



Biodiversity

Town of Pound Ridge, NY

2020

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A COMPANION DOCUMENT TO THE NATURAL RESOURCES INVENTORY

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Chair, Conservation Board

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The Biodiversity of Pound Ridge

OVERVIEW

BIODIVERSITY

Biodiversity refers to the variety of life on earth and embraces ecosystems and habitats, all species of plants, animals, fungi, and microorganisms, and the genes they contain. Biodiversity in its many forms constitutes a natural resource of immeasurable and under-appreciated value, providing us with benefits ranging from the building of healthy soils, filtering pollutants from air and water, slowing down storm runoff and recharging water supplies, as well as providing renewables such as timber, food, and pharmaceuticals. Our daily dependency on wells and septic systems comes to mind. Less obvious is the importance of the availability of micronutrients for healthy foods, the global need and demand for natural products to use as medicinal products and biomedical research, and an understanding of how human activities and disturbance alter interactions between organisms, including patterns of infectious disease. Richard Ostfeld, Ph.D. (2020) at the Carey Institute of Ecosystem Studies, has suggested it is no coincidence that Lyme-prone areas are where human disruption of forests and other habitats prevail. According to World Health Organization (2020), human health ultimately depends upon ecosystem products and services. Biodiversity is key to sustainable development goals at global and local levels. With a focus on biodiversity, this document complements the *Natural Resources Inventory, Town of Pound Ridge, NY* (2018) and is substantially supported by *Significant Habitats in the Town of Pound Ridge* (2018), a study conducted by *Hudsonia Ltd.*

Genetic and species diversity changes constantly. It increases through genetic variations and is reduced by habitat degradation, extirpations (local extinctions) and global extinctions. Some scientists talk about being in a sixth mass extinction that started near the Pleistocene-Holocene geologic time boundaries with the disappearance of large North American mammals. As with so many situations, we crossed the boundary of the Holocene and entered the Anthropocene, the current geological age during which humans are the dominant force, with little thought, experience and direction. Today fragmentation, invasive species, and other human impacts threaten biodiversity in Pound Ridge. Climate change will both increase and further reduce diversity. As noted by Doug Tallamy, Ph.D. (2020):

This is a growing problem for humanity because it is the plants and animals around us that produce the life support we all depend on. Every time a species is lost from an ecosystem, that ecosystem is less able to support us. We must abandon the notion that humans and nature cannot live together. Though vital as short-term refuges, nature preserves are not large enough to meet our ecological needs so we must restore the natural world where we live, work, and play. Because nearly 85% is privately owned, our private properties are an opportunity for long-term conservation if we design them to meet the needs of the life around us.

PURPOSE

This document is a companion to the *Natural Resources Inventory, Town of Pound Ridge* as it (1) complements the *Hudsonia* Habitat inventory, (2) defines biodiversity in a more robust way, (3) assembles species lists for Pound Ridge in one document, and (4) creates a baseline for species diversity of Pound Ridge. The document, written for a lay audience, including residents, volunteers serving on town boards and agencies, amateur naturalists, birders, etc., will be useful to professionals as well and is posted to the Conservation Board webpage.

The document also supports the comprehensive plan under revision at this time. Two guiding principles of the comprehensive plan related to biodiversity are harmony with nature and responsible regionalism. To be in harmony with nature means to ensure that the contributions of natural resources to human well-being and other living organisms are explicitly recognized, valued, and preserved, and that maintaining their health is a primary objective and a shared responsibility of residents and the Town. This principle may be implemented through efforts to restore, connect, and protect natural habitats including but not limited to forest cover, soils, sensitive lands, watersheds, and wetlands. Responsible regionalism acknowledges the artificial nature of political boundaries and the need to ensure that local proposals and actions account for, connect with, and support the responsible plans of conservation land managers, adjacent towns, and municipalities, etc. in the surrounding region. Those familiar with the recommendations in *Eastern Westchester Biotic Corridor* (Miller and Klemens 2002) recognize an earlier and unsuccessful attempt to apply this principle locally.

TERMINOLOGY: DEFINING & DESCRIBING SPECIES

Species, a term used throughout this document, refers to a group of living organisms consisting of similar individuals capable of exchanging genes or interbreeding. Each species is given two Latin names (or a binomial). In addition, many adjectives are used to describe a species. To illustrate, consider the American bullfrog, a native species in our area and an introduced species throughout the western U.S. and several other countries. Outside of their native habitat, bullfrogs typically prey upon indigenous species and become the dominant species. As such, bullfrogs in the western U.S. are an invasive species. Therefore, the bullfrog may be referred to as a *native species*, an *aggressive species*, a *non-native* or *introduced species*, and an *invasive species* depending upon the location and its role there.

Common names are used throughout the body of this document. For reference, a list of scientific names for those species is provided as an appendix. Defined below, many useful adjectives describe the ecological relationship of a species to a region and to other species and succinctly capture what may be happening in the environment.

A domesticated species has been selectively bred and genetically adapted over generations to live alongside humans.

An exotic species is not native to the continent on which it is now found. For example, plants from Europe are exotic in North America; plants from North America are exotic in Japan.

An introduced species is not native to the place or area to which it is has been accidentally or deliberately transported by human activity. The introduction of a species to a new environment can have unexpected and serious biological consequences.

An invasive species, from the Presidential Executive Order 13112 (February 1999), is non-native to the ecosystem and one whose introduction causes or is likely to cause harm to the economy, environment, or to human health.

Keystone species, a term coined in the 1960s, applies to a species whose presence and role within an ecosystem has a disproportionate effect on other organisms within the system. Keystone species often hold the ecosystem together. Three types of keystone species are predators, ecosystem engineers, and mutualists.

Predators help control the populations of prey species, which in turn affects the quantity of plants and animals further along the food web. Once wolves inhabited the Northeast and preyed on deer and smaller predators. A classic example of a keystone species, wolves kept deer herds healthy, prevented over browsing of the forest, and protected habitat for small mammals and ground-nesting birds. By the beginning of the 20th century, through loss of habitat and unregulated hunting, wolves were extirpated in New York.

Ecosystem engineers create, change, or destroy habitats. The beaver exemplifies a keystone engineer because of the effects their dams have on channel flow, geomorphology, and ecology.

Mutualists are species that interact for each other's benefit, such as bees and other pollinators. Both the bees and the plants mutually benefit as one group receives food and, for the other, the odds of cross-pollination and seed development improve.

A native species is part of the balance of nature that has developed over hundreds or thousands of years in a particular region or ecosystem. A geographic qualifier adds clarity, e.g., native to New England. Organisms found in this country before European settlement are typically considered native to the United States.

A naturalized species is a non-native that does not need human help to reproduce and maintain itself over time in an area where it is not native. In our area both Queen Anne's Lace and chicory are examples of naturalized species.

A non-native species is introduced with human help (intentionally or accidentally) to a new place or new type of habitat where it was not previously found. Not all non-native species are invasive. In fact, when many non-native species, such as ornamental plants, are introduced to new places, they cannot reproduce or spread readily without human help.

A translocated species is not native to the portion of the continent where it is now found. For example, Norway Spruce and California Poppies in New England are translocated species. Bullfrogs are translocated species in the Western U.S.

Now consider “Big Red”, a resident of the Town Park skate pond, as another example of multiple adjectives applied to the same species. Over time, this particular goldfish or common carp has grown to be larger than a football. Goldfish, a *domesticated species* first bred in ornamental gardens in ancient China, were brought to the U.S. as exotic species. “Big Red” became an *introduced species* when its owner dumped it into the pond. This *non-native species* introduced into the wild not only looks different, as it swims along it causes ecological problems in several ways: uprooting vegetation, disturbing sediment and releasing nutrients that trigger excess algal growth. It feeds broadly, eating algae, small invertebrates and fish eggs and can transmit exotic diseases and parasites. The common carp is capable of cross breeding with other carp species. If it finds a mate, a female can produce up to 40,000 eggs per year. With no natural predators and having eluded capture for years, “Big Red” is an *exotic species* in the Town’s skate pond. In other places, this carp is one of the worst invasive species--a reminder that it is always best to get rid of unwanted animals responsibly by giving them away to an aquarium, pet store, or hobbyist.

This document continues with a more detailed description of the biodiversity of Pound Ridge, from biomes and communities, to habitats and lists of plant and animal species associated with this area and concludes with current threats to local diversity and recommendations based upon what we know and understand today.

AT THE MACROLEVEL: BIOMES TO COMMUNITIES, HABITATS, AND SPECIES

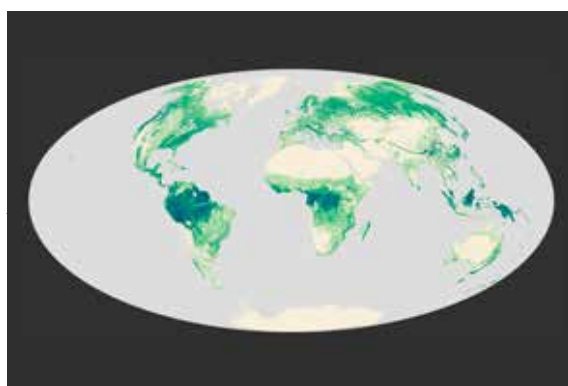


Image: Global Forest Heights: Take Two
earthobservatory.nasa.gov

Pound Ridge lies within the large temperate forest biome circling the globe in the Northern Hemisphere. A finer-scale analysis places Pound Ridge in an ecoregion known as the Northeast Coastal Forest (NCF), as identified by the *World Wildlife Fund* (Ricketts et al. 1999). This ecoregion ranges from northern Maryland to southern

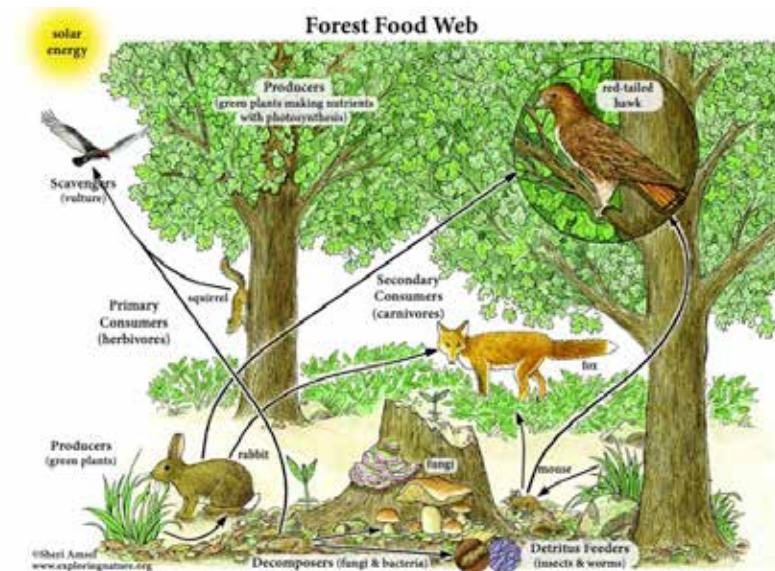
Maine and encompasses approximately 34,600 square miles. Conservation organizations and environmental agencies use the concept of an ecoregion to systematically understand how biodiversity levels and ecosystem dynamics differ across the world.

An ecosystem is made out of plants, animals, microorganisms, soil, rocks, minerals water sources, and the local atmosphere interacting with one another as a system. Nutrient cycles and energy flows link parts of the system together. For instance, the energy from the sun is captured by plants through photosynthesis. Photosynthesis is a biological process through which plants manufacture their own food from carbon dioxide and water with the aid of sunlight energy. The plants, in turn, serve as a food source for organisms that are incapable of producing their own food. By feeding on these plants, energy and nutrients flow from one consumer to the next through simple food chains and more complex food webs. Dead organic matter is then broken down by decomposers, eventually releasing materials for nutrient cycling, or for use by other living organisms. The soils below ground are highly diverse with bacteria, fungal hyphae, and a wide range of mites, nematodes, earthworms, and arthropods. This vast and hidden diversity contributes to the total terrestrial biomass and is intimately linked to above-ground biodiversity in poorly understood ways.

PLANT COMMUNITIES AND FLORAL DIVERSITY

Plants determine the quality of the living environment. They support complex community food webs as well as provide shelter for animals, soil stabilization and fertility, rain water management, filtration of air and water pollutants, regulation of air temperatures, and other services. Plants with high wildlife value, such as oaks, goldenrods, and milkweed, serve as keystone species. There is no doubt about it: plants matter.

Where plants grow is related to climate, soil types, topography, hydrology, plus geology and in part is shaped by past and present land uses. Patterns of vegetation, therefore, emerge as fairly predictable plant communities. In general, the dominant local vegetation is comprised of two forest types and the plant communities associated with them: oak-hickory and northern mixed hardwood (maple-beech-birch) forests. These forests are part of the greater Eastern Deciduous Forest complex that extends throughout eastern United States. The two forest types are classified by their dominant tree species. Where they are found is related to the climate, topography and hydrology. Upland forests occur on the drier slopes and ridges, whereas wetland forests occur in the lowland basins



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where the soils are periodically flooded. Pound Ridge is at the northeastern limit of oak-hickory forest range and at the southeastern limit of the northern-ranging northern hardwood forest. The border between the two will shift northward with changes to the climate. Pound Ridge tends to be a mosaic of these two forest types. In addition, small stands of a typical hemlock and mixed hardwood forest and a hemlock forest are found within our boundaries.

The section that follows includes descriptions and lists of the characteristic species composition of the tree, shrub, and herb strata (layers) of nine plant communities in Pound Ridge from *Land Use Through Ecology*, pp.32-39 (PRUP report 1980). It represents the plants found at the time and associated with natural succession in our area prior to the impact of browse pressure from deer, described later in this document. What may have been a complete list at the time as stated within the excerpt (p. 33, line 9) has indeed changed. A list of invasive plant species found later in the document provides a sense of change. Note the use of the word “invaders” in the PRUP report (p. 33, line 20) is applied to native species and therefore differs from the definition of invasive species provided earlier and used throughout this document.

ABOUT SPECIES LISTS AND DIVERSITY

The lists of plants and animals in this document demonstrate several metrics of diversity: species richness, specific taxa (units or groups), and a number of distinct plant functional types (such as grasses, forbs, bushes, or trees). The lists, however, are inherently incomplete. In regards to wildlife, changes in the time of day and seasons of the year bring animals into and out of an area. Even plants move slowly through seed dispersal. Change over time proceeds in ongoing and sometimes unpredictable ways. As communities change, the species mix changes,

too. The lists are also published with care to avoid specific information regarding sightings and locations of rare, threatened, or endangered – or even just charismatic— plants and animals. This effort is made to discourage the unethical and/or illegal removal of plants or capture and illegal hunting of wildlife.

Many other ways of looking at the species comprising the local flora and fauna lie beyond the scope of this document. More refined studies might compare past and present records for the preserves within Pound Ridge boundaries and managed by Ward Pound Ridge Reservation, Mianus River Gorge Preserve, Pound Ridge Land Conservancy, and Westchester Land Trust. This information might yield understandings of the abundance or rarity of a species, population size and dynamics, site specific data, and a better understanding of species resilience.

COMMUNITY DESCRIPTIONS AND PLANTS

Excerpts from Glowczewski, J. E. *Land Use Through Ecology: A Case Study of Pound Ridge*. Sponsored by Pound Ridge United for Planning (PRUP) Trust. 1980.

Note: Plant lists do not have the same credibility as voucher specimens and those that follow from the PRUP report, now forty years later, are best updated to capture changes in the nomenclature and current conditions. Mosses, lichens, liverworts, mushrooms and other fungi were not reported. Nonetheless useful information can be gleaned from these lists: to select plants for the home landscape, as a baseline study of local changes in species composition, for the identification of past and current keystone plants and/or the values of specific plants, as a comparison of invasive plant species found then and now, and for discussions regarding restoration goals, the impacts of deer, climate change, etc.

V. Vegetation

Apart from topography, vegetation is the

most visible part of the environment and is the aspect of nature most familiar to the inhabitants of Pound Ridge. The area has a diverse landscape with many distinctive vegetation types within its 14,130 acres.

What follows is a description of the species composition characteristic of each of the nine plant communities found in Pound Ridge and a complete species list for most of them. The species lists include the plants that are generally found in such communities. It is possible that a few additional varieties could be found.

1. **Old field.** This community is characterized by a predominance of grasses, sedges, and herbs, with a few scattered shrubs and trees. Shrubs that grow vigorously in the open, such as the highbush blueberry and raspberry, and that reproduce vegetatively in clones, such as gray dogwood, are among the first invaders as the process of reforestation begins. This "post-disturbance" vegetation of grasses, with colorful daisies, butterfly weed, goldenrod, and characteristic red cedars, is bounded by handsome old stone walls and provides aesthetically pleasing diversity in an otherwise forested landscape. The red cedars, whose seedlings invaded the cleared fields during the period of active agriculture in Pound Ridge, often survived browsing because they are very bristly and unpalatable to livestock. These cedars and the fastgrowing gray birches are the most frequent tree invaders found in the old-field vegetation type. The large variety of seed-bearing herbs and berried shrubs make the abandoned fields an ideal habitat for many birds and small animals. In some meadow thickets one can flush a woodcock or pheasant.

There are many examples of old field vegetation, among them the complex of red-cedar fields west of Trinity Lake on water company land and the fields north of Upper Shad Road and east of Long Ridge Road.

Old Field Species

TREE STRATUM

Trees larger than 15 feet at maturity:
Acer rubrum, (Red Maple)
Acer saccharum, (Sugar Maple)

Betula lenta, (Black Birch)*
Betula populifolia, (Grey Birch)*
Carpinus caroliniana, (Blue Beech)
Fraxinus pennsylvanica, (Green Ash)
Juniperus virginiana, (Red Cedar)*
Nyssa sylvatica, (Black Gum)
Ostrya virginiana, (Hornbeam)
Populus grandidentata, (Big Toothed Aspen)*
Populus tremuloides, (Trembling Aspen)
Prunus pennsylvanica, (Choke Cherry)
Prunus serotina, (Black Cherry)
Pyrus malus, (Apple)
Quercus rubra var. *borealis*, (Northern Red Oak)
Quercus velutina, (Black Oak)
Robinia pseudo-acacia, (Black Locust)

SHRUB STRATUM

Woody trees smaller than 15 feet and larger than 3 feet at maturity:
Amelanchier ssp., (Shadbush)
Cornus racemosa, (Grey Dogwood)*
Elegans angustifolia, (Russian Olive)
Gaylussacia baccata, (Huckleberry)
Myrica pennsylvanica, (Bayberry)
Potentilla fruticosa, (Shrubby Cinquefoil)
Rhus glabra, (Smooth Sumac)*
Rhus copallina, (Winged Sumac)
Rubus ideaus, (Red Raspberry)
Rubus phoenicolasius, (Wine Berry)
Rubus occidentalis, (Black Raspberry)
Rubus odoratus, (Purple Flowering Raspberry)
Rosa spp., (Wild Roses)
Smilax herbacea, (Carrion Flower)
Smilax rotundifolia, (Greenbriar)
Spiraea latifolia, (Meadowsweet)
Spiraea tomentosa, (Steeple Bush)
Vaccinium carymbosum, (Highbush Blueberry)*
Viburnum lentago, (Nannyberry)
Vitis spp., (Wild Grape)

HERB STRATUM

Woody or herbaceous plants smaller than 3 feet at maturity:
Achillea millefolium, (Yarrow)
Agrostis alba, (Redtop)
Alliaria officinalis, (Garlic Mustard)
Andropogon virginicus, (Broomsedge)
Andropogon scoparius, (Little Bluestem)

*dominant species

Anthoxanthum odoratum, (Sweet Vernal Grass)
Antennaria spp., (Pussytoes)
Ambrosia artemisiifolia, (Common Ragweed)
Asclepias syriaca, (Common Milkweed)
Asclepias tuberosa, (Butterfly Weed)
Chamaelirium luteum, (Devil's Bit)
Cichorium intybus, (Chicory)
Comptonia perigrina, (Sweet Fern)
Coronilla varia, (Crown Vetch)
Crysanthemum leucanthemum, (Ox-eye Daisy)
Dactylus glomeratus, (Orchard Grass)
Daucus carota, (Queen Anne's Lace)
Dennstaedia punctiloba, (Hay scented Fern)
Rigeron spp., (Daisy Fleabane)
Festuca ovina, (Sheep Fescue)
Fragaria americana, (Strawberry)
Galium spp., (Bedstraws)
Leersia virginica, (Catchfly Grass)
Linaria vulgaris, (Butter and Eggs)
Lotus corniculatus, (Birdfoot Trefoil)
Melilotus alba, (White Sweet Clover)
Melilotus officinalis, (Yellow Sweet Clover)
Parthenocissus quinquefolia, (Virginia Creeper)
Phytolacca americana, (Pokeweed)
Poa pratense, (Kentucky Bluegrass)
Phleum pratense, (Timothy Grass)
Polygonum lapathifolium, (Pale Smartweed)
Potentilla spp., (Cinquefoils)
Prunella vulgaris, (Self Heal)
Pteridium aquilinum, (Bracken Fern)
Lysimachia quadrifolia, (Whorled Loosestrife)
Rhus radicans, (Poison Ivy)*
Rubus hispidus, (Bristly Dewberry)
Rudbeckia hirta, (Black Eyed Susan)
Silene cucubalus, (Bladder Campion)
Solanum carolinense, (Horse Nettle)
Solidago spp., (Goldenrods)*
Taraxacum officinale, (Dandelion)
Trifolium pratense, (Red Clover)
Urtica dioica, (Stinging Nettle)
Vaccinium angustifolium, (Low Bush Blueberry)
Verbascum thapsus, (Mullein)
Vicia spp., (Vetch)

2. **Successional forest.** In this plant community the aspect is that of a young forest that is changing. Black birch and large-toothed

*dominant species

aspens are common pioneers. Large, beautiful sugar maples growing along the stone walls have in many cases served as an abundant seed source, resulting in some successional stands of almost pure sugar maple. Winged seeds from large white and green ashes found along stone walls also seed into fields. Pioneer trees may include a large number of species, but ash, black and gray birch, black locust, aspen, black cherry, and sugar maple are the most common.

The shade of these trees changes the light and temperature conditions of the soil beneath them, and their leaf litter rebuilds the soil structure and humus content that were altered by agriculture. As the vegetation modifies the environmental conditions, the forest edge encroaches further on the once-cleared land, and one of the more mature forest-vegetation types found in Pound Ridge begins to establish itself. The successional period, when the species that first invade the unforested land can thrive, is transitional. Few of the mature trees, shrubs, and herbs that eventually provide self-perpetuating and relatively stable vegetation cover are members of the species commonly found in successional stages.

The forerunners of the more mature forest lose dominance because their seedlings are intolerant of shade, because root systems of different species compete for nutrients and water, and because these and other factors interact. Black birch, for example, although it is a successful clearing invader, is particularly susceptible to *Nectria* fungi.

Stands of fungi-cankered black birch surrounded by vigorous seedlings and saplings of other species such as sugar maple, sassafras, and tulip poplar are a testimony to the complex successional interactions and are quite common in Pound Ridge.

Examples of the successional forest vegetation community are the sugar-maple stand seeding an old apple-orchard complex south of Stone Hill Road and east of Honey Hollow Road and the black-birch stand infected with *Nectria* north of Stone Hill River and east of Michigan Trail.

This community is too variable and transitional (between field and forest types) for us to give a species list.

Pound Ridge lies in a region of diverse forest vegetation. To the north, in New England, lies the forest region dominated by hemlock, northern hardwoods, and white pine, where sugar maple, beech, and yellow birch mix with conifers. To the south are regions of mixed forests, where oak-hickory associations of more mesophytic mixed hardwoods such as tulip poplar, sugar maple, and beech share dominance. The local forest vegetation reflects a mixing of these types, which surround Pound Ridge on a north-south climatic continuum.

Although Pound Ridge is located in a region designated as the glaciated section of the oak-chestnut region of dominant forest vegetation, the American chestnut, the most valuable and one of the largest and stately of the forest's dominant species, has been wiped out in the last fifty years.

The chestnut blight and its effect on the lower Hudson forest region illustrate the impact of a biological disaster on the forest and the different successional directions that can follow a large-scale disturbance of the ecosystem. Chestnut blight is caused by *Endothia parasitica*, an ascomycetous fungus. Like the cause of Dutch elm disease, it is an imported pathogen, thought to have been introduced on nursery stock from the Orient. In 1904, American chestnuts in New York began to die suddenly. The introduction of this alien fungus into a system where the environment was conducive to rapid growth, where the host (the American chestnut) had no genetic resistance, and where the fungus could exist saprophytically on the bark of oaks that were forest co-dominants of the chestnut resulted in the chestnut blight's advance at a rate close to twenty-four miles a year.

The root collar of the chestnut, however, resists the infection and produces root sprouts that reach sapling height in this region. Today Pound Ridge lies in what has been designated the "sprout hardwood" region of the northeast. Following the blight and logging operations that are part of the history of this landscape, many oaks and American chestnuts have reproduced vegetatively by sprouting. This sprouting ability is one of the mechanisms working in the process of reforestation to maintain some of

the original forest composition.

Sprouts of American chestnut are common in forested portions of Pound Ridge, as are the rotting stumps of the blighted trees, the result of logging operations to salvage the chestnut wood. These are the remnants of forest trees that reached sixty to ninety feet and could be three to five feet in diameter at maturity. The chestnut sprouts today are usually three to eight feet high and grow to one to two inches in diameter before they show symptoms of chestnut-blight cankers. The largest sprout we have seen in Pound Ridge is four inches in diameter and about twenty feet high. It shows no sign of disease at this time and is growing in the mature mixed forest west of the Siscowit Reservoir on the Stamford Water Company land.

Forest succession has taken several different directions after the elimination of the American chestnut. Of the four vegetation communities that follow, two in particular—oak and mixed hardwood—have been most responsible for successional replacement after the chestnut blight.

3. Oak forest. The four oak species commonly growing in this community are northern red, white, black, and chestnut oaks, and these are often found in association with black birch and sassafras. A subdivision within this type can be called "oak knolls." This is a community occurring on well-drained rocky hills that support a good proportion of chestnut oak and often an understory of mountain laurel, an ericaceous evergreen shrub that grows well in the slightly acidic soil formed by oak litter and in some places forms an almost impenetrable stratum. In other oak areas the shrub layer is more open and the ericaceous high- and low-bush blueberries are present. Herb layer species are characteristically not abundant in this community, but they include the beautiful pink lady's slipper orchid, wild sarsaparilla, wintergreen, and mosses.

Gypsy-moth defoliation has been particularly severe on oak knolls dominated by chestnut oak. Many of these knolls in Pound Ridge support dead trunks of this oak species, with young chestnut oak, black oak, and red oak species seeding in.

Examples of the oak-forest type are found

in numerous Pound Ridge locations. One is the oak ridge west of Route 124 and beyond the substation.

Oak Forest Species

TREE STRATUM

Trees larger than 15 feet at maturity:

- Acer rubrum*, (*Red Maple*)
- Acer saccharum*, (*Sugar Maple*)
- Betula allegheniensis*, (*Yellow Birch*)
- Betula lenta*, (*Black Birch*)*
- Carya ovata*, (*Shagbark Hickory*)
- Carya glabra*, (*Pignut Hickory*)
- Carya tomentosa*, (*Mockernut Hickory*)
- Fagus grandifolia*, (*Beech*)
- Liriodendron tulipifera*, (*Tulip Poplar*)
- Prunus serotina*, (*Black Cherry*)
- Quercus alba*, (*White Oak*)*
- Quercus prinus*, (*Chestnut Oak*)*
- Quercus rubra* var. *borealis*, (*Northern Red Oak*)*
- Quercus velutina*, (*Black Oak*)*
- Sassafras albidum*, (*Sassafras*)

SHRUB STRATUM

Woody trees smaller than 15 feet and larger than 3 feet at maturity:

- Acer pennsylvanicum*, (*Striped Maple*)
- Castanea dentata*, (*Chestnut (sprouts)*)
- Hamamelis virginiana*, (*Witch Hazel*)
- Kalmia latifolia*, (*Mountain Laurel*)*
- Vaccinium corymbosum*, (*Highbush Blueberry*)*

HERB STRATUM

Woody or herbaceous plants smaller than 3 feet at maturity:

- Aralia nudicaulis*, (*Wild Sarsaparilla*)
- Cypripedium acaule*, (*Pink Lady's Slipper*)*
- Gaultheria procumbens*, (*Wintergreen*)
- Gaylussacia baccata*, (*Huckleberry*)
- Geranium maculatum*, (*Wild Geranium*)
- Hepatica acutiloba*, (*Hepatica*)
- Hepatica americana*, (*Haircup Moss*)
- Maianthemum canadense*, (*Canada Mayflower*)*
- Polystichum acrostichoides*, (*Christmas Fern*)*
- Thelypteris nova boracensis*, (*New York Fern*)
- Vaccinium angustifolium*, (*Lowbush Blueberry*)*

*dominant species

4. Mixed hardwood forest. In the oak-dominant mixed-hardwood forest, it is likely that sugar maples, tulip poplars, and black birches, as well as additional oak seedlings, invaded the forest gaps left by the chestnut blight. This results in a forest with many northern red oaks, white oaks, and black oaks, but with thirty to fifty percent of the canopy trees belonging to other hardwood species.

In the mixed-mesophytic type of hardwood forest, sugar and red maples and tulip poplars share dominance with white ashes, beeches, and four species of hickory. Maple-leaved viburnum and witch hazel are common in the shrub layer. Woodland herbs such as Solomon's seal, wild geranium, wild ginger, and asters are colorfully dispersed among ferns, which include New York, lady, hay-scented, and maidenhair.

The outstanding example of a mature mixed-mesophytic forest is the Mianus Watershed study area, southeast of Twin Lakes off Pine Brook Road.

Mixed Hardwood Forest Species

TREE STRATUM

Trees larger than 15 feet at maturity:

- Acer saccharum*, (*Sugar Maple*)
- Acer rubrum*, (*Red Maple*)
- Betula lenta*, (*Black Birch*)
- Carpinus caroliniana*, (*Blue Beech*)
- Carya cordiformis*, (*Bitternut Hickory*)
- Carya glabra*, (*Pignut Hickory*)
- Carya ovata*, (*Mockernut Hickory*)

SHRUB STRATUM

Woody trees smaller than 15 feet and larger than 3 feet at maturity:

- Castanea dentata*, (*American Chestnut (sprouts)*)
- Hamamelis virginiana*, (*Witch Hazel*)
- Viburnum acerifolium*, (*Maple Leafed Viburnum*)*
- Viburnum dentatum*, (*Arrowwood*)

HERB STRATUM

Woody or herbaceous plants smaller than 3 feet at maturity:

- Aetaea pachypoda*, (*White Baneberry*)

*dominant species

Aetaea rubra, (Red Baneberry)
Athyrium filix-femina, (Lady Fern)
Adiantum pedatum, (Maidenhair Fern)
Agrimonia spp., (Agrimony)
Asarum canadense, (Wild Ginger)
Aster spp., (Asters)
Botrychium virginianum, (Rattlesnake Fern)
Caulophyllum thalictroides, (Blue Cohosh)
Dennstaedtia punctilobula, (Hay-scented Fern)*
Desmodium glutinosum, (Pointed Leaf Tick
 Trefoil)
Dicentra cucullaria, (Dutchman's Breeches)
Dryopteris spinulosa, (Spinulose Wood Fern)
Geranium maculatum, (Wild Geranium)
Maianthemum canadense, (Canada Mayflower)*
Medeola virginiana, (Indian Cucumber Root)
Podophyllum peltatum, (May Apple)
Polygonum beflorum, (Solomon Seal)
Polystichum acrostichoides, (Christmas Ferns)
Pryol spp., (Shinleaf)
Rhus radicans, (Poison Ivy)*
Sanguinaria canadense, (Bloodroot)
Smilacina racemosa, (False Solomon's Seal)
Solidago spp., (Goldenrods)
Thelypteris novboraiensis, (New York Fern)
Trillium erectum, (Wake Robin)

5. Hemlock and Mixed Hardwood Forest. A typical hemlock and mixed hardwood forest is found in Pound Ridge on the eastern side of the Mianus River near the Southwood Homes area. Overstory species from the hardwood community are mixed with hemlocks in varying proportions. The shrub layer in this community is usually sparse, and its species are a mixture of the hardwood type with that of the hemlock community.

This community typically has a variable mixture of species common to the hemlock community and the mixed-hardwood community. Therefore no separate species list is given.

6. Hemlock forest. In a hemlock forest, such as that found on the steep slopes of the Mianus Gorge, an occasional beech, northern red oak, or black birch grows with these thick-crowned conifers. Mountain laurel can be found in spots, although the shrub and herb layers are rather sparsely vegetated in the shade of the hemlock canopy. However, in this herb layer

*dominant species

several lovely wildflowers can be found, including pink lady's slipper, rattlesnake plantain, partridge berry, starflower, and the saprophytic Indian pipes. Ground pines and other club mosses add patches of green to the well-shaded hemlock-needle forest floor.

Hemlock Forest Species

TREE STRATUM

Trees larger than 15 feet at maturity:
Betula lenta, (Black Birch)
Fagus grandifolia, (Beech)
Quercus rubra, (Red Oak)
Tsuga canadensis, (Hemlock)*

SHRUB STRATUM

Woody trees smaller than 15 feet and larger than 3 feet at maturity:
Hamamelis virginiana, (Witch Hazel)
Kalmia latifolia, (Mountain Laurel)

HERB STRATUM

Woody or herbaceous plants smaller than 3 feet at maturity:
Aralia nudicaulis, (Wild Sarsaparilla)
Chimaphila maculata, (Spotted Wintergreen)
Cypripedium acaule, (Pink Lady's Slipper)
Goodyera spp., (Rattlesnake Plantain)
Lycopodium complanatum, (Ground Pine)
Lycopodium lucidulum, (Shining Clubmoss)
Lycopodium obscurum, (Tree Clubmoss)
Maianthemum canadense, (Canada Mayflower)
Mitchella repens, (Partridge Berry)
Monotropa uniflora, (Indian Pipe)
Parthenocissus quinquefolia, (Virginia Creeper)
Polypodium vulgare, (Common Polypody)
Polystichum acrostichoides, (Christmas Fern)
Trientalis borealis, (Starflower)

7. Conifer plantation. There are several single-species conifer plantings in Pound Ridge, such as the Norway spruce of Carolyn's Grove, off Stone Hill Road, and the red pine on water company properties. These areas in some cases cover several acres and are a notable feature of the landscape.

*dominant species

Conifer Plantation Species

The tree groups below were usually planted in separate groups according to species. In some cases, however, mixtures of several species have been planted.

Larix laricina, (Larch)
Picea abies, (Norway Spruce)
Picea glauca, (White Spruce)
Pinus resinosa, (Red Pine)
Pinus strobus, (White Pine)
Pinus sylvestris, (Scotch Pine)
Tsuga occidentalis, (Arborvitae)
Tsuga canadensis, (Hemlock)

8. Open-water vegetation. This community, which exists in Pound Ridge's ponds and streams, was not investigated by the survey team.

Open-water Vegetation Species

Alisma spp., (Water Plantain)
Alnus rugosa, (Speckled Alder)
Arisaema atrorubens, (Jack in the Pulpit)
Cephalanthus occidentalis, (Buttonbush)
Cryosplenium americanum,
Elecharis spp., (Spikerush)
Eupatorium perfoliatum, (Boneset)
Hydrocotyl americana, (Water Pennywort)
Impatiens biflora, (Jewel Weed)
Leersia virginica, (Catchfly grass)
Ludwigia palustris, (Water Purslane)
Myriophyllum spp., (Water Millefoils)
Nymphaea variegatum, (Millheae Pond Lily)
Nymphaea spp., (Waterlilies)
Phragmites communis, (Phragmites)
Polygonum sagittatum, (Arrow Leafed Tear-thumb)
Polygonum spp., (Smartweed)
Pontederia cordata, (Pickereel Weed)
Potamogeton spp., (Pondweeds)
Sagittaria spp., (Arrowheads)
Sambucus canadensis, (American Elder)
Trillium erectum, (Red Trillium)
Typha latifolia, (Cattails)
Utricularia vulgaris, (Common Bladderwort)

9. Wetlands vegetation. In Pound Ridge swamp vegetation occurs in lakes that have

*dominant species

been naturally vegetated or in areas hollowed by glaciation so that the water table is at or just below the surface of the soil. Muck and peaty soil are built up by the decomposition of the vegetation. Some of the Pound Ridge wetlands have tree, shrub, and herb layers. The swamps are shaded by red maple (swamp maple), the dominant species, with associated black ash, American elm, black gum, and yellow birch also found in some of the mature swamp forests. The shrub layer in this vegetation community is dominated by sweet pepper bush and spicebush in varying proportions, with swamp azalea occurring in some spots.

The tall wetland ferns, cinnamon and interrupted, and the characteristic sensitive and royal ferns are closely associated with skunk cabbage, jewel weed, and tussock sedge. Often large tulip poplars over two feet in diameter can be found on sloping ridges surrounding swamps. It is likely that some of the largest tulip poplars survived clearing for agriculture because access was poor.

An example of a swamp forest is the extensive stretch of red maple swamp south of Mallard Lake and across Upper Shad Road. A mature complex forest with large yellow birches exists in some of the open areas of the Briarwood residential complex.

Wetlands Vegetation Species

TREE STRATUM

Trees larger than 15 feet at maturity:
Acer rubrum, (Red Maple)*
Betula allegheniensis, (Yellow Birch)
Fraxinus nigra, (Black Ash)
Liriodendron tulipifera, (Tulip Poplar)
Nyssa sylvatica, (Black Gum)
Quercus bicolor, (Swamp White Oak)
Ulmus americana, (American Elm)

SHRUB STRATUM

Woody trees smaller than 15 feet and larger than 3 feet at maturity:
Alnus spp., (Alder)
Azalea viscosum, (Swamp Azalea)
Clethra alnifolia, (Sweet Pepperbush)
Lindera benzoin, (Spicebush)

*dominant species

Lonicera spp., (Fly Honeysuckle)
Lyonia lugustrina, (Maleberry)
Viburnum dentatum, (Arrowwood)
Viburnum lentago, (Nannyberry)
Sambucus canadensis, (Common Elderberry)

HERB STRATUM

Woody or herbaceous plants smaller than 3 feet at maturity:
Arisaema atrorubens, (Jack in the Pulpit)
Caltha palustris, (Marsh Marigold)
Carex stricta, (Tussock Sedge)

Impatiens biflora, (Jewel weed)
Onoclea sensibilis, (Sensitive Fern)*
Osmunda cinnamomea, (Cinnamon Fern)*
Osmunda claytoniana, (Interrupted Fern)
Osmunda regalis, (Royal Fern)
Symplocarpus foetidus, (Skunk Cabbage)
Thalictrum polygamum, (Tall Meadow Rue)
Thelypteris palustris, (Marsh Fern)
Typha latifolia, (Cattail)
Viola spp., (Violets)

*dominant species

INVASIVE PLANT SPECIES

A list of invasive plant species is included here to add to the inventory of the plants currently found in Pound Ridge. Except for two aquatic species, information about plant communities is not indicated here. This list silently attests to observable and significant changes to plant communities since the PRUP report was published. The value of invasive plants, or the extent that these plants provide food for wildlife, shelter and nesting sites, and ecoservices such as erosion control, stands as a

controversial, understudied topic at this time. It is generally accepted that non-native plants do not support the food web as well as native plants. The harm caused by invasive plants is described later in this document.

It is worth noting that field biologists (*Hudsonia Ltd.* report 2018 p. 21) observed “while many of the forest edges of Pound Ridge had abundant invasive species, the interiors of larger stands, i.e. areas farther from forest edges, were often relatively free of invasive herbs and shrubs”.

INVASIVE PLANT SPECIES KNOWN TO OCCUR IN POUND RIDGE, NY

Primary source: iMap, February 2020

Secondary sources: sightings unreported to iMap and therefore unconfirmed

Stratum (tree, shrub, and herb strata or layers) as used in *Land Use Through Ecology* (PRUP report 1980):

Tree stratum– larger than 15 feet at maturity

Shrub stratum– smaller than 15 feet and larger than 3 feet at maturity

Herb stratum-woody or herbaceous smaller than 3 feet at maturity and most vines

STRATUM	SCIENTIFIC NAME	COMMON NAME	IMAP FEB. 2020
Herb	<i>Aegopodium podagraria</i>	Bishop's gout weed	unreported
Tree	<i>Acer palmatum</i>	Japanese maple	✓
Tree	<i>Acer platanoides</i>	Norway maple	✓
Vine	<i>Actinidia arguta</i>	Hardy kiwi	eradicated
Tree	<i>Ailanthus altissima</i>	Tree of Heaven	✓
Herb	<i>Alliaria petiolata</i>	Garlic mustard	✓
Herb	<i>Ampelopsis brevipedunculata</i>	Porcelain berry	✓
Herb	<i>Anthriscus sylvestris</i>	Wild chervil	unreported
Tree	<i>Aralia elata</i>	Japanese angelica; Devil's walking stick	✓
Herb	<i>Artemisia vulgaris var. vulgaris</i>	Mugwort	✓
Shrub	<i>Berberis thunbergii</i>	Japanese barberry	✓
Herb	<i>Cardamine hirsuite</i>	shotweed	unreported
Herb	<i>Cardamine impatiens</i>	Narrowleaf cress	✓
Tree	<i>Catalpa speciosa</i>	Catalpa tree	unreported
Vine	<i>Celastrus orbiculatus</i>	Oriental bittersweet	✓
Herb	<i>Cirsium arvense</i>	Canadian thistle	✓
Shrub	<i>Elaeagnus umbellata</i>	Autumn olive	✓
Shrub	<i>Elaeagnus</i>	Russian or Autumn olive	✓
Herb	<i>Epipactis helleborine</i>	Helleborine	✓
Shrub	<i>Euonymus alatus</i>	Winged euonymus; burning bush	✓
Herb	<i>Euonymus fortunei</i>	Wintercreeper	✓
Herb	<i>Ficaria verna ssp. Verna; Ranunculus ficaria</i>	Fig buttercup	✓

Tree	<i>Frangula alnus</i>	Glossy buckthorn	✓
Shrub	<i>Hedera helix</i>	English ivy	✓
Herb	<i>Hesperis matronalis</i>	Dame's Rocket	✓
Herb	<i>Humulus japonicus</i>	Japanese hops	✓
Shrub	<i>Ilex crenata</i>	Japanese holly	✓
Herb	<i>Iris pseudacorus</i>	Yellow flag	✓
Herb	<i>Lamium galeobdolon</i>	Yellow deadnettle	✓
Shrub	<i>Ligustrum spp. (species unknown)</i>	Privet	✓
Shrub	<i>Ligustrum vulgare</i>	Privet	✓
Shrub	<i>Lonicera japonica</i>	Japanese honeysuckle	✓
Shrub	<i>Lonicera morrowii</i>	Morrow's honeysuckle	✓
Shrub	<i>Lonicera spp (species unknown)</i>	Honeysuckle	✓
Herb	<i>Microstegium vimineum</i>	Japanese stiltgrass	✓
Tree	<i>Morus alba</i>	White mulberry	✓
Aquatic	<i>Myriophyllum spicatum</i>	Eurasian watermilfoil	✓
Herb	<i>Pachysandra terminalis</i>	Pachysandra	✓
Herb	<i>Persicaria maculosa</i>	Lady's thumb	unreported
Herb	<i>Persicaria perfoliata</i>	Mile-a-minute	✓
Shrub	<i>Photinia villosa</i>	Photinia or Christmas berry	✓
Herb	<i>Phragmites australis ssp. australis</i>	Phragmites	✓
Herb	<i>Poa compressa</i>	Canadian bluegrass	✓
Herb	<i>Poa pratensis ssp. pratensis</i>	Kentucky bluegrass	✓
Herb	<i>Polygonum cuspidatum</i>	Japanese knotweed	
Tree	<i>Populus alba</i>	Silver aspen	
Aquatic	<i>Potamogeton crispus</i>	Curly pondweed	unreported
Herb	<i>Reynoutria japonica var. japonica; Fallopia japonica var. japonica</i>	Japanese knotweed	✓
Shrub	<i>Rhodotypos scandens</i>	Black jetbead	✓
Tree	<i>Robinia pseudoacacia</i>	Black locust	✓
Shrub	<i>Rosa multiflora</i>	Multiflora rose	✓
Shrub	<i>Rubus phoenicolasius</i>	Wineberry	✓
Shrub	<i>Salix fragilis</i>	Crack willow	✓
Herb	<i>Salvia glutinosa</i>	Sticky sage	✓
Herb	<i>Solanum dulcamara</i>	Nightshade	unreported
Herb	<i>Symplocos paniculata</i>	Sapphireberry	✓
Herb	<i>Verbascum thapsus</i>	Mullein	✓
Herb	<i>Veronica officinalis</i>	Speedwell	✓
Shrub	<i>Viburnum dilatatum</i>	Linden	✓
Shrub	<i>Viburnum sieboldii</i>	Siebold	✓
Shrub	<i>Viburnum plicatum</i>	Doublefile	unreported
Herb	<i>Vincetoxicum louiseae; Cyanchum</i>	Black swallowwort	✓
Herb	<i>Vincetoxicum spp. (species unknown)</i>	Swallowwort	✓
Herb	<i>Wisteria sinensis</i>	Chinese wisteria	✓
Herb	<i>Wisteria spp. (species unknown)</i>	Wisteria	✓

HABITATS AND HABITAT DIVERSITY

WHAT IS A HABITAT?

Within Pound Ridge exist a diversity of habitats—many more than the nine plant communities in the PRUP report. In ecology, a habitat is the type of natural environment, including all living and nonliving factors or conditions of the surrounding environment, in which a particular species lives. A species' habitat includes the area where it can find food, shelter, protection, and mates for reproduction. Preserving habitats is therefore crucial to protecting species and the genomes they contain.

Understanding the concept of a habitat can be tricky. A habitat can be large or quite small, even microscopic; habitats can be nested within other habitats. An organism inhabited by parasites is as much a habitat as a grove of trees or a small pond. A grove of trees may shelter deer, fisher, opossum, mice, owls, woodpeckers as well as a

wormsnake, red spotted newt, a cecropia moth, leopard slug, Hercules beetle, and nest of termites, etc. The canopy, tree cavities, hollow logs, leaf litter, and decaying logs each provide a different kind of habitat as would a small pond with its varying depths.

Different factors influence the animals found in certain habitats. In regards to food, some animals have specific dietary preferences. Gray squirrels, seemingly ubiquitous, require the nuts of mast-producing trees such as oak and hickory. To survive, some species require pools of water too small for fish that would prey on their eggs. Four-toed salamanders lay their eggs in the sphagnum moss and tussock sedge hummocks in wetlands. For breeding and raising their young, worm-eating warblers select steep forested slopes within unfragmented upland forest. Specific needs qualify some species as specialists, in contrast to generalists, and influence an animal's habitat.

IMPACTS OF PLANTS AND ANIMALS

Habitats are dynamic places. The animals present – including humans – affect plant community composition and dynamics, and vice versa. This was true in the past as it is now. Fossils are rarely found in Pound Ridge, but the bones of a mastodon found in 1976 provide evidence that large mammals once roamed here. Interestingly, the extinction of the large mammals (megafauna) following the Pleistocene is widely believed to have been a result of human hunting pressure. In addition, the loss of the megafauna may have led to the near-disappearance of the Kentucky coffeetree (Bronaugh 2011). The digestive system of these large mammals possibly supported seed germination for plants that they ate. It seems that in order for the tough leathery seed pods to release the seeds, the pod and seeds need to pass through the digestive tract of large mammals. Without the megafauna, coffeetree populations are now limited in number and found in scattered locations throughout North America. As in the past, plants, animals, and humans interact with each other.

Present day examples of plant-animal interactions that impact habitats in Pound Ridge are (1) an over population of deer, (2) declining insect populations, and (3) increasing populations of beaver.

- White-tailed deer are widely considered to be overabundant throughout the Hudson Valley and Tri-state area, including Pound Ridge. They prefer to shelter within more dense cover and to feed along woodland edges—notably our driveways, lawns, and gardens. Development favors deer. With an abundance of food and a relatively small number of predators, deer over-browse the plants within their reach, reduce forest regrowth, and alter the forest structure. These impacts favor the spread of unpalatable native and invasive plant species, increase storm water run-off, and cause other problems. Depleting food plants and vegetative cover impacts and reduces diversity among insects, woodland birds, and small mammal populations. Another issue is the increased numbers of collisions between automobiles and deer. In Pound Ridge, a Deer Management Program was first adopted on a small-scale in 2006 with the expectation that benefits would not be apparent for 15-20 years. A report is made available annually. Since the start of the program, the total deer take has been 748 deer on Town managed hunting properties (511 female and 237 male deer). In the Final Report 2019 it was recommended that for the next 8-10 years additional data should be collected to determine deer density in Pound Ridge and the surrounding region and to assess impact on vegetation.

- Insects, what E.O. Wilson, an American biologist, naturalist, and writer and the world's leading expert in ants, calls the "little things that run the world" are declining. He is often quoted for saying, "If we were to wipe out insects alone on this planet, the rest of life and humanity with it would mostly disappear from the land. Within a few months." Lower insect populations mean less food for wildlife and a reduction in other ecosystem services such as pollination and decomposition.

Insects make up a major part of the diets of terrestrial and aquatic animals. In the woods, animals from small insects and spiders such as assassin bugs, robber flies, orb-spinning spiders, to bats, birds, frogs, toads, salamanders, snakes of all kinds, and mammals of all sizes—voles, weasels, opossums, skunks, foxes, bobcats, and martens—prey on insects and in the water, diving beetles, dragonfly nymphs, wading birds, all kinds of fishes, frogs, and turtles do the same.

Many plants are dependent on insects for pollination and even seed dispersal. These plants have developed reward systems and dedicate a huge portion of their energy to attracting insects. Beside the familiar association of bees and flowers, other examples abound: columbine flowers entice hummingbirds with color, shape, and by blooming as the birds return in the spring; the dull brown, low-lying and hidden flowers of wild ginger attract beetles; the unusual flowers of Dutchman's pipevine lure flies; and after flowering, the seeds of Bloodroot, Dutchman's breeches, and other spring ephemerals tempt ants which then redistribute the seeds to other locations.

Just as important is the work of insects, especially cockroaches, carpenter ants, termites and many beetles, plus insect relatives, in breaking down dead organic material. This process recycles needed mineral and organic material to be reused in the natural world.

- Beavers, among the largest living rodents in the world, physically alter habitats by cutting down trees, building dams, digging canals and building lodges and thus indirectly changing the distribution and abundance of other plant and animal species. With the creation of a beaver pond, the flow of water is changed from fast-moving to slow-moving. The rate of sedimentation goes up. The vegetation along with the animals associated with it changes. The beavers

VERTICAL DIVERSITY

CANOPY

Warblers
Tanagers
Owls
Peewees
Flycatchers
Chickadees
Kinglets
Hawks

MID-STORY & TRUNK

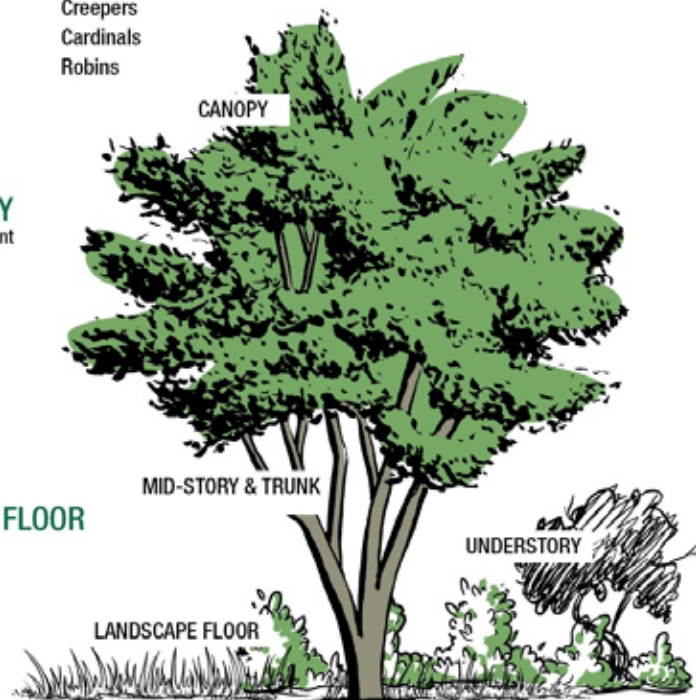
Nuthatches
Woodpeckers
Sapsuckers
Creepers
Cardinals
Robins

UNDERSTORY

(Small, shade-tolerant trees, shrubs, berry bushes)
Juncos
Hummingbirds
Sparrows
Some thrushes
Wrens
Goldfinches

LANDSCAPE FLOOR

Quail
Ovenbirds
Towhees



build with and eat trees and the composition of tree species within the area may change as they have certain preferences. American beavers give birth to one to four offspring, known as kits. The kits are usually weaned in around two weeks. At around 2 years of age, the kits leave the lodge and make one of their own. At 3 years, they find a monogamous mate. The beaver population in Pound Ridge appears to be growing and learning to co-exist with beaver may become increasingly challenging.

HABITATS OF POUND RIDGE

Within the two large-scale dominant vegetative patterns that dominate Pound Ridge: upland forest and forested wetland habitats are many different habits. In a recent study of our Town by *Hudsonia* Ltd. (*Significant Habitats in the Town of Pound Ridge, Westchester County, New York*. August 2018), the following ecologically significant habitats are identified:

UPLAND HABITATS	WETLAND HABITATS
<p>Upland forest; Hardwood Conifer Mixed Red Cedar woodland Crest/ledge/talus Non-calcareous Calcareous Rocky barren Upland shrubland Upland meadow Orchard/ Plantation Cultural</p>	<p>Swamp Hardwood swamp Mixed forest swamp Shrub swamp Intermittent woodland pool/ pool-like swamp Buttonbush Pool Marsh Wet Meadow Fen Spring/seep Constructed pond Open Water Stream (perennial & intermittent) and Riparian Corridor</p>

The 2018 *Hudsonia* study encompassed 51% of the Town. In the study area, each habitat is mapped and defined. In narrative form, broad habitat types are described by their physical characteristics related to topography, bedrock, soil and vegetation cover plus associated fauna. Maps present information about each habitat above including locations and the size of contiguous tracts in the portions of Town under study. Descriptions for each habitat include ecological attributes, occurrence within the Town, and sensitivities and impacts. A second study is underway of the remaining portion of Town and due to be completed in 2021. Unlike lists of plant species and lists of fauna, knowing where significant habitats exist and where

large tracts remain unfragmented provides a far greater knowledge base for protecting the diversity of species on those lists. Protecting habitats respects the known and unknown elements and processes inherent within a system.

LOOKING AT HABITATS

During land planning or decision-making processes, there are multiple and overlapping ways to look at habitats each with its own set of limitations.

- **By prevalence and/or size within our boundaries**

Wetlands are common in our community and it is worth spotlighting the value of wetlands. Starting with the arrival of European settlers, wetlands have had a long history of being destroyed and exploited. Once viewed as filled with disease, a barrier to travel, or useless for farming, wetlands were drained, filled-in, or transformed in other ways. Many species of concern depend upon wetlands. Wetlands provide breeding, nesting and feeding grounds and cover for waterfowl, and shore birds including migratory waterfowl and rare species such as the bald eagle, and other wildlife soon to be mentioned. In addition to habitat, wetlands provide flood and storm control by the slowing down, filtering out pollutants, absorbing, and storing water, protection and recharge of ground water resources, absorption of silt and organic matter, important nutrient source for food cycles, absorbing and storing carbon, and aesthetic and recreational value. Since 1969, Pound Ridge has had a wetlands ordinance to regulate the drainage, use, obstruction and diversion of streams, lakes, ponds, swamps and bogs and a Water Control Commission to implement its provisions.

Large tracts of intact forest areas are also prevalent in Pound Ridge. A large forested area, Ward Pound Ridge Reservation, is located in Pound Ridge and Lewisboro. The Reservation, a 4,700-acre county park, was identified by the New York State Department of Environmental Conservation (DEC) in 2000 as a Significant Biodiversity Area. In conjunction with watershed buffer areas surrounding the public water supply reservoirs and 26 preserves within Pound Ridge, these large areas of forested open space are refuge to many forms of wildlife. Contiguous tracts of forested areas, watercourses, and water bodies provide important habitat for a variety of plant and wildlife species and help to preserve plant and animal gene pools.

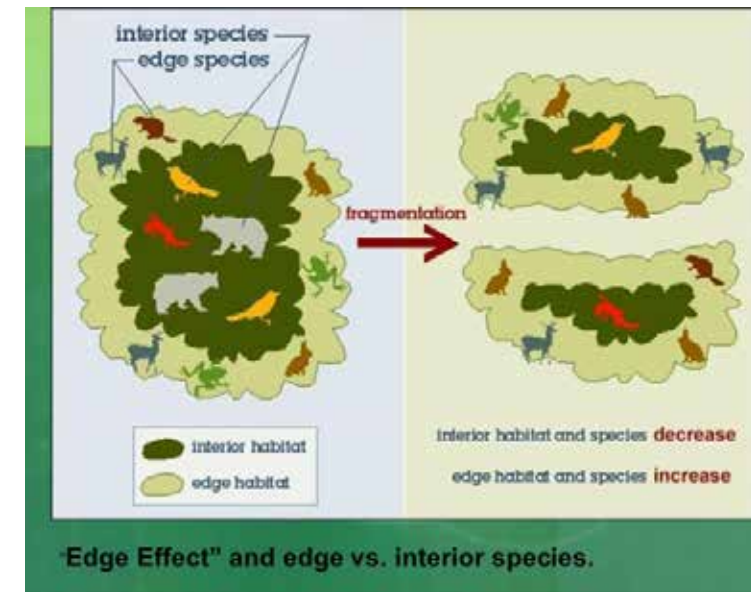
Through habitat fragmentation, large, contiguous habitats become divided into smaller, isolated patches of habitats. The causes and effects of fragmentation are numerous and not fully addressed in this document. In Pound Ridge, early habitats were fragmented by country roads and land clearing for homesteads. Overtime this increased to include further subdivision of habitats to build homes with driveways and surrounding lawns, paved roadways, utility right-of-way, and businesses with expanses for parking. Fragmentation affects biodiversity by separating plants and animals from one another and reducing the amount of suitable habitat available for some organisms. Others may benefit from an increase in the edge areas described elsewhere in this document. To a degree, the loss of natural habitat can be mitigated by development which incorporates the characteristics of nearby natural habitats and protects areas with high wildlife value.

- **By relationship or connectivity to other habitats**

With habitat fragmentation, the corridors, such as the Eastern Westchester Biotic Corridor, that connect core natural areas achieve increasing importance. These “greenways,” or corridors of open space, serve as migratory routes for wildlife and facilitate plant species migration across the landscape. This is especially important as species migrate generally northward as a response to climate change. Large unfragmented areas and the corridors that connect them should be considered in the review of development projects.

- **By particular value, such as the number of species protected within the habitat or the status of particular species (rare, threatened) or by determining wildlife value**

To begin, natural areas differ in biological importance and different kinds of impacts can diminish the biological value of a natural area. An invasive plant species, for example, may create a monoculture and significantly lower the faunal species supported in the area. One way to evaluate a natural area is by using a *Floristic Quality Assessment Index*, a tool based on ideas from Grimes C-S-R model, and *Index of Biological Integrity (IBI)* for wetlands.



SINGULAR NATURAL COMMUNITIES AND HABITATS

Two communities and habitats in Pound Ridge, Acidic Talus Slope Woodland and Fens, have been singled out as particularly significant:

Acidic Talus Slope Woodland community in multiple patches are included by *New York Natural Heritage Program* in its report for Pound Ridge (2020) as a significant natural community of a moderate size in very good condition, on the escarpment along the southern edge of Ward Pound Ridge Reservation. To be considered significant by *NY Natural Heritage* communities are viewed from a statewide perspective. In particular, this is a high-quality example of a more common community type and is considered to have high ecological and conservation value. In *Significant Habitats in the Town of Pound Ridge* by *Hudsonia* Ltd (2018) both non-calcareous (acidic) and calcareous (typically marble) crest and ledge habitats are described (p. 28-34; 83-86) and mapped as “crest/ledge/talus” (in dark gray Figure 8, p. 87. See also p.30).

Fens as a rare habitat type associated with limited distribution of carbonate bedrock, calcareous groundwater seepage, and the historic alteration of wetlands are also identified in the report by *Hudsonia*. Fens support many species of conservation concern including rare plants, invertebrates, reptiles, and breeding birds. There are several kinds of fens in New York, and most are uncommon to rare.

The following table, from the *Hudsonia* report, succinctly makes evident the relationship of several habitats in Pound Ridge to species of concern.

Table 2. Priority habitats, species of concern, and associated priority conservation zones identified by Hudsonia in the Town of Pound Ridge, Westchester County, New York, 2018.

Priority Habitat	Associated Species or Group of Concern	Priority Conservation Zone	Rationale	References
Large forest	Forest interior-breeding birds	Unfragmented patches of at least 130-200 ac (53-80 ha)	Required for high probability of supporting breeding hermit and wood thrush in a 60% forested landscape.	Rosenberg et al. 2003
Rocky barren and extensive crest/ledge/talus	Northern copperhead,* eastern ratsnake,* northern black racer*	Extensive crest/ledge/talus, and 3,300 ft (1,000 m) zone around barrens habitats	Includes habitat essential for denning, nesting, basking, foraging, and dispersal.	Fitch 1960, Todd 2000, Blouin-Demers and Weatherhead 2002
Intermittent woodland pool	Pool-breeding amphibians	750 ft (230 m) from pool.	Area of non-breeding season habitat considered critical for sustaining populations.	Madison 1997, Semlitsch 1998, Calhoun and Klemens 2002, Veysey et al. 2011
Fen	Rare plants*	entire watershed of the fen and connected wetlands	Land uses within the watershed affect the quality and quantity of surface water and groundwater feeding fen, which affect plant populations.	(none available)
Wetland complex	Spotted turtle*	Minimum upland zone of 400 ft (120 m) beyond outermost wetlands in a complex.	Corresponds to maximum reported distance of nests from the nearest wetland.	Joyal et al. 2001
Perennial stream	Wood turtle*	820 ft (250 m) from stream.	Encompasses most of the critical habitat, including hibernacula, nesting areas, spring basking sites, foraging habitat, and overland travel corridors.	Carroll and Ehrenfeld 1978, Harding and Bloomer 1979, Buech et al. 1997, Foscarini and Brooks 1997, Tingley et al. 2009

FAUNAL DIVERSITY

Today a sighting of a black bear ambling through the Town Park sparks chatter throughout town. A good photo of a bobcat or bald eagle draws admiration from friends and pops up on Facebook. This is what we like to talk about in our small town. The diverse flora and fauna of Pound Ridge contributes to our sense of place.

A WORD ABOUT INVERTEBRATES

An abundant variety of organisms without backbones—spiders, snails, slugs, insects, worms, crayfish, freshwater clams, and so much more—are found on the land, in the air, and under water throughout Pound Ridge. Doug Tallamy, Ph.D., University of Delaware, has shared with many audiences that insects are the most important group of animals that transfer energy captured by plants to other animals. As important as these animals are in the food web, most of these species are not inventoried. Two exceptions are Odonata (dragonflies and damselflies) and Lepidoptera or “Leps” (butterflies and moths). The *New York Dragonfly and Damselfly Survey* (White et al. 2010), a five-year sampling effort begun in 2005, yielded many important finds. Most notable were five species added to the list of known odonates for the state. This brings the cumulative total to 194 species, one of the highest diversities of any U.S. state. A more complete database of butterflies and moths found in Westchester County may be queried at the *Butterflies and Moths of North America* (BAMONA) website. It currently lists 385 Leps for Westchester. Rare dragonfly and butterfly species are listed on the table, *The New York Natural Heritage*

Program Report on Rare Animals, Rare Plants, and Significant Natural Communities.

INVASIVE INSECTS AND PESTS

Even though little is known about local invertebrate populations, recent changes in these populations, particularly insects, create concern here and beyond the borders of Pound Ridge. For example, insects in general and pollinators more specifically are on the decline. What this may mean in terms of natural food webs, plant reproduction, and the recycling of organic matter is unknown. At the same time, the number of introduced species (e.g. gypsy moth, jumping worms) that have become invasive is increasing. Examples of both changes are within the memories of residents living in Pound Ridge. First, many would agree with the windshield phenomenon, a term given to the anecdotal observation that people tend to find fewer insects smashed on car windshields (or on window screens and around outdoor lights after dark) now compared to a decade or so ago. This effect has been ascribed to major global declines in insect abundance. Second, many of the invasive species, such as emerald ash borer and brown marmorated stink bug, listed on the next table have become problematic recently. Others not found in Pound Ridge at this time, can be expected to be found locally in the future. The long-term impacts of this relatively short list of insects and pests on local ecology, especially the woodlands, remain unknown.

INVASIVE INSECTS AND PESTS

COMMON NAME	SCIENTIFIC NAME	OCCURRENCE
Brown marmorated stinkbug	<i>Halyomorpha halys</i>	in Pound Ridge
Lily leaf beetle	<i>Lilioceris lillii</i>	in Pound Ridge
Emerald ash borer	<i>Agrilus planipennis</i>	in Pound Ridge
Hemlock woolly adelgid	<i>Adelges tsugae</i>	In Pound Ridge
Gypsy moth	<i>Lymantria dispar</i>	In Pound Ridge
Viburnum leaf beetle	<i>Pyrrhalta viburni</i>	In Pound Ridge
Asian long-horned beetle	<i>Anoplophora glabripennis</i>	Quarantined in NY, NJ plus other states
Sirex wood wasp	<i>Sirex noctilio</i>	In NY, not reported in Pound Ridge
Southern pine beetle	<i>Dendroctonus frontalis</i>	In NY, not reported in Pound Ridge
Jumping worms	<i>Amyntas asgrestis</i> , <i>A. tokioensis</i> , <i>Metaphire hilgendorfi</i>	In Pound Ridge

A WORD ABOUT VERTEBRATES

A tremendous variety of mammals, birds, reptiles, amphibians, and fishes live in or pass through Pound Ridge. Several lists of species provided by *Great Ecology, Inc.*, *NYS DEC* (2020), and *Hudsonia Ltd.*, including lists of Rare Plants and Animals and Species of Concern, are appended to this document. These lists gathered within one document serve a purpose far greater than this brief paragraph represents. The reader is encouraged to pause here and glance at these lists. If we have entered a time of mass extinction, as many scientists argue based upon the data, the endangered or critically imperiled species are most at risk.

AT THE MICROLEVEL: GENETIC DIVERSITY

To recap, biodiversity refers to the variety of life on earth and includes ecosystems and habitats, all the different species of plants, animals, fungi and microorganisms, and the genes they contain. The document so far has captured descriptions of communities and habitats, a compilation of the many plant and animal species found in Pound Ridge, and some of the interactions that occur in ecosystems. The scope of the genetic diversity in Pound Ridge is and probably will remain less known.

A genome is an organism’s complete set of DNA, including all of its genes. Each genome contains all of the information needed to build and maintain that organism. The basic units of genetic diversity, chromosomes and genes, are passed on through the generations from parents to offspring and determine many of the characteristics of the offspring.

Genetic variations result from random pollination or mating between organisms, random fertilization of the egg, mutation, and the recombination of chromosomes during cell division (meiosis). The local variations that occur in wild populations or ‘straight species’ (a term used by gardeners to discern open pollinated plants from cultivars) can increase or decrease a species’ ability to adapt to environmental stresses such as drought, fire, and climate change, to resist diseases caused by fungi, bacteria, or viruses, or to escape being eaten by insects, birds, or other animals. For example, genetic variations in plants may lead to changes in color, scent, or taste—traits that may improve reproductive strategies (e.g. a lengthening of bloom period), attract pollinators, discourage insects and animals that eat plants, or appeal to humans and engage our support. In contrast, variations in cultivated species have been minimized.

The genetic variation that occurs within and among populations of the same species is viewed as advantageous to a population because it enables some individuals to adapt to the environment, therefore maintaining the survival of the population. It is less clear when hybridization benefits a population—or species. Hybridization occurs when two populations of distinct but closely related species come into contact and successfully mate. Some North American birds are known to hybridize. In the wild, hybridization of native species with introduced species can accelerate a decline. For example, local extirpations of native American bittersweet are attributed to hybridization with Oriental bittersweet (Steward 2003). Native red mulberry is also susceptible to loss through cross-pollination with white mulberry.

Genetic variation can be measured in a number of different ways. It is known that large parts of the genome in different animal species are very similar and other parts are different. One of the challenges for biologists is to identify which genes are important for a species to survive through evolution. Because of the intricate and deep connections of all of Earth's ecosystems and life forms, our survival is ultimately linked to the survival of other species. Therefore, assessing the loss of genetic diversity may remain unknowable.

We do know that fragmentation of habitats, and the plant and animal populations within them, threatens species' persistence on the landscape. Isolated populations lack an injection of new genes and gradually lose genetic variation and the ability to survive environmental change. Ecosystem functioning and resilience depends on a dynamic relationship within species, among species and between species and their abiotic environment, as well as the physical and chemical interactions within the environment. Among the many unknowns are the rate that climate change may proceed and how time factors in the evolutionary, adaptive processes of plants and animals. The conservation and, where appropriate, restoration of species interactions and ecosystem processes is of greater significance for the long-term maintenance of biological diversity than an attempt to protect a species in isolation.

THREATS TO BIODIVERSITY

Major threats to diversity in Pound Ridge are:

- **Habitat loss, fragmentation, and edge effect**

Small habitats such as a seasonal woodland pool can be destroyed in a short time with a bulldozer. Dams, weirs, and culverts impede the movement of gametes, larvae, and fish and contribute to the fragmentation of stream habitats. Roads are barriers or hazardous crossing sites with collisions leading to roadside mortality. Larger habitats can be fragmented by the creation of a housing development. Interspecific competition for food, safety, and places to raise offspring heighten with shrinking habitats and fragmentation. The more viable pieces of habitat taken away, the fewer species can be supported by the remaining patches. Species most effective at finding and defending those resources will survive. An example is the golden-winged warbler and its competitor, the blue-winged warbler. Both of these birds use the same types of habitat and have overlapping ranges. The blue-winged warblers are more effective at attracting mates of both species, and reproduce in greater numbers than golden-winged warblers.

Creating building lots where a woodland or meadow existed leads to edge effect. Where the proportion of habitat edges increases compared to interior areas there is more direct sunlight, higher soil and air temperatures, differences in humidity, depth of humus, increased wind exposure, and snow loads, plus increased disturbance through noise, light, and human activity. Edges create changes in habitat and in the species composition for a given area. Edges are more suitable for some species, such as deer (as previously mentioned), cowbirds, crows, raccoons and opossums, and less suitable for others such as forest songbirds and ground-nesting birds. Forest fragmentation is a major contributor to the increase in forest edge, especially in a largely forested landscape like Pound Ridge.

- **Invasive Species**

According to the *Comprehensive Wildlife Conservation Strategy for New York, Lower Hudson*, p. 296:

Second only to outright habitat destruction as a threat to the ecological health of our ecosystems and species, invasive plants spread into natural habitats often out compete and eliminate native plants. They change habitat structure, to the detriment of the native insects, birds and animals that depend on native plants for food and shelter. Invasive plants also may change fundamental ecosystem processes such as nutrient cycling, decomposition rates, soil chemistry, hydrology, frequency of wildfires, vegetation structure, natural succession, and rate of soil erosion. Invasive, non-native species are a major cause, or contributing factor, in the decline of 49% of the U.S. species federally listed as threatened or endangered. Recent research (Narango, Tallamy, and Marra 2018) found that in residential yards, where nonnative plants dominate, both insect availability and chickadee population growth declined. The results of the study demonstrate that nonnative plants reduce habitat quality for insectivorous birds and restoration of human-dominated areas should prioritize native plants to support local food webs.

- **Climate change through thermal stress and more frequent and severe weather events**

The major effects of climate change on diversity for our area (Julius et al, p. 4) are:

- Changes in life cycle patterns for some plants, with some flowering a day or two earlier per decade
 - A shift in species distribution with plants and animals moving to higher elevations and latitudes
 - Significant lengthening of the growing season in higher latitudes
 - Degradation of surface water quality due to higher temperatures, more nutrients, increased acidification, and other changes to the aquatic ecosystem
 - The full impact of climate change is unknown.
- **Other common threats to diversity include**
 - Imbalanced populations of species and changes in keystone species e.g. (1) the negative effect of deer, raccoons, fox, opossums, brown-headed cowbirds, and feral and free ranging domestic cats on other species, including birds and snakes, (2) the lack of a healthy of predatory population
 - Point and nonpoint contaminants from sewer overflows, storm water runoff and other nonpoint source discharges, atmospheric deposition of mercury, and chemical and oil spills
 - Degraded water quality by low dissolved oxygen, eutrophication, toxic contaminants, and sedimentation
 - Unethical, illegal or unregulated harvest of plants and animals for food or the pet trade

This document captures the communities, habitats, and species found in Pound Ridge and alludes to some of the complex interactions within our borders. With the combined impacts of human activity including climate change on local plant and animal populations, some species will thrive, others will not. Ecosystems will be disassembling and reassembling with changes in services and functions. As reported in the *Summary of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services* (IPBES, May 2019.), "Nature is declining globally at rates unprecedented in human history – and the rate of species extinctions is accelerating, with grave impacts on people around the world now likely." It is an empirically-based conclusion that high species diversity has a positive effect on numerous functions of ecosystems. It is unclear at this time how the loss of a single species impacts an ecosystem. Protecting

species alone is inadequate. Preserving habitats helps to protect ecosystem functions, species and genomes.

As we enter a period of great change, we must act to understand and protect local biodiversity. Public participation and input are a critical part of land use planning. It is imperative that we convey our concern to the elected and appointed officials who protect this local natural resource.

CONCLUSIONS

Property owners, Town boards and commissions, plus private organizations can and do take steps to preserve the biodiversity of Pound Ridge. Within the municipality are the Pound Ridge Town Board, Conservation Board, Planning Board, Zoning Board, Water Control Commission, Building Department, Highway and Maintenance Departments, Recreation Committee, Deer Management Program, Open Space Acquisitions Committee, Sustainability Task Force, and Energy Action Committee. With much of Ward Pound Ridge Reservation within our borders, Westchester County is an interested party. Among the private organizations dedicated to or invested in protecting our environment are the Pound Ridge Land Conservancy, the Henry Morgenthau Preserve, Mianus River Botanical Preserve, the Pound Ridge Garden Club, The Invasives Project, Pound Ridge Partnership and Pound Ridge Business Association, Aquarion Water Company, Suez, and Rockrimmon Country Club. Regional organizations, initiatives and partnerships include NYS DEC Region 3, Westchester Land Trust, Hudson-to-the-Housatonic, and the Lower Hudson Partnership in Invasive Species Management. Local schools, NYS DEC, Teatown Reservation, Pace University, and Hudsonia Ltd. provide environmental education opportunities and internships. It is due to the individual and collective efforts of many people over a long period of time that Pound Ridge remains rich in biodiversity.

Among the many efforts that should be commended and continued are:

- protection of large, continuous, undeveloped tracts
- connectivity between significant communities and habitats
- promoting conservation agreements
- direction of human uses toward least sensitive areas

- consideration of environmental concerns early in the planning process (location of the site, minimizing impervious surfaces and surface water runoff, preserving view sheds, minimizing alteration of natural features, and many others)
- construction practices to limit surface water runoff during and after construction
- protection of sensitive areas
- restoration and maintenance of buffer zones with natural vegetation to protect wetlands, streams, and water bodies
- and many other practices

The long-term benefits of these existing efforts is significant. The Town should continue its efforts to protect the environmental quality and ecological integrity of the Town's natural resources.

This document concludes with recommendations for all those in a position to protect the biodiversity of Pound Ridge as a natural resource. Each recommendation is intended to extend existing efforts to live in harmony with nature, protect the diversity of Pound Ridge, and demonstrate responsibility to the natural resources which lie inside and beyond our borders.

FOR THE HOMEOWNER

1. Know the plants on your property. For help with identification, try the App *Seek* and to keep records, try *iNaturalist*.
2. Monitor and reduce the invasive plants on your property. Watch for newcomers. The principle behind this is referred to as "early detection/rapid response". Be aware that there are look-alike species. For example, honey locust has similar leaves, inconspicuous flower, long thorns on the bark compared to black locust which has conspicuous flowers and 2 spines at base of leaf. A useful reference, *Mistaken Identity*, is made available by New York Botanical Garden. Consider invasive plants a source of biological pollution, spreading by seed into natural environments, outcompeting native species, and creating monocultures as well as possibly cross-pollinating and hybridizing with natives.

3. Research best management strategies for invasive species. Timing is often important. Minimize use of herbicides. Have plan and work your plan.
4. Ask: what value does this plant add to my property? Consider beauty, seasonal interest, intrigue, and wildlife values such as shelter and food. Two helpful online resources are *The Native Plant Finder*, hosted by National Wildlife Federation, and Illinois Wildflowers.
5. Buy and plant natives. On the Town website, the Conservation Board has posted many helpful lists of native plants. Planting native plants is a safe course of action. Avoid cultivars. Plants grown from local seed are the best, but do not dig them from the wild! For fun, collect the seed of native plants and try winter sowing them.
6. To create a naturalistic landscape: avoid planting in pairs. Use odd numbers, uneven spacing or clusters, combine areas of mass plantings with open areas, and curved borders or edges.
7. To create a formal garden with native plants: use straight borders and edges. Plant pairs at entry points.
8. Reduce the lawn. To show that you are maintaining your property, use mowing strips around garden beds of meadow plants & shrub.
9. Create a sense of care through structures (gazebo, patio, fire pit), pathways (paved or unpaved, mowed strips), and objects (birdbath, gazing ball, statue).
10. Create habitat stone walls, wood piles, evergreens for winter shelter and interests.
11. Create layers by adding transitional areas with herbaceous plants and shrubs between the lawn and woods.
12. Natural borders, hedgerows, screening plants create edge environment.
13. Start with a small native plant garden. Then try replicating it to make a large garden.
14. Other Best Management Practices:
Leave dead trees, logs and leaf litter.

Care for the soil by incorporating compost and using no till methods.

Conserve water, reduce weeding and benefit by slow-release of organic material by applying mulch.

Minimize pesticides and fertilizers. Always read the label.

Minimize use of leaf blowers. Go electric.

Support deer management programs. Utilize fenced areas, create deer exclosures and/or use tree tubes to protect native plantings.

Volunteer and learn more by helping with local efforts at our preserves, town parks, etc.

For large parcels of land, consider a conservation easement to restrict future land use and/or development on the property "in perpetuity" and simultaneously reduce taxes on the property.

FOR TOWN AGENTS

1. Periodically reference this document and existing studies of Pound Ridge habitats and diversity regarding areas where development might occur and update areas in need of protection and/or additional biodiversity assessments.
2. Continually review land use planning tools and open space acquisition plans in regards to protecting areas of high-quality habitat for species that are classified as endangered, threatened or vulnerable to extinction and connecting corridors and passages associated with these areas.
3. Evaluate the benefits to municipal agents such as Planning, Conservation, Water Control Commission and Open Space Advisory Committee of using a *Floristic Quality Assessment Index* based on ideas from Grimes C-S-R model, and/or an *Index of Biological Integrity* (IBI) for wetlands.
4. Continue to avoid the construction of buildings, roads, trails, power lines, pipelines, etc. in areas with high-quality habitat for species that are classified as endangered, threatened or vulnerable to extinction.
5. Identify smaller connecting corridors and passages, particularly in regards to high-quality habitats for

species that are classified as endangered, threatened or vulnerable to extinction.

6. Incorporate land use and planning to minimize habitat loss, fragmentation, and edge effect. For example, allow for the use of clustered subdivisions, or utilize the Conservation District overlays.
7. Consider requiring biodiversity offsets and voluntary compensatory actions.
8. Prior to construction, request the implementation of strategies (e.g. allow local naturalist to collect and relocate wildflowers, amphibians, and reptiles prior to construction; avoiding disruption during breeding and nesting seasons) to reduce the duration, intensity and extent of impacts on biodiversity and wildlife.
9. Following construction or disturbance, such as the installation of buried pipes or underground wires, require remediation and restoration of vegetation with native plants and follow-up monitoring and efforts on an annual basis for three years to ensure successful restoration of vegetative cover.
10. Continue to evaluate methods to reduce the use of road salt.
11. Amend Open Space Advisory referendum to provide for the long-term care of preserved lands through endowed funds.
12. Identify sites with high roadside mortality of amphibians and reptiles and post warning signs for motorists and encourage amphibian rescue efforts during periods of peak migration.
13. Consider height limitations and geographical placement of structures like cell phone towers, wind turbines, and large buildings that pose a serious threat to birds and bats to reduce the negative effects of these structures on wildlife.
14. Review existing culvert sizes and address undersized culverts to reduce barriers to aquatic life and flooding.
15. Adopt town policy regarding the use of native plants for landscaping and replacement plantings on town property.
16. Review tree ordinance every 10 years.

17. Assess urban forestry tree canopy in Scotts Corners and other developed areas for tree plantings every 10 years.
18. Review lighting ordinances to reduce night pollution that impacts migrating birds and insects, such as moths, that are attracted to light, and at the same time, to reduce greenhouse gas emissions.
19. Encourage ongoing study of the flora and fauna of Pound Ridge by students, naturalists and organizations such as the local garden club, conservation board and with tools such as *INaturalist* and *IMapInvasives*.
20. Regarding requests to landscape, plant or remove trees, manage invasive species, etc. on Town owned open space properties including Burial Hill, Conant Hall/ Museum, triangles or greens, and within the business district, clarify the following: who is the primary contact and secondary contact (such as the Conservation Board or building inspector), who gives final approval, plus an outline that results in a written record with copies to Town Board and Police Department.
21. Continue to educate the public about the value of native plants in the home landscape and principles of naturalistic landscape, the application of IPM strategies, the harm caused by domestic pets, night sky pollution, herbicides and pesticides, invasive plants, impermeable surfaces, underground oil tanks, failing septic systems, and storm water runoff, etc.
22. Adopt a policy regarding town properties to minimize invasive plants and increase the use of native plants.
23. Adopt a policy to minimize disturbance of wildlife during sensitive seasons such as mating, nesting, raising of young by removal of trees and mowing of meadows.

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APPENDICES

TOWN OF POUND RIDGE, NY

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LIST OF MAMMALS KNOWN TO OCCUR IN OR MIGRATE THROUGH WESTCHESTER COUNTY

SCIENTIFIC NAME	COMMON NAME	DISTRIBUTION	STATE STATUS ^A	FEDERAL STATUS ^B
<i>Didelphus virginiana</i>	North American opossum	Statewide	G	U
<i>Sorex cinereus</i>	Masked shrew	Statewide	U	U
<i>Sorex palustris</i>	Water shrew	Statewide	U	U
<i>Sorex fumeus</i>	Smoky shrew	Statewide	U	U
<i>Sorex dispar</i>	Long-tailed shrew	Statewide, except L.I.	U	U
<i>Blarina brevicauda</i>	Northern short-tailed shrew	Statewide	U	U
<i>Cryptotis parva</i>	Least shrew	S, Cent. NY	U	U
<i>Parascalops breweri</i>	Hairy-tailed mole	Statewide	U	U
<i>Scalopus aquaticus</i>	Eastern mole	SE NY	U	U
<i>Condylura cristata</i>	Star-nosed mole	Statewide	U	U
<i>Myotis lucifugus</i>	Little brown myotis	Statewide	U	U
<i>Myotis keenii</i>	Keen's myotis	Statewide	U	
<i>Myotis sodalis</i>	Indiana myotis	Statewide	E	E
<i>Myotis leibii</i>	Eastern small-footed myotis	Statewide	G	U
<i>Lasionycteris noctivagans</i>	Silver-haired bat	Statewide	U	U
<i>Pipistrellus subflavus</i>	Eastern pipistrelle	Statewide	U	U
<i>Eptesicus fuscus</i>	Big brown bat	Statewide	U	U
<i>Lasiurus borealis</i>	Red bat	Statewide	U	U
<i>Lasiurus cinereus</i>	Hoary bat	Statewide	G	U
<i>Sylvilagus floridanus</i>	Eastern cottontail	Not in NE	G	U
<i>Sylvilagus transitionalis</i>	New England cottontail	E New York	SC	U
<i>Lepus americanus</i>	Snowshoe hare	Statewide	G	U
<i>Tamias striatus</i>	Eastern chipmunk	Statewide	U	U
<i>Marmota monax</i>	Woodchuck	Statewide	G	U

SCIENTIFIC NAME	COMMON NAME	DISTRIBUTION	STATE STATUS ^A	FEDERAL STATUS ^B
<i>Ursus americanus</i>	Bear	Statewide	G	U
<i>Canis latrans</i>	Coyote	Statewide	G	U
<i>Pekania pennanti</i>	Fisher	Statewide	G	U
<i>Sciurus carolinensis</i> <i>Tamiasciurus hudsonicus</i>	Gray squirrel Red squirrel	Statewide Statewide	G U	U U
<i>Glaucomys volans</i>	Southern flying squirrel	Statewide	U	U
<i>Glaucomys sabrinus</i>	Northern flying squirrel	Statewide	U	U
<i>Castor canadensis</i>	Beaver	Statewide	G	U
<i>Peromyscus maniculatus</i>	Deer mouse	Statewide	U	U
<i>Peromyscus leucopus</i>	White-footed mouse	Statewide	U	U
<i>Neotoma floridana</i>	Eastern woodrat	Catskills and south	E	
<i>Clethrionomys gapperi</i>	Southern red-backed vole	Statewide	U	U
<i>Microtus pennsylvanicus</i>	Meadow vole	Statewide	U	U
<i>Microtus pinetorum</i>	Woodland vole	Not in ST. Lawrence Valley	U	
<i>Ondatra zibethicus</i>	Muskrat	Statewide	G	U
<i>Synaptomys cooperi</i>	Southern bog lemming	Statewide	U	U
<i>Zapus hudsonicus</i>	Meadow jumping mouse	Statewide	U	U
<i>Erethizon dorsatum</i>	Porcupine	Statewide	U	U
<i>Vulpes vulpes</i>	Red fox	Statewide	G	U
<i>Urocyon cinereoargenteus</i>	Gray fox	Statewide	G	U
<i>Procyon lotor</i>	Raccoon	Statewide	G	U
<i>Mustela ermina</i>	Ermine	Statewide	G	U
<i>Mustela frenata</i>	Long-tail weasel	Statewide	G	U
<i>Mustela vison</i>	Mink	Statewide	G	U
<i>Mephitis mephitis</i>	Striped skunk	Statewide	G	U
<i>Lynx rufus</i>	Bobcat	Statewide	G	U
<i>Odocoileus virginianus</i>	White-tailed deer	Statewide	G	U

^AE = Endangered;
^ASC = Special Concern;
^AG = Game;
^AU = Unprotected
^BU = Unprotected;
^BE = Endangered

LIST OF BIRDS KNOWN TO OCCUR IN OR MIGRATE THROUGH WESTCHESTER COUNTY

GROUP	SCIENTIFIC NAME	COMMON NAME	STATE STATUS^A	FEDERAL STATUS^B	GROUP	SCIENTIFIC NAME	COMMON NAME	STATE STATUS^A	FEDERAL STATUS^B	
American Vultures	<i>Cathartes aura</i>	Turkey vulture	G	MBTA	Finches	<i>Carduelis flammea</i>	Common redpoll	P	MBTA	
	<i>Coragyps atratus</i>	Black vulture	P	MBTA		<i>Carduelis pinus</i>	Pine siskin	P	MBTA	
Bitterns and Herons	<i>Ardea alba</i>	Great egret	P	MBTA		<i>Carduelis tristis</i>	American goldfinch	P	MBTA	
	<i>Ardea herodias</i>	Great blue heron	P	MBTA		<i>Carpodacus mexicanus</i>	House finch	P	MBTA	
	<i>Botaurus lentiginosus</i>	American bittern	SC	MBTA		<i>Carpodacus purpureus</i>	Purple finch	P	MBTA	
	<i>Butorides virescens</i>	Green heron	P	MBTA		<i>Coccothraustes vespertinus</i>	Evening grosbeak	P	MBTA	
	<i>Egretta thula</i>	Snowy egret	P			<i>Loxia curvirostra</i>	Red crossbill	P	MBTA	
	<i>Ixobrychus exilis</i>	Least bittern	T	MBTA		<i>Loxia leucoptera</i>	White-winged crossbill	P	MBTA	
	<i>Nyctanassa violacea</i>	Yellow-crowned night-heron	P	MBTA		<i>Pinicola enucleator</i>	Pine grosbeak	P	MBTA	
	<i>Nycticorax nycticorax</i>	Black-crowned night-heron	P	MBTA		Goatsuckers	<i>Caprimulgus vociferus</i>	Whip-poor-will	SC	MBTA
					<i>Chordeiles minor</i>		Common nighthawk	SC	MBTA	
Blackbirds and Orioles	<i>Agelaius phoeniceus</i>	Red-winged blackbird	P	MBTA	Grouse, Turkeys, and Quails	<i>Bonasa umbellus</i>	Ruffed grouse			
	<i>Dolichonyx oryzivorus</i>	Bobolink	G	MBTA		<i>Colinus virginianus</i>	Northern bobwhite			
	<i>Euphagus carolinus</i>	Rusty blackbird	P	MBTA		<i>Meleagris gallopavo</i>	Wild turkey			
	<i>Icterus galbula</i>	Baltimore oriole	P	MBTA	<i>Phasianus colchicus</i>	Ring-necked pheasant				
	<i>Icterus spurius</i>	Orchard oriole	P	MBTA	Gulls	<i>Larus delawarensis</i>	Ring-billed gull	P	MBTA	
	<i>Molothrus ater</i>	Brown-headed cowbird	P	MBTA		<i>Larus thayeri</i>	Herring gull	P	MBTA	
	<i>Quiscalus quiscula</i>	Common grackle	P	MBTA	Hummingbirds	<i>Archilochus colubris</i>	Ruby-throated hummingbird	P	MBTA	
	<i>Sturnella magna</i>	Eastern meadowlark	P	MBTA		<i>Corvus brachyrhynchos</i>	American crow	G	MBTA	
	<i>Molothrus ater</i>	Brown-headed cowbird	P	MBTA	<i>Corvus ossifragus</i>	Fish crow	G	MBTA		
	<i>Quiscalus quiscula</i>	Common grackle	P	MBTA	<i>Cyanocitta cristata</i>	Blue jay	G	MBTA		
	<i>Sturnella magna</i>	Eastern meadowlark	P	MBTA	Kingfishers	<i>Ceryle alcyon</i>	Belted kingfisher	P	MBTA	
	Cardinals, Grosbeaks, and Buntings	<i>Cardinalis cardinalis</i>	Northern cardinal	P		MBTA	Kinglets and Thrushes	<i>Catharus fuscescens</i>	Veery	P
		<i>Guiraca caerulea</i>	Blue grosbeak	P	MBTA	<i>Catharus guttatus</i>		Hermit thrush	P	MBTA
<i>Passerina cyanea</i>		Indigo bunting	P	MBTA	<i>Catharus minimus</i>	Gray-cheeked thrush		P	MBTA	
<i>Pheucticus ludovicianus</i>		Rose-breasted grosbeak	P	MBTA	<i>Catharus ustulatus</i>	Swainson's thrush		P	MBTA	
Chickadees and Titmice	<i>Baeolophus bicolor</i>	Tufted titmouse	G	MBTA	<i>Hylocichla mustelina</i>	Wood thrush		P	MBTA	
	<i>Poecile atricapillus</i>	Black-capped chickadee	P	MBTA	<i>Polioptila caerulea</i>	Blue-gray gnatcatcher		G	MBTA	
Creepers	<i>Sitta pusilla</i>	Brown creeper	G	MBTA	<i>Regulus calendula</i>	Ruby-crowned kinglet		P	MBTA	
Cuckoos	<i>Coccyzus americanus</i>	Yellow-billed cuckoo	P	MBTA	<i>Regulus satrapa</i>	Golden-crowned kinglet		P	MBTA	
	<i>Coccyzus erythrophthalmus</i>	Black-billed cuckoo	P	MBTA	<i>Sialia sialis</i>	Eastern bluebird	G	MBTA		
Falcons	<i>Falco columbarius</i>	Merlin	P	MBTA	<i>Turdus migratorius</i>	American robin	P	MBTA		
	<i>Falco peregrinus</i>	Peregrine falcon	E	MBTA						
	<i>Falco sparverius</i>	American kestrel	G	MBTA						

GROUP	SCIENTIFIC NAME	COMMON NAME	STATE STATUS ^A	FEDERAL STATUS ^B	GROUP	SCIENTIFIC NAME	COMMON NAME	STATE STATUS ^A	FEDERAL STATUS ^B
Kites, Eagles, and Hawks	<i>Accipiter cooperii</i>	Cooper's hawk	SC	MBTA	Starlings	<i>Sturnus vulgaris</i>	European starling	U	U
	<i>Accipiter gentilis</i>	Northern goshawk	SC	MBTA	Swallows	<i>Hirundo rustica</i>	Barn swallow	P	MBTA
	<i>Accipiter striatus</i>	Sharp-shinned hawk	SC	MBTA		<i>Progne subis</i>	Purple martin	P	MBTA
	<i>Buteo jamaicensis</i>	Red-tailed hawk	P	MBTA		<i>Stelgidopteryx serripennis</i>	Rough-winged swallow	P	MBTA
	<i>Buteo lagopus</i>	Rough-legged hawk	G	MBTA		<i>Tachycineta bicolor</i>	Tree swallow	P	MBTA
	<i>Buteo lineatus</i>	Red-shouldered hawk	SC	MBTA	Swans, Geese, and Ducks	<i>Aix sponsa</i>	Wood duck	SC	MBTA
	<i>Buteo platypterus</i>	Broad-winged hawk	P	MBTA		<i>Anas acuta</i>	Northern pintail	G	MBTA
	<i>Circus cyaneus</i>	Northern harrier	T	MBTA		<i>Anas americana</i>	American wigeon	G	MBTA
	<i>Haliaeetus leucocephalus</i>	Bald eagle	T	MBTA		<i>Anas clypeata</i>	Northern shoveler	G	MBTA
<i>Pandion haliaetus</i>	Osprey	SC	MBTA	<i>Anas crecca</i>		Green-winged teal	G	MBTA	
Larks	<i>Eremophila alpestris</i>	Horned lark	SC	MBTA		<i>Anas discors</i>	Blue-winged teal	SC	MBTA
	<i>Sitta canadensis</i>	Red-breasted nuthatch	P	MBTA		<i>Anas penelope</i>	Eurasian wigeon	G	MBTA
Nuthatches	<i>Sitta carolinensis</i>	White-breasted nuthatch	P	MBTA		<i>Anas platyrhynchos</i>	Mallard	SC	MBTA
	<i>Passer domesticus</i>	House sparrow	U	U		<i>Anas rubripes</i>	American black duck	SC	MBTA
Owls	<i>A. acadicus</i>	Northern saw-whet owl	P	MBTA		<i>Anas strepera</i>	Gadwall	G	MBTA
	<i>Asio flammeus</i>	Short-eared owl	E	MBTA	<i>Aythya affinis</i>	Lesser scaup	G	MBTA	
	<i>Asio otus</i>	Long-eared owl	P	MBTA	<i>Aythya americana</i>	Redhead	G	MBTA	
	<i>Bubo virginianus</i>	Great horned owl	P	MBTA	<i>Aythya collaris</i>	Ring-necked duck	G	MBTA	
	<i>Otus asio</i>	Eastern screech-owl	P	MBTA	<i>Aythya fuligula</i>	Tufted duck			
	<i>Strix varia</i>	Barred owl	P	MBTA	<i>Aythya marila</i>	Greater scaup	G	MBTA	
	<i>Tyto alba</i>	Barn owl	G	MBTA	<i>Aythya valisneria</i>	Canvasback	SC	MBTA	
	<i>Columba livia</i>	Rock dove	U	U	<i>Branta canadensis</i>	Canada goose	G	MBTA	
Pigeons and Doves	<i>Zenaidura macroura</i>	Mourning dove	P	MBTA	<i>Lophodytes cucullatus</i>	Hooded merganser	SC	MBTA	
Pipits	<i>Anthus rubescens</i>	American pipit	P	MBTA	<i>Mergus merganser</i>	Common merganser	G	MBTA	
Plovers	<i>Charadrius vociferus</i>	Killdeer	G	MBTA	<i>Mergus serrator</i>	Red-breasted merganser	G	MBTA	
Rails, Gallinules, and Coots	<i>Fulica americana</i>	American coot	G	MBTA	<i>Oxyura jamaicensis</i>	Ruddy duck	G	MBTA	
Coots	<i>Porzana carolina</i>	Sora	G	MBTA	Tanagers	<i>Piranga olivacea</i>	Scarlet tanager	G	MBTA
	<i>Rallus elegans</i>	King rail	T	MBTA		<i>Piranga rubra</i>	Summer tanager	G	MBTA
	<i>Rallus limicola</i>	Virginia rail	G	MBTA	Thrashers	<i>Dumetella carolinensis</i>	Gray catbird	P	MBTA
Sandpipers	<i>Actitis macularia</i>	Spotted sandpiper	G	MBTA		<i>Mimus polyglottos</i>	Northern mockingbird	P	MBTA
	<i>Bartramia longicauda</i>	Upland sandpiper	T	MBTA		<i>Toxostoma rufum</i>	Brown thrasher	P	MBTA
	<i>Gallinago gallinago</i>	Common snipe	G	MBTA	Towhees, Sparrows, and Longspurs	<i>Junco hyemalis</i>	Dark-eyed junco	P	MBTA
	<i>Scolopax minor</i>	American woodcock	G	MBTA					
Shrikes	<i>Lanius excubitor</i>	Northern shrike	P	MBTA					
	<i>Lanus ludovicianus</i>	Loggerhead shrike	E	MBTA					

GROUP	SCIENTIFIC NAME	COMMON NAME	STATE STATUS ^A	FEDERAL STATUS ^B	GROUP	SCIENTIFIC NAME	COMMON NAME	STATE STATUS ^A	FEDERAL STATUS ^B
Towhees, Sparrows, and Longspurs	<i>Melospiza georgiana</i>	Swamp sparrow	P	MBTA	Wood Warblers	<i>Dendroica caerulescens</i>	Black-throated blue warbler	P	MBTA
	<i>Melospiza lincolni</i>	Lincoln's sparrow	P	MBTA		<i>Dendroica castanea</i>	Bay-breasted warbler	P	MBTA
	<i>Melospiza melodia</i>	Song sparrow	P	MBTA		<i>Dendroica cerulea</i>	Cerulean warbler	SC	MBTA
	<i>Passerella iliaca</i>	Fox sparrow	P	MBTA		<i>Dendroica coronata</i>	Yellow-rumped warbler	P	MBTA
	<i>Pipilo erythrophthalmus</i>	Eastern towhee	P	MBTA		<i>Dendroica discolor</i>	Prairie warbler	P	MBTA
	<i>Poocetes gramineus</i>	Vesper sparrow	SC	MBTA		<i>Dendroica dominica</i>	Yellow-throated warbler	P	MBTA
	<i>Spizella arborea</i>	American tree sparrow	P	MBTA		<i>Dendroica fusca</i>	Blackburnian warbler	P	MBTA
	<i>Spizella pallida</i>	Clay-colored sparrow	P	MBTA		<i>Dendroica magnolia</i>	Magnolia warbler	P	MBTA
	<i>Spizella passerina</i>	Chipping sparrow	P	MBTA		<i>Dendroica nigrescens</i>	Black-throated green warbler	P	MBTA
	<i>Spizella pusilla</i>	Field sparrow	G	MBTA		<i>Dendroica palmarum</i>	Palm warbler	P	MBTA
	<i>Zonotrichia albicollis</i>	White-throated sparrow	P	MBTA		<i>Dendroica pensylvanica</i>	Chesnut-sided warbler	P	MBTA
	<i>Zonotrichia leucophrys</i>	White-crowned sparrow	G	MBTA		<i>Dendroica petechia</i>	Yellow warbler	P	MBTA
	Tyrant Flycatchers	<i>Contopus cooperi</i>	Olive-sided flycatcher	P		MBTA	<i>Dendroica pinus</i>	Pine warbler	P
<i>Contopus virens</i>		Eastern wood-pewee	P	MBTA	<i>Dendroica striata</i>	Blackpoll warbler	P	MBTA	
<i>Empidonax alnorum</i>		Alder flycatcher	P	MBTA	<i>Dendroica tigrina</i>	Cape May warbler	P	MBTA	
<i>Empidonax flaviventris</i>		Yellow-bellied flycatcher	P	MBTA	<i>Geothlypis formosa</i>	Kentucky warbler	P	MBTA	
<i>Empidonax minimus</i>		Least flycatcher	P	MBTA	<i>Geothlypis trichas</i>	Common yellowthroat	P	MBTA	
<i>Empidonax traillii</i>		Willow flycatcher	P	MBTA	<i>Helmitheros vermivorus</i>	Worm-eating warbler	P	MBTA	
<i>Empidonax virescens</i>		Acadian flycatcher	P	MBTA	<i>Icteria virens</i>	Yellow-breasted chat	SC	MBTA	
<i>Myiarchus crinitus</i>		Great crested flycatcher	P	MBTA	<i>Mniotilta varia</i>	Black-and-white warbler	P	MBTA	
<i>Sayornis phoebe</i>		Eastern phoebe	P	MBTA	<i>Oporornis agilis</i>	Connecticut warbler	P	MBTA	
<i>Tyrannus tyrannus</i>		Eastern kingbird	P	MBTA	<i>Oporornis formosus</i>	Kentucky warbler	P	MBTA	
Vireos	<i>Vireo flavifrons</i>	Yellow-throated vireo	P	MBTA	<i>Oporornis philadelphia</i>	Mourning warbler	P	MBTA	
	<i>Vireo gilvus</i>	Warbling vireo	P	MBTA	<i>Parula americana</i>	Northern parula	P	MBTA	
	<i>Vireo griseus</i>	White-eyed vireo	G	MBTA	<i>Protonotaria citrea</i>	Prothonotary warbler	P	MBTA	
	<i>Vireo olivaceus</i>	Red-eyed vireo	P	MBTA	<i>Seiurus aurocapillus</i>	Ovenbird	P	MBTA	
	<i>Vireo philadelphicus</i>	Philadelphia vireo	P	MBTA	<i>Seiurus motacilla</i>	Louisiana waterthrush	P	MBTA	
	<i>Vireo solitarius</i>	Solitary vireo	P	MBTA	<i>Seiurus noveboracensis</i>	Northern waterthrush	P	MBTA	
Waxwings	<i>Bombycilla cedrorum</i>	Cedar waxwing	P	MBTA	<i>Setophaga ruticilla</i>	American redstart	P	MBTA	
	<i>Bombycilla garrulus</i>	Bohemian waxwing	P	MBTA	<i>Vermivora celata</i>	Orange-crowned warbler	P	MBTA	
					<i>Vermivora chrysoptera</i>	Golden-winged warbler	SC	MBTA	
					<i>Vermivora peregrina</i>	Tennessee warbler	P	MBTA	
					<i>Vermivora pinus</i>	Blue-winged warbler	G	MBTA	
					<i>Vermivora ruficapilla</i>	Nashville warbler	P	MBTA	
					<i>Wilsonia canadensis</i>	Canada warbler	G	MBTA	
					<i>Wilsonia citrina</i>	Hooded warbler	P	MBTA	
					<i>Wilsonia pusilla</i>	Wilson's warbler	G	MBTA	

GROUP	SCIENTIFIC NAME	COMMON NAME	STATE STATUS ^A	FEDERAL STATUS ^B
Woodpeckers	<i>Colaptes auratus</i>	Northern flicker	P	MBTA
	<i>Dryocopus pileatus</i>	Pileated Woodpecker	P	MBTA
	<i>Melanerpes carolinus</i>	Red-bellied woodpecker	P	MBTA
	<i>Melanerpes erythrocephalus</i>	Red-headed woodpecker	SC	MBTA
	<i>Picoides pubescens</i>	Downy woodpecker	P	MBTA
	<i>Picoides villosus</i>	Hairy woodpecker	P	MBTA
	<i>Sphyrapicus varius</i>	Yellow-bellied sapsucker	P	MBTA
	<i>Cistothorus palustris</i>	Marsh wren	P	MBTA
	<i>Cistothorus platensis</i>	Sedge wren	T	MBTA
Wrens	<i>Thryothorus ludovicianus</i>	Carolina wren	P	MBTA
	<i>Troglodytes aedon</i>	House wren	P	MBTA
	<i>Troglodytes troglodytes</i>	Winter wren	P	MBTA

***T = Threatened**
P = Protected
SC = Special Concern
G = Game
***MBTA = Migratory Bird Treaty Act**
U = Unprotected

Group	Scientific Name	Common Name	Distribution	State Status ^A	Federal Status ^B
Snakes	<i>Agkistrodon contortrix mokasen</i>	Northern copperhead	SE; except LI	U	U
	<i>Carphophis amoenus</i>	Eastern worm snake	SE	SC	U
	<i>Coluber constrictor constrictor</i>	Northern black racer	SE	U	U
	<i>Diadophis punctatus edwardsii</i>	Northern ringneck snake	Statewide	U	U
	<i>Elaphe obsoleta obsoleta</i>	Black rat snake	central, SE; except LI	U	U
	<i>Heterodon platirhinos</i>	Eastern hognose snake	SE	SC	U
	<i>Lampropeltis triangulum triangulum</i>	Eastern milk snake	Statewide	U	U
	<i>Nerodia sipedon sipedon</i>	Northern water snake	Statewide	U	U
	<i>Storeria dekayi dekayi</i>	Northern brown snake	Statewide	U	U
	<i>Thamnophis sauritus</i>	Eastern ribbon snake	Statewide	U	U
	<i>Thamnophis sirtalis</i>	Common garter snake	Statewide	U	U
	Toads and Frogs	<i>Bufo americanus americanus</i>	Eastern American toad	Statewide	G
<i>Bufo fowleri</i>		Fowler's toad	SE, LI	G	U
<i>Hyla versicolor</i>		Gray treefrog	Statewide	G	U
<i>Pseudacris crucifer crucifer</i>		Northern spring peeper	Statewide	G	U
<i>Rana catesbeiana</i>		Bullfrog	Statewide	G	U
<i>Rana clamitans melanota</i>		Green frog	Statewide	G	U
<i>Rana palustris</i>		Pickrel frog	Statewide	G	U
<i>Rana pipiens</i>		Northern leopard frog	Statewide; except LI	G	U
<i>Rana sylvatica</i>		Wood frog	Statewide	G	U
Turtles		<i>Chelydra serpentina serpentina</i>	Common snapping turtle	Statewide	U
	<i>Chrysemys picta</i>	Painted turtle	Statewide	U	U
	<i>Clemmys guttata</i>	Spotted turtle	central, SE	SC	U
	<i>Clemmys insculpta</i>	Wood turtle	Statewide; except LI	SC	U
	<i>Glyptemys muhlenbergii</i>	Bog turtle	SE	E	T
	<i>Sternotherus odoratus</i>	Common musk turtle	central, SE	U	U
	<i>Terrapene carolina carolina</i>	Eastern box turtle	south, SE	SC	U

***T = Threatened;**
SC = Special Concern;
G = Game;
U = Unprotected
***U = Unprotected;**
E = Endangered

LIST OF REPTILES AND AMPHIBIANS KNOWN TO OCCUR IN OR MIGRATE THROUGH WESTCHESTER COUNTY

Group	Scientific Name	Common Name	Distribution	State Status ^A	Federal Status ^B
Lizards	<i>Sceloporus undulatus</i>	Northern fence lizard	Statewide		
	<i>hyacinthinus</i>			T	U
Salamanders	<i>Ambystoma maculatum</i>	Spotted salamander	Statewide	U	U
	<i>Ambystoma opacum</i>	Marbled salamander	SE; LI	U	U
	<i>Desmognathus fuscus</i>	Northern dusky salamander	Statewide; except LI	U	U
	<i>Eurycea bislineata</i>	Northern two-lined salamander	Statewide	U	U
	<i>Hemidactylium scutatum</i>	Four-toed salamander	Spotty	U	U
	<i>Notophthalmus viridescens viridescens</i>	Red-spotted newt	Statewide	U	U
	<i>Plethodon cinereus cinereus</i>	Northern redback salamander	Statewide	U	U



NYSDEC SPECIES RECORDS OF FISHES FOR THE TOWN OF POUND RIDGE (2020)

FAMILY	SCIENTIFIC	COMMON NAME	NYS STATUS
Catfish	<i>Ictalurus nebulus</i>	Brown Bullhead	
Eel	<i>Anguilla rostrata</i>	American Eel	SGCN - HP
Minnow	<i>Carassius auratus*</i>	Goldfish	
	<i>Cyprinus carpio*</i>	Common Carp	
	<i>Notropis cornutus</i>	Common Shiner	
	<i>Semotilus atromaculatus</i>	Creek Chub	
	<i>Exoglossum maxillingua</i>	Cutlip Minnow	
	<i>Rhinichthys atratulus</i>	Eastern Blacknose Dace	
	<i>Semotilus corporalis</i>	Fallfish	
	<i>Notemigonus crysoleucas</i>	Golden Shiner	
	<i>Rhinichthys cataractae</i>	Longnose Dace	
	<i>Notropis hudsonius</i>	Spotfin Shiner	
Perch	<i>Etheostoma olmstedii</i>	Tessellated Darter	
	<i>Perc flavascens</i>	Yellow Perch	
Pike	<i>Esox niger</i>	Chain Pickerel	
	<i>Esox americanus</i>	Redfin Pickerel	
Sucker	<i>Emimyzon oblongus</i>	Eastern Creek Chubsucker	
	<i>Catostomus commersoni</i>	White Sucker	
Sunfish	<i>Lepomis macrochirus*</i>	Bluegill	
	<i>Micropterus salmoides*</i>	Largemouth Bass	
	<i>Lepomis gibbosus</i>	Pumpkinseed	
	<i>Lepomis auritus</i>	Yellowbelly or Redbreast Sunfish	
	<i>Ambloplites rupestris</i>	Rock Bass	
Trout	<i>Micropterus dolomieu*</i>	Smallmouth Bass	
	<i>Salvelinus fontinalis</i>	Brook Trout	SGCN
	<i>Salmo trutta*</i>	Brown Trout	
	<i>Salmo gairdneri*</i>	Rainbow Trout	

* non- native species

SGCN- Species of Greatest Conservation Need

HP-High priority



LIST OF RARE PLANTS AND ANIMALS

New York Natural Heritage Program

Excerpted from Report on Rare Animals, Rare Plants, and Significant Natural Communities

Town of Pound Ridge January, 2020

The New York Natural Heritage Program facilitates conservation of the State's bio-diversity by providing comprehensive information and expertise on rare species and natural ecosystems. This program is a partnership between the NYSDEC and State University of New York College of Environmental Science and Forestry. The information provided by the program helps protect and conserve rare animals, rare plants and natural ecosystems.

The following rare plants, rare animals, and significant natural communities** have been documented in the Natural Heritage database for the

TOWN OF POUND RIDGE, NY

January, 2020

	COMMON NAME	SCIENTIFIC NAME	NY STATE LISTING	NY STATE RANK
Reptile	Bog Turtle	<i>Glyptemys</i>	Endangered and	S2
		<i>muhlenbergii</i>	Federally Listed as Threatened	
	Eastern Wormsnake	<i>Carphophis amoenus</i>	Special Concern	S2
Birds	Kentucky Warbler	<i>Geothlypis formosa</i>	Unlisted	S2B
Dragonflies	Tiger Spiketail	<i>Cordulegaster erronea</i>	Unlisted	S1
	Arrowhead Spiketail	<i>Cordulegaster obliqua</i>	Unlisted	S3
	Mocha Emerald	<i>Somatochlora linearis</i>	Unlisted	S2S3
	New England Bluet	<i>Enallagma laterale</i>	Unlisted	S3
Butterflies	Northern Oak	<i>Satyrrium favonius</i>	Unlisted	S2S4
	Hairstreak	<i>ontario</i>		
Plants	Rattlebox	<i>Crotalaria sagittalis</i>	Endangered	S1
	Stiff Flat-topped Goldenrod	<i>Solidago rigida var. rigida</i>	Threatened	S2
	Southern Wood Violet	<i>Viola hirsutula</i>	Endangered	SH
	Large Twayblade	<i>Liparis liliifolia</i>	Endangered	S1
	Purple Milkweed	<i>Asclepias purpurascens</i>	Threatened	S2S3
	Featherfoil	<i>Hottonia inflata</i>	Threatened	S2

* Conservation status in NYS as ranked by NY Natural Heritage Program on a 1 to 5 scale:

S1 = Critically imperiled S2 = Imperiled S3 = Rare or uncommon S4 = Abundant and apparently secure

S5 = Demonstrably abundant and secure SH = Historical records only; not seen in New York State since before 1980.

This report only includes records from the NY Natural Heritage databases. For most sites, comprehensive field surveys have not been conducted, and we cannot provide a definitive statement as to the presence or absence of all rare or state-listed species. This information should not be substituted for on-site surveys that may be required for environmental impact assessment. Information regarding completing an Environmental Assessment Form, for project site screening, or other activities is available on their website.

New York Natural Heritage Program SUNY College of Environmental Science and Forestry

In partnership with NYS Department of Environmental Conservation

625 Broadway, Albany, NY 12233-4757, (518) 402-8935, NaturalHeritage@dec.ny.gov

A Rare Species Reporting Form can be found on the NY Natural Heritage Program website.

SPECIES OF CONCERN IN POUND RIDGE

Data derived from field surveys and fieldwork and published in Miller, N. A. and M. W. Klemens. 2002. *Eastern Westchester Biotic Corridor*. MCA Technical Paper Series; No. 4, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, New York. (p.10)

Table 1. Species of conservation concern observed in Pound Ridge*

Mammals	Reptiles and Amphibians	Birds
River Otter	Black Rat Snake	American Redstart
Bobcat	Bog Turtle	American Woodcock
	Eastern Box Turtle	Baltimore Oriole
	Eastern Hognose Snake	Barred Owl
	Eastern Ribbon Snake	Black-and-white Warbler
	Eastern Worm Snake	Black-throated Blue Warbler
	Four-toed Salamander	Black-throated Green Warbler
	Fowlers Toad	Blue-gray Gnatcatcher
	Gray Treefrog	Bobolink
	Marbled Salamander	Brown Thrasher
	Northern Black Racer	Canada Warbler
	Northern Copperhead	Cerulean Warbler
	Northern Dusky Salamander	Eastern Bluebird
	Spotted Salamander	Eastern Kingbird
	Spotted Turtle	Eastern Towhee
	Wood Frog	Eastern Wood-pewee
	Wood Turtle	Indigo Bunting
		Ovenbird
		Pileated Woodpecker
		Rose-breasted Grosbeak
		Scarlet Tanager
		Veery
		Warbling Vireo
		Wood Thrush
		Worm-eating Warbler
		Yellow-billed Cuckoo
		Yellow-throated Vireo

*Data derived from two sources: (1) MCA field surveys and (2) other fieldwork conducted by Michael W. Klemens.

SPECIES OF CONCERN

Significant Habitats in the Town of Pound Ridge (Aug. 2018) Hudsonia Ltd. (Appendix C)

Species of conservation concern potentially associated with habitats in the Town of Pound Ridge. These are not comprehensive lists, but merely a sample of the species of conservation concern known to use these habitats in the region. The letter codes given with each species name denote its conservation status. Codes include **New York State ranks** (E, T, R, SC), **New York Natural Heritage Program ranks** (S1, S2, S3), **NYSDEC Species of Greatest Conservation Need** (SGCN) and **Hudsonia's regional ranks** (RG). For birds, we also indicate those species listed by **Partners in Flight** as **high conservation priorities** at the continental (PIF1) and regional (PIF2) level. These ranks are explained in Appendix B.

UPLAND HARDWOOD FOREST		
Plants	Vertebrates (cont.)	Vertebrates (cont.)
ambiguous sedge (E, S3)	marbled salamander (SC, S3, SGCN)	Acadian flycatcher (PIF2, S3)
red pinesap (S3?, RG)	four-toed salamander (RG)	wood thrush (PIF1, SGCN)
silvery spleenwort (RG)	eastern box turtle (SC, S3, SGCN ^{HP})	cerulean warbler (SC, PIF1, S3?B, SGCN)
American ginseng (S3S4)	eastern worm snake (SC, S2, SGCN)	Canada warbler (PIF1, SGCN ^{HP})
red baneberry (RG)	northern black racer (SGCN)	Kentucky warbler (S2, PIF1, SGCN ^{HP})
poke milkweed (RG)	eastern ratsnake (SGCN)	black-and-white warbler (PIF2)
lopseed (RG)	northern goshawk (SC, S3S4B, S3N, SGCN)	black-throated green warbler (RG)
winter grape (E, S1)	red-shouldered hawk (SC, S4B, SGCN)	worm-eating warbler (PIF2, SGCN)
leatherwood (RG)	Cooper's hawk (SC, S4)	hooded warbler (PIF2, RG)
black cohosh (RG)	sharp-shinned hawk (SC, S4)	ovenbird (RG)
Vertebrates	broad-winged hawk (PIF2, RG)	scarlet tanager (PIF2, SGCN)
wood frog (RG)	ruffed grouse (SGCN)	northern long-eared bat (T, S1, SGCN)
spotted salamander (RG)	American woodcock (SGCN)	black bear (RG)
Jefferson salamander (SC)	whip-poor-will (SC, PIF1, S3, SGCN ^{HP})	bobcat (RG)
blue-spotted salamander (SC, SGCN ^{HP})	eastern wood-pewee (PIF2)	New England cottontail (SC, S1S2, SGCN ^{HP})
		fisher (RG)
UPLAND CONIFER FOREST		
Plants	Vertebrates (cont.)	Vertebrates (cont.)
red pinesap (S3?, RG)	Cooper's hawk (SC, S4)	red-breasted nuthatch (RG)
common rattlebox (S1,E)	sharp-shinned hawk (SC, S4)	black-throated green warbler (RG)
Vertebrates	American woodcock (SGCN)	purple finch (RG)
blue-spotted salamander (SC, SGCN ^{HP})		
RED CEDAR WOODLAND		
Plants	Vertebrates	Vertebrates (cont.)
yellow wild flax (T, S2)	wood turtle (SC, S3, SGCN ^{HP})	eastern bluebird (RG)
whorled milkweed (R, S3)	eastern box turtle (SC, S3, SGCN ^{HP})	brown thrasher (PIF2, S3S4B, SGCN ^{HP})
butterflyweed (RG)	eastern hognose snake (SC, S3, SGCN ^{HP})	golden-winged warbler (SC, PIF1, S3, SGCN ^{HP})
Invertebrates	ruffed grouse (SGCN)	blue-winged warbler (PIF2, SGCN)
olive hairstreak (butterfly) (RG)	black-billed cuckoo (PIF1, SGCN)	eastern towhee (PIF2)
spotted turtle (SC, S3, SGCN ^{HP})	whip-poor-will (SC, PIF1, S3, SGCN ^{HP})	
NON-CALCAREOUS CREST/LEDGE/TALUS		
Plants	Invertebrates (cont.)	Vertebrates (cont.)
Bicknell's sedge (R, S3)	olive hairstreak (butterfly) (RG)	eastern hognose snake (SC, S3, SGCN ^{HP})
clustered sedge (T, S2S3)	northern hairstreak (butterfly) (S2S4, SGCN)	northern copperhead (S3, SGCN)
reflexed sedge (T, S2S3)	gray hairstreak (butterfly) (RG)	turkey vulture (RG)

NON-CALCAREOUS CREST/LEDGE/TALUS (cont.)

blunt-leaf milkweed (RG)	Invertebrates (cont.)	Vertebrates (cont.)
rock sandwort (RG)	Horace's duskywing (butterfly) (RG)	whip-poor-will (SC, PIF1, S3, SGCN ^{HP})
goat's-rue (RG)	swarthy skipper (butterfly) (RG)	black vulture (RG)
slender knotweed (R, S3)	Leonard's skipper (butterfly) (RG)	common raven (RG)
dittany (RG)	Vertebrates	winter wren (RG)
Torrey's mountain-mint (E, S1)	Fowler's toad (SGCN)	eastern bluebird (RG)
stiff-leaved aster (RG)	northern slimy salamander (RG)	cerulean warbler (SC, PIF1, S3?B, SGCN)
Invertebrates	marbled salamander (SC, S3, SGCN)	worm-eating warbler (PIF2, SGCN)
Edward's hairstreak (butterfly) (S3S4)	eastern box turtle (SC, S3, SGCN ^{HP})	eastern small-footed bat (SC, S1S3, SGCN)
striped hairstreak (butterfly) (RG)	eastern ratsnake (SGCN)	southern red-back vole (RG)
brown elfin (butterfly) (RG)	northern black racer (SGCN)	fisher (RG)
		bobcat (RG)

CALCAREOUS CREST/LEDGE/TALUS

Plants	Plants (cont.)	Invertebrates
purple cliffbrake (RG)	yellow cordalis (R, S3)	anise millipede (RG)
walking fern (RG)	black cohosh (RG)	olive hairstreak (butterfly) (RG)
wall-rue (RG)	pellitory (RG)	Vertebrates
Emmons' sedge (R, S3)	northern blazing-star (T, S2)	eastern hognose snake (SC, S3, SGCN ^{HP})
Bicknell's sedge (R, S3)	small-flowered crowfoot (R, S3)	northern black racer (SGCN)
yellow wild flax (T, S2)	roundleaf dogwood (RG)	eastern ratsnake (SGCN)
Allegheny-vine (RG)		northern copperhead (S3, SGCN)

ROCKY BARREN

Plants	Invertebrates (cont.)	Vertebrates (cont.)
clustered sedge (T, S2S3)	Edward's hairstreak (butterfly) (S3S4)	common raven (RG)
dwarf shadbush (RG)	Vertebrates	prairie warbler (PIF1, SGCN)
Invertebrates	copperhead (S3, SGCN)	field sparrow (PIF2)
brown elfin (butterfly) (RG)	turkey vulture (RG)	vesper sparrow (SC, SGCN)
Leonard's skipper (butterfly) (RG)	whip-poor-will (SC, PIF1, SGCN)	eastern towhee (PIF2)

UPLAND SHRUBLAND

Plants	Vertebrates (cont.)	Vertebrates (cont.)
stiff-leaf goldenrod (RG)	spotted turtle (SC, S3, SGCN ^{HP})	blue-winged warbler (PIF2, SGCN)
shrubby St. Johnswort (T, S2)	eastern box turtle (SC, S3, SGCN ^{HP})	golden-winged warbler (SC, PIF1, S3, SGCN ^{HP})
butterflyweed (RG)	wood turtle (SC, S3, SGCN ^{HP})	prairie warbler (PIF1, SGCN)
Invertebrates	ruffed grouse (SGCN)	yellow-breasted chat (SC, PIF2, S2?B, SGCN ^{HP})
Aphrodite fritillary (butterfly) (RG)	black-billed cuckoo (PIF1, SGCN)	vesper sparrow (SC, S3, SGCN ^{HP})
Leonard's skipper (butterfly) (RG)	whip-poor-will (SC, PIF1, S3, SGCN ^{HP})	field sparrow (PIF2)
Vertebrates	brown thrasher (PIF2, S3S4B, SGCN ^{HP})	grasshopper sparrow (SC, PIF2, S3, SGCN ^{HP})
wood frog (RG)	white-eyed vireo (RG)	eastern towhee (PIF2)
		New England cottontail (SC, S1S2, SGCN ^{HP})

UPLAND MEADOW

Plants	Invertebrates (cont.)	Vertebrates (cont.)
small-flowered agrimony (R, S3)	Aphrodite fritillary (butterfly) (RG)	sedge wren (T, S3, SGCN ^{HP})
Bush's sedge (R, S3)	northern oak hairstreak (S2S4, SGCN)	eastern bluebird (RG)
common rattlebox (E, S1)	Leonard's skipper (butterfly) (RG)	savannah sparrow (RG)
stiff-leaved goldenrod (T, S2)	swarthy skipper (butterfly) (RG)	vesper sparrow (SC, S3, SGCN ^{HP})

UPLAND MEADOW (cont.)

Invertebrates	Vertebrates	Vertebrates (cont.)
Baltimore (butterfly) (RG)	spotted turtle (SC, S3, SGCN ^{HP})	grasshopper sparrow (SC, PIF2, S3, SGCN ^{HP})
meadow fritillary (butterfly) (RG)	eastern box turtle (SC, S3, SGCN ^{HP})	bobolink (PIF1, SGCN ^{HP})
	wood turtle (SC, S3, SGCN ^{HP})	eastern meadowlark (PIF2, SGCN ^{HP})

SWAMP

Plants	Vertebrates	Vertebrates (cont.)
swamp cottonwood (T, S2)	blue-spotted salamander (SC, SGCN ^{HP})	Virginia rail (RG)
swamp lousewort (T, S2S3)	four-toed salamander (RG, SGCN ^{HP})	American woodcock (SGCN)
winged monkey-flower (R, S3)	spotted turtle (SC, S3, SGCN ^{HP})	red-shouldered hawk (SC, S4B, SGCN)
purple milkweed (S2S3, T)	wood turtle (SC, S3, SGCN ^{HP})	white-eyed vireo (RG)
false hop sedge (T, S2)	eastern box turtle (SC, S3, SGCN ^{HP})	eastern bluebird (RG)
Invertebrates	great blue heron (RG)	Canada warbler (PIF1, SGCN ^{HP})
phantom crane fly (RG)	American bittern (SC, S4, SGCN)	Louisiana waterthrush (PIF2, SGCN)

INTERMITTENT WOODLAND POOL

Plants	Invertebrates (cont.)	Vertebrates (cont.)
Virginia chain fern (RG)	springtime physa (snail) (RG)	spotted salamander (RG)
false hop sedge (T, S2)	Vertebrates	spotted turtle (SC, S3, SGCN ^{HP})
featherfoil (T, S2)	wood frog (RG)	wood turtle (SC, S3, SGCN ^{HP})
Invertebrates	Jefferson salamander (SC)	American black duck (S3, SGCN ^{HP})
black dash (butterfly) (RG)	marbled salamander (SC, S3, SGCN)	Louisiana waterthrush (PIF2, SGCN)
mulberry wing (butterfly) (RG)	four-toed salamander (RG, SGCN ^{HP})	

BUTTONBUSH POOL

Plants	Vertebrates	Vertebrates (cont.)
<i>Helodium paludosum</i> (moss) (RG)	wood frog (RG)	spotted salamander (RG)
pale alkali-grass (RG)	blue-spotted salamander (SC, SGCN ^{HP})	spotted turtle (SC, S3, SGCN ^{HP})
short-awned foxtail (RG)	Jefferson salamander (SC)	common ribbon snake (SGCN)
	marbled salamander (SC, S3, SGCN)	American black duck (S3, SGCN ^{HP})

MARSH

Plant	Vertebrates	Vertebrates (cont.)
winged monkey-flower (R, S3)	Atlantic coast leopard frog (SGCN)	pied-billed grebe (T, S3, S1N, SGCN)
Invertebrates	southern leopard frog (SC)	American black duck (S3, SGCN ^{HP})
black dash (butterfly) (RG)	spotted turtle (SC, S3, SGCN ^{HP})	king rail (T, S1, SGCN ^{HP})
bronze copper (butterfly) (RG)	American bittern (SC, S4, SGCN)	Virginia rail (RG)
mulberry wing (butterfly) (RG)	least bittern (T, S3, S1N, SGCN)	common moorhen (RG)
	great blue heron (RG)	marsh wren (PIF2, RG)

WET MEADOW

Invertebrates	Invertebrates (cont.)	Vertebrates (cont.)
Baltimore (butterfly) (RG)	bronze copper (butterfly) (RG)	spotted turtle (SC, S3, SGCN ^{HP})
mulberry wing (butterfly) (RG)	eyed brown (butterfly) (RG)	American bittern (SC, S4, SGCN)
black dash (butterfly) (RG)	phantom crane fly (RG)	Virginia rail (RG)
two-spotted skipper (butterfly) (RG)	Vertebrates	American woodcock (SGCN)
meadow fritillary (butterfly) (RG)	common ribbon snake (RG, SGCN)	sedge wren (T, S3, PIF2, SGCN ^{HP})

FEN

Plants	Plants (cont.)	Invertebrates (cont.)
wood horsetail (RG)	round-leaved sundew (RG)	Dion skipper (butterfly) (S3)
twig-rush (RG)	small-flowered agrimony (R, S3)	Baltimore (butterfly) (RG)
Schweinitz's sedge (T, S2S3)	buckbean (RG)	mulberry wing (butterfly) (RG)
Bush's sedge (R, S3)	alder-leaf buckthorn (RG)	black dash (butterfly) (RG)
slender lady's-tresses (RG)		

FEN (cont.)

<i>Plants (cont.)</i>	<i>Invertebrates</i>	<i>Vertebrates</i>
rose pogonia (RG)	<i>Gammarus pseudolimnaeus</i> (amphipod) (RG)	Atlantic coast leopard frog (SGCN)
spreading globeflower (R, S3)	<i>Pomatiopsis lapidaria</i> (snail) (RG)	southern leopard frog (SC)
scarlet Indian paintbrush (E, S1)	phantom crane fly (RG)	bog turtle (E, S2, SGCN ^{HP})
grass-of-Parnassus (RG)	eyed brown (butterfly) (RG)	spotted turtle (SC, S3, SGCN ^{HP})
fringed gentian (RG)	silver-bordered fritillary (butterfly) (RG)	common ribbon snake (SGCN)
swamp lousewort (T, S2S3)	two-spotted skipper (butterfly) (RG)	sedge wren (T, S3, PIF2, SGCN ^{HP})

OPEN WATER/CONSTRUCTED POND

<i>Invertebrates</i>	<i>Vertebrates (cont.)</i>	<i>Vertebrates (cont.)</i>
dusky dancer (S1, SGCN)	wood turtle (SC, S3, SGCN ^{HP})	pie-billed grebe (T, S3, S1N, SGCN)
<i>Vertebrates</i>	American bittern (SC, S4, SGCN)	osprey (SC, SGCN)
spotted turtle (SC, S3, SGCN ^{HP})	great blue heron (RG)	bald eagle (T, S2S3, SGCN)
	American black duck (S3, SGCN ^{HP})	river otter (SGCN)

SPRING/SEEP

<i>Plants</i>	<i>Invertebrates</i>	<i>Vertebrates</i>
Bush's sedge (R, S3)	Piedmont groundwater amphipod (SGCN)	northern dusky salamander (RG)
devil's-bit (T, S1S2)	gray petaltail (dragonfly) (SC, S2, SGCN)	
	tiger spiketail (dragonfly) (S1, SGCN)	

STREAM & RIPARIAN CORRIDOR

<i>Plants</i>	<i>Invertebrates (cont.)</i>	<i>Vertebrates (cont.)</i>
winged monkey-flower (R, S3)	<i>Sphaerium fabale</i> (fingernail clam) (RG)	Atlantic coast leopard frog (SGCN)
riverweed (T, S2)	arrowhead spiketail (dragonfly) (S2S3, SGCN)	northern dusky salamander (RG)
cattail sedge (T, S1)	tiger spiketail (S1, SGCN)	wood turtle (SC, S3, SGCN ^{HP})
Davis' sedge (T, S2)	mocha emerald (dragonfly) (S2S3, SGCN)	great blue heron (RG)
small-flowered agrimony (S3)	sable clubtail (dragonfly) (S1, SGCN)	American black duck (S3, SGCN ^{HP})
false-mermaid (RG)	ostrich fern borer (moth) (SGCN)	American woodcock (SGCN)
swamp rose-mallow (RG)	<i>Vertebrates</i>	bank swallow (RG)
may-apple (RG)	creek chubsucker (fish) (RG)	winter wren (RG)
<i>Invertebrates</i>	bridle shiner (fish) (RG)	cerulean warbler (SC, S3?B, PIF1, SGCN)
<i>Marstonia decepta</i> (snail) (RG)	brook trout (fish) (SGCN)	Louisiana waterthrush (PIF2, SGCN)
brook floater (mussel) (T, S1, SGCN)	slimy sculpin (fish) (RG)	river otter (SGCN)
<i>Pisidium adamsi</i> (fingernail clam) (RG)	southern leopard frog (SC)	northern long-eared bat (T, S1, SGCN)

SPECIES REFERENCED IN TEXT

COMMON NAME	SCIENTIFIC NAME OR GROUP	COMMON NAME	SCIENTIFIC NAME OR GROUP
American bittersweet	<i>Celastrus scandens</i>	Hercules beetle	<i>Dynastes tityus</i>
American bullfrog	<i>Lithobates catesbeianus</i>	hickory	<i>Carya spp.</i>
ants	Family: <i>Formicidae</i>	honey locust	<i>Gleditsia triacanthos</i>
assassin bug	Family: <i>Reduviidae</i>	hummingbird, ruby-throat	<i>Archilochus colubris</i>
bald eagle	<i>Haliaeetus leucocephalus</i>	jumping worms	<i>Ammythas spp. and Metaphire spp.</i>
bear, black	<i>Ursus americanus</i>	Kentucky coffee tree	<i>Gymnocladus dioica</i>
beaver	<i>Castor canadensis</i>	leopard slug	<i>Limax maximus</i>
beech, American	<i>Fagus grandifolia</i>	maple	<i>Acer spp.</i>
birch	<i>Betula sp.</i>	mastodon	<i>Mammut americanum</i>
black locust	<i>Robinia pseudoacacia</i>	milkweed, common	<i>Aesclepius syriaca</i>
bloodroot	<i>Sanguinaria canadensis</i>	mice, white-footed	<i>Peromyscus leucopus</i>
bobcat	<i>Lynx rufus</i>	mugwort	<i>Artemisia vulgaris</i>
brown marmorated stink bug	<i>Halyomorpha halys</i>	Norway spruce	<i>Picea abies</i>
California poppy	<i>Eschscholzia californica</i>	oak	<i>Quercus spp.</i>
Cecropia moth	<i>Hyalophora cecropia</i>	opossum	<i>Didelphis virginiana</i>
chicory	<i>Cichorium intybus</i>	oriental bittersweet	<i>Celastrus orbiculatus</i>
columbine	<i>Aquilegia canadensis</i>	orb-spinning spiders	Family: <i>Araneidae</i>
common carp	<i>Cyprinus carpio</i>	owl, barred	<i>Strix varia</i>
coyote	<i>Canis latrans</i>	Queen Ann's Lace	<i>Daucus carota</i>
crayfish	Class: <i>Malacostraca</i>	red mulberry	<i>Morus rubra</i>
dandelion	<i>Taraxacum officinale</i>	red spotted newt	<i>Notophthalmus viridescens</i>
deer, white-tailed	<i>Odocoileus virginianus</i>	red-tailed hawk	<i>Buteo jamaicensis</i>
dung beetles	<i>Aphodius spp.</i>	robber flies	Family: <i>Asilidae</i>
dutchman's pipevine	<i>Isotrema macrophyllum</i>	skunk	<i>Mephitis mephitis</i>
emerald ash borer	<i>Agrilus planipennis</i>	termites, Eastern	<i>Reticulitermes flavipes</i>
fisher	<i>Pekania pennanti</i>	trout lily	<i>Erythronium americanum</i>
four-toed salamander	<i>Hemidactylum scutatum</i>	vulture, black	<i>Coragyps atratus</i>
fox, red	<i>Vulpes vulpes</i>	West Nile virus	<i>Flavivirus</i>
freshwater clams	Phylum: <i>Mollusca</i>	white mulberry	<i>Morus alba</i>
garter snake	<i>Thamnophis sirtalis</i>	wild ginger	<i>Asarum canadense</i>
gray squirrel	<i>Sciurus carolinensis</i>	wolf	<i>Canis lupus</i>
goldenrod	<i>Solidago spp.</i>	woodpecker, downy	<i>Picoides pubescens</i>
gypsy moth	<i>Lymantria dispar</i>	worm-eating warblers	<i>Helmitheros vermivorus</i>
hemlock, Eastern	<i>Tsugacanadensis</i>	wormsnakes	<i>Carphophis amoenus</i>



Recommendations for Protecting the Natural Heritage of Pound Ridge

To: Town Supervisor, Town Board, Recreation Commission, Planning Board, Zoning Board, Water Control Commission, Building Department, Highway Department, and Maintenance Department

From: Conservation Board
October 2020

Background:

The recommendations below are intended to extend and enhance long-standing practices of the Town. Town agencies, such as Planning, Zoning, Water Control, should be commended for, among other practices, a long history of recommending the use of native plants to residents and the Recreation Commission should be commended for allowing removal of invasive plants and the planting of natives along Shelly's Walk. The Departments of Highway and Maintenance should be commended for avoiding the use of herbicides, minimizing the use of road salt, and for balancing the unique demands of roads and roadside management in a small town with historic, narrow, winding roads and New England weather.

Among the factors that impact our natural heritage are the kinds of plants growing here and the timing of human activity, such as the mowing of a meadow or removing of a tree.

The kinds of plants that grow in Pound Ridge determine what wildlife, including birds, thrive here. Plants support complex community food webs and provide shelter for animals. Animals often have preferences. Gray squirrels require the nuts of mast-producing trees such as oak and hickory, all of which are common in our area. Baltimore orioles, a little less common, favor building their nests in tulip trees. Our generalist species include squirrel, deer, raccoon, bear, skunk, robin, mockingbird, red-tailed hawk, and many others. A few of the specialists, those with narrow and specific food and habitat preferences found in Pound Ridge, are river otter, wood turtle, spotted and four-toed salamanders, barred owl, and many warblers. Specialist species are less adaptable and therefore less common than generalists. Native plants support local wildlife, especially specialists, better than invasive plant species do.

The timing of human activities also impacts the life cycles and reproduction of plants and animals. This information can be used to our advantage, e.g., reducing the spread of invasive species by preventing

flowering and seed production. Conversely, poorly timed human activity disrupts the migration of amphibians or the breeding and successful rearing of birds and young animals.

The following recommendations regarding plants and the timing of activities are intended to further support the natural heritage of Pound Ridge in four areas:

1. Use of Native Plants on Town Properties

(Town Park, Slade Preserve, Sachs Park, Eastwoods, Lawther, triangles, etc.)

- a. Recommended Action: The use of native plants is recommended as general policy on town-owned properties. Opportunities to use native plants present with the offer to plant a garden or tree by the local garden club or an outside organization, a memorial planting, the planting and management of town triangles, repair of storm damage, and required and repeated cutting of plants by Highway or Maintenance for visibility or accessibility, etc. In addition, it shall be the policy to encourage the use of native plants throughout town. For reference, several lists of native plants for a variety of situations are posted to the Conservation Board's webpage.

Rationale: Native plants support the natural heritage and aesthetics of the community and provide enhanced habitat for wildlife.

- b. Recommended Action: It is recommended that the general policy of the Town be to reduce invasive plants as opportunity presents.

In addition to the variety of opportunities previously outlined, the Town shall review and, as feasible, support the plans of others to remove invasive plants on town property. Examples might include the installation of a public garden, the removal of invasive plants growing on town property bordering a local preserve, or the removal of an early detection/ rapid response species by an outside agency for the greater good.

Rationale: The Town's actions to reduce invasive plant species on Town property is responsible and prudent as it (1) removes a source for seed and plant fragments that spread further into the community, including the many preserves in Pound Ridge, (2) provides an example and leadership to the community, (3) supports the natural heritage and aesthetics of the community, and (4) provides improved habitat for wildlife.

2. Native plant and small animal rescue

Recommended Action: In an effort to save native plant and animal species, the Town will continue to encourage residents to contact the Conservation Board, The Invasives Project-Pound Ridge and/or land stewards at Pound Ridge Land Conservancy, Westchester Land Trust, or Mianus River Gorge Preserve prior to construction in naturalized areas of driveways, foundations, pools, tennis courts, etc.. A board member or land steward can inventory the native species and discuss options with property owners such as relocating plants and animals on their property or to another location.

Rationale: Construction can lead to the loss of native plant and/or amphibian and reptile species and local stewards have the capacity to inventory species, discuss options with property owners, and conduct a rescue. Native species are threatened by climate change, development, competition by invasive species and the introduction of pests and diseases, etc. Local land stewards are vested in the protection of natural resources. Plants might be immediately replanted, raised in a propagation nursery, and, in some cases, used for stock and seed. Amphibians and reptiles would be relocated to an appropriate habitat. Local stewards would be encouraged to inform the Conservation Board of actions related to Pound Ridge and support local outreach and restoration projects.

3. Roadside application of pesticides (NYSDOT)

Recommended Action: To minimize the application of pesticides, near the beginning of the summer, the Conservation Board will contact NYSDOT Transportation Maintenance Office (1) to ascertain plans for pesticide applications on roads in Pound Ridge and (2) to confirm that the town policy is not to use herbicides and also to urge residents to avoid using herbicides.

Rationale: In Pound Ridge, our town policy is not to use herbicides without a clearly identified need and lack of a viable alternative. We urge residents to avoid using herbicides and prefer that herbicides are not sprayed along the roads in Pound Ridge.

As there may be reasons to use an herbicide, we request advance notification (7-10 days) prior to the spraying of herbicides in Pound Ridge to the Office of the Supervisor, Conservation Board, and Highway Department of the rationale, areas, and timing of herbicide applications planned for Pound Ridge in order to assess the need and alternatives. This action supports our ability to respond to questions from residents and protect the natural resources of Pound Ridge.

4. Tree cutting, trimming, and pruning

(NYSEG, Highway Dept., Maintenance)

Recommended Action: To minimize disturbance to birds during the breeding and raising of young, routine tree trimming should be limited to late summer/fall/winter and early spring months (e.g. August through April).

The Town Supervisor should contact NYSEG's regional supervisor to establish the annual timing of routine tree trimming practices to late summer/ fall/ winter/ and early spring months (e.g. August through April).

Routine Highway and Maintenance and town-contracted tree services should be limited to August through April.

Rationale: With 4,500 acres of preserved open space within its 23 square miles, Pound Ridge is home to many species of concern, including over two dozen bird species. Because of its rich habitat and species biodiversity, Pound Ridge, like Lewisboro and North Salem, is a refuge with unusually first-rate habitat worthy of protection within Westchester County and the highly developed tri-state suburban/urban

area. Tree cutting, trimming and pruning should be limited to the majority of the months of the year when birds are not nesting, generally August through April. This includes cutting, trimming and pruning dead and dying trees and limbs (except when they pose a safety risk), which are used as nest sites for screech owls; six species of woodpeckers that occur locally; Black-capped chickadees, white-breasted nuthatches, and others. Although some of these are among the more common species in Pound Ridge and elsewhere, they constitute an important part of our local wildlife population and should be given a chance to complete their nesting cycle before cutting occurs. It perhaps goes without saying that cutting a limb or tree that contains a bird nest would likely result in the mortality of those birds.