# A Natural History
## of the
## National Conservation Training Center Property

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Update February 2004

This publication is designed to introduce visitors to the plants and animals that can be found at the National Conservation Training Center (NCTC). The campus itself comprises a little over a hundred acres, leaving more than 400 acres to be explored and enjoyed by those willing to get out of the buildings and onto the trails. Natural habitats include open fields and meadows, patches of deciduous forest in various successional stages, the riparian edge of the Potomac River, springs, creeks and ponds, small wetlands, and moss-covered limestone cliffs scattered with an ever-changing kaleidoscope of native spring wildflowers. Plant and animal communities here have both a northern and southern component, with many species from both zones at the limits of their ranges.

Several factors facilitate migration of species to this area. Wooded ridges extending north into Pennsylvania and south into Virginia act as migration corridors for both plants and animals, and the Potomac River and its relatively intact riparian edge form a natural migration corridor for migrant birds and other species. The towpath of the C & O Canal National Historical Park on the opposite side of the river creates a trail more than one hundred eighty miles in length allowing mammals such as bobcats, coyotes and black bears to occasionally travel through the area

Please note that some plant communities are relatively rare, with only a few individuals of several species occurring here. So please do not collect flowers or other plant parts.

## Regional Setting

NCTC is located on the eastern edge of the Ridge and Valley physiographic province, which is characterized by long ridges of resistant sedimentary rock trending NE-SW alternating with linear valleys composed of softer sedimentary rock. NCTC lies within a long trough just west of the Blue Ridge formed from the more easily eroded limestones and shales known as the Great Valley, a geologic feature that extends from New York to Alabama.

The valley culturally goes by several names, but in Virginia and West Virginia it is called the Shenandoah Valley, named for the major river that flows in a northeasterly direction down the valley until it meets the Potomac River at Harpers Ferry. Technically the Shenandoah Valley should extend northward only to Harpers Ferry, about 10 miles south of NCTC, where the combined waters of the Shenandoah and Potomac Rivers travel through a gap in the Blue Ridge, but local convention extends the Shenandoah Valley a few miles north until it comes under the political jurisdiction of Maryland, where it becomes the Hagerstown Valley. The Potomac River, which forms about two miles of

NCTC's northern boundary, cuts "across the grain" of the geologic units in this region, a hint that the river's ancient course was established before the current landforms were created by millions of years of differential erosion.

Elevations at NCTC range from about 300 feet above sea level on the north side of the property adjacent to the river, to just over 440 feet on the southern side of the property.

Because the present landscape has remained above sea level since before the Age of Dinosaurs, plant and animal species have migrated here and evolved in place over a period of more than 200 million years. The last great pulse of glacial ice in the northern hemisphere left its terminal moraine about a hundred miles to the north in Pennsylvania, but the resulting cooler climate had a lasting impact on the plant communities in the region. Boreal species commonly found in Canada today dominated this area as little as 8000 years ago, about the time the first evidence of human habitation is found in this region; remnants of these post-Pleistocene plant communities can still be found in the higher elevations of West Virginia. The native mesic hardwood forest plant communities seen here today can be considered a somewhat random collection of plants that have either survived the cooler temperatures of the Ice Ages or successfully invaded the countryside in the meantime taking advantage of the gradually warming climate. The valleys of the Potomac and Shenandoah Rivers have formed natural migration corridors for southern and coastal species extending their ranges northward. The rivers have also aided in the spread of invasive exotics such as garlic mustard, which was relatively rare 30 years ago but is widespread throughout the region today.

In the last 250 years the influx of a European culture and its associated plants has had a very strong impact on the species composition of the herbaceous and shrub layers of the area, with about half of the plant species found at NCTC being considered non-native to this area. Nearly all of the larger tree species found today were present before the arrival of Europeans (an exception is Ailanthus, or Tree of Heaven, an invasive exotic notoriously difficult to eradicate that first arrived here in serious numbers in the last quarter of the 20$^{th}$ century.)

## Climate

Mean annual precipitation in the eastern panhandle of West Virginia is approximately 102 cm/yr (40 in/yr). Because the region lies in the rain shadow of the Alleghenies to the west, precipitation is slightly lower than the rest of West Virginia. Summer temperatures average about 38° C (73 F) while winter temperatures average about 13° C (25 F) with 120-150 days of below freezing temperatures annually. The length of time that the ground is covered by snow any given year could be several hours to several months.

## Geology and Soils

The NCTC property is underlain by a geologic unit known as the Conococheague Limestone, a moderately folded and metamorphosed, sparsely fossiliferous carbonate of late Cambrian / early Ordovician age. Chemically it is dominated by calcium and magnesium carbonates, and contains occasional shaly or sandy layers. The strike of the bedding planes and rock outcrops is generally oriented about N15E. The limestone bedrock is susceptible to sinkholes, fissures and solution cavities. More resistant layers within this limestone have formed a bedrock sill and island in the Potomac River north of the campus.

Rounded cobbles and gravels of quartzite can commonly be found along the upper river terrace, deposited more than 30,000 years ago when the base level of the Potomac was at this elevation, eroding the resistant silica-rich ridges to the west. Based on the mapped distribution of these quartzite deposits, the Potomac River has largely stayed within or very near its present channel near NCTC for more than 50,000 years, the elevation largely controlled by a series of bedrock sills.

In upland areas, fairly rich red clay-loam soils have developed in place from the underlying parent material, while the floodplains and benches near the Potomac are composed of fine-grained alluvial soils. The carbonate-derived soils tend to be higher in pH than the more acidic soils of the Blue Ridge and other nearby ridges, which have formed from rock with a higher silica content. This explains why some regionally common species such as white pine, mountain laurel, scarlet oak, and American holly do not occur here in naturally growing stands, although they may sometimes be successfully planted.

## Land Use History

In the western United States, plant distributions and patterns can often be best explained by ecological factors such as moisture gradients, elevation, or geology. A glance out the window of an airplane flying over the mid-Atlantic region is all the evidence you need that there are other factors at play here to account for the fanciful patterns of plants across the landscape. The pattern of plant distributions at NCTC, like much of the land east of the 100$^{th}$ meridian, is most strongly correlated with past and present human landscape management practices

Archeological evidence has shown that Native Americans used the property at least seasonally for more than 8000 years. The most recent evidence for occupation dates to about 400 years before the arrival of Europeans. Cultural practices such as the use of fire and the growing of crops such as corn and squash no doubt had a significant influence on the plant communities that were established here by the 1700s. Europeans first began developing plantation agriculture on the property that became NCTC in the early 1730s. Trees specifically mentioned on early land surveys for the property in the eighteenth century include white oak, red oak, black oak, hickory, black walnut, elm, boxelder, honey locust, sugar maple, and ash – all trees that still exist on the property today. The

presence of these trees in the early surveys shows that the property was at least partly forested when Europeans first arrived.

In 1734 the property was included as part of one of the very first King's Patents issued in the region, suggesting that the earliest settlers, who could pick from among the choicest properties, found something very attractive here. Since the earliest colonists had to quickly establish forage and cash crops for survival, they were unlikely to have chosen land in continuous closed canopy forest (why spend months or years cutting down trees if you don't have to?). It seems probable the landscape was a mix of meadow and scattered groups of trees. Fire and grazing by herds of buffalo and elk likely helped to maintain a more open landscape, just as they did a few miles to the west on the open prairie of the Shenandoah Valley. The center of the Shenandoah Valley was (and is) more likely to retain an open sparsely wooded landscape because of poorer soils derived from the underlying Martinsburg Shale, an area the early colonists referred to as the "barrens". The first European visitors to Terrapin Neck, however, would have been more apt to encounter forested areas because of the richer soils, and thus any openings in the forest would necessarily have required the presence of frequent fires or grazing to remove fast-growing woody species.

Since the 1730s, crops have included tobacco, wheat, corn and various grain crops as well as flax, hemp, hay, and apple orchards. Farm animals were raised here continuously for nearly 250 years and included cattle, sheep, horses, and hogs. Most trees that were standing in the 1730s were probably removed before 1800; the same fields have been farmed as crops or pasture ever since, although several changes in the locations of fencelines have occurred over the years. Various small remnant patches of forest in rockier, less accessible areas have been selectively cut or clearcut for firewood, fencing, or lumber for more than 200 years.

Much of the area surrounding the campus now forested with sycamore, tulip poplar and boxelder was an open pasture in 1938. The only extensive patches of trees on the property more than 100 years old are located on the narrow, steep slope north of the campus buildings overlooking the river, and a rocky strip along Terrapin Neck road. These older forest patches (counts of tree rings on some of the older-looking trees suggest they were saplings in the 1880s) have been selectively cut over the years but still retain the highest concentration of native forbs and shrubs in the understory. Grazing in the pastures and woodlands by beef cattle ended about 1995; since then succession has created a brambly understory of multiflora rose, ailanthus, Japanese honeysuckle and various European annuals. During facility construction care was taken to save many small patches of overstory trees but edge effects from disturbance and increased sunlight have created impenetrable thickets of invasive exotics along the edges of most of these remnant patches.

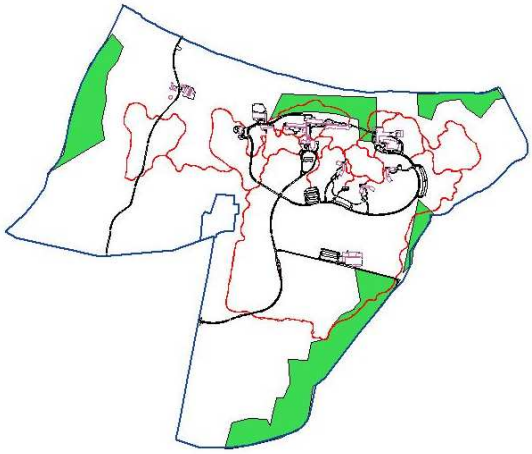
## Habitat Types

The following section describes some general vegetative habitat types at NCTC. More detailed information can be found on the Geographical Information System (GIS) developed by NCTC's Technical Training Branch. Mapping of plant units on the property was accomplished in 1997 for the use of the GIS courses at NCTC using several classification schemes, including the Anderson Land Use / Land Cover classification, the Society of American Foresters classification, and the National Vegetation Classification System. In this document, vegetation will be described in more general terms, including the location and primary species composition. A plant list for the property is included in a later section.

***Older Forest***

The older forest community occurs on the edges of NCTC, including the north-facing slopes and ravines overlooking the river, along the Terrapin Neck road property boundary, and along the western fenceline of the property. The boundaries of this forest type today correlate well with those areas under forest canopy in a 1938 aerial photo. Tree ring cores taken from several of the larger trees suggest some of the trees were established in the 1870s.

The overall species composition of this forest type is very diverse and contains the highest concentration of native species. The dominant overstory trees include black oak, red oak, bitternut hickory, green ash, black walnut, sugar maple, American elm, and hackberry. Common understory trees include pawpaw, sugar maple, and flowering dogwood, with redbud near the sunnier edges. Characteristic understory shrubs include spicebush, blackhaw and several invasive exotics including multiflora rose, tartarian honeysuckle and wineberry.

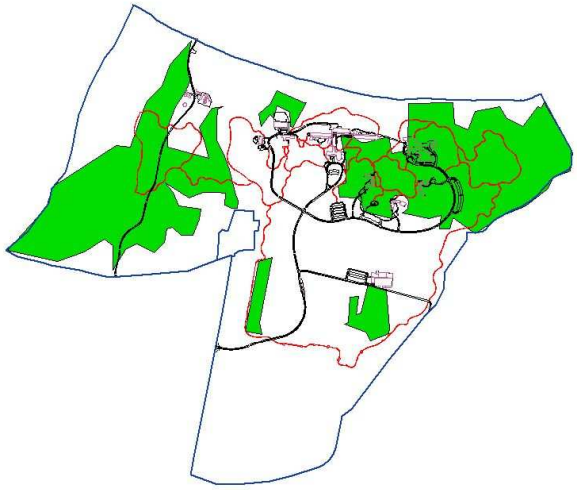


Along Terrapin Neck road and the north-facing slope overlooking the river the understory herbaceous plants exhibit a fairly high percentage of native species, including spring wildflowers such as mayapple, ramp (wild leek), squirrel corn, dutchman's breeches, twinleaf, wild ginger, cut-leaf toothwort, spring beauty, trillium and yellow trout lily. The western fenceline tends to have fewer native herbaceous plants because of recent grazing by beef cattle, but it does contain a nice stand of older beech trees.

In the forested areas that were grazed or otherwise disturbed in more recent times the understory herbaceous plants tend to be composed of white snakeroot, and exotics such as Indian strawberry, Japanese stilt grass, chickweed, and beefstake plant. The edges of this forest type, including the interior gaps that allow increased sunlight, are commonly overgrown with vines and shrubs including natives such as wild grape, Virginia creeper, greenbriar and poison ivy, and invasive exotics such as Japanese honeysuckle, young ailanthus trees, multiflora rose and wineberry. Because these forest patches were selectively cut and occasionally grazed by beef cattle over the years, and have a high edge-to-area ratio, they commonly take on many of the characteristics of a younger, more highly disturbed forest. The steep ravines and slopes in the northeast corner of NCTC and portions of the woods along Terrapin Neck road have the most intact native species composition.

***Younger Forest***

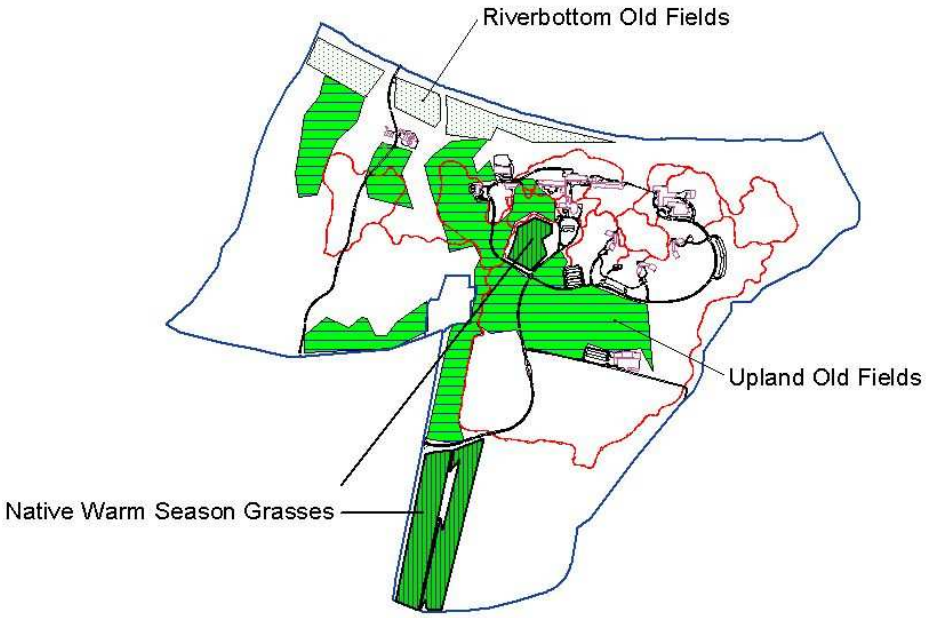
The younger forested areas at NCTC correlate well with those areas now forested, but were open pasture or croplands in a 1938 aerial photo. These areas have grown nearly as tall or taller than the older forest patches and in some areas have a nearly closed canopy, but can still be recognized by the tree and understory species composition. Dominant overstory tree species include sycamore, tulip poplar, and black walnut, while the understory trees include a high percentage of boxelder and pawpaw. Occasional patches of red cedar struggling to survive in the shade give evidence of more recent sunny conditions. Shrubs and vines often make it difficult to walk in these areas – the increased availability of sunlight from a relatively open canopy, trails and other edges often create a jungle of spicebush, multiflora rose, wineberry, Japanese honeysuckle, poison ivy, wild grape, greenbriar and Virginia creeper. Paths and edges in the shadier portions are often lined with herbaceous plants such as white snakeroot, Japanese stilt grass, smartweed, beefsteak plant and clearweed. The sunnier edges take on the herbaceous species composition of a meadow, commonly including several species of goldenrod, wingstem, American germander, orchard grass and tall fescue. The herbaceous understory is composed of a lower percentage of native plants; native spring wildflowers are often difficult to find.



***Old Field***

Old fields can be divided into three types at NCTC: the upland old fields, the riverbottom old fields, and the old fields that were planted in native warm season grasses in May

1999. The area south of the NCTC campus along the entrance road that is managed as open grassland is one of the main locations for the upland old field habitat type, although there are several smaller patches on the western side of the property. Orchard grass and tall fescue, along with several other grasses including purple top, Kentucky bluegrass, broomsedge, yellow foxtail, timothy and barnyard grass dominate the species composition. Other common herbaceous species include dandelion, chickory, common fleabane, moth mullein, nodding thistle, bull thistle, Queen Anne's lace, field cress and black medic. Old fence lines and rock outcrops have allowed trees such as ailanthus, red cedar, boxelder, black locust, black cherry, and hackberry to become established in small, linear patches. Common woody invaders that have started to become established in the fields include multiflora rose, autumn olive, boxelder, and red cedar.



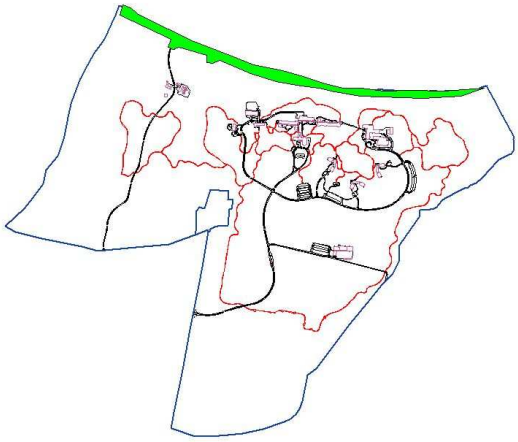

The old fields in the bottomland next to the Potomac, last plowed in 1997, are rapidly undergoing succession, with boxelder, silver maple, and green ash becoming established near the riparian zone (the area just east of the boatramp has been mowed several times in the last few years and is in an earlier stage of succession). Common understory plants include many of those listed above, but additionally include a high percentage of such species as annual wormwood, Canada thistle, wingstem, several species of goldenrod, and curly dock. Near the riparian edge Virginia wild rye is common.

Following an application of glyphosate herbicide, twenty-six acres were planted in native warm season grasses in spring 1999. The first field, adjacent to Shepherd Grade south of the NCTC entrance, was last planted in corn in 1998, while a second field, just above it on the hillside, was planted in oats in 1998. A small 5 acre field just south of Instructional West was an old pasture split by a fence, since removed, that was first

planted after disking and an herbicide treatment in a non-native wildflower and grass mix about 1997, but it instead became an impenetrable mass of nodding thistle and bull thistle over most of the acreage (the seed mix was successfully established only in the lower western slope of this field). All three fields in 1999 were planted with a native seed mix including big bluestem, little bluestem, Indian grass, gamma grass, switchgrass, and side-oats gramma, with a native wildflower seedmix containing mostly black-eyed Susan and coreopsis. Several months of severe drought followed planting, which slowed the initial establishment, but by summer 2001 the two larger fields near the entrance were largely successful, while the smaller field next to campus at first had a high concentration of yellow foxtail and barnyard grass that overwhelmed about half of the field; by summer 2003 the native seed mix was much more prominent.

***Riparian***

The riparian community can be found along the relatively steep north-facing riverbank directly adjacent to the Potomac River. The plant community here is composed of species tolerant of the frequency and magnitude of Potomac River flood events. A close inspection reveals that the riverbank is "stepped" about halfway down. The "step" is referred to as the height of the bankfull channel and marks the height of the river when it is most efficient at moving sediment; this is also referred to as the channel forming discharge. The area below the step and above the wetted perimeter is considered part of the active channel, which experiences fairly frequent flood events. On average the river reaches the height of the bankfull channel – the "step" – about every 1.5 years. The broad flat bench south of the riverbank once used for crops is an old floodplain or bench, with flood frequency probabilities over the hundred-year range.

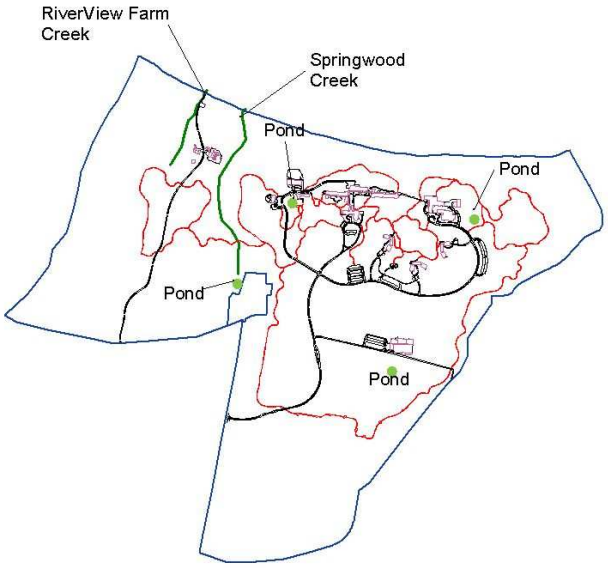


The most common trees in the riparian zone are primarily flood tolerant species. Below the bankfull stage height, the most common species by far are boxelder (dominant in terms of numbers of individuals), silver maple (dominant in terms of basal area, or biomass), and sycamore. Above the bankfull discharge height, additional species include pawpaw, American elm, green ash, hackberry, and black walnut. The commonest shrubs include spicebush and bladderpod. Common herbaceous plants include Virginia wild rye, wood nettle, gill-oer-the-ground, jewelweed and garlic mustard. Spring wildflowers include the non-native star of Bethlehem, and natives such as yellow trout lily, white trout lily, wild ginger, and Virginia bluebells.

***Springs, Creeks and Ponds***

There are both intermittent and perennial springs forming small creeks on the NCTC property. The water is "hard", leaving calcium carbonate deposits (travertine) on the creek bottoms especially where small waterfalls aerate the water. The creek entering the Potomac west of the boatramp originates on the lower slope of the hillside below the ruins of RiverView Farm, and several other locations downstream. This creek is intermittent and only flows at its lower end during hot and dry weather. Summer temperatures are in the 14-16° C (57-61° F) range, with pH between 8 and 8.5, and dissolved oxygen between 5 and 9 ppm. Conductivity is in the 600-700 µS range, and is relatively higher than the other creek because of lower water volumes and perhaps longer residence time in the substrate.

The creek near the Springwood estate begins in several adjacent perennial springheads that feed into a shallow pond excavated in the mid-20th century. The pond changes the chemical nature of the water in the stream below, with summer temperatures in the 18-22° C (64-72° F) range, and pH slighter higher in the 8.5 to 8.9 range because of the increased primary productivity using up the available carbon dioxide. Summer daytime dissolved oxygen levels are about the same as the other creek, in the 5-9 ppm range, and conductivity is somewhat lower, in the 400-600 µS range. No fish have been collected in these spring-fed creeks, but snapping turtles, wood turtles and various amphibians have been found there.




Three storm water management ponds were built during the construction of NCTC that hold water year round. In just a few years they have attracted a number of frog, toad and salamander species, aquatic and wetland plants and insects. Problematic species that have required some control measures include the phragmites that is prominent in the pond near the Daycare center. Summer temperatures, water volumes, and resulting water chemistry limit the survival of some species in these ponds. Daytime water temperatures can be nearly 90° F during the hottest part of the summer. Primary productivity is high during the day because of the algae and other aquatic plants, leading to supersaturated dissolved oxygen levels and a pH greater than 10. At night pH levels drop and dissolved oxygen levels are reduced to zero, creating a rather harsh chemical environment for many aquatic species. Conductivity of the pond water is typically in the 100-200 µS range, a result of its stormwater derivation and the clay liner that limits contact with the underlying carbonate substrate.

The Potomac River in the summer has a pH of about 7.5-8, in the winter it is between 6 and 7. Summer specific conductivity is in the 200-400 µS range. Summer temperatures can be very warm during low flow; for example in 1999 summer daytime temperatures monitored in the river adjacent to NCTC ranged from 24 to 32° C (75-90 F); this was a year of severe drought when the hydrograph went one direction – down – from May through August.

***Wetlands***

Wetlands at NCTC are located in small pockets adjacent to the two creeks where topographic relief allows the water to spread out a few tens of feet to the side. The species composition tends to be high in natives, though there are often just a few individuals of each species present. Collection of plants from these areas, therefore, should be avoided, as you may remove the only individuals growing here. Some characteristic species include New York ironweed, ditch stonecrop, rattlesnake mannagrass, rice cutgrass, and several species of carex and scirpus. Small, scattered patches of wetland plants (mostly facultative) can be found on the river terrace and near small seeps.

# NCTC Plant List

## Trees

| COMMONNAME | GENUS | SPECIES | FAMILY | NATIVE |
|---|---|---|---|---|
| Boxelder | Acer | negundo | Aceraceae | native |
| Sugar Maple | Acer | saccharum | Aceraceae | native |
| Silver Maple | Acer | saccharinum | Aceraceae | native |
| Black Maple | Acer | nigrum | Aceraceae | native |
| Tree of Heaven | Ailanthus | altissima | Simaroubacea | alien |
| Paw-Paw | Asimina | triloba | Annonaceae | native |
| Sweet Birch | Betula | lenta | Corylaceae | native |
| River Birch | Betula | nigra | Corylaceae | native |
| Shagbark Hickory | Carya | ovata | Juglandaceae | native |
| Pignut Hickory | Carya | glabra | Juglandaceae | native |
| Bitternut Hickory | Carya | cordiformis | Juglandaceae | native |
| Hackberry | Celtis | occidentalis | Ulmaceae | native |
| Redbud | Cercis | canadensis | Leguminosae | native |
| Flowering Dogwood | Cornus | florida | Cornaceae | native |
| American Beech | Fagus | grandifolia | Fagaceae | native |
| Green Ash | Fraxinus | pennsylvanica | Oleaceae | native |
| White Ash | Fraxinus | americana | Oleaceae | native |
| Honey Locust | Gleditsia | triacanthos | Leguminosae | native |
| Black Walnut | Juglans | nigra | Juglandaceae | native |
| Red Cedar | Juniperus | virginianus | Cupressaceae | native |
| Tulip Poplar | Liriodendron | tulipifera | Magnoliaceae | native |
| Cucumber Tree | Magnolia | acuminata | Magnoliaceae | native |
| White Mulberry | Morus | alba | Moraceae | alien |
| Virginia Pine | Pinus | virginiana | Pinaceae | native |
| Pitch Pine | Pinus | rigida | Pinaceae | native |
| White Pine | Pinus | strobus | Pinaceae | native |
| Sycamore | Platanus | occidentalis | Platanaceae | native |
| Bigtooth Aspen | Populus | grandidentata | Salicaceae | native |
| Cottonwood | Populus | deltoides | Salicaceae | native |
| Black Cherry | Prunus | serotina | Rosaceae | native |
| Sweet Cherry | Prunus | avium | Rosaceae | alien |
| Wild Crabapple | Pyrus | coronaria | Rosaceae | native |
| Scarlet Oak (?) | Quercus | coccinea | Fagaceae | native |
| Chinquapin Oak | Quercus | muhlenbergii | Fagaceae | native |
| Red Oak | Quercus | rubra | Fagaceae | native |
| Chestnut Oak | Quercus | prinus | Fagaceae | native |
| Black Oak | Quercus | velutina | Fagaceae | native |
| White Oak | Quercus | alba | Fagaceae | native |
| Black Locust | Robinia | pseudo-acacia | Leguminosae | native |
| Sassafras | Sassafras | albidum | Lauraceae | native |
| Basswood | Tilia | americana | Tiliaceae | native |
| Slippery Elm | Ulmus | rubra | Ulmaceae | native |
| American Elm | Ulmus | americana | Ulmaceae | native |

# Shrubs

| COMMONNAME | GENUS | SPECIES | FAMILY | NATIVE |
|---|---|---|---|---|
| Prickly Gooseberry | Ribes | cynosbati | Saxifragaceae | native |
| Staghorn Sumac | Rhus | typhina | Anacardiaceae | native |
| Jetbead | Rhodotypos | scandens | Rosaceae | alien |
| Elderberry | Sambucus | canadensis | Caprifoliaceae | native |
| Multiflora Rose | Rosa | multiflora | Rosaceae | alien |
| Witch Hazel | Hamamelis | virginiana | Hamamelidace | native |
| Wild Hydrangea | Hydrangea | arborescens | Saxifragaceae | native |
| Spicebush | Lindera | benzoin | Lauraceae | native |
| Bladderpod | Staphylea | trifolia | Staphyleaceae | native |
| Autumn Olive | Elaeagnus | umbellata | Eleagnaceae | alien |
| Blackhaw | Viburnum | prunifolium | Caprifoliaceae | native |
| Tartarian Honeysuckle | Lonicera | tartarica | Caprifoliaceae | alien |

# Grasses

| COMMONNAME | GENUS | SPECIES | FAMILY | NATIVE |
|---|---|---|---|---|
| Colonial Bent Grass | Agrostis | tenuis | Poaceae | native |
| Broomsedge | Andropogon | virginicus | Poaceae | native |
| Big Bluestem* | Andropogon | gerardi | Poaceae | native |
| Little Bluestem* | Andropogon | scoparius | Poaceae | native |
| Sweet Vernal Grass | Anthoxanthum | odoratum | Poaceae | alien |
| Small Carp Grass | Arthraxon | hispidus | Poaceae | alien |
| Oats | Avena | sativa | Poaceae | alien |
| Side-oats Grama* | Bouteloua | curtipendula | Poaceae | native |
| Long-awned Wood Grass | Brachyeletrum | erectrum | Poaceae | native |
| Brome Grass | Bromus | tectorum | Poaceae | alien |
| Brome Grass | Bromus | inermis | Poaceae | alien |
| Bermuda Grass | Cynodon | dactylon | Poaceae | alien |
| Orchard Grass | Dactylus | glomerata | Poaceae | alien |
| Smooth Crabgrass | Digitaria | ischaemum | Poaceae | alien |
| Crabgrass | Digitaria | sanguinalis | Poaceae | alien |
| Barnyard Grass | Echinochloa | crusgalli | Poaceae | alien |
| Goose Grass | Eleusine | indica | Poaceae | alien |
| Wild Rye | Elymus | villosus | Poaceae | native |
| Canadian Rye | Elymus | canadensis | Poaceae | native |
| Virginia Wild Rye | Elymus | virginicus | Poaceae | native |
| Frank's Love Grass | Eragrostis | frankii | Poaceae | native |
| Tall Fescue | Lolium | arundinaceum | Poaceae | alien |
| Rattlesnake Mannagrass | Glyceria | canadensis | Poaceae | native |
| Fowl Mannagrass | Glyceria | striata | Poaceae | native |
| Bottlebrush Grass | Elymus | hystrix | Poaceae | native |
| White Grass | Leersia | virginica | Poaceae | alien |
| Rice Cutgrass | Leerzia | orizoides | Poaceae | alien |

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|---|---|---|---|---|
| Italian Rye Grass | Lolium | multiflorum | Poaceae | alien |
| Perennial Rye | Lolium | perenne | Poaceae | alien |
| Two-flower Melica | Melica | mutica | Poaceae | native |
| Japanese Stilt Grass | Microstegium | viminium | Poaceae | alien |
| Wood Witch Grass | Panicum | philadephicum | Poaceae | native |
| Switch Grass* | Panicum | virgatum | Poaceae | native |
| Timothy | Phleum | pratense | Poaceae | alien |
| Phragmites | Phragmites | communis | Poaceae | native |
| Kentucky Bluegrass | Poa | pratensis | Poaceae | alien |
| Rye Grass | Secale | cereale | Poaceae | alien |
| Yellow Foxtail | Setaria | glauca | Poaceae | alien |
| Foxtail | Setaria | faberii | Poaceae | alien |
| Indian Grass* | Sorghastrum | nutans | Poaceae | native |
| Johnson Grass | Sorghum | halapense | Poaceae | alien |
| Dropseed | Sporobolus | vaginiflorus | Poaceae | native |
| Purpletop | Tridens | flavum | Poaceae | native |
| Wheat | Triticum | aestivum | Poaceae | alien |

* Denotes those grasses that were planted on about 26 acres in 1999 and now established.

# Forbs

| COMMONNAME | GENUS | SPECIES | FAMILY | NATIVE |
|---|---|---|---|---|
| Velvet-leaf | Abutilon | theophrasti | Malvaceae | alien |
| Wingstem | Actinomeris | alternifolia | Asteraceae | native |
| Tall Agrimony | Agrimonia | gryposepala | Rosaceae | native |
| Garlic Mustard | Alliaria | officinalis | Cruciferae | alien |
| Meadow Garlic | Allium | canadense | Liliaceae | native |
| Wild Leek | Allium | tricoccum | Liliaceae | native |
| Green Amaranth | Amaranthus | retroflexus | Amaranthacea | alien |
| Giant Ragweed | Ambrosia | trifida | Asteraceae | native |
| Ragweed | Ambrosia | artemisiifolia | Asteraceae | native |
| Common Pimpernel | Anagallis | arvensis | Primulaceae | alien |
| Rue-anemone | Anemonella | thalictroides | Ranunculacea | native |
| Mayweed | Anthemis | cotula | Asteraceae | alien |
| Puttyroot | Aplectrum | hyemale | Orchidaceae | native |
| Indian Hemp | Apocynum | cannabinum | Apocynaceae | native |
| Wild Columbine | Aquilegia | canadensis | Ranunculacea | native |
| Spreading Rockcress | Arabis | patens | Cruciferae | native (rare) |
| Rockcress | Arabis | perstellatus | Cruciferae | native (rare) |
| Smooth Rock Cress | Arabis | laevigata | Cruciferae | native |
| Burdock | Arctium | minus | Asteraceae | alien |
| Jack-in-the-Pulpit | Arisaema | atrorubens | Araceae | native |
| Mugwort | Artemisia | vulgaris | Asteraceae | alien |
| Annual Wormwood | Artemisia | annua | Asteraceae | alien |
| Wild Ginger | Asarum | canadense | Aristolochiacea | native |

| | | | | |
|---|---|---|---|---|
| Green-flowered Milkweed | Asclepias | viridiflora | Asclepiadacea | native |
| Common Milkweed | Asclepias | syriaca | Asclepiadacea | native |
| Butterfly Weed | Asclepias | tuberosa | Asclepiadacea | native |
| White Wood Aster | Aster | divaricatus | Asteraceae | native |
| Bushy Aster | Aster | dumosus | Asteraceae | native |
| Calico Aster | Aster | lateriflorus | Asteraceae | native |
| Lowrie’s Aster | Aster | lowrieanus | Asteraceae | native |
| Short's Aster | Aster | shortii | Asteraceae | native |
| Small White Aster | Aster | vimineus | Asteraceae | native |
| Heath Aster | Aster | pilosus | Asteraceae | native |
| Wild Indigo | Baptisia | tinctoria | Leguminosae | native |
| Early Winter Cress | Barbarea | verna | Cruciferae | alien |
| Winter Cress | Barbarea | vulgaris | Cruciferae | alien |
| Larger Bur Marigold | Bidens | leavis | Asteraceae | native |
| Begger Ticks | Bidens | frondosa | Asteraceae | native |
| False Nettle | Boehmeria | cylindrica | Urticaceae | native |
| Tall Bellflower | Campanula | americana | Campanulacea | native |
| Shepherd's Purse | Capsella | bura-pastoris | Cruciferae | alien |
| Hairy Bittercress | Cardamine | hirsuta | Cruciferae | native |
| Common Thistle | Carduus | acanthoides | Asteraceae | alien |
| Musk Thistle | Carduus | nutans | Asteraceae | alien |
| Blue Cohosh | Caulophyllum | thalictroides | Berberidaceae | native |
| Yellow Star Thistle | Centaurea | solstitialis | Asteraceae | alien |
| Brown Knapweed | Centaurea | jacea | Asteraceae | alien |
| Mouse-Ear Chickweed | Cerastium | vulgatum | Caryophyllacea | alien |
| Celandine | Chelidonium | majus | Papaveraceae | alien |
| Turtlehead | Chelone | glabra | Scrophulariace | native |
| Lamb's-quarters | Chenopodium | album | Chenopodiace | alien |
| Skeleton-weed | Chondrilla | juncea | Asteraceae | alien |
| Ox-eye Daisy | Chrysanthemu | leucanthemum | Asteraceae | alien |
| Chicory | Cichorium | intybus | Asteraceae | alien |
| Black Cohosh | Cimicifuga | racemosa | Ranunculacea | native |
| Enchanter's Nightshade | Circaea | quadrisulcata | Chenopodiace | native |
| Bull Thistle | Cirsium | vulgare | Asteraceae | alien |
| Canada Thistle | Cirsium | arvense | Asteraceae | alien |
| Spring Beauty | Claytonia | virginica | Portulacaceae | native |
| Horse-balm | Collinsonia | canadensis | Scrophulariace | native |
| Asiatic Dayflower | Commelina | communis | Commelinacea | alien |
| Poison Hemlock | Conium | maculatum | Umbelliferae | alien |
| Cancerroot | Conopholis | americana | Orobanchacea | native |
| Hare's-Ear Mustard | Conringia | orientalis | Cruciferae | alien |
| Hedge Bindweed | Convulvulus | sepium | Convulvulacea | native |
| Lance-leaved Tickseed | Coreopsis | lanceoloata | Asteraceae | native |
| Yellow Corydalis | Corydalis | flavula | Fumariaceae | native |
| Honewort | Cryptotaenia | canadensis | Umbelliferae | native |
| Tarweed | Cuphea | petiolata | Lythraceae | native |
| Jimsonweed | Datura | stramonium | Solanaceae | native |
| Queen Anne's Lace | Daucus | carota | Umbelliferae | alien |

| | | | | |
|---|---|---|---|---|
| Dwarf Larkspur | Delphinium | tricorne | Ranunculacea | native |
| Cut-Leaved Toothwort | Dentaria | laciniata | Cruciferae | native |
| Tick-trefoil | Desmodium | perplexum | Leguminosae | native |
| Tick-trefoil | Desmodium | paniculatum | Leguminosae | native |
| Tick-trefoil | Desmodium | glutinosum | Leguminosae | native |
| Hoary Tick-Trefoil | Desmodium | canascens | Leguminosae | native |
| Deptford Pink | Dianthus | armeria | Caryophyllacea | alien |
| Dutchman's Breeches | Dicentra | cucullaria | Fumariaceae | native |
| Squirrel Corn | Dicentra | canadensis | Fumariaceae | native |
| Shooting Star | Dodecatheon | meadia | Primulaceae | native |
| Indian Strawberry | Duchesnea | indica | Rosaceae | alien |
| Viper's Bugloss | Echium | vulgare | Boraginaceae | alien |
| Ellisia | Ellisia | nyctelea | Hydrophyllacea | native |
| Purple-leaved Willow Herb | Epilobium | coloratum | Onagraceae | native |
| Northern Willow Herb | Epilobium | glandulosum | Onagraceae | native |
| Harbinger of Spring | Erigenia | bulbosa | Umbelliferae | native |
| Daisy Fleabane | Erigeron | annuus | Asteraceae | native |
| Horseweed | Erigeron | canadensis | Asteraceae | native |
| Common Fleabane | Erigeron | philadelphicus | Asteraceae | native |
| Daisy Fleabane | Erigeron | strigosus | Asteraceae | native |
| Trout Lily | Erythronium | americanum | Liliaceae | native |
| White Trout Lily | Erythronium | albidum | Liliaceae | native |
| Boneset | Eupatorium | perfoliatum | Asteraceae | native |
| Spotted Joe-Pye Weed | Eupatorium | maculatum | Asteraceae | native |
| White Snakeroot | Ageretina | altissima | Asteraceae | native |
| Mistflower | Conoclinium | coelestinum | Asteraceae | native |
| Late Flowering Thoroughwort | Eupatorium | serotinum | Asteraceae | native |
| Cyperus Spurge | Euphorbia | cyparissias | Euphorbiaceae | alien |
| Spotted Spurge | Euphorbia | maculata | Euphorbiaceae | alien |
| False Mermaid Weed | Floerkea | proserpinacoid | Limnanthaceae | native |
| Woodland Strawberry | Fragaria | vesca | Rosaceae | alien |
| Galinsoga | Galinsoga | ciliata | Asteraceae | alien |
| Fragrant Bedstraw | Galium | triflorum | Rubiaceae | native |
| Hairy Bedstraw | Galium | pilosum | Rubiaceae | native |
| Long-stalked Cranesbill | Geranium | columbinum | Geraniaceae | alien |
| Small-flowered Cranesbill | Geranium | pusillum | Geraniaceae | alien |
| White Avens | Geum | canadense | Rosaceae | native |
| Rough Avens | Geum | virginianum | Rosaceae | native |
| Gill-over-the-ground | Glechoma | hederacea | Labiatae | alien |
| Cudweed | Gnaphalium | obtusifolium | Asteraceae | native |
| Virginia Stickseed | Hackelia | virginiana | Boraginaceae | native |
| Sneezeweed | Helenium | autumnale | Asteraceae | native |
| Thin-leaved Sunflower | Helianthus | decapetalus | Asteraceae | native |
| Rough Ox-eye | Heliopsis | scabra | Asteraceae | native |
| Ox Eye Daisy | Heliopsis | helianthoides | Asteraceae | native |
| Day Lily | Hemerocallis | fulva | Liliaceae | alien |
| Round-lobed Hepatica | Hepatica | americana | Ranunculacea | native |
| Dame's Rocket | Hesperis | matronalis | Cruciferae | alien |

| | | | | |
|---|---|---|---|---|
| Flower-of-an-Hour | Hibiscus | trionum | Malvaceae | alien |
| Virginia Waterleaf | Hydrophyllum | virginianum | Hydrophyllacea | native |
| Common St. Johnswort | Hypericum | perforatum | Guttiferae | alien |
| Spotted St. Johnswort | Hypericum | punctatum | Guttiferae | native |
| Dwarf St. Johnswort | Hypericum | mutilum | Guttiferae | native |
| Jewelweed | Impatiens | capensis | Balsaminaceae | native |
| Pale Touch-Me-Not | Impatiens | pallida | Balsaminaceae | native |
| Ivy-Leaved Morning-Glory | Ipomea | hederacea | Convulvulacea | alien |
| Twinleaf | Jeffersonia | diphylla | Berberidaceae | native |
| Water Willow | Justicia | americana | Acanthaceae | native |
| Prickly Lettuce | Lactuca | scariola | Asteraceae | alien |
| Wood Nettle | Laportea | canadensis | Urticaceae | native |
| Motherwort | Leonurus | cardiaca | Labiatae | alien |
| Field Cress | Lepidium | campestre | Cruciferae | alien |
| Bushclover | Lespedeza | intermedia | Leguminosae | native |
| Butter-and-eggs | Linaria | vulgaris | Scrophulariace | alien |
| False Pimpernel | Lindernia | dubia | Scrophulariace | native |
| Cardinal Flower | Lobelia | cardinalis | Lobeliaceae | native |
| Great Lobelia | Lobelia | syphilitica | Lobeliaceae | native |
| Indian Tobacco | Lobelia | inflata | Lobeliaceae | native |
| Spiked Lobelia | Lobelia | spicata | Lobeliaceae | native |
| White Campion | Lychnis | alba | Caryophyllacea | alien |
| Northern Bugleweed | Lycopus | uniflora | Labiatae | native |
| Moneywort | Lysimachia | nummularia | Primulaceae | alien |
| Fringed Loosestrife | Lysimachia | ciliata | Primulaceae | native |
| White Sweetclover | Melilotus | alba | Leguminosae | alien |
| Yellow Sweetclover | Melilotus | officinalis | Leguminosae | alien |
| Virginia Bluebell | Mertensia | virginica | Boraginaceae | native |
| Bishop's Cap | Mitella | diphylla | Saxifragaceae | native |
| Wild Bergomot | Monarda | fistulosa | Labiatae | native |
| Indian Pipe | Monotropa | uniflora | Pyrolaceae | native |
| Watercress | Nasturtium | officianale | Cruciferae | alien |
| Catnip | Nepeta | cataria | Labiatae | alien |
| Common Evening | Oenothera | biennis | Onagraceae | native |
| Northern Evening | Oenothera | parviflora | Onagraceae | native |
| White Evening Primrose | Oenothera | speciosa | Onagraceae | native |
| Star-of-Bethlehem | Ornithogalum | umbellatum | Liliaeae | alien |
| Sweet Cicely | Osmorhiza | claytoni | Umbelliferae | native |
| Yellow Wood Sorrel | Oxalis | europaea | Oxalidaceae | native |
| Yellow Wood-Sorrel | Oxalis | stricta | Oxalidaceae | native |
| Poppy | Papaver | dubium | Papaveraceae | alien |
| Ditch Stonecrop | Penthorum | sedoides | Saxifragaceae | native |
| Beefsteak Plant | Perilla | frutescens | Labiatae | alien |
| Mountain Phlox | Phlox | ovata | Polemoniaceae | native |
| Blue Phlox | Phlox | divaricata | Polemoniaceae | native |
| Lopseed | Phryma | leptostachya | Phrymaceae | native |
| Smooth Ground Cherry | Physalis | subglabrata | Solanaceae | native |
| Common Ground-cherry | Physalis | heterophylla | Solanaceae | native |

| | | | | |
|---|---|---|---|---|
| Pokeweed | Phytolacca | americana | Phytolaccacea | native |
| Clearweed | Pilea | pumila | Urticaceae | native |
| Common Plantain | Plantago | rugellii | Plantaginaceae | native |
| Common Plantain | Plantago | major | Plantaginaceae | alien |
| English Plantain | Plantago | lanceolata | Plantaginaceae | alien |
| Mayapple | Podophyllum | peltatum | Berberidaceae | native |
| Solomon's Seal | Polygonatum | canaliculatum | Liliaceae | native |
| Mild Water Pepper | Polygonum | hydropiperoide | Polygonaceae | native |
| Water Smartweed | Polygonum | coccineum | Polygonaceae | native |
| Dock-leaved Smartweed | Polygonum | lapathifolium | Polygonaceae | native |
| Ladies Thumb | Polygonum | persicaria | Polygonaceae | alien |
| Water Smartweed | Polygonum | punctatum | Polygonaceae | native |
| Asiatic Water Pepper | Polygonum | cespitosum | Polygonaceae | alien |
| Large-flowered Leafcup | Polymnia | uvedalia | Asteraceae | native |
| Rough-fruited Cinquefoil | Potentilla | recta | Rosaceae | alien |
| Rough Cinquefoil | Potentilla | norvegica | Rosaceae | native |
| Tall Cinquefoil | Potentilla | arguta | Rosaceae | native |
| Self-Heal | Prunella | vulgaris | Labiatae | native |
| Swamp Buttercup | Ranunculus | septentrionalis | Ranunculacea | native |
| Crowfoot | Ranunculus | abortivus | Ranunculacea | native |
| Cursed Crowfoot | Ranunculus | sceleratus | Ranunculacea | native |
| Hooked Crowfoot | Ranunculus | recurvatus | Ranunculacea | native |
| Black-Eyed Susan | Rudbeckia | hirta | Asteraceae | native |
| Brown-eyed Susan | Rudbeckia | fulgida | Asteraceae | native |
| Ruellia | Ruellia | strepens | Acanthaceae | native |
| Curly Dock | Rumex | crispus | Polygonaceae | alien |
| Sheep Sorrel | Rumex | acetosella | Polygonaceae | alien |
| Bloodroot | Sanginaria | canadensis | Papaveraceae | native |
| Long-Fruited Snakeroot | Sanicula | trifoliata | Umbelliferae | native |
| Black Snake Root | Sanicula | marylandica | Umbelliferae | native |
| Bouncing Bet | Saponaria | officinalis | Caryophyllacea | alien |
| Wild Basil | Satureja | vulgaris | Labiatae | alien |
| Lizard Tail | Saururus | cernuus | Saururaceae | native |
| Early Saxifrage | Saxifraga | virginiensis | Saxifragaceae | native |
| Mad-dog Skullcap | Scutellaria | lateriflora | Labiatae | native |
| Wild Stonecrop | Sedum | ternatum | Crassulaceae | native |
| Squaw-weed | Senecio | obovatus | Asteraceae | native |
| Golden Ragwort | Senecio | aureus | Asteraceae | native |
| Prickly Mallow | Sida | spinosa | Malvaceae | alien |
| Hedge Mustard | Sisymbrium | officinale | Crusiferae | alien |
| Tumble Mustard | Sisymbrium | altissimum | Cruciferae | alien |
| Blue-eyed Grass | Sisyrinchium | angustifolium | Iridaceae | native |
| False Solomon's Seal | Smilacina | racemosa | Liliaceae | native |
| Horse Nettle | Solanum | carolinense | Solanaceae | native |
| Black Nightshade | Solanum | americanum | Solanaceae | native |
| Wreath Goldenrod | Solidago | caesia | Asteraceae | native |
| Sweet Goldenrod | Solidago | odora | Asteraceae | native |
| Late Goldenrod | Solidago | gigantea | Asteraceae | native |

| | | | | |
|---|---|---|---|---|
| Early Goldenrod | Solidago | juncea | Asteraceae | native |
| Rough-stemmed Goldenrod | Solidago | rugosa | Asteraceae | native |
| Spiny Sow Thistle | Sonchus | asper | Asteraceae | alien |
| Venus Looking Glass | Specularia | perfoliata | Campanulacea | native |
| Rough Hedge-Nettle | Stachys | tenuifolia | Labiatae | native |
| Common Chickweed | Stellaria | media | Caryophyllacea | alien |
| Star Chickweed | Stellaria | pubera | Caryophyllacea | native |
| Common Dandelion | Taraxacum | officinale | Asteraceae | alien |
| American Germander | Teucrium | canadense | Labiatae | native |
| Tall Meadow Rue | Thalictrum | polygamum | Ranunculacea | native |
| Foam Flower | Tiarella | cordifolia | Saxifragaceae | native |
| Virginia Knotweed | Tovara | virginiana | Polygonaceae | native |
| Yellow Goat's Beard | Tragopogon | pratensis | Asteraceae | alien |
| Yellow Goat's Beard | Tragopogon | major | Asteraceae | alien |
| Low Hop Clover | Trifolium | campestre | Leguminosae | alien |
| Rabbit's Foot Clover | Trifolium | arvense | Leguminosae | alien |
| Red Clover | Trifolium | pratense | Leguminosae | alien |
| White Clover | Trifolium | repens | Leguminosae | alien |
| Red Trillium | Trillium | erectum | Liliaeae | native |
| Toad Trillium | Trillium | sessile | Liliaeae | native |
| Coltsfoot | Tussilago | farfara | Asteraceae | alien |
| Cattail | Typha | latifolia | Typhaceae | native |
| Burning Nettle | Urtica | dioica | Urticaceae | alien |
| Moth Mullein | Verbascum | blattaria | Scrophulariace | alien |
| Common Mullein | Verbascum | thapsus | Scrophulariace | alien |
| Blue Vervain | Verbena | hastata | Verbenaceae | native |
| White Vervain | Verbena | urticifolia | Verbenaceae | native |
| New York Ironweed | Vernonia | noveboracensi | Asteraceae | native |
| Corn Speedwell | Veronica | arvensis | Scrophulariace | alien |
| European Brooklime | Veronica | beccabunga | Scrophulariace | alien |
| Pale Violet | Viola | striata | Violaceae | native |
| Round-leaved Violet | Viola | rotundifolia | Violaceae | native |
| Common Blue Violet | Viola | papilionacea | Violaceae | native |
| Cocklebur | Xanthium | strumarium | Asteraceae | native |

# Sedges and Rushes

| COMMONNAME | GENUS | SPECIES | FAMILY | NATIVE |
|---|---|---|---|---|
| Blunt Broom Sedge | Carex | tribuloides | Cyperaceae | native |
| Carex | Carex | laxiculmis | Cyperaceae | native |
| Carex | Carex | stipata | Cyperaceae | native |
| Carex | Carex | intumescens | Cyperaceae | native |
| Carex | Carex | frankii | Cyperaceae | native |
| Carex | Carex | lurida | Cyperaceae | native |
| Many-flowered Flatsedge | Cyperus | lancastriensis | Cyperaceae | native |
| Galingale | Cyperus | strigosus | Cyperaceae | native |
| Nut Sedge | Cyperus | esculentus | Cyperaceae | native |

| | | | | |
|---|---|---|---|---|
| Common Rush | Juncus | effusus | Juncaceae | native |
| Path Rush | Juncus | tenuis | Juncaceae | native |
| Great Bulrush | Scirpus | validus | Cyperaceae | native |
| Scirpus | Scirpus | lineatus | Cyperaceae | native |

# Vines

| COMMONNAME | GENUS | SPECIES | FAMILY | NATIVE |
|---|---|---|---|---|
| Trumpet Creeper | Campsis | radicans | Bignoniaceae | native |
| Climbing Bittersweet | Celastrus | scandens | Celastraceae | native |
| Field Bindweed | Convolvulus | arvensis | Convulvulacea | alien |
| Japanese Hop | Humulus | japonicus | Canabinaceae | alien |
| Common Morning Glory | Ipomea | purpurea | Convulvulacea | alien |
| Wild Potato Vine | Ipomea | pandurata | Convulvulacea | native |
| Japanese Honeysuckle | Lonicera | japonica | Caprifoliaceae | alien |
| Moonseed | Menispermum | canadense | Menispermace | native |
| Virginia Creeper | Parthenocissus | quinquefolia | Vitaceae | native |
| Yellow Passion Flower | Passiflora | lutea | Passifloraceae | native |
| Poison Ivy | Toxicodendron | radicans | Anacardiaceae | native |
| Wineberry | Rubus | phoenicolasius | Rosaceae | alien |
| Black Raspberry | Rubus | occidentalis | Rosaceae | native |
| Flowering Raspberry | Rubus | odoratus | Rosaceae | native |
| One-seeded Bur Cucumber | Sicyos | angulatus | Cucurbitaceae | native |
| Cat Briar | Smilax | rotundifolia | Liliaceae | native |
| Periwinkle | Vinca | minor | Apocynaceae | alien |
| Summer Grape | Vitis | aestivalis | Vitaceae | native |
| Muscadine | Vitis | rotundifolia | Vitaceae | native |
| Winter Grape | Vitus | vulpina | Vitaceae | native |

# Ferns and Fern Allies

| COMMONNAME | GENUS | SPECIES | FAMILY | NATIVE |
|---|---|---|---|---|
| Maidenhair Spleenwort | Asplenium | trichomanes | Polypodiaceae | native |
| Meadow Spikemoss | Selagenella | apoda | Sellagenellace | native |
| Field Horsetail | Equisetum | arvense | Equisetaceae | native |
| Rattlesnake Fern | Botrychium | virginianum | Ophioglossace | native |
| Purple Cliff-brake | Pellaea | atropurpurea | Polypodiaceae | native |
| Common Maidenhair | Adiantum | pedatum | Polypodiaceae | native |
| Liverwort | Marchantia | polymorpha | Marchantiacea | native |
| Ebony Spleenwort | Asplenium | platyneuron | Polypodiaceae | native |
| Fragile Fern | Cystopteris | fragilis | Polypodiaceae | native |
| Sensitive Fern | Onoclea | sensibilis | Polypodiaceae | native |
| Southern Lady Fern | Athyrium | asplenioides | Polypodiaceae | native |
| Bulblet Bladder Fern | Cystopteris | bulbifera | Polypodiaceae | native |
| Christmas Fern | Polystichum | acrostichoides | Polypodiaceae | native |

| | | | | |
|---|---|---|---|---|
| Spinulose Wood Fern | Dryopteris | spinulosa | Polypodiacea | native |
| Rockcap Fern | Polypodium | virginianum | Polypodiaceae | native |
| Walking Fern | Camptosorus | rhyzophyllum | Polypodiaceae | native |

Note: Ornamental species planted during and after the construction phase of NCTC are not included in this list, with the exception of the native warm season grasses planted in 1999. Some of the plants in the vine category could also be considered shrubs and visa versa. The list is current as of March 2004. Nomenclature tends to follow Strausbaugh and Core, Flora of West Virginia, though is gradually conforming to NRCS Plants Database (http://plants.usda.gov) as changes are discovered. Identification by Dan Everson and Alan Temple; database maintained by Dan Everson.

# Mammals

| | |
|---|---|
| White-tailed deer | *Odocoileus virginianus* |
| Red Fox | *Vulpes fulva* |
| Gray Fox | *Urocyon cinereoargenteus* |
| Bobcat | *Lynx rufus* |
| Black Bear | *Ursus americanus* (rarely travels through the area) |
| Coyote | *Canis latrans* |
| Long-tailed Weasel | *Mustela frenata* |
| Mink | *Mustela vison* |
| Gray Squirrel | *Sciurus carolinensis* |
| Eastern Fox Squirrel | *Sciurus niger* |
| Striped Skunk | *Mephitis mephitis* |
| Common Raccoon | *Procyon lotor* |
| Virginia Opossum | *Didelphus virginiana* |
| Groundhog | *Marmota monax* |
| Masked Shrew | *Sorex cinereus* |
| Common Water Shrew | *Sorex palustris* |
| Hairy-tailed Mole | *Parascalops breweri* |
| Eastern Mole | *Scalopus aquaticus* |
| Star-nosed Mole | *Condylura cristata* |
| Meadow Vole | *Microtus pennsylvanicus* |
| Eastern Woodrat | *Neotoma floridana* |
| Deer Mouse | *Peromyscus maniculatus* |
| White-footed Mouse | *Peromyscus leucopus* |
| House Mouse | *Mus musculus* |
| Eastern Chipmunk | *Tamius striatus* |
| Little Brown Bat | *Myotis lucifigus* |
| Big Brown Bat | *Eptesicus fuscus* |
| Red Bat | *Lasiurus borealis* |
| Hoary Bat | *Lasiurus cinereus* |
| Eastern Pipistrelle Bat | *Pipestrellus subflavus* |
| Eastern Cottontail Rabbit | *Sylvilagus floridanus* |
| American Beaver | *Castor canadensis* |
| River Otter | *Lutra canadensis* |
| Eastern Cottontail | *Silvilagus floridanus* |

# Birds

The Shenandoah Valley and the Potomac River form natural migration corridors for birds in the spring and fall, thus many of the species listed below can only be seen during these periods of migration; the species listed below have been seen at NCTC or in the immediate vicinity. Common winter residents are marked with an asterisk*.

**Cormorants, Grebes and Loons**
- ☐ Double-crested Cormorant
- ☐ Pied-billed Grebe
- ☐ Common Loon

**Herons and Bitterns**
- ☐ Great Blue Heron*
- ☐ Green Heron
- ☐ American Bittern
- ☐ Black-crowned Night Heron

**Waterfowl**
- ☐ Canada Goose*
- ☐ Tundra Swan
- ☐ Wood Duck*
- ☐ Green-winged Teal
- ☐ Blue-winged Teal
- ☐ Mallard*
- ☐ Black Duck
- ☐ American Wigeon
- ☐ Ring-necked Duck
- ☐ Lesser Scaup
- ☐ Common Goldeneye
- ☐ Bufflehead
- ☐ Ruddy Duck
- ☐ Hooded Merganser
- ☐ Common Merganser
- ☐ Red-breasted Merganser
- ☐ American Coot

**Vultures**
- ☐ Turkey Vulture*
- ☐ Black Vulture*

**Hawks and Eagles**
- ☐ Sharp-shinned Hawk*
- ☐ Red-tailed Hawk*
- ☐ Red-shouldered Hawk
- ☐ Bald Eagle*
- ☐ Broad-winged Hawk
- ☐ American Kestrel*
- ☐ Cooper's Hawk
- ☐ Osprey
- ☐ Peregrine Falcon

**Quail and Turkeys**
- ☐ Northern Bobwhite*
- ☐ Wild Turkey*

**Sandpipers and Shorebirds**
- ☐ Killdeer
- ☐ Solitary Sandpiper
- ☐ Baird's Sandpiper
- ☐ Least Sandpiper
- ☐ American Woodcock
- ☐ Greater Yellowlegs
- ☐ Lesser Yellowlegs

**Gulls**
- ☐ Ring-billed Gull

**Pigeons and Doves**
- ☐ Rock Dove*
- ☐ Mourning Dove*

**Cuckoos and Allies**
- ☐ Yellow-billed Cuckoo
- ☐ Black-billed Cuckoo

**Goatsuckers**
- ☐ Common Nighthawk
- ☐ Whip-Poor-Will

**Owls**
- ☐ Great Horned Owl*
- ☐ Barred Owl*
- ☐ Eastern Screech Owl*
- ☐ Long-eared Owl

**Hummingbirds**
- ☐ Ruby-throated Hummingbird

**Kingfishers**
- ☐ Belted Kingfisher*

**Woodpeckers**
- ☐ Northern Flicker*
- ☐ Red-headed Woodpecker*
- ☐ Pileated Woodpecker*
- ☐ Red-bellied Woodpecker*
- ☐ Yellow-bellied Sapsucker*
- ☐ Hairy Woodpecker*
- ☐ Downy Woodpecker*

**Flycatchers**
- ☐ Eastern Kingbird
- ☐ Great Crested Flycatcher
- ☐ Eastern Phoebe
- ☐ Acadian Flycatcher
- ☐ Eastern Wood-pewee

**Swallows and Swifts**
- ☐ Barn Swallow
- ☐ Cliff Swallow
- ☐ Bank Swallow
- ☐ Tree Swallow
- ☐ Northern Rough-winged Swallow
- ☐ Purple Martin
- ☐ Chimney Swift

**Jays, Crows and Ravens**
- ☐ Blue Jay*
- ☐ American Crow*
- ☐ Fish Crow*
- ☐ Common Raven*

**Chickadees and Titmice**
- ☐ Carolina Chickadee*
- ☐ Black-capped Chickadee*
- ☐ Tufted Titmouse*

**Nuthatches and Creepers**
- ☐ White-breasted Nuthatch*
- ☐ Red-breasted Nuthatch
- ☐ Brown Creeper*

**Wrens**
- ☐ House Wren
- ☐ Carolina Wren*
- ☐ Winter Wren

**Mimic Thrushes**
- ☐ Northern Mockingbird*
- ☐ Gray Catbird
- ☐ Brown Thrasher

**Shrikes**
- ☐ Loggerhead Shrike

**Thrushes**
- ☐ American Robin*
- ☐ Wood Thrush
- ☐ Hermit Thrush
- ☐ Eastern Bluebird*

**Kinglets and Gnatcatchers**
- ☐ Blue-gray Gnatcatcher
- ☐ Ruby-crowned Kinglet

- ☐ Golden-crowned Kinglet

**Waxwings**
- ☐ Cedar Waxwing*

**Starlings**
- ☐ European Starling*

**Vireos**
- ☐ Solitary Vireo
- ☐ Red-eyed Vireo
- ☐ Philadelphia Vireo
- ☐ Warbling Vireo
- ☐ White-eyed Vireo
- ☐ Yellow-throated Vireo

**Wood Warblers**
- ☐ Blue-winged Warbler
- ☐ Northern Parula
- ☐ Nashville Warbler
- ☐ Yellow-rumped Warbler
- ☐ Cerulean Warbler
- ☐ Kentucky Warbler
- ☐ Black-throated Blue Warbler
- ☐ Black-throated Green Warbler
- ☐ Blackburnian Warbler
- ☐ Pine Warbler
- ☐ Prairie Warbler
- ☐ Palm Warbler
- ☐ Bay-breasted Warbler
- ☐ Blackpoll Warbler
- ☐ Worm-eating Warbler
- ☐ Mourning Warbler
- ☐ Tennessee Warbler
- ☐ Wilson's Warbler
- ☐ Yellow Warbler
- ☐ Chestnut-sided Warbler
- ☐ Magnolia Warbler
- ☐ Cape May Warbler
- ☐ Black-and-White Warbler
- ☐ American Redstart
- ☐ Prothonotary Warbler
- ☐ Ovenbird
- ☐ Northern Waterthrush
- ☐ Louisiana Waterthrush
- ☐ Common Yellowthroat
- ☐ Yellow-breasted Chat

**Weaver Finches**
- ☐ House Sparrow*

**Blackbirds and Orioles**
- ☐ Bobolink
- ☐ Eastern Meadowlark
- ☐ Red-winged Blackbird*
- ☐ Rusty Blackbird*
- ☐ Common Grackle*
- ☐ Brown-headed Cowbird*
- ☐ Orchard Oriole
- ☐ Baltimore Oriole

**Tanagers**
- ☐ Scarlet Tanager

**Finches, Sparrows, etc.**
- ☐ Northern Cardinal*
- ☐ Indigo Bunting
- ☐ House Finch*
- ☐ Dickcissel
- ☐ American Goldfinch
- ☐ Rufous-sided Towhee
- ☐ Chipping Sparrow
- ☐ Field Sparrow
- ☐ Song Sparrow*
- ☐ Lincoln's Sparrow
- ☐ Swamp Sparrow
- ☐ American Tree Sparrow
- ☐ Fox Sparrow
- ☐ Grasshopper Sparrow
- ☐ White-throated Sparrow*
- ☐ White-crowned Sparrow
- ☐ Dark-eyed Junco*
- ☐ Bobolink
- ☐ Purple Finch
- ☐ Evening Grosbeak
- ☐ Rose-breasted Grosbeak

Additional Species:

## Reptiles and Amphibians

| | | |
|---|---|---|
| Spotted Salamander | *Ambystoma maculatum* | |
| Valley and Ridge Salamander | *Plethodon hoffmani* | |
| Northern Dusky Salamander | *Desmognathus brimleyorum* | |
| Long-tailed Salamander | *Eurycea longicauda* | |
| Red-backed Salamander | *Plethodon cinereus* | |
| American Toad | *Bufo americanus* | |
| Fowler's Toad | *Bufo woodhouseii* | |
| Upland Chorus Frog | *Pseudacris triseriata feriarum* | |
| Gray Tree Frog | *Hyla versicolor* | |
| Green Tree Frog | *Hyla cinerea* | disjunct population |
| Spring Peeper | *Hyla crucifer crucifer* | |
| Green Frog | *Rana clamitans* | |
| Pickerel Frog | *Rana palustris* | |
| Bull Frog | *Rana catesbeiana* | |
| Wood Frog | *Rana sylvatica* | |
| Snapping Turtle | *Chleydra serpentina* | |
| Eastern Box Turtle | *Terrapene carolina* | |
| Eastern Painted Turtle | *Chrysemys picta picta* | |
| Wood Turtle | *Clemmys insculpta* | |
| Black Rat Snake | *Elaphe obsoleta obsoleta* | |
| Northern Water Snake | *Nerodia sipedon* | |
| Northern Black Racer | *Coluber constrictor* | |
| Eastern Garter Snake | *Thamnophis sirtalis* | |
| Eastern Ribbon Snake | *Thamnophis sauritus sauritus* | |

## Fish

(no fish have been recorded living in any of the ponds or small creeks on the property)
The following list contains fish common to this section of the Potomac River

| | |
|---|---|
| Smallmouth Bass | *Micropterus dolomieu* |
| Largemouth Bass | *Microptera salmoides* |
| Common Carp | *Cyprinus carpio* |
| Quillback | *Carpiodes cyprinus* |
| Bluegill | *Lepomis macrochirus* |
| Redbreast Sunfish | *Lepomis auritus* |
| Pumpkinseed | *Lepomis gibbosus* |
| Green Sunfish | *Lepomis cyanellus* |
| Long-eared Sunfish | *Lepomis megalotis* |
| Rockbass | *Ambloplites rupestris* |
| American Eel | *Anguilla rostrata* |
| Channel Catfish | *Ictalurus punctatus* |
| Yellow Bullhead | *Ameiurus natalis* |
| Margined Madtom | *Noturus insignis* |
| Walleye* | *Stizostedion vitreum* |
| Muskelunge* | *Esox masquinongy* |

| | |
|---|---|
| Creek Chub | *Semotilus atromaculatus* |
| Fallfish | *Semotilus corporalis* |
| River Chub | *Nocomis micropogon* |
| Greenside Darter | *Etheostoma blenniodes* |
| Rainbow Darter | *Etheostoma caeruleum* |
| Fantail Darter | *Etheostoma flabellare* |
| Tesselated Darter | *Etheostoma olmstedi* |
| Central Stoneroller | *Campostoma anomalum* |
| Spotfin Shiner | *Cyprinella spiloptera* |
| Cutlips Minnow | *Exoglossum maxillingua* |
| Common Shiner | *Luxilus cornutus* |
| Golden Shiner | *Notemigonus crysoleucas* |
| Comely Shiner | *Notropis amoenus* |
| Spottail Shiner | *Notropis hudsonius* |
| Rosyface Shiner | *Notropis rubellus* |
| Bluntnose Minnow | *Pimephales notatus* |
| Blacknose Dace | *Rhinichthys atratulus* |
| Longnose Dace | *Rhinichthys cataractae* |
| Pearl Dace | *Margariscus margarita* |
| White Sucker | *Catostomus commersoni* |
| Northern Hogsucker | *Hypentelium nigricans* |
| Golden Redhorse Sucker | *Moxostoma erythrurum* |
| Shorthead Redhorse Sucker | *Moxostoma macrolepidotum* |
| Brook Trout* | *Salvelinus fontinalis* |
| Banded Killifish | *Fundulus diaphanus* |
| Yellow Perch | *Perca flavescens* |

* = stocked fish

# Invertebrates

**(Note: invertebrates and aquatic macrophytes have not been recorded in great detail as yet, but we are working on it – the list below is what we have thus far.)**

**Aquatic invertebates** include Asiatic clam, *Corbicula fluminea* which is present in high numbers in the Potomac River. It is an invasive exotic that appeared in the mid-20th century, with old shells several inches deep on the edges of Shepherd Island. Native mussels from several genera are also found in the Potomac including L*ampsilis* and E*lliptio.*

List of caddisflies collected by B. Bauer of BHE Environmental 5/26/99

| | |
|---|---|
| *Protoptila palina* | *Hydropsyche scalaris* |
| *Cheumatopsyche campyla* | *Hydroptila spatulata* |
| *Cheumatopsyche sordida* | *Oecetis inconspicua* |
| *Hydropsyche hageni* | *Triaenodes injustus* |
| *Hydopsyche phalerata* | |

**Butterflies** (collected 1998, specimens curated at NCTC Lab Building)

| | |
|---|---|
| Summerbrood Hairstreak | *Everes comyntas comyntas* |
| Great Spangled Fritillary | *Speyeria cybele cybele* |
| European Skipper | *Thymelicus lineola* |
| Clouded Sulphur | *Colias philodice philodice* |
| Peck's Skipper | *Polites peckius* |
| Orange Sulphur | *Colias eurytheme* |
| Meadow Fritillary | *Boloria bellona bellona* |
| Tawny Emporer | *Asterocampa clyton clyton* |
| Grey Hairstreak | *Strymon melinus humuli* |
| Silvery Checkerspot | *Chlosyne nycteis nycteis* |
| Pearl Crescent | *Phyciodes tharos* |
| Silver Spotted Skipper | *Epargyreus clarus* |
| Tiger Swallowtail | *Papilio glaucus* |
| Monarch | *Danaus plexippus* |
| Zebra Swallowtail | *Eurytides marcellus* |

Other known butterfly species:

| | |
|---|---|
| Mourning Cloak | *Nymphalis antiopa antiopa* |
| Red-spotted Purple | *Limenitis arthemus astyanax* |
| Spicebush Swallowtail | *Papilio troilus troilus* |
| Hackberry Butterfly | *Asterocampa celtis celtis* |

(there are more than 20 additional species that could be commonly found here, so this list is not yet a representative sample of the butterflies of the area.)

## Invertebrates Recorded by Alan Temple's Macroinvertebrate Ecology and Identification Course in 2002 and 2003:

**Platyhelminthes**
- Turbellaria (flatworms)

**Gastropoda**
- Pulmanata
  - Physidae (pond snails)
- Prosobranchia
  - Pleuroceridae (pleurocerid snails)

**Bivalvia**
- Unionidae
  - *Elliptio* (native mussels)
- Corbiculidae
  - *Corbicula fluminea* (Asian clam)

**Arachnida**
- Acariformes
  - Hydracarina (water mites)

**Crustacea**
- Isopoda
  - Asellidae (aquatic sow bugs)
- Amphipoda (scuds)

**Insecta**
- Hemiptera
  - Corixidae (water boatmen)
  - Notonectidae (backswimmers)
  - Nepidae
    - Ranatra (water scorpions)
  - Belostomatidae (giant water bugs)
  - Gerridae (water striders)
- Coleoptera
  - Gyrinidae (whirligig beetles)
  - Elmidae (riffle beetles)
  - Dytiscidae (predaceous diving beetles)
  - Hydrophilidae (water scavenger beetles)
  - Psephidae (water pennies)
- Odonata
  - Zygoptera
    - Calopterygidae (broadwinged damselflies)
    - Lestidae (spreadwinged damselflies)
  - Anisoptera
    - Gomphidae (clubtail dragonflies)
    - Aeshnidae (darner dragonflies)
    - Libellulidae (skimmer dragonflies)
- Plecoptera
  - Perlidae (common stoneflies)
  - Perlodidae (perlodid stoneflies)
- Ephemeroptera
  - Isonichiidae
    - *Isonychia* (brushlegged mayflies)
  - Caenidae (small squaregill mayflies)
  - Ephemerellidae

- *Drunella* (spiny crawler mayflies)
- Heptageniidae (flatheaded mayflies)
- Potamanthidae (burrowing mayflies)

Megaloptera
- Corydalidae
  - Corydalus (hellgrammites)

Trichoptera (caddisflies)
- *Protoptila*
- *Cheumatopsyche*
- *Hydropsyche*
- *Hydroptila*
- *Oecetis*
- *Triaenodes*

Diptera
- Chaoboridae (phantom midges)
- Culicidae (mosquitoes)
- Simuliidae (blackflies)
- Chironomidae (midges)

# Fungi

identified and collected by WV DNR, June 26-28, 2001
voucher specimens curated at Davis and Elkins College Herbarium

| | |
|---|---|
| *Auricularia auricularia* | Tree-Ear (Jelly Fungi) |
| *Bovista sp* | Puffball |
| *Chalciporus rubinellus* | Purple-red Bolete |
| *Cheimonophyllum candidissimus* | White Oysterette |
| *Collybia luxurians* | (a gilled mushroom) |
| *Conocybe lactea* | White Dunce Cap |
| *Coprinus quadrifidus* | |
| *Crepidotus applanatus* | Flat Crepidotus |
| *Crepidotus crocophyllus* | |
| *Crucibulum laeve* | Bird's Nest Fungi |
| *Daldinia concentrica* | Carbon Balls, Crampballs |
| *Exidia thuretiana* | (a Jelly Fungi) |
| *Gyroporus castaneus* | Chestnut Bolete |
| *Lepiota cristata* | Malodorous Lepiota |
| *Megacollybia platyphylla* | (a gilled mushroom) |
| *Microstoma floccosum* [floccosa?] | Shaggy Scarlet Cup |
| *Phylloporus rhodoxanthus* | Gilled Bolete |
| *Pluteus admirabilis* | Yellow Pluteus |
| *Pluteus atricapillus* (P. cervinus) | Fawn Mushroom, Deer Mushroom |
| *Polyporus mori* | |
| *Polyporus varius* | |
| *Psathyrella candolleana* | Common Psathyrella |
| *Sarcoscypha occidentalis* | Stalked Scarlet Cup |
| *Schizophyllum commune* | Common Split Gill |
| *Scleroderma areolatum* | Puffball |
| *Scutellinia scutellata* | (a Saucer fungi) |
| *Ustulina deusta* | Carbon Cushion |
| *Xerula megalospora* | (a gilled mushroom) |
| *Xerula radicata* var. *radicata* | (a gilled mushroom) |
| *Xylaria polymorpha* | Dead Man's Fingers |

## Rare, Threatened or Endangered Plants and Animals

The Non-Game Wildlife Program of the West Virginia Dept. of Natural Resources has developed a list of species that they are particularly interested in locating and monitoring, either because of rarity, severe population decline, or interest in the actual distribution of difficult to find species. If any of these species are seen, you can contact them at PO Box 67, Elkins, WV 26241, phone number 304-637-0245

The following rare plants have been found at NCTC and already reported:

*Arabis patens* - Rock Cress, on north-facing cliffs
*Arabis perstellatus* – Rock Cress, on north-facing cliffs, creek near treatment plant.
*Erythronium albidum* - White Trout Lily, riparian edge of Potomac

For locations of these plants, contact Dan Everson at NCTC.

From a protection standpoint, there is more of a concern at NCTC for the small areas that are densely populated with a few individuals of many native species, such as wet areas beside creeks, springs, and the north-east bluff overlooking the river.

# Be On the Lookout

The following vertebrate species can potentially be found in the vicinity of NCTC and are of particular interest to the West Virginia DNR:

**Fish**

| | |
|---|---|
| Satinfin Shiner | *Notropis analostanus* |
| Slimy Sculpin | *Cottus cognatus* |

**Amphibians and Reptiles**

| | |
|---|---|
| Jefferson Salamander | *Ambystoma jeffersonianum* |
| Upland Chorus Frog | *Pseudacris triseriata feriarum* |
| Cricket Frog | *Acris crepitans crepitans* |
| Northern Leopard Frog | *Rana pipiens* |
| Spotted Turtle | *Clemmys guttata* |
| Wood Turtle | *Clemmys insculpta* |
| Redbelly Turtle | *Pseudemys rubriventris rubriventris* |
| Broadhead Skink | *Eumeces laticeps* |

**Birds** (Note: only nesting activity at NCTC is of interest, since these species can be seen during migration or during long-distance foraging activities).

| | |
|---|---|
| American Bittern | Long-eared Owl |
| Least Bittern | Bewick's Wren |
| Black Vulture | Sedge Wren |
| Osprey | Olive-sided Flycatcher |
| Coopers Hawk | Loggerhead Shrike |

| | |
|---|---|
| Northern Harrier | Golden-winged Warbler |
| Bald Eagle | Dickcissel |
| Peregrine Falcon | Bachman's Sparrow |
| Upland Sandpiper | Henslow's Sparrow |
| Barn Owl | Lark Sparrow |

**Mammals**

| | |
|---|---|
| Pygmy Shrew | *Sorex hovi* |
| Star-nosed Mole | *Codylura cristata* |
| Eastern Mole | *Scalopus aquaticus* |
| Northern Long-eared Bat | *Myotis septentrionalis* |
| Meadow Jumping Mouse | *Zapus hudsonius* |
| Least Weasel | *Mustela nivalis* |

## Outdoor Concerns

**Ticks** – deer ticks and dog ticks are present at NCTC and can potentially carry a number of diseases including Lyme Disease; just be aware and check yourself after spending time in unmowed areas during any warm day – winter or summer. They usually take several hours to attach themselves to your skin after they have hitched a ride, giving you a window of opportunity to remove them. Lyme Disease is serious, so it is important to be vigilant (deer ticks are tiny, dog ticks are bigger and easier to detect). If a tick does become attached, make sure you remove it carefully, and wash the site of contact. Lyme disease is easily treated with antibiotics in the early stages, so watch for a reddish circle and inflammation around the area of tick bite and see a doctor if you have any questions.

**Chiggers** – these are the microscopic larval forms of an insect known as the harvest mite. In general they can be found in high grasses and uncut areas between July and September, though we are fortunate that they are infrequently encountered at NCTC. Red, itching dots along your waistband or under the elastic areas of your socks are clues that you may have become part of their food chain. They do not burrow into your skin, as is commonly believed, but instead the redness and inflammation are caused by an allergic reaction to their digestive enzymes. Exposure to ticks and chiggers can be minimized by wearing long pants tucked into socks or boots, and taking a shower soon after spending time in their favored habitats.

**Snakes** – NCTC is potential habitat for copperheads and rattlesnakes, and they are found in the region typically along bluffs and ridges, but neither species has been officially documented here on the NCTC property. Historically a spring nearby was called Rattlesnake Spring, though given that many people call just about any snake a copperhead or rattlesnake, even this reference may be a case of overwrought imagination on the part of someone in the 1830s.

**Poison Ivy** – the most common form here is a vine winding up a tree trunk, though you can also find it as a small woody-stemmed plant about knee high mixed in with other forbs, grasses, and shrubs. The plant is relatively uncommon at NCTC. Watch for a grayish, hairy vine, perhaps with white berries. In summer the leaves will be in 3's, with a characteristic waxy looking sheen. The tell-tale symptoms of skin bubbling and intense itching may not show up for several days after exposure, depending on your level of reaction to the irritant. The skin irritant is urushiol, an oil which can be cleaned off with commercial products such as TecNu, or with other products that break down oils (unfortunately soaps don't seem to work effectively for many people – washing your hands with a mild soap may only serve to spread the oil around, depending on the level of reaction you have to the irritant; note that the active ingredient of TecNu, is paint thinner).