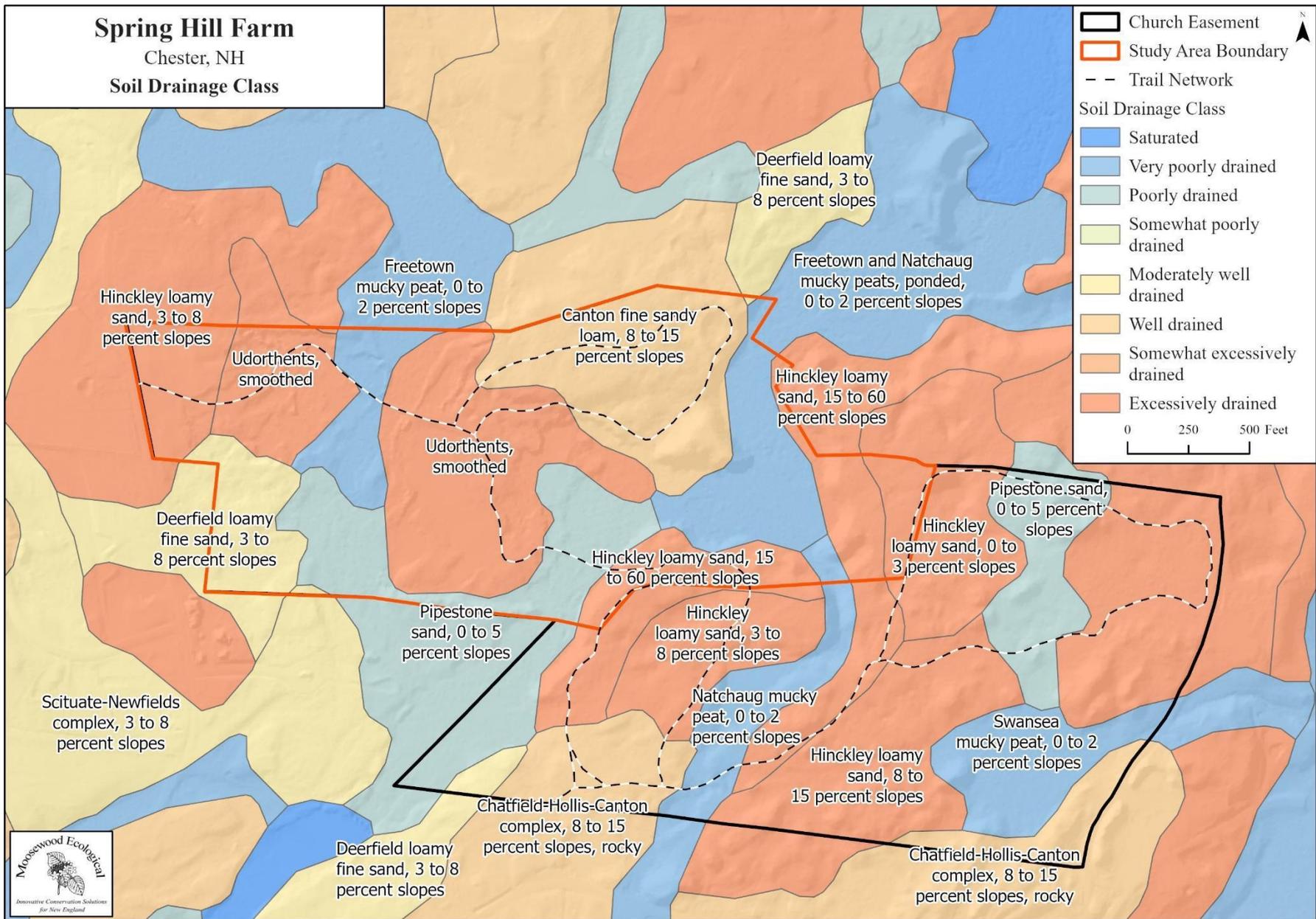


Figure 4. Natural Resources Conservation Service soil data for Spring Hill Farm. Boundaries between soil types are approximate and may represent gradual transition zones rather than abrupt changes.

Wildlife Inventory Findings

Wildlife Habitats

Wildlife habitats were originally mapped by the Wildlife Action Plan (NH Fish and Game, 2015) using habitat models based on various site conditions such as soils, geology, and location in southern NH. These habitats were last revised in 2020 and verified during field assessments in 2023 (Figure 5). The upland forests of Spring Hill Farm are best characterized by a mix of species associated with Appalachian oak-pine and hemlock-hardwood-pine forests. This is not uncommon in southern New Hampshire where forests of northern and southern affinities overlap, creating a diverse mix of tree species. However, given site conditions and climate projections these forests will continue to succeed into Appalachian oak-pine forest ecosystems.

The current condition of the upland forests has been strongly influenced by past land use history, introduction of invasive species and forest pathogens as well as a changing climate. While specific indigenous presence and land-uses at the site of Spring Hill Farm is unknown, the Penacook and earlier peoples were actively hunting, fishing, foraging, and shaping ecological processes in the region surrounding Chester many centuries prior to colonization. Indigenous peoples traveling along the nearby Pawtucket Trail, mapped by Price (1958), may have utilized Spring Hill Farm for its hickory nuts, beech nuts, acorns, fiddleheads, and other food resources. During European colonization of the area in the early 1700s, the land at Spring Hill Farm was likely cleared for homesteads and associated agriculture, followed by land abandonment and forest regeneration. Evidence of at least three logging events can be found in this second-growth forest, as well as clues pointing to relatively recent excavation of sand and gravel. These varied land uses have resulted in forest patches that are roughly 60 years old or younger, although examples of older trees are present. In fact, one of the oldest trees observed was a multi-trunked oak that germinated in the late 1800s and was consequently cut down approximately 50-60 years ago. This logging event did not kill the individual tree, leaving the root system alive and intact, resulting in the multi-trunked appearance today.

Upland habitats also include the grasslands or hayfield and other agricultural areas on the western side of Spring Hill Farm. Additional open habitat dominated by grasses, other herbaceous plants, and shrubs can be found in the middle of the study area surrounded by wetlands. Young, dense forest stands lay interspersed between open habitats and older forests.

Wetlands offer complimentary habitats to their upland counterparts. These vary in their structure from the open water habitat associated with the pond to marsh/shrub wetlands and forest swamps found along the stream drainages. The largest forest swamp can be found west of the pond along the slow drainage leading north into the larger wetland ecosystem. The second main wetland includes the shrub-dominated habitat to the east of the pond along the tributary to the Exeter River. Parts of this wetland ecosystem are characterized by peatland soils resulting in acidic site conditions, and the wetland also includes forest swamps along its margins interspersed with small marsh habitat. Beavers have historically altered the habitat structure and hydrology of the wetland along this stream due to periodic damming and associated inundation of water. Vernal pools can also be found scattered throughout the property.

The combination of various uplands and wetlands provide distinct habitats for diverse wildlife at Spring Hill Farm. This diversity has been highlighted through wildlife surveys for birds, mammals, amphibians, reptiles, and invertebrates described below. The list of wildlife documented through this study should be considered incomplete as additional species certainly utilize Spring Hill Farm at various parts of the year.

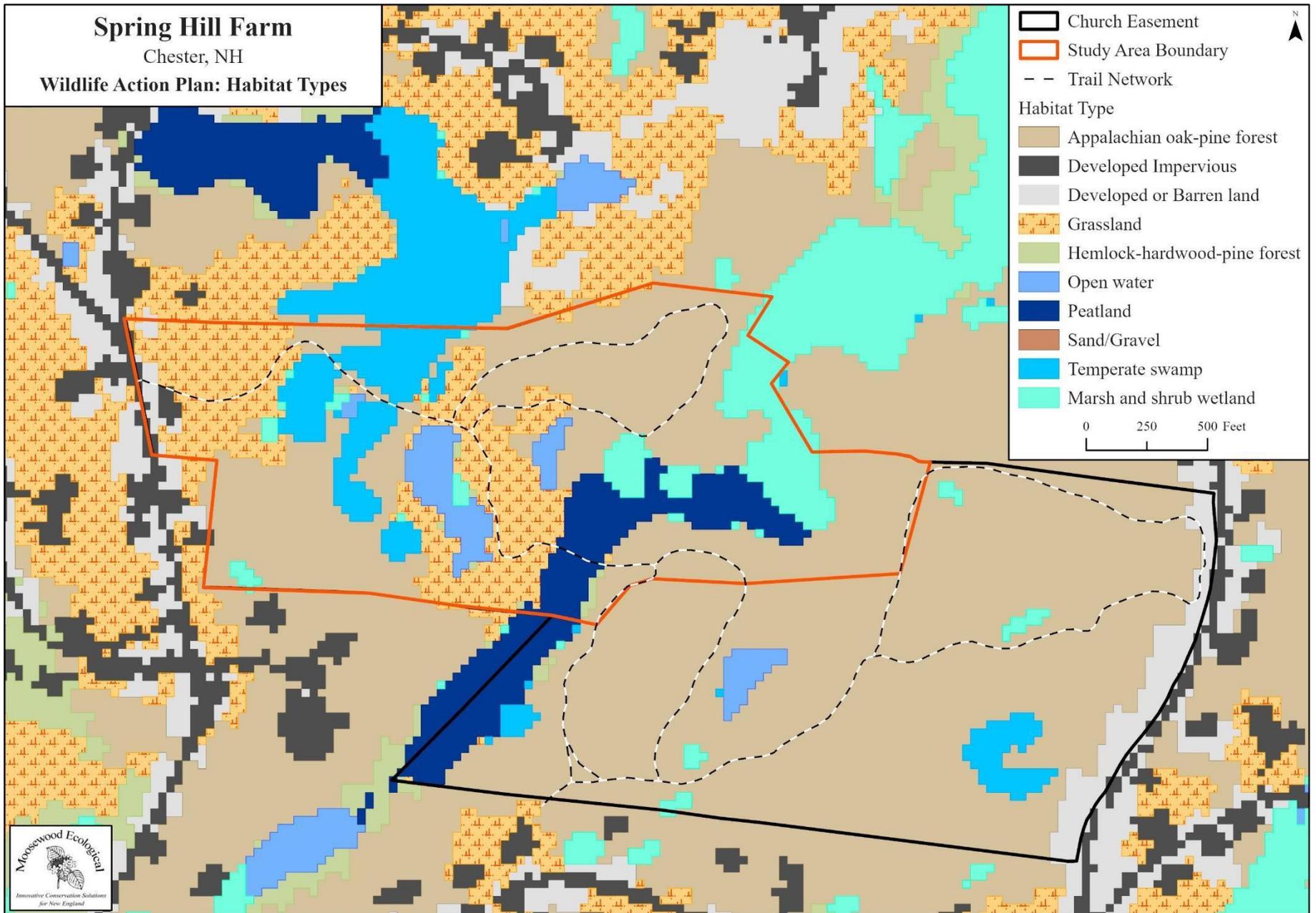


Figure 5. Wildlife Action Plan habitat types (2020 revision) at Spring Hill Farm with the study area outlined in orange.

Birds

Standardized surveys for breeding birds took place on May 26, June 14, and June 23, when most local breeding species were expected to have returned from spring migration and before birdsong waned later in the summer. Sampling occurred within earshot of all habitat types present at Spring Hill Farm, and 16 point-count stations were spaced at least 400 feet apart to reduce double-counting of individual birds. To maximize detection of breeding songbirds, surveys occurred on calm mornings with no precipitation and ended no later than three hours after sunrise. Each survey visited all point-count stations, where all birds confidently identified by sight or sound were recorded during a 10-minute observation window. In addition to these standardized surveys, all birds detected during non-avian surveys or other site visits were incidentally noted. Based on our field observations of bird behavior and knowledge of the available habitat, we assigned a breeding status to each species.

Over the course of the 2023 field season, we documented 87 bird species at Spring Hill Farm. Breeding bird surveys detected 69 species, including 19 species of conservation concern (Table 1). While Northern Parulas, Palm Warblers, and American Redstarts only visited Spring Hill Farm during spring and fall migration, the remaining 16 species of conservation concern exhibited evidence of possible breeding at Spring Hill Farm or within earshot of the property boundary. For species such as the Killdeer, which likely nests west of Towle Road, the field east of the road offers plentiful resources for food and shelter.

Table 1. Species of conservation concern detected at Spring Hill Farm.

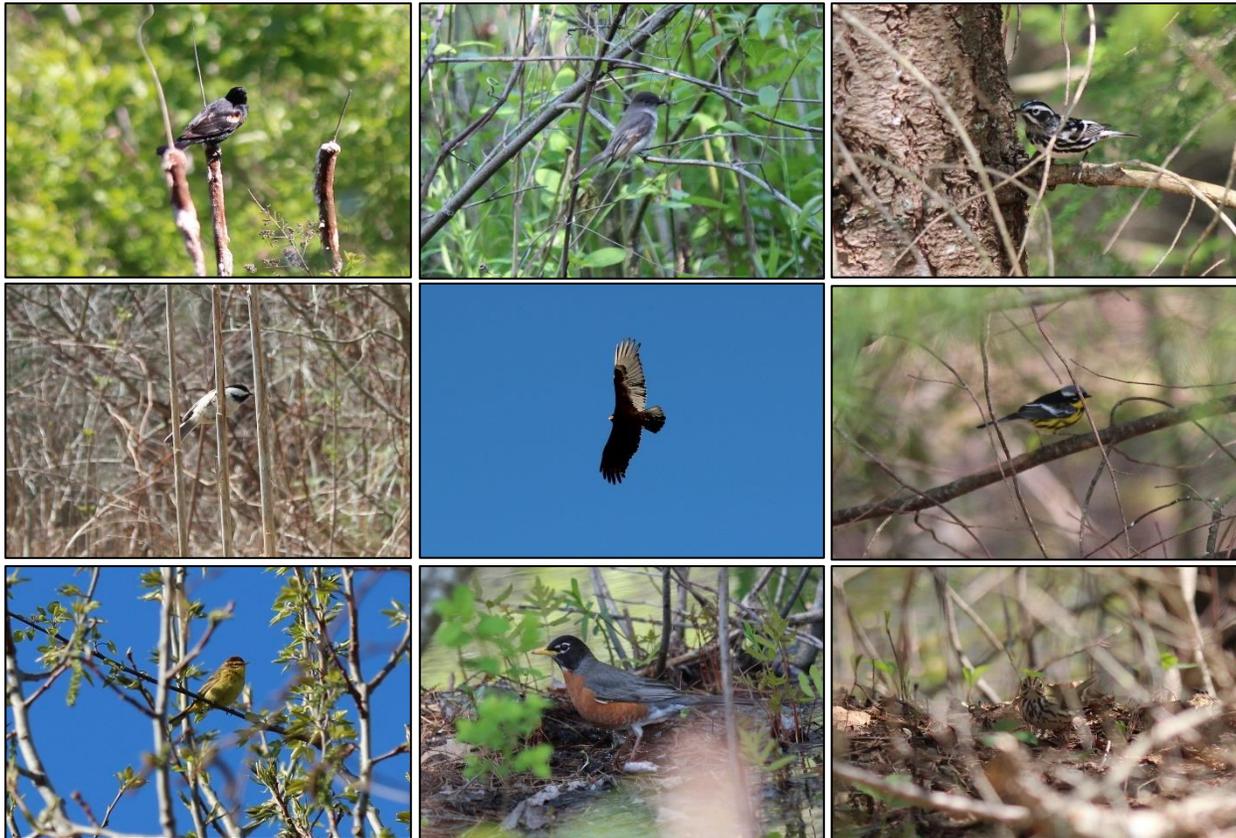
Common Name	Conservation Status	Common Name	Conservation Status
American Redstart	1	Northern Parula	1
Barn Swallow	1	Ovenbird	1
Black-throated Green Warbler	1	Palm Warbler	1
Brown Creeper	1	Prairie Warbler	2, 3, 4, 5
Chimney Swift	1, 2, 3, 4, 5	Rose-breasted Grosbeak	1
Common Grackle	2	Scarlet Tanager	4, 5
Eastern Towhee	4, 5	Veery	1, 4, 5
Eastern Wood-Pewee	1	Wood Duck	1
Killdeer	1	Wood Thrush	1, 2, 3, 4, 5
Northern Flicker	1		

Key to conservation status identifiers:

- 1 – Bird Conservation Region 14 assessment (Dettmers, 2006)
- 2 – Partners in Flight assessment (Rosenberg et al., 2016)
- 3 – North American Bird Conservation Initiative assessment (NABCI, 2022)
- 4 – New Hampshire Wildlife Action Plan (NHFG, 2015)
- 5 – New Hampshire Audubon assessment (Hunt, 2020)

Widely-distributed species that occurred at a high percentage of point-count stations at Spring Hill Farm included Pine Warbler, Northern Cardinal, Mourning Dove, and American Goldfinch, each of which were detected at all 16 stations (Figure 6). Scarlet Tanager, a species of greatest conservation need within New Hampshire, and Ovenbird, a common ground-nesting warbler, were detected at all but one station. Species at the low end of the point frequency spectrum often represent birds with lower rates of detection, such as Green Heron and Barred Owl, or species that are found only in specific habitat types, like the Prairie Warbler and Wood Duck. Overall, these point frequency values can generally indicate how easily detectable each species may be at any given location at Spring Hill Farm during the breeding season.

Another metric, relative abundance, offers a different perspective by calculating the percentage of all total detected birds represented by each species. In other words, birds with a higher relative abundance make up more of the overall bird population than those with a lower relative abundance. At Spring Hill Farm, Veery, Ovenbird, Black-capped Chickadee, Tufted Titmouse, Gray Catbird, and American Goldfinch represented the most-abundant species, each exhibiting a relative abundance greater than 4% (Figure 7). Some of Spring Hill Farm’s more rare species include Belted Kingfisher, Common Raven, Rose-breasted Grosbeak, and Red-breasted Nuthatch. For these species, Spring Hill Farm may offer limited habitat availability or, for wide-ranging species like the Pileated Woodpecker, good habitat that is visited less regularly.



First row (left to right): Red-winged Blackbird, Eastern Phoebe, Black-and-white Warbler. Second row: Black-capped Chickadee, Turkey Vulture, Magnolia Warbler. Third row: Palm Warbler, American Robin, Ovenbird.

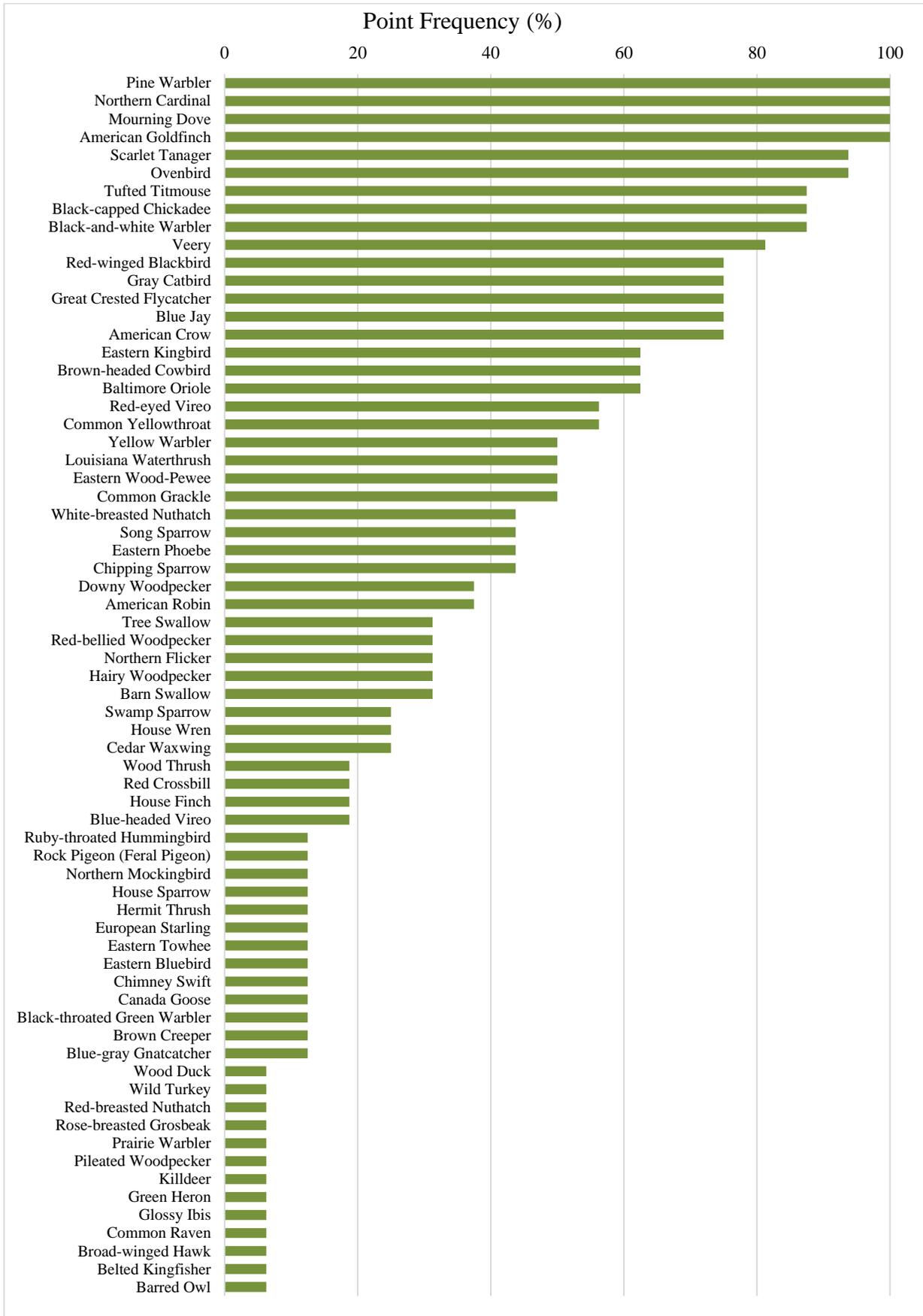


Figure 1. Point frequency of birds detected during breeding bird surveys at Spring Hill Farm.

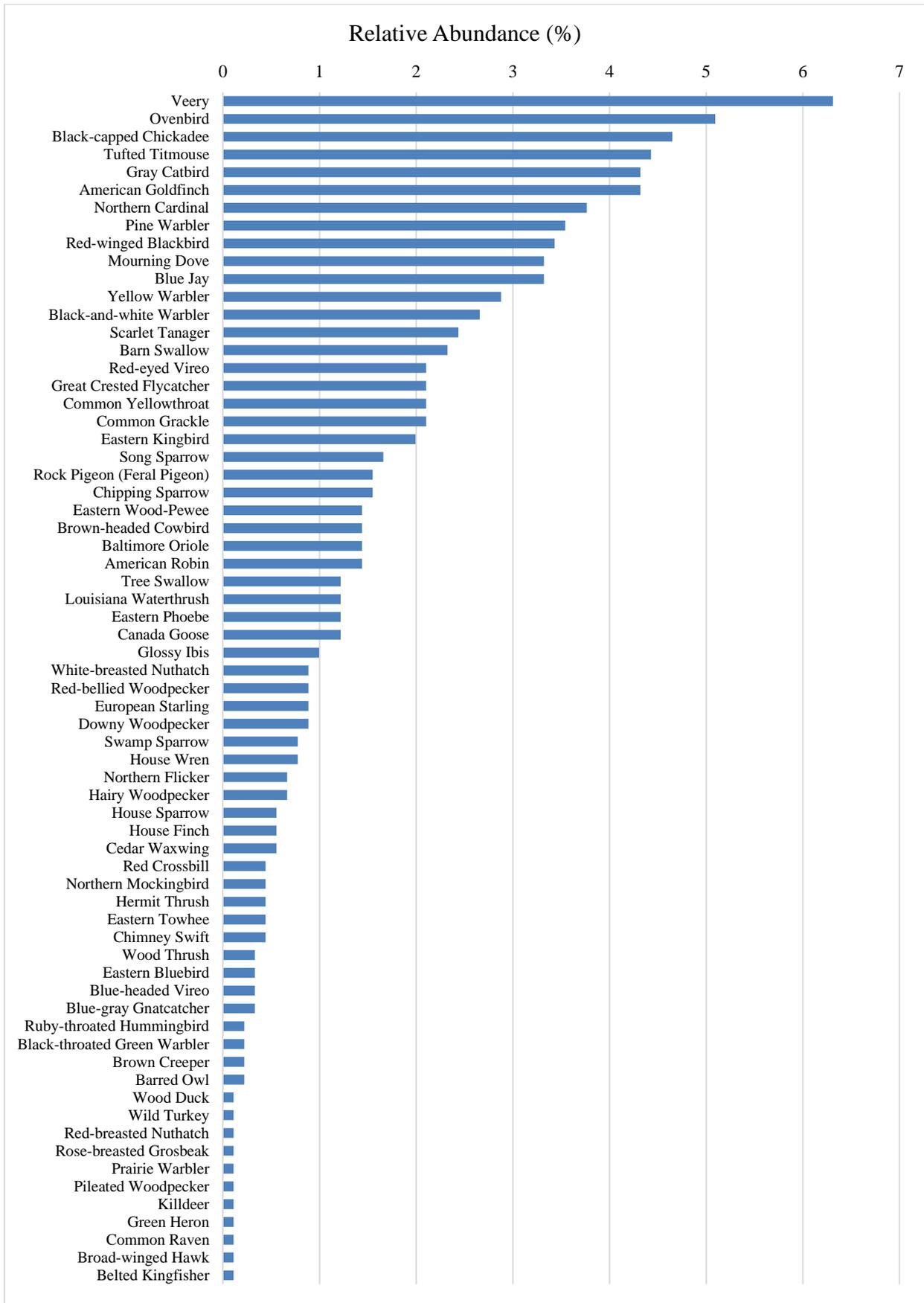


Figure 2. Relative abundance of birds detected during breeding bird surveys at Spring Hill Farm.

Mammals

Spring Hill Farm’s mammalian species were primarily sampled using an array of camera traps, which were deployed in three locations between May 10 and November 10, 2023. Each location fell in an upland area away from human trails with evidence of a path used by wildlife. Accordingly, results from this aspect of the study do not account for wildlife usage of wetlands and recreational trails. Biologists also recorded all other mammals incidentally observed during in-person site visits. Camera trapping efforts yielded 800 detections of 23 species, 15 of which were mammals. The other eight species represented birds that forage primarily or frequently on the ground. The camera traps documented three species of squirrels (Eastern Chipmunk, Eastern Gray Squirrel, and American Red Squirrel) most frequently, followed by White-tailed Deer and Eastern Cottontail (Figure 8). The comparable tallies of gray and red squirrels indicate a forest canopy of equal parts hardwood trees and conifer trees, and the apparent abundance of three squirrel species points to a copious supply of nuts and seeds on the property.

The presence of such wide-ranging species as Bobcat and North American River Otter suggests that Spring Hill Farm is connected to a large, relatively undisturbed landscape. It remains unknown if either species breeds on the property, but they undoubtedly visit Spring Hill Farm occasionally to hunt. In-person surveys also detected American Beaver, Meadow Jumping Mouse, and Northern Short-tailed Shrew, bringing the total known number of mammals to 18. All camera trap data for weasels and mice were kept at a higher identification level since night-time photos limit visibility of the differentiating characteristics between Long-tailed Weasel vs. Short-tailed Weasel (subfamily *Mustelinae*) and White-footed Mouse vs. Deer Mouse (genus *Peromyscus*). However, at least one weasel was confirmed as Long-tailed Weasel. These slender carnivores often use old chipmunk dens as nest sites.

Moosewood Ecological’s survey efforts did not extend to include bats and small mammals, and several species of each group likely utilize the available habitat at Spring Hill Farm for at least part of their life cycles.



Left to right: Striped Skunk, Bobcat, Common Raccoon, Coyote.

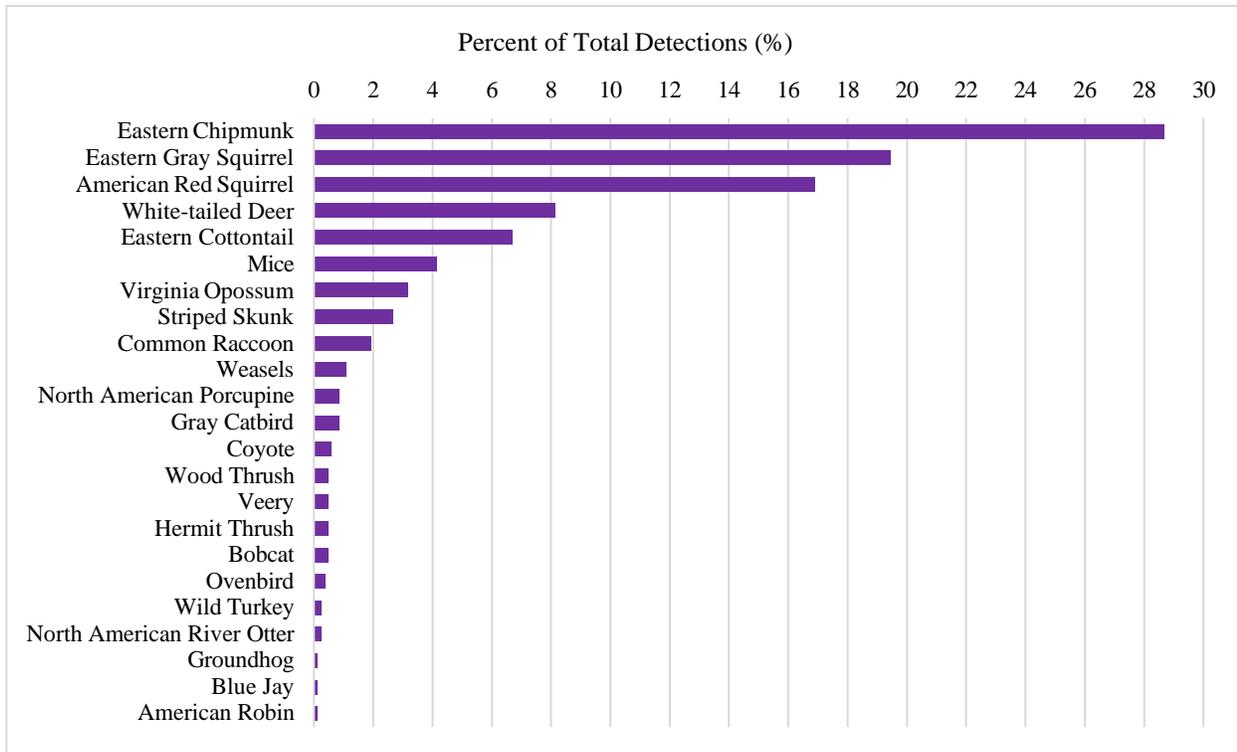


Figure 8. Percent of total wildlife detections captured via camera trapping at Spring Hill Farm.

Reptiles and Amphibians

Prior to Moosewood Ecological’s study, the Conservation Commission was already aware of at least two species of greatest conservation need within the vicinity of Spring Hill Farm. To survey for these species and other reptiles of conservation concern, we employed visual basking surveys along wetland perimeters on warm, sunny days to improve detectability. Surveys primarily took place during the spring as turtles emerge from their wintertime brumation, and several site visits were conducted during the mid-summer nesting to look for nesting evidence. Visual encounter surveys for amphibians also took place during the spring when vernal pools are typically full and most amphibians are active seeking mates. All incidentally-observed reptiles and amphibians during other surveys were also recorded to complement data from targeted surveys.

Combined, we observed 7 species of reptiles and 7 species of amphibians utilizing the upland or wetland habitats found at Spring Hill Farm. Painted Turtles outnumbered all other reptiles, and were found in most wetland types within the study area. Common Snapping Turtles were observed with less frequency, and seemed to prefer the larger, mucky-bottomed wetlands. Given the sandy-gravelly substrate throughout most of the study area, nesting opportunities appeared abundant, including within and adjacent to recreational trails. The three snake species observed, Northern Watersnake, Eastern Milksnake, and Eastern Ribbon Snake, can occupy a range of habitats, although watersnakes and ribbon snakes generally prefer

wetlands and associated riparian areas. The Eastern Ribbon Snake is a species of special concern within New Hampshire due to significant habitat degradation, widespread loss of suitable wetland, and regional declines in amphibian populations.

Egg masses of two ecologically-sensitive amphibians, Wood Frogs and Spotted Salamanders, were documented in several fish-free wetlands and vernal pools at Spring Hill Farm. These isolated bodies of water provide critical reproductive sites for Wood Frogs, Spotted Salamanders, fairy shrimp, and other vernal pool obligates. Some turtles also readily use vernal pools for foraging sites, pre-nesting staging areas, shelter, and sometimes as overwintering sites. Other amphibians detected at Spring Hill Farm include common species native to New Hampshire: Green Frog, American Bullfrog, Pickerel Frog, Gray Tree Frog, Spring Peeper, and American Toad.



Eastern Ribbon Snake

Invertebrates

While no standardized or targeted surveys were conducted for invertebrates at Spring Hill Farm, it was hard not to document these often photogenic or poorly-studied creatures. Our observations of 185 species of invertebrates only begin to scratch the surface of this biodiverse group, and additional surveys could yield many hundreds more species. While insects represented the bulk of recorded invertebrates with 160 species, we also identified 20 spiders and mites, two mollusks, a leech, a fairy shrimp, and a nematode.

Relative to the sheer biodiversity of invertebrates, very few species have been assessed for potential listing as a species of conservation concern. However, as more data becomes available through research projects, including community science databases like iNaturalist, initial working groups have been formed to begin conservation status assessments. Data points from this inventory that were submitted to iNaturalist are already helping inform potential inclusion of several insect species within the forthcoming 2025 New Hampshire Wildlife Action Plan. None of the currently state-listed invertebrate species were observed at Spring Hill Farm; however, Monarchs, a species of greatest conservation need, likely use the property for nectaring resources during fall migration and may occasionally lay eggs on common milkweed plants.

Numerous species documented by this inventory represented first-known records for the Town of Chester, Rockingham County, and even New Hampshire. For the time being, it remains unknown if these species are truly rare, relatively uncommon, or simply overlooked common species. Table 2 provides a sampling of noteworthy invertebrates.



Eastern Pine Elfin

Table 2. Partial list of notable insects observed at Spring Hill Farm.

Scientific Name	Common Name	Taxonomic Group	Significance
<i>Atrytonopsis hianna</i>	Dusted Skipper	Butterflies	Under review for listing as a regional species of conservation concern
<i>Auplopus architectus</i>		Spider Wasps	First record for New Hampshire, pending ID confirmation
<i>Chirosia flicis</i>		Muscoid Flies	Third record for New Hampshire
<i>Dichomeris nonstrigella</i>	Little Devil Moth	Twirler Moths	First record for Rockingham County
<i>Evarcha hoyi</i>	Hoy's Jumping Spider	Jumping Spiders	Second record for Rockingham County
<i>Gambrinus griseus</i>	Hairy Click Beetle	Click Beetles	Second record for New Hampshire, pending ID confirmation
<i>Hadromorphus inflatus</i>		Click Beetles	First record for Rockingham County
<i>Helocordulia uhleri</i>	Uhler's Sundragon	Dragonflies	Second record for Rockingham County
<i>Microdon tristis</i>	Long-horned Ant Fly	Hover Flies	First record for New Hampshire, pending ID confirmation
<i>Olethreutes appendiceum</i>	Serviceberry Leafroller	Tortricid Leafroller Moths	First record for New Hampshire
<i>Oncopsis cinctifrons</i>		Typical Leafhoppers	First record for New Hampshire
<i>Pelochrista kimballi</i>		Tortricid Leafroller Moths	Second record for New Hampshire
<i>Quedius canadensis</i>		Rove Beetles	First record for Rockingham County, pending ID confirmation

Plant Inventory Findings

Natural Communities

Natural communities are assemblages of plants, their physical environments, and ecological processes that affect them. Essentially, they are ecological units that are repeated on the landscape. Natural communities include both uplands and wetlands, such as forests and woodlands, shorelines, vernal pools, forested swamps, peatlands, floodplains, and deep aquatic systems. Each natural community is distinguished by its species composition, physical structure, and condition.

These communities provide scientists and resource managers with an ecological understanding of the land and its inhabitants to make intelligent, informed decisions regarding land use. Therefore, natural community classifications provide conservationists with a powerful tool to guide strategic planning. Equally as important, such classifications provide a basis from which inventory and monitoring programs can be developed, and a means to document and track

rare species and exemplary natural communities. The natural community types discussed below follow Sperduto and Nichols (2011), and natural community system types follow Sperduto (2011). Species common names were standardized to the NH Natural Heritage Bureau database.

Contributing to the diversity of wildlife, the natural communities and other ecological features at Spring Hill Farm provide varied plant structure and composition (Figure 5). These include multiple types of uplands and wetlands. While past land use history has resulted in a highly-altered ecosystem, thereby making definitive classification of natural communities difficult, on-site observations suggest the following natural communities and systems may be present. Table 3 provides a crosswalk between the Wildlife Action Plan habitats (noted above and in Figure 5) and the natural communities documented at Spring Hill Farm. These natural communities provide a more detailed understanding of the ecological complexity of vegetation structure to track natural communities and their change over time. While no rare or exemplary natural communities were observed, one example is worth special attention.

A red maple-black ash swamp is located along the slow drainage to the west of the main pond. This forested swamp community is associated with a larger wetland complex to the north of Spring Hill Farm. Many, if not all, of the mature black ash have died or are dying presumably all from the Emerald Ash Borer, but some saplings exist. While this wetland community is not considered rare, it is locally significant. Due to the introduction of the Emerald Ash Borer, black ash trees are being eliminated from this natural community, thereby changing its tree species composition. Eventually, red maple will dominate this forest swamp. However, the hydrology will continue to support plants associated with groundwater seepage.

Table 3. Crosswalk associated with natural communities and wildlife action plan habitats types.

Natural Community	NH Wildlife Action Plan Habitat
Dry Appalachian oak-pine forest (S3)	Appalachian oak-pine forest
Dry red oak-white pine forest (S3S4)	
Hemlock-beech-oak-pine forest (S5)	
Red maple-black ash swamp (S3)	Temperate forest swamp
Seasonally flooded red maple swamp (S4)	
Mixed alluvial shrubland (S4)	Marsh and shrub wetland (peatland and non-peatland types)
Alder-dogwood-arrowwood alluvial shrub thicket (S4)	
Cattail marsh (S4)	
Aquatic bed (S5)	
Vernal pool (not ranked)	Vernal pool



Rare and Uncommon Plants

There were no rare plants documented during the 2023 field surveys, and a data check of NH Natural Heritage Bureau (NHNHB) on August 30, 2022 resulted in no known listed rare plant species. However, a lack of documentation does not mean that rare plants are truly absent. As of 2020, only one state-endangered plant, an orchid called dragon's-mouth (*Arethusa bulbosa*), was known from the Town of Chester (NHNHB, 2020). Given this species' preference for acidic, boggy habitat, it is unlikely to be found at Spring Hill Farm.

The 2015 New Hampshire Wildlife Action Plan listed rare plant species associated with 18 habitat types. Habitat data from the Wildlife Action Plan depicts the uplands of Spring Hill Farm as Appalachian oak – pine forest (Figure 5), while on-site observations presented a transitional forest with characteristics of both Appalachian oak – pine forest and hemlock – hardwood – pine forest. No ecological indicators of mineral-enriched soils were observed, which ruled out the possibility of finding rare plants associated with rich mesic forests. Hence the list of potentially occurring rare plants at Spring Hill Farm is limited to those adapted to nutrient-poor soils in either Appalachian oak – pine forests or hemlock -hardwood – pine forests:

- Fall coral-root (*Corallorhiza odontorhiza*)
- Smooth small-leaved tick-trefoil (*Desmodium marilandicum*)
- Round-fruited rosette-panicgrass (*Dichanthelium sphaerocarpon*)
- Narrow-leaved hawkweed (*Hieracium umbellatum*)
- Common star-grass (*Hypoxis hirsuta*)
- Large whorled pogonia (*Isotria verticillata*)
- Narrow-leaved pinweed (*Lechea tenuifolia*)
- Trailing bush-clover (*Lespedeza procumbens*)
- Slender bush-clover (*Lespedeza virginica*)
- Pine-drops (*Pterospora andromedea*)
- Mossy-cup oak (*Quercus macrocarpa*)
- Narrow-leaved white-topped aster (*Sericocarpus linifolius*)
- Licorice goldenrod (*Solidago odora*)
- Goat's rue (*Tephrosia virginiana*)
- Bird-foot violet (*Viola pedata*)

Invasive Plants and Forest Pathogens

Invasive, non-native plants whose introduction to an area can degrade environmental quality, present a growing issue in New Hampshire. On par with other landscapes with a long history of human activities, Spring Hill Farm contains an array of invasive plants. Approximately 11% of all plants documented on the property originated outside of New England, mostly coming from Europe, Asia, or North Africa. If left unmanaged, seven particularly invasive species pose significant threats to the ecological integrity of Spring Hill Farm. Glossy buckthorn, autumn olive, Japanese barberry, multiflora rose, winged euonymus (also called burning bush), oriental bittersweet, and purple loosestrife occur throughout the property, often in both wetlands and uplands. These invasives tend to be concentrated in more newly-forested areas where

disturbance was relatively recent, as well as along current and past recreational trails where seeds can spread more easily from heightened activity. Seeds are also spread by birds and small mammals, who ingest the fleshy, low-nutrition fruits and defecate or store the seeds elsewhere.

Surveys uncovered several forest pathogens that may also negatively impact the forest of Spring Hill Farm over the coming decades. Ash trees throughout southern New Hampshire are rapidly declining due to the Emerald Ash Borer outbreak, and Chester has not escaped this outbreak. Several wetlands in the western half of the study area host black ash, an uncommon relative to the more widespread, upland-dwelling white ash. Virtually all of Spring Hill Farm’s black ash trees have perished from Emerald Ash Borer activity, and the few with intact root systems are sprouting new basal branches – a sign that these trees are in distress. Emerald Ash Borer typically affects mature trees, so any young black ash saplings or seeds present in these wetlands may keep the local population from being eradicated.

Both American beech trees and eastern hemlock trees face two-pronged threats from other forest pathogens. Beech bark canker fungus affects the bark of a high proportion of trees at Spring Hill Farm. This disease stresses affected trees and reduces the likelihood of reaching a mature age. Fortunately, the canker fungus does not quickly kill trees like the Emerald Ash Borer. A new threat, only having recently spread to New Hampshire, is a nematode called beech leaf disease. This pathogen appears to spread on American beech leaves in the understory and midstory, killing the leaves partway through the year. As a result, affected trees suffer from reduced rates of photosynthesis, leading to poor nutrition and reduced carbon sequestration. Only a handful of affected beech trees were observed in the southwestern corner of the study area.

Eastern hemlock trees, on the other hand, are feeling the impacts of hemlock woolly adelgid and elongate hemlock scale, two nearly-microscopic insects that feed on sap produced by host trees. Either insect can kill a host plant within 10 years, and this process is sometimes hastened if both pests are present. Native lacewings and lady beetles can provide a natural biological control of these pests, helping to keep populations at bay.



Top row (left to right): glossy buckthorn, autumn olive, multiflora rose. Second row: Japanese barberry, beech leaf disease, hemlock woolly adelgid.

Landscape Context

Unfragmented Land Blocks

Anthropogenic development divides our landscape into discrete, fragmented blocks of natural land cover. This division of land occurs when roadways are created to support our built infrastructure, including residential, commercial, and industrial developments. The continuous development of new roadways and other projects further fragments large forested blocks, which eventually creates a mosaic of smaller unfragmented forest blocks that can no longer support robust wildlife and plant populations. Many types of wildlife depend on large unfragmented lands for survival and successful reproduction, including otters, black bears, bobcat, and even small songbirds such as the Ovenbird.

Adapting a landscape-scale perspective is critical when assessing the impact of habitat fragmentation, as natural resources and processes (e.g., wildlife dispersal and migration) do not observe political boundaries and the pattern and distribution of unfragmented land blocks is rarely observed at the parcel scale. Thus, it is important to consider not only the area immediately adjacent to Spring Hill Farm, but also the surrounding landscape. This approach provides a better perspective for understanding potential species presence and ecological integrity of the local landscape in light of current development patterns.

For the purposes of this project, fragmenting features were defined as 500 feet on either side of existing roadways, including all state and town roads but excluding class VI roads and trails, as well as private roads and driveways. This 500-foot area is where most developments typically occur relative to roadways. Unfragmented blocks of land include a variety of natural habitats such as forests, wetlands, streams, and ponds, as well as some human-modified areas beneficial to some wildlife (e.g., agricultural fields, orchards; figure 9).

Spring Hill Farm spans the center of an unfragmented land block measuring 252 acres in size, which adequately hosts many of the wildlife species observed over the course of this study (Figure 9). However, unfragmented habitat blocks less than 500 acres generally do not contain enough resources to fully support bobcats, river otters, Blue-gray Gnatcatcher, Hermit Thrush, Wood Thrush, Ovenbird, Louisiana Waterthrush, and several other area-sensitive species found at Spring Hill Farm. For these species, the unfragmented habitat block associated with the study area may play a critical role in patchworking together the minimum habitat area required to meet their basic biological needs. The presence of some of these area-sensitive species may represent remnant individuals of more abundant populations that once thrived before roads and development fragmented Chester's natural landscape. Further habitat loss or degradation surrounding Spring Hill Farm would likely limit future use of the property by these species. However, conserving existing wildlife corridors between nearby patches of unfragmented habitat may provide an important lifeline for large carnivores and numerous birds dependent on the habitats at Spring Hill Farm.

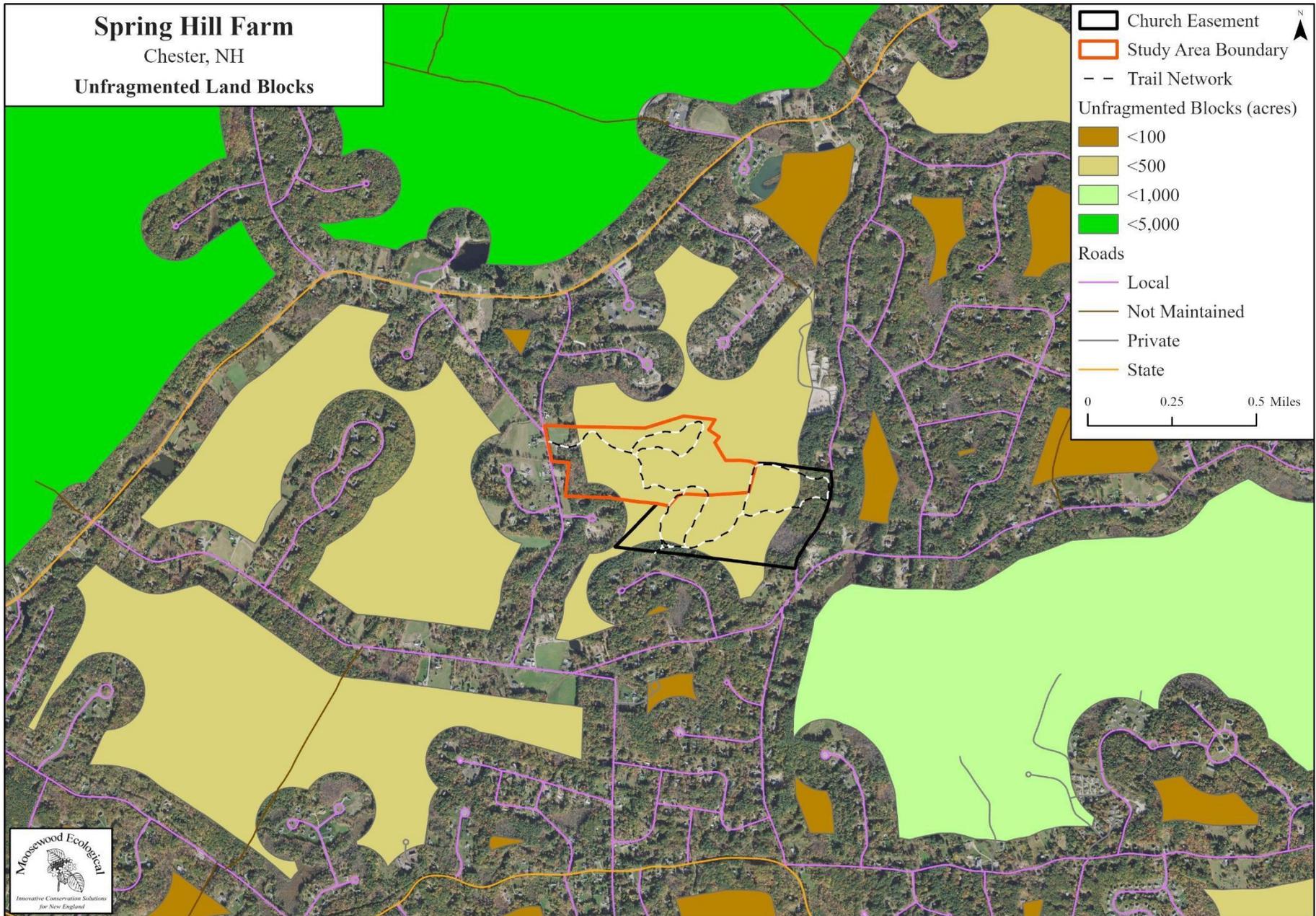


Figure 9. Unfragmented land blocks within the vicinity of Spring Hill Farm.

Wildlife Corridors

Large unfragmented landscapes allow wildlife to migrate to new territories and to move among critical feeding, breeding, nesting, and overwintering habitats. Maintaining connectivity between critical habitats can provide permanent wildlife corridors within the built environment, enabling wildlife populations to survive. Wildlife must be able to travel safely throughout the landscape to meet their biological needs. Many animals depend upon a variety of habitats for their survival and may utilize several natural features for travel, including riparian zones of wetlands, ponds and streams, ridgelines, utility rights-of-way, and forest patches acting as a safe route between two or more habitats. A variety of wildlife can be associated with these corridors, including otter, muskrat, fox, coyote, bobcat, deer, moose, fisher, mink, and bear.

Wildlife corridors are not only significant for mammals but equally important for amphibians, reptiles, and aquatic species. Amphibians and reptiles begin to move from their wintering habitats to their respective breeding and nesting grounds in the spring. This is the time of year that most mortality can be noticed as these species travel across roadways in search of suitable habitats. This negative effect is repeated when the same individuals return to their wintering habitats. Thus, there is a great significance in maintaining habitat connectivity, as well as understanding where these patterns of movement are taking place. This latter point can be an important focus for both community education and awareness about wildlife corridors that cross roadways. This knowledge can provide a means to adjust transportation patterns to decrease potential road mortality and identify sites for road modifications, including bridges and culverts designed to allow wildlife to safely cross within them.

According to state-wide GIS modeling conducted by New Hampshire Fish and Game, Spring Hill Farm sits at the crossroads of multiple primary, secondary, and riparian wildlife corridors that connect patches of priority habitat north, west, and southeast of the property (Figure 10). Wildlife corridors represent top-scoring linkages for all focal species combined and may benefit multiple wildlife species with a variety of dispersal behaviors. Secondary corridors represent top-scoring linkages for each focal species considered individually, whereas riparian corridors represent optimal movement paths for many aquatic-associated species (e.g., otters, reptiles, amphibians). Virtually the entirety of the Spring Hill Farm study area is crossed by at least one type of modeled wildlife corridor, and inventory data backed up these predictions with multiple observations of both wide-ranging mammals (e.g., otters, bobcat) and local species with annual movements (e.g., turtles).

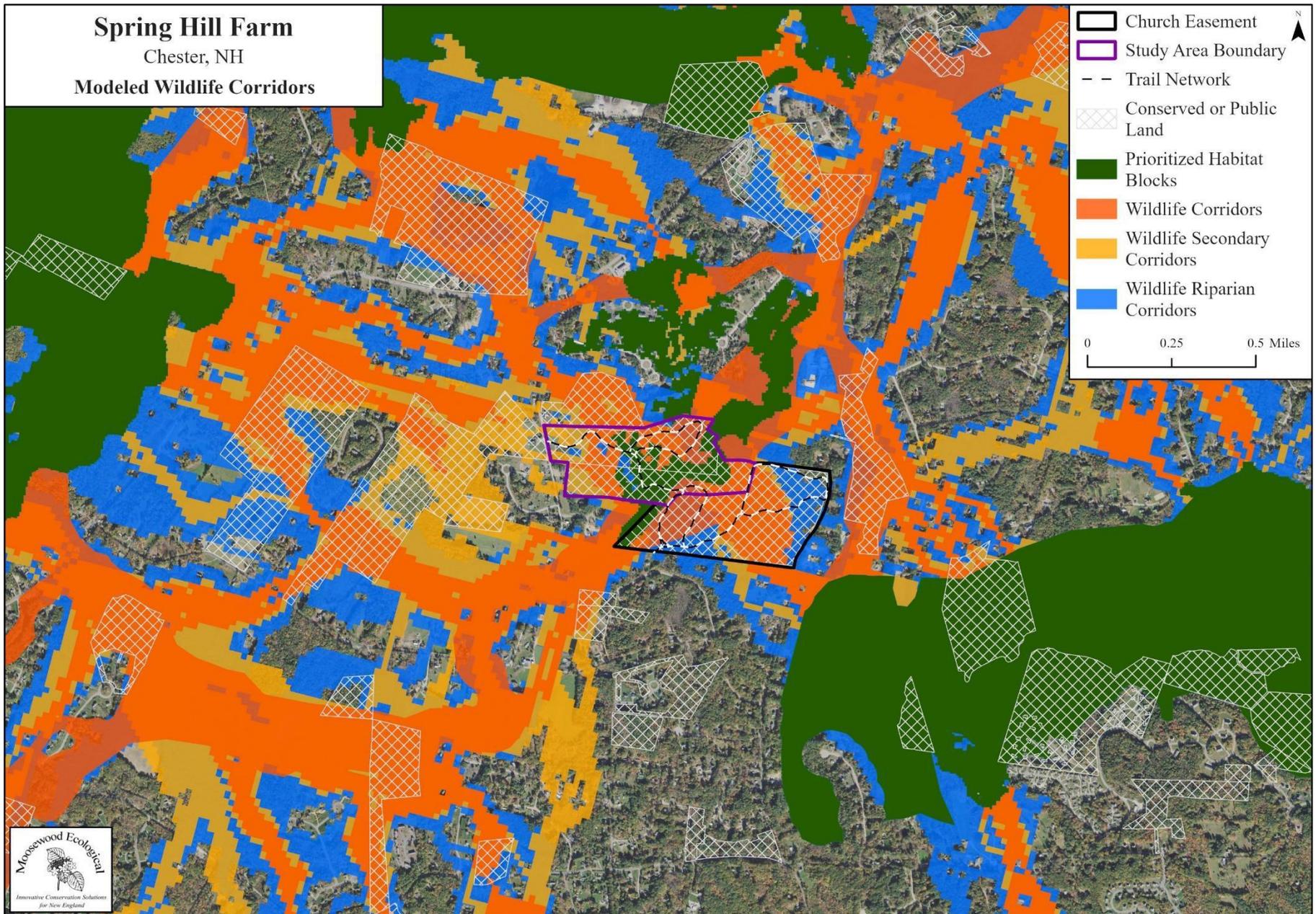


Figure 10. Wildlife corridors and priority habitat blocks modeled by New Hampshire Fish and Game.

Recommendations

Based on our findings, Moosewood Ecological suggests the following actions and considerations:

- Develop an invasive species management plan that seeks to prioritize ecologically sensitive areas for invasive species management actions. Sections of this management plan may include 1) monitoring the spread of glossy buckthorn, multiflora rose, Japanese barberry, purple loosestrife, oriental bittersweet, winged euonymus, and autumn olive, and 2) suitable control options for these species.
- To improve vernal pool habitat within the vernal pool just east of the study area, consider adding several downed tree branches to increase the number of attachment points for egg masses.
- Maintain habitat integrity of confirmed and potential vernal pools by retaining a mostly closed forested canopy while minimizing forest floor disturbance in the upland terrestrial life zone around vernal pools. Should any future forest management occur on the property, consider adopting strong buffers for vernal pools and other ecologically sensitive areas. The tiered approach outlined by Calhoun and deMaynadier (2004) provides a good template to use for vernal pool protection during timber operations. This approach decreases harvest intensity within proximity of the vernal pool. It further emphasizes three distinct important management zones, including the *vernal pool depression*, *vernal pool protection zone*, and *amphibian life zone*. Each zone includes desired management outcomes, rationale, and management guidelines.
- Avoid consistent use of steeply sloped areas for recreation (e.g., unsanctioned trails) as these areas exhibit a high risk of erosion due to the sandy-gravel substrate.
- Consider promoting biodiversity within Spring Hill Farm's forests by maintaining multiple age classes (e.g., keeping the eastern section of the study area in a young-forest state, while forests on the rest of the property mature).
- Restrict the development of new trails, or the re-opening of historically-used trails, to maintain existing ecological integrity.
- Develop a stewardship plan based on the findings noted above to promote biodiversity and ecological integrity of Spring Hill Farm, outlining management activities with a 10-year action plan. This plan should address, among other topics, monitoring significant habitats (i.e., vernal pools, reptile nesting areas, black ash swamp), recreational use and impacts, upland habitat management, protective buffers for sensitive habitats, invasive species management, and community outreach.

Specific to furthering the Conservation Commission's goals of reptile conservation and protection of environmentally sensitive areas at Spring Hill Farm, we propose the following recommendations:

- Direct recreational use away from sensitive areas such as nesting sites and wetlands. Simple signs can be placed to inform the public of these sensitive areas.
- Consider prohibiting the use of wheeled vehicles on the property.

- Minimize soil compaction when using heavy equipment.
- If using pesticides, limit their aerial drift and use only within the specified area of treatment. Examples may include herbicide application for invasives plant management.
- Maintain nesting areas to prevent dense vegetation from colonizing these sites.
- To further achieve goals of reptile and amphibian conservation at Spring Hill Farm, consider using additional guidelines from Mitchell et al. (2006) and Willey and Jones (2014) in the overall stewardship plan.
- This sign (right), provided by NH Fish and Game, shows an example that notifies trail users of sensitive areas. It was designed in such a way that landowners may place a small decal on either side of the Fish and Game logos. This helps to identify the Chester Conservation Commission as the managing authority at Spring Hill Farm and notify the public where they can reach out for more information.

Specific to discussion related to clearing vegetation along the shoreline of the main pond at Spring Hill Farm, we recommend:

- Leaving all native vegetation intact to help protect aquatic wildlife from disturbance and continue providing key habitat resources for birds, dragonflies, amphibians, and fish.
- Monitoring for and removing invasive plant species from the pond edge, which can rapidly degrade the ecological integrity of a site.
- If maintaining a view of the pond is desirable, consider creating, maintaining, and clearly marking a small pollinator garden or meadow that consists of native wildflowers and low-growing shrubs. This added wildlife feature would benefit many dozens of wildlife species while maintaining both a natural vegetative buffer around the pond and an aesthetic view for the public.



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Appendix A: Birds of Spring Hill Farm

Key to conservation status identifiers:

- 1 – Bird Conservation Region 14 assessment (Dettmers, 2006)
- 2 – Partners in Flight assessment (Rosenberg et al., 2016)
- 3 – North American Bird Conservation Initiative assessment (NABCI, 2022)
- 4 – New Hampshire Wildlife Action Plan (NHFG, 2015)
- 5 – New Hampshire Audubon assessment (Hunt, 2020)

Common Name	Scientific Name	Conservation Status	NH Population Trend	Seasons Present at Spring Hill Farm
American Crow	<i>Corvus brachyrhynchos</i>		Increasing	Year-round
American Goldfinch	<i>Spinus tristis</i>		Stable	Year-round
American Redstart	<i>Setophaga ruticilla</i>	1	Decreasing	Spring/Fall migration
American Robin	<i>Turdus migratorius</i>		Stable	Year-round
Baltimore Oriole	<i>Icterus galbula</i>		Increasing	Spring, Summer, Fall
Barn Swallow	<i>Hirundo rustica</i>	1	Strongly decreasing	Spring, Summer, Fall
Barred Owl	<i>Strix varia</i>		Increasing	Year-round
Belted Kingfisher	<i>Megaceryle alcyon</i>		Decreasing	Year-round
Black-and-white Warbler	<i>Mniotilta varia</i>		Strongly decreasing	Spring, Summer, Fall
Black-capped Chickadee	<i>Poecile atricapillus</i>		Increasing	Year-round
Black-throated Green Warbler	<i>Setophaga virens</i>	1	Increasing	Spring, Summer, Fall
Blue Jay	<i>Cyanocitta cristata</i>		Decreasing	Year-round
Blue-gray Gnatcatcher	<i>Poliptila caerulea</i>		Increasing	Spring, Summer, Fall
Blue-headed Vireo	<i>Vireo solitarius</i>		Increasing	Spring, Summer, Fall
Broad-winged Hawk	<i>Buteo platypterus</i>		Increasing	Spring, Summer, Fall
Brown Creeper	<i>Certhia americana</i>	1	Increasing	Year-round
Brown-headed Cowbird	<i>Molothrus ater</i>		Decreasing	Spring, Summer, Fall
Canada Goose	<i>Branta canadensis</i>		Strongly increasing	Year-round
Cedar Waxwing	<i>Bombycilla cedrorum</i>		Stable	Year-round
Chimney Swift	<i>Chaetura pelagica</i>	1, 2, 3, 4, 5	Strongly decreasing	Spring, Summer, Fall
Chipping Sparrow	<i>Spizella passerina</i>		Increasing	Spring, Summer, Fall
Common Grackle	<i>Quiscalus quiscula</i>	2	Strongly decreasing	Spring, Summer, Fall
Common Raven	<i>Corvus corax</i>		Increasing	Year-round
Common Yellowthroat	<i>Geothlypis trichas</i>		Stable	Spring, Summer, Fall

Common Name	Scientific Name	Conservation Status	NH Population Trend	Seasons Present at Spring Hill Farm
Cooper's Hawk	<i>Accipiter cooperii</i>		Strongly increasing	Year-round
Dark-eyed Junco	<i>Junco hyemalis</i>		Strongly decreasing	Fall, Winter, Spring
Downy Woodpecker	<i>Dryobates pubescens</i>		Strongly increasing	Year-round
Eastern Bluebird	<i>Sialia sialis</i>		Strongly increasing	Year-round
Eastern Kingbird	<i>Tyrannus tyrannus</i>		Strongly decreasing	Spring, Summer, Fall
Eastern Phoebe	<i>Sayornis phoebe</i>		Stable	Spring, Summer, Fall
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	4, 5	Strongly decreasing	Spring, Summer, Fall
Eastern Wood-Pewee	<i>Contopus virens</i>	1	Decreasing	Spring, Summer, Fall
European Starling	<i>Sturnus vulgaris</i>		Strongly decreasing	Year-round
Glossy Ibis	<i>Plegadis falcinellus</i>		Not evaluated	Vagrant
Golden-crowned Kinglet	<i>Regulus satrapa</i>		Increasing	Year-round
Gray Catbird	<i>Dumetella carolinensis</i>		Stable	Spring, Summer, Fall
Great Blue Heron	<i>Ardea herodias</i>		Increasing	Spring, Summer, Fall
Great Crested Flycatcher	<i>Myiarchus crinitus</i>		Stable	Spring, Summer, Fall
Green Heron	<i>Butorides virescens</i>		Strongly decreasing	Spring, Summer, Fall
Hairy Woodpecker	<i>Dryobates villosus</i>		Increasing	Year-round
Hermit Thrush	<i>Catharus guttatus</i>		Stable	Spring, Summer, Fall
Hooded Merganser	<i>Lophodytes cucullatus</i>		Increasing	Year Round
House Finch	<i>Haemorhous mexicanus</i>		Stable	Year-round
House Sparrow	<i>Passer domesticus</i>		Strongly decreasing	Year-round
House Wren	<i>Troglodytes aedon</i>		Decreasing	Spring, Summer, Fall
Killdeer	<i>Charadrius vociferus</i>	1	Strongly decreasing	Spring, Summer, Fall
Least Flycatcher	<i>Empidonax minimus</i>		Strongly decreasing	Spring/Fall migration
Louisiana Waterthrush	<i>Parkesia motacilla</i>		Stable	Spring, Summer, Fall
Magnolia Warbler	<i>Setophaga magnolia</i>		Stable	Spring/Fall migration
Mallard	<i>Anas platyrhynchos</i>		Increasing	Year-round
Mourning Dove	<i>Zenaida macroura</i>		Increasing	Year-round
Northern Cardinal	<i>Cardinalis cardinalis</i>		Strongly increasing	Year-round
Northern Flicker	<i>Colaptes auratus</i>	1	Decreasing	Spring, Summer, Fall
Northern Mockingbird	<i>Mimus polyglottos</i>		Decreasing	Year-round

Common Name	Scientific Name	Conservation Status	NH Population Trend	Seasons Present at Spring Hill Farm
Northern Parula	<i>Setophaga americana</i>	1	Strongly increasing	Spring/Fall migration
Osprey	<i>Pandion haliaetus</i>		Increasing	Spring/Fall migration
Ovenbird	<i>Seiurus aurocapilla</i>	1	Stable	Spring, Summer, Fall
Palm Warbler	<i>Setophaga palmarum</i>	1	Strongly increasing	Spring/Fall migration
Pileated Woodpecker	<i>Dryocopus pileatus</i>		Strongly increasing	Year-round
Pine Warbler	<i>Setophaga pinus</i>		Strongly increasing	Spring, Summer, Fall
Prairie Warbler	<i>Setophaga discolor</i>	2, 3, 4, 5	Increasing	Spring/Fall migration
Red Crossbill	<i>Loxia curvirostra</i>		Unknown	Year-Round
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>		Strongly increasing	Year-round
Red-breasted Nuthatch	<i>Sitta canadensis</i>		Increasing	Year-round
Red-eyed Vireo	<i>Vireo olivaceus</i>		Increasing	Spring, Summer, Fall
Red-shouldered Hawk	<i>Buteo lineatus</i>		Increasing	Year-round
Red-tailed Hawk	<i>Buteo jamaicensis</i>		Increasing	Year-round
Red-winged Blackbird	<i>Agelaius phoeniceus</i>		Decreasing	Spring, Summer, Fall
Rock Pigeon (Feral Pigeon)	<i>Columba livia domestica</i>		Stable	Year-round
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	1	Strongly decreasing	Spring, Summer, Fall
Ruby-crowned Kinglet	<i>Corthylio calendula</i>		Decreasing	Spring/Fall migration
Ruby-throated Hummingbird	<i>Archilochus colubris</i>		Increasing	Spring, Summer, Fall
Savannah Sparrow	<i>Passerculus sandwichensis</i>		Decreasing	Spring/Fall migration
Scarlet Tanager	<i>Piranga olivacea</i>	4, 5	Strongly decreasing	Spring, Summer, Fall
Song Sparrow	<i>Melospiza melodia</i>		Decreasing	Year-round
Swamp Sparrow	<i>Melospiza georgiana</i>		Stable	Spring, Summer, Fall
Tree Swallow	<i>Tachycineta bicolor</i>		Decreasing	Spring, Summer, Fall
Tufted Titmouse	<i>Baeolophus bicolor</i>		Strongly increasing	Year-round
Turkey Vulture	<i>Cathartes aura</i>		Strongly increasing	Spring, Summer, Fall
Veery	<i>Catharus fuscescens</i>	1, 4, 5	Decreasing	Spring, Summer, Fall
White-breasted Nuthatch	<i>Sitta carolinensis</i>		Strongly increasing	Year-round
White-throated Sparrow	<i>Zonotrichia albicollis</i>		Strongly decreasing	Fall, Winter, Spring
Wild Turkey	<i>Meleagris gallopavo</i>		Strongly increasing	Year-round
Wood Duck	<i>Aix sponsa</i>	1	Increasing	Spring, Summer, Fall

Common Name	Scientific Name	Conservation Status	NH Population Trend	Seasons Present at Spring Hill Farm
Wood Thrush	<i>Hylocichla mustelina</i>	1, 2, 3, 4, 5	Strongly decreasing	Spring, Summer, Fall
Yellow Warbler	<i>Setophaga petechia</i>		Strongly decreasing	Spring, Summer, Fall
Yellow-rumped Warbler	<i>Setophaga coronata</i>		Stable	Spring/Fall migration

Appendix B: Spring Hill Farm Species List

An interactive species list updated in real-time as new observations are posted to iNaturalist can be viewed at [here](#). Birds are not included in this list (see Appendix A). Combined, appendices A and B list 575 species that are known to occur at Spring Hill Farm.

Scientific Name	Common Name	Class	Order	Family	Genus
<i>Placobdella parasitica</i>	Smooth Turtle Leech	Clitellata	Rhynchobdellida	Glossiphoniidae	Placobdella
<i>Callobius bennetti</i>	Bennett's Laceweaver	Arachnida	Araneae	Amaurobiidae	Callobius
<i>Cyclosa conica</i>	Conical Trashline Orbweaver	Arachnida	Araneae	Araneidae	Cyclosa
<i>Eustala</i>		Arachnida	Araneae	Araneidae	Eustala
<i>Castianeira cingulata</i>	Two-banded Ant-mimic Sac Spider	Arachnida	Araneae	Corinnidae	Castianeira
<i>Dictynidae</i>	Meshweavers	Arachnida	Araneae	Dictynidae	
<i>Pardosa</i>	Thin-legged Wolf Spider sp.	Arachnida	Araneae	Lycosidae	Pardosa
<i>Eris militaris</i>	Bronze Jumping Spider	Arachnida	Araneae	Salticidae	Eris
<i>Evarcha hoyi</i>	Hoy's Jumping Spider	Arachnida	Araneae	Salticidae	Evarcha
<i>Hentzia mitrata</i>	White-jawed Jumping Spider	Arachnida	Araneae	Salticidae	Hentzia
<i>Maevia inclemens</i>	Dimorphic Jumping Spider	Arachnida	Araneae	Salticidae	Maevia
<i>Zygoballus rufipes</i>	Hammer-jawed Jumping Spider	Arachnida	Araneae	Salticidae	Zygoballus
<i>Dermacentor variabilis</i>	American Dog Tick	Arachnida	Ixodida	Ixodidae	Dermacentor
<i>Ixodes scapularis</i>	Eastern Black-legged Tick	Arachnida	Ixodida	Ixodidae	Ixodes
<i>Phalangiinae</i>		Arachnida	Opiliones	Phalangiidae	
<i>Acalitus ferrugineum</i>	Beech Erineum Mite	Arachnida	Sarcoptiformes	Eriophyidae	Acalitus
<i>Aceria campestricola</i>	Elm Leaf Gall Mite	Arachnida	Sarcoptiformes	Eriophyidae	Aceria
<i>Aculops rhois</i>	Poison Ivy Leaf Mite	Arachnida	Sarcoptiformes	Eriophyidae	Aculops
<i>Eriophyes laevis</i>	Alder Leaf Gall Mite	Arachnida	Sarcoptiformes	Eriophyidae	Eriophyes
<i>Vasates quadripedes</i>	Maple Bladdergall Mite	Arachnida	Sarcoptiformes	Eriophyidae	Vasates
<i>Trombidia</i>	Velvet Mites, Chiggers, and Relatives	Arachnida	Trombidiformes		
<i>Eubbranchipus</i>		Branchiopoda	Anostraca	Chirocephalidae	Eubbranchipus
<i>Atalantycha bilineata</i>	Two-lined Leatherwing	Insecta	Coleoptera	Cantharidae	Atalantycha
<i>Podabrus rugosulus</i>	Wrinkled Soldier Beetle	Insecta	Coleoptera	Cantharidae	Podabrus
<i>Cicindela sexguttata</i>	Six-spotted Tiger Beetle	Insecta	Coleoptera	Carabidae	Cicindela
<i>Donaciinae</i>	Aquatic Leaf Beetle sp.	Insecta	Coleoptera	Chrysomelidae	
<i>Harmonia axyridis</i>	Asian Lady Beetle	Insecta	Coleoptera	Coccinellidae	Harmonia
<i>Cyrtopistomus castaneus</i>	Asian Oak Weevil	Insecta	Coleoptera	Curculionidae	Cyrtopistomus
<i>Polydrusus cervinus</i>		Insecta	Coleoptera	Curculionidae	Polydrusus
<i>Polydrusus formosus</i>	Green Immigrant Leaf Weevil	Insecta	Coleoptera	Curculionidae	Polydrusus
<i>Gambrinus griseus</i>		Insecta	Coleoptera	Elateridae	Gambrinus
<i>Hadromorphus inflatus</i>		Insecta	Coleoptera	Elateridae	Hadromorphus
<i>Limoniis aurifer</i>		Insecta	Coleoptera	Elateridae	Limoniis
<i>Limoniis basilaris</i>		Insecta	Coleoptera	Elateridae	Limoniis
<i>Dineutus</i>		Insecta	Coleoptera	Gyrinidae	Dineutus
<i>Ellychnia corrusca</i>	Winter Firefly	Insecta	Coleoptera	Lampyridae	Ellychnia
<i>Quedius canadensis</i>		Insecta	Coleoptera	Staphylinidae	Quedius
<i>Isomira</i>		Insecta	Coleoptera	Tenebrionidae	Isomira

Scientific Name	Common Name	Class	Order	Family	Genus
<i>Agromyza vockerothi</i>		Insecta	Diptera	Agromyzidae	Agromyza
<i>Euhexomyza schineri</i>	Poplar Twiggall Fly	Insecta	Diptera	Agromyzidae	Euhexomyza
<i>Ophiomyia maura</i>		Insecta	Diptera	Agromyzidae	Ophiomyia
<i>Phytomyza albiceps</i> (complex)		Insecta	Diptera	Agromyzidae	Phytomyza
<i>Phytomyza aralivora</i>		Insecta	Diptera	Agromyzidae	Phytomyza
<i>Phytomyza miniscula</i> (complex)		Insecta	Diptera	Agromyzidae	Phytomyza
<i>Chirosia filicis</i>		Insecta	Diptera	Anthomyiidae	Chirosia
<i>Neoitamus</i>		Insecta	Diptera	Asilidae	Neoitamus
<i>Bibio lanigerus</i>		Insecta	Diptera	Bibionidae	Bibio
<i>Villa</i>		Insecta	Diptera	Bombyliidae	Villa
<i>Calliphoridae</i>	Blow Flies	Insecta	Diptera	Calliphoridae	
<i>Acericecis ocellaris</i>	Ocellate Gall Midge	Insecta	Diptera	Cecidomyiidae	Acericecis
<i>Caryomyia</i>	Hickory Gall Midge sp.	Insecta	Diptera	Cecidomyiidae	Caryomyia
<i>Polystepha pilulae</i>	Oak Leaf Gall Midge	Insecta	Diptera	Cecidomyiidae	Polystepha
<i>Chloropinae</i>	Grass Flies	Insecta	Diptera	Chloropidae	
<i>Aedes</i>		Insecta	Diptera	Culicidae	Aedes
<i>Condylostylus patibulatus</i>		Insecta	Diptera	Dolichopodidae	Condylostylus
<i>Lauxaniidae</i>	Lauxaniid Flies	Insecta	Diptera	Lauxaniidae	
<i>Limoniidae</i>	Limoniid Crane Flies	Insecta	Diptera	Limoniidae	
<i>Pollenia</i>	Cluster Flies	Insecta	Diptera	Polleniidae	Pollenia
<i>Chrysopilus proximus</i>		Insecta	Diptera	Rhagionidae	Chrysopilus
<i>Rhagio mystaceus</i>	Common Snipe Fly	Insecta	Diptera	Rhagionidae	Rhagio
<i>Trypetoptera canadensis</i>		Insecta	Diptera	Sciomyzidae	Trypetoptera
<i>Helophilus fasciatus</i>	Narrow-headed Marsh Fly	Insecta	Diptera	Syrphidae	Helophilus
<i>Microdon tristis</i>	Long-horned Ant Fly	Insecta	Diptera	Syrphidae	Microdon
<i>Sphaerophoria</i>	Globetail sp.	Insecta	Diptera	Syrphidae	Sphaerophoria
<i>Toxomerus marginatus</i>	Margined Calligrapher	Insecta	Diptera	Syrphidae	Toxomerus
<i>Epalpus signifer</i>	Early Tachinid Fly	Insecta	Diptera	Tachinidae	Epalpus
<i>Ephemera simulans</i>	Brown Drake	Insecta	Ephemeroptera	Ephemeridae	Ephemera
<i>Leptophlebia cupida</i>	Early Brown Spinner	Insecta	Ephemeroptera	Leptophlebiidae	Leptophlebia
<i>Adelges tsugae</i>	Hemlock Woolly Adelgid	Insecta	Hemiptera	Adelgidae	Adelges
<i>Pineus strobi</i>	Pine Bark Adelgid	Insecta	Hemiptera	Adelgidae	Pineus
<i>Euceraphis</i>	Birch Aphid sp.	Insecta	Hemiptera	Aphididae	Euceraphis
<i>Hormaphis hamamelidis</i>	Witch-hazel Cone Gall Aphid	Insecta	Hemiptera	Aphididae	Hormaphis
<i>Prociphilus tessellatus</i>	Woolly Alder Aphid	Insecta	Hemiptera	Aphididae	Prociphilus
<i>Lepyronia coleoptrata</i>		Insecta	Hemiptera	Aphrophoridae	Lepyronia
<i>Philaenus spumarius</i>	Meadow Spittlebug	Insecta	Hemiptera	Aphrophoridae	Philaenus
<i>Oncopsis cinctifrons</i>		Insecta	Hemiptera	Cicadellidae	Oncopsis
<i>Penthimia americana</i>		Insecta	Hemiptera	Cicadellidae	Penthimia
<i>Acanthocephala terminalis</i>		Insecta	Hemiptera	Coreidae	Acanthocephala
<i>Anasa tristis</i>	Squash Bug	Insecta	Hemiptera	Coreidae	Anasa
<i>Fiorinia externa</i>	Elongate Hemlock Scale	Insecta	Hemiptera	Diaspididae	Fiorinia
<i>Aquarius conformis</i>		Insecta	Hemiptera	Gerridae	Aquarius

Scientific Name	Common Name	Class	Order	Family	Genus
<i>Gerris</i>		Insecta	Hemiptera	Gerridae	Gerris
<i>Limnopus dissortis</i>		Insecta	Hemiptera	Gerridae	Limnopus
<i>Leptopterna dolabrata</i>	Meadow Plant Bug	Insecta	Hemiptera	Miridae	Leptopterna
<i>Chinavia hilaris</i>	Green Stink Bug	Insecta	Hemiptera	Pentatomidae	Chinavia
<i>Psylla</i>		Insecta	Hemiptera	Psyllidae	Psylla
<i>Zelus luridus</i>	Pale Green Assassin Bug	Insecta	Hemiptera	Reduviidae	Zelus
<i>Andrena</i>	Mining Bee sp.	Insecta	Hymenoptera	Andrenidae	Andrena
<i>Bombus bimaculatus</i>	Two-spotted Bumble Bee	Insecta	Hymenoptera	Apidae	Bombus
<i>Bombus impatiens</i>	Common Eastern Bumble Bee	Insecta	Hymenoptera	Apidae	Bombus
<i>Nomada</i>	Nomad Bee sp.	Insecta	Hymenoptera	Apidae	Nomada
<i>Xylocopa virginica</i>	Eastern Carpenter Bee	Insecta	Hymenoptera	Apidae	Xylocopa
<i>Callirhytis</i>		Insecta	Hymenoptera	Cynipidae	Callirhytis
<i>Disholcaspis quercusglobulus</i>	Round Bullet Gall Wasp	Insecta	Hymenoptera	Cynipidae	Disholcaspis
<i>Neuroterus tantulus</i>		Insecta	Hymenoptera	Cynipidae	Neuroterus
<i>Zapatella quercusphellos</i>		Insecta	Hymenoptera	Cynipidae	Zapatella
<i>Camponotus pennsylvanicus</i>	Eastern Black Carpenter Ant	Insecta	Hymenoptera	Formicidae	Camponotus
<i>Formica exsectoides</i>	Allegheny Mound Ant	Insecta	Hymenoptera	Formicidae	Formica
<i>Formica integra</i>	Integra-group Field and Mound Ants	Insecta	Hymenoptera	Formicidae	Formica
<i>Formica neogagates</i>	Neogagates-group Field Ants	Insecta	Hymenoptera	Formicidae	Formica
<i>Formica pallidefulva</i>	Pallidefulva-group Field Ants	Insecta	Hymenoptera	Formicidae	Formica
<i>Augochlorella</i>		Insecta	Hymenoptera	Halictidae	Augochlorella
<i>Acordulecera</i>		Insecta	Hymenoptera	Pergidae	Acordulecera
<i>Auplopus architectus</i>		Insecta	Hymenoptera	Pompilidae	Auplopus
<i>Priocnemis minorata</i>		Insecta	Hymenoptera	Pompilidae	Priocnemis
<i>Metallus rohweri</i>		Insecta	Hymenoptera	Tenthredinidae	Metallus
<i>Tiphia</i>		Insecta	Hymenoptera	Tiphiidae	Tiphia
<i>Polistes fuscatus</i>	Northern Paper Wasp	Insecta	Hymenoptera	Vespidae	Polistes
<i>Coleophora</i>	Casebearer sp.	Insecta	Lepidoptera	Coleophoridae	Coleophora
<i>Anageshna primordialis</i>	Yellow-spotted Webworm Moth	Insecta	Lepidoptera	Crambidae	Anageshna
<i>Anania funebris</i>	White-spotted Sable	Insecta	Lepidoptera	Crambidae	Anania
<i>Crambus laqueatellus</i>	Eastern Grass-veneer	Insecta	Lepidoptera	Crambidae	Crambus
<i>Crambus praefectellus</i>	Common Grass-veneer	Insecta	Lepidoptera	Crambidae	Crambus
<i>Desmia</i>		Insecta	Lepidoptera	Crambidae	Desmia
<i>Saucrobotys futilalis</i>	Dogbane Saucrobotys Moth	Insecta	Lepidoptera	Crambidae	Saucrobotys
<i>Drasteria grandirena</i>	Figure-seven Moth	Insecta	Lepidoptera	Erebidae	Drasteria
<i>Hypenodes fractilinea</i>	Broken-lined Hypenodes Moth	Insecta	Lepidoptera	Erebidae	Hypenodes
<i>Dichomeris nonstrigella</i>	Little Devil Moth	Insecta	Lepidoptera	Gelechiidae	Dichomeris
<i>Dichomeris punctidiscellus</i>	Spotted Dichomeris Moth	Insecta	Lepidoptera	Gelechiidae	Dichomeris
<i>Eufidonia notataria</i>	Powder Moth	Insecta	Lepidoptera	Geometridae	Eufidonia
<i>Macaria brunneata</i>	Rannoch Looper Moth	Insecta	Lepidoptera	Geometridae	Macaria
<i>Metarranthis obfirmaria</i>	Yellow-washed Metarranthis Moth	Insecta	Lepidoptera	Geometridae	Metarranthis
<i>Protoarmia porcelaria</i>	Porcelain Gray	Insecta	Lepidoptera	Geometridae	Protoarmia
<i>Cameraria caryaefoliella</i>	Pecan Leafminer Moth	Insecta	Lepidoptera	Gracillariidae	Cameraria

Scientific Name	Common Name	Class	Order	Family	Genus
<i>Cameraria guttiferella</i>	Poison Ivy Leaf-miner Moth	Insecta	Lepidoptera	Gracillariidae	Cameraria
<i>Cameraria tubiferella</i>		Insecta	Lepidoptera	Gracillariidae	Cameraria
<i>Phyllocnistis populiella</i>	Aspen Serpentine Leafminer Moth	Insecta	Lepidoptera	Gracillariidae	Phyllocnistis
<i>Phyllocnistis vitifoliella</i>		Insecta	Lepidoptera	Gracillariidae	Phyllocnistis
<i>Phyllonorycter</i>		Insecta	Lepidoptera	Gracillariidae	Phyllonorycter
<i>Heliozela aesella</i>		Insecta	Lepidoptera	Heliozelidae	Heliozela
<i>Atrytonopsis hianna</i>	Dusted Skipper	Insecta	Lepidoptera	Hesperiidae	Atrytonopsis
<i>Polites mystic</i>	Long Dash	Insecta	Lepidoptera	Hesperiidae	Polites
<i>Callophrys niphon</i>	Eastern Pine Elfin	Insecta	Lepidoptera	Lycaenidae	Callophrys
<i>Celastrina</i>	Holarctic Azure sp.	Insecta	Lepidoptera	Lycaenidae	Celastrina
<i>Lycaena hypophlaeas</i>	American Copper	Insecta	Lepidoptera	Lycaenidae	Lycaena
<i>Mompha</i>		Insecta	Lepidoptera	Momphidae	Mompha
<i>Ectoedemia populella</i>	Aspen Petiole Gall Moth	Insecta	Lepidoptera	Nepticulidae	Ectoedemia
<i>Ectodemia rubifoliella</i>		Insecta	Lepidoptera	Nepticulidae	Ectoedemia
<i>Stigmella prunifoliella</i>		Insecta	Lepidoptera	Nepticulidae	Stigmella
<i>Stigmella quercipulchella</i>		Insecta	Lepidoptera	Nepticulidae	Stigmella
<i>Stigmella rhoifoliella</i>		Insecta	Lepidoptera	Nepticulidae	Stigmella
<i>Coenonympha californica</i>	Common Ringlet	Insecta	Lepidoptera	Nymphalidae	Coenonympha
<i>Limenitis archippus</i>	Viceroy	Insecta	Lepidoptera	Nymphalidae	Limenitis
<i>Limenitis arthemis</i>	Red-spotted Admiral	Insecta	Lepidoptera	Nymphalidae	Limenitis
<i>Limenitis arthemis astyanax</i>	Red-spotted Purple	Insecta	Lepidoptera	Nymphalidae	Limenitis
<i>Megisto cymela</i>	Little Wood Satyr	Insecta	Lepidoptera	Nymphalidae	Megisto
<i>Nymphalis antiopa</i>	Mourning Cloak	Insecta	Lepidoptera	Nymphalidae	Nymphalis
<i>Phyciodes</i>	Crescents	Insecta	Lepidoptera	Nymphalidae	Phyciodes
<i>Vanessa virginiensis</i>	American Lady	Insecta	Lepidoptera	Nymphalidae	Vanessa
<i>Mathildana newmanella</i>	Newman's Mathildana Moth	Insecta	Lepidoptera	Oecophoridae	Mathildana
<i>Psyche casta</i>	Common Bagworm Moth	Insecta	Lepidoptera	Psychidae	Psyche
<i>Coptotriche aenea</i>	Blackberry Leafminer Moth	Insecta	Lepidoptera	Tischeriidae	Coptotriche
<i>Tischeria quercitella</i>	Oak Blotch Miner Moth	Insecta	Lepidoptera	Tischeriidae	Tischeria
<i>Argyrotaenia velutinana</i>	Red-banded Leafroller Moth	Insecta	Lepidoptera	Tortricidae	Argyrotaenia
<i>Olethreutes appendiceum</i>	Serviceberry Leafroller	Insecta	Lepidoptera	Tortricidae	Olethreutes
<i>Olethreutes hamameliana</i>	Witch-hazel Olethreutes	Insecta	Lepidoptera	Tortricidae	Olethreutes
<i>Pelochrista kimballi</i>		Insecta	Lepidoptera	Tortricidae	Pelochrista
<i>Pseudosciaphila duplex</i>	Poplar Leafroller Moth	Insecta	Lepidoptera	Tortricidae	Pseudosciaphila
<i>Chrysopa oculata</i>		Insecta	Neuroptera	Chrysopidae	Chrysopa
<i>Brachynemurus</i>		Insecta	Neuroptera	Myrmeleontidae	Brachynemurus
<i>Anax junius</i>	Common Green Darner	Insecta	Odonata	Aeshnidae	Anax
<i>Calopteryx maculata</i>	Ebony Jewelwing	Insecta	Odonata	Calopterygidae	Calopteryx
<i>Argia fumipennis</i>	Variable Dancer	Insecta	Odonata	Coenagrionidae	Argia
<i>Chromagrion conditum</i>	Aurora Damsel	Insecta	Odonata	Coenagrionidae	Chromagrion
<i>Enallagma divagans</i>	Turquoise Bluet	Insecta	Odonata	Coenagrionidae	Enallagma
<i>Ischnura posita</i>	Fragile Forktail	Insecta	Odonata	Coenagrionidae	Ischnura
<i>Ischnura verticalis</i>	Eastern Forktail	Insecta	Odonata	Coenagrionidae	Ischnura

Scientific Name	Common Name	Class	Order	Family	Genus
<i>Cordulegaster diastatops</i>	Delta-spotted Spiketail	Insecta	Odonata	Cordulegastridae	Cordulegaster
<i>Epiptera</i>	Baskettail sp.	Insecta	Odonata	Corduliidae	Epiptera
<i>Helocordulia uhleri</i>	Uhler's Sundragon	Insecta	Odonata	Corduliidae	Helocordulia
<i>Phanogomphus exilis</i>	Lancet Clubtail	Insecta	Odonata	Gomphidae	Phanogomphus
<i>Celithemis elisa</i>	Calico Pennant	Insecta	Odonata	Libellulidae	Celithemis
<i>Erythemis simplicicollis</i>	Eastern Pondhawk	Insecta	Odonata	Libellulidae	Erythemis
<i>Ladona julia</i>	Chalk-fronted Corporal	Insecta	Odonata	Libellulidae	Ladona
<i>Leucorrhinia intacta</i>	Dot-tailed Whiteface	Insecta	Odonata	Libellulidae	Leucorrhinia
<i>Libellula cyanea</i>	Spangled Skimmer	Insecta	Odonata	Libellulidae	Libellula
<i>Libellula incesta</i>	Slaty Skimmer	Insecta	Odonata	Libellulidae	Libellula
<i>Libellula luctuosa</i>	Widow Skimmer	Insecta	Odonata	Libellulidae	Libellula
<i>Pachydiplax longipennis</i>	Blue Dasher	Insecta	Odonata	Libellulidae	Pachydiplax
<i>Plathemis lydia</i>	Common Whitetail	Insecta	Odonata	Libellulidae	Plathemis
<i>Didymops transversa</i>	Stream Cruiser	Insecta	Odonata	Macromiidae	Didymops
<i>Arphia sulphurea</i>	Sulphur-winged Grasshopper	Insecta	Orthoptera	Acrididae	Arphia
<i>Chloealtis conspersa</i>	Sprinkled Locust	Insecta	Orthoptera	Acrididae	Chloealtis
<i>Melanoplus</i>	North American Spur-throated Grasshopper sp.	Insecta	Orthoptera	Acrididae	Melanoplus
<i>Psinidia fenestralis</i>	Longhorn Band-wing Grasshopper	Insecta	Orthoptera	Acrididae	Psinidia
<i>Scudderia</i>	Scudder's Bush Katydid sp.	Insecta	Orthoptera	Tettigoniidae	Scudderia
<i>Ptilostomis ocellifera</i>		Insecta	Trichoptera	Phryganeidae	Ptilostomis
<i>Anaxyrus americanus</i>	American Toad	Amphibia	Anura	Bufo	Anaxyrus
<i>Hyla versicolor</i>	Gray Tree Frog	Amphibia	Anura	Hylidae	Hyla
<i>Pseudacris crucifer</i>	Spring Peeper	Amphibia	Anura	Hylidae	Pseudacris
<i>Lithobates catesbeianus</i>	American Bullfrog	Amphibia	Anura	Ranidae	Lithobates
<i>Lithobates clamitans</i>	Green Frog	Amphibia	Anura	Ranidae	Lithobates
<i>Lithobates palustris</i>	Pickerel Frog	Amphibia	Anura	Ranidae	Lithobates
<i>Lithobates sylvaticus</i>	Wood Frog	Amphibia	Anura	Ranidae	Lithobates
<i>Ambystoma maculatum</i>	Spotted Salamander	Amphibia	Caudata	Ambystomatidae	Ambystoma
<i>Odocoileus virginianus</i>	White-tailed Deer	Mammalia	Artiodactyla	Cervidae	Odocoileus
<i>Canis latrans</i>	Coyote	Mammalia	Carnivora	Canidae	Canis
<i>Lynx rufus</i>	Bobcat	Mammalia	Carnivora	Felidae	Lynx
<i>Mephitis mephitis</i>	Striped Skunk	Mammalia	Carnivora	Mephitidae	Mephitis
<i>Lontra canadensis</i>	North American River Otter	Mammalia	Carnivora	Mustelidae	Lontra
<i>Mustelinae</i>	Weasels	Mammalia	Carnivora	Mustelidae	
<i>Procyon lotor</i>	Common Raccoon	Mammalia	Carnivora	Procyonidae	Procyon
<i>Didelphis virginiana</i>	Virginia Opossum	Mammalia	Didelphimorphia	Didelphidae	Didelphis
<i>Blarina brevicauda</i>	Northern Short-tailed Shrew	Mammalia	Eulipotyphla	Soricidae	Blarina
<i>Sylvilagus floridanus</i>	Eastern Cottontail	Mammalia	Lagomorpha	Leporidae	Sylvilagus
<i>Castor canadensis</i>	American Beaver	Mammalia	Rodentia	Castoridae	Castor
<i>Peromyscus</i>	North American Deer Mice	Mammalia	Rodentia	Cricetidae	Peromyscus
<i>Erethizon dorsatum</i>	North American Porcupine	Mammalia	Rodentia	Erethizontidae	Erethizon
<i>Marmota monax</i>	Groundhog	Mammalia	Rodentia	Sciuridae	Marmota

Scientific Name	Common Name	Class	Order	Family	Genus
<i>Sciurus carolinensis</i>	Eastern Gray Squirrel	Mammalia	Rodentia	Sciuridae	Sciurus
<i>Tamias striatus</i>	Eastern Chipmunk	Mammalia	Rodentia	Sciuridae	Tamias
<i>Tamiasciurus hudsonicus</i>	American Red Squirrel	Mammalia	Rodentia	Sciuridae	Tamiasciurus
<i>Zapus hudsonius</i>	Meadow Jumping Mouse	Mammalia	Rodentia	Zapodidae	Zapus
<i>Lampropeltis triangulum</i>	Eastern Milksnake	Reptilia	Squamata	Colubridae	Lampropeltis
<i>Nerodia sipedon sipedon</i>	Northern Watersnake	Reptilia	Squamata	Colubridae	Nerodia
<i>Thamnophis saurita saurita</i>	Eastern Ribbon Snake	Reptilia	Squamata	Colubridae	Thamnophis
<i>Chelydra serpentina</i>	Common Snapping Turtle	Reptilia	Testudines	Chelydridae	Chelydra
<i>Chrysemys picta</i>	Painted Turtle	Reptilia	Testudines	Emydidae	Chrysemys
<i>Unionida</i>	Freshwater Mussels	Bivalvia	Unionida		
<i>Succineinae</i>		Gastropoda	Stylommatophora	Succineidae	
<i>Litylenchus crenatae</i>	Beech Leaf Disease	Chromadorea	Rhabditida	Anguinidae	Litylenchus
<i>Viridothelium virens</i>	Speckled Blister Lichen	Dothideomycetes	Trypetheliales	Trypetheliaceae	Viridothelium
<i>Hesperomyces harmoniae</i>		Laboulbeniomycetes	Laboulbeniales	Laboulbeniaceae	Hesperomyces
<i>Cladonia arbuscula</i>	Reindeer Lichen	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
<i>Cladonia cristatella</i>	British Soldier Lichen	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
<i>Cladonia rangiferina</i>	Gray Reindeer Lichen	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
<i>Cladonia rei</i>	Wand Lichen	Lecanoromycetes	Lecanorales	Cladoniaceae	Cladonia
<i>Lecanora</i>	Rim Lichen sp.	Lecanoromycetes	Lecanorales	Lecanoraceae	Lecanora
<i>Cetraria arenaria</i>	Sand-loving Iceland Lichen	Lecanoromycetes	Lecanorales	Parmeliaceae	Cetraria
<i>Hypogymnia physodes</i>	Hooded Tube Lichen	Lecanoromycetes	Lecanorales	Parmeliaceae	Hypogymnia
<i>Parmelia</i>	Shield lichen sp.	Lecanoromycetes	Lecanorales	Parmeliaceae	Parmelia
<i>Platismatia tuckermanii</i>	Crumpled Rag Lichen	Lecanoromycetes	Lecanorales	Parmeliaceae	Platismatia
<i>Usnocetraria oakesiana</i>	Yellow Ribbon Lichen	Lecanoromycetes	Lecanorales	Parmeliaceae	Usnocetraria
<i>Dibaeis baeomyces</i>	Pink Earth Lichen	Lecanoromycetes	Pertusariales	Icmadophilaceae	Dibaeis
<i>Rhytisma ilicincola</i>		Leotiomycetes	Rhytismatales	Rhytismataceae	Rhytisma
<i>Neonectria faginata</i>	Beech Bark Canker Fungus	Sordariomycetes	Hypocreales	Nectriaceae	Neonectria
<i>Taphrina robinsoniana</i>	Eastern American Alder Tongue Gall Fungus	Taphrinomycetes	Taphrinales	Taphrinaceae	Taphrina
<i>Amanita</i>	amanita mushrooms	Agaricomycetes	Agaricales	Amanitaceae	Amanita
<i>Laccaria</i>	Deceiver sp.	Agaricomycetes	Agaricales	Hydnangiaceae	Laccaria
<i>Exidia</i>		Agaricomycetes	Auriculariales	Auriculariaceae	Exidia
<i>Astraeus</i>	Barometer Earthstar sp.	Agaricomycetes	Boletales	Astraeaceae	Astraeus
<i>Scleroderma</i>	Earthball sp.	Agaricomycetes	Boletales	Sclerodermataceae	Scleroderma
<i>Fomitopsis betulina</i>	Birch Polypore	Agaricomycetes	Polyporales	Fomitopsidaceae	Fomitopsis
<i>Neofavolus</i>		Agaricomycetes	Polyporales	Polyporaceae	Neofavolus
<i>Trametes versicolor</i>	Turkey-tail	Agaricomycetes	Polyporales	Polyporaceae	Trametes
<i>Stereum complicatum</i>	Crowded Parchment	Agaricomycetes	Russulales	Stereaceae	Stereum
<i>Xylobolus frustulatus</i>	Ceramic Parchment	Agaricomycetes	Russulales	Stereaceae	Xylobolus
<i>Exobasidium vaccinii</i>	Lingonberry Gall	Exobasidiomycetes	Exobasidiales	Exobasidiaceae	Exobasidium
<i>Entomophthoraceae</i>		Entomophthoromycetes	Entomophthorales	Entomophthoraceae	
<i>Aulacomnium palustre</i>	Ribbed bog moss	Bryopsida	Aulacomniales	Aulacomniaceae	Aulacomnium
<i>Plagiomnium</i>	Thyme and allied mosses sp.	Bryopsida	Bryales	Mniaceae	Plagiomnium

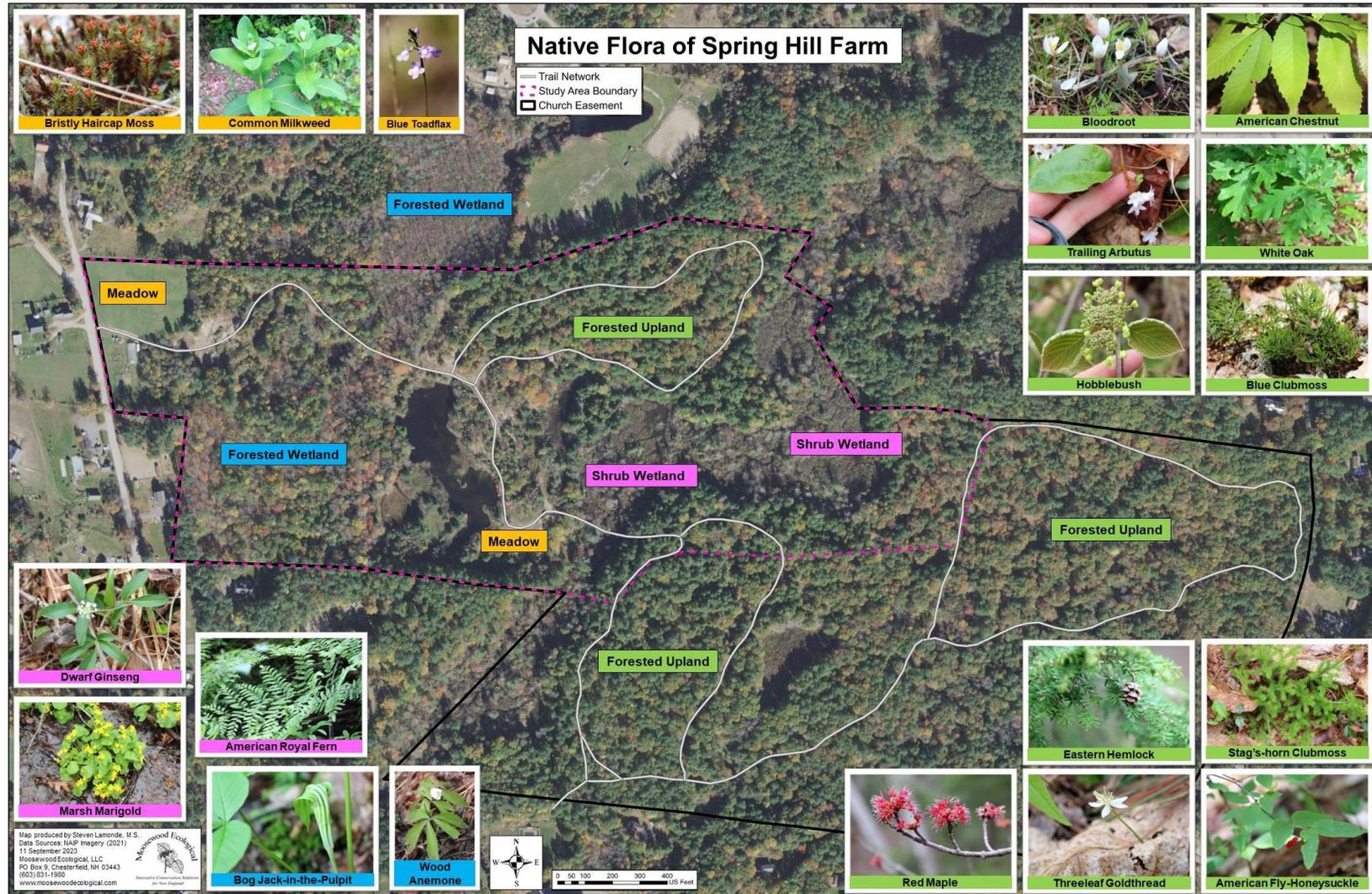
Scientific Name	Common Name	Class	Order	Family	Genus
<i>Leucobryum</i>	Leucobryum moss sp.	Bryopsida	Dicranales	Leucobryaceae	Leucobryum
<i>Pleurozium schreberi</i>	Red-stemmed feather moss	Bryopsida	Hypnales	Hylocomiaceae	Pleurozium
<i>Ulota crispa</i>	Crisped pincushion	Bryopsida	Orthotrichales	Orthotrichaceae	Ulota
<i>Atrichum</i>	Smoothcap moss sp.	Polytrichopsida	Polytrichales	Polytrichaceae	Atrichum
<i>Polytrichum commune</i>	Common haircap moss	Polytrichopsida	Polytrichales	Polytrichaceae	Polytrichum
<i>Polytrichum piliferum</i>	Bristly haircap moss	Polytrichopsida	Polytrichales	Polytrichaceae	Polytrichum
<i>Sphagnum</i>	Sphagnum moss sp.	Sphagnopsida	Sphagnales	Sphagnaceae	Sphagnum
<i>Bazzania trilobata</i>	Greater whipwort	Jungermanniopsida	Jungermanniales	Lepidoziaceae	Bazzania
<i>Pellia epiphylla</i>	Common pellia	Jungermanniopsida	Pelliales	Pelliaceae	Pellia
<i>Frullania eboracensis</i>	New York scalewort	Jungermanniopsida	Porellales	Frullaniaceae	Frullania
<i>Arisaema stewardsonii</i>	Bog Jack-in-the-pulpit	Liliopsida	Alismatales	Araceae	Arisaema
<i>Maianthemum canadense</i>	Canada mayflower	Liliopsida	Asparagales	Asparagaceae	Maianthemum
<i>Maianthemum racemosum</i>	Solomon's plume	Liliopsida	Asparagales	Asparagaceae	Maianthemum
<i>Polygonatum pubescens</i>	Hairy solomon's-seal	Liliopsida	Asparagales	Asparagaceae	Polygonatum
<i>Iris pseudacorus</i>	Yellow iris	Liliopsida	Asparagales	Iridaceae	Iris
<i>Cypripedium acaule</i>	Pink lady's slipper	Liliopsida	Asparagales	Orchidaceae	Cypripedium
<i>Pontederia cordata</i>	Pickernelweed	Liliopsida	Commelinales	Pontederiaceae	Pontederia
<i>Medeola virginiana</i>	Cucumber root	Liliopsida	Liliales	Liliaceae	Medeola
<i>Veratrum viride</i>	Green false hellebore	Liliopsida	Liliales	Melanthiaceae	Veratrum
<i>Carex intumescens</i>	Bladder sedge	Liliopsida	Poales	Cyperaceae	Carex
<i>Carex pensylvanica</i>	Pennsylvania sedge	Liliopsida	Poales	Cyperaceae	Carex
<i>Carex stricta</i>	Tussock sedge	Liliopsida	Poales	Cyperaceae	Carex
<i>Cyperus esculentus</i>	Yellow nutsedge	Liliopsida	Poales	Cyperaceae	Cyperus
<i>Schizachyrium scoparium</i>	Little bluestem	Liliopsida	Poales	Poaceae	Schizachyrium
<i>Setaria pumila</i>	Yellow foxtail	Liliopsida	Poales	Poaceae	Setaria
<i>Dendrolycopodium obscurum</i>	Flat-branched tree-clubmoss	Lycopodiopsida	Lycopodiales	Lycopodiaceae	Dendrolycopodium
<i>Diphasiastrum digitatum</i>	Fan clubmoss	Lycopodiopsida	Lycopodiales	Lycopodiaceae	Diphasiastrum
<i>Diphasiastrum tristachyum</i>	Blue clubmoss	Lycopodiopsida	Lycopodiales	Lycopodiaceae	Diphasiastrum
<i>Lycopodium clavatum</i>	Stag's-horn clubmoss	Lycopodiopsida	Lycopodiales	Lycopodiaceae	Lycopodium
<i>Aralia nudicaulis</i>	Wild sarsaparilla	Magnoliopsida	Apiales	Araliaceae	Aralia
<i>Panax trifolius</i>	Dwarf ginseng	Magnoliopsida	Apiales	Araliaceae	Panax
<i>Ilex verticillata</i>	Winterberry holly	Magnoliopsida	Aquifoliales	Aquifoliaceae	Ilex
<i>Achillea millefolium</i>	Common yarrow	Magnoliopsida	Asterales	Asteraceae	Achillea
<i>Erechtites hieraciifolius</i>	American burnweed	Magnoliopsida	Asterales	Asteraceae	Erechtites
<i>Erigeron canadensis</i>	Horseweed	Magnoliopsida	Asterales	Asteraceae	Erigeron
<i>Eupatorium perfoliatum</i>	Common boneset	Magnoliopsida	Asterales	Asteraceae	Eupatorium
<i>Eurybia divaricata</i>	White wood aster	Magnoliopsida	Asterales	Asteraceae	Eurybia
<i>Ionactis linariifolia</i>	Flax-leaved aster	Magnoliopsida	Asterales	Asteraceae	Ionactis
<i>Leucanthemum vulgare</i>	Oxeye daisy	Magnoliopsida	Asterales	Asteraceae	Leucanthemum
<i>Pilosella</i>	Mouse ear hawkweed sp.	Magnoliopsida	Asterales	Asteraceae	Pilosella
<i>Pseudognaphalium obtusifolium</i>	Sweet everlasting	Magnoliopsida	Asterales	Asteraceae	Pseudognaphalium
<i>Solidago</i>	Goldenrod spp.	Magnoliopsida	Asterales	Asteraceae	Solidago

Scientific Name	Common Name	Class	Order	Family	Genus
<i>Taraxacum</i>	Dandelion sp.	Magnoliopsida	Asterales	Asteraceae	Taraxacum
<i>Myosotis</i>	Forget-me-not sp.	Magnoliopsida	Boraginales	Boraginaceae	Myosotis
<i>Barbarea</i>	Wintercress sp.	Magnoliopsida	Brassicales	Brassicaceae	Barbarea
<i>Berteroa incana</i>	Hoary alyssum	Magnoliopsida	Brassicales	Brassicaceae	Berteroa
<i>Cardamine pensylvanica</i>	Pennsylvania bittercress	Magnoliopsida	Brassicales	Brassicaceae	Cardamine
<i>Turritis glabra</i>	Tower mustard	Magnoliopsida	Brassicales	Brassicaceae	Turritis
<i>Dianthus deltoides</i>	Maiden pink	Magnoliopsida	Caryophyllales	Caryophyllaceae	Dianthus
<i>Psammophiliella muralis</i>	Low baby's-breath	Magnoliopsida	Caryophyllales	Caryophyllaceae	Psammophiliella
<i>Silene</i>	Catchfly sp.	Magnoliopsida	Caryophyllales	Caryophyllaceae	Silene
<i>Stellaria</i>	Chickweed sp.	Magnoliopsida	Caryophyllales	Caryophyllaceae	Stellaria
<i>Phytolacca americana</i>	American pokeweed	Magnoliopsida	Caryophyllales	Phytolaccaceae	Phytolacca
<i>Rumex acetosella</i>	Sheep's sorrel	Magnoliopsida	Caryophyllales	Polygonaceae	Rumex
<i>Celastrus orbiculatus</i>	Oriental bittersweet	Magnoliopsida	Celastrales	Celastraceae	Celastrus
<i>Euonymus alatus</i>	Winged euonymus	Magnoliopsida	Celastrales	Celastraceae	Euonymus
<i>Diervilla lonicera</i>	Northern bush honeysuckle	Magnoliopsida	Dipsacales	Caprifoliaceae	Diervilla
<i>Lonicera canadensis</i>	American fly-honeysuckle	Magnoliopsida	Dipsacales	Caprifoliaceae	Lonicera
<i>Sambucus</i>	Elder sp.	Magnoliopsida	Dipsacales	Viburnaceae	Sambucus
<i>Viburnum acerifolium</i>	Mapleleaf viburnum	Magnoliopsida	Dipsacales	Viburnaceae	Viburnum
<i>Viburnum dentatum</i>	Southern arrowwood	Magnoliopsida	Dipsacales	Viburnaceae	Viburnum
<i>Viburnum lantanoides</i>	Hobblebush	Magnoliopsida	Dipsacales	Viburnaceae	Viburnum
<i>Clethra alnifolia</i>	Sweet pepperbush	Magnoliopsida	Ericales	Clethraceae	Clethra
<i>Epigaea repens</i>	Trailing arbutus	Magnoliopsida	Ericales	Ericaceae	Epigaea
<i>Gaultheria procumbens</i>	Eastern teaberry	Magnoliopsida	Ericales	Ericaceae	Gaultheria
<i>Kalmia angustifolia</i>	Sheep laurel	Magnoliopsida	Ericales	Ericaceae	Kalmia
<i>Lyonia ligustrina</i>	He-huckleberry	Magnoliopsida	Ericales	Ericaceae	Lyonia
<i>Monotropa uniflora</i>	Ghost pipe	Magnoliopsida	Ericales	Ericaceae	Monotropa
<i>Pyrola elliptica</i>	Shinleaf	Magnoliopsida	Ericales	Ericaceae	Pyrola
<i>Vaccinium corymbosum</i>	Northern highbush blueberry	Magnoliopsida	Ericales	Ericaceae	Vaccinium
<i>Vaccinium macrocarpon</i>	American cranberry	Magnoliopsida	Ericales	Ericaceae	Vaccinium
<i>Lysimachia borealis</i>	Northern starflower	Magnoliopsida	Ericales	Primulaceae	Lysimachia
<i>Lysimachia quadrifolia</i>	Whorled loosestrife	Magnoliopsida	Ericales	Primulaceae	Lysimachia
<i>Amphicarpaea bracteata</i>	American hog-peanut	Magnoliopsida	Fabales	Fabaceae	Amphicarpaea
<i>Trifolium aureum</i>	Large hop clover	Magnoliopsida	Fabales	Fabaceae	Trifolium
<i>Trifolium pratense</i>	Red clover	Magnoliopsida	Fabales	Fabaceae	Trifolium
<i>Vicia cracca</i>	Tufted vetch	Magnoliopsida	Fabales	Fabaceae	Vicia
<i>Alnus</i>	Alder sp.	Magnoliopsida	Fagales	Betulaceae	Alnus
<i>Betula alleghaniensis</i>	Yellow birch	Magnoliopsida	Fagales	Betulaceae	Betula
<i>Betula lenta</i>	Sweet birch	Magnoliopsida	Fagales	Betulaceae	Betula
<i>Betula papyrifera</i>	Paper birch	Magnoliopsida	Fagales	Betulaceae	Betula
<i>Betula populifolia</i>	Gray birch	Magnoliopsida	Fagales	Betulaceae	Betula
<i>Carpinus caroliniana</i>	American hornbeam	Magnoliopsida	Fagales	Betulaceae	Carpinus
<i>Castanea dentata</i>	American chestnut	Magnoliopsida	Fagales	Fagaceae	Castanea
<i>Fagus grandifolia</i>	American beech	Magnoliopsida	Fagales	Fagaceae	Fagus

Scientific Name	Common Name	Class	Order	Family	Genus
<i>Quercus alba</i>	White oak	Magnoliopsida	Fagales	Fagaceae	Quercus
<i>Carya</i>	Hickory sp.	Magnoliopsida	Fagales	Juglandaceae	Carya
<i>Comptonia peregrina</i>	Sweet-fern	Magnoliopsida	Fagales	Myricaceae	Comptonia
<i>Apocynum androsaemifolium</i>	Spreading dogbane	Magnoliopsida	Gentianales	Apocynaceae	Apocynum
<i>Asclepias syriaca</i>	Common milkweed	Magnoliopsida	Gentianales	Apocynaceae	Asclepias
<i>Cephalanthus occidentalis</i>	Buttonbush	Magnoliopsida	Gentianales	Rubiaceae	Cephalanthus
<i>Galium aparine</i>	Catchweed bedstraw	Magnoliopsida	Gentianales	Rubiaceae	Galium
<i>Galium mollugo</i>		Magnoliopsida	Gentianales	Rubiaceae	Galium
<i>Houstonia caerulea</i>	Azure bluet	Magnoliopsida	Gentianales	Rubiaceae	Houstonia
<i>Mitchella repens</i>	Partridgeberry	Magnoliopsida	Gentianales	Rubiaceae	Mitchella
<i>Lycopus</i>	Water horehound sp.	Magnoliopsida	Lamiales	Lamiaceae	Lycopus
<i>Trichostema dichotomum</i>	Blue curls	Magnoliopsida	Lamiales	Lamiaceae	Trichostema
<i>Fraxinus nigra</i>	Black ash	Magnoliopsida	Lamiales	Oleaceae	Fraxinus
<i>Epifagus virginiana</i>	Beechdrops	Magnoliopsida	Lamiales	Orobanchaceae	Epifagus
<i>Nuttallanthus canadensis</i>	Blue toadflax	Magnoliopsida	Lamiales	Plantaginaceae	Nuttallanthus
<i>Veronica officinalis</i>	Heath speedwell	Magnoliopsida	Lamiales	Plantaginaceae	Veronica
<i>Verbascum thapsus</i>	Great mullein	Magnoliopsida	Lamiales	Scrophulariaceae	Verbascum
<i>Lindera benzoin</i>	Northern spicebush	Magnoliopsida	Laurales	Lauraceae	Lindera
<i>Hypericum gentianoides</i>	Pineweed	Magnoliopsida	Malpighiales	Hypericaceae	Hypericum
<i>Populus deltoides</i>	Eastern cottonwood	Magnoliopsida	Malpighiales	Salicaceae	Populus
<i>Populus grandidentata</i>	Bigtooth aspen	Magnoliopsida	Malpighiales	Salicaceae	Populus
<i>Populus tremuloides</i>	Trembling aspen	Magnoliopsida	Malpighiales	Salicaceae	Populus
<i>Salix</i>	Willow sp.	Magnoliopsida	Malpighiales	Salicaceae	Salix
<i>Viola</i>	Violet spp.	Magnoliopsida	Malpighiales	Violaceae	Viola
<i>Lythrum salicaria</i>	Purple loosestrife	Magnoliopsida	Myrtales	Lythraceae	Lythrum
<i>Circaea</i>	Enchanter's nightshade sp.	Magnoliopsida	Myrtales	Onagraceae	Circaea
<i>Berberis thunbergii</i>	Japanese barberry	Magnoliopsida	Ranunculales	Berberidaceae	Berberis
<i>Sanguinaria canadensis</i>	Bloodroot	Magnoliopsida	Ranunculales	Papaveraceae	Sanguinaria
<i>Anemonoides quinquefolia</i>	Wood anemone	Magnoliopsida	Ranunculales	Ranunculaceae	Anemonoides
<i>Caltha palustris</i>	Marsh marigold	Magnoliopsida	Ranunculales	Ranunculaceae	Caltha
<i>Coptis trifolia</i>	Threeleaf goldthread	Magnoliopsida	Ranunculales	Ranunculaceae	Coptis
<i>Ranunculus</i>	Buttercup sp.	Magnoliopsida	Ranunculales	Ranunculaceae	Ranunculus
<i>Thalictrum dioicum</i>	Early meadow-rue	Magnoliopsida	Ranunculales	Ranunculaceae	Thalictrum
<i>Thalictrum pubescens</i>	Tall meadow-rue	Magnoliopsida	Ranunculales	Ranunculaceae	Thalictrum
<i>Elaeagnus umbellata</i>	Autumn olive	Magnoliopsida	Rosales	Elaeagnaceae	Elaeagnus
<i>Frangula alnus</i>	Glossy buckthorn	Magnoliopsida	Rosales	Rhamnaceae	Frangula
<i>Amelanchier</i>	Serviceberry sp.	Magnoliopsida	Rosales	Rosaceae	Amelanchier
<i>Fragaria virginiana</i>	Virginia strawberry	Magnoliopsida	Rosales	Rosaceae	Fragaria
<i>Malus</i>	Apple sp.	Magnoliopsida	Rosales	Rosaceae	Malus
<i>Potentilla</i>	Cinquefoil sp.	Magnoliopsida	Rosales	Rosaceae	Potentilla
<i>Prunus serotina</i>	Black cherry	Magnoliopsida	Rosales	Rosaceae	Prunus
<i>Rosa multiflora</i>	Multiflora rose	Magnoliopsida	Rosales	Rosaceae	Rosa
<i>Rubus pubescens</i>	Dwarf raspberry	Magnoliopsida	Rosales	Rosaceae	Rubus

Scientific Name	Common Name	Class	Order	Family	Genus
<i>Ulmus</i>	Elm sp.	Magnoliopsida	Rosales	Ulmaceae	Ulmus
<i>Boehmeria cylindrica</i>	False nettle	Magnoliopsida	Rosales	Urticaceae	Boehmeria
<i>Rhus typhina</i>	Staghorn sumac	Magnoliopsida	Sapindales	Anacardiaceae	Rhus
<i>Toxicodendron radicans</i>	Eastern poison ivy	Magnoliopsida	Sapindales	Anacardiaceae	Toxicodendron
<i>Toxicodendron vernix</i>	Poison sumac	Magnoliopsida	Sapindales	Anacardiaceae	Toxicodendron
<i>Acer pensylvanicum</i>	Striped maple	Magnoliopsida	Sapindales	Sapindaceae	Acer
<i>Acer rubrum</i>	Red maple	Magnoliopsida	Sapindales	Sapindaceae	Acer
<i>Ribes</i>	Currant/Gooseberry sp.	Magnoliopsida	Saxifragales	Grossulariaceae	Ribes
<i>Proserpinaca</i>	Proserpinaca sp.	Magnoliopsida	Saxifragales	Haloragaceae	Proserpinaca
<i>Hamamelis virginiana</i>	Common witch-hazel	Magnoliopsida	Saxifragales	Hamamelidaceae	Hamamelis
<i>Parthenocissus quinquefolia</i>	Virginia creeper	Magnoliopsida	Vitales	Vitaceae	Parthenocissus
<i>Vitis</i>	Grapevine sp.	Magnoliopsida	Vitales	Vitaceae	Vitis
<i>Juniperus communis</i>	Common juniper	Pinopsida	Pinales	Cupressaceae	Juniperus
<i>Juniperus virginiana</i>	Eastern redcedar	Pinopsida	Pinales	Cupressaceae	Juniperus
<i>Pinus rigida</i>	Pitch pine	Pinopsida	Pinales	Pinaceae	Pinus
<i>Pinus strobus</i>	Eastern white pine	Pinopsida	Pinales	Pinaceae	Pinus
<i>Tsuga canadensis</i>	Eastern hemlock	Pinopsida	Pinales	Pinaceae	Tsuga
<i>Osmunda spectabilis</i>	American royal fern	Polypodiopsida	Osmundales	Osmundaceae	Osmunda
<i>Osmundastrum cinnamomeum</i>	Cinnamon fern	Polypodiopsida	Osmundales	Osmundaceae	Osmundastrum
<i>Athyrium angustum</i>	Northern lady fern	Polypodiopsida	Polypodiales	Athyriaceae	Athyrium
<i>Dennstaedtia punctilobula</i>	Hay-scented fern	Polypodiopsida	Polypodiales	Dennstaedtiaceae	Dennstaedtia
<i>Pteridium aquilinum</i>	Common bracken	Polypodiopsida	Polypodiales	Dennstaedtiaceae	Pteridium
<i>Dryopteris carthusiana</i>	Spinulose wood fern	Polypodiopsida	Polypodiales	Dryopteridaceae	Dryopteris
<i>Dryopteris marginalis</i>	Marginal wood fern	Polypodiopsida	Polypodiales	Dryopteridaceae	Dryopteris
<i>Polystichum acrostichoides</i>	Christmas fern	Polypodiopsida	Polypodiales	Dryopteridaceae	Polystichum
<i>Onoclea sensibilis</i>	Sensitive fern	Polypodiopsida	Polypodiales	Onocleaceae	Onoclea
<i>Amauropelta noveboracensis</i>	New York fern	Polypodiopsida	Polypodiales	Thelypteridaceae	Amauropelta
<i>Fuligo septica</i>	Dog Vomit Slime Mold	Myxomycetes	Physarales	Physaraceae	Fuligo

Appendix C: Flora of Spring Hill Farm Poster



Appendix D: Fauna of Spring Hill Farm Poster

